

CLASS 137, FLUID HANDLING**SECTION I - CLASS DEFINITION**

This is the residual class for fluid material handling, and takes processes, systems, combinations, subcombinations and certain elements pertaining thereto not otherwise classified.

Fluid materials include gas and liquids primarily, but the handling of other flowable materials, as fluent granular solids, is also found.

Handling for this class comprises the transfer of fluent material by flow, as by confining, directing, causing and/or controlling the flow, and includes making the material available for flow or separating a smaller from a larger body of fluid material, as by tanks, containers, receivers, traps, etc., or pipes or conduits, with or without siphons, pumps, pressure or displacing fluids or other flow imparting means.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

The class is divided into two groups, subclasses 1+ for processes, and subclasses 38 to 616 for automatic or condition change responsive devices, special types and combinations of the necessary elements of the class with the subject matter of other classes or with features added to perfect the operation of the material handling means, and the more complex devices of the class generally grouped under the title "systems." Class 251, Valves and Valve Actuation, provides for valves and valve actuation not otherwise classified. Subclasses 777 to 802 comprise subcombinations and elements pertaining to fluid handling not particularly related to any of the special types and not otherwise classified.

Automatic or condition change responsive systems and devices of this class are discussed more at length in (1) Automatic Control below, (2) Plural Valves, and (3) Valve Actuation.

(1) AUTOMATIC CONTROL

Devices and systems in which the presence or absence of, or a change in, a condition is sensed and control exercised as a result thereof are commonly called automatic, and in this class form the basis of a number of "special type" and general categories.

Line condition change response refers to control exer-

cised over the material being handled in the system as a result of a change in the condition of that material, as temperature, quantity, pressure or rate of flow. Condition change response does not include the mere fact of flow or those fluid pressure operated devices where change does not affect the operation of the device, nor those where the flow is changed by external means for the purpose of causing operation of the control means or with that result.

Combinations of an automatic valve with a nonautomatic valve have been excluded for line condition change responsive groupings because the system comprising such combinations is not primarily automatic.

Fluid actuated or retarded valves which have not been considered automatic even though they depend on the presence of fluid flowing in the line, and have been classified in the following subclasses in Class 251; are (1) fluid actuated valves with compulsory cut-off after a flow period (subclasses 15+), (2) dash-pot or fluid controlled timers and retarders for valves, operating fluid for which is derived from the line controlled (subclasses 50+).

The following groups of subject matter in this class are wholly or partly of automatic or closely related types. In each instance the search notes in the definitions of the particular subclasses referenced in Subclass References of the Current Class, below, should be consulted for related art.

Atmospheric

Boiler (see temperature)

Combustion (see temperature)

Discriminating Valves (see level response).

Failure Responsive and Testing Devices

Freeze (see Temperature).

Heating (see Temperature)

Inertia or Position Change

Level Response or Maintenance, Floats, Gravitating Tanks, including: (A) By pressure connection at liquid level; (B) By gravitating vessel; and (C) By floats - This class is the generic place for floats, per se, and systems controlled by floats are classified in various appropriate groups, the subclasses in Subclass References to the

Current Class provide especially for float control or operation.

Line Condition Change Response - See the definition, second paragraph of this section, and listings under Plural heading below

Periodic or Cyclic

Plural - For a discussion of plural valves as such, see following section (4). In this category, plural flow controllers, valves, or condition responsive means may be (A) plural valves controlling different flows, (B) plural valves controlling the same flow, (C) one valve responding to changes in plural conditions, or (D) plural valves each responding to a different condition change. Subclass References to the Current Class includes subclasses references to the following: (1) Plural Flows; (2) Plural Condition Responses; (3) Plural Controls, One Condition Responsive -Where the controls are separate valves controlling the same flow and one is not automatic or line condition responsive the patent is excluded from line condition responsive categories. See section 2, definitions. Such patents may appear in the earlier special type groups of subclasses, however:

Pressure Modulating

Pump

Safety cut-offs - For resetting operations see (3) Manual Control, Resetting, and Adjusting Devices, especially the subclass references to Cut-offs With Resetting.

Speed Responsive Control

Temperature. (See Boiler, Combustion)

(2) PLURAL VALVES

Control means for plural flow paths comprising a single movable body having plural seats or plural port obstructing positions have been classified as multiway valve units in subclasses 625+. Valves associated with dispensers have been classified in Class 222, Dispensing. See especially the Search Notes in the appropriate subclasses of these classes and in the main class definitions, as well as the Search Notes to the subclasses listed below.

In Class 137 devices for controlling plural flows have been regarded as comprising a system (1) if additional flow confining means was claimed to a greater extent than as a mere mounting for the valves, (2) if some defi-

nite significant relation between fact of flow and/or the direction of flow in the plural flow paths exists, or (3) if one or more conduits or passages have two or more valves or cut-off devices which function to control the flow of the fluid by means of the valves. Some plural flow path controls of various automatic or condition change responsive types are also found in the earlier subclass groups, but on that basis rather than as systems in and of themselves.

Plural valves having a common means for simultaneous or alternating actuation, are for the most part in appropriate subclasses under subclass 561. Some valves, because of motor or complex mechanical actuation, have been classified in Class 251, Valves and Valve Actuation, under the type of actuation.

For plural automatic or condition responsive valves, see (1) Automatic Control, "Plural Condition Responses", above and the associated references in Subclass References to the Current Class.

For plural valves, one automatic or condition responsive and one or more mechanically or manually actuated, see section for Automatic Control, Plural Controls, "One Condition Responsive", above and the associated references in Subclass References to the Current Class.

(3) MANUAL CONTROL, RESETTING AND ADJUSTING DEVICES

See section for Automatic Control, Plural Controls, One Condition Responsive, above for notes on manual control of valves which are also condition responsive and for manual valves combined with automatic or condition responsive valves.

The term "manual" in some instances includes nonautomatic valve actuation of other types, as by mechanical movements or even motors.

The term "control" or "actuation" as applied to the operation of valves does not include the resetting of valves which are either condition responsive or trip actuated to move from a preset position and which do not return to that position when the operating force is removed or reversed, but require intervention of an external independent agency to restore them to their set position. Mere adjustment of bias, spacing, seating or actuator connection of a valve is not included in these terms.

(A) Flow Control or Valve Actuation - See references to (1) Automatic Control, "Plural Controls, One Condition Responsive", for manual and automatic actuation of

valves, and also (2) "Plural Valves," for plural valves, including actuation.

(B) Cut-Offs with Resetting - Also see references to (1) Automatic Control, "Safety Cut-offs."

(C) Adjustment

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

2+, for processes of controlling a flow by condition or characteristic of a fluid, especially subclasses 3+ for mixture control. (Automatic Control - Line Condition Change Response).

3+, processes of mixing plural fluids of diverse characteristics or conditions. (Automatic Control - Plural Flows).

6, processes of mixing controlled by heat of combustion of mixture. (Automatic Control - Combustion).

8, processes for producing uniform flow. (Automatic Control - Pump).

13, processes for affecting flow by the addition of energy (Automatic Control - Pump).

11, Processes of regulating boiler feed water level. (Automatic Control - Boiler).

11, processes of regulating boiler water level. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks).

10, processes of flow control by speed of fluid. (Automatic Control - Speed Responsive Control).

13, processes of affecting flow by the addition of heat. (Automatic Control - Temperature).

38+, for change of altitude as reflected by change in air pressure, see subclass 81. (Automatic Control - Inertia or Position Change).

39, control by change of position or inertia of system with second control. (Automatic Control - Plural Controls, One Condition Responsive).

39, control by change or position or inertia of system with second control. (Automatic Control - Plural Condition Responses).

40+, marine governors. (Automatic Control - Combustion).

49, speed responsive valve control with manual control. (Automatic Control - Plural Controls, One Condition Responsive).

76, and 77, heat destructible or fusible control elements with external closing means. (Automatic

Control - Plural Controls, One Condition Responsive).

80, atmospheric temperature change responsive control with additional diverse control. (Automatic Control - Plural Controls, One Condition Responsive).

41, float controlled marine governors. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).

47+, speed responsive valve control. (Automatic Control - Speed Responsive Control).

43, vent closing in overturned containers. (Automatic Control - Safety cut-offs).

50, and 57, excess speed responsive controls. (Automatic Control - Safety cut-offs).

50, and 51+, speed responsive control with other condition responsive valve control. (Automatic Control - Plural Condition Responses).

50, and 57, excess speed cut-offs. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).

52, speed responsive valve control with governor drive failure control. (Automatic Control - Failure Responsive and Testing Devices).

59+, freeze condition responsive safety cut-off. (Automatic Control - Temperature).

65+, combustion failure responsive safety cut-offs for burners. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).

65+, combustion failure responsive fuel safety cut-offs for burners. (Automatic Control - Boiler).

65+, combustion failure responsive fuel safety cut-off for burners. (Automatic Control - Temperature).

65+, combustion failure responsive fuel safety cut-offs for burners. (Automatic Control - Combustion).

65+, combustion failure responsive fuel safety cut-off for burners. (Automatic Control - Safety cut-offs).

65+, combustion failure responsive cut-off for burner fuel. (Automatic Control - Failure Responsive and Testing Devices).

67+, frangible, soluble, deformable or fusible control elements, the failure of which caused operation of safety means. (Automatic Control - Failure Responsive and Testing Devices).

67+, destructible or deformable element control, especially subclasses 72+, heat destructible or fusible. (Automatic Control - Combustion).

72+, heat destructible or fusible element control. (Automatic Control - Temperature).

73,	heat destructible of fusible element control with second sensing means. (Automatic Control - Plural Condition Responses).		
75+,	heat destructible or fusible safety cut-offs. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).	129,	163, 190, 401, and 404, sinking or bucket type floats. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By gravitating vessel).
80,	atmospheric temperature change responsive control with additional diverse control. (Automatic Control - Plural Condition Responses).	120,	161, 162+, 189, 402, and 403+, especially subclass 408, gravitating tanks. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By gravitating vessel).
82+,	pressure modulating relays or followers. (Automatic Control - Pressure Modulating).	120,	and 122, filling successive tanks by float controlled receiver. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
98+,	self-proportioning flow systems. (Automatic Control - Plural Condition Responses).	129,	sinking float operated siphons. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
75+,	heat destructible or fusible safety cut-off elements. (Automatic Control - Safety cut-offs).	129,	163, 190, 401, and 404, for sinking or bucket type floats: see level response. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
78+,	for atmospheric condition change responsive controls. (Automatic Control - atmospheric).		
79+,	atmospheric temperature change responsive control. (Automatic Control - Temperature).		
87.01+,	plural flows. (Automatic Control - Line Condition Change Response).	131,	float controlled discharge from a siphon to a receiver. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
87.01+,	self-proportioning or correlating systems. (Automatic Control - Plural Flows).	132+,	periodic or accumulation responsive siphon discharge. (Automatic Control - Periodic or Cyclic).
88+,	apparatus for controlling mixtures. (Automatic Control - Line Condition Change Response).	133,	periodic siphons with manual control. (Automatic Control - Plural Controls, One Condition Responsive).
96+,	control of pump-motive fluid by level of pumped liquid. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks).	135,	float operated inlet for siphons. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
98+,	self-proportioning flow systems. (Automatic Control - Line Condition Change Response).	137,	for float operated vents for trapped air in a siphon. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
90,	mixture condition maintaining or sensing by temperature or heat content. (Automatic Control - Temperature).	154+,	diverse fluid containing pressure systems, especially subclass 155, gas lift valves for wells, 180, 183, 199, 204, 213+. (Automatic Control - Line Condition Change Response).
94,	fuel controlled by boiler or water system condition. (Automatic Control - Temperature).	154+,	155, 156+, for diverse fluid containing pressure systems which repeatedly discharge gas and/or liquid upon accumulation thereof. (Automatic Control - Periodic or Cyclic).
94,	fuel controlled by boiler or water system condition. (Automatic Control - Boiler).		
94,	fuel controlled by boiler or water system condition. (Automatic Control - Combustion).		
101.25+,	for self-proportioning systems with liquid level sensing means. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks).	154+,	diverse fluid containing pressure systems, especially subclasses 156+, gas pressure discharge of liquid feed traps to receivers under pressure and 173+, plural discriminating outlets for diverse fluids in pressure systems. (Automatic Control - Plural Flows).
103+,	vacuum or suction pulsator type systems. (Automatic Control - Periodic or Cyclic).		
106,	reversing or 4-way valve systems. (Automatic Control - Periodic or Cyclic).		
109+,	self-controlled branch flow systems. (Automatic Control - Line Condition Change Response).		
115.03+,	by-pass or relief responsive to change in rate or main line flow in self-controlled branch systems. (Automatic Control - Speed Responsive Control).	156+,	gas pressure discharge of liquid feed traps to boilers. (Automatic Control - Boiler).

- 158, gas pressure discharge of liquid feed trap controlled by level in boiler or receiver. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By pressure connection at liquid level).
- 169, manual control of gas pressure in discharging liquid feed traps to boilers. (Manual Control, Resetting And Adjusting Devices - Flow Control or Valve Actuation).
- 171+, fluid separating traps or vents. (Automatic Control - Boiler).
- 171+, accumulation responsive fluid separating traps and vents. (Automatic Control - Periodic or Cyclic).
- 163, 165+, 185+, 192+, and 202, for float control in diverse fluid containing pressure systems. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
- 171+, fluid separating traps and vents. (Automatic Control - Discriminating Valves).
- 173+, plural discriminating outlets for diverse fluids in pressure systems. (Automatic Control - Plural Condition Responses).
- 183+, 199+, for accumulation responsive gas pressure discharge of liquid feed traps to receivers under pressure. (Automatic Control - Periodic or Cyclic).
- 184, plural successively opened discriminating fluid responsive valves for liquid in diverse fluid containing pressure systems. (Automatic Control - Plural Condition Responses).
- 185+, for gas collecting floats, e.g., inverted bucket type. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
- 213+, liquid level responsive gas vent or whistle. (Automatic Control - Boiler).
- 213+, liquid level responsive gas vent or whistle. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By pressure connection at liquid level).
- 215+, back flow prevention by vacuum breaking. (Automatic Control - Line Condition Change Response).
- 214, high and low level responsive gas vents or whistles for diverse fluid containing pressure systems. (Automatic Control - Plural Condition Responses).
- 218, back flow preventing air vent in liquid line with coacting valve in liquid flow path. (Automatic Control - Plural Condition Responses).
- 220, line condition change responsive valves of the Lerner-Johnson type. (Automatic Control - Line Condition Change Response).
- 223+, tire filling chuck and stem type connectors. (Automatic Control - Plural Controls, One Condition Responsive).
- 224+, pressure-responsive pressure-control means for tire inflation devices. (Automatic Control - Pump).
- 226, coaxial inflation and relief valves for tire inflation with pressure-responsive pressure-control means. (Automatic Control - Plural Condition Responses).
- 229, selectively connected gauge and inflow or relief passages in tire inflation devices. (Plural Valves).
- 230, stem attached relief valves for tires. (Automatic Control - Line Condition Change Response).
- 238+, steam sterilizing. (Automatic Control - Temperature).
- 255+, plural tanks or compartments with parallel flow. (Plural Valves).
- 270 through 270.5, for a convertible unit orientable in a single location between plural positions.
- 271, for convertible units interchangeable between alternate locations.
- 274, 286+, 614+, and 616, valve actuators comprising movable flow pipes. (Manual Control, Resetting And Adjusting Devices - Flow Control or Valve Actuation).
- 285, 299 and 300, serial valves in hydrants. (Plural Valves).
- 289, balanced valves in hydrants. (Plural Valves).
- 290, 291+, and 298, hydrant valve actuators. (Manual Control, Resetting And Adjusting Devices - Flow Control or Valve Actuation).
- 297, hydrant casing with heater. (Automatic Control - Temperature).
- 301+, hydrant protection against freezing. (Automatic Control - Temperature).
- 309+, regenerative furnace type reversing valves. (Automatic Control - Combustion).
- 309, regenerative furnace type reversing valves. (Plural Valves).
- 310, regenerative furnace type reversing valves with cooling means. (Automatic Control - Temperature).
- 334+, heating or cooling of fluid handling systems. (Automatic Control - Temperature).
- 334+, heating, especially subclasses 335+, burner type. (Automatic Control - Combustion).
- 345+, locomotive associated systems. (Automatic Control - Combustion).
- 344+, heating, especially subclasses 335+ burner type. (Automatic Control - Boiler).

346,	locomotive boiler or steam dome associated systems. (Automatic Control - Boiler).	479+,	combustion engine induction type governors. (Automatic Control - Combustion).
386+,	liquid level responsive or maintaining systems. (Automatic Control - Boiler).	457,	safety cut-offs responding to thermal conditions and requiring resetting. (Automatic Control - Temperature).
389,	liquid level responsive systems with a second diverse control. (Automatic Control - Plural Condition Responses).	458,	and 459+, line condition change responsive valves of the safety cut-off type responding to velocity or rate of flow. (Automatic Control - Speed Responsive Control).
390,	liquid level responsive systems with manual control. (Automatic Control - Plural Controls, One Condition Responsive).	458,	safety cut-offs responsive to both high and low pressure or velocity. (Automatic Control - Plural Condition Responses).
391,	control of both inflow and outflow of a tank by liquid level responsive means. (Automatic Control - Plural Condition Responses).	482,	combustion engine induction type. (Automatic Control - Plural Condition Responses).
393,	liquid level control or maintenance. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By pressure connection at liquid level).	493,	line condition change responsive valves of the bidirectional type governor with suction compensator. (Automatic Control - Plural Condition Responses).
396+,	for self-emptying tanks responsive to level of accumulated liquid. (Automatic Control - Periodic or Cyclic).	456+,	line condition change responsive safety cut-off valves requiring resetting. (Automatic Control - Safety cut-offs).
397,	398+, 401, 404, and 409+, for float control in liquid level responsive or maintaining systems. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).	455+,	line condition change responsive valves, especially 469+, pop valves. (Automatic Control - Boiler).
399,	low level safety cut-off of tank outflow. (Automatic Control - Safety cut-offs).	486+,	for pilot or servo-controlled valves responsive to change in rate of fluid flow. (Automatic Control - Speed Responsive Control).
399,	float operated low level safety cut-offs. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).	497+,	for valves with separate connected fluid reactor surface responsive to change in rate of fluid flow. (Automatic Control - Speed Responsive Control).
405,	oil burner fuel overflow preventing safety cut-offs operated by accumulated fluid weight. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).	468,	line condition thermal change responsive valves. (Automatic Control - Temperature).
405,	oil burner fuel overflow preventing safety cut-offs operated by weight of accumulated fuel. (Automatic Control - Combustion).	482,	combustion engine induction type governor with suction compensator. (Automatic Control - atmospheric).
436+,	float arm operated valves with restrictors, e.g., silencers. (Automatic Control - Plural Controls, One Condition Responsive).	455+,	line condition change responsive valves. (Automatic Control - Line Condition Change Response).
456+,	line condition change responsive safety cut-offs requiring resetting. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).	506,	and 512+, plural line condition change responsive valves. (Automatic Control - Plural Condition Responses).
475+,	pop valve with adjustable choke (Automatic Control - Plural Controls, One Condition Responsive).	522+,	for safety valves with testing means. (Automatic Control - Failure Responsive and Testing Devices).
481,	combustion engine induction type governor with manual modifier. (Automatic Control - Plural Controls, One Condition Responsive).	524,	for a valve (i.e., check valve, etc.) that directly responds to a change in line condition having a bias adjustment indicator.
495,	line condition responsive valves with a separate connected fluid reactor surface and manual or external control for the valve. (Automatic Control - Plural Controls, One Condition Responsive).	530,	for a reciprocating valve (i.e., check valve, etc.) that directly responds to a change in line condition having a bias fixed or adjusted by a cam.
		531,	for a reciprocating valve (i.e., check valve, etc.) that directly responds to a change in line

- condition having a bias fixed or adjusted by varying its lever.
- 533+, position or extent of motion indicators for fluid handling apparatus. (Manual Control, Resetting And Adjusting Devices - Adjustment).
- 571+, plural tanks or compartments connected for serial flow. (Plural Valves).
- 583, systems with plural openings, one a gas vent or access opening. (Plural Valves).
- 586, access opening interlock with outlet valve actuator. (Manual Control, Resetting And Adjusting Devices - Flow Control or Valve Actuation).
- 595, 601, 607, 609, 888+, and 896+, plural valves with common operator in plural flow paths, either separate or branching. (Plural Valves).
- 596, stop and waste systems. (Plural Valves).
- 598, hill holders for hydraulic brake lines. (Automatic Control - Plural Controls, One Condition Responsive).
- 606, and 861+, flow control means for plural flows in distribution systems. (Plural Valves).
- 613+, distribution systems comprising a single flow path with plural serial valves and/or closures. (Plural Valves).
- 622+, multiple valve type fluid distributors for plural chamber servo motors. (Plural Valves).
- 624.11+, for timer controlled flow. (Manual Control, Resetting And Adjusting Devices - Flow Control or Valve Actuation).
- 624.22, for time cam-operated trips. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).
- 625+, multiway valve units. (Plural Valves).
- 624.14, for self-cycling flows. (Automatic Control - Line Condition Change Response).
- 624.27, for line condition change responsive release of valve. (Automatic Control - Line Condition Change Response).
- 625.61+, for variable orifice modulator for pilot valve of supply and exhaust valve. (Automatic Control - Plural Controls, One Condition Responsive).
- 624.13+, for repeating cyclic control. (Automatic Control - Periodic or Cyclic).
- 251, Valves and Valve Actuation, subclasses 16+ for main line cut-off after flow period reset by operation of serial main valve. (Automatic Control - Safety cut-offs).
- 251, Valves and Valve Actuation, subclasses 12+, for fluid actuated or retarded valves, especially subclasses 15+ for compulsory cut-off after flow period, and subclass 50 for line pressure connected chambers for retarding or timing valves. (Automatic Control - Line Condition Change Response).
- 251, Valves and Valve Actuation, subclass 11 for buoyancy motor actuators for valves. (Automatic Control - Level Response or Maintenance, Floats, Gravitating Tanks, By floats).
- 251, Valves and Valve Actuation, subclass 27 for servo failure responsive control of a fluid servo operated valve and 69, for electrical trip actuated valves with trip operation on failure of electric power. (Automatic Control - Failure Responsive and Testing Devices).
- 251, Valves and Valve Actuation, subclasses 16+ for serial main line cut-off and manual valves, the cut-off operating after a predetermined flow and being reset only by closing the serial manual or mechanically operated valve; subclass 117 for valve and restrictors in parallel flow passages; subclasses 118+ for valves and serial restrictors; subclasses 129+ for valve actuators comprising plural solenoids, which may operate separate valves; and 281+ for balanced valves. (Plural Valves).
- 251, Valves and Valve Actuation, subclass 3, for pattern tracer controlled actuators; subclass 11, for heat or buoyancy motor actuators; subclass 12+, for fluid actuators or retarder.; subclass 64, for nonfluid retarder.; subclass 65, for permanent magnet actuators.; subclass 66, for biased trip actuators; subclass 75, for snap action actuators.; subclass 76, for impact type actuators; subclass 77+, for actuators with lost motion.; subclass 89, for means for holding an actuator in set position; subclass 128 and 335, for seals for actuator connecting means; subclass 128 and 291+, for detachable actuators; subclass 129+, for electrical actuators; subclass 149+ and 149.8, for valves operated by conduit motion; subclass 213+, for mechanical movement actuators; subclass 289, for actuation from plural position.; subclass 290, for plural neutral positions of an actuator; subclass 293, for actuator extensions; subclass 294, for flexible actuators; subclass 295, for pedal actuators; subclass 339, for actuators extending through

SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 11 for heat motor actuators for valves. (Automatic Control - Temperature).

- fluid flow path; subclass 340, for actuators surrounding flow pipes; subclass 341 and 349, for valve actuators wherein part of the valve body is movable. (Manual Control, Resetting And Adjusting Devices - Flow Control or Valve Actuation).
- 251, Valves and Valve Actuation, subclasses 15+, for fluid actuated valves with compulsory cut-off after a flow period; 48+, for fluid retarders or timers for valves; subclasses 64+, for non-fluid retarders for valves; 66+, for biased trip valve actuation. (Manual Control, Resetting And Adjusting Devices - Cut-Offs with Resetting).
- 251, Valves and Valve Actuation, subclass 35 for a valve actuated or retarded by a fluid type servomotor having a choke passage that varies according valve position, subclass 42 for a fluid actuated or retarded valve having choke passage pressure type servomotor including an adjustable opening limit for a main valve, subclass 60 for a fluid actuated or retarded valve having an adjustable limit stop, subclasses 84-88 for valve heads movable connected for accommodation to seat, subclasses 120-122 for a valve having a movable or resilient material guide or restrictor, subclass 233 for a valve having a variable leverage lever actuator that is adjustable during operation or subclass 234 for a valve having an adjustable leverage lever.
- 417, Pumps, for pumps, per se. For distinction of the line between Classes 137 and 417, see the class definition. (Automatic Control - Pump).

SECTION V - GLOSSARY

SPECIAL TYPE CATEGORIES

Those comprising a group of related patents directed toward solving a problem in one specific field of activity, which have been classified on the basis of and under a title reflecting that activity rather than on a generalized basis. Examples of special type categories are 94, Fuel controlled by boiler or water system condition; 108, Pump unloader type (indented under Self-proportioning or correlating systems).

SYSTEM

A term applied to any apparatus of the class which comprises more than a single flow path and/or a single valve unit. It may include only an unvalved branched flow path or a single flow path having two or more valve

units. In some instances subcombinations or elements having special utility in the combination and having no other classification have been included in the group of subclasses pertaining to the system, as subclasses 777-802, Expansible Chamber Devices.

VALVES AND VALVE ACTUATION

The term "valve unit," as used above, is applied to either a single or multiway valve. In the multiway type plural passages are controlled by valve means having plural flow closing areas or points, but the entire means is housed in a single casing or organized as a body or unit. Valve units as such are classified in subclasses 625+. The class also provides for some valve units under the special titles. Radiator vent check valves, Reversing cokes and valves, Flush or water closet valves, Drain valves, Float valves, Temperature operated cut-off valves, Safety valves, and certain analogous types. The class also takes valves combined with other structure, as the tire inflation type combined with or adapted for connection with inflation means and/or the inflatable article. Class 251, Valves and Valve Actuation provides for valves combined with certain actuators, particularly the fluid and electric motors and the more complex mechanical movement actuators.

The term "Valves" includes variable restrictors, which frequently cannot be distinguished as claimed, and have been set apart only in certain subclasses having the term restrictor or choke in the title, as subclasses 436+, and 475+, primarily because of their special function as silencers. Closures are also frequently indistinguishable from valves, particularly as used and claimed in fluid handling systems. In some instances they have been classified with valves, as in subclasses 613+, Single flow path with plural serial valves and/or closures and Class 251, Valves and Valve Actuation, provides for restrictors or flow guides in subclasses 118.01+.

SUBCLASSES

1 PROCESSES:

This subclass is indented under the class definition. Processes.

- (1) Note. All patents containing method claims drawn to the method of operation of any of the systems or parts thereof involved in the class are included in this and the indented subclasses, but methods of making parts of the system are not included. They will be found in the subclass providing for the system or part.

- (2) Note. This subclass includes, for example, methods of operation of speed regulators for prime movers, valves, fluid motors; methods of developing fluid pressures by series parallel combinations of pumps, tanks or pipes; methods for affecting fluid flow by using pipe sections of varying diameter or joined at critical angles, or by slugging.

SEE OR SEARCH CLASS:

- 166, Wells, subclasses 244.1+ for process of flowing or treating a well; and particularly subclasses 373+ for a method of operating a valve, closure, or changeable restrictor in a well wherein some significant manipulative step regarding the well is recited.
- 210, Liquid Purification or Separation, subclasses 606, 631, 632, 639, 663+, 696+, 702+, and 749+ for a process comprising the step of adding a chemical to a liquid with treatment of the liquid.
- 222, Dispensing, subclass 1 for processes of dispensing.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotographic device.
- 414, Material or Article Handling, subclasses 800+ for a process of material or article handling.

2 With control of flow by a condition or characteristic of a fluid:

This subclass is indented under subclass 1. Processes in which one or more conditions or characteristics of a fluent material are determined and used to control the system in such a manner as to cause delivery of controlled quantities of a fluent material at a part of the system.

- (1) Note. See the main class definition, for collected search notes on automatic fluid handling devices of this and related classes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 455+, for line condition change responsive valves, and see the search notes to subclass 455.

3 Mixing of plural fluids of diverse characteristics or conditions:

This subclass is indented under subclass 2. Processes in which two or more fluent materials of different conditions or characteristics are mixed and the determined condition or characteristic may be taken from any or all the fluent materials and used to control the quantitative flow in any or all the branches or in the mixed channel.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 87.01+, for self proportioning or correlating systems, especially subclasses 88+ for those involving mixture condition maintaining or sensing.

4 Controlled by consistency of mixture:

This subclass is indented under subclass 3. Processes in which the determined condition is the consistency of the mixture.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 92, for systems for mixture condition maintaining or sensing by viscosity or consistency.
- 467.5, for line consistency responsive flow controller.

5 Controlled by conductivity of mixture:

This subclass is indented under subclass 3. Processes in which the determined condition is the conductivity of the mixture.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 93, for systems for maintaining or sensing a mixture condition by optical or chemical properties.

6 Controlled by heat of combustion of mixture:

This subclass is indented under subclass 3. Processes in which the determined condition or characteristic is the heat of combustion of the mixture.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

90, for systems of mixture condition maintaining or sensing by temperature or heat content.

SEE OR SEARCH CLASS:

431, Combustion, subclass 12 for a process of combustion involving the control or proportioning of burner feed.

7 Controlled by pressure:

This subclass is indented under subclass 3. Processes in which the determined condition or characteristic is a pressure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

87.01+, for self-correlating or proportioning flow systems controlled by the pressure in one or more flow lines or branches.

8 For producing uniform flow:

This subclass is indented under subclass 2. Processes in which one or more characteristics or conditions of a fluent material is determined and used to control the system in such a manner as to cause a uniform flow of a fluent material through a part of the system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

494+, particularly subclasses 505+ for pressure regulators having a separate connected reactor service.

517+, for direct response condition change controlled valves of the pressure regulating type, and see the search notes to subclass 517.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 55 for dispensers which maintain a constant weight, volume or pressure by means controlled by the output.

9 For producing proportionate flow:

This subclass is indented under subclass 2. Processes in which one or more conditions of a fluent material is determined and used to produce or control the flow of a fluent material at a part of the system, which flow is regulated by

the condition or conditions sensed so as to vary proportionally therewith.

(1) Note. The flow in which the condition is sensed may be the controlled flow or a different flow.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

82+, for pressure modulating relays or followers, per se.

98+, for self-proportioning flow systems.

109+, for self-controlled branched flow systems.

10 By speed of fluid:

This subclass is indented under subclass 2. Processes in which the condition or characteristic determined is the speed of the fluent material of the system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

497+, for line condition responsive valves which are responsive to a change in the rate of fluid flow, and see the search notes to subclass 497.

11 For regulating boiler feed water level:

This subclass is indented under subclass 2. Processes in which one or more conditions or characteristics of a fluent material is determined and used to control the flow of boiler feed water.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

94, for fuel control devices for boilers responsive to boiler or water system conditions.

156+, for gas pressure discharge of liquid feed traps to boilers.

386+, for liquid level responsive or maintaining systems.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclasses 451+ for boiler feeders combined with boilers, and subclasses 412+ for boiler feed heaters.

12 By fluid pressure:

This subclass is indented under subclass 2. Processes in which the condition or characteristic which is determined is a fluid pressure and the determination is used to cause delivery of controlled quantity of a fluent material at a part of the system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 7, for processes of mixture control depending on pressure sensing.
- 455+, for line condition change responsive valves, and see the search notes to subclass 455.

12.5 Carbonated beverage handling processes:

This subclass is indented under subclass 1. Processes for handling potable liquids which are impregnated with gas.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 154+, for systems which contain, under pressure, a plurality of diverse type fluids, as gas and liquids, and especially 170.1+ for apparatus for controlling foam in handling such liquids, and 206+ for gas pressure storage over or displacement of liquids in such systems.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 1 for dispensing methods and subclasses 394 and 396 to 402 for apparatus for dispensing liquids under fluid (gas) pressure.
- 426, Food or Edible Material: Processes, Compositions, and Products, appropriate subclasses, especially 474+ for process involving gas-liquid contact including preparation of carbonated beverages.

13 Affecting flow by the addition of material or energy:

This subclass is indented under subclass 1. Processes in which the flow of fluent material is facilitated by the addition of material which affects the flow characteristics of the fluent material, or by the application of heat or other forms of energy.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 3, for processes of mixing plural fluids with automatic control.
- 88+, for automatic mixture condition maintaining by the addition of materials, etc.
- 334+, for fluid handling means combined with heating means, and see the search notes thereto.
- 565.01+, for distribution systems comprising pumps, and see the search notes thereto.
- 803+, for a pure fluid device or system capable of performing the process of this subclass (13).

SEE OR SEARCH CLASS:

- 208, Mineral Oils: Processes and Products, subclass 370 for miscellaneous treatments of mineral oils during transportation.
- 507, Earth Boring, Well Treating, and Oil Field Chemistry, subclass 90 for compositions for preventing contaminant deposits in petroleum oil conduits and methods of preventing such deposits involving no significant manipulative steps.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically supe-

rior provision in the USPC for the specifically claimed art.

- 520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 175 for a composition containing a synthetic resin or natural rubber having utility related to improving drag reduction formation or systems which are effective for reducing the dynamic drag of a turbulent fluid in contact with a surface or to processes of preparing said composition.

14 Involving pressure control:

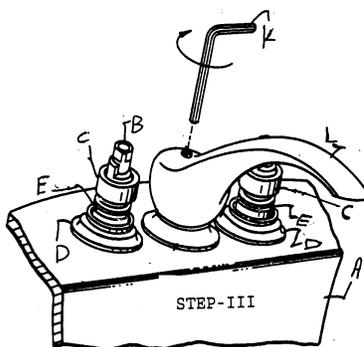
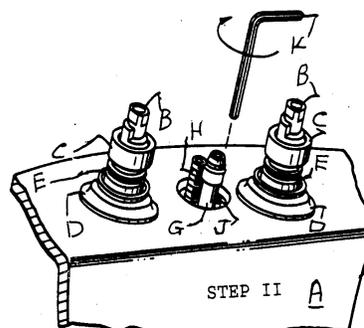
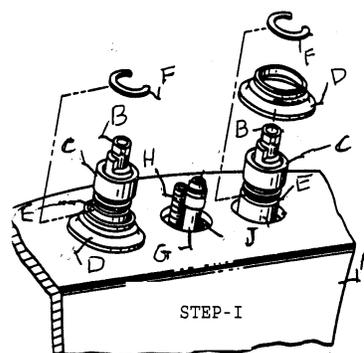
This subclass is indented under subclass 1. Processes in which the pressure of the fluent material is reduced for the purpose of facilitating handling of the material or avoiding damage to the equipment, or equalized with the pressure in another part of the system or a container to facilitate transfer of the fluent material or of control thereof, or regulated to maintain the pressure of the fluent material at a desired value.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 7, for processes of mixing fluids automatically controlled by pressure.
12, for processes for controlling the flow of material by sensing the pressure thereof.

15.01 Cleaning, repairing, or assembling:

This subclass is indented under subclass 1. Subject matter wherein the method comprises the removal of undesirable material from the system, restoration of the system or its component to a sound condition, or connecting together various components of the system.



Figures 1, 2, and 3: A typical example of the subject mattershowing various steps of assembling and mounting a faucet structure.A - Sink deck; B - Valve stem; C - Nut; D - Protective shield; E- Groove; F - 'C' clip; G - Spout tube; H - Spout bolt; J - Clampingscrew; K - Wrench; L - Draw spout.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

237 through 246.23, with cleaner, lubrication added to fluid or liquid sealing at a valve interface.

315.01 through 329.4, for a fluid handling system with repair, tapping or assembly means.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 402.01 through 402.21 for a method of mechanical repair.

166, Wells, subclass 277 for a process of repairing an object in a well, subclasses 311-312 for a process of cleaning or unloading a well or subclasses 378-380 for a process of assembling a well part.

15.02 Repairing or assembling hydrant (e.g., fire-plug, etc.):

This subclass is indented under subclass 15.01. Subject matter wherein the process of repairing or assembling is directed to a system having a discharge pipe including a valve and a spout, at which water may be drawn from a water main or water system.

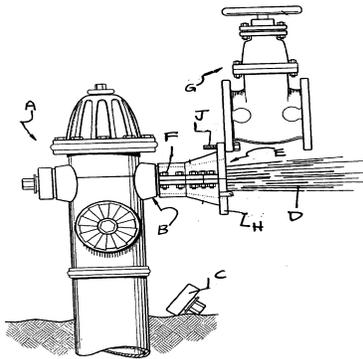


Figure 1: A typical example of the subject matter. A - Firehydrant; B - Nozzle; C - Cap; D - Jet of water; E - Nozzle expander bolted to 'B' by bolts 'F'; F - Bolts; G - Shutoff valve; H - Flange; J - Bolts secure to 'E' and 'G'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

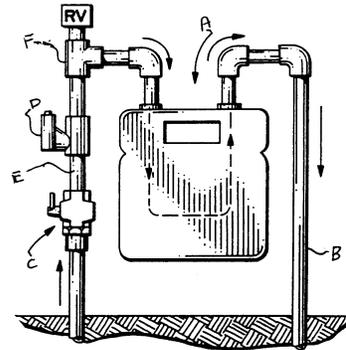
236.1, for a fluid handling distribution system involving a geographic feature.

272 through 308, for a hydrant type.

15.03 Gas or water meter repairing or assembling:

This subclass is indented under subclass 15.01.

Subject matter wherein the process of repairing or assembling is directed to an instrument for measuring and recording the quantity of combustible mixture used for commercial or industrial heating or for measuring and recording the quantity of water supplied for commercial or domestic use.



A typical example of the subject matter. Figure 1: A - Gasmeter; B - Outlet gas supply; C - Control valve; D - Regulator; E - Riser nipple; F - Relief valve.

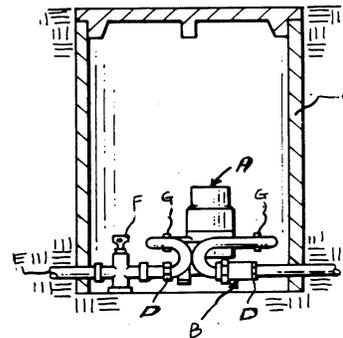


Figure 2: A - Water meter; B - Backflow prevention valve; C - Meter pit; D - Coaxial fitting; E - Fluid conduit; F - Flowcontrol valve; G - Fittings to facilitate meter mounting.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

364 through 371, for a static ground supported valve or meter well.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 97 through 99 for repairing of a pipe or tubular conduit.

15.04 Fluid cleaning or flushing:

This subclass is indented under subclass 15.01. Subject matter wherein the process of comprises injecting a pressurized gas, liquid, or a mixture of flowable solid and liquid through the system to eliminate or wash out the material from the system.

(1) Note. The liquid may contain a solid particle.

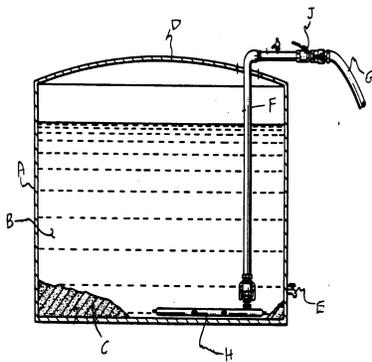


Figure 1: A typical example of the subject matter. A -Storage tank; B - Oil; C - Sludge (unwanted material); D - Tankroof; E - Loading valve; F - Riser; G - Pump hose (pressurized cleaning fluid); H - Bottom hose; J - Main valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

238 through 245.5, for a fluid handling system with a cleaning or steam sterilizing means.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclass 246.5 for a brushing, scrubbing, or general cleaning implement, device, or machine attached to a tank.

15.05 Liquid cleaning or flushing:

This subclass is indented under subclass 15.04. Subject matter wherein the process of washing out or eliminating the undesirable material

from the system is accomplished by use of a desirable material which is a fluid that is not in gaseous form.

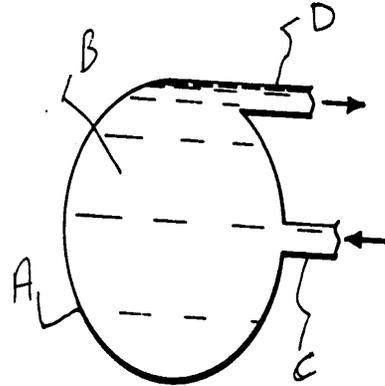


Figure 1: A typical example of the subject matter. Brake cylinder 'A' is filled with brake liquid 'B'. Inlet valve 'C' is provided for introduction of new brake liquid. The outlet valve 'D' is for removal of spent brake liquid due to purging.

SEE OR SEARCH CLASS:

134, Cleaning and Liquid Contact with Solids, subclass 22.12 for a process of cleaning the internal surface of a pipe, tubing, hose, or conduit with pressurized fluid or fluid manipulation, or subclass 40 for a process of removing oil, grease, tar, or wax by dissolving.

15.06 Valve or valve seat cleaning:

This subclass is indented under subclass 15.05. Subject matter wherein the flushing liquid is being passed through the body of a flow regulating device or around the circular ring or annular sealing surface used for resting or supporting the head of the device.

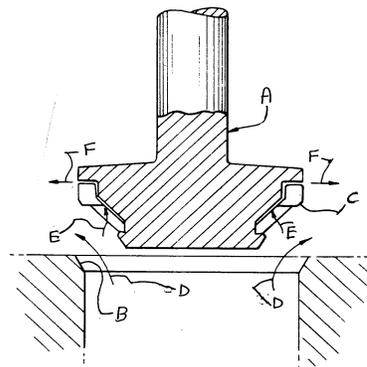


Figure 1: A typical example of the subject matter. A - Seatassembly; B - Valve seat; C - Replaceable gasket; D - Representswashing fluid being flushed; E, F - Path of washing fluid throughslots of gasket.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

246 through 246.23, for a fluid handling system with liquid supplied at a valve interface for sealing.

15.07 Mechanical cleaning (e.g., pig, etc.):

This subclass is indented under subclass 15.01. Subject matter comprising an internally movable element consisting of a brush, scraper, inflatable ring, or similar means used for removing undesirable material from the system.

(1) Note. The pig is an in-line scraper, brush, blade, cutter, or swab forced through a pipeline by fluid pressure to remove undesirable material.

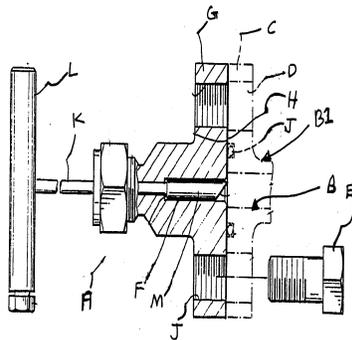


Figure 1: A typical example of the subject matter. A -Cleaning tool to clean 'B' of 'B1'; B - Axial bore; B1 - Manifoldbody; C - Manifold flange; D - Manifold opening for 'E'; E - Mountingbolt; F, G, H, J, K, L - Cleaning tool assembly; M - Cleaning memberwith sharp edge.

SEE OR SEARCH CLASS:

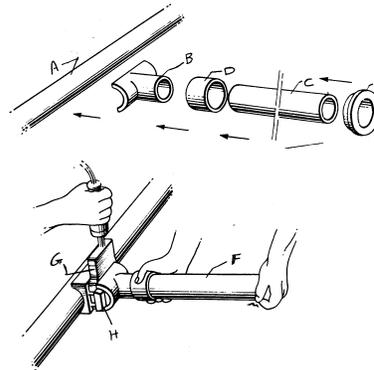
15, Brushing, Scrubbing, or General Cleaning, subclasses 3.5 through 3.52 for a machine with means to pass a solid cleaning agent and a fluid carrier through tubular work or subclasses 104.03-104.33 for a pipe, tube, or conduit cleaning implement, especially subclasses 104.05-104.33 for an

implement to clean inside a pipe, tube, or conduit.

138, Pipes and Tubular Products, subclass 93 for a pipe or conduit with an inflatable closure or plug.

15.08 Repairing, securing, replacing, or servicing pipe, joint, valve, or tank:

This subclass is indented under subclass 15.01. Subject matter wherein the process is directed to a tubular product, coupling, a flow regulating device, or a container or receptacle.



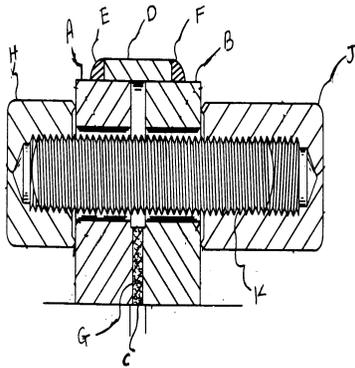
Figures 1and 2: A typical example of the subject matter. A- Supply main; B - Pipe saddle; C - Pipe conduit; D - Coupling;E - Flange adaptor; F - Coupled assembly; G - Standard tool; H -Control valve.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 97 through 99 for repairing of a pipe or tubular conduit.
 251, Valves and Valve Actuation, subclass 152 for a correlated flow line having a pipe coupling or union where a valve seat and coupling element is removable as a unit.
 285, Pipe Joints or Couplings, subclasses 18 through 40 for a pipe joint or coupling with assembly means or feature.

15.09 Including joint or coupling:

This subclass is indented under subclass 15.08. Subject matter wherein the significance is attributed to a union formed by two abutting pipes or ducts, an area at which two ends or edges of the pipe or duct are attached, or a device that serves to connect the ends of adjacent parts of a pipe or duct.



A typical example of the subject matter. Figure 1: COUPLING: A, B - Flanges; C - Gasket; D - Band; E, F - Welds; G - Seat; H, J - Sealing nuts; K - Bolt.

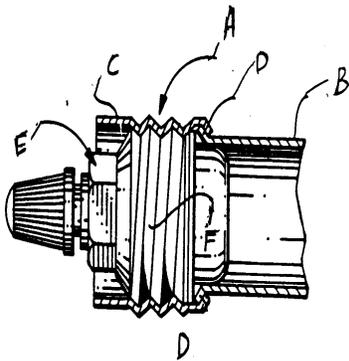


Figure 2: PIPE JOINT: A - Pipe Joint; B, C - Pipe; D - Internalsheff; E - Connector; F - Fitting.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclasses 509 through 513 for a method of assembling by deforming a part over an edge of a seated part or subclasses 525.01-525.15 for assembling or joining by applying separate fastener.
- 285, Pipe Joints or Couplings, subclasses 15 through 17 having repairing means, subclasses 18-40 with or having means to assemble or disassemble, or subclasses 363-368 for a flanged pipe joint having a packing.
- 403, Joints and Connections, subclasses 11 through 22 for a protector or broken part retainer with repair, assembly, or disassembly feature.

- 405, Hydraulics and Earth Engineering, subclasses 169 through 170 for assembling a line of pipe or cable in or from a marine environment.

15.1 HIGHSPEED FLUID INTAKE MEANS (E.G., JET ENGINE INTAKE):

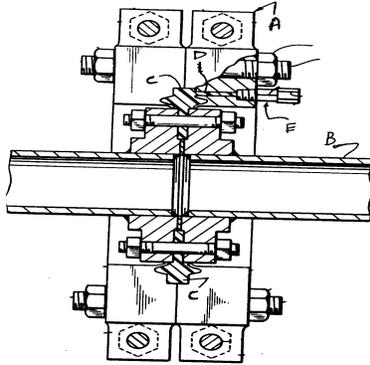
This subclass is indented under the class definition. Apparatus comprising intake means described for use in an ambient gaseous medium to gather a portion of that medium, said incoming medium moving at a relatively high speed with respect to the intake means, said intake means comprising a flow passage for the incoming medium, said flow passage disclosed as having at least (1), a portion which converges in the direction of flow or (2), a portion which diverges in the direction of flow or (3), an enlarged portion downstream of the intake end.

- (1) Note. Many of the patents herein disclose the intake means as being used to convert a portion of the kinetic energy of the incoming gas into static pressure energy.
- (2) Note. A claim to merely recite the wall structure of a tubular member, or to a mere tubular member with a restricting or baffle means for facilitating or restricting flow of fluid is classifiable in Class 138, Pipes and Tubular Conduits. For classification in Class 137, some additional fluid handling features must be claimed. See the reference to Class 137 under "SEARCH CLASS" in the definition of subclass 37 in Class 138.
- (3) Note. A claim with a nominal recitation of the apparatus to which the incoming gaseous medium is being delivered, (e.g., jet engine, pump), in combination with the intake means, does not preclude classification in Class 137.

15.11 Detecting or repairing leak:

This subclass is indented under subclass 15.08. Subject matter wherein the significance is attributed to discovering or determining presence or existence of a crack, crevice, or hole that usually by wear and tear or mishap allows gas or liquid to escape, and restoring to a sound condition by patching, applying, or injecting a

liquid, semi-liquid, or semi-solid material to prevent gas or liquid entry to or loss from a pipe, duct, container, or valving system.



A typical example of the subject matter. Figure 1: INJECTINGSEALANT: A - Leak repair clamp; B - Pipe line; C - Cavity for receivingsealant; D - Passage-way for sealant injection; E - Stopper plug.

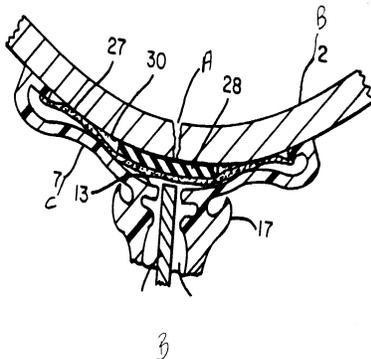


Figure 2: FLEXIBLE PATCH: A - Sealing leak; B - Pipe; C- Sealing patch.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

312 through 314, for leakage or drip collecting.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 402.09 through 402.17 for a method of repairing by attaching a repair preform (e.g., remaking, restoring, patching, etc.).

73, Measuring and Testing, subclasses 40 through 49.3 using fluid pressure to test or determine a leak.

228, Metal Fusion Bonding, subclass 119 for a process of repairing, restoring, or renewing a product for reuse.

285, Pipe Joints and Couplings, subclasses 13 through 14 for leakage or drip disposal including weep holes.

15.12 Tapping pipe, keg, or tank:

This subclass is indented under subclass 15.08. Subject matter wherein the significance is attributed to piercing an aperture or removing a plug from a tubular product, a small cask or barrel, or a container or receptacle used for transporting, holding, or storing a gas or liquid.

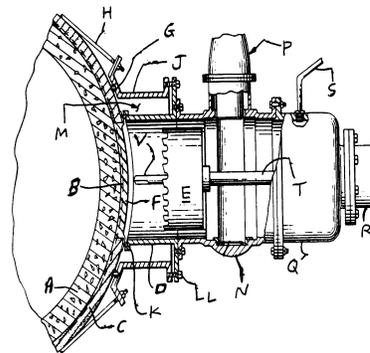


Figure 1: A typical example of the subject matter. A - Concretetube or pipe; B - Tensioned wires; C - Cement coating; D - Sealinggland; E - Shell cutter; F - Film (auxiliary coating); G - Saddle;H - Straps; J - Saddle neck; K - Gasket; L - Tightening bolts; M- Grout; N - Valve casing; P - Valve; Q - Adapter for tapping machine;R - Tapping machine; S - Conduit for fluid under pressure; T - Cuttingmachine shaft; V - Centering drill.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

317 through 325, for an apparatus for tapping a pipe, keg or apertured tank under pressure.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 522.1 through 524.1 for a method of assembly or joining by deforming a radially expanding part in a cavity, aperture, or hollow body or subclasses 890.14-890.15 for a method of making a specific gas or water plumbing component.

- 138, Pipes and Tubular Products, subclasses 94 through 94.5 for a laterally insertable closure or plug.

15.13 Particular aperture forming means:

This subclass is indented under subclass 15.12. Subject matter wherein the significance is attributed to creating a hole, gap, indentation, or a narrow, deep opening.

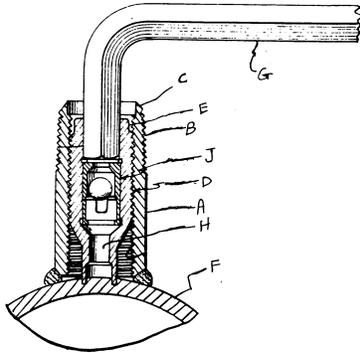


Figure 1: A typical example of the subject matter. A - Nipple(outer end); B - Exterior threads; C - Enlarged outer end portion;D - Perforating tool; E - Exterior taper; F Main pipe; G - Allenwrench; H - Passageway; J - Valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 318, for an apparatus for tapping a pipe, keg, or apertured tank under pressure with aperture forming means.

SEE OR SEARCH CLASS:

- 83, Cutting, subclass 54 for a process of cutting the wall of a hollow work in general.
- 408, Cutting by Use of Rotating Axially Moving Tool, subclasses 22 through 30 combined with diverse cutting means, subclass 704 for drilling small holes, or subclass 705 for drilling deep holes.

15.14 Cutter or cutting tool:

This subclass is indented under subclass 15.13. Subject matter comprising a shearing device to remove a portion of the pipe or keg to provide an aperture.

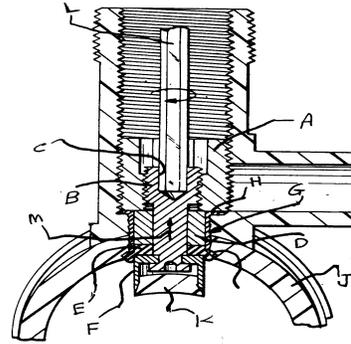


Figure 1: A typical example of the subject matter. A - Cutterassembly; B - Piston; C - Recess; D - Bushing; E - Resilient ring;F - Cutter; G - Tubular insert; H - Annular ring; J - Pipe wall;K - Cut portion (coupon); L - Allen wrench; M - Piston movement.

SEE OR SEARCH CLASS:

- 83, Cutting, subclass 30 for a process of puncturing or subclass 54 for a process of cutting a wall of hollow work.
- 222, Dispensing, subclasses 81 through 90 for a cutter or punch to form a dispensing opening in a container.
- 228, Metal Fusion Bonding, subclass 171 for a process of producing opposed complementary matching bonding surfaces by cutting prior to bonding.
- 408, Cutting by Use of Rotating Axially Moving Tool, subclasses 87 through 102 for a cutting tool in combination with a tool-opposing, work-engaging surface.

15.15 Having deformable or inflatable means:

This subclass is indented under subclass 15.13. Subject matter wherein the method of forming an aperture further includes sealing by use of an abnormally expandable bladder, compressible stopper, or similar resilient member.

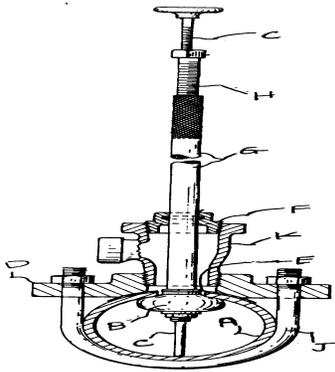


Figure 1: A typical example of the subject matter. A - Pipemain; B - Resilient plug (inflatable); C - Inner rod; D - Saddle; E - Opening in pipe; F - Pipe plug; G - Stopper rod; H - Intermediaterod; J - U-bolt; K - Service tree.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 89.1 through 89.2 for an inflation stem type air and dust cap, subclass 89.3 for an inflation stem type air cap, subclass 89.4 for an inflation stem type dust cap, subclass 93 for an inflatable closure or plug, subclasses 94-94.5 for a laterally insertable closure or plug, or subclasses 97-99 for repairing a pipe or tubular conduit.

15.16 With content loading or unloading (e.g., dispensing, discharge assistant, etc.):

This subclass is indented under subclass 15.08. Subject matter comprising a method of filling the pipeline or tank with a substance or material or removing a substance or material from a pipeline or tank.

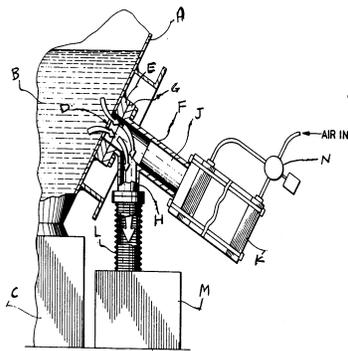


Figure 1: A typical example of the subject matter. A - Vessel; B - Viscous material; C - Gear pump; D - Drain opening; E - Boss; F - Valve body; G - Flange connection; H - Side outlet; J - Piston; K - Actuator; L - Hose; M - Container; N - Solenoid valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

587 through 588, for a fluid handling system having a tank that includes a gas vent and a liquid inlet or outlet.

SEE OR SEARCH CLASS:

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 2 through 3 for a process of filling a dispenser or subclasses 5-7 for a process of manipulating gas within the receiver and filling with fluent nongaseous materials, especially subclass 7 for a process of evacuation of a container.

222, Dispensing, subclasses 321.1 through 321.9 with discharge assistant (e.g., impeller, pump, conveyer, movable trap chamber, etc.), a movable nozzle interconnected with it and a material supply container and discharge assistant casing.

15.17 Specific valve or valve element mounting or repairing:

This subclass is indented under subclass 15.08. Subject matter wherein the significance is attributed to the process of installing, replacing, or servicing a flow regulating device or its component.

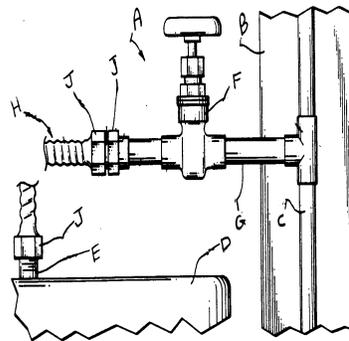


Figure 1: A typical example of the subject matter. A - Valveassembly; B - Interior wall; C - Distribution pipe;

D - Tank; E- Tank inlet; F - Main valve; G - Water inlet line; H - Flexible tube; J - Fittings.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.18 through 15.26, for a process of assembling, disassembling, or repairing a valve or valve member.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 213.1 through 221.6 for assembly or disassembly means for applying or removing a valve, subclass 890.121 for a method of repairing, converting, servicing, or salvaging a valve or choke, or subclasses 890.124-890.131 for a method of assembly, disassembly, or composite valve or choke making.

15.18 Valve or valve element assembling, disassembling, or repairing:

This subclass is indented under subclass 15.01. Subject matter wherein the significance is attributed to the process of installing, replacing, or securing a flow regulating device or its component.

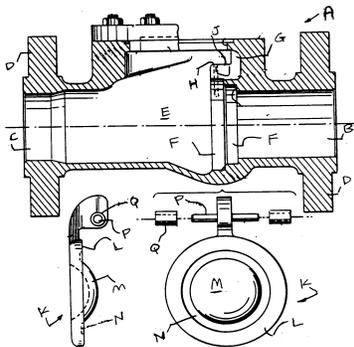


Figure 1: A typical example of the subject matter. A - Valvebody; B - Inlet port; C - Outlet port; D - Flanges; E - Valve chamber; F - Seat sections; G - Valve body portion; H - Hanger surface; J - Hanger recess; K - Clapper; L - Annular ring; M - Spherical segment; N - Annular recess; P - Clapper pin; Q - Bushing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.17, for a process having a particular repairing or mounting feature for the valve or valve member.

329.01 through 329.06, for repair by means where a valve head or seat is replaceable or having an unworn surface movable into operative position.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 213.1 through 221.6 for assembly or disassembly means for applying or removing a valve, subclass 890.121 for a method of repairing, converting, servicing, or salvaging a valve or choke, or subclasses 890.124-890.131 for a method of assembly, disassembly, or composite valve or choke making.

15.19 Fluid actuated or retarded:

This subclass is indented under subclass 15.18. Subject matter wherein the significance is attributed to the opening or closing movement of the valve and is produced by the relative force of a gas, liquid, or a mixture of a solid and liquid.

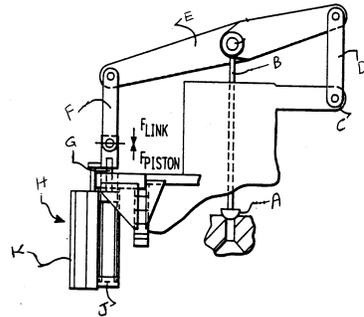


Figure 1: A typical example of the subject matter. A - Control valve; B - Valve stem; C, D, E, F - Lever and link mechanism; G - Piston; H - Servomechanism; J - Actuator; K - Manifold to control actuator.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

601.13, for systems dividing into parallel flow lines then recombining having a fluid actuated or retarded valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 12 through 63.6 for a fluid actuated or retarded valve actuating means or subclass 175 for means to

increase head and seat contact by fluid pressure.

- 15.2 With condition responsive control means:**
This subclass is indented under subclass 15.1. Apparatus having means sensing a condition of the ambient medium, or of the medium flowing through the intake means, said sensing means controlling operation of a control means for the medium flowing through the intake means, or for a separate fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

601.13, for systems dividing into parallel flow lines then recombining having a fluid actuated or retarded valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 12 through 63.6 for a fluid actuated or retarded valve actuating means or subclass 175 for means to increase head and seat contact by fluid pressure.

15.21 Multi way valve:

This subclass is indented under subclass 15.18. Subject matter wherein the valve regulates or controls a plurality of flow lines.

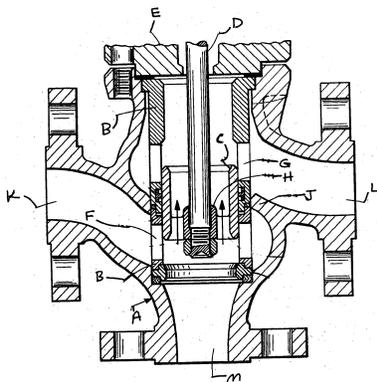


Figure 1: A typical example of the subject matter. A - Valvebody; B - Valve cage; C - Valve plug; D - Valve stem; E - Bonnet; F, G - Valve ports; H - Central boss; J - Valve body bridge; K, L - Side ports; M - Bottom port.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.09, for a fluid handling system with means for assembling or disassembling a multi way valve device.

625 through 625.5, for a multi way valve unit.

15.22 Ball valve or rotary ball valve:

This subclass is indented under subclass 15.18. Subject matter wherein the significance is attributed to a valve comprising a reciprocating spherical element, a pivoting spherical element, or a housing having a flow passage therethrough with a valve seat, and a spherical head that contacts the seat and can be rotated about an axis passing generally through its geometrical center by actuating means.

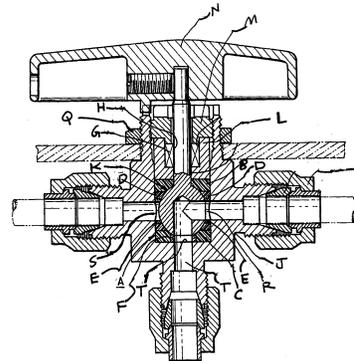


Figure 1: A typical example of the subject matter. A - Valveseat; B - Upper valve seat; C - Lower valve seat; D - Packings; E, F - Retainers; G, H - Bearing packings; J - Valve box; K - Valverod; L - Packing gland; M - Gland screw; N - Ball handle; P - Capnut; Q - Lock nut; R, S, T - Fluid passages.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.18 through 315.21, for a rotary ball valve with assembling or disassembling.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 315.1 through 315.15 for housing construction for a ball valve.

15.23 Gate valve:

This subclass is indented under subclass 15.18. Subject matter wherein the significance is attributed to a valve comprising essentially a wedge-shaped or flat sliding plate that can be lowered into a seat or raised to regulate fluid flow.

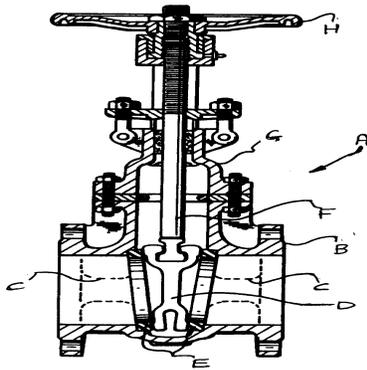


Figure 1: A typical example of the subject matter. A - Gatevalve; B - Valve body; C - Passageway; D -Valve gate; E - Valveseats; F - Valve stem; G - Valve yoke; H - Valve handle.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.29 through 315.32, for a reciprocating gate valve with assembling or disassembling means.

625.45, for system shaving a multi way valve unit that uses a pivoted gate valve unit.

625.49, for systems having a multi way valve unit that uses a reciprocating combined disk or plug for closing one port and a gate or piston valve for closing another port.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 300 for a pivoted terminal gate valve, subclasses 301-302 for a pivoted gate valve, or subclasses 326-329 for a reciprocating gate valve.

15.24 Plug valve:

This subclass is indented under subclass 15.18. Subject matter wherein the significance is attributed to a valve comprising a cock with a conical or cylindrical piece which is being turned to regulate the flow.

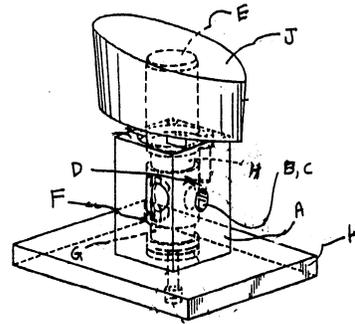


Figure 1: A typical example of the subject matter. A - Valveassembly; B, C - Inlet and outlet in axial alignment with each other;D - Cylindrical plug assembly with valve assembly 'A'; E - Upperactuating portion of plug 'D'; F - Lower actuating portion of plug'D'; G, H - Sealing grooves for plug 'D'; J - Plug valve handle;K - Valve support surface.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.25 through 315.26, for a plug valve with means to assemble or disassemble.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 309 through 312 for a rotary plug valve or subclass 904 for a snap-fit plug valve.

15.25 Butterfly valve:

This subclass is indented under subclass 15.18. Subject matter wherein significance is attributed to a valve comprising a substantially flat and coplaner wings depending from a central axis of rotation.

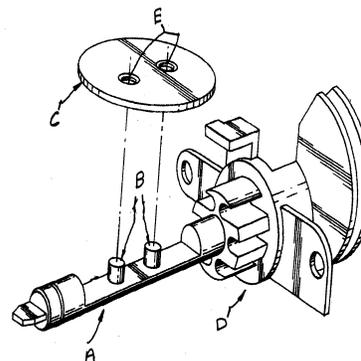


Figure 1: A typical example of the subject matter. A - Throttlevalve shaft; B - Cylindrical bosses; C - Throttle valve disk; D- Spring retainer and lever; E - Holes to receive bosses 'B'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.22 through 315.24, for a butterfly valve with assembly or disassembly means.

601.17, for systems dividing into parallel flow lines then recombining including a butterfly valve.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 890.124 through 890.131 for valve making in general with assembly, disassembly, or composite article making.

454, Ventilation, subclasses 333 through 336 for an adjustable damper type valve; subclass 369 for a fire damper in general.

15.26 Float valve:

This subclass is indented under subclass 15.18. Subject matter wherein the significance is attributed to a valve comprising a hollow, buoyant element, usually attached at the end of a lever, providing positive buoyancy while resting on the fluid surface.

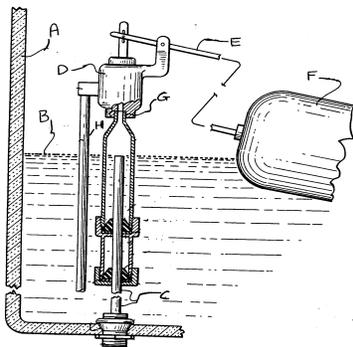


Figure 1: A typical example of the subject matter. A - Tank; B - Water level; C - Standpipe; D - Ballcock valve; E - Lever arm; F - Float; G - Port; H - Fill tube. Note: Valve 'D' operates such that downward articulation of lever arm 'E' causes valve 'D' to open so that water can communicate between port 'G' and the fill tube 'H'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

165 through 168, for a float responsive to liquid in a trap (e.g., boiler, etc.) to control gas pressure within the trap.

315.08, for a fluid handling system combined with means to assemble or disassemble a float or float valve.

409 through 451, for a liquid level responsive or maintaining system by a float controlled valve.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 322.5 for a float structure.

119, Animal Husbandry, subclasses 78 through 80 for a watering or liquid feed device with a float-controlled supply.

340, Communications: Electrical, subclasses 623 through 625 for a liquid level responsive indicating system using a float sensor.

38 CONTROL BY CHANGE OF POSITION OR INERTIA OF SYSTEM:

This subclass is indented under the class definition. Apparatus wherein a flow of fluid is controlled in response to (1) the shifting of the position of the system as a whole relative to gravitational field or to a body of liquid in which the system exists or (2) the inertia or displacement of the system as a whole.

(1) Note. Systems which are controlled by overflow pipes or arrangements are excluded from this and indented subclasses and are classified on a basis appropriate to the system claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

53+, for systems wherein the control is in response to the inertia or position of a speed responsive element (e.g., fly ball governors).

581, for distribution systems comprising a movable tank.

SEE OR SEARCH CLASS:

184, Lubrication, subclass 26 for lubricating pumps operated by the vibration of a machine.

- 220, Receptacles, subclasses 203.19+ for a receptacle closure comprising a pressure responsive vent or valve which is also responsive to tilting of the receptacle.
- 222, Dispensing, subclasses 160+ for movably mounted supply containers for dispensers; subclasses 454+ for dispensers which have a trap which is filled and emptied solely by the tilting motion of the assembly, and subclasses 500+ for dispensers having gravity or inertia operated outlet elements.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotographic device.
- 417, Pumps, subclasses 231+ for pumps operated by a vehicle.
- 700, Data Processing: Generic Control Systems or Specific Applications, subclass 281 for control of fluid level or volume, and subclasses 282-285 for flow control.
- 39 With second control:**
This subclass is indented under subclass 38. Apparatus which includes, in addition to the control responsive to the position or inertia of the system as a whole, a second means for operating the control means.
- (1) Note. The second control may be manual or operated in response to some other condition, such as pressure, temperature, etc.
- (2) Note. This subclass also provides for systems including means to neutralize or overcome the effect of a change of position on a second flow control.
- (3) Note. See the class definition, section 3, for search notes on combined automatic and manual control of fluid handling systems.
- 40 Position relative body of water (e.g., marine governors):**
This subclass is indented under subclass 38. Apparatus wherein the flow is controlled in response to the position of the system as a whole relative to a body of water in which the system is located.
- (1) Note. To be classifiable in this or indented subclass the apparatus must include some means for sensing the position of the system relative to the body of water.
- (2) Note. Marine governors operated in response to the shifting of the position of the system relative to gravity (due to ocean wave motion for example) but which do not include means for sensing the position of the system relative the water are found in other subclasses of this group.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
146, for the plunge or immersion starting of siphons.
- SEE OR SEARCH CLASS:
440, Marine Propulsion, subclass 74 for marine propulsion screw type propellers combined with propeller brakes to prevent racing of the propeller.
- 41 Float controlled:**
This subclass is indented under subclass 40. Apparatus which includes a float means for sensing the position of the system relative the body of water in which the system exists.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
386+, and Notes thereto for other float controlled apparatus.
- 42 Pressure or head controlled:**
This subclass is indented under subclass 40. Apparatus which includes means to sense the pressure or head of the body of water in which the system exists.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
403+, for liquid level responsive or maintaining systems in which the level is determined by head or pressure.

43 Vent opening or closing on tipping container:

This subclass is indented under subclass 38. Apparatus including means to close or open a vent opening on a container when the position of the container is varied, e.g., when the container is tipped.

SEE OR SEARCH THIS CLASS, SUBCLASS:

583+, for distribution systems having plural flow passages, one of which is a gas vent, and see the search notes to subclass 583.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 500 for gravity or inertia actuated outlet elements for dispensers.

429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclasses 84+ for vents combined with battery structure and battery vents, per se, of the nonspill type.

44 By shifting of liquid level:

This subclass is indented under subclass 38. Apparatus wherein the control is effected by a change in a level of a liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

40+, where the control is in response to a change or shift in the level of a body of water in which the system is located relative to the system.

45, for similar devices in which a liquid is employed as a shifting weight in combination with a pendulum or swinging member.

386+, for liquid level responsive systems which are not inertia controlled.

45 By pendulum or swinging member:

This subclass is indented under subclass 38. Apparatus wherein the flow is controlled by means of a pendulum or other pivoted member swinging about its pivot in response to a change of position of the system or to the inertia of the system.

SEE OR SEARCH CLASS:

33, Geometrical Instruments, subclasses 391+ for pendulum type levels or plumbs.

46 With servo connection to valve:

This subclass is indented under subclass 45. Apparatus in which the pendulum or pivoted member controls the application of another source of power for operating the control instead of by acting directly through a mechanical connection.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for fluid servo or pilot operated valves, and see the search notes to subclass 25.

47 SPEED RESPONSIVE VALVE CONTROL:

This subclass is indented under the class definition. Systems including the combination of a valve or valves and an actuator therefor, the actuator including a driven means which changes its position or produces a regulating pressure which varies in accordance with the speed at which it is driven.

(1) Note. The driven means may comprise one or more governors.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 488+ for a speed responsive device, per se.

116, Signals and Indicators, subclasses 37+ and 57 for vehicle speed responsive indicators and subclasses 200+ for speed limit indicators.

399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

700, Data Processing: Generic Control Systems or Specific Applications, subclasses 282 through 285 for flow control including valve or pump control, and subclasses 301 and 304 for pressure and speed control, respectively.

48 Acceleration responsive valve control:
This subclass is indented under subclass 47. Control systems wherein the driven means changes its position in accordance with the rate of change of speed at which it is driven.

49 With manual valve control:
This subclass is indented under subclass 47. Control systems including additional means whereby the valve or valves may be manually operated.

- (1) Note. Manually operated means to modify the response setting of the speed responsive means or to reset the trip latch, are not deemed to constitute a manual control within the definition of this subclass. However, if the manual reset means also actuates the valve or valves, the device would be considered as being manually operated for classification herein. See the class definition, section 3, for search notes on combined automatic and manual control means for fluid handling systems, and Section 5, for a listing of manual control, resetting and adjusting devices in this class.
- (2) Note. The term "manual" as used herein includes both hand and foot actuated means.
- (3) Note. This subclass includes manual valve actuating means in which a speed responsive device become effective at a predetermined speed of the engine or vehicle, either (1) to disconnect the mechanical movement of the manual actuator, and in some instances also to operate a trip mechanism to permit a biasing means to close the valve, or (2) to act as a limit stop to prevent further valve opening by the manual actuator.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
57, for excess speed responsive control, and see the search notes thereto.

SEE OR SEARCH CLASS:
73, Measuring and Testing, subclass 513 for a speed responsive device combined with manual control.

50 Speed change and excess speed valve control:

This subclass is indented under subclass 47. Control systems wherein the driven means is operable to vary the extent of opening of the valve or valves in response to changes in speed and to effect closing of the valve or valves in response to a speed above a predetermined speed.

- (1) Note. The driven means may comprise one or more governors which may control a single valve or a plurality of valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

57, for excess speed responsive valve control of the centrifugal mass type, and see the search notes thereto.

51 With other condition responsive valve control:

This subclass is indented under subclass 47. Control systems including additional means responsive to another operating condition which may actuate the same valve which is actuated by the speed responsive means, or another valve.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 509 for a speed responsive device that is also responsive to a nonspeed condition.

52 Governor drive failure responsive:

This subclass is indented under subclass 51. Control systems wherein the additional condition responsive means comprises a control device responsive to the breaking or failure of the driving means for the speed responsive governor to effect closing or substantial closing of a valve.

- (1) Note. The valve which is closed or substantially closed on failure of the driving means may be the valve controlled by the speed responsive governor or another valve.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclass 508 for a governor having drive failure responsive means.
- 251, Valves and Valve Actuation, subclass 27 for fluid pressure servo operated valves having means to close the valve on failure of the servo means, and subclass 69 for biased trip valves having the trip actuated on failure of the electric power.

53

Centrifugal mass type (exclusive of liquid):

This subclass is indented under subclass 47. Control systems wherein the speed responsive means comprises a rotating or revolving weight or weights, the position assumed by such weight or weights due to centrifugal force varying as a function of the speed at which they are rotated or revolved.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 535+ for a centrifugal type speed responsive device, per se.

54

With multiple valves:

This subclass is indented under subclass 53. Control systems wherein two or more valves are provided, at least one of said valves being actuated by the speed responsive means.

- (1) Note. See the class definition, section 3, for search notes on plural automatic valves in this and related classes.

55

Periodically actuated valve:

This subclass is indented under subclass 53. Control systems wherein the valves or valve are periodically and continually opened and closed, the governor being effective to vary the period and/or the extent of opening.

- (1) Note. The valves are usually disclosed for use in a reciprocating type of expansible chamber motor, the valves being periodically actuated for admitting motive fluid to the power cylinder and the governor varies the quantity of motive fluid in accordance with the motor speed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 631+, for nonautomatic cyclically operated valves, and see the search notes to subclass 631.

56

Rotating valve and rotating governor:

This subclass is indented under subclass 53. Control systems wherein the speed responsive means and the valve or valves are combined to comprise a continuously rotating construction.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 55, for valves connected with a speed responsive governor to rotate therein in order to periodically open and close the valve, the governor producing an axial motion of the valve to control the period and/or extent of valve openings.

57

Excess speed responsive:

This subclass is indented under subclass 53. Control systems wherein the speed responsive means is effective to actuate the valve or valves only at speeds above a predetermined speed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 50, for speed change and excess speed valve control.
- 456+, for safety cut-offs of general utility which respond to line condition and require resetting.

SEE OR SEARCH CLASS:

- 116, Signals and Indicators, subclass 57 and 62.1+ for vehicle speed limit indicators and alarms.

58

With fluid servo-motor:

This subclass is indented under subclass 53. Control systems wherein the speed responsive means transmits its regulating motion to the valve or valves by means of a fluid type servo-motor mechanism.

SEE OR SEARCH CLASS:

- 91, Motors: Expansible Chamber Type, subclasses 366 and 458 for speed governor operated expansible chamber motors.

- 251, Valves and Valve Actuation, subclasses 25+ for fluid pressure actuated valves of the pilot or servo-motor type, and see the search notes to subclass 25.
- 418, Rotary Expansible Chamber Devices, subclasses 40+ for speed controlled rotary expansible chamber devices.

59 FREEZE CONDITION RESPONSIVE SAFETY SYSTEMS:

This subclass is indented under the class definition. Apparatus which includes means which senses the existence of conditions which would cause the freezing of liquid within the system and in response thereto exercises a control to protect the liquid from freezing or to safeguard the system as a whole from the effects of freezing of a part thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 72+, for valves controlled by heat destructible or fusible means.
- 79+, for devices responsive to atmospheric temperature not amounting to a freeze condition.
- 107, for apparatus wherein a waste valve opens in response to the stopping of flow through the line, disclosed as preventing freezing.
- 118.01+, for branched flow systems responsive to temperature of the system.
- 301+, for hydrants with means to prevent freezing.
- 457, for safety cut-offs requiring reset and responsive to thermal conditions in a fluid line.
- 468, for other valves controlled in response to thermal conditions in a fluid line.

SEE OR SEARCH CLASS:

- 62, Refrigeration, subclasses 132+ for condition sensing controls for a refrigeration system, particularly subclasses 139+ for control by accumulation on a freezing surface.
- 123, Internal-Combustion Engines, subclasses 41.14, 41.15, 41.42, 41.5, and 142.5 for devices for protecting the cooling systems of internal combustion engines against cold.

- 138, Pipes and Tubular Conduits, subclasses 27+ for freeze protecting pressure compensators, and subclasses 32+ for freeze protection for pipes and tubular conduits.
- 236, Automatic Temperature and Humidity Regulation, appropriate subclasses.
- 237, Heating Systems, subclass 80 for heating radiators having means for preventing freezing.

60 With freeze waste:

This subclass is indented under subclass 59. Apparatus which includes means to protect the liquid from freezing by responding to the freezing of the liquid in a chamber.

- (1) Note. The freeze chamber may be in the main flow line or may be an auxiliary control chamber which is more exposed to the low temperature.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 67+, for frangible control elements not responsive to a freeze condition.

61 Stop and waste:

This subclass is indented under subclass 59. Apparatus which closes the system to liquid flow and opens a waste outlet so that at least part of the liquid in the system is drained or wasted in response to the sensing of low temperature or freezing conditions.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 107, for opening fluid waste passage in response to stopping of the main flow.
- 596+, for stop and waste devices not responsive to change in condition, and see the search notes thereto.

62 Low temperature responsive drains:

This subclass is indented under subclass 59. Apparatus which operates to open an outlet so that at least part of the system is drained or emptied of liquid in response to the sensing of low temperature or freezing conditions.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 570, for drain valve actuator combined with a pump.

596+, for distribution systems comprising a drain which is not automatic, and see the search notes thereto.

65 COMBUSTION FAILURE RESPONSIVE FUEL SAFETY CUT-OFF FOR BURNERS:

This subclass is indented under the class definition. Subject matter comprising a flow control device or safety valve in the fuel supply to a burner which is automatically actuated to discontinue the fuel flow in response to the extinguishment of the main or pilot burner.

- (1) Note. These devices are not self-opening, but must be manually reset, usually requiring that the pilot burner be lighted first.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 405, for cut-offs responsive to an accumulation of unburned fuel oil delivered to a burner.
456+, for safety cut-offs responsive to a change in line condition, which also require resetting.

SEE OR SEARCH CLASS:

- 431, Combustion, subclasses 42+ for a burner system in which the sensor of a first burner controls a second burner and subclasses 77+ for a burner shutdown by a means sensing a failure of the burner flame.

66 Thermo-electric:

This subclass is indented under subclass 65. Control systems wherein the safety valve is retained in its set or open position under the action of a solenoid, which solenoid is energized by the electric current generated by a thermoelectric element, e.g., a thermocouple, subject to the heat of the pilot burner or main burner.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 11 for heat motor actuated valves of general utility, and subclasses 68+ for electrical trip actuation of biased valves, including electrical resetting.
431, Combustion, subclass 80 for a burner assembly including a shutdown con-

trol responsive to combustion failure or overheat having a thermoelectric combustion sensor.

67 DESTRUCTIBLE OR DEFORMABLE ELEMENT CONTROLLED:

This subclass is indented under the class definition. Subject matter in which the flow of fluid is controlled in response to the destruction, fusion or permanent deformation of an element or body.

- (1) Note. The destruction, fusion or deformation may result automatically in response to the existence of some condition causing destruction, fusion or deformation (e.g., heat), or may be deliberately brought about by external means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 318, for tapping a system under pressure by making an aperture therein.

SEE OR SEARCH CLASS:

- 166, Wells, subclasses 316+ for closures used in wells and destructible by drilling.
222, Dispensing, subclass 54 for automatic control of dispensers by fusible or soluble means; subclasses 80+ for dispensers having a cutter or punch associated therewith; subclasses 541.1+ for dispensers having a frangible outlet element.
251, Valves and Valve Actuation, subclass 1.2 for a blowout preventer having a deformable annulus.

68.11 Destructible element:

This subclass is indented under subclass 67. Subject matter in which the fluid flow control element is physically broken by having a force acting directly upon it.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 797, for frangible elements, the breaking of which do not control any flow of fluid.

- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 80+ for dispensers having a cutter or punch associated therewith.
- 68.12 Combined destructible and fusible element:**
This subclass is indented under subclass 68.11. Subject matter in which the element breaks and melts at a specific temperature to control the fluid flow or has, in addition to the destructible element, a separate element which melts at a specific temperature to control the fluid flow.
- 68.13 Explosive actuation:**
This subclass is indented under subclass 68.11. Subject matter which includes means capable of detonation for creating a force for breaking or deforming the destructible element (e.g., an explosive element moves a plunger or creates a pressure surge to break the element).
- 68.14 Separable valve coupling or conduit:**
This subclass is indented under subclass 68.11. Subject matter where the destructible element is a fluid-conveying assembly such as a nipple, valve assembly, or hose that disconnects at a specific joint when an excessive force is applied to it.
- 68.15 Tensile or sheer pin or bolt:**
This subclass is indented under subclass 68.14. Subject matter where the destructible element is a pin or bolt that holds the coupling together and destructs when a perpendicular or axial excessive force is applied to the coupling.
- 68.16 Tensile or sheer pin or bolt:**
This subclass is indented under subclass 68.11. Subject matter where the destructible element is a pin or bolt that destructs when an excessive force is applied.
- 68.17 Pressure causes pin or bolt to destruct:**
This subclass is indented under subclass 68.16. Subject matter that destructs when the applied excessive force that fractures the pin or bolt is applied over the surface of the pin or bolt.
- 68.18 With alarm or indicator:**
This subclass is indented under subclass 68.11. Subject matter that includes a sensing means that sends a signal when the element breaks.
- 68.19 Rupture disc:**
This subclass is indented under subclass 68.11. Subject matter where the destructible element is a diaphragm or seal that holds fluid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
72, for a fluid-controlled fusible diaphragm.
- SEE OR SEARCH CLASS:
220, Receptacles, subclasses 89.2+ for a receptacle that is a frangible diaphragm within a container or vessel.
- 68.21 Means for holding entire disc after rupture:**
This subclass is indented under subclass 68.19. Subject matter that has a specific means for preventing the rupture disc from tearing away (e.g., hinge-reinforcing member).
- 68.22 Disc burst after destruction of additional element:**
This subclass is indented under subclass 68.19. Subject matter that includes a second frangible element in a system which destructs before the rupture disc.
- (1) Note. This subject matter would include a system with two or more rupture discs in a flow passage.
- 68.23 Direct pressure causes disc to burst:**
This subclass is indented under subclass 68.19. Subject matter wherein the destructible element is destroyed by excessive pressure exerted by the fluid flow.
- 68.24 Two-way rupture disc:**
This subclass is indented under subclass 68.23. Subject matter that is designed to break either in the direction of or opposite the direction of the fluid flow when an excessive pressure differential exists.
- 68.25 Dome shape:**
This subclass is indented under subclass 68.23. Subject matter that is specifically designed to be hemispherical to enable the disc to more easily rupture as pressure builds.

68.26 Reverse buckling:

This subclass is indented under subclass 68.25. Subject matter which has excessive pressure at the convex side of the disc to cause the disc to reverse its concavity and burst.

68.27 Specific weakening point:

This subclass is indented under subclass 68.19. Subject matter specially modified to have an area of varied thickness creating a vulnerable section to enable the pressure disc to more easily break.

68.28 Integral disc assembly:

This subclass is indented under subclass 68.19. Subject matter including a support member welded or bonded with adhesive to the rupture disc or the rupture disc is directly bonded or welded to the assembly.

68.29 Knife or cutter causes disc to break:

This subclass is indented under subclass 68.19. Subject matter penetrated by a piercing device to enable the disc to more easily break when the internal pressure in the system becomes excessive.

68.3 Movable knife or cutter:

This subclass is indented under subclass 68.29. Subject matter wherein the piercing device is positionable.

69 With counterbalancing element:

This subclass is indented under subclass 68.12. Apparatus which includes means for applying a force or bias to the frangible means in a direction opposing the force (usually fluid pressure) which tends to break the frangible element.

70 Frangible element returns pressure responsive valve:

This subclass is indented under subclass 68.12. Apparatus in which a valve which opens in response to increased pressure is retained in closed position by means of a frangible element, opening of the valve resulting from the breaking of the frangible element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

455+, for line condition responsive valves not opposed by frangible means.

71 Having pressure responsive valve:

This subclass is indented under subclass 68.12. Apparatus including a pressure responsive valve controlling the fluid flow in response to the pressure thereof in addition to the control in response to the breaking of the frangible element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

511+, for direct pressure responsive valves.

SEE OR SEARCH CLASS:

220, Receptacles, subclass 203.08 for a vent or valve in a removeable closure, said vent or valve designed to rupture when exposed to excessive pressure.

72 Heat destructible or fusible:

This subclass is indented under subclass 67. Apparatus in which the flow is controlled in response to an element which is fusible or destructible by heat (e.g., combustible).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

79+, for atmospheric temperature responsive flow control.

457, for safety cut-off valves controlled by a thermal condition of the line.

468, for other valves controlled by a thermal condition of a fluid line.

SEE OR SEARCH CLASS:

116, Signals and Indicators, subclasses 217+ for indicators of the fusible type.

122, Liquid Heaters and Vaporizers, subclass 504.1 for safety device for a boiler with fusible control and subclass 504.3 for a fusible type safety device extinguishing a fire under a boiler.

222, Dispensing, subclass 54 for dispensers having a fusible controller.

431, Combustion, subclass 21 for a burner assembly controlled by a combustion destructible element.

73 With second sensing means:

This subclass is indented under subclass 72. Apparatus which includes a means for controlling the fluid flow in response to a change in condition in addition to the control in response

to the fusion or destruction of the heat destructible element.

- (1) Note. See the class definition, section 3 for search notes on plural automatic controls in fluid handling devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:

75+, for safety cut-offs operated by fusible means but without responding to a second sensing means.

74 **In fluid flow path:**

This subclass is indented under subclass 72. Apparatus in which the fusible or heat destructible element is in the passage carrying the flow controlled and functions as a barrier or stop member for such flow.

- (1) Note. The fusion of the fusible element may result in either the opening or closing of the passage carrying the fluid flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

251+, for liquid valves or barriers.

75 **Safety cut-off:**

This subclass is indented under subclass 72. Apparatus in which the valve controlling the fluid flow is biased toward a closed position but is held open by a restraining means, the fusion or destruction of the heat destructible or fusible means causing a release of the restraining means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

457, for other cut-offs which are operated in response to a change in thermal condition in the fluid within the controlled line.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 66+ for biased trip valve actuators not responsive to a condition change.

76 **With heater for destructible or fusible element:**

This subclass is indented under subclass 75. Apparatus which includes a heating means for the fusible or heat destructible element.

- (1) Note. The heating element is usually for the purpose of fusing or otherwise destroying the destructible element to control the operation of the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

468, for line condition responsive valves controlled by thermal conditions, and see the search notes thereto.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 11 for heat motor actuators for valves.

77 **With external closing means:**

This subclass is indented under subclass 75. Apparatus including a means for closing the valve by manual or external means in addition to the operation in response to the fusible or heat destructible element.

- (1) Note. See the class definition, Automatic Control, and Subclass References to the Current Class for search notes on combined automatic and nonautomatic control of a fluid handling device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

76, for manual or external closing by heating the fusible or heat destructible element.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 66+ for biased trip valve actuators not responsive to a condition change.

78.1 **AMBIENT CONDITION CHANGE RESPONSIVE:**

This subclass is indented under the class definition. Apparatus which controls a flow of a fluid in response to a variation in a condition of, or in the surrounding environment.

- (1) Note. To be classifiable in this or indented subclasses the apparatus must include a sensing means responsive to changes in environmental conditions and there must be a disclosure that the control is in response to such changes. Devices which employ a sensing means using environmental pressure merely as a standard against which some internal pressure or condition is measured are not classified in this or indented subclass but are classified elsewhere on a basis appropriate to the system.
- (2) Note. This and indented subclasses include devices which include means for sensing changes in an environmental condition and exercising a compensating effect so as to neutralize any effect the change in environmental condition would otherwise have on the operation of the device.
- (3) Note. See the class definition, section 3, for search notes on the automatic control of fluid handling systems.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

59+, for device which sense the existence of freeze condition in the atmosphere and in response thereto operate to prevent freezing of liquid in the system.

78.2 For controlling soil irrigation:

This subclass is indented under subclass 78.1. Apparatus in which flow of water to the ground is controlled by means responsive to an environmental condition.

78.3 Coil moisture sensing:

This subclass is indented under subclass 78.2. Apparatus in which flow of water to the ground is controlled in response to a change in moisture content of the ground.

78.4 Burner gas cutoff:

This subclass is indented under subclass 78.1. Apparatus in which flow of flammable gas to a burner is stopped in response to a sensed environmental extinguishing action to the flame of the burner.

78.5 Atmospheric:

This subclass is indented under subclass 78.1. Apparatus in which control of a flow of fluid is responsive to a variation in a condition of, or in surrounding atmosphere.

79 Temperature:

This subclass is indented under subclass 78.5. Apparatus which controls a fluid flow in response to variations of temperature in the surrounding atmosphere.

- (1) Note. This subclass includes apparatus which sense the presence of a fire in the atmosphere and exercise a control in response thereto.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

59+, for freeze condition responsive safety devices.
67+, for systems controlled by a heat destructible or fusible means.
468, for thermally responsive valves responding to line condition change, and see the search notes thereto.

SEE OR SEARCH CLASS:

169, Fire Extinguishers, subclasses 56+ for fire extinguishers including valves responsive to the occurrence of fire conditions.

80 With additional diverse control:

This subclass is indented under subclass 79. Apparatus which also includes, in addition to the atmosphere temperature responsive element, an additional means for operating the control means.

- (1) Note. See the class definition, Section 3 for search notes on automatic and combined automatic and nonautomatic control of fluid handling systems.

81.1 Pressure:

This subclass is indented under subclass 78.5. Apparatus in which a fluid flow is controlled in response to variations of atmospheric pressure.

- (1) Note. See (1) Note and (2) Note to the definition of subclass 78.1.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

455+, for valves controlled by changes in line pressure, especially subclass 482 for suction compensators for combustion engine induction type line conduction change responsive valves.

SEE OR SEARCH CLASS:

454, Ventilation, subclasses 70+, 238, 255, and 340 for apparatus for maintaining a pressure in enclosure including means responsive to air conditions either in the atmosphere or in the enclosure.

81.2 Underwater:

This subclass is indented under subclass 78.1. Apparatus in which control of a flow of fluid is responsive to a variation in a condition of, or in an environment beneath the surface of a body of water.

82 PRESSURE MODULATING RELAYS OR FOLLOWERS:

This subclass is indented under the class definition. Apparatus which continuously varies or modulates a fluid in response to a varying control condition. The modulation is usually accompanied by varying a pressure bleed.

- (1) Note. Only the subcombination, without a pressure responsive device, and a main valve controlled thereby is classified in this subclass; for the combination search appropriate succeeding subclasses, as indicated below.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

102, for pressure regulators which regulate by supply and exhaust valves to maintain a pre-set pressure.

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, appropriate subclasses for apparatus under this definition combined with the expansible chamber motor which is operated by the fluid pressure.
236, Automatic Temperature and Humidity Regulation, subclasses 79+ for temperature control systems utilizing

pressure modulators to operate fluid pressure motors.

- 251, Valves and Valve Actuation, subclasses 25+ for apparatus which by means of a pilot valve controls the application of fluid pressure to an expansible chamber motor which in turn controls a main line valve.
399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

83 Jet control type:

This subclass is indented under subclass 82. Apparatus which utilize a fluid jet and one or more jet receiving orifices with the control condition varying the pressure in the orifices by varying the amount of jet fluid entering the orifices.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

625.6, for a jet control type pressure modulator combined with a pilot valve and a supply and exhaust valve.

SEE OR SEARCH CLASS:

- 91, Motors: Expansible Chamber Type, subclass 3 for expansible chamber motors combined with a jet type control therefor.
239, Fluid Sprinkling, Spraying, and Diffusing, appropriate subclasses, especially subclasses 505+, 518+ and 587.1+ for jet producing discharge members, per se.

84 Plural series units:

This subclass is indented under subclass 82. Apparatus wherein a plurality of modulating relays on followers are connected in series; the output pressure of one controlling the modulation in the next.

85 With counter-balancing pressure feedback to the modulating device:

This subclass is indented under subclass 82. Apparatus in which the modulated pressure is utilized in a feedback arrangement to counter-balance the modulating control element.

86 With counter-counter balancing pressure feedback:

This subclass is indented under subclass 85. Apparatus in which the modulated pressure is utilized in a second feedback arrangement to counterbalance the counterbalance of the modulating control element.

87.01 SELF-PROPORTIONING OR CORRELATING SYSTEMS:

This subclass is indented under the class definition. Subject matter wherein a fluid flow in a first flow line is proportioned or correlated with the fluid flow in a second fluid flow line by a movable means, which is positioned in one of the fluid flow lines and controlling the fluid flow in the other fluid flow line in response to a sensor detecting a variable condition or characteristic of the fluid in the other fluid flow line.

- (1) Note. The flow proportioning or correlating may constitute plural separate flow lines, branches of the same flow and a branch thereof.
- (2) Note. The proportioning and correlating of the fluid flows may be continuous or discontinuous and may vary directly or inversely and according to any ratio or in any manner.
- (3) Note. Systems that rely on static means (e.g., a jet pump) to produce a correlated flow are excluded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

155, for gas lift devices for wells including a valve between a gas line and a liquid column responsive to the pressure differential between the gas and the liquid.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclasses 198.1+ for a system including a chemical feeder and a separating means.

222, Dispensing, subclass 57 for dispensing of one material controlled by the weight, volume, or pressure of a second dispensed material.

251, Valves and Valve Actuation, subclasses 12+ for mere fluid pressure actuated valves, even though the flow through the valve may be disclosed as being related or proportioned to the pressure in the fluid pressure actuator line.

399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

87.02 Liquid level responsive:

This subclass is indented under subclass 87.01. Subject matter wherein the sensor is detecting the variation in an uppermost horizontal surface of the liquid in one of the flow lines and in response thereto the sensor controls the flow in the other flow line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101.25, for a self-proportioning flow system with liquid level sensing.

386+, for a liquid level responsive means without proportionate or correlated flow.

87.03 Flow rate responsive:

This subclass is indented under subclass 87.01. Subject matter wherein the sensor is detecting the variation in the amount of fluid flowing in one of the flow lines in a set period of time or is detecting the variation in fluid pressure (i.e., pressure differential) along the flow line and in response thereto the sensor controls the flow in the other flow line.

87.04 Pressure differential:

This subclass is indented under subclass 87.03. Subject matter wherein the sensor is detecting the variation of the fluid pressures at two distinct points along one of the flow lines and in response thereto the sensor controls the flow in the other flow line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101, for the self-proportioning flow system responsive to flow comparison or pressure differential.

87.05 Plural sensors:

This subclass is indented under subclass 87.01. Subject matter including two or more sensors for detecting two distinct or similar conditions or characteristics of the fluid in one of the flow lines and in response thereto the sensors control the flow in the other flow line.

87.06 For single valve:

This subclass is indented under subclass 87.05. Subject matter comprising one valve element and wherein the sensors operate only one valve element to control the flow.

88 Mixture condition maintaining or sensing:

This subclass is indented under subclass 87.01. Systems in which a condition of a fluid mixture is maintained by controlling the flow of at least one of the fluids mixed in response to a means which sense the condition of the mixture.

SEE OR SEARCH THIS CLASS, SUBCLASS:

3+, for the corresponding processes.

89 Dividing and recombining flow:

This subclass is indented under subclass 88. Systems in which a fluid flow is divided into a plurality of flow paths which are subsequently recombined, the ratio of the flows thus divided and recombined being controlled in response to a means sensing a condition to be maintained.

- (1) Note. This subclass includes, for example, systems in which one of the plurality of flow paths pass through a means to treat the fluid to restore the property to be maintained, the amount of fluid passing through the treating means being controlled by the condition sensing means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

91 By specific gravity:

This subclass is indented under subclass 88. Systems in which the condition maintained or sensed is specific gravity.

SEE OR SEARCH THIS CLASS, SUBCLASS:

403+, for systems in which a single flow is controlled by weight of an accumulated fluid, and see the search notes to subclass 403.

92 By viscosity or consistency:

This subclass is indented under subclass 88. Systems in which the condition maintained or sensed is viscosity or consistency.

- (1) Note. Due to their similarity with systems classified in this subclass, systems are also included in which the viscosity or consistency of a stream is sensed and in response thereto the subsequent addition of water is controlled in order to produce a predetermined or desired viscosity or consistency.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4, for the corresponding process.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, subclasses 258 and 380 for systems for maintaining the consistency or viscosity of paper making pulp combined with paper making apparatus.

93 By optical or chemical property:

This subclass is indented under subclass 88. Systems in which the condition maintained or sensed is an optical or chemical property.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, for processes of controlling flow according to the conductivity of the mixture.

392, for control of a single fluid flow by sensing electrical characteristics.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 200+ for photocell circuits.

356, Optics: Measuring and Testing, for examination of material by light for optical properties particularly subclasses 128+ for refraction tests, subclasses 410+ for shade or color tests

- involving flowing liquids, and subclasses 432+ for light transmission tests involving gases or liquids.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 50+ for chemical analyzers; and subclasses 105+ for apparatus operating in response to a sensed condition.
- 94 Fuel controlled by boiler or water system condition:**
This subclass is indented under subclass 87.01. Subject matter in which a condition of the fluid in a boiler or water heating system controls the flow of fuel used for heating the boiler or water.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
386+, for liquid level responsive or maintaining systems.
468, for thermally responsive controllers, and see the search notes thereto.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclasses 448.1 through 448.4 for automatic control of fluid fuel and feed water to a boiler.
- 98 Self-proportioning flow systems:**
This subclass is indented under subclass 87.01. Systems in which the control means maintains a predetermined ratio between flows in a plurality of flow lines.
- (1) Note. The flows may be separate or may subsequently be combined or may be branches from a single source of a fluid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
577 through 579, for systems having a tank with movable or adjustable outlet or overflow pipe.
599.01 through 601.21, for systems dividing into parallel flow lines then recombining.
861 through 887, for systems having flow control means for branched passages.
- SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 195+ for rate of flow meter systems employing two or more meters usually for measuring and comparing a plurality of flows.
210, Liquid Purification or Separation, subclass 101 for proportionate feed means combined with separating means.
261, Gas and Liquid Contact Apparatus, appropriate subclass for gas and liquid contact devices including means for maintaining a proportional flow between a gas and liquid; see particularly subclasses 69.1+ for systems in which the flow of liquid is controlled in response to the rate of flow in the gas line as measured by means of a venturi in the gas line.
- 99 Interconnected flow displacement elements:**
This subclass is indented under subclass 98. Systems in which the proportioning or correlating means includes mechanically interconnected flow displacement elements.
- (1) Note. Flow displacement elements include primarily pump and meter arrangements and vanes or other elements exposed to the flow and shifted in response to variations therein, such shifting elements usually acting both as controlling and detecting means.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
565+, for nonautomatic distribution systems including pumps.
- 99.5 Movable trap chamber:**
This subclass is indented under subclass 99. Subject matter wherein the flow displacement element comprises a bodily movable measuring chamber which provides continuous flow with increment feeding.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
101.31, for a stationary measuring chamber.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 344+ for systems wherein the movable discharge assistant is not related to a continuous flow, and see the search notes thereunder.

100 Flow comparison or differential response:

This subclass is indented under subclass 98. Systems in which the sensing means is sensitive to the differences between the rates of flow or pressure difference along the line in a plurality of flow lines or at spaced points along one line.

- (1) Note. Means sensing changes in the difference between the flows may control the flow in a third flow line or may exercise a control on the flows compared.

SEE OR SEARCH THIS CLASS, SUBCLASS:

497+, for line change condition responsive valves controlled by change in the rate of flow, and see the search notes to subclass 497.

101 Flow dividers (e.g., reversely acting controls):

This subclass is indented under subclass 100. Systems in which a flow is divided into a plurality of flow paths and the ratio between the flow in each branch maintained in response to means sensing differences in flow or pressure in each branch by throttling one branch an amount equal to the amount the other branch is opened.

- (1) Note. Many of the patents in this subclass are for systems in which a single pressure fluid is employed to supply a plurality of fluid pressure motors with means to automatically maintain the amounts of fluid fed to each motor proportional.

SEE OR SEARCH CLASS:

60, Power Plants, subclasses 420+ for automatic control of a plurality of fluid motors.

91, Motors: Expansible Chamber Type, appropriate subclasses and especially subclasses 165+ and 508+ for automatic control of a plurality of expansible chamber motors.

101.11 Main line flow displaces or entrains material from reservoir:

This subclass is indented under subclass 100. Subject matter wherein a shunt line having a reservoir therein relies on the pressure difference between its connection to the main line to cause flow therethrough to entrain material in the reservoir, or to displace the reservoir material or an intermediate distinct fluid layer or expansible chamber device whereby the reservoir material is forced into the main line without mixing with the flow while in the shunt.

101.19 With electrical controller:

This subclass is indented under subclass 100. Subject matter comprising an electrical controller responsive to the sensing means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 129+ for an electrical valve actuator.

101.21 Flow displacement element actuates electrical controller:

This subclass is indented under subclass 98. Subject matter comprising an electrical controller responsive to a flow displacement element.

101.25 Liquid level response:

This subclass is indented under subclass 98. Subject matter comprising at least one means which senses the level of a liquid in means to receive an accumulation thereof and in response thereto exercises a control of the flow in one or more of the flow lines.

SEE OR SEARCH THIS CLASS, SUBCLASS:

386+, for liquid level responsive means without proportionate or correlated flow. See the search notes thereunder.

101.27 Float controlled weir or valve:

This subclass is indented under subclass 101.25. Subject matter wherein a weir or valve is responsive to the level sensing means.

101.29 Swinging outlet pipe controller:
This subclass is indented under subclass 101.25. Subject matter wherein a swinging outlet pipe controls the flow from an accumulator or tank responsive to the level sensing means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

577+, for a tank with a movable or adjustable outlet or overflow pipe.

101.31 With measuring type discharge assistant:
This subclass is indented under subclass 98. Subject matter comprising a measuring type discharge assistant in one flow line responsive to a flow displacement element in another flow line or by the weight of accumulated fluid of a proportionate part of the flow in another line to provide continuous flow through the system with increment feeding.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 261+ for dispensing apparatus with discharge assistants.

102 Supply and exhaust type:
This subclass is indented under subclass 87.01. Systems in which an outlet or receiver alternatively receives a fluid from a source of supply and drains the fluid to an exhaust, the flow of fluid from the supply or to the exhaust, being controlled in response to a means sensing a change in condition.

(1) Note. Many of the patents classified in this subclass are drawn to distributor valves for fluid motors.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

224+, for tire inflation apparatus which may have condition responsive filling and relief valves

596+, for distribution systems involving stop and waste arrangements, and see the search notes thereto.

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, appropriate subclasses for apparatus under this definition combined with

an expansible chamber motor which is controlled thereby.

103 Vacuum or suction pulsator type (e.g., milking machine):

This subclass is indented under subclass 102. Systems in which an outlet or receiver is alternately connected to a source of suction or vacuum and a source of fluid under pressure or vent (usually the atmosphere).

(1) Note. Many of the patents classified in this subclass are for milking machine pulsators.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

526, for vacuum relief valves of the type responding to fluid pressure exerted directly on the valve face.

SEE OR SEARCH CLASS:

119, Animal Husbandry, subclasses 14.01+ for milking machines.

104 With trip linkage or snap action:

This subclass is indented under subclass 103. Apparatus which include a snap acting or trip linkage in the control system.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 66+ for valves with biased trips, and see the search notes to subclass 66, and subclass 76 for snap action valves, per se, and see the search notes thereto.

105 With pulsation responsive pilot valve:

This subclass is indented under subclass 103. Apparatus wherein the flow controlling valve is moved by a fluid servo under control of a second valve which is itself fluid operated under control of the first valve, there being no mechanical linkage between the two valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

488+, for line condition change responsive fluid pressure type servo or pilot controlled valves.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 28+ for fluid servo or pilot actuated valves having fluid actuated pilot valve.

106 Reversing or 4-way valve systems:

This subclass is indented under subclass 102. Systems which include two outlets or receivers, one outlet or receiver being connected to the supply while the other is connected to the exhaust, the connections being reversed or changed in response to a means sensing a change in condition.

(1) Note. Many of the patents classified in this subclass are drawn to distributor valves for plural expansible chamber motors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

625+, for multiway valve units and their actuators, and see the search notes to subclass 625.

107 Waste responsive to flow stoppage:

This subclass is indented under subclass 102. Systems wherein a waste or drain is opened in response to the stopping of the fluid flow from the supply to the outlet or receiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:

61, for stop and waste systems which are responsive to means sensing freeze conditions.

596+, for stop and waste systems not responsive to any change in a condition, and see the search notes thereto.

109 Self-controlled branched flow systems:

This subclass is indented under subclass 87.01. Systems in which a single flow is divided into a plurality of flow paths or a plurality of flow paths are combined into a single flow path or in which a single flow path is divided and then recombined, and in which the flow in one branch or line is controlled in response to a change in a condition in another branch or line.

(1) Note. This and indented subclasses takes only those systems which include

some significant branched structure such as having a valve and/or sensing means in a plurality of the branches or which require branched flow in order to be operative. For example, a pressure flow line having a mere relief valve or pressure relief passage mounted in the side is not classifiable as a branched system, because the outflow end of the line is not necessary for the operation of the pressure relief valve; such valves operate in the same manner when applied to a tank.

(2) Note. Plural relief valves opening into the atmosphere or the same tank or source are not branched flow systems, nor is a valve in which the flow is divided and recombined within the same valve body a branched flow system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

455+, for relief and other condition responsive valves whether mounted in a flow line or in a container. (See (1) Note.)

561+, for branched flow distribution systems in which there is no control of a flow in response to a change in a sensed condition.

110 Dividing and recombining:

This subclass is indented under subclass 109. Systems in which a single flow path is divided into a plurality of branch flow paths which are in turn recombined into a single flow path and in which at least one branch flow path is controlled in response to a sensing means which is at least partially affected by a condition in another branch flow path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

89, for mixture condition maintaining or sensing systems involving dividing and recombining the flow.

115.01+, for by-pass or relief flows controlled by main line condition.

599.09, for systems dividing into parallel flow lines, having a fluid pressure-regulating valve, then recombining.

111 Plural inflows:

This subclass is indented under subclass 109. Systems in which a plurality of flows from separate sources are joined, or are provided with a common outflow, and in which at least one flow path is controlled in response to a sensed condition change.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 88+, for system in which a plurality of fluids are mixed and the flow of at least one of the fluids is controlled in response to a change in a sensed condition of the mixture.
- 98+, for self-proportioning systems involving mutual control features in plural lines.
- 480, for combustion engine induction type governor valves controlling one or more auxiliary inlets, the main flow also being controlled in some instances.
- 602+, for branched flow distribution systems with multiple inlets and a single outlet in which there is no control of a flow in response to a change in a sensed condition.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 57 for control of a dispensed material by the weight, volume or pressure of a second dispensed material.

112 Alternate or successive inflows:

This subclass is indented under subclass 111. Systems in which flow in one inlet is alternated with the flow in a second inlet or is substituted therefor in response to a sensing of a changed condition.

113 Control by depletion of source:

This subclass is indented under subclass 112. Systems in which the control is in response to a failure or depletion of the source of the flow in one of the inflow.

- (1) Note. Many of the patents in this subclass are drawn to bottled gas handling devices for substituting a second source of gas for the first when the pressure in the first drops below a satisfactory value.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 6 for gas or vapor dispensing of this type.

114 One inflow supplements another:

This subclass is indented under subclass 111. Systems in which one inflow is added to or supplements the second flow and is in response to a sensed condition change such as reduction in pressure or flow in the second inflow or in the combined flow or in the level of accumulated fluid derived from the second or combined flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 98+, for self proportioning flow systems involving the uniting of a plurality of inflows with mutual control effects.

115.01 Bypass or relief controlled by main line fluid condition:

This subclass is indented under subclass 109. Subject matter including a flow line with an inlet and outlet for a main flow and an outlet branch or bypass in which the flow is controlled in response to a variation in the fluid condition (e.g., fluid level, flow rate or pressure, or the like) in the main flow line detected by a sensor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 223+, for inflatable article filling means having a back pressure cut-off or relief means.
- 455+, for relief and other condition responsive valves whether mounted in a flow line or container, in which there is no significantly claimed branched flow structure.
- 599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 96.1+ for a liquid purification or separation responsive to a variation of constituents in a liquid mixture.

115.02 Liquid level responsive:

This subclass is indented under subclass 115.01. Subject matter wherein the sensor is detecting the variation in the levels of the liquid in the main line and in response thereto the sensor controls the flow in the bypass or relief.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

87.02, for a self-proportioning and correlating having a liquid level sensor.

101.25+, for a self-proportioning flow system having a liquid level sensor.

115.03 Flow rate responsive:

This subclass is indented under subclass 115.01. Subject matter wherein the sensor is detecting the variation in the quantity of the fluid flowing in the main flow line in a set period of time and in response thereto the sensor controls the flow in the bypass or relief.

- (1) Note. This subclass also includes a flow measurement by a pressure differential along the main line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

87.03+, for a self-proportioning and correlating system having a flow rate sensor.

107, for supply and exhaust-type waste valves opening in response to the stoppage of the main line flow.

118.04+, for flow rate responsive plural outflows.

215+, for back flow prevention by vacuum breaking.

455+, for line condition responsive valves which respond to a change in the flow rate.

115.04 Including controlling main line flow:

This subclass is indented under subclass 115.03. Subject matter wherein the sensor is regulating the flow in the main line in response to the variation in the flow rate.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

596.12, for supply and exhaust system with bypass.

115.05 Relief or bypass closes as main opens:

This subclass is indented under subclass 115.04. Subject matter wherein the sensor, in response to the change in the flow rate, is simultaneously opening a main line valve and closing a relief valve in a branch line or vice versa.

115.06 Bypass or relief valve biased open:

This subclass is indented under subclass 115.03. Subject matter comprising a valve means for permitting the flow to the bypass or relief valve is held open in absence of the flow by a flexibly adjustable device (e.g., a weight of the valve body itself, or a spring or such similar flexible means).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115.16+, for pressure responsive biased open bypass or relief valve.

115.07 Pilot valve operated:

This subclass is indented under subclass 115.03. Subject matter comprising an auxiliary valve control and wherein the bypass or relief valve is controlled by the auxiliary control valve in response to the variation of the flow rate in the main line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

300, for a supplemental valve independent of a main valve for hydrant-type fluid handling.

115.08 Carried choke:

This subclass is indented under subclass 115.03. Subject matter wherein the sensor is a fluid flow restricting element which is an integral part of the bypass or relief valve and the element is moving with the bypass or relief valve to restrict the flow.

115.09 Choke:

This subclass is indented under subclass 115.03. Subject matter wherein the sensor includes a device for restricting the flow of the fluid in the main flow line.

SEE OR SEARCH CLASS:

166, Wells, subclasses 316+ for changeable chokes.

115.1 Variable choke resistance:

This subclass is indented under subclass 115.09. Subject matter wherein the choke is adjustable to provide different flow resistances without requiring disassembly of the sensor.

115.11 Venturi:

This subclass is indented under subclass 115.03. Subject matter wherein the sensor includes a device which is a part of the main flow passage having a cross section of the part gradually constricted to a throat between two ends of the part and gradually expanded from the throat to the cross section of the passage.

- (1) Note. The device is used with a pressure tap at the throat and another pressure tap at the normal flow passage to register the pressure differential at the throat relative to a pressure in the normal passage and signals the sensor which in turn exercises the control of the flow in the bypass or relief.

115.12 Flapper:

This subclass is indented under subclass 115.03. Subject matter wherein the sensor includes a member supported at one end and moving by the momentum of the fluid in the flow line to operate the bypass or relief valve.

115.13 Pressure responsive:

This subclass is indented under subclass 115.01. Subject matter wherein the sensor is detecting the pressure of the fluid in the main flow line and in response thereto controls the bypass or relief valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

118.06+, and 119.08+, for self-controlled pressure responsive plural outflows and pressure responsive alternate and substituted plural outflows respectively.

115.14 Common sensor for both bypass or relief valve and other branch valve:

This subclass is indented under subclass 115.13. Subject matter comprising an additional valve in another flow path and wherein the sensor which controls the bypass or relief valve also controls the additional valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

488+, for fluid pressure-type pilot valves.

115.15 Bypass or relief valve opens as other branch valve closes.

This subclass is indented under subclass 115.14. Subject matter wherein the sensor opens the bypass or relief valve in the main line while it closes the additional valve in the main line or vice versa.

115.16 Bypass or relief valve biased open:

This subclass is indented under subclass 115.13. Subject matter wherein the bypass or relief passage is held open in absence of the fluid pressure by a flexibly adjustable device (e.g., a weight of the valve body itself, or a spring, or such similar flexible means).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115.06, for flow rate responsive biased open bypass or relief valve.

115.17 Increasing pressure progressively closes then reopens bypass or relief valve:

This subclass is indented under subclass 115.16. Subject matter wherein the increase in the fluid pressure progressively closes the bypass or relief valve and reopens at still higher pressure.

115.18 Bypass or relief valve responsive to pressure downstream of outlet valve:

This subclass is indented under subclass 115.13. Subject matter wherein the outlet branch includes a valve which is located before the bypass or relief valve and the bypass or relief valve is controlled by the fluid pressure between the outlet valve and the bypass or relief valve.

115.19 Pilot valve:

This subclass is indented under subclass 115.18. Subject matter comprising an auxiliary control valve and wherein the bypass or relief valve is controlled by the auxiliary control valve in response to the pressure in the main flow line.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
488+, for a fluid pressure-type pilot control.
- 115.2 Outlet valve carried by bypass or relief valve:**
This subclass is indented under subclass 115.18. Subject matter wherein the outlet valve is an integral part of the bypass or relief valve and the outlet valve moves with the bypass or relief valve.
- (1) Note. The outlet valve in this subclass is located between the pressure sensor and the bypass or relief valve.
- 115.21 Plural sensors for single bypass or relief valve:**
This subclass is indented under subclass 115.13. Subject matter comprising at least two pressure sensors for controlling either the bypass or relief valve.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
115.03+, for a flow responsive bypass or relief valve.
- 115.22 Sensors interconnected by timing or restrictive orifice:**
This subclass is indented under subclass 115.21. Subject matter wherein the pressure sensors are connected to each other directly by means of a restrictive passage in order that all the sensors react to the same pressure, but with a different speed of response.
- SEE OR SEARCH CLASS:
192, Clutches and Power-Stop Control, subclasses 109+ for fluid retarders.
- 115.23 Pilot valve operated:**
This subclass is indented under subclass 115.13. Subject matter comprising an auxiliary control valve and wherein the bypass or relief valve is controlled by the auxiliary control valve in response to the pressure in the main flow line.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
115.07, for a pilot valve responsive to a fluid flow rate.
- 115.24 Mechanical movement between sensor and valve:**
This subclass is indented under subclass 115.13. Subject matter wherein the sensor and the bypass or relief valve are so interconnected that the sensor is moving at a different rate and in different direction than the movement of the bypass or relief.
- 115.25 Electrical control:**
This subclass is indented under subclass 115.13. Subject matter comprising an electrical element and wherein the sensor controls the bypass or relief by means of the electrical element.
- 115.26 Sensor rigid with valve:**
This subclass is indented under subclass 115.13. Subject matter wherein the sensor is either (a) assembled as an integral part of the bypass or relief valve, or (b) attached inflexibly to the bypass or relief valve.
- 115.27 Flexible sensor:**
This subclass is indented under subclass 115.26. Subject matter wherein the sensor is constructed of a thin pliable or resilient material such as used in a diaphragm or bellows or the like.
- 115.28 Pressure responsive outlet valve:**
This subclass is indented under subclass 115.26. Subject matter comprising a valve on the outlet branch and wherein the valve is responsive to a pressure being sensed in the outlet branch.
- 116.3 With pressure reducing inlet valve:**
This subclass is indented under subclass 115. Devices with a correlated fluid pressure responsive regulator or pressure reducing valve controlling the inlet branch.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
505.11, for pressure regulators with independently operable relief valves.
- 116.5 Relief port through common sensing means:**
This subclass is indented under subclass 116.3. Devices in which a common sensing means for both inlet control and relief control has a valve controlled outlet or relief passage.

118.01 Plural outflows:

This subclass is indented under subclass 109. Subject matter comprising a sensor and wherein the flow is from a single source and is divided in to a plurality of paths which the flow may take to separate destinations and the flow is controlled by the sensor in response to the change in the condition (e.g., fluid level, flow rate, or pressure, or the like), or a characteristic of the fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

98+, for plural flow systems with mutual control devices.

115.01+, for branch flow systems in which a bypass is controlled in response to a change in condition.

455+, for pressure relief valve which may be mounted on the side of the flow line in which there is no branched flow characteristics claimed.

861+, for nonautomatic distribution systems having a plurality of controlled outflows.

118.02 Single actuator operates plural outlets simultaneously:

This subclass is indented under subclass 118.01. Subject matter comprising an outlet valve in each outflow and wherein the outlet valves are opened or closed at the same time by only one sensor.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

625+, for noncorrelated multiway valves.

862+, for plural outlet valves controlled by a single operator without correlation control.

118.03 Biased open isolation valve:

This subclass is indented under subclass 118.01. Subject matter comprising an outlet valve in each outflow and wherein each outlet valve is held open in the absence of a fluid pressure by a flexibly adjustable device (e.g., a weight of the valve body itself, or a spring) and at least one valve closes in response to a sudden pressure drop or flow increase in the outlet line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

458, through 466, for valves on a single line (one inlet and one outlet) serving the same purpose, but requiring reset.

498, and 517+, for valves on a single line that are biased open and shut when the downstream line has a sudden pressure drop.

SEE OR SEARCH CLASS:

303, Fluid-Pressure Brake and Analogous Brake Systems, subclass 84.2 for a flow retarding isolation valves.

118.04 Flow rate responsive:

This subclass is indented under subclass 118.01. Subject matter wherein the sensor is detecting a change in the quantity of the fluid flowing in the main line in a set period of time and in response thereto controls the outflows.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115.03+, for bypass or relief controlled by the flow rate in self-controlled branch flow system.

118.05 Primer valve:

This subclass is indented under subclass 118.04. Subject matter wherein the change in the fluid flow rate in the main line actuates an outlet leading to a liquid trap seal.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

247+, for liquid trap seals or liquid valves.

118.06 Pressure responsive:

This subclass is indented under subclass 118.01. Subject matter wherein the sensor detects a change in the fluid pressure in the main line and in response thereto controls the outflows.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115.13+, for a similar device controlling a bypass or relief valve.

119.08+, for self-controlled pressure responsive alternately or successively substituted plural outflows.

118.07 With external control for correlating valve (e.g., manual):

This subclass is indented under subclass 118.06. Subject matter wherein, in addition to the pressure responsive sensor, the outflows are controlled by a device independent of the condition of the flow line.

- (1) Note. Modifiers which merely vary the loading are not deemed to constitute external control means within this definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 481, for suction controlled valves which are manually modified or adjusted.
 522+, for direct response valves in combination with external means for opposing the closing bias.
 613+, for system comprising plural valves arranged in series in the flowline wherein manual or external means operate one valve to produce a change in the condition in the flowline in order to utilize such changed condition to effect automatic operation of the other valve in the flowline.

119.01 Alternately or successively substituted outflow:

This subclass is indented under subclass 118.01. Subject matter wherein (a) the fluid is flowing first through one outlet and then changed to another outlet, or (b) more than two outlets are substituted for each other in sequence; in response to the change in the condition or characteristic of the main line flow detected by the sensor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 160+, for plural feed traps alternately filled and alternately discharged by gas pressure.
 625+, for multiway valve unit actuation which is not responsive to a change in condition.

119.02 Four port reversing valve:

This subclass is indented under subclass 119.01. Subject matter including a four way valve having an inlet port, an outlet port and

two intermediate ports, the valve being selectively movable into two positions, in one position the inlet port being connected to the first intermediate port and the second intermediate port being connected to the outlet port, and in the other position the inlet port being connected to the second intermediate port and the first intermediate port being connected to the outlet port.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 309+, for reversing valves in connection with a regenerative type of furnace.
 625.43, for four port reversing valve not of the correlating type.

119.03 Responsive to pressure or flow interruption:

This subclass is indented under subclass 119.01. Subject matter comprising a valve and wherein the alternately or successively substituted outflow is controlled by the valve in response to a break in the pressure of the fluid or a break in the flow of the fluid being detected by the sensor.

119.04 Plural outlets control with automatic reset:

This subclass is indented under subclass 119.03. Subject matter wherein the valve is regulating more than one outlet; said valve opens one outlet in response to the pressure or flow interruption and closes that outlet and opens another outlet when the pressure or flow is restored.

- (1) Note. The valves in this subclass are diverter valves that operate, for example, when a valve in a rinse sprayer is manually opened.

119.05 Manually set to a single outflow position:

This subclass is indented under subclass 119.03. Subject matter wherein the sensor causes the valve to move from a first position to a second position to open or close one outlet, but the valve is moved back to the first position by an application of a force exerted by a living being.

119.06 Flow rate responsive:

This subclass is indented under subclass 119.01. Subject matter wherein the alternately or successively substituted outflow is responsive to a change in the amount of fluid flowing

in the flow line in a set period of time being detected by the sensor.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

87.03+, for a flow rate responsive bypass or relief.

118.04+, for flow rate responsive plural outflows.

119.07 Flow sensing turbine:

This subclass is indented under subclass 119.06. Subject matter wherein the sensor comprising a member pivoted for oscillation or rotation, and having blades, vanes or surfaces which are exposed to the flow and rotating or tending to rotate the member.

119.08 Pressure responsive:

This subclass is indented under subclass 119.01. Subject matter wherein the change in the condition is a fluid pressure detected by the sensor for controlling the alternately or successively substituted outflow of the fluid in the main flow line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

87.04, for a pressure differential sensor controlling the flow.

118.06+, for pressure responsive plural outflows.

119.09 Responsive to outlet pressure:

This subclass is indented under subclass 119.08. Subject matter wherein in response to the change in the fluid pressure in the outlet branch the sensor controls the outflow of the fluid.

119.1 Electrical control:

This subclass is indented under subclass 119.01. Subject matter comprising an electrical element and wherein the sensor controls the outlet by means of the electrical element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

596.16, for an electric pilot-actuated supply and exhaust system.

120 Control by filling auxiliary gravitating or float operating tank:

This subclass is indented under subclass 119.01. Systems in which the control of the flow is in response to a filling of a separate or auxiliary tank of the gravitating or float operating type.

- (1) Note. Many of the patents in this subclass are drawn to rain spouts in which the initial flow is wasted to remove dirt before the rain water is fed to the cistern or storage vessel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

386+, for other liquid level responsive flow control, especially subclass 408 for gravitating tank devices and subclasses 409+ for float operated valves, and see the search notes to subclasses 386, 403, 408, and 409.

121 Control by filling outlet tank or receiver:

This subclass is indented under subclass 119.01. Systems in which the control of the flow is in response to a filling of a tank or receivers receiving fluid from an outflow of the system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115.01+, for by-pass control in response to a change in main line condition.

386+, for other liquid level responsive flow control.

SEE OR SEARCH CLASS:

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 198+ for filling devices controlled by the quantity in a separable receiver.

222, Dispensing, subclass 56 for delivery from a dispenser controlled by the quantity in a discharging receiver.

122 Float controlled:

This subclass is indented under subclass 121. Systems in which the filling of the tank or receiver is sensed by means of a float.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

386+, particularly subclasses 397, 398+ and 409+ for other flow control responsive to a float, and see the search notes to subclass 409.

123 SIPHONS:

This subclass is indented under the class definition. Apparatus having a flow passage comprising two branches or legs of unequal effective length by which a liquid can be transferred to a lower level over an intermediate elevation by the pressure of the atmosphere in forcing the liquid up the shorter branch or leg immersed in it while the excess of weight of the liquid in the longer branch (when once filled) causes a continuous flow.

- (1) Note. This group of subclasses is directed to the siphon subcombination, i.e., the siphon element, per se, and this element associated with supply and/or receiver chambers and/or such other adjuncts as are commonly found in this class combined with the basic subject matter of the class. Patents for combinations of siphons with other art devices are classified with the art device.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

591, for tanks with internally extending inverted U passage, which are not intended to operate as siphons even though of the proper design for it.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 368+ for water closet flushing tanks having an outlet siphon and subclasses 421+ for siphon bowls.
- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 230 for siphon tube filling of separable receivers, and see the search notes thereto.
- 222, Dispensing, subclass 204 for dispenser type siphons with external starting means and subclass 416 for dispensing siphons, per se.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent

image within an electrophotographic device.

124 Plural:

This subclass is indented under subclass 123. Apparatus including a plurality of siphons.

125 Tank truck mounted:

This subclass is indented under subclass 124. Apparatus in which the siphons are connected to the compartments of a tank truck to discharge the liquid contained therein.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

267, for tank trucks having a plurality of compartments with manifold or grouped outlets arranged for parallel flow.

899+, for vehicle supported fluent material handling systems, and see the search notes to subclasses 351 and 899.

126 Sequentially discharging in parallel:

This subclass is indented under subclass 124. Apparatus in which the plural siphons operate successively to produce plural discharges from the same or from different supply chambers. Means are usually provided whereby the termination of the discharge of one of the siphons initiates the discharge of a subsequently operated siphon.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

627, 627.5 and 628+, for sequentially actuated valves, and see the search notes thereto.

127 From plural tanks:

This subclass is indented under subclass 126. Apparatus in which at least some of the siphons are supplied from different chambers.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

256+, for sequentially filled and emptied plural tanks in parallel relation.

128 Main siphon with auxiliary starting, stopping or resetting siphon:

This subclass is indented under subclass 124. Apparatus having a main siphon through which the major portion of the fluid is discharged and

an auxiliary siphon which operates to start or stop fluid flow through the main siphon, or, after discharge of the main siphon, restores some or all of the main siphon operating means to a position permitting a subsequent discharge.

- (1) Note. In series arrangements of plural tanks and siphons wherein one siphon discharges into a tank which is emptied by a second siphon, the first siphon is not regarded as a starter for the second when discharge of the second siphon results merely upon accumulation of sufficient fluid in the tank to permit such discharge, and patents for this subject matter are not included in this or the indented subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 132+, for periodic siphons, or those which discharge as often as a supply sufficient for starting is accumulated.
142+, for other siphon starting means.

129 Sinking or bucket-type float operated main siphon, float emptying auxiliary siphon:

This subclass is indented under subclass 128. Apparatus having a float which fills with liquid and sinks to initiate discharge through the main siphon, the auxiliary siphon then emptying the float.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 404, for liquid level responsive control means comprising a sinking or bucket type float, and see the search notes thereto.
427, for float controlled valves with float leakage disposal.

130 With discharge-controlling receiver:

This subclass is indented under subclass 123. Apparatus having a receiver for the discharge of the siphon, the siphon discharge being controlled by a condition in the receiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 121, for self correlating systems controlled by a filled receiver.

- 453+, for liquid level maintaining systems including barometric control.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 230 for siphon tube filling of separable receivers, and see the search notes thereto.
222, Dispensing, subclass 56 for automatic control of dispensing by the quantity in a receiver which is also discharging.

131 With float:

This subclass is indented under subclass 130. Apparatus in which a float responsive to a condition in the receiver controls discharge of the siphon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 135+, for siphon discharge controlled by float means responsive to liquid accumulation in the system.
409+, for float operated valves of general utility, and see the search notes to subclass 409.

132 Periodic or accumulation responsive discharge:

This subclass is indented under subclass 123. Apparatus having means responsive to a condition or characteristic of the fluid in the system whereby the siphon is caused to discharge at recurrent intervals, i.e., as often as a certain level of tank contents is reached.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 130+, for apparatus in which siphon discharge is controlled by a condition in a receptacle into which the siphon discharges.
396+, for self-emptying tanks of other types which empty in response to liquid level as often as filled, and see the search notes to subclass 396.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 222 and 226 for tank type meters with siphon discharge.

133 With manual control:

This subclass is indented under subclass 132. Apparatus having means whereby the siphon may be discharged either by manual operation or by a condition or characteristic of the fluid in the system, the manual control being either auxiliary to the automatic or the control being convertible from one type to the other.

- (1) Note. See the class definition, section 3 for search notes on combined automatic and nonautomatic controls in this and related classes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
269+, for convertible fluid handling systems.

134 Control by filling auxiliary tank:

This subclass is indented under subclass 132. Apparatus having an additional accumulation receptacle arranged to discharge recurrently into the siphon chamber, such recurrent discharge initiating discharge of the siphon.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
142+, for other siphon starting means.

135 Float-operated inlet to siphon:

This subclass is indented under subclass 132. Apparatus having a float responsive to the accumulation of liquid in the siphon chamber in which the float actuates means for admitting liquid to the siphon element to initiate liquid flow there through.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
409+, for float controlled valves of general utility, and see the search notes to subclass 409.

136 Release of trapped air:

This subclass is indented under subclass 132. Apparatus in which the liquid accumulating in the siphon chamber traps air in the siphon element and means is provided to release such trapped air to initiate liquid flow through the siphon.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 143, for siphon venting or breaking.
144, for removal of the air which accumulates in siphons during use.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 369+ for water closet flush tanks having an outlet siphon which is prevented from discharging until air is positively release therefrom.

137 Through float-operated vent:

This subclass is indented under subclass 136. Apparatus in which the trapped air releasing means is actuated by a float responsive to accumulation of liquid in the siphon system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 202, and 213+, for liquid level responsive vents for gas in diverse fluid containing pressure systems.
409+, for float operated valves of general utility and see the search notes to subclass 409.
583+, for distribution systems having a gas vent and other flow passages, and see the search notes to subclasses 583 and 587.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 69 for float operated vents in dispensers.

138 Through liquid trap seal:

This subclass is indented under subclass 136. Apparatus in which the trapped air releasing means comprises a liquid trap seal, which may be formed by suitable configuration of the discharge end of the siphon element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 247+, for combinations of liquid trap seals with fluid distribution apparatus other than siphons, and see the search notes to subclass 247.

139 Auxiliary liquid trap seal:

This subclass is indented under subclass 138. Apparatus in which the air releasing seal comprises a second liquid trap seal in addition to the air trapping seal necessarily present at the discharge end of the siphon element.

140 With strainer, filter, separator or sediment trap:

This subclass is indented under subclass 123. Apparatus combined with a strainer, filter, separator or sediment trap.

SEE OR SEARCH THIS CLASS, SUBCLASS:

544+, for other fluid distribution apparatus combined with means for separating solid material from the fluid, and see the search notes to subclass 544.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclasses 416.1+ for filter means of that class (210) combined with means providing a suction.

141 With recorder, register, signal, indicator or inspection window:

This subclass is indented under subclass 123. Apparatus combined with a recorder, register, signal, indicator or inspection window.

SEE OR SEARCH THIS CLASS, SUBCLASS:

551+, for other fluid distribution apparatus combined with the listed devices, and see the search notes to subclass 551.

142 With flow starting, stopping or maintaining means:

This subclass is indented under subclass 123. Apparatus having means for applying pressure to initiate, stop or maintain liquid flow, to vent air for starting, stopping or maintaining siphon flow, or for controlling the flow by opening, closing or variably restricting the main flow path of the siphon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

128+, for siphons with auxiliary starting siphon.

130+, for siphon discharge controlled by the receiver.

132+, for periodic discharging or level responsive siphons.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 204 for dispenser siphons with auxiliary starting means and subclass 416 for dispenser siphons.

143 Siphon venting or breaking:

This subclass is indented under subclass 142. Apparatus in which the siphon is provided with means for stopping or regulating the flow through the siphon by admitting air into the siphon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

151, for apparatus including siphons having a valve or closure for controlling the flow of liquid therethrough.

215+, for apparatus for preventing reverse flow siphoning action in apparatus not normally operating by siphon action.

583+, for distributing systems including a gas vent and at least one other flow opening, and see the search notes to subclasses 583 and 587.

144 With leakage or entrained air removal:

This subclass is indented under subclass 142. Apparatus having means for removing air which accumulates in the siphon while it is discharging liquid, such means comprising a positively acting eductor connected at one or more high points of a siphon and having either a separate or a line jet operated pumping means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

136+, for release of trapped air to start a siphon of the periodic type.

143, for siphon venting means which operate to reduce or stop the flow in the siphon.

145 Pressure applied to liquid in supply chamber:

This subclass is indented under subclass 142. Apparatus in which pressure either of liquid or a displacing gas is developed in that part of the system which holds the material into which the

- inlet end of the siphon dips to fill the siphon and start the flow.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 130, for siphons started by controlling the position or pressure condition of the receiver.
- 206+, for gas pressure displacement of a liquid, and see the search notes to subclass 206.
- 565+, for distribution systems having a pump as part thereof, and see the search notes to subclass 565.
- SEE OR SEARCH CLASS:
- 4, Baths, Closets, Sinks, and Spittoons, subclass 375 for water displacer starters for siphons in water closet tanks.
- 222, Dispensing, subclass 204 for siphons combined with discharge assistants in dispensers.
- 146 Plunge or immersion starting:**
This subclass is indented under subclass 142. Apparatus in which a movable siphon is provided with an enlarged entrance chamber whereby when the chamber end is rapidly introduced into the supply a surge of fluid through the line results, which fills the siphon and initiates flow.
- 147 Pump or liquid displacement device for flow passage:**
This subclass is indented under subclass 142. Apparatus in which the means comprises a pump mounted in or on the siphon.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 565+, for distribution systems with pumps, and see the search notes to subclass 565.
- SEE OR SEARCH CLASS:
- 4, Baths, Closets, Sinks, and Spittoons, subclasses 42+ for siphon starters for water closet tanks.
- 222, Dispensing, subclass 204 for siphons with pump or other discharge assistant type starter.
- 148 Piston:**
This subclass is indented under subclass 147. Apparatus in which the pump includes a piston.
- SEE OR SEARCH CLASS:
- 4, Baths, Closets, Sinks, and Spittoons, subclass 373 for water closet flushing tanks having a siphon outlet which is started by a piston or its equivalent.
- 149 Co-axial within flow passage:**
This subclass is indented under subclass 148. Apparatus in which the piston is moved in the flow passage of the siphon.
- 150 Collapsible bulb:**
This subclass is indented under subclass 147. Apparatus in which the pump comprises a collapsible bulb.
- SEE OR SEARCH CLASS:
- 222, Dispensing, subclass 209 for collapsible bulb fluid pressure generators in dispensers.
- 150.5 Siphon inlet movable to and from seat:**
This subclass is indented under subclass 142. Apparatus in which the siphon is movably mounted so that the inlet end comes into contact with the supply chamber wall when flow is cut off, the contact either operating a valve or directly blocking flow through the siphon.
- 151 With valve or closure in-flow passage:**
This subclass is indented under subclass 142. Apparatus having a flow controlling stopping means which comprises a valve or closure.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
- 131, for float-operated valves in receivers controlling the discharge of siphons.
- 135, for float-operated valves for inlets to siphons of the level responsive type.
- 152 With means for mounting and/or positioning relative to siphon chamber:**
This subclass is indented under subclass 123. Apparatus in which the siphon is provided with means for mounting and/or positioning it relative to the chamber from which liquid is supplied to the siphon.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 416 for dispensing siphons, per se.

153 Elements:

This subclass is indented under subclass 123. Apparatus comprising the siphon passage forming means, per se.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 416 for dispenser siphons, per se.

154 DIVERSE FLUID CONTAINING PRESSURE SYSTEMS:

This subclass is indented under the class definition. Apparatus which contain under pressure a plurality of fluids having diverse characteristics such as fluid phase (i.e., gas and liquid) or specific gravity, and which fluids are in contact in at least a part of the system.

- (1) Note. The pressure need not exist continuously in the system, but must be present at least some of the time.
- (2) Note. This subclass does not include systems in which diverse fluids as steam and water are utilized merely for heating purposes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

241, for steam sterilization in fluid handling systems.
 246, for liquid supplied at a valve interface, which liquid may be different from the fluid handled in the system.
 334+, for gas and liquid containing systems for heating, as by mixing steam and water. See Note (1) above.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 394+ for dispensers with fluid pressure discharge assistants, and see the search notes to subclass 394.
 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

155 Gas lift valves for wells:

This subclass is indented under subclass 154. Apparatus which controls a gas to be injected or introduced into the liquid column of well to elevate the liquid.

SEE OR SEARCH CLASS:

417, Pumps, subclass 109 for aerated column type pumps combined with valve means for a controlling a gas inlet.

156 Gas pressure discharge of liquids feed traps (e.g., to boiler):

This subclass is indented under subclass 154. Apparatus which includes a receiving chamber which holds a liquid for subsequent discharge to a receiver at a higher pressure, which discharge is controlled or enabled by the controlled application of a gas pressure over the liquid equal to or greater than the pressure to which the liquid is discharged.

- (1) Note. The discharge may be to a closed receiver at higher pressure than the trap filling pressure, which may be at atmospheric pressure, or the discharge may be to atmosphere or an open receiver from a vacuum system.
- (2) Note. A feed or discharge trap in the fluid handling art is an auxiliary chamber which collects or portions out a separated quantity of fluid which is to be added to or removed from the quantity in the container to which it is auxiliary. It may discharge the separated quantity or merely make it accessible.

SEE OR SEARCH THIS CLASS, SUBCLASS:

177+, for gas traps which may utilize internal uncontrolled pressure for liquid discharge.
 206+, for gas pressure discharge of non feed trap type containers.
 571+, for plural tanks or compartments connected for serial flow, and see the search notes to subclass 571.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclasses 451+ for feed-traps of particular application to boilers.

- 417, Pumps, subclasses 118+ for liquid pumping by supplying or exhausting gaseous motive fluid to or from a liquid pumping chamber.
- 157 Gas pressure controlled by amount of liquids in boiler or discharge receiver:**
This subclass is indented under subclass 156. Feed-traps wherein the application of gas pressure is controlled by the amount of liquid in the discharge receiving receptacle, as the boiler.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
130+, for siphon discharge controlled by the receiver.
205, for liquid filling by evacuating a container and see the search notes thereto.
- SEE OR SEARCH CLASS:
141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 39+ for diverse fluid containing pressure filling systems wherein the filling means is controlled by the gas condition in the receiver.
222, Dispensing, subclass 56 for automatic dispensing controlled by the quantity in a discharging receiver.
- 158 Pressure connection at liquid level in boiler or discharge receiver:**
This subclass is indented under subclass 157. Feed-traps which include a gas pressure connection at the desired liquid level in the discharging receiver.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
393, for level controlled valves having a control fluid connection at the desired liquid level in nonpressure systems.
- 159 Gas pressure controlled by amount of liquid in trap:**
This subclass is indented under subclass 156. Feed-traps wherein the application of gas pressure is controlled by the amount of liquid in the feed-trap chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
183+, and 199+, for fluid responsive valves in fluid separating traps in diverse fluid containing pressure systems.
- 160 Plural trap chambers:**
This subclass is indented under subclass 159. Feed-traps which include a plurality of trap chambers.
- (1) Note. The plural trap chambers may be arranged serially or in parallel, as for alternating use.
- 161 Gravitating:**
This subclass is indented under subclass 160. Feed-traps wherein alternately acting feed traps are moved by gravity to discharge their contents and the lowering of one trap raises the other trap.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
403+, for liquid level responsive or maintaining control systems operated by the weight of accumulated fluid, especially subclass 408 for accumulation in the gravitating tank, and see the search notes to subclasses 403 and 408.
- SEE OR SEARCH CLASS:
177, Weighing Scales, subclass 90 for weighing apparatus in which alternating weight chambers control flow of the material being weighed.
- 162 Gravitating vessel:**
This subclass is indented under subclass 159. Feed-traps wherein liquid accumulates in a vessel which lowers by gravity upon the accumulation of a predetermined amount of liquid therein to control the admission of gas pressure.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
189+, for separating traps of the gravitating type in diverse fluid containing pressure systems.

- 408, for liquid level responsive devices of the gravitating tank type, and see the search notes thereto.
- 163 Sinking or bucket type float:**
This subclass is indented under subclass 162. Feed-traps wherein the vessel is an open-topped float which floats in liquid and sinks when filled with liquid.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
404, for sinking floats in liquid level responsive or maintaining systems, and see the search notes thereto.
- 164 Pivoted vessel with fluid passage through pivot:**
This subclass is indented under subclass 162. Feed-traps wherein the vessel is pivoted and a fluid passage is provided through the pivot.
- 165 Float responsive:**
This subclass is indented under subclass 159. Feed-traps wherein the gas pressure application is controlled by a float in the feed-trap chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
192+, and 202, for float responsive fluid separating traps and vents in diverse fluid containing pressure systems.
409+, for float operated valves of general utility, and see the search notes to subclass 409.
- 166 Liquid control valve positively actuated:**
This subclass is indented under subclass 165. Feed-traps wherein a valve in the liquid flow line to or from the trap is actuated by a distinct positively acting mechanism in conjunction with the float control of the gas inlet.
- (1) Note. Self actuating valves such as check valves are not “positively” actuated.
- (2) Note. See the class definition, section 3 for search notes on automatic valves combined with other actuating means.
- 167 Gas condensing type:**
This subclass is indented under subclass 165. Feed-traps which are not provided with a gas outlet, as the gas applied to discharge the trap is in the form of a readily condensed vapor such as steam which condenses to eliminate the gas pressure after discharge to allow subsequent filling of the trap.
- 168 Gas inlet and outlet valves unitary:**
This subclass is indented under subclass 165. Feed-traps provided with gas inlet and outlet valves which are integrally mounted on a single actuating stem.
- (1) Note. See the class definition, section 4 for search notes on plural valves in the fluid handling systems of this and related classes.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
411, for liquid level responsive or maintaining systems in which plural valves are controlled by one float.
- 169 Gas pressure controlled by manual or cyclic means:**
This subclass is indented under subclass 156. Feed-traps wherein the gas pressure application to the feed-traps controlled by manual or cyclic means.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
631+, for cyclic actuation of valves, and see the search notes to subclass 631.
- 170 Movable trap chamber:**
This subclass is indented under subclass 169. Feed traps wherein the feed trap is moved into discharge relationship with the receiver for discharge and the controlling gas pressure is the pressure in the discharge receiver which may enable discharge of the liquid by the mere flow connection of the trap chamber to the receiver.
- SEE OR SEARCH CLASS:
222, Dispensing, subclass 636 for fluid flow discharge from a movable trap chamber and subclasses 344+ for dispensers with movable trap chambers.

406, Conveyors: Fluid Current, subclasses 63+ for material intake into a fluid current conveyor and comprising successively registering pockets.

170.1 Foam control in gas charged liquids:

This subclass is indented under subclass 154. Apparatus in which the fluids comprise a liquid and a gas which has been intentionally and desirably entrained in the liquid to form a mixture which is subject to frothing under certain conditions and having means for preserving or modifying the pressure of gas in the mixture, thereby controlling the amount of froth released, retained or formed in the handling of the mixture.

- (1) Note. Disclosures of froth or foam control functions for structures of general utility in the fluid handling arts does not result in classification in this or the indented subclasses unless there is a claimed disclosure of a combination of handling features which specialize the overall apparatus to a foam controlling function and for which no suitable general classification exists elsewhere.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 12.5, for methods of controlling foam in handling carbonated liquids.
206+, for gas pressure storage over or displacement of liquids in diverse fluid containing pressure systems, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or subcombination compositions for the breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

170.2 Level or pressure responsive:

This subclass is indented under subclass 170.1. Apparatus having means for sensing a force exerted by the mixture or of either of its com-

ponent parts, or means for sensing a fluid level, such means causing operation of a control device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 386+, for liquid level responsive or maintaining systems of general application.

SEE OR SEARCH CLASS:

- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or subcombination compositions for the breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

170.3 Separate handling of foam:

This subclass is indented under subclass 170.1. Apparatus having means apart from the mixture handling means for treating or disposing of the froth while it remains in the frothy state either by discharging said froth, by extracting liquid from it, or by storing or retaining it in a separate chamber.

- (1) Note. Structures involving foam control within the meaning of subclass 170.1 have been placed in this subclass where the claimed structure includes a passage-way for the discharge of foam on the basis of the applicant's disclosure that foam is so discharged rather than gas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 170.4+, for similar structures where only liberated gas is separately handled.

SEE OR SEARCH CLASS:

- 96, Gas Separation: Apparatus, subclasses 155+ for degasifying means for liquid, per se.
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or sub-

combination compositions for the breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

170.4 With conditioning trap or chamber:

This subclass is indented under subclass 170.1. Apparatus wherein the means for preserving or modifying the pressure of the gas includes an enclosed vessel through which such fluids pass and in which they are retained for a time.

SEE OR SEARCH THIS CLASS, SUBCLASS:

571+, for plural tanks or compartments, including traps, connected for serial flow.

613+, for single flow path devices with serial valves which may comprise alternately seated inlet and outlet valves.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 424.5+ for dispensers including stationary trap chambers, and especially subclass 442 for such arrangements in which a vent is provided for the trap chamber. See also Class 222, Class Definition, "Stationary Traps," for a discussion of the disposition of stationary trap chamber structures and for a listing of other classes containing similar structures.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or subcombination compositions for the breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

170.5 Recarbonation:

This subclass is indented under subclass 170.4. Apparatus having means associated with the vessel for withdrawing evolved gas from the mixture and means whereby some or all of such evolved gas may be returned to the mix-

ture for reentrainment therein before being discharged by the apparatus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

SEE OR SEARCH CLASS:

261, Gas and Liquid Contact Apparatus, appropriate subclasses for devices for contacting liquids and gases, generally.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or subcombination compositions for the breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

170.6 With trap or chamber by-pass:

This subclass is indented under subclass 170.4. Apparatus having conduits or passages so connecting portions of the apparatus that the mixture may be directed to a point of discharge without passing through the vessel so that it is possible to discharge either material which has been held or treated in the vessel, material which has not been so treated, or a desired combination of such materials.

SEE OR SEARCH THIS CLASS, SUBCLASS:

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 318 for dispensers having means to by-pass or to otherwise return the material to the source.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or subcombination compositions for the

breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

171 Fluid separating traps or vents:

This subclass is indented under subclass 154. Apparatus which separates and provides for the removal of one or more of the diverse fluids from the system.

- (1) Note. The material may be collected in an auxiliary chamber or trap prior to discharge, or it may be vented directly through a controlled or restricted outlet in the system. In either case, a given discharge means is intended to relieve the system of one fluid but not others.
- (2) Note. Mere vents for gas in diverse fluid containing pressure systems are found in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 213+, for venting gas from the supply stored over or used to displace a liquid.
- 312+, for collection of external condensate or drip.

SEE OR SEARCH CLASS:

- 34, Drying and Gas or Vapor Contact With Solids, subclass 125 for liquid removal devices for steam drying apparatus.
- 96, Gas Separation: Apparatus, for apparatus for gas separation, per se, particularly subclasses 155+ for degasifying means for liquid, per se.
- 210, Liquid Purification or Separation, appropriate subclasses for separation of liquids from liquids or solids.
- 236, Automatic Temperature and Humidity Regulation, appropriate subclasses, especially subclass 41 and 53-60 for thermally operated or responsive traps or vents in fluid handling system for automatic temperature regulation.

172 Liquids separated from liquid:

This subclass is indented under subclass 171. Separating traps wherein the diverse fluids are liquids of different specific gravity.

- (1) Note. Systems containing diverse fluids which are liquids will be found in subclass 154 of this group where discrimination is not involved.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 513+ for liquid separating decanters, and see the search notes thereunder.
- 222, Dispensing, subclasses 62 and 395 for dispensers having a liquid pressure fluid for displacing the material to be dispensed.

173 Plural discriminating outlets for diverse fluids:

This subclass is indented under subclass 171. Separating traps which are provided with plural discriminating outlets each of which permits outflow of one fluid and prevents outflow of other diverse fluids.

SEE OR SEARCH CLASS:

- 236, Automatic Temperature and Humidity Regulation, subclass 53 for traps having a float controlled liquid outlet and a thermostatic air valve.

174 Common actuator for control valves:

This subclass is indented under subclass 173. Separating traps wherein the outlets are valve controlled and the valves have a common actuator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 595, for systems having a plural noncommunicating flow paths with a common valve operator.
- 601.01 through 601.12, for systems dividing into parallel flow lines then recombining including valves having a common operator therefor.
- 607, for systems having a multiple inlet with a single outlet, a flow control valve in each inlet, and a common valve operator.
- 862 through 871, for systems having a flow control means for branched passages and a common valve operator.

175 Choke or restricted passage gas bleed:

This subclass is indented under subclass 173. Separating traps wherein one of the discriminating outlets is a restricted gas bleed, which by its small size acts or tends to act as a discriminating gas outlet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 179+, for a discriminating liquid outlet with a nondiscriminating gas vent in a diverse fluid containing pressure system.
- 583+, for distribution systems having a gas vent and at least one other flow passage, and see the search notes to subclasses 583 and 587.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 117 for valves having a restrictor in parallel flow relation thereto, and subclasses 118+ for valves combined with material guides or restrictors, and see the search notes to subclass 118.

176 From above liquid level:

This subclass is indented under subclass 175. Separating traps wherein the gas bleed has its inlet above the normal maximum liquid level in the trap chamber.

177 Discriminating outlet for liquid:

This subclass is indented under subclass 171. Separating traps wherein the separating trap is provided with a discriminating outlet which permits outflow of liquid but prevents outflow of gas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 159+, for traps having discriminating liquid outlets, the liquid in the trap controlling gas pressure application to the trap for discharging the liquid.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 66 for empty container cut-offs for dispensers.

- 236, Automatic Temperature and Humidity Regulation, subclasses 53 through 60 for temperature responsive liquid separating traps.

178 With alternately operated inlet and outlet valves:

This subclass is indented under subclass 177. Separating traps further provided with a valve controlling a trap chamber inlet which is operated alternately with the outlet valve.

- (1) Note. See the main class definition, Lines With Other Classes and Within This Class, Plural Valves, and also Subclass References to the Current Class, for search notes on plural valves in fluid handling systems.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 596+, for distribution systems having alternately seated stop and waste valves, and see the search notes thereto.
- 602+, 627.5 and 861+, for other alternately seated valves.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 425+, especially subclasses 445+ and 450+ for dispensers with stationary traps and cut-offs for inlet and outlet, which are ordinarily alternately seated.

179 With non-discriminating gas vent or liquid discharge:

This subclass is indented under subclass 177. Separating traps provided with a nondiscriminating gas vent, an additional nondiscriminating liquid outlet or an additional control of the discriminating liquid outlet, the additional control being such as to give a nondiscriminating action to the discriminating outlet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 175, for plural discriminating outlet trap devices in which one outlet is a choked or restricted passage gas bleed.
- 583+, for distribution systems with plural openings, one of which is a gas vent, and see the search notes to subclasses 583 and 587.

180 Abnormal pressure responsive liquid blow-off or drain:

This subclass is indented under subclass 179. Separating traps wherein the additional liquid outlet or additional control of the liquid outlet responds to a system pressure either above or below the normal operating pressure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

493, for line condition change responsive valves operated by flow in either direction, i.e., high or low pressures on either side.

181 Manual control:

This subclass is indented under subclass 179. Separating traps wherein the nondiscriminating fluid discharge is manually controlled.

(1) Note. See the class definition, Lines With Other Classes and Within This Class, (3) Manual Control, Resetting, etc., and also Subclass References to the Current Class, for search notes on manual valve actuation in this and related classes.

182 With auxiliary inlet or by-pass valve:

This subclass is indented under subclass 177. Separating traps further provided with a non-discriminating valve in the trap inlet or a valve providing a by-pass of the trap.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

597, and 602+, for distribution systems having multiple inlets with multiple and single outlets respectively, and see the search notes to subclass 602.
599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

183 With fluid responsive valve:

This subclass is indented under subclass 177. Separating traps wherein the discrimination is obtained by an outlet valve which is responsive to a fluid condition.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

455+, for line condition change responsive valves of the safety cut-off, pop, pressure regulating, safety or check types, and see the notes to subclass 455 for search notes on condition responsive valves in this and related classes.

SEE OR SEARCH CLASS:

236, Automatic Temperature and Humidity Regulation, subclasses 53 through 60 for temperature responsive liquid separating traps in devices for automatic temperature regulation.

184 Successively opened valves:

This subclass is indented under subclass 183. Separating traps having a plurality of successively opened liquid outlet valves.

(1) Note. See the class definition, Lines With Other Classes and Within This Class, Plural Valves, and also Subclass References to the Current Class, for search notes on plural valves in this and related classes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

628+, for sequentially progressive actuation of plural valves to opening or closing position, and see the search notes to subclass 628.
861+, for distribution systems having plural valved branches, and see the search notes to subclass 861.

185 Gas collecting float (e.g., inverted bucket):

This subclass is indented under subclass 183. Separating traps wherein the valve closes in response to the collection of gas in an open-bottom float.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

409+, for float operated valves, and see the search notes to subclass 409.

186 Downstream from valve:

This subclass is indented under subclass 185. Separating traps wherein the float is located downstream from the valve.

- 187 Level responsive:**
This subclass is indented under subclass 183. Separating traps wherein the valve is controlled by the level of liquid in the trap.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
159+, for liquid level control of gas pressure discharge type feed-traps.
386+, for liquid level responsive valves for other and general uses, and see the search notes to subclass 386.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 64+ for dispensers controlled by material level.
- 188 Weight or pressure:**
This subclass is indented under subclass 187. Separating traps wherein the valve is responsive to the weight or pressure of accumulated liquid.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
403+, for control devices responsive to the weight of accumulated liquid, and see the search notes to subclass 403.
- 189 Gravitating vessel:**
This subclass is indented under subclass 188. Separating traps wherein liquid accumulates in a vessel which lowers in response to the weight of the liquid which lowering controls the valve.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
161, and 162+, for similar subject matter with a control for applying gas pressure to the trap to force the discharge thereof as to a boiler.
408, for gravitating tank devices responsive to and controlling liquid level, and see the search notes thereto.
- 190 Sinking or bucket type float:**
This subclass is indented under subclass 189. Separating traps wherein the vessel is an open-topped float which floats in liquid and sinks when filled with liquid.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
404, for liquid level responsive or maintaining systems controlled by a sinking or bucket type float, and see the search notes thereto.
- 191 Servo-control:**
This subclass is indented under subclass 190. Separating traps wherein the float operates a servo-mechanism or pilot valve controlled device which in turn operates the valve.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
195, for servo control with level responsive means of the float type in these devices.
412+, for servo relay operation of control in float controlled valves.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 25+ for fluid pressure type servo-motors for valve actuation, and see the search notes to subclass 25 and subclasses 129+ for electrical actuators for valves.
- 192 Float:**
This subclass is indented under subclass 187. Separating traps wherein the level responsive means is a float.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
386+, for liquid level responsive or maintaining systems, especially 409+ for float controlled valves, and see the search notes to subclasses 386 and 409.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 67+ for float operated flow controllers in dispensers.
- 193 With main line gas outlet from trap chamber:**
This subclass is indented under subclass 192. Separating traps wherein the trap chamber is provided with an inlet for gas and liquid, a discriminating outlet for liquid and a nondiscriminating outlet for gas.

nating outlet for the main flow of the gas to a gas distribution system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

173, for devices having a gas and liquid inlet and discriminating outlets for both fluids.

179, for devices having a discriminating outlet for liquid and a nondiscriminating vent for gases, i.e., one which does not discharge the main flow of the material being handled.

194 With outlet extending above liquid in trap:

This subclass is indented under subclass 192. Separating traps wherein the discriminating liquid outlet pipe rises above the normal liquid level in the trap chamber, thus requiring the gas pressure in the chamber to discharge the liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

206+, for diverse fluid containing pressure systems in which gas is used as a liquid displacing means, and see the search notes to subclass 206.

590+, for distribution systems having internally extending pipes, and see the search notes to subclass 590.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 373 for fluid pressure discharge of material from a dispenser trap.

195 Servo-control:

This subclass is indented under subclass 192. Separating traps wherein the liquid outlet valve is controlled by a servo mechanism or pilot valve operated means which is in turn controlled by the float.

SEE OR SEARCH THIS CLASS, SUBCLASS:

191, for similar devices in which the level responsive means responds to weight or pressure of the accumulated fluid, and see the search notes thereto.

SEE OR SEARCH CLASS:

236, Automatic Temperature and Humidity Regulation, subclass 55 for a float controlled pilot with a thermostati-

cally controlled trap in automatic temperature regulation devices.

251, Valves and Valve Actuation, subclasses 25+ for fluid pressure servomotors for valve actuation, and see the search notes to subclass 25.

196 With pressure balanced outlet valve:

This subclass is indented under subclass 192. Separating traps wherein a plurality of coacting liquid outlet valves are arranged to act in opposition or a single outlet valve is provided with opposed surfaces to cancel out the effect of internal pressure on the valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 281+ for balanced valves of general utility and see the search notes thereto.

197 Discriminating outlet for gas:

This subclass is indented under subclass 171. Separating traps wherein the trap is provided with an outlet through which outflow of a gas is permitted but outflow of a liquid or diverse gas therethrough is prevented.

SEE OR SEARCH THIS CLASS, SUBCLASS:

173+, for diverse fluid containing pressure systems having plural discriminating outlets or vents.

175+, for traps having a choke or restricted gas bleed.

213+, for liquid level responsive gas vents for boilers or other gas pressure over liquid devices which may also be utilized as safety or warning devices or whistles.

386, for liquid level responsive or maintaining devices involving hygroscopic means.

388, for liquid excluding devices for gas inlets or outlets in systems which are not diverse fluid containing pressure systems.

583+, for distribution systems having plural passages, one of which is a gas vent, and see the search notes to subclasses 583 and 587.

- SEE OR SEARCH CLASS:
 96, Gas Separation: Apparatus, for apparatus for gas separation, per se, particularly subclasses 155+ for degasifying means for liquid, per se.
 222, Dispensing, subclass 69 for float operated controllers for dispensing container vents.
- 198 With reverse flow stop or pressure regulating valve:**
 This subclass is indented under subclass 197. Separating traps further provided with a pressure responsive valve in the gas outlet which prevents reverse flow or regulates the system gas pressure.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
 455+, for line condition change responsive valves, especially subclass 496 for those having separate reactor surface and closing in response to reverse flow, subclass 505 for the pressure regulating type, and subclasses 511+ for check valves, especially subclasses 517+ for those biased open.
- 199 Fluid sensing valve:**
 This subclass is indented under subclass 197. Separating traps wherein the discrimination is obtained by an outlet valve which is responsive to a fluid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
 183+, for fluid responsive valves comprising discriminating outlets for liquids.
 455+, for line condition change responsive valves of general types, and see the search notes to subclass 455.
- 200 With vaporized liquid stop:**
 This subclass is indented under subclass 199. Separating traps wherein the valve or an additional device functions to stop normally liquid fluid which is vaporized, such as steam, in the system.
- 201 With separate return for condensate:**
 This subclass is indented under subclass 200. Separating traps wherein a separate return path is provided from the trap to the system for condensed vapor.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
 156+, for devices of this type where the condensed vapor is returned to a boiler or other receivers under higher pressure.
- 202 Float responsive:**
 This subclass is indented under subclass 199. Separating traps wherein the valve is responsive to a float member.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
 192+, for devices of this type which are discriminating for liquids.
 409+, for float controlled valves, and see the search notes to subclass 409.
- 203 With liquid emptying means:**
 This subclass is indented under subclass 171. Separating traps wherein the provision for removal of a fluid from the system is a nondiscriminating liquid outlet.
- (1) Note. Nondiscriminating outlets for gas in systems of this type have been placed in the subclass under which this subclass is indented.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
 179+, for systems of this type having both discriminating and nondiscriminating outlets for liquid.
 861+, for distribution systems having plural valved outlets, and see the search notes to subclass 861.
- 204 Self-emptying:**
 This subclass is indented under subclass 203. Separating traps wherein the outlet empties the system of liquid of its own volition, as when the system pressure is removed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 183+, and 199+, for fluid responsive valves in diverse fluid containing pressure systems.
396+, for self-emptying tanks which are level responsive.

205 Liquid filling by evacuating container:

This subclass is indented under subclass 154. Apparatus providing means whereby a container may be filled with a liquid by evacuating the container either prior to or simultaneously with the liquid filling.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 130+, for siphon systems with discharge controlling receiver.
571+, for distribution systems comprising plural tanks connected for series flow.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coating Means, subclasses 59+ for filling devices in which a separable receiver is placed under vacuum for filling.
166, Wells, subclass 165 and the subclasses there noted for receptacles used in wells and filled by liquid because the receptacle has been evacuated or is filled with air at a pressure lower than the surrounding liquid.
417, Pumps, subclasses 118+ and particularly subclasses 148+ for means for pumping a liquid by exhausting a gaseous motive fluid from the liquid pump chamber.

205.5 Main line flow displaces additive from shunt reservoir:

This subclass is indented under subclass 154. Apparatus including a shunt line having a reservoir therein containing a fluid diverse from that in the main line and wherein the reservoir material is fed into the main line, without mixing with main line material in the reservoir, by main line flow into the shunt due to differential pressure along the main line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 268, for means to entrain a solid material into a fluid handling system and see the search notes thereunder.
564.5, for a line responsive follower type feeder in a shunt line.

206 Gas pressure storage over or displacement of liquid:

This subclass is indented under subclass 154. Apparatus wherein a gas under pressure is provided over a body of liquid or is utilized to displace a liquid and a definite coaction exists between the gas and liquid which affects the system.

- (1) Note. The usual purpose for mere storage of gas over liquid is for an air cushion or surge eliminating means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 145, for application of pressure to liquid in a siphon chamber to initiate a flow through a siphon connected thereto.
156+, for liquid feed traps utilizing a gas pressure for discharge.
170.1+, for diverse fluid containing pressure systems in which the fluids are in the form of a liquid impregnated with gas and there are means for controlling the degree of froth or foam formed in the handling of such fluids.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 61+, 258, 261 to 263 and 396+ for dispensers with fluid pressure discharge assistants.
417, Pumps, subclasses 118+ for liquid pumping by supplying or exhausting gaseous motive fluid to or from a liquid pumping chamber.

207 Surge suppression:

This subclass is indented under subclass 206. Apparatus wherein the gas is trapped in a dome over a liquid from a liquid distribution system to suppress or absorb pressure surges in the liquid system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

568, and 593, for surge chambers for distribution systems in which a head of liquid supplies the cushion or bias in the system. The chamber may be closed, but air pressure is not relied on for surge suppression.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 26+ for pressure compensators for pipes and tubular conduits.
417, Pumps, subclasses 543+ for expandible chamber type pumps having a pulsation damping means of the direct contact compressible fluid type.

207.5 With return of liquid to supply:

This subclass is indented under subclass 206. Apparatus in which the liquid in one part of the system is allowed to flow back, is forced back, or is by-passed back to the source of supply, in order to empty the system for cleaning, storage, etc.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

239, for fluid handling systems of general application having means for reversing the normal direction of flow of the fluid for assisting in the cleaning of such systems.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 318 for dispensing devices embodying discharge assisting means and having a bypass or return to supply.

208 Plural units:

This subclass is indented under subclass 206. Apparatus wherein a plurality of similarly functioning gas pressure over liquid units are provided.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

255+, for fluid handling systems comprising plural tanks with parallel outflow, and see the search notes to subclass 225.

209 With gas maintenance or application:

This subclass is indented under subclass 206. Apparatus wherein means are provided to maintain or apply the gas pressure over or to the liquid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

145, and 147+, for pressure fluid supply for starting siphons.

SEE OR SEARCH CLASS:

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 19 for puncturing gas pressure reservoirs for filling dispensers.
222, Dispensing, subclass 209 for resilient wall fluid pressure generating pump or pulsator for dispensers, subclasses 399 for gas pressure supplying reservoirs and 401+ for container mounted fluid pressure generating pump or pulsator.

210 Gas carried by or evolved from liquid:

This subclass is indented under subclass 209. Apparatus in which the gas is derived from a liquid not necessarily the liquid over which the gas acts.

SEE OR SEARCH CLASS:

62, Refrigeration, subclasses 45.1+ for process and apparatus for handling liquefied gas as a commodity including steps or means involving pressure or temperature control special to liquefied gas and more than required for other liquids under gas pressure.

211 Gas injectors:

This subclass is indented under subclass 210. Apparatus with a device to add or inject gas into the liquid of the system to replenish the gas over the liquid.

SEE OR SEARCH CLASS:

261, Gas and Liquid Contact Apparatus, appropriate subclasses for carbonators, per se.

211.5 Gas injected by liquid pressure or flow:

This subclass is indented under subclass 209. Apparatus including means to apply gas pressure over the liquid said means utilizing the pressure of flow of the liquid to apply the gas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

211, for gas injectors utilizing the pressure or flow of the liquid in which the gas is carried into the storage tank by the liquid.

212 Unitary mounting for gas pressure inlet and liquid outlet:

This subclass is indented under subclass 209. Apparatus wherein the gas pressure inlet and liquid outlet have a common mounting adapted for manipulation as a unit for positioning or removal from a gas and liquid container.

SEE OR SEARCH THIS CLASS, SUBCLASS:

317+, for devices for tapping a container under pressure which frequently comprise the liquid outlet subcombination of the subject matter under this definition.

594+, and 625.18+, for fluid distribution systems including noncommunicating flow paths where one flow path may be for gas and the other for liquid.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 394+ for dispensers having fluid pressure discharge assistants, especially subclass 399 for those having a gas reservoir and subclasses 401+ for those having a pressure generating pump mounted on the supply container, and see the search notes to subclass 394.

213 With liquid level responsive gas vent or whistle:

This subclass is indented under subclass 206. Apparatus wherein a gas vent or whistle is opened in response to a predetermined liquid level.

(1) Note. An example of such apparatus is a low water level steam exhaust and signal for a boiler.

SEE OR SEARCH THIS CLASS, SUBCLASS:

197+, for discriminating gas outlets or vents which may be liquid level responsive.

386+, for liquid level responsive or maintaining systems.

558, for liquid level indicators involving release of a separate gas for their operation, or of internal gas pressure when gas is the only fluid in the system. The use of whistles with gas exhaust devices as found in diverse fluid containing pressure systems is so common in the art that no cross reference is made of patents involving such subject matter to subclass 558. The search note under subclass 558 directs that search be made in subclasses 213+.

SEE OR SEARCH CLASS:

116, Signals and Indicators, subclasses 137+ for whistles, per se.

222, Dispensing, subclass 39 for audible signals for dispensers and subclass 69 for float controlled vents for dispensers.

446, Amusement Device: Toys, subclasses 204+ for a sounding toy comprising a whistle.

214 Combined high and low level responsive:

This subclass is indented under subclass 213. Apparatus wherein the gas vent or whistle is opened in response to a high and low liquid level.

SEE OR SEARCH THIS CLASS, SUBCLASS:

391, for liquid level control of both inflow and outflow in a tank.

215 BACK FLOW PREVENTION BY VACUUM BREAKING (E.G., ANTI-SIPHON DEVICES):

This subclass is indented under the class definition. Apparatus which stop reverse flow of a liquid in a distribution system by preventing or eliminating the vacuum condition which would

cause the reverse flow, such as a condition which would start siphoning.

- (1) Note. The normal flow in these systems is not of the siphon type.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 143, for breakers in flow devices which are intended to act as siphons.
441, for refill pipes which may act as vacuum breakers.
526, for vacuum relief valves, per se.
583+, for distribution systems having plural openings, one of which is a gas vent, and see the search notes to subclasses 583 and 587.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 34 for reverse flow prevention in choked pressure type servo motors which actuate valves.
399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotographic device.

216 Air vent in liquid flow line:

This subclass is indented under subclass 215. Apparatus wherein the back flow is prevented by an air vent or gap in the liquid flow line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 143, for vent type breakers in flow devices which are intended to act as siphons.
583+, for distribution systems having plural flow passages, one of which is a gas vent, and see the search notes to subclasses 583 and 587.

216.1 With liquid seal in liquid flow line:

This subclass is indented under subclass 216. Apparatus including a liquid seal means in the liquid flow line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 247+, for liquid seals.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 211, 218 and 219 for ventilation of house plumbing or sewers.

216.2 Automatic valve in vent line:

This subclass is indented under subclass 216.1. Subject matter including an automatic valve in the vent line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 217, for valved vents without a liquid seal means.

217 Valved:

This subclass is indented under subclass 216. Apparatus wherein the air vent is provided with a valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 216.2, for valved vents in a flow line of the instant type including a liquid seal.
526, for vacuum relief valves, per se.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclass 426 for vented siphon bowls.

218 With co-acting valve in liquid flow path:

This subclass is indented under subclass 217. Apparatus wherein a valve is provided in the liquid flow path which operates in conjunction with the air vent valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 861+, for distribution systems having plural valved flow paths, and see the search notes to subclass 861.

219 LARNER-JOHNSON TYPE VALVES; I.E., TELESCOPING INTERNAL VALVE IN EXPANDED FLOW LINE SECTION:

This subclass is indented under the class definition. Flow control devices comprising a flow line having a contracted portion, a valve seat adjacent said contracted portion and an internal coaxial valve part comprising telescoping members, one of which is a movable needle or valve head which engages said seat.

- (1) Note. These valves are commonly known as Johnson or Lerner-Johnson valves, and are used principally in water conduits providing for very large flow, as in dams and hydraulic installations associated therewith.
- (2) Note. In addition to one or two moving valve heads or needles the internal part of the device comprises one or more stationary members around which flow occurs. The stationary members may be merely guides for the needles or they may complete a pressure chamber arrangement in cooperation with the movable member or members, but in either case a flow channel must be formed around a stationary member and between it and the wall of the flow line; i.e., the parts of the internal device must be surrounded by flowing fluid, except for the supports or connections between the stationary member and the wall.
- (3) Note. The contracted portion of the flow line constitutes a region of relatively low fluid pressure, and the usual streamlining of the needle or stationary part, or both, provides a balanced or easily controlled valve suitable for controlling large flows.
- (4) Note. The inner valve element frequently comprises a closed top-shaped body having fluid pressure chambers therein, but may comprise annular members having annular chambers therebetween, or less streamlined forms. In any form the valve head always lies in an enlarged portion of the flow line.
- (5) Note. The valve may be operated (1) by fluid pressure derived either from the line or from an external source, the expansible chambers comprising (a) the telescoping valve body (b) a separate motor within the valve body or (c) a mechanical movement connected fluid pressure motor external to the line, (2) by mechanical movement or electric motor means either within or outside of the flow line; or (3) by combinations of fluid pressure operating means and non-fluid operated means.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
455+, for line condition responsive valves of other types.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, appropriate subclasses for valves and valve actuation generally, especially subclasses 12+ for fluid actuated or retarded valves of other types, and subclasses 123+ for combined valves and restrictors in which the valve is located at the point of greatest restriction in the line.
399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.
- 220 Line condition change responsive:**
This subclass is indented under subclass 219. Flow control devices in which the valve is actuated in response to a change in condition of the fluid handled.
- (1) Note. Such devices as pressure regulators and excess or reverse flow responsive valves, and combinations of the above with each other or with manual or other external controls, are included.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
455+, for line condition responsive valves of other types, especially subclasses 485+ for pilot or servo-controlled condition change responsive valves.
- 221 Internal servo-motor with internal pilot valve:**
This subclass is indented under subclass 219. Flow control devices in which a controlled motor device comprising a pilot operated or servo-mechanism is involved, the motor device and its pilot or control valve being located within the internal part of the valve, i.e., the part comprising the telescoping support and the needle or movable valve head lying within the flow passage.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for valve actuation involving fluid type pilot or servo type motors, and see the search notes to subclass 25.

222 Pilot controlled passage in nose or needle:

This subclass is indented under subclass 221. Flow control devices in which the pilot valve controls a passage through the needle or movable part of the valve means internal to the flow line.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 38+ for choked pressure type servo motors for valve actuation in which the pilot valve is seated in the motor or valve element.

223 INFLATABLE ARTICLE (E.G., TIRE FILLING CHUCK AND/OR STEM):

This subclass is indented under the class definition. Apparatus comprising valved inflation stems of the type attached to pneumatic tires and analogous inflatable articles, including filling and/or relief extensions of such stems, valved filling chucks or the type attached to pressure fluid supplying conduits and employed to inflate such articles by means of the inflation stems, and combinations of such inflation stems and filling chucks.

- (1) Note. Relief and filling extensions to be attached to inflation stems have means to hold open the valve normally present in such stems.
- (2) Note. The claiming of a source of supply of inflating fluid by name only does not exclude patents otherwise classifiable herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

320+, for means comprising a tap or other attachable flow conduit which can be applied to a container under pressure to open a valve therein for transfer of fluids.

455+, for line condition change responsive valves, e.g., safety and check valves.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 89.1 through 89.4 for inflation stem closures and caps.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 4 for methods of charging separable receivers with gas, subclass 38 for filling apparatus for filling tires with gas and liquid, and appropriate subclasses for charging tires with gas, comprising in addition to the chuck and/or stem a significantly claimed source of supply, means for holding or supporting the tire or other Class 141 feature.

152, Resilient Tires and Wheels, subclasses 415+ for tire inflating devices combined with vehicle or wheel structure.

222, Dispensing, subclasses 3+ for gas dispensers.

224 With pressure-responsive pressure-control means:

This subclass is indented under subclass 223. Apparatus having fluid pressure responsive means permanently associated therewith for controlling the pressure therein or in the inflatable article during the inflating operation or while the inflatable article is in use.

- (1) Note. If the pressure responsive control device is associated with the stem and controls the article in use, it does not interfere with the inflation operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

230, for relief valves adapted to be mounted on the end of a conventional inflation stem, and not having a filling passage. See (1) Note.

494+, particularly subclasses 505+ and 511+ for pressure regulators and relief valves of general utility with and without separate reactor surfaces, respectively.

224.5 Pulsating:

This subclass is indented under subclass 224. Devices wherein the fluid is dispensed in successive charges until the predetermined pressure is reached.

225 Diaphragm, bellows or expandible tube:

This subclass is indented under subclass 224. Apparatus having a diaphragm, bellows or expandible tube as the pressure responsive means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 510, for relief valves of general utility closing in the direction of fluid flow and having a reactor surface comprising flexible diaphragm or bellows.
- 777+, for expandible chamber devices, per se, and see the notes to subclass 777.
- 793+, for diaphragms and bellows, per se, and see the notes to subclass 793.

226 Co-axial inflation and relief valves:

This subclass is indented under subclass 224. Apparatus having inflation and relief valves on a common axis.

- (1) Note. See the class definition, Section 4 for search notes on plural valves in this and related classes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 228, and 230, for other relief valves associated with inflation stems.
- 493+, for line condition responsive valves of the bi-directional type, including plural valves of which one may relieve high pressure and another relieve vacuum or reverse pressure.
- 505.11, for combined pressure regulators and relief valves of general utility.
- 512.2, 614.16+, 630+, and 637.2+, for other valves mounted on a common axis.

227 With gauge or indicator:

This subclass is indented under subclass 223. Apparatus having a fluid pressure gauge or indicator combined therewith.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 224+, for inflation devices having fluid pressure responsive pressure control means in association with a fluid pressure gauge or indicator or wherein the pressure responsive means is also a gauge or indicator or part thereof.
- 557, for combinations of fluid delivery systems other than inflatable article filling chucks or stems with fluid pressure responsive gauges or indicators.
- 524, for check and safety valves having means to adjust and indicate the setting of the biasing means.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 146.2+ for fluid pressure gauges connected to a tire valve stem and mounted on the stem or a vehicle carrying the stem and subclasses 700+ for fluid pressure gauges, per se.
- 116, Signals and Indicators, subclass 34 for signals, indicators and alarms for indicating when tire pressure is different from a desired valve.

228 With deflating means:

This subclass is indented under subclass 227. Apparatus having means for releasing fluid from the article being inflated while the gauge or indicator remains combined with the filling chuck and/or stem.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 230, for stem attached relief valves.
- 511+, for relief valves of general utility in which the pressure fluid acts directly on the valve head, without separate reactor surfaces.

229 Selectively connected:

This subclass is indented under subclass 227. Apparatus having means whereby the gauge or indicator may be selectively placed in or out of communication with the filling passage of the chuck or stem.

230 Stem attached relief valve:

This subclass is indented under subclass 223. Valved devices which are adapted to be mounted in the end of a conventional pneumatic tire inflation stem to relieve excess pressure.

- (1) Note. These valves each include a projection which holds the conventional valve open when it is in place.
- (2) Note. Since these valves do not include an inflow passage, they must be removed during inflation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 224+, for tire pressure relief valves integral with tire inflating stems and/or chucks, and intended to remain in place during inflation. See (2) Note.
- 320+, for tapping connections to valved containers which are under pressure, the connection comprising or carrying means for opening the valve after or during the connecting operation.
- 494+, and 511+, for relief valves with and without separate reactor surfaces, respectively some of which are disclosed for use with inflatable articles.

231 With coupling means:

This subclass is indented under subclass 223. Apparatus having significant structure for connecting a filling chuck to an inflation stem, or an inflation stem to a second inflation stem or filling tube, the second stem or tube usually being permanently associated with a tire.

- (1) Note. The mere statement that a chuck or stem is screw threaded or flanged for coupling is not regarded as significant coupling structure for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 614.02+, and 614.05, for a valve operated by coupling motion of the flow path sections.
- 798+, for nonvalved couplings joining two or more flow lines in fluid connecting relation, and see the search notes to subclass 798.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 383+ for couplings between a separable dispenser and receiver, and see the search notes to subclass 223 of this class (137).
- 251, Valves and Valve Actuation, subclasses 142+ for a valve associated with a flow path, particularly subclasses 149+ wherein the valve is operated by the act of joining flow path sections.

232 With cap:

This subclass is indented under subclass 223. Apparatus, usually of the inflation stem type, having a cap or closure for protecting and/or sealing the end thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 800, for closures associated with devices of this class, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 49, Movable or Removable Closures, appropriate subclasses, for closures of the type provided for, and see the search notes thereto in section IV for the loci of closures in other classes.
- 138, Pipes and Tubular Conduits, subclasses 89.1 through 89.4 for inflation stem type closures and plugs.

233 Valve actuating, assembling or locking means on cap:

This subclass is indented under subclass 232. Apparatus in which the cap is provided with means for actuating, locking in place, or assembling a valve located in an inflation stem.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 315.01 through 329.4, for a fluid handling system with repair, tapping, or assembly means.
- 613+, for a flow path with serial valves and/or closures.

SEE OR SEARCH CLASS:

152, Resilient Tires and Wheels, subclass 431 for combined valve stem caps and tools, the tool usually being employed to manipulate a valve in the stem.

234 Valve manually seated:

This subclass is indented under subclass 233. Apparatus in which the valve which is actuated, locked or assembled is seated by manual manipulation.

(1) Note. The valve may also be provided with biasing means tending to seat it.

234.5 Removable valve head and seat unit (valve insides):

This subclass is indented under subclass 223. Devices comprising one or more valve heads and their cooperating seats formed in a sleeve or similar structural unit which is removable as such from a tire stem.

SEE OR SEARCH THIS CLASS, SUBCLASS:

283+, and 454.2+, for similar structure removable from other fluid handling devices.

234.6 WITH VEHICLE GUIDE OR SUPPORT, E.G., SERVICE STATION:

This subclass is indented under the class definition. Fluid handling system combined with means for supporting, guiding or confining a vehicle relative to fluid handling means which supplies a fluid to the vehicle, e.g., lubricant or fuel.

(1) Note. Included in this subclass are a fluid system which services vehicles, which system has a defined relationship to an area or body of land or water or a vehicle support or guide even though a nozzle or metering device such as those used in a Class 141, 222 or 239 system is defined.

SEE OR SEARCH THIS CLASS, SUBCLASS:

236, for other fluid handling systems involving geographic features.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclasses 169.1+ for a building defined as having a specific relationship to the adjacent terrain, and subclass 174 for a static structure, combined with a defined traffic confining or directing feature wherein no fluid handling feature is defined.

62, Refrigeration, subclass 260 for such apparatus related to the terrain.

184, Lubrication, particularly subclass 1.5 for an automobile gear and crank case system having means specifically related to the crank case.

210, Liquid Purification or Separation, subclasses 170.01 through 170.11 for liquid purification or separation means installed in a geographic feature.

222, Dispensing, for a dispensing device with a casing or support not related to a guide or support for a vehicle being serviced.

399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

236.1 DISTRIBUTION SYSTEMS INVOLVING GEOGRAPHIC FEATURES:

This subclass is indented under the class definition. Fluid handling systems including or specifically related to a particular geographic feature, e.g., a hill, river, ocean shore, city street, etc.

(1) Note. Mere location of a fluid handling system or a portion thereof below the surface of the ground is not sufficient for inclusion in this subclass.

(2) Note. The geos:graphic feature may be either natural or artificial, but must be a clearly defined area on or below the surface of the earth.

SEE OR SEARCH THIS CLASS, SUBCLASS:

272+, for hydrant type devices including water cranes, which usually have a connection to a water main and a

- valve located below the surface of the ground. See (1) Note, above.
- 363+, for casings for fluent material handling devices which separate the device from the ground and support the adjacent earth, as valve and meter wells and pipe line housings. See (1) Note, above.

SEE OR SEARCH CLASS:

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 201+ for ground or floor embedded sprinkler systems.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

237 WITH CLEANER, LUBRICATION ADDED TO FLUID OR LIQUID SEALING AT VALVE INTERFACE:

This subclass is indented under the class definition. Fluid handling systems having (1) devices to render the system or parts thereof free from undesirable material, or (2) devices for lubricating the system or parts thereof by adding a lubricating medium to the stream of fluent material carried by the system or (3) devices for preventing leakage between the valve and a solid valve seat by introducing a liquid between the valve and its seat.

- (1) Note. Cleaning means for this group requires the installation of additional means or connections to treat the apparatus, not the material being handled, or the manipulation of the system in some special way to secure the cleaning effect.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15.01 through 15.26, for a process of cleaning, repairing, or assembling.
- 247+, for liquid valves, i.e., those having liquid seats.
- 544+, for screens, filters, etc., for physically separating solid or unwanted materials from the material being handled.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 148+ for dispensers with installed cleaning means.

- 225, Severing by Tearing or Breaking, subclasses 12+ for installed beer pipe cleaners.
- 251, Valves and Valve Actuation, subclass 355 for lubrication of actuators or parts of a valve in which the lubricant does not enter the flow path.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

238 Cleaning or steam sterilizing:

This subclass is indented under subclass 237. Systems containing a means other than those causing or controlling the normal or unmodified flow of the fluent material of the system for removing germs or other undesirable internal or extraneous material from the system itself or parts thereof, as distinguished from treating the material being handled to remove undesirable material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15.04 through 15.06, for a process of fluid cleaning a fluid handling system.
- 171+, for traps for separating or venting either gas or liquid from a pressure system containing both materials.
- 312+, for leakage or drip collecting in fluid handling devices.
- 387, for washing machine cycle control involving liquid level response or maintenance.
- 544+, for screens, filters, sediment, traps, etc., for removing undesired particles from the material being handled.

SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 137+ for cleaning and laundering processes for textiles and fibers. 147+ for manipulative fluid treatment processes for textiles and fibers.
- 15, Brushing, Scrubbing, and General Cleaning, appropriate subclasses for fluid blast or suction cleaning and mechanical cleaning with or without the addition of liquid.

- 62, Refrigeration, subclass 303 for a refrigerator combined with cleaning means.
- 68, Textiles: Fluid Treating Apparatus, appropriate subclasses for fabric cleaning by liquid contact.
- 134, Cleaning and Liquid Contact With Solids, appropriate subclasses for cleaning by liquid contact.

239 Reverse fluid flow:

This subclass is indented under subclass 238. Systems in which the cleaning device includes a means for causing a fluid to flow in the reverse direction to the normal flow path to remove undesirable material from the system or parts thereof.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 102+, for reversing valves in supply and exhaust type self-regulating systems, especially subclasses 103+ for the suction pulsator type and 106 for 4-way valve systems.
- 207.5, for diverse fluid containing pressure systems having means to return fluid contained in the system to the source of supply.
- 249+, and 309+, for reversing valves of the regenerative furnace type.
- 627, for sequential distributing valves.

240 With separate material addition:

This subclass is indented under subclass 238. Systems in which a separate material such as steam, air, water, valve grinding compounds or other chemical or physical agents are introduced into the fluent material of the system to clean parts of the system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 255+, for systems having parallel discharge from plural tanks.
- 268, for systems with holders for solid, flaky or pulverized material to be dissolved or entrained, and see the search notes thereto.
- 602+, for systems having plural inflows and a single outflow, and see the search notes to subclass 602.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 129+ for dispensers in which plural diverse fluids from plural sources are discharged either separately or together.

241 Steam sterilizing:

This subclass is indented under subclass 238. Systems in which steam is used as a medium for cleaning germs or other infective agents from parts of the system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 13, and 565+, for processes and systems using steam as a propelling fluid.
- 334+, for systems using influent gas or vapor for heating fluid.

SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, subclasses 316.1+ for cleaning by gas blast only.

242 Mechanical cleaning:

This subclass is indented under subclass 238. Systems in which the undesired material is removed from the device or system or parts thereof by the physical interaction of two or more parts of the device or system, not including relations or operations which are part of or necessary for flow handling.

- (1) Note. One or more of the interacting parts may be parts present solely for cleaning purposes, or all may have utility as flow handling means provided the two modes of operation are present.
- (2) Note. This and the first indented subclass include disclosures relating to valve grinding only where the assembled system is described as having a specific nonvalving member or motion which produces valve grinding action or where the system or part when disassembled has a specific member that facilitates valve grinding.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.01 through 329.4, for a fluid handling system with repair, tapping, or assembly means.

330+, for systems having nonvalving motion of the valve or valve seat for purposes other than cleaning or disassembling, though the motion may prevent fouling or dislodge material tending to settle on the valve parts.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclasses 104.31+ for sewer cleaners.

243 Valve grinding motion of valve on seat:

This subclass is indented under subclass 242. Systems in which the fluent material system or a part thereof has means for giving the valve or its seat a motion which produces cleaning or grinding of the valve and/or its seat.

(1) Note. This motion must be one not contemplated or normally occurring in the fluid controlling movement of the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

240, for this subject matter wherein a separate material (e.g., grinding compound) is added at the grinding zone.

330+, for other nonvalving motion of valves or valve seats.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 215+ for plural motions of mechanically actuated valves.

451, Abrading, subclasses 115+ for grinding a valve on a seat by use of plural workholders, without an abrading tool.

243.1 Concentric stem:

This subclass is indented under subclass 243. Devices in which the actuator is made up of an axial rod mounted within a sleeve.

243.2 Spring pressed:

This subclass is indented under subclass 243. Devices provided with a spring which permits regrinding of the valve head on its seat.

243.3 Lost motion permits grinding:

This subclass is indented under subclass 243. Devices provided with lost motion which permits the valve to rotate on its seat before it leaves the seat upon opening.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

243.2, for such connections which use a spring.

243.4 With swivel-preventing means:

This subclass is indented under subclass 243. Devices in which a normally swiveled connection between the head and stem is blocked to cause the head to rotate on the seat as the stem rotates.

243.5 Nut releasable from body and/or stem:

This subclass is indented under subclass 243. Devices comprising screw actuated valves in which the nut is disconnected from the body or the stem, or both, to permit the valve head to rotate without reciprocating.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

243.2, for valves in which a spring permits limited movement between the nut and the body or stem.

243.6 With independent grinding actuator:

This subclass is indented under subclass 243. Devices which are provided with means in addition to and independent of the normal valve actuator for imparting the grinding motion to the valve.

243.7 Separable:

This subclass is indented under subclass 243.6. Devices in which the grinding means is normally removed from the valve.

244 Cleaning member reciprocates in passage:

This subclass is indented under subclass 242. Systems in which the fluent material system has a member which has a reciprocating movement to enter a restricted passage of the system

to clean either or both parts, either the member, the passage or the movement being nonworking characteristics of the system; i.e., not contributing to the fluid flow causing or controlling function of the system, though the member or passage may be carried by a working part of the system.

SEE OR SEARCH CLASS:

22, Dispensing, subclasses 149+ for dispensers in which a cleaning element enters the container outlet.

245 By-pass cleaning:

This subclass is indented under subclass 244. Systems in which the reciprocating member cleans a branch channel.

- (1) Note. The branch channel may comprise a diverting passage for fluid to be used to operate a valve, pilot valve, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

245.5 Independent actuation:

This subclass is indented under subclass 244. Devices wherein the means to actuate the cleaning means is independent of the valve actuator.

246 Liquid supplied at valve interface:

This subclass is indented under subclass 237. Systems in which a separate fluid is applied between the valve and its seats to seal the valve against passage of the fluent material carried by the system.

- (1) Note. The sealing material may be a lubricant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15.06, for a process of cleaning using liquid on a valve or valve seat.

247+, for liquid valves and liquid trap seals.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 355 for lubrication in which the lubricant does not enter the flow path.

246.11 Plural feed:

This subclass is indented under subclass 246. Valves wherein plural feed means (other than gravity) are provided for the sealing liquid to cause flow thereof.

246.12 Line pressure feed:

This subclass is indented under subclass 246. Valves wherein line pressure is used to feed the sealing liquid.

246.13 Feed by or with actuation:

This subclass is indented under subclass 246. Valves wherein the feed means is actuated by the valve actuator or is so interrelated therewith that feeding of sealing liquid is dependent on valve actuation.

246.14 Loss control:

This subclass is indented under subclass 246. Valves having means to control or prevent the loss of sealing means to the line flow.

246.15 Screw feed:

This subclass is indented under subclass 246. Valves having a screw means (e.g., screw fed plunger) for feeding the fluid.

246.16 With check valve:

This subclass is indented under subclass 246.15. Valve having check valve means in the lubrication or sealing system.

246.17 Excess relief:

This subclass is indented under subclass 246.16. Valves having means to permit escape of the sealing liquid from its flow system to prevent excessive pressure therein or as an indication of complete flow therein.

246.18 Jacking:

This subclass is indented under subclass 246.16. Valves wherein the valve is lifted from its seat to aid actuation by the pressure of the lubricant.

246.19 Jacking:

This subclass is indented under subclass 246.15. Valves wherein the lubrication pressure lifts the valve from its seat.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
246.18, for "jacking" with a check valve in the lubrication system.

246.2 Seating:

This subclass is indented under subclass 246.15. Valves wherein the lubrication pressure aids in seating of the valve.

246.21 Spring biased piston feed:

This subclass is indented under subclass 246. Valves wherein the lubricant feed means is a spring biased piston.

246.22 External pressure:

This subclass is indented under subclass 246. Valves wherein the sealing material is introduced into the valve under pressure from some means such as a grease gun or oil pump.

246.23 Gravity or capillary feed:

This subclass is indented under subclass 246. Valves wherein the lubricant flows by gravity or by capillarity.

247 WITH LIQUID VALVES OR LIQUID TRAP SEALS:

This subclass is indented under the class definition. Apparatus in which a liquid, maintained at the desired location by some form of reservoir, is used as a seal or closure between adjacent parts of a system containing either a gas or a liquid which is lighter than the sealing liquid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

138+, for periodic siphon discharge by release of trapped air through a liquid trap seal.

154+, for diverse fluid containing pressure systems, especially subclasses 154 and 172 for those containing plural liquids and 171+ for fluid separating traps and vents.

246+, for liquid sealing at the valve interface by supplying the sealing liquid to the flow path or directly to the valve interface.

505.31, and 505.4, for reactor surface of the inverted cup type having liquid seal.

SEE OR SEARCH CLASS:

4, Baths, Closets, Sinks, and Spittoons, appropriate subclasses for liquid trap seals and valves combined with the subject matter of the class.

222, Dispensing, subclass 188 for fluid trap seals for dispenser inlets and outlets, including vents.

399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotographic device.

247.11 Liquid seal in liquid flow line; flow liquid forms seal:

This subclass is indented under subclass 247. Apparatus comprising a U-shaped flow passage which retains a portion of a line flow liquid to provide a gas seal in the said line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

138+, for periodic siphon discharge through liquid trap seals.

171+, for diverse fluid containing pressure systems with fluid separating traps, especially subclasses 177+ for a discriminating outlet for liquid.

216.1+, for a vented siphon breaking system including a liquid seal.

251, for seals utilizing a diverse liquid.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, appropriate subclasses for separation apparatus comprising liquid seals, particularly subclasses 163+ for grated inlet surface drains, subclasses 295+ for grated inlet catch basins, subclasses 116 and 119 for the same with a backflow preventing float or filtrate accumulation responsive valve, respectively, and subclasses 532.1+ for catch basins with gravitational separation.

247.13 Valves:

This subclass is indented under subclass 247.11. Apparatus having a valve in the liquid flow line in or adjacent to the seal.

247.15 Line condition change responsive:

This subclass is indented under subclass 247.13. Apparatus in which the valve is responsive to a change in the condition of the liquid in the flow line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

386+, for liquid level responsive valves where no liquid seal is present, and particularly subclasses 409+ for float controlled valves.

455+, for other line condition change responsive valves.

247.17 Plural valves or valve seats:

This subclass is indented under subclass 247.15. Apparatus having a plurality of line condition responsive valves or having such a valve which seats alternatively on one of a plurality of seats.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

512+, for plural direct response valves.

516.25, for check valves having serially arranged plural seats.

613+, for systems with plural serial valves in a single flow path.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 211 for a valve, per se, having serial alternately closed ports.

247.19 Pivoted valve:

This subclass is indented under subclass 247.15. Apparatus in which the valve is pivoted.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

517+, for a biased opened direct response valve.

527+, for a pivoted check valve.

247.21 Ball valve:

This subclass is indented under subclass 247.15. Apparatus in which the valve is a substantially spherical element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

409+, especially subclasses 433 and 449 for float responsive ball valves.

519.5, for weight biased open direct response valves of the ball type.

533.11, for a weight biased ball check valve.

539+, for a spring biased ball check valve.

247.23 Seats vertically up:

This subclass is indented under subclass 247.21. Apparatus having a seat lying in a general horizontal plane above the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

519.5, for ball valves which are weight biased open.

247.25 Seal replenishers:

This subclass is indented under subclass 247.11. Devices having (1) a distinct compartment with a restricted orifice which stores flow line liquid during flow and discharges it into the seal after the flow ceases in order to assure a seal or replace lost seal liquid, or (2) a connection to an outside source of seal liquid for the same purpose.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

114, and 118, for valves providing correlated flow in seal replenishing apparatus of the (2) type.

240, for means to add a cleaning material to a fluid handling system.

247.27 Plural inlet:

This subclass is indented under subclass 247.11. Devices having connections for a plurality of inlet pipes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

216.1+, for liquid seals with plural connections one of which is for an external vent means.

602+, for systems having multiple inlets and a single outlet, and see the search notes thereunder.

247.29 Divided and recombined passages:

This subclass is indented under subclass 247.11. Devices having divided and recombined passage means for flow liquid and/or air, for preventing seal loss by forward siphonage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247.25, for divided and recombined passages where a seal replenishing chamber is included.

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

247.31 Tangential inlet flow:

This subclass is indented under subclass 247.11. Devices wherein the flow enters a leg of the U-shaped passage tangentially to the axis of the leg.

247.33 Downward partition encircles projecting outlet:

This subclass is indented under subclass 247.11. Seals in which the U-shaped passage is formed by a chamber having a downwardly extending partition comprising an inverted cup and a distinct outlet pipe which projects up into the cup.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclasses 163+ and 247 for grated inlet surface drains with similar liquid seal means where the inverted cup functions as a filtrate splash plate or deflector.

247.35 Submerged inlet pipe end:

This subclass is indented under subclass 247.11. Seals comprising a chamber having a distinct inlet pipe projecting thereinto and an outlet at a higher level than the inlet pipe end opening.

247.37 Hinged seal bowl:

This subclass is indented under subclass 247.35. Seals wherein the chamber comprises an overflow seal bowl hinged for movement into and out of seal forming position.

247.39 Distinct seal bowl in flow line connected casing:

This subclass is indented under subclass 247.35. Seals wherein the chamber comprises a distinct overflow seal bowl within a flow line connected closed casing.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 247 for devices of similar structure including separation means.

247.41 U-seals:

This subclass is indented under subclass 247.11. Seals wherein the U-shaped passage comprises a U-bend of which one leg thereof is an inlet pipe and constitutes the downflow column and the other leg is distinct and externally spaced from the first leg and constitutes the upflow column.

247.43 Topside access beneath cover plate closed floor opening:

This subclass is indented under subclass 247.41. Apparatus installed beneath a surface and having a top side access means located beneath an opening in the surface, the opening being provided with a removable cover plate.

247.45 Enlarged upflow leg:

This subclass is indented under subclass 247.41. Seals wherein the upflow leg or a portion thereof ahead of the overflow into the outlet is transversely larger than the downflow (inlet) leg.

247.47 Topside access opening:

This subclass is indented under subclass 247.45. Seals with a top side access means located above the liquid seal level.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247.43, for the same apparatus positioned beneath a surface, such as a floor, having a covered access opening therein.

247.49 Even diameter legs:

This subclass is indented under subclass 247.41. Seals wherein both legs of the U-bend have substantially uniform and like internal cross sections.

247.51 Access opening:

This subclass is indented under subclass 247.49. Seals having access means.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclass 92 for lateral plugs and closures.

248 Seal for relatively movable valving parts:

This subclass is indented under subclass 247. Apparatus in which the liquid is used to seal a gap between relatively movable valving parts of a valve in at least one position of the valve, the liquid pool comprising in effect the seat for the movable valve element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

246+, for liquid sealing at a valve interface where the liquid is supplied to seal the crack and is washed away when the valve is opened.

249 Horizontally moving valve:

This subclass is indented under subclass 248. Apparatus in which the movement of the valve has a component in a horizontal plane.

SEE OR SEARCH THIS CLASS, SUBCLASS:

309+, for reversing valves of the regenerative furnace type which do not have a liquid seat.

250 Rotary:

This subclass is indented under subclass 249. Apparatus in which the movement in a horizontal plane is rotary.

SEE OR SEARCH THIS CLASS, SUBCLASS:

311, for rotary reversing valves of the regenerative furnace type which do not have a liquid seat.

251.1 Liquid valves:

This subclass is indented under subclass 247. Apparatus in which the sealing liquid alone performs a valving function in response to either external control means or to fluid pressure in the flow path, i.e., no flow conduit is withdrawn from the liquid to open a flow path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

455+, for line condition responsive valve comprising solid material valve parts.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 188 for fluid trap seals for dispenser inlets and outlets, including vents.

252 Branched passage for sealing liquid:

This subclass is indented under subclass 251.1. Apparatus in which at least one side of the liquid valve is provided with a branching path whereby as the sealing liquid rises on that side beyond a predetermined point it divides into a plurality of branches.

SEE OR SEARCH THIS CLASS, SUBCLASS:

472, for pop safety valves in which the top pressure reactor is in a branched released path.

253 With auxiliary means for varying liquid level:

This subclass is indented under subclass 251.1. Apparatus including auxiliary means independent of the flow path for adjusting or varying the height of the liquid in the valve.

254 With baffle:

This subclass is indented under subclass 251.1. Apparatus in which one or more baffles is provided either in or above the liquid of the valve, usually to restrict, deflect, or slow up sudden rising of the valving liquid.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 118+ for devices having flow restrictors, especially subclass 127 for restrictors comprising baffles, and see the search notes to subclasses 118 and 127.

255 PLURAL TANKS OR COMPARTMENTS WITH PARALLEL FLOW:

This subclass is indented under the class definition. Apparatus having two or more tanks or compartments so connected that (1) fluid from the same or different sources is separately supplied to different tanks or compartments, and/

or (2) the tanks or compartments discharge separate fluid flows externally of the system or to parts of the system other than one another.

SEE OR SEARCH THIS CLASS, SUBCLASS:

87.01+, for self proportioning or correlating systems involving plural fluid sources.

124+, for plural siphons, especially subclass 127 for sequential parallel discharge from plural tanks.

208, for plural units in pressure systems having gas pressure stored over or displacing liquids.

571+, for plural tanks or compartments connected for series flow, i.e., discharging into one another, and see the search notes to subclass 571.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 129+ for dispensers having plural sources, compartments and containers.

256 **Sequentially filled and emptied (e.g., holding type):**

This subclass is indented under subclass 255. Apparatus having means for successively filling the tanks and means for subsequently emptying the filled tanks in succession. Many of the patents in this group of subclasses are directed to milk pasteurization tank systems, wherein milk at pasteurization temperatures is retained in a tank for a period of time before the tank is emptied.

SEE OR SEARCH THIS CLASS, SUBCLASS:

119.01+, for alternately substituted outlets of a line, as to plural tanks, in a self controlled system.

127, for siphon discharge of plural tanks in sequence.

160+, and 169+, for plural traps sequentially filled and emptied by gas pressure into a pressure chamber such as a boiler.

266+, for plural tanks discharging, receiving or vented through a manifold or through grouped outlets and 263 for similar devices in which the manifold is a tank.

627, for sequential distributor or collector type valve actuation.

257 **With relative rotation of tank group and filling head:**

This subclass is indented under subclass 256. Apparatus in which a group of tanks or compartments and the filling means therefor are mounted for rotation with respect to one another.

SEE OR SEARCH THIS CLASS, SUBCLASS:

581, for movable tanks, and see the search notes thereto.

SEE OR SEARCH CLASS:

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 129+ for apparatus for filling separable receivers having means to supply and position successive receivers relative to the filling means.

222, Dispensing, subclass 144 for rotatably mounted assemblies of plural dispensing containers.

258 **With rotary filling and emptying head:**

This subclass is indented under subclass 257. Apparatus in which the filling means rotates with respect to the tank group and the filling means also includes means for emptying the tanks.

SEE OR SEARCH THIS CLASS, SUBCLASS:

627, for sequential operation of distributing and collecting valves, and see the search notes thereto.

259 **With housings, supports or stacking arrangements:**

This subclass is indented under subclass 255. Apparatus having means for enclosing some or all of the tanks or compartments, means for positioning the tanks or compartments with respect to a supporting surface or member other than the tanks or compartments themselves, or constructional features specially designed to permit stacking one upon another.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 264, for parallel discharging tanks positioned one within another.
 356+, for static constructional installations of fluid handling devices, especially subclasses 357+ for buildings.
 376, for supported tanks other than those arranged for parallel flow.

SEE OR SEARCH CLASS:

- 206, Special Receptacle or Package, subclasses 503+ for a receptacle having feature or element intended to facilitate stacking.
 222, Dispensing, subclass 143 for packing or stacking arrangements for plural dispensing containers and subclasses 173+ for dispenser supports and casings.

260 Battery or electrolytic cell replenishment:

This subclass is indented under subclass 255. Apparatus in which the tanks or compartments are storage battery or electrolytic cells and means is provided for supplying liquid thereto, usually to maintain a constant liquid level in the cells.

- (1) Note. Patents for subcombinations specialized for use in battery or cell filling apparatus are classified herein.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 386+, for liquid level responsive or maintaining systems other than those for storage batteries electrolytic cell, especially subclasses 453+ for barometric type level maintenance.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coating Means, appropriate subclasses, especially subclasses 285+ for battery filling devices which are not continuously associated with a particular battery.
 204, Chemistry: Electrical and Wave Energy, subclass 263 and see the note thereto for electrolytic cells provided

with means for feeding and/or withdrawing material therefrom.

- 429, Chemistry: Electrical Current Producing Apparatus, Product and Process, subclasses 72+ for battery having means feeding electrolyte thereto.

261 Barometric supply:

This subclass is indented under subclass 260. Apparatus in which the supply means comprises a closed container elevated with respect to the cells and adapted to be placed in continuous communication therewith, whereby, upon lowering of the liquid level in the cell, liquid is supplied thereto.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 453+, for tank level responsive or maintaining systems of the barometric type wherein the tank is other than a battery or an electrolytic cell, and see the search notes to subclass 453.

262 Flow dividing compartments:

This subclass is indented under subclass 255. Apparatus in which fluid from a single source is supplied to a plurality of compartments, each of which has a normally open outlet, for the purpose of proportionally dividing the single flow into a plurality of flows.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 561+, for distribution systems comprising plural flow paths, and especially subclass 561 for those comprising an inlet and a plurality of flow dividing outlets which have no valves and do not accumulate any liquid at the entrance to the flow path.
 861+, for fluid distribution systems having a plurality of branches with means for stopping or controlling fluid flow in at least one of the branches.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 215+ for weir type meters.
 222, Dispensing, subclass 330 for dispensers having plural outlets from a discharge assistant and subclasses 478+ for supply containers having plural outlets or discharge guides.

263 Tank type manifold (i.e., one tank supplies or receives from at least two others):

This subclass is indented under subclass 255. Apparatus in which one tank or compartment is arranged to supply to and/or receive from a plurality of additional tanks or compartments, with or without the intervention of a manifold.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

266+, for tanks arranged for parallel flow having a filling and/or emptying manifold which does not supply to or receive from a tank or compartment in addition to those arranged for parallel flow, and see the definition of subclass 266 for the meaning of the term "manifold".

571+, for plural tanks arranged for serial flow only.

264 Tank within tank:

This subclass is indented under subclass 255. Apparatus in which one tank is positioned within another.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

259, for tanks with stacking or superposing means.

340, for jackets forming a flow path in heat-exchange type fluid handling systems.

375, for jacketed containers in a fluid handling system. The jacket may be spaced and disclosed for holding fluid, for storage, heat exchange or any other purpose, but the inlet and/or outlet is not claimed.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 131 for dispensers comprising a supply container and a spaced, nondispensing jacket and subclass 183 for dispenser supply containers with nonspaced jackets.

265 With cross connecting passage:

This subclass is indented under subclass 255. Apparatus having a connecting passage whereby fluid may flow between the tanks or compartments.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

571+, for plural tanks connected for flow only from tank to tank, and see the search notes on serial tanks and/or traps collected in the definition of subclass 571.

266 With manifold or grouped outlets:

This subclass is indented under subclass 255. Apparatus having (1) a filling and/or emptying or venting manifold or (2) separate outlet conduits from plural tanks or compartments arranged to terminate adjacent one another, usually for convenience in discharging the contents of the several compartments.

(1) Note. In this and the indented subclasses, the term "manifold" includes any arrangement in which flow conduits to or from two or more tanks or compartments arranged for parallel flow merge into a common flow passage.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

262, for flow dividing compartments.

263, for plural tanks in parallel having a filling and/or emptying manifold which is itself a tank or for plural tanks or compartments arranged for parallel flow which discharge into or are supplied from at least one other tank by means of a manifold.

561+, for distribution systems having branched flow lines, including manifolds, per se.

597, for systems having a multiple inlet with a multiple outlet.

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

602 through 607, for systems having multiple inlets with a single outlet.

861 through 877, for systems having a flow control means for branched passages.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 145.1+ for dispensers having plural sources, compartments or containers and a common discharge.

267 Tank truck type:

This subclass is indented under subclass 266. Apparatus in which the plural compartments are of the type commonly mounted on a truck or other vehicle.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 125, for plural compartment tank trucks having siphon discharge outlets.
- 899+, for other fluid delivery systems combined with vehicles, especially subclasses 351+ for automobile type vehicles, and see the search notes to subclasses 351 and 899.

268 WITH HOLDER FOR SOLID, FLAKY OR PULVERIZED MATERIAL TO BE DISSOLVED OR ENTRAINED:

This subclass is indented under the class definition. Fluid handling devices including a member for holding and bringing a fluent material and a material to be dissolved or entrained into contact with the fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 101.11, for self proportioning systems comprising differential response means with means to entrain material from a reservoir.
- 205.5, for a diverse fluid containing pressure system including means for main line flow to displace material from a shunt reservoir into the main line.
- 240, for cleaning means involving the supplying for cleaning purposes of material other than and in addition to the material handled by the system.
- 255+, for systems having parallel discharge from plural tanks.
- 564.5, for a follower type feeder in a shunt line responsive to mainline flow.
- 602+, for systems having plural inflows and a single outflow, and see the search notes to subclass 602.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 222+ for chemical holders in water closets.

- 15, Brushing, Scrubbing, and General Cleaning, subclasses 302 and 320 for air blast or suction cleaners with liquid or other cleaning material application to the work.
- 34, Drying and Gas or Vapor Contact With Solids, appropriate subclasses for material handling in contact with gas or vapor for drying, and also for such other purposes as are not otherwise classified.
- 48, Gas: Heating and Illuminating, subclasses 38+ for carbide feeders for acetylene generators.
- 68, Textiles: Fluid Treating Apparatus, subclass 17 for soap supply means for significantly included fluid treating apparatus for textiles.
- 134, Cleaning and Liquid Contact With Solids, appropriate subclasses for the application of liquid to solids for cleaning and also for other miscellaneous purposes.
- 169, Fire Extinguishers, subclass 15 for fluid systems having means to add a chemical (e.g., extinguishing agent) to a flow line.
- 206, Special Receptacle or Package, subclass 77.1 for a soap container provided with means to facilitate the lifting or removal of a piece of soap from the container.
- 210, Liquid Purification or Separation, subclasses 198.1+ for a separating means combined with means to add a treating material and see the search notes thereunder.
- 220, Receptacles, appropriate subclasses for shaving cups.
- 222, Dispensing, subclass 133 for a measuring dispenser for one supply receiving an indeterminate flow from another, and subclasses 630+ for fluid flow dispensing of an entrained material.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 310+ for spray discharging apparatus with dissolving means.
- 248, Supports, subclasses 200+ for a bracket type soap holder, subclasses 317+ for a suspended type soap holder, and subclasses 683+ for a holder which supports the soap while

- in storage position and remains with the soap while in use.
- 312, Supports: Cabinet Structure, subclass 351 for a soap dish provided with means to support the soap in spaced relation to the bottom wall of the structure.
- 401, Coating Implements With Material Supply, subclasses 88+ for a soap holder which holds the soap in such a manner that a portion of the soap may be directly rubbed on the user's body or on a surface; subclass 261 for a porous applicator pad wherein the soap is retained in a pocket of the pad through which it seeps when fluidized; and subclass 268 for a device wherein soap is held in direct contact with and for application to, an applicator of the brush, broom or mop type.
- 406, Conveyors: Fluid Current, subclasses 108+ for material intake apparatus for fluid current conveyors.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 261+ for dissolvers, extractors, and leachers including those having a holder for nonliquid material for making solutions wherein the holder as disclosed is incapable of retaining a liquid, where dissolving takes place in the holder and may thereafter be added to a stream, and the handling of liquids being restricted to the purpose of dissolving.
- 269 CONVERTIBLE:**
This subclass is indented under the class definition. Apparatus so designed that its mode of operation can be changed by reassembling all or some of its parts in a different relationship to each other or by the addition or omission of a part.
- (1) Note. Apparatus in which a change in direction of an outlet nozzle or spout is accomplished by disassembly and reassembly are classified here.
 - (2) Note. See the class definition, Lines With Other Classes and Within This Class, (3) Manual Control, etc. and also Subclass References to the Current
- Class, for search notes on fluid handling systems having adjusting means.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
329 through 329.06, for systems having repair by providing alternate wear part.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 290 for a valve or actuator having plural selective neutral positions.
- 269.5 Reversible check:**
This subclass is indented under subclass 269. Devices comprising check valves mounted in alternately positionable carriers whereby a carried valve may check fluid flow in either of two directions by repositioning the carrier.
- 270 Unit orientable in a single location between plural positions:**
This subclass is indented under subclass 269. Apparatus in which a part or a unitary subassembly of parts may be assembled with the remainder of the apparatus in only one location, but plural relative angular positions or orientations with respect thereto are possible with corresponding changes in the mode of operation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
329+, for devices in which parts may be shifted to replace a worn area, but without any change in the mode of operation.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 290 for a valve or actuator having plural selective neutral positions.
- 270.5 Reversible stop and vent or waste:**
This subclass is indented under subclass 270. Devices comprising stop and vent or waste valve units having means to associate the waste port with either principal port.

271 Units interchangeable between alternate locations:

This subclass is indented under subclass 269. Apparatus in which the mode of operation can be changed by interchanging plural parts or unitary subassemblies. One of the parts interchanged may be a mere plug or closure.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 290 for valve parts, handles or actuators which may be applied in different positions with relation to the devices without any change in the mode of operation.

272 HYDRANT TYPE:

This subclass is indented under the class definition. Fluid distributors characterized by a vertical delivery riser with a valve at the bottom, to avoid freezing when installed below the frost line, and an extended actuator for the valve, usually for actuating the valve from a point adjacent the outlet from the riser or an extension thereof.

(1) Note. The common form of this device is the fire hydrant, but railway water cranes, outdoor toilet installations and frost-proof irrigation outlets are included.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15.02, for a process of repairing or assembling a hydrant (e.g., fireplug, etc.).
364+, for valve and meter wells in which an underground pipe is tapped or controlled, but no flow occurs using the well or a pipe extending vertically through it as a flow path.

SEE OR SEARCH CLASS:

166, Wells, subclasses 72+ for a well with an above ground means for actuating means in the well.
251, Valves and Valve Actuation, subclasses 142+, especially subclasses 145+ and 148+ for well pipe drain valves, many of which have an actuator extending vertically along the pipe to be accessible from the ground level.

273 Water crane type:

This subclass is indented under subclass 272. Apparatus including a laterally extending delivery spout at the top of the riser for delivery of liquid, usually to movable tanks, e.g., water to railroad locomotive tenders or gasoline to tank trucks.

SEE OR SEARCH THIS CLASS, SUBCLASS:

615+, for distribution systems having articulated and swinging flow conduits, and see the search notes to subclass 615.
801, for nozzles and spouts, per se, and see the search notes thereto.

274 Spout operated valve:

This subclass is indented under subclass 273. Apparatus in which the valve is actuated by movement of the spout into delivery position.

SEE OR SEARCH THIS CLASS, SUBCLASS:

616+, for distribution systems having valves controlled by articulated or swinging flow conduits, and see the search notes thereto.

275 Rotating riser:

This subclass is indented under subclass 273. Apparatus in which the riser is rotatable about its axis to position the spout for delivery of water.

SEE OR SEARCH THIS CLASS, SUBCLASS:

286+, for rotating risers in hydrants, i.e., those vertical discharge pipes which lack lateral extensions.

276 Spout articulated to riser:

This subclass is indented under subclass 275. Apparatus in which the spout is attached to the rotatable riser by a flexible joint providing for movement of the spout in at least one plane.

SEE OR SEARCH THIS CLASS, SUBCLASS:

279, for water cranes having a spout articulated to a stationary or movable but nonrotating riser.

- 615+, for articulated or swinging flow conduits in distribution systems, and see the search notes to subclass 615.
- 801, for nozzles or spouts, per se, and see the search notes thereto.
- 277 Vertically movable riser:**
This subclass is indented under subclass 275. Apparatus in which the riser is movable vertically as well as rotatably.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
287+, for hydrants having vertically reciprocating risers which may also rotate.
- 278 Extensible spout:**
This subclass is indented under subclass 273. Apparatus in which the spout is extensible in a lateral direction from the riser to vary its length.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 522+ for dispensers having axially slidable tubes or sleeves.
- 279 Spout articulated to riser:**
This subclass is indented under subclass 273. Apparatus in which the spout is attached to the riser by a flexible joint providing for movement of the spout in at least one plane.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
276, for similar spouts associated with rotating risers.
615+, for articulated or swinging flow conduits in distribution systems, and see the search notes to subclass 615.
801, for nozzles or spouts, per se, and see the search notes thereto.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 526+ for movable material discharge guides for dispensers.
- 280 Plural riser:**
This subclass is indented under subclass 272. Apparatus in which at least part of the riser is divided into plural parallel fluid flow passages.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
294+, for hydrant risers having a casing or housing which is not a flow path but merely a support or protector.
- 281 Expandible chamber operated by valve actuator for draining riser:**
This subclass is indented under subclass 272. Apparatus including an expandible chamber near the bottom of the riser and operated by movement of the riser and/or valve actuator to evacuate water from the riser as the valve is closed or receive the drain or waste after the valve is closed, and to refill the riser as or before the valve is opened.
- (1) Note. These are primarily anti-freeze devices for storing the water trapped in the riser at the lowest point above the valve, and returning it to the flow path at the start of the next discharge.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
62, for low temperature responsive drains.
301+, for other antifreeze protection of hydrants.
568, for reserve or surge receiving means for distribution systems having pumps.
596+, for distribution systems provided with stop and waste means or drains.
777+, for expandible chamber devices, per se.
- SEE OR SEARCH CLASS:
123, Internal-Combustion Engines, subclass 41.14 for means for withdrawing and storing the water from the cooling system of an internal combustion engine when the engine is not operating.
138, Pipes and Tubular Conduits, subclasses 27+ for freeze protecting expandible chambers for pipes and tubular conduits.
- 282 With pump or ejector:**
This subclass is indented under subclass 272. Apparatus combined with a pump or ejector.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

575+, for distribution systems embodying pumps, and see the search notes to subclass 565.

283 Removable valve and valve seat:

This subclass is indented under subclass 272. Apparatus in which a valve and its valve seat are so arranged as to facilitate removal, usually where the valve opens downwardly.

(1) Note. The valve and valve seat concerned may be either the main valve or the drain valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

234.5, and 454.2+, for other removable units.
326, for foot valve extraction through a tank.
327, for disassembly tool engaging features in fluent material handling systems.
439, for float arm operated valves which may be removed by working from the outside of the tank, leaving the actuating mechanism in the tank.

284 With extension to facilitate removal:

This subclass is indented under subclass 283. Apparatus in which the valve seat is provided with an extension independent of the riser, to facilitate its removal.

285 Removable valve with supplemental check valve:

This subclass is indented under subclass 272. Apparatus in which the main valve is arranged to be removable, and a supplemental check valve is provided, biased closed by a spring or by fluid pressure and normally held open by a projection on the main valve or its actuator when the main valve is in place.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

223+, for inflation stems having a valved extension which comprises means for opening the valve in the main stem.
283+, for hydrants having the valve and valve seat removable.

320+, for devices for tapping a system under pressure, the system having a valve actuated by the separable tapping device or by means carried thereby.

326, for foot valve extraction through a tank.

327+, for systems having means provided for engagement by tools for assembling and disassembling the system.

329.1, and 329.2+, for repair check type valves held inactive except at times of repair.

613+, for distribution systems having serial valves in a single flow line.

286 Movable riser actuated valve:

This subclass is indented under subclass 272. Apparatus in which the riser serves as the actuator for the valve, i.e., movement of the riser in a predetermined manner actuates the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

274, for spout-operated valves in water cranes.

275+, for rotating risers having laterally extending spouts.

616+, for distribution systems in which an articulated or swinging flow conduit actuates the valve, and see the search notes thereto.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 341+ and 349+ for valves operated by moving the casing or an extension thereof, including inlets and outlets.

287 Reciprocating riser:

This subclass is indented under subclass 286. Apparatus in which reciprocating movement of the riser actuates the valve.

(1) Note. This subclass includes those hydrants in which a combination of reciprocating movement and rotary movement of the riser actuates the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

277, for water crane risers which reciprocate and rotate.

- 288 Piston type valve:**
This subclass is indented under subclass 287. Apparatus in which the valve is a piston cooperating with one or more ports in a cylindrical valve seat.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 318+ for reciprocating valves of general utility, and see the search notes thereto, and subclasses 324+ for piston valves, per se.
- 289 Balanced valve:**
This subclass is indented under subclass 272. Apparatus in which the valve is balanced, i.e., has opposed surfaces of equal or nearly equal area exposed to the line fluid pressure.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 281 for balanced valves of general application and see the search notes thereto.
- 290 Valve actuator extends laterally from bottom of riser:**
This subclass is indented under subclass 272. Apparatus in which the valve actuator has at least one element projecting in a generally horizontal direction adjacent the bottom of the riser, or comprises a linkage such that the resultant movement of the valve is in a generally horizontal direction.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 213+ for mechanical movement valve actuators, especially subclass 279 for actuating linkages.
- 291 Valve actuator outside riser:**
This subclass is indented under subclass 272. Apparatus in which the extended valve actuator does not extend longitudinally through the flow path or riser, but is located entirely outside the riser.
- (1) Note. The valve may have a spindle or stem which serves as a mounting for the valve disk or plug and extends through the top of the valve body.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
364+, for valve and meter wells which house an actuator for an underground valve which has no vertical flow path.
- 292 Lever actuator:**
This subclass is indented under subclass 291. Apparatus in which the valve actuator includes a lever.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 231+ for valve actuators of general utility which includes a lever, and see the search notes thereto.
- 293 With casing, flush with ground or pavement surface:**
This subclass is indented under subclass 291. Apparatus with a ground supporting casing for at least the upper end of the riser whereby the discharge end of the riser can be at or below the surface of the ground or pavement where it is installed.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
295, for other types of hydrants with a casing flush with ground or pavement.
363+, for apparatus of this class in general combined with a ground supporting casing, especially subclasses 363+ for valve and meter wells which house a valve for underground flow lines and a vertically extending, usually removable, actuator.
- 294 With casing:**
This subclass is indented under subclass 272. Apparatus combined with an external enclosure for the riser, valve casing or valve actuator or for a part thereof.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
343+, particularly subclasses 364+ and 375 for other apparatus of this class combined with an external enclosure or casing, and see the search notes on casings generally under subclass 375.

295 Flush with ground or pavement surface:

This subclass is indented under subclass 294. Apparatus in which at least a portion of the casing provides a ground supporting recess for the discharge end of the riser whereby the discharge opening can be at or below the surface of the ground or pavement where it is installed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

293, for hydrants with actuator outside riser and with casing flush with ground or pavement.
364+, for ground supporting casings for valves and their actuators or for meters.

296 Cap, cover or hood:

This subclass is indented under subclass 294. Apparatus in which the casing includes a cap, cover or hood for the top or discharge outlet of the riser.

SEE OR SEARCH THIS CLASS, SUBCLASS:

300, for valves at the outlet of a hydrant.
371, for covers for valve and meter wells.
800, for closures for fluent material handling systems, and see the search notes thereto.

297 With heater:

This subclass is indented under subclass 294. Apparatus which includes a heating means, e.g., a heat exchange device or a gas or oil burner.

SEE OR SEARCH THIS CLASS, SUBCLASS:

281, and 301+, for other means for protecting hydrants against freezing.
334+, for other apparatus of this class combined with a heating or cooling means, especially subclass 338 for hydrant and meter wells having passages for thermal circulation of air and see the search notes to subclass 334.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 32+ for thawing and freeze protection of pipes and tubular conduits.

298 With actuator lubricating means:

This subclass is indented under subclass 272. Apparatus which includes means for lubricating the valve actuator.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 355 for valve actuator lubrication of general utility, and see the search notes thereto.

299 With valve at outlet:

This subclass is indented under subclass 272. Apparatus which includes one or more valves at outlets from the riser, either in the riser or in a discharge spout, and provided in addition to the main or foot valve of the riser.

SEE OR SEARCH THIS CLASS, SUBCLASS:

613+, for systems involving a single flow path with plural serial valves, and see the search notes to subclass 613.
861+, for systems involving flow control means for plural passages, and see the search notes to subclass 861.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 147 for pipe terminal mountings for valves.

300 With supplemental valve:

This subclass is indented under subclass 272. Apparatus which includes an additional valve independent of the main valve and exposed to fluid upstream of the main valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

290, for hydrants having a single main valve which is located upstream from the base of the riser.
613+, for systems including a single flow path with plural serial valves, and see the search notes to subclass 613.

301 Protection against freezing:

This subclass is indented under subclass 272. Apparatus which makes some provision for preventing freezing of water in the riser or around the valve, by providing for its removal from the hydrant, by arrangement of the connection to the water main or by means provided inside the flow path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 59+, for freeze condition responsive safety systems, especially subclass 61 for low temperature responsive cut offs, and 62 for low temperature responsive drains.
- 68.11+, for system control by frangible means.
- 107, for systems where a waste or drain valve opens in response to stoppage of flow.
- 272, for arrangements for getting water out of frozen hydrants.
- 281, for prevention of freezing by providing an expansible chamber for draining water from the riser and retaining it below the frost line for later use.
- 297, for hydrant casings with heater.
- 338, for system installations providing for circulation of air from below to above ground for freeze protection purposes.

SEE OR SEARCH CLASS:

- 138, Pipes and Tubular Conduits, subclasses 32+ for thawing and freeze protection for pipes and tubular conduits.

302 Stop and waste:

This subclass is indented under subclass 301. Apparatus in which freezing of water in the riser is prevented by providing an auxiliary valve operated in at least one direction by the actuator of the main valve for draining the riser when the main valve is closed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 61, for low temperature responsive stop and waste devices.
- 102+, for self correlating systems of the supply and exhaust type, especially sub-

class 107 for waste responsive to flow stoppage.

- 281, for expansible chambers for draining water from the riser and retaining it.
- 596+, for stop and waste and drain valves in other types of fluent material handling apparatus, and see the search notes thereto.
- 625.2, for stop and waste valve units.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 337 and 339 for water closets having antifreeze drain means in riser pipes.
- 251, Valves and Valve Actuation, subclasses 143+ for drains for well pipes, etc.

303 With disabling means:

This subclass is indented under subclass 302. Apparatus including selective means for preventing operation of the auxiliary or drain valve.

- (1) Note. These devices are usually operative during the summer.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 89+ for means for disabling or preventing operation of a valve of general utility, and see the search notes thereto.

304 Separate relatively movable valves with single actuator:

This subclass is indented under subclass 302. Apparatus in which the control valve and the drain valve are relatively movable but are operated by a single actuator.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 445+ for non-rigidly connected cut-offs for stationary measuring traps in dispensers.
- 251, Valves and Valve Actuation, subclasses 631+ for cyclic valves, and see the notes to the definition of subclass 631.

- 305 Unidirectional abutting connection between main valve or actuator and waste valve:**
This subclass is indented under subclass 304. Apparatus in which the drain valve is operated in only one direction by abutment of a part thereof with the control valve or a projection thereon or on the valve actuator, operation in the other direction being by weight or spring bias.
- SEE OR SEARCH CLASS:
222, Dispensing, subclass 231 for free engagement connection between successive agitators and discharge assistant and/or interconnected valve, and subclass 446 for free engagement interconnection between trap chamber cut-offs in dispensers.
- 306 With screw or gear in actuating mechanism:**
This subclass is indented under subclass 304. Apparatus in which the valve actuator includes a screw or gear interposed between the main valve and the waste valve.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 215+ and 264+ for valve actuators of general application involving a screw, and subclasses 248+ for valve actuators of general application including a gear.
- 307 Reciprocating relatively fixed valves:**
This subclass is indented under subclass 302. Apparatus in which the control valve and drain valve are relatively fixed and comprise a reciprocating body. A unitary body, usually cylindrical, and cooperating with plural ports to accomplish the stop and waste function is included in this subclass.
- (1) Note. Screw actuated valves are considered reciprocating for the purposes of this subclass when the rotary component of the valve movement is not necessary to the valving function.
- SEE OR SEARCH CLASS:
222, Dispensing, subclass 453 for axially slidable rigidly connected valves for stationary measuring traps for dispensers.
- 308 Waste through lower valve guide:**
This subclass is indented under subclass 307. Apparatus in which the drain passage is through a guide channel for a valve extension or the valve stem or actuator projection and below the normal travel limits of the valve.
- 309 REVERSING VALVES - REGENERATIVE FURNACE TYPE:**
This subclass is indented under the class definition. Fluid handling devices comprising four-way reversing valves disclosed for fluid distribution in connection with a regenerative type of furnace, gas generator, or similar circuit having two connections to two heat exchangers or regenerators, a connection for incoming air or fuel or both, and a connection to the exhaust stack, the valve being selectively movable into two positions; in one position the incoming air or fuel is passed through a first heat exchanger or regenerator to the furnace or gas generator, the exhaust gases passing through the second heat exchanger or regenerator to the exhaust stack; and in the other position of the valve the incoming air or fuel is passed through said second heat exchanger or regenerator, to the furnace or gas generator, and the exhaust gases pass through said first heat exchanger or regenerator to the exhaust stack.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
248+, for reversing valves of this type having liquid trap seals.
631+, for cyclically actuated valves, and see the search notes to subclass 631.
- 310 With cooling:**
This subclass is indented under subclass 309. Reversing valves wherein a coolant, such as air or water, is circulated in heat exchange relation with the valve, valve seat, or operating parts thereof.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
334+, for fluid handling systems having heating or cooling means and see the search notes to subclass 334.

311 Rotary reversing valve:

This subclass is indented under subclass 309. Reversing valves wherein the valve is mounted for rotating or oscillating motion.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

250, for rotary reversing valves of this type having liquid trap seals.

312 WITH LEAKAGE OR DRIP COLLECTING:

This subclass is indented under the class definition. Apparatus in which means are provided to catch or otherwise dispose of material dripping, leaking or being discharged as waste material.

- (1) Note. By drip, leakage or waste is meant material which escapes to the exterior of the normal flow path and which is not caught or received by the intended receiver, including condensate and water derived from melting ice, for example.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.11, for a process of detecting or repairing a leak in a pipe, joint, valve, or tank.

144, for siphons having means to remove air leakage.

427, for float leakage disposal.

596+, for distribution systems having drain and stop and waste devices, and see the search notes thereto.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 108+ for drip, leakage or waste catching or disposal in dispensers.

251, Valves and Valve Actuation, subclass 128 for valves having detachable actuators and means to prevent leakage when the actuator is detached.

399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

313 Relatively movable receptacle or drain pipe and outlet:

This subclass is indented under subclass 312. Apparatus in which either a receptacle or a pipe means is provided to collect the fluid dripping from an outlet after cessation of normal flow, the collecting means and the outlet being relatively movable.

314 Collector for waste liquid derived from solid, gas or vapor:

This subclass is indented under subclass 312. Apparatus in which a collecting or drain means is provided for a liquid which is derived from a solid, gas, or vapor.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

171+, for diverse fluid containing pressure systems providing for the collection of one of the diverse fluids with discriminating outlets for said diverse fluids.

SEE OR SEARCH CLASS:

62, Refrigeration, subclasses 272+ for atmospheric condensate handling, subclass 391 for a withdrawable liquid receiver, subclasses 420+ for an air cooler utilizing ice, and subclasses 459+ for an enclosure with ice supports.

315.01 WITH REPAIR, TAPPING, ASSEMBLY, OR DISASSEMBLY MEANS:

This subclass is indented under the class definition. Subject matter wherein the parts of the fluid handling system are equipped with means to restore the system to its former condition, means for piercing or withdrawing a plug in the system, or means for securing or taking apart parts of the system.

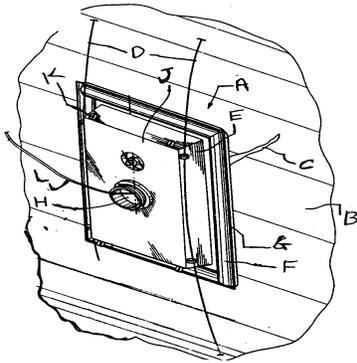


Figure 1: A typical example of the subject matter. REPAIR PATCH FOR RUPTURED FLUID TANK. A - Patch; B - Fluid tank; C - Rupture; D - Cable (to secure container to tank); E - Container; F - Peripheral edge; G - Tubular seal (fluid filled); H - Fluid bypass passage; J, K - Exterior surface with protruding eyelets; L - Triggering wire.

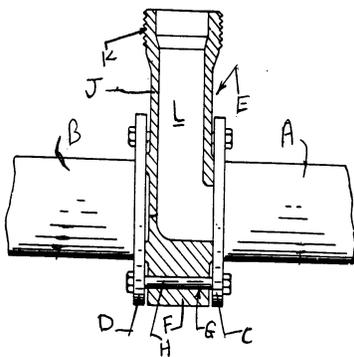


Figure 2: A typical example of the subject matter. DIVERSION BLIND FITTING FOR PIPELINE REPAIR. A, B - Pipe sections; C, D - Flanges; E - Diversion blind fitting; F - Circular body section; G, H - Bolt holes with bolts; J - Threaded pipe section; K - Pipe coupling; L - Fluid duct.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15.01 through 15.26, for a process of cleaning, repairing, or assembling.
- 270 through 270.5, for a convertible unit orientable in a single location between plural positions.
- 271, for convertible units interchangeable between alternate locations.
- 524, for a valve (i.e., check valve, etc.) that directly responds to a change in line

condition having a bias adjustment indicator.

- 530, for a reciprocating valve (i.e., check valve, etc.) that directly responds to a change in line condition having a bias fixed or adjusted by a cam.
- 531, for a reciprocating valve (i.e., check valve, etc.) that directly responds to a change in line condition having a bias fixed or adjusted by varying its lever.

SEE OR SEARCH CLASS:

- 138, Pipes and Tubular Conduits, subclasses 97 through 99 for repairing a pipe or tubular conduit.
- 166, Wells, subclasses 85.1 through 85.5 for above ground well assembly or disassembly means (e.g., handling, guiding, tool feature, etc.).
- 251, Valves and Valve Actuation, subclass 35 for a fluid actuated or retarded variable valve position choke passage pressure type servomotor for valve actuation, subclass 42 for a fluid actuated or retarded valve having choke passage pressure type servomotor including an adjustable opening limit for a main valve, subclass 60 for a fluid actuated or retarded valve having an adjustable limit stop, subclasses 84-88 for valve heads movable connected for accommodation to seat, subclasses 120-122 for a valve having a movable or resilient material guide or restrictor, subclasses 148-152 for a pipe coupling or union with a correlated flow line, subclass 233 for a valve having a variable leverage lever actuator that is adjustable during operation, subclass 234 for a valve having an adjustable leverage lever, or subclass 367 for a sectional valve body.

315.02 Blowout preventer or choke valve device (e.g., oil well flow controlling device, etc.):

This subclass is indented under subclass 315.01. Subject matter comprising a plurality of relatively movable flow obstruction members controlling an annular fluid flow passage about an axial rod or pipe, such as between a well casing and drill stem or a fluid flow regulating device, in combination with a means for stopping the abrupt escape of fluid in the annu-

lar space between a casing supported enclosure and pipe, rod, tubing, or wireline.

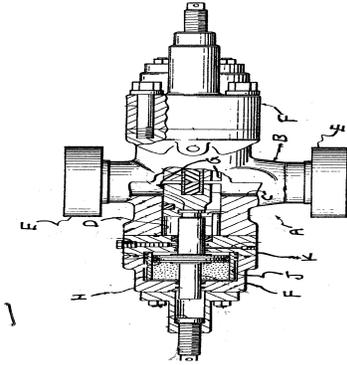


Figure 1: A typical example of the subject matter. A - Blowout preventer; B - Main body; C - Vertical bore; D - Guideways; E - Upper and lower flanges; F - Bonnet; G - Ram (reciprocates during normal preventer operation); H - Bonnet body; J - Cylinder; K - Bonnet head.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

382 through 382.5, for a casing for a valve.

SEE OR SEARCH CLASS:

166, Wells, subclasses 86.1 through 88.1 for an above ground apparatus having blowout preventing means and a valve, subclasses 88.1-88.4 for an above ground apparatus having blowout preventing means and a lateral port, or subclasses 179-203 for a packer or plug insertable from the top of a well or into a well conduit.

251, Valves and Valve Actuation, subclasses 1.1 through 1.3 for a blowout preventer or subclasses 118-127 for a material guide or restrictor.

315.03 Solenoid or electromagnetically actuated valve:

This subclass is indented under subclass 315.01. Subject matter wherein the valve is controlled by electricity such as an electrically energized coil of insulated wire producing a magnetic field within the coil.

- (1) Note. A solenoid usually acts as a switch or control for a mechanical device (e.g., valve, etc.) and has a coil of wire, usually in cylindrical form, that acts like a

magnet when carrying a current to draw a movable core into the coil.

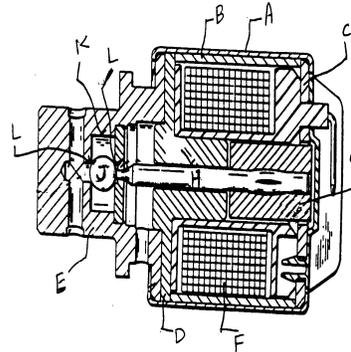


Figure 1: A typical example of the subject matter. A - Valve casing; B - Valve sleeve; C - Valve cover; D - Guiding member; E - Valve body; F - Spool; G - Armature; H - Plunger; J - Valve element; K - Valve chamber; L - Valve seats.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

66, for a safety valve retained in its set or open position under the action of a solenoid which is energized by the electric current generated by a thermoelectric element.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 30.01 through 30.05 for a fluid actuated or retarded valve controlled by an electrically actuated pilot valve or subclasses 129.15-129.22 for an electrically actuated valve including a solenoid.

315.04 Pressure regulating type valve:

This subclass is indented under subclass 315.01. Subject matter comprising a valve adapted to be connected in a fluid line or fluid system for shutting off flow in response to a fluid force in the nature of a thrust distributed over an area in excess of a predetermined thrust.

- (1) Note. Included in this subclass are 'pressure regulators' and 'reducing valves' in which a main valve which regulates the supply of fluid from an inlet to an outlet passage is actuated as to its opening

movements by a piston which is operated by fluid from the inlet passage, the supply and exhaust of which to and from the actuating piston are controlled by a secondary or controlling valve, the movements of which are in turn regulated by a movable abutment subjected on one side to pressure from the outlet-passage and on the other side to the pressure of a spring or weight.

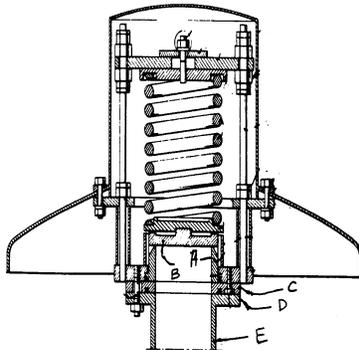


Figure 1: A typical example of the subject matter. SELF-CENTERING VALVE FOR CONTROLLING LIQUID PRESSURE. Nozzle 'A' and valve shutter plate 'B' form seating components of the valve, locking ring 'C' mounted on flange 'D' and the upper end of pipe 'E' to which valve is fitted.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 224 through 226, for an inflatable article (e.g., tire filling chuck or stem, etc.) having a pressure-responsive pressure-control means.
- 517 through 521, for a biased open line condition responsive check valve.
- 599.09, for systems dividing into parallel flow lines, then recombining having a fluid pressure-regulating valve.

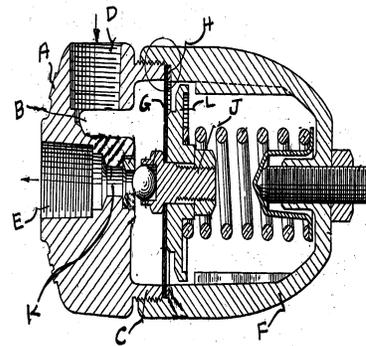


Figure 1: A typical example of the subject matter. A - Valve body; B - Central cavity; C - Circumferential rim defining opening to 'B'; D - Fluid inlet passage; E - Fluid outlet passage; F - Bonnet or casing; G - Flexible diaphragm defining closed pressure chamber within 'B'; H - Thin metallic gasket; J - Valve stem; K - Valved passage; L - Backup plate.

315.05 Diaphragm type:

This subclass is indented under subclass 315.04. Subject matter wherein the valve has a thin flexible member (e.g., disk shaped, etc.) secured at its periphery to the valve body and deformable by fluid pressure to act as an open and close member for the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 315.07, for a fluid handling system with means to assemble or disassemble a compressible tube or diaphragm type valve.
- 456 through 466, for a line condition change responsive valve with safety cutoff requiring reset.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 281 through 283 for a valve proportioned so that forces exerted by line pressure on both sides of the valve are balanced, subclass 331 for a diaphragm type reciprocating valve, subclass 335.2 for a diaphragm type hermetic flexible wall seal for a valve actuator, or subclass 901 for a curtain type valve.

315.06 Gas or water meter replacing:

This subclass is indented under subclass 315.01. Subject matter wherein means for restoring to a serviceable condition or fitting together various parts so as to make into an operative whole is directed to an instrument for measuring and recording the quantity of a combustible mixture used for commercial or industrial heating or for measuring and recording the quantity of water supplied for commercial or industrial use.

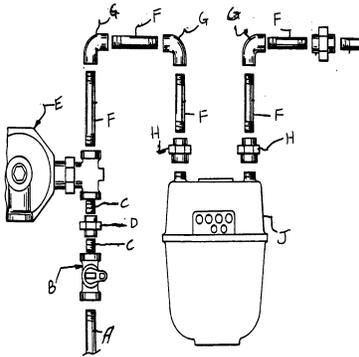


Figure 1: A typical example of the subject matter. A - Riserpipe; B - Shutoff valve; C - Nipples; D - Union; E - Regulator; F - Nipples; G - Elbow; H - Union fittings; J - Gas meter.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 201 for a meter combined with the housing boxes or means for connecting the meter into a pipeline or meter box; this subclass also includes the structure of the meter or meter box; subclass 272 for a meter subcombination or elements of the meter used for volume or rate of flow; subclass 276 for a check valve combined with a meter structure

315.07 Assembling or disassembling flexible tube or sleeve type valve:

This subclass is indented under subclass 315.01. Subject matter wherein means comprises a flow regulating clamp for regulating the flow of fluid through a resilient or pliable hollow elongated, usually cylindrical body or a flexible, resilient elastomeric tubular part designed to fit over another part together with

means to constrict the tubular part so as to regulate, throttle, or terminate the flow of fluid.

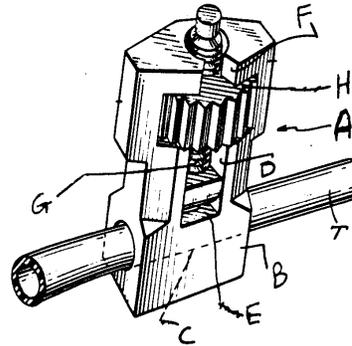


Figure 1: A typical example of the subject matter. A - Tubingclamp assembly; B - Clamp body; C - Passage; D - Parallel side walls; E - End wall; F - Restricted opening; G - Threaded shank; H - Threadednut.

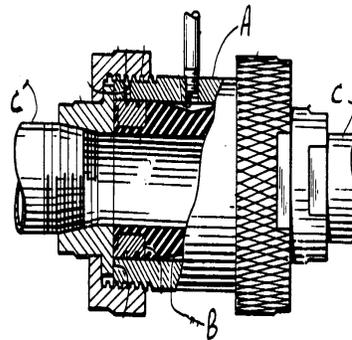


Figure 2: A typical example of the subject matter. A - Hollowhousing; B - Sleeve portion; C - Process fluid containing pipeline.Motive fluid fills actuating space between housing 'A' and sleeve'B'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.05, for a fluid handling system with repair, tapping, assembly, or disassembly means for a diaphragm type pressure regulator, pressure-regulating valve, or reducing valve.

SEE OR SEARCH CLASS:

24, Buckles, Buttons, Clasps etc., subclass 115 for a ball or roller cord or rope holder, or subclasses 459-462 for a clasp having dissociable gripping members.

- 92, Expandable Chamber Devices, subclasses 96 through 104 for a diaphragm type collapsible chamber.
- 251, Valves and Valve Actuation, subclasses 4 through 10 for a means to control flow by compressing a flexible fluid conveying tube, or subclass 331 for a diaphragm type reciprocating valve.
- 411, Expanded, Threaded, Driven, Headed, Tool-Deformed, or Locked-Threaded Fastener, subclass 907 for an elastomeric fastener or fastener element.

315.08 Assembling or disassembling float or float valve:

This subclass is indented under subclass 315.01. Subject matter comprising a hollow buoyant element usually attached at the end of a lever and providing positive buoyancy while resting on the surface of the fluid.

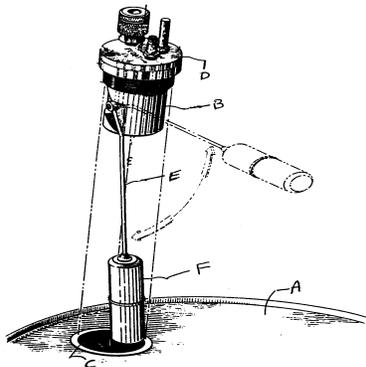


Figure 1: A typical example of the subject matter. A - Tank; B - Valve body; C - Bung hole; D - Mounting flange; E - Float arm; F - Float.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 15.26, for a process of assembling, disassembling, or repairing a float valve.
- 165 through 168, for a float responsive to liquid in a trap (e.g., boiler, etc.) to control gas pressure within the trap.
- 409 through 451, for a liquid level responsive or maintaining system by a float controlled valve.

SEE OR SEARCH CLASS:

- 261, Gas and Liquid Contact Apparatus, subclass 70 for a float controlled fluid distribution valve.

- 431, Combustion, subclass 64 for a level responsive means to control fuel level in a wick pot or pot type burner.

315.09 Assembling or disassembling multi way valve:

This subclass is indented under subclass 315.01. Subject matter comprising a device wherein a single flow regulating element regulates a plurality of flow lines.

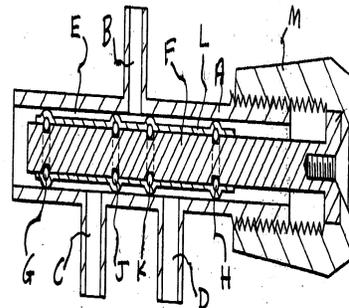


Figure 1: A typical example of the subject matter. A - Valvebody; B, C, D - Radial ports; E - Cylindrical bore; F - Spindle (mandrel); G, H, J, K, - O-rings; L - Thin protective sleeve; M - Spindle cap. In operation, 'G' and 'H' seal the valve against loss of fluid; 'J' and 'K' divide the space between spindle and bore into three discrete flow passages.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 15.21, for a process of assembling, disassembling, or repairing a multi way valve.
- 625 through 625.5, for a multi way valve device.

315.11 Assembling, disassembling, or mounting cartridge type valve (e.g., insertable or removable as a unit, etc.)

This subclass is indented under subclass 315.01. Subject matter comprising means, usually replaceable and designed to permit ready insertion or removal, and usually consists of a single, self-contained assembly.

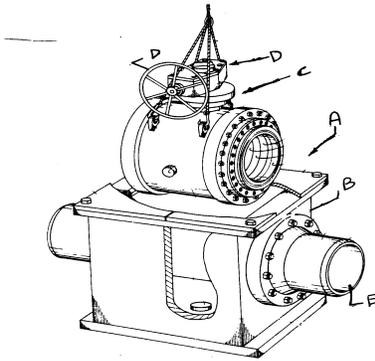


Figure 1: A typical example of the subject matter. A - Valveassembly; B - Support box; C - Valve module or cartridge; D - Valveoperating means; E - Flow passage-way.

315.12 Faucet type (e.g, domestic water use, etc.):

This subclass is indented under subclass 315.11. Subject matter comprising a fixture for drawing a liquid from a pipe, cask, or other vessel for household use.

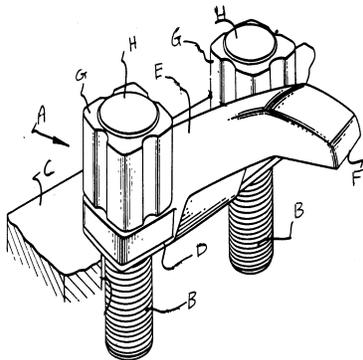


Figure 1: A typical example of the subject matter. A - Faucetassembly; B - Inlet nipples; C - Support deck; D - Base plate; E - Cover plate; F - Spout (outlet); G - Operator (knob) ; H - Readilyremovable plate.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

603, for systems having multiple inlets with a single outlet including a faucet attachment.

SEE OR SEARCH CLASS:

285, Pipe Joints and Couplings, subclasses 18 through 40 for joint or coupling with assembly means or fea-

ture or subclass 921 for a snap-fit type of joint or coupling.

403, Joints and Connections, subclass 361 for socket type interfitted members.

315.13 Including removable valve head and seat unit:

This subclass is indented under subclass 315.12. Subject matter wherein the disk part of the faucet and the ring on which the disk part rests are adapted to be assembled into a unitary construction and can be replaced as one single assembly.

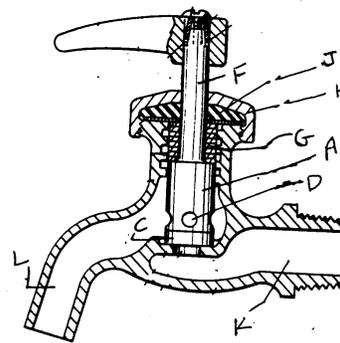


Figure 1: A typical example of the subject matter. A - Valvestem assembly; C - Valve seat; D - Sleeve opening; F - Valve stem;G - Washers; H - Packing nut; J - Packing; K - Fluid inlet; L -Fluid outlet.

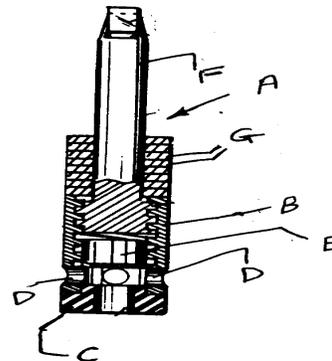


Figure 2: A typical example of the subject matter. A - Valvestem assembly; B - Sleeve; C - Valve seat; D - Sleeve Opening; E- Valve member controls fluid; F - Valve stem; G - Washers.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

329.02 through 329.04, for repair by means where a valve head or seat having

oppositely disposed duplicate surfaces forming a unitary structure is replaceable or having an unworn surface movable into an operative position.

454.2 through 454.6, for a removable valve head and seat unit.

315.14 Including mechanical movement actuator:

This subclass is indented under subclass 315.12. Subject matter wherein the significance is attributed to moving parts of the mechanism that transmit definite motion to the component of the valve or to the valve itself, such that the motion provided at the input (actuator) end of the mechanism is different in direction or distance traveled than the motion at the output (valve) end of the mechanism.

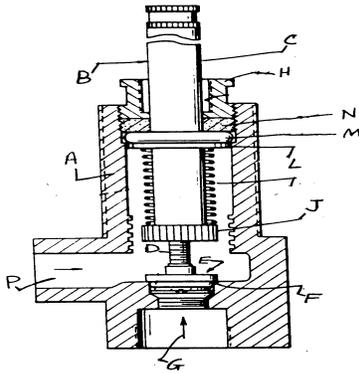


Figure 1: A typical example of the subject matter. A - Faucetbody; B - Valve stem; C - Upper sleeve with internal threads; D - Lower rod with external threads; E - Valve head; F - Valve seat; G - Direction of water flow; H - Gland nut; J - Threaded lock nut; K - Compression spring to urge 'E' against 'F'; L - Annular frictionring; M - Deformable 'O' ring; N - Packing material; P - Commonconduit.

SEE OR SEARCH THIS CLASS, SUBCLASS:

315.35 through 315.4, for a particular mechanical actuator of a valve with repair, tapping, assembly, or disassembly means.

SEE OR SEARCH CLASS:

220, Receptacles, subclasses 288 through 304 for a removable screw type closure guided in rotary and reciprocatory movement.

251, Valves and Valve Actuation, subclasses 213 through 280 for a mechanical movement actuator.

315.15 Particular handle or handle fastening means:

This subclass is indented under subclass 315.12. Subject matter wherein the significance is attributed to a faucet adapter for adapting a part that is designed especially to be grasped by hand for mounting on the valve stem of various configurations.

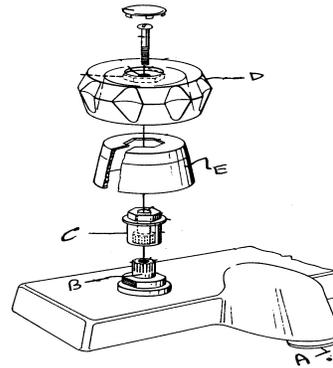


Figure 1: A typical example of the subject matter. A - Spout; B - Valve stem; C - Adaptor; D - Faucet handle; E - Skirt.

SEE OR SEARCH CLASS:

16, Miscellaneous Hardware (e.g., Bushing, Carpet Fastener, Caster, Door Closer, Panel Hanger, Attachable or Adjunct Handle, Hinge, Window Sash Balance, etc.), subclass 114 for a detachable handle, subclass 121 for a knob type handle, digest 24 for handle fastening means, or digest 30 for a knob or control lever.

74, Machine Element or Mechanism, subclasses 527 through 542 for a control lever and linkage system having a detent element, subclasses 548-551 for a control lever and linkage system having a handle shaft connection element or subclass 553 for a control lever and linkage system having a knob or dial shaft connection element.

403, Joints and Connections, subclass 359 for interfitted members having a longitudinally splined or fluted rod.

315.16 Assembling or disassembling pivoted valve:

This subclass is indented under subclass 315.01. Subject matter comprising flow regulating means wherein the disk or plug unit of the regulating means swings around the means by which it is mounted with respect to the seat or casing of the regulating means.

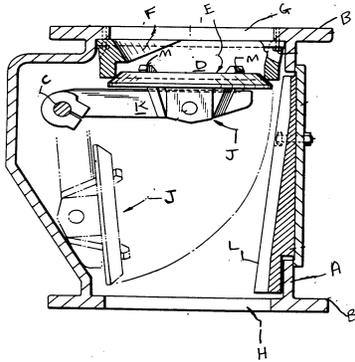


Figure 1: A typical example of the subject matter. A - Valvehousing; B - Mounting flanges; C - Pivot shaft; D - Valve seat; E - Valve flapper; F - Deflector; G - Inlet port; H - Outlet port; J - Clevis and pin assembly; K - Lever arm; L - Wear surface; M - Centering lugs.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 58 for a fluid actuated or retarded valve with a mechanical movement between actuator and valve, subclass 228 for a pivoted valve having a mechanical movement actuator, or subclasses 298-303 for a pivoted valve.

315.17 Assembling or disassembling rotary valve:

This subclass is indented under subclass 315.01. Subject matter comprising flow regulating means wherein the head of the regulating means turns or revolves about its axis.

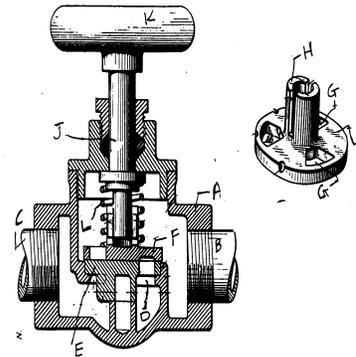


Figure 1: A typical example of the subject matter. A - Valve casing; B - Fluid inlet; C - Fluid outlet; D - Fluid passage through valve; E - Valve seat; F - Rotary valve head; G - Valve head openings; H - Valve head hub; J - Valve stem; K - Valve handle; L - Spring to hold valve seat.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 56, for a centrifugal mass type, exclusive of liquid, speed responsive control for a rotating valve.
- 250, for a seal for a valve that rotates in a horizontal plane.
- 625.15 through 625.16, for a fluid handling system having a rotary multi way valve unit including sequentially progressive opening or closing of plural ports with subsequent closing of the first port.
- 625.21 through 625.24, for a fluid handling system having a rotary multi way valve unit including a supply and exhaust.
- 625.34, for a fluid handling system dividing into parallel flow lines with recombining having multi way valve using a reciprocating spool.
- 625.41, for a fluid handling system having a multiple inlet with single outlet using a multi way valve.
- 625.46 through 625.47, for a fluid handling system having a rotary multi way valve.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 149.2 for a correlated flow path where a valve is rotatably or hingedly mounted and includes a linear valve

operating component to the flow path sections, subclasses 160-166 for rotary valves having means to increase the head and seat contact pressure, subclass 283 for a rotary valve that uses differing opposing surface areas to balance forces exerted on the valve by differing pressures, or subclasses 286-288 for a limit stop for a rotary valve.

315.18 Rotary ball valve:

This subclass is indented under subclass 315.17. Subject matter wherein the flow regulating means comprises a housing having a flow passage therethrough and a seat for the regulating means and a spherical plug type closure member that contacts the seat and can be rotated about an axis passing generally through its geometrical center by an actuating means.

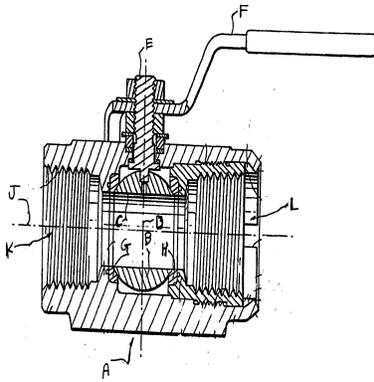


Figure 1: A typical example of the subject matter. A - Barstock type ball valve; B - Ball type valve member; C - Elongated valve bore; D - Ball rotation axis; E - Valve stem; F - Valve handle; G, H - Valve seats; J - Housing axis; K, L - Valve open ends connected to pipelines. In operation, fluid flows through the housing when bore 'C' is in alignment with axis 'J' and fluid flow is blocked when ball 'B' is rotated 90 degrees so that bore 'C' is transverse to axis 'J'.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15.22, for a process of assembling, disassembling, or repairing a ball valve or rotary ball valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 315.01 through 329.4 for a rotary ball valve.

315.19 Particular valve seat or interface seal:

This subclass is indented under subclass 315.18. Subject matter wherein the significance is attributed to a usually circular ring on which the valve head rests or to a tight, perfect enclosure or joint that is formed by resting of the valve head on the ring.

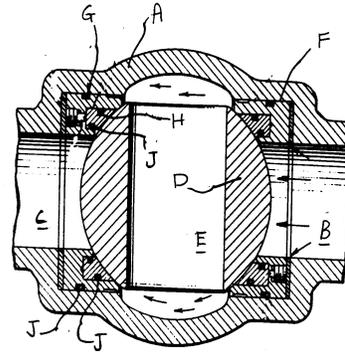


Figure 1: A typical example of the subject matter. A - Valvebody; B - Intake port; C - Outlet port; D - Ball element; E - Fluid passage; F - Seal seat assembly; G - Seal seat assembly; H - Sealseat; J - 'O' rings. Note: Ball 'D' is engaged (inlet side) by sealseat assembly 'F' and (outlet side) by seal seat assembly 'G'.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 314 through 317.01 for a seat or interface seal for a rotary valve.
384, Bearings, subclasses 416 through 419 for a plain bearing for a rotary member.

315.2 Replaceable:

This subclass is indented under subclass 315.19. Subject matter comprising seat or sealing element so constructed or arranged as to be readily removed and restored to its former condition.

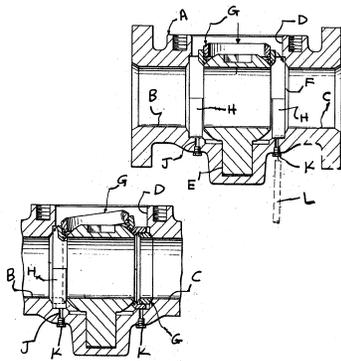


Figure 1: A typical example of the subject matter. A - Valvebody; B - Inlet; C - Outlet; D - Valve opening to provide access;E - Valve stem; F - Valve seating surface; G - Annular valve seat;H - Cylindrical recess to support 'G'; J - Hole in valve body intersectsrecess 'H' to receive rod 'L'; K - Plug to close hole 'J'; L - Rod facilitates seat removal.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 316 through 317.01 for a replaceable seat or interface seal for a rotary valve or subclasses 360-363 for a removable valve seat, especially subclass 363 for a removable valve seat with a seal.

315.21 With top entry valve:

This subclass is indented under subclass 315.2. Subject matter wherein the upper part of the flow regulating means can be dismantled by being withdrawn vertically up from the housing of the regulating means while the lower part remains inside the housing so that the seat and the seal adapter of the regulating means can be inspected, overhauled, or replaced without the regulating means being discontinued from the flow passageway.

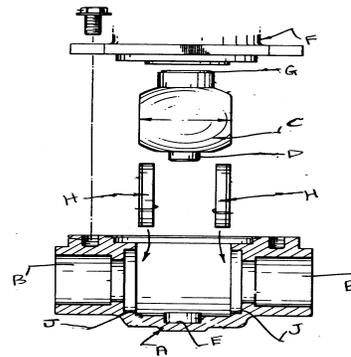


Figure 1: A typical example of the subject matter. A - Valvebody; B - Fluid passages; C - Valve element; D - Trunion; E - Socket;F - Plate removable from top; G - Trunion; H - Valve seats; J -Valve seat shoulder.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

327 through 328, for a disassembly tool engaging feature.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 315.12 for a ball valve having a housing construction that allows head removable from actuator side (i.e., top entry).

315.22 Butterfly valve:

This subclass is indented under subclass 315.17. Subject matter wherein the significance is attributed to a valve comprising a substantially flat and coplanar wing depending from a central axis of rotation.

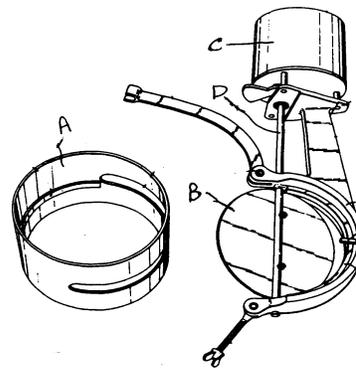


Figure 1: A typical example of the subject matter. A - Pipe,duct, or conduit; B - Throttle or butterfly valve; C - Adjustable drive motor; D - Valve stem or rod.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 15.25, for a process of assembling, disassembling, or repairing a butterfly valve.
601.17, for systems dividing into parallel flow lines then recombining including a butterfly valve.

SEE OR SEARCH CLASS:

- 49, Movable or Removable Closures, subclasses 74.1 through 92.1 for a louver-type closure (e.g., slats, panels, etc.).
123, Internal Combustion Engines, subclass 337 for a specific throttle valve structure (e.g., butterfly, etc.).
220, Receptacles, subclasses 810 through 849 for a hinged closure.
251, Valves and Valve Actuation, subclasses 305 through 308 for a rotary butterfly valve.
454, Ventilation, subclasses 333 through 336 for an inlet air way having an adjustable valve (e.g., damper, etc.) or subclass 369 for a fire damper.

315.23 Having valve head or seat packing:

This subclass is indented under subclass 315.22. Subject matter comprising a sealing material or element carried by the disk part of the valve or the circular ring on which the disk part rests.

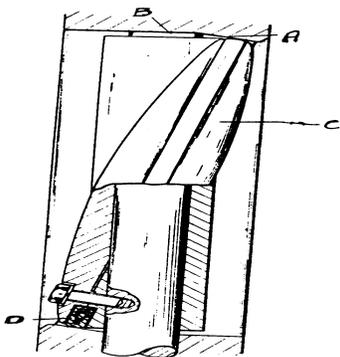


Figure 1: A typical example of the subject matter. A - Valveseat; B - Valve stem; C - Butterfly leaf; D - Ring packing.

SEE OR SEARCH CLASS:

- 228, Metal Fusion Bonding, subclasses 165 through 169 for a process of forming a channel, groove, or an aperture for the reception of a filler material prior to bonding.
251, Valves and Valve Actuation, subclass 171 with means to press the seat to the valve to increase contact pressure and packing pressed by a gland or subclasses 306-307 for a head or seat packing for a rotary butterfly valve.
285, Pipe Joints or Couplings, subclasses 364 through 368 for a packed, clamped, or flanged pipe joint or coupling.

315.24 With head and stem connections:

This subclass is indented under subclass 315.22. Subject matter comprising means for attaching the disk part of the valve and the rod element by means of which the disk part is moved to open and close the valve.

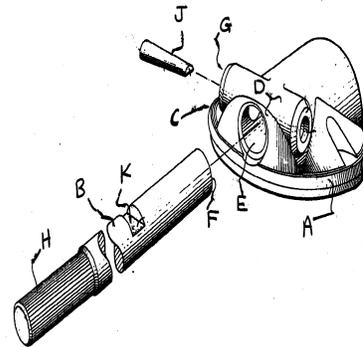


Figure 1: A typical example of the subject matter. A - Valveclosure member; B - Valve shaft; C - Joint connections for valve; D - Boss; E - First valve passage receives shaft end 'F'; G - Second valve passage; H - Shaft end driven by hand or power driven means; J - Tapered key; K - Groove on shaft 'B' to engage key 'J'

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 308 for head and stem connections of the rotary butterfly valve.
384, Bearings, subclasses 202 through 204 for a self-adjusting or self-aligning resilient plain bearing.

315.25 Plug valve:

This subclass is indented under subclass 315.17. Subject matter comprising a cylindrical or conical element that can be turned to rotate on its own axis and has a flow passage through it and at least the inlet or outlet of that passage is transverse to the axis of rotation.

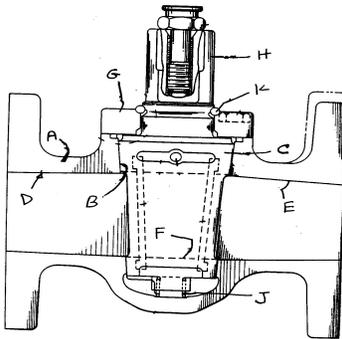


Figure 1: A typical example of the subject matter. A - Valvebody; B - Tapered bore to receive plug valve; C - Plug valve; D - Inlet passage; E - Outlet passage; F - Through port in valve openposition; G - Valve chamber cover; H - Valve stem; J - Biasing spring; K - Seal ring.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.24, for a process of assembling, disassembling, or repairing a plug valve.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 554 for a rotary plug type flow controller.

251, Valves and Valve Actuation, subclasses 309 through 312 for a plug valve or subclass 904 for a snap-fit plug valve.

315.26 Having retainer at actuator end:

This subclass is indented under subclass 315.25. Subject matter wherein means for holding the plug valve head in the body is one the same side of the head as the valve mechanism that is being used for opening or closing the valve.

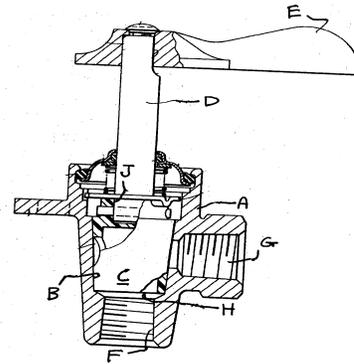


Figure 1: A typical example of the subject matter. A - Valvebody; B - Valve chamber; C - Valve plug or element; D - Valve stem; E - Valve handle; F - Inlet passageway; G - Outlet passageway; H - Hollow open end of 'C'; J - Inner end of 'D' is disposed without 'J'.

315.27 Assembling or disassembling reciprocating valve:

This subclass is indented under subclass 315.01. Subject matter wherein the flow regulating means has a linear motion to and from the flow obstructing position.

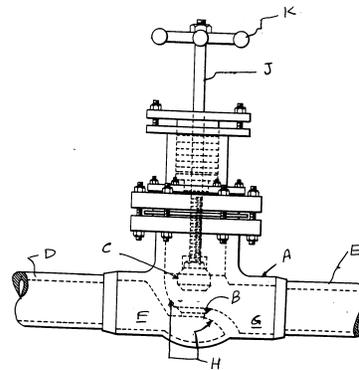


Figure 1: A typical example of the subject matter. A - Valvebody; B - Valve seat; C - Valve element; D - Inlet fluid conduit; E - Outlet fluid conduit; F - Lower fluid chamber; G - Upper fluidchamber; H - Internal wall; J - Valve stem; K - Valve handle.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

625.48 through 625.5, for a multi way reciprocating valve unit.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 282 for a reciprocating valve that uses differing opposing surface areas to balance forces exerted by differing pressures or subclasses 318-334 for a reciprocating valve.

315.28 Having particularly packed or sealed mechanical movement actuator:

This subclass is indented under subclass 315.27. Subject matter wherein the valve stem that transmits motion to the valve is specifically associated with means which is being assembled into a compact group or is being firmly secured to prevent fluid leakage.

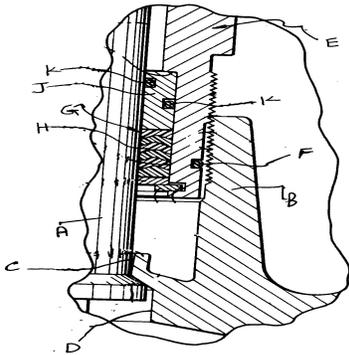


Figure 1: A typical example of the subject matter. A - Facestem; B - Bonnet; C, D - Bonnet peripheral surfaces connect to facestem 'A'; E - Packing sleeve engages bonnet 'B'; F - Outer 'O' ring provides seal between 'E' and 'B'; G - Packing assembly made of plurality of packing rings 'H'; H - Packing rings; J - Packing bushing.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 214 for a particularly packed or sealed mechanical movement actuator or subclass 330 for a reciprocating valve having an actuator controlled stem seal.
- 277, Joints and Packing, subclass 511 for a circumferential contact seal for other than a piston between relatively movable parts (i.e., dynamic seal) contained or compressed by gland member in packing box having installation, removal, assembly, disassembly, or repair feature or subclass 630 for a contact seal for other than inter-

nal combustion engine, or pipe, conduit, or cable between fixed parts or static contact against relatively movable parts having installation, removal, assembly, disassembly, or repair feature.

315.29 Gate valve:

This subclass is indented under subclass 315.27. Subject matter wherein the valve comprises essentially a flat or wedge-shaped sliding barrier that can be lowered into a seat to seal off the flow or raised into an external recess for a partial or full flow condition.

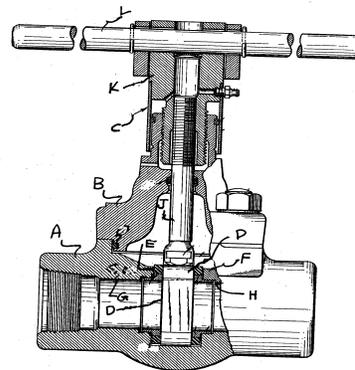


Figure 1: A typical example of the subject matter. A - Valvebody; B - Bonnet; C - Valve stem mechanism; D - Gate valve; E, F - Seal assemblies; G, H - Flow passages; J - Valve stem; K - Valveoperator; L - Valve hand wheel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 15.23, for a process of assembling, disassembling, or repairing a reciprocating gate valve.
- 625.49, for systems having a multi way valve unit that uses a reciprocating combined disk or plug for closing one port and a gate or piston valve for closing another port.

SEE OR SEARCH CLASS:

- 251, Valves and Valves Actuation, subclasses 326 through 329 for a reciprocating gate valve.

315.3 Bifaced:

This subclass is indented under subclass 315.29. Subject matter wherein the valve head has two seating or sealing surfaces.

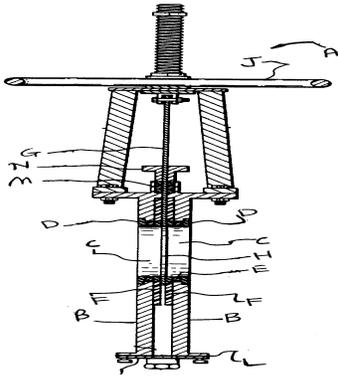


Figure 1: A typical example of the subject matter. A - Valve assembly; B - Blind valve plates; C - Blind valve apertures; D - Resilient seats; E - Metal inserts; F - Apertured body liners; G - Apertured gate; H - Gate aperture; J - Hand wheel (rotation of 'J' causes 'G' to rise or descend between 'F'); K - Sealing plates; L - Gasket; M - Packing or seal; N - Packing gland.

315.31 Having particular valve seat:

This subclass is indented under subclass 315.29. Subject matter wherein the significance is attributed to a normally stationary and usually circular element which cooperates with the valve.

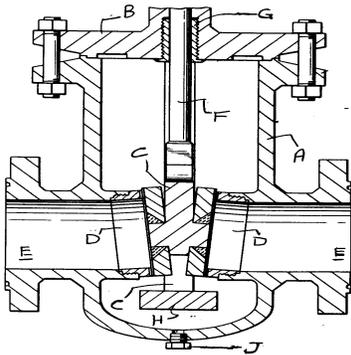


Figure 1: A typical example of the subject matter. A - Valve body; B - Valve bonnet or cover; C - Wedge-type slide valve; D - Valve seats; E - Flow passages; F - Valve stem; G - Stuffing box; H - Internal valve stop; J - Drain.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 359 through 365 for a valve seat of general utility.

315.32 Including seal:

This subclass is indented under subclass 315.31. Subject matter wherein a separate element is being disposed between the valve seat and the seat supporting body structure to prevent leakage.

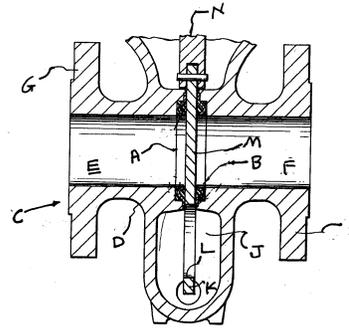


Figure 1: A typical example of the subject matter. A, B - Seal members; C - Through conduit gate valve; D - Valve body; E, F - Aligned flow passages; G, H - Flanges to connect flow system; J - Valve chamber; K - Gate having passage 'L'; L - Gate valve open portion; M - Gate valve solid portion; N - Valve stem.

SEE OR SEARCH CLASS:

277, Joints and Packing, subclass 630 for a contact seal for other than internal combustion engine, or pipe, conduit, or cable between fixed parts or static contact against relatively movable parts having installation, removal, assembly, disassembly, or repair feature.

315.33 Assembling or disassembling check valve:

This subclass is indented under subclass 315.01. Subject matter comprising flow regulating means which automatically limits the fluid flow to a single direction and is sensitive to the fluid pressure.

- (1) Note. Since the check valve has not other actuator, its movement from a normal, neutral, or biased position is caused solely by a change in the fluid flow or pressure in the pipeline, and the valve returns to its original position when the original condition is restored.

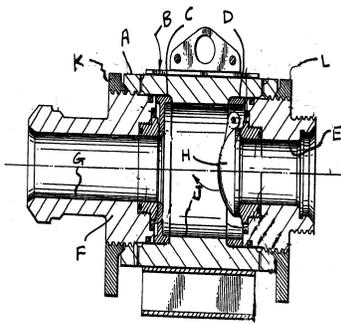


Figure 1: A typical example of the subject matter. A -Check valve; B - Valve cradle; C, D - Opposed valve counterbores;E - Inlet head main bore; F - Head member; G - Internal passageway;H - Valve closure member or disk; J - Interior valve bore; K, L- Locknuts.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 329.1 through 329.4, for fluid handling with repair, tapping, or assembly means for a removable valve with a normally disabled supplemental check valve.
- 511 through 543.23, for a line condition direct response valve (i.e., check valve type).
- 904, for a cushion check valve.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 490 for a slitted resilient diaphragm or nipple or subclasses 491-497 for an outlet element operated by pressure of contents.
- 251, Valves and Valve Actuation, subclasses 336 through 338 for a biased valve.

315.35 With mechanical movement between actuator and valve:

This subclass is indented under subclass 315.01. Subject matter wherein the significance is attributed to repair, assembly, or disassembly of moving parts of the mechanism that transmit a definite motion to the valve or valve component.

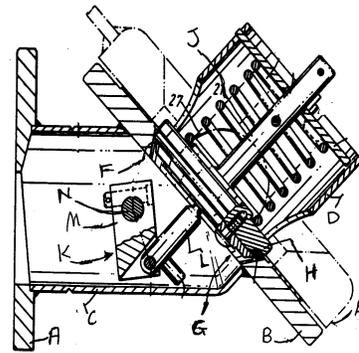


Figure 1: A typical example of the subject matter. A, B, C,D - Constitute valve assembly; E - Flanged orifice of the container;F - Valve seat; G - Movable valve member; H - Valve head; J - Valvestem; K - Valve operating mechanism or mechanical movement actuator; L - Connecting rod; M - Crank; N - Shaft; P - Operating lever secured to 'N' (not shown); Connecting rod 'L' cooperates with 'G' for positive opening of valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 315.14, for a particular mechanical actuator of a domestic faucet with assembling or disassembling, or mounting or removing means.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 129.03 for an electrically actuated valve with a nonelectrical actuator, subclass 129.2 for an electrical valve actuator having mechanical movement between valve and solenoid, or subclasses 213-280 for a mechanical movement actuator.

315.36 Plural motions of valve:

This subclass is indented under subclass 315.35. Subject matter wherein the mechanical movement actuator provides more than one movement of the valve or valve component which movements are concurrent or consecutive.

- (1) Note. An example of a mechanical movement that produces plural concurrent motions of a valve is one in which the valve member is mounted on a screw device. Actuation of the screw both

rotates and reciprocates the valve member.

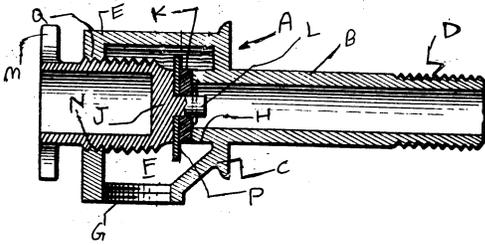


Figure 1: A typical example of the subject matter. A - Discharge valve; B - Tubular extension; C - Ringer flange; D - Threaded extension serves to clamp the operative position within the container (not shown); E - Hollow body forming a discharge chamber 'F'; G - Discharge outlet; H - Valve seat; J - Valve closure; K - Washer valve; L - Valve stem; M - Lug; N - Threaded outer surface; P - Locking disc; Q - Opening of the hollow body 'E'. In operation, lug 'M', when turned, causes its threaded outer surface 'N' to feed through the opening 'Q' of the hollow body 'E', which forms a discharge chamber 'F' and thus moves the washer valve 'K' toward and away from the valve seat 'H'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 330 through 333, for a non-valving motion of a valve or valve seat.
- 616.3, for plural motions of a valve actuated by an articulated or swinging flow conduit.

SEE OR SEARCH CLASS:

- 123, Internal Combustion Engines, subclasses 90.28 through 90.3 for a poppet valve operating mechanism that provides for nonvalving movement of the valve (e.g., about the valve, etc.).
- 251, Valves and Valve Actuation, subclass 56 for a fluid actuated or retarded valve having plural operations (e.g., lifting and rotating rotary valve, etc.), subclasses 215-227 for a mechanical movement actuator having plural motions of a valve, subclass 296 for plural motions of an actuator, subclass 346 for a valve actuator in a valve casing or extension of it having plural

motions of valve, or subclass 351 for a valve actuator in an inlet or outlet having plural motions of valve.

315.37 Lever type:

This subclass is indented under subclass 315.35. Subject matter wherein the mechanical movement actuator comprises an elongated rigid means pivoted at one point to a support and having the actuating power and the valve connection at at least two other points.

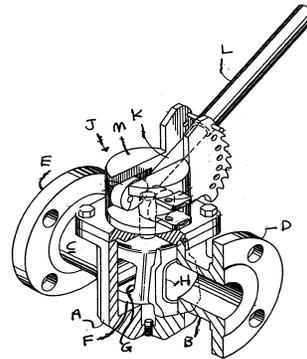


Figure 1: A typical example of the subject matter. A - Hollow valve body; B, C - Inlet and outlet channels; D, E - Valve flanges; F - Rotary plug; G - Plug passageway; H - Valve seal; J - Valve operator mechanism; K - Lever arm; L - Outer tubular handle; M - Operator housing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 434 through 451, for a float arm operated valve.

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, appropriate subclasses for a mechanical movement actuator including a lever.
- 251, Valves and Valve Actuation, subclasses 231 through 247 for a lever actuated mechanical movement actuator.

315.38 Gear type:

This subclass is indented under subclass 315.35. Subject matter wherein the mechanical movement actuator comprises (1) relatively movable toothed members, round, linear, or irregular, which transmit motion by meshing of the teeth during travel of the members, and (2) friction gearing in which the members lack

teeth, and the force is transmitted by pressing one moving surface against the other, including those have one endless flexible member or belt.

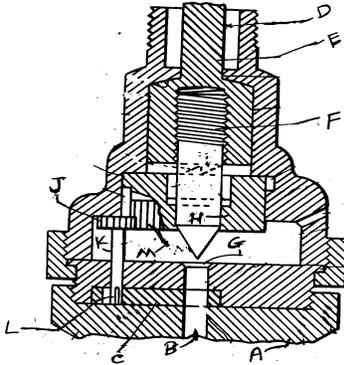


Figure 1: A typical example of the subject matter. A - Body of the gauge cock or valve; B - Connection to water gauge or other article; C - Disc closure or cutoff; D - Valve operating handle; E - Valve stem; F - Valve plug coacts with valve seat 'G'; G - Valve seat.

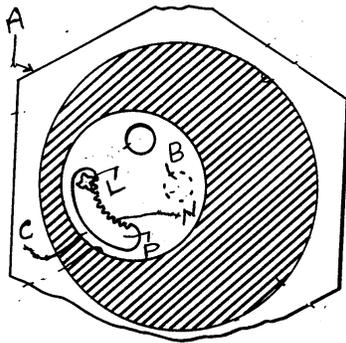


Figure 2: A typical example of the subject matter. A - Body of the gauge cock or valve; B - Connection to water gauge or other article; C - Disc closure or cutoff. Notes (1) Rotation of the collar 'H' (see Figure 1) causes the rotation of the cutoff or disc closure 'C'; this motion is being transmitted through the gear or gear element 'M' (Figure 1), through gear 'J' (see Figure 1), the gear shaft 'K' (see Figure 1), pinion 'L', and the gear or gear element 'N'. (2) The pinion 'L' that meshes with the gear or gear element 'N' is formed on the disc closure or cutoff 'C' and is segmental type located on the arcuate slot 'P' formed in cutoff 'C'.

SEE OR SEARCH THIS CLASS, SUBCLASS:

446, for a float arm actuated valve with interposed cam, gear, or threaded connection.

SEE OR SEARCH CLASS:

74, Machine Element and Mechanism, subclasses 640 through 468 for gearing.
475, Planetary Gear Transmission Systems or Components, appropriate subclasses for planetary gearing.

315.39 Cam type:

This subclass is indented under subclass 315.35. Subject matter wherein the mechanical movement actuator comprises an eccentrically mounted rotating or swinging member or members, the varying radii of which produce varying positions of the valve.

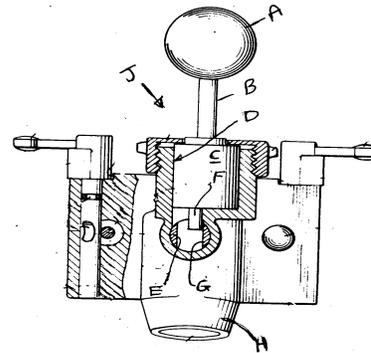


Figure 1: A typical example of the subject matter. A - Actuator knob; B - Actuator handle; C - Bearing portion; D - Cylinder bore; E - Valve stem; F - Pin; G - Slot; H - Valve; J - Actuator. Note: The bearing portion 'C' is rotatable in bore 'D' and axis of bore 'D' is offset from axis of valve stem 'E'; Pin 'F' or slot 'G' provide a connection between actuator 'J' and valve 'H'; pin 'F' is eccentric to axis of bore 'D'.

SEE OR SEARCH THIS CLASS, SUBCLASS:

446, for a float arm actuated valve with interposed cam, gear, or threaded connection.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, appropriate subclasses under mechanical movements for cam type movements, and subclasses 567 through 569 for a cam element.
251, Valves and Valve Actuation, subclasses 251 through 263 for a cam type mechanical movement actuator.

315.4 Screw type:

This subclass is indented under subclass 315.35. Subject matter wherein the mechanical movement actuator comprises a simple machine consisting of a spirally grooved solid cylinder and a correspondingly grooved hollow cylinder of equal dimension which is operable to reciprocate the movable valve member through connecting means but does not impart the rotary motion of the machine to the valve member.

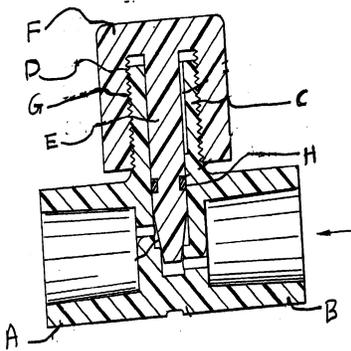


Figure 1: A typical example of the subject matter. A, B- Valve end portions; C - Cylinder externally threaded at 'D'; E- Elongated needle valve; F - Hollow cap type actuator internally threaded at 'G'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.36, for a particular mechanical actuator having plural motions of a valve flow control member with repair, tapping, assembly, or disassembly means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 264 through 278 for a screw type mechanical movement actuator.

315.41 Tool for applying or removing valve or valve member:

This subclass is indented under subclass 315.01. Subject matter wherein the significance is attributed to the specific features of the instrument that is being used for manipulating the flow regulating means or its component.

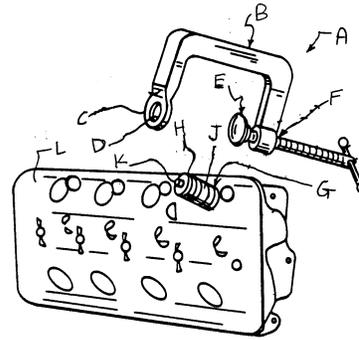


Figure 1: A typical example of the subject matter. A - Valvespring compression tool; B - 'C' frame; C - Fixed pad; D - Aperture; E - Movable pad; F - Structure to move 'E' toward or away from 'C'; G - Valve; H - Valve washer; J - Valve spring; K - Valve stem; L- Engine block. Note: When 'G' bears against 'E' and 'H' against 'C', 'J' is compressed and valve 'G' is disassembled.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclasses 213.1 through 221.6 for a valve applying or removing means, especially subclass 214 for an engine valve unit puller or applier and subclass 221.6 for a valve removal tool.
- 30, Cutlery, subclasses 93 through 108 for a rotary pipe or rod cutter.
- 81, Tools, subclasses 15.2 through 15.7 for a repair tool for a resilient tire.
- 220, Receptacles, subclasses 284 through 286 for a closure having special tool or tool engaging means for opening.
- 251, Valves and Valve Actuation, subclasses 157 through 204 for means to increase head and seat contact pressure.

315.42 Including sealing feature:

This subclass is indented under subclass 315.41. Subject matter wherein the significance is attributed to a tool which is being used for temporarily sealing a valve connection to a conduit or a tool for blocking or precluding flow of fluid through a conduit means, from a tank, or from a similar fluid containing vessel.

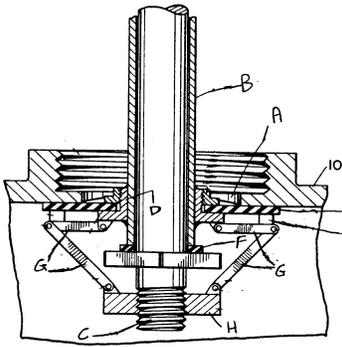


Figure 1: A typical example of the subject matter. A - Opening to be sealed; B - Hollow support; C - Actuating rod; D - Flanged collar; E - Annular seal; F - Washer; G - Series of links; H - Nut; J - Clamp block.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclass 890.11 for a method of mechanical manufacture for a tapping device making.

316 With holding means functioning only during transportation assembly or disassembly:

This subclass is indented under subclass 315.01. Devices having combined with a part of the device a fixture, attachment, support, or stop, which is inoperative in the assembled operating device, for (1) supporting and/or aligning parts of the device during assembly or disassembly, or (2) for immobilizing a moving part of the device other than an actuator or taking the pressure off a wear surface to permit transportation or safe storage.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclasses 700+ for assembling or disassembling apparatus of general application.
- 251, Valves and Valve Actuation, subclasses 89+ for devices having means to hold an actuator in a desired position to prevent accidental or unwanted movement of the valve or controller.
- 269, Work Holders, appropriate subclasses for workholders of general application.

317 Tapping a pipe, keg, or apertured tank under pressure:

This subclass is indented under subclass 315.01. Devices in which access is gained to a closed container or system by means of a connectable device or tap which comprises a flow passage to receive material from the system and means to form an opening in or open a closed passage of the system, either by removing a plug or by opening a valve which has no other actuating means, the connection being made in a manner which prevents loss of material from the system and/or admission of extraneous matter to it.

- (1) Note. The connectable flow passage forming element is usually a tap for a beer keg, but irrigation system couplings and other analogous devices are included, the source being a stationary type and the tap being portable or in the nature of an attachment.
- (2) Note. Antisplash guards comprising baffles or packing means around the entering portion of the tap are included in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 15.12 through 15.15, for a process of tapping a pipe or tank (e.g., gas main, water main, keg, etc.).
- 209+, for means for supplying gas to pressure systems containing gas and another fluid, especially subclass 212 for beer taps with gas pressure inlets.
- 453+, for barometric liquid level maintaining systems, especially subclass 454 for those having a removable font provided with a cut-off operable by engagement with the support-receiver, and see the search notes to subclass 454.
- 614.02+, and 614.05, for separable, valved, flow path sections, at least one of the valves being operated by the joining of the sections.

SEE OR SEARCH CLASS:

- 29, Metal Working, subclasses 213.1+, for structure for assembling valve

- parts, including assembling by use of a pressurized container.
- 141, Fluent Material Handling, With Receiver or Receiver Coating Means, subclasses 329+ for puncturing type connecting means and, subclasses 346+ for filling devices for receivers having keyed or other special coupling means.
- 217, Wooden Receptacles, subclasses 98+ for barrel bungs, especially subclasses 99+ for valved bungs.
- 251, Valves and Valve Actuation, subclass 89.5 and subclasses 149+ for a valved flow path section joined to another section, the act of joining causing the valve to open, subclass 89.5 also including features of the joint which may block or disable the valve actuator.
- 318 With aperture forming means:**
This subclass is indented under subclass 317. Devices in which the connectable means carries a cutter or punch for making the opening in the closed system through which flow will occur. The aperture may be formed at the time the connection is placed, or subsequently by operation of means carried by the connectable means.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 80+ for dispensers having means to form an aperture in the supply container or receiver, and see section 19 of the main class definition for collected notes on this subject matter.
- 408, Cutting by Use of Rotating Axially Moving Tool, appropriate subclasses for cutting in that class manner in the absence of fluid handling structure, except when fluid handling is ancillary to the cutting operation. For cutting of Class 408 combined with ancillary fluid handling, search subclasses 56+ of Class 408.
- 319 Imperforate closure removing and holding tap:**
This subclass is indented under subclass 317. Devices in which the system has an opening closed by a plug, cap, cork or other imperforate closure, and the connectable part has means to engage, completely remove and hold the closure, which may or may not be replaced in closing position upon disconnection of the parts.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
320+, for screw or friction held closures which have flow passages therein, so that when partially displaced they serve as valves.
- 324+, for taps and related devices which merely push the bung or cork out of the opening, allowing it to fall inside the keg or container.
- SEE OR SEARCH CLASS:
141, Fluent Material Handling, With Receiver or Receiver Coating Means, subclass 38 for devices for removing and holding tire valve cores while water is forced into the tire.
- 320 With valved closure or bung:**
This subclass is indented under subclass 317. Devices in which the system is provided with a valved opening, the valve having no externally operable actuator, and the connectable means either opens the system valve as the coupling is made or carries an actuator which engages the valve as a result of the coupling, being manipulated subsequently to open and close the valve.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
223+, for inflatable article filling chuck and/or stem.
- 454, for removable barometric reservoirs having valves which are operated by engagement with the receiving and supporting receptacle and see the search notes thereto.
- 614, for disconnectable flow pipe sections with plural serial valves.
- SEE OR SEARCH CLASS:
141, Fluent Material Handling, With Receiver or Receiver Coating Means, subclass 346 for filling devices for receivers having keyed or other special coupling means.
- 217, Wooden Receptacles, subclasses 99+ for barrel bungs of the valved type.

321 Combined rotary and longitudinal movement of valve:

This subclass is indented under subclass 320. Devices in which the valve means of the system comprises a head which moves axially and rotationally with respect to its seat, usually as a result of being engaged with a screw type actuator or tap.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 215+ for valves of general utility operated by a mechanical movement which imparts plural movements to the valve head.

322 Longitudinal movement of valve:

This subclass is indented under subclass 320. Devices in which the valve opens with a straight line motion with reference to the axis or the outlet when engaged by the connectable device or the actuator carried thereby.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 318+ for reciprocating valves and their actuators, and see the search note thereto.

323 Rotary movement of valve:

This subclass is indented under subclass 320. Devices in which the valve rotates around the axis of the flow path when actuated by engagement with the connecting means at the attached flow device or by the actuator carried thereon.

324 With core ejectors:

This subclass is indented under subclass 317. Devices in which the system is closed by a bung or cork or other frictionally held closure and the connectable part has a portion, usually tapered, which enters the opening so closed and pushes or drives out the closure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

319, for similar devices in which the closure though driven entirely from the opening, remains impaled on or secured to the tapping device.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 80+ for similar devices comprising dispensers.

325 Impact operated:

This subclass is indented under subclass 324. Devices in which the connectable or tapping member is forced into the opening by blows delivered by a means which is ordinarily not part of the system, the member being provided merely with a surface designed to receive the blow.

326 Foot valve extraction from top of enclosure:

This subclass is indented under subclass 315.01. Devices comprising a container having an access opening at the top and a valve located in a part of the container remote from the access opening usually at the bottom, with means for disassembling and removing the valve and/or its seat through the access opening.

SEE OR SEARCH THIS CLASS, SUBCLASS:

283+, for hydrants having a removable valve and valve seat.

584+, for dispensing systems comprising a tank having an access opening and a fluid inlet or outlet, and see the search notes to subclass 584.

327 With disassembly tool engaging feature:

This subclass is indented under subclass 315.01. Devices one or more parts of which have a member for interlocking with a tool for disassembling the part or disengaging the part from the device.

(1) Note. The member must be something in addition to the configuration of the part or of means used to secure parts together.

328 Wrench engaging lugs:

This subclass is indented under subclass 327. Devices in which the interlocking means are projections or ears for engaging the jaws of a wrench.

329 With provision of alternate wear parts:

This subclass is indented under subclass 315.01. Devices having a part or parts made in attached duplicate form or of extensive area movably mounted in such a manner the worn or injured part may be replaced by a duplicate part or another unworn surface to restore the device to its former condition.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

269+, for devices which by movement of a part to a different orientation change the mode of operation of the device.

329.01 Valve heads and/or seats:

This subclass is indented under subclass 329. Devices relating to valve heads and/or seats.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.18 through 15.26, for a process of assembling, disassembling, or repairing a valve or valve member.

329.02 Opposite duplicate surfaces of unitary structure:

This subclass is indented under subclass 329.01. Devices having oppositely disposed duplicate surfaces forming a unitary structure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.13, for assembling, disassembling, mounting, or removing a domestic faucet having a unitized valve head and seat.

329.03 Homogeneous material:

This subclass is indented under subclass 329.02. Devices relating to an homogeneous material forming the surfaces and their intermediate support.

329.04 Valve heads:

This subclass is indented under subclass 329.03. Devices relating to valve heads.

329.05 Different portions of continuous surfaces:

This subclass is indented under subclass 329.01. Devices in which different portions of the same surface are adjusted to a certain position to form a valve interface.

329.06 Successively used adjacent independent elements:

This subclass is indented under subclass 329.01. Devices in which are stored adjacently a plurality of separate elements forming duplicate surfaces successively used.

329.1 Removable valve with normally disabled supplemental check valve:

This subclass is indented under subclass 315.01. Apparatus in which the main valve is arranged to be removable and a supplemental check valve is provided upstream, biased to close by fluid pressure and/or a spring; the check-valve being maintained inoperative in normal use of the main valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

285, for a hydrant having a removable valve with a supplemental check valve.

300, for a hydrant having a supplemental valve.

301, for a hydrant having protection against freezing.

315.33, for a check valve (e.g., non-return valve, etc.) with assembling or disassembling means.

512 through 513, for plural line condition direct response valves (i.e., check valve type).

613 through 614.21, for system shaving a flow line with serial valves or closures.

329.2 Check valve disabled by normally movable main valve part:

This subclass is indented under subclass 329.1. Devices in which the check valve is biased opened by a part of the main valve which is movable in normal usage of the main valve. Usually a spacer or projection between the check valve and main valve is provided.

329.3 Ball check:

This subclass is indented under subclass 329.2. Devices in which the check valve is of the ball-check type.

329.4 Spring bias:

This subclass is indented under subclass 329.2. Devices having a spring bias to close the check valve or to supplement the bias of the fluid.

330 NON-VALVING MOTION OF THE VALVE OR VALVE SEAT:

This subclass is indented under the class definition. Apparatus in which means is provided for moving either a valve or a valve seat with respect to its cooperating member independently of opening or closing movement in such a direction or between such limits as to be ineffective to open or close the valve, usually to reduce friction or to prevent sticking or to equalize wear.

- (1) Note. This subclass does not include a rotation of a reciprocating valve after it is seated merely for the purpose of perfecting the seating of the valve or any other movement which is performed as a part of the normal actuation of the valve. Such patents are classified on the basis of the actuator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 242+, for movements of valves in mechanical cleaning.
329 through 329.06, for systems having repair by providing alternate wear part.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 56 for pressure actuated valves with plural motions of the valve, and subclasses 215+ for mechanical movement actuated valves with plural motions of the valve, and see the search notes thereto.

331 Rotary motion of a reciprocating valve:

This subclass is indented under subclass 330. Apparatus which provides means for imparting rotary motion to a reciprocating valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 56, for reciprocating valves which continuously rotate with a speed responsive actuator.

- 243, for valve grinding movement of a reciprocating valve.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 215+ for valves and their actuators in which the valves have plural diverse motions, as rotating and reciprocating.

332 Turbine on valve:

This subclass is indented under subclass 331. Apparatus in which the rotating means is a turbine mounted on the valve or valve stem.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 499, for condition responsive valve actuation by a turbine reactor connected to the valve, and see the search notes thereto.

333 Manual rotating means:

This subclass is indented under subclass 331. Apparatus in which a manual actuator is provided for rotating the valve.

334 WITH HEATING OR COOLING OF THE SYSTEM:

This subclass is indented under the class definition. Fluent material device to which has been added means for heating or cooling the device or the fluent material.

- (1) Note. This subclass does not include heating or cooling of the system by the transfer of heat between the fluent material and the device or from one part of the fluent material to another except where a part of the fluent material is diverted to heat or cool the device or where part of the fluent material in a separate channel is placed in heat exchange relationship with respect to other parts of the fluent material under conditions of difference in temperature.

- (2) Note. This subclass does not include heating or cooling to cause actuation of a valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 13, for processes of affecting flow by the use of heat.
- 241, for steam sterilizing in flow handling systems.
- 297, for hydrants with heaters.
- 468, for thermally responsive valves, and see the search notes thereto.
- 564, for thermal type closed circulating systems.
- 599.14 through 599.15, for systems dividing into parallel flow lines then recombining having a bypass including a cleaning, treating, or heat transfer feature.

SEE OR SEARCH CLASS:

- 62, Refrigeration, appropriate subclasses for refrigeration processes and apparatus for cooling a material, particularly subclasses 45.1+ for process and apparatus for handling liquefied gas as a commodity including steps or means involving pressure or temperature control special to liquefied gas and more than required for other liquids, and subclasses 389+ for a withdrawable liquid cooler and subclass 404 for a gas (air) cooler.
- 123, Internal-Combustion Engines, subclass 142.5 for internal combustion engines with heating means.
- 138, Pipes and Tubular Conduits, subclasses 32+ for devices for thawing pipes and tubular conduits.
- 165, Heat Exchange, appropriate subclasses for means for handling fluid for heat exchange purposes.
- 222, Dispensing, subclass 113 for dispensers with burners and subclass 146 for dispensers with other heating and cooling means.
- 251, Valves and Valve Actuation, subclass 11 for heat motor actuated valves.

335 **With burner:**

This subclass is indented under subclass 334. Apparatus in which the source of heat for the device includes a burner.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 113 for dispensers with burners.

336 **Flue extending through fluid:**

This subclass is indented under subclass 335. Apparatus in which an enclosed passageway for gases and flames from the burner extends through the fluid.

337 **Hot and cold water system having a connection from the hot to the cold channel:**

This subclass is indented under subclass 334. Fluid handling systems comprising hot and cold water systems having a cross connection from the hot water channel to the cold water channel to permit flow of hot water to the cold water channel.

- (1) Note. This subclass includes antifreeze thermosiphons and no-drain devices for hot water tanks.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 59+, and 118+, for flow diverting means responsive to freezing or other temperature variations.
- 563+, for distribution systems providing continuous circulation of fluid therein, especially subclass 564 for thermal circulating systems.
- 602+, for systems comprising multiple inlets with a single outlet, especially subclasses 888+ and 896+ for mixing valves; and see the search notes to subclasses 888 and 896.

338 **Air heated or cooled (fan, fins, or channels):**

This subclass is indented under subclass 334. Fluid handling systems in which (1) air as a heating or cooling fluid for the system has a thermally caused movement through channels whereby it is warmed by contact with the earth and/or an object buried in the earth, such as a pipe line; or (2) the fluent material system or a part thereof is equipped with a fan or fins to aid in the heating or cooling of the device or the fluid by heat exchange with the air.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 564, for distribution systems involving closed circulating systems of the thermal type.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, sub-classes 41 and 52.1+ for air cooled internal combustion engines.

339 With diversion of part of fluid to heat or cool the device or its contents:

This subclass is indented under subclass 334. Apparatus in which a part of the fluid is diverted in a separate channel to heat or cool the device or a part thereof, or to heat or cool another part of the fluid that has assumed a different temperature.

- (1) Note. See the definition of subclass 334, (1) Note.

340 Circulating fluid in heat exchange relationship:

This subclass is indented under subclass 334. Apparatus in which a heating or cooling medium circulates in a channel which is in heat exchange relationship with the fluent material device or part thereof.

- (1) Note. This subclass includes only devices in which the heating or cooling medium is maintained separate from the fluent material normally operated on by the device. There is no mixing of the medium and the fluent material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

375, for jacketed flow devices in which the jacket may contain heating or cooling means or fluid, but in which there is no means for causing or directing circulation within the jacket.

SEE OR SEARCH CLASS:

165, Heat Exchange, appropriate sub-classes for fluid handling means as an adjunct to heat exchange means.

341 With electric heating element:

This subclass is indented under subclass 334. Apparatus in which an electric heating element is used to heat the fluid or the device or a part thereof.

- (1) Note. Electric elements used to actuate parts of the fluent material device, such

as a valve, and which are in the flow path of the fluent material, are not included in this subclass even though they incidentally may heat the fluent material as an inherent part of their mode of operation, since they are not effective as heat exchange means except during valve actuation. Such devices have been classified as valve actuators.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

66, for thermoelectric combustion failure responsive fuel safety cut-offs for burners.
76, for heaters for destructible or fusible elements in safety cut-offs.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclass 33 for electric thawing and freeze protection for pipes and tubular conduits.
219, Electric Heating, subclasses 628+ for inductive fluid heating, subclasses 687+ for microwave fluid heating, and subclass 772 for the capacitive dielectric heating of fluent materials, and subclasses 280+ for other electric fluid heating apparatus.
251, Valves and Valve Actuation, subclass 11 for electrical heat motor valve actuators, and subclasses 139 and 140 for solenoid operated valves where the solenoid is within or surrounds the flow path. See (1) Note above.

342 WITH FLUID SYSTEM SUPPORT FOR WORKMAN OR NON-SYSTEM MATERIAL:

This subclass is indented under the class definition. Apparatus comprising a fluent material handling device combined with a fixture or attachment carried by the device or a part thereof exterior of the flow path for supporting material or articles that may be used in conjunction with the device or its contents or for supporting persons, usually workmen who are tending the fluent material handling device.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

268, where the material is held within the flow to be dissolved or entrained.

374, for fluid handling systems combined with articles of furniture where no specific support for other articles or material, such as a shelf, is claimed.

SEE OR SEARCH CLASS:

182, Fire Escape, Ladder, or Scaffold, subclass 52 for a fluid conduit serving as a support for a ladder or scaffold.
222, Dispensing, subclass 192 for dispensers combined with supports for additional articles, as tools, oil cans, mirrors, or advertising material.

343 WITH CASING, SUPPORT, PROTECTOR OR STATIC CONSTRUCTIONAL INSTALLATIONS:

This subclass is indented under the class definition. Apparatus comprising (1) fluid handling devices combined with means for supporting the device or a part thereof relative to means external to the device; (2) the combination of such devices or parts thereof with an enclosing member, fixture, or attachment to (a) protect the device or part thereof from soil, contamination, injury, theft or loss; or (b) protect persons or things from injury through contact with the system or a part thereof.

(1) Note. This subclass does not include supports or connectors between parts of the same fluent material system. The combination of such supports with elements of the system may be found in the subclass involving the pertinent elements of the fluid distributing system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

342, for systems having supporting means for material or things external to the system, including workmen's supports.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 201 for meter boxes.
222, Dispensing, subclasses 102, 131, 142.2, 142.3, 144, 160+, and 173+ for dispensers having casings and/or external supports, and see the notes to subclass 173.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 130+ and 146+ for spray apparatus having mobile supply and discharge, subclasses 722+ for sprayers having ambulant discharge and stationary supply, subclasses 200+, 225.1+ and 273+ for devices having nonambulant supply and discharge, subclass 168 for fluid sprinklers having hose holders and a fluid supply, and subclasses 288+ for guards and/or protectors for the apparatus or for the operator.

248, Supports, subclasses 49+ for pipe and cable supports, 75+ for hose and nozzle supports, 102+ for nursing bottle supports, 108+ for past tube supports, 128+ for movable receptacle supports and 146+ for supports for stationary receptacles.

251, Valves and Valve Actuation, subclasses 143+ for the mounting of valves on other parts of a fluid handling device.

285, Pipe Joints or Couplings, subclasses 19, 131.1 and 136.1+ for pipe and plate or box couplings, 149.1+ for pipe and box couplings, and 189+ for pipe and plate couplings.

345 Locomotive:

This subclass is indented under subclass 899. Apparatus in which the casing, support or protector is a locomotive or a part thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

156+, for gas pressure discharge of liquid feed-traps to boilers.

SEE OR SEARCH CLASS:

105, Railway Rolling Stock, subclasses 26+ for locomotives, especially subclasses 37+ for steam locomotives.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 173 and 174 for sprayers attached to track guided cars and locomotive cabs.

291, Track Sanders, subclasses 3+ for fluid delivery in track sanders.

454, Ventilation, subclasses 84+ for locomotive cab ventilation.

346 Boiler or steam dome:

This subclass is indented under subclass 345. Apparatus in which the casing or protector is the boiler or steam dome of a locomotive.

347 Railway car:

This subclass is indented under subclass 899. Apparatus in which the casing support or protector is a railroad car or a part thereof.

SEE OR SEARCH CLASS:

- 62, Refrigeration, appropriate subclasses, particularly subclasses 239+ for a refrigerated vehicle.
- 105, Railway Rolling Stock, subclasses 238.1+ for a special railway car body, especially subclasses 358+ for tank cars.
- 213, Railway Draft Appliances, subclass 76 for the combination of a car coupling and a train line (fluid conduit) coupling.
- 454, Ventilation, subclasses 83+ for ventilation of railway cars.

348 Car frame:

This subclass is indented under subclass 347. Apparatus in which the supports, casing or protector is the car frame or a part thereof.

SEE OR SEARCH CLASS:

- 105, Railway Rolling Stock, subclasses 396+ for car framing.

349 End of car:

This subclass is indented under subclass 347. Apparatus in which the support casing or protector is the end or end wall of car.

350 Roof, wall or floor:

This subclass is indented under subclass 347. Apparatus in which the support, casing or protector is the roof, wall or floor of a railroad car.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 247.11+, especially subclasses 247.33, 247.35, 247.37, and 247.39 for liquid sealed refrigeration car drain installations.
- 354, for fluid handling devices installed in the floor of a vehicle.

360+, and 362, for fluid handling devices installed in the wall or floor of a building.

351 Automotive:

This subclass is indented under subclass 899. Apparatus in which the casing, support or protector is a self propelled land vehicle that contains within itself means of motion and direction control.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 38+, for fluent material handling devices controlled by the position or inertia of the system, especially subclass 43 for safety overturn valves.
- 47+, for speed responsive valve control.
- 345+, and 347+, for fluid handling means installed in railway rolling stock.
- 479+, for combustion engine type valves responsive to suction in the intake system.
- 598, for hill holders in fluid pressure braking systems.

SEE OR SEARCH CLASS:

- 105, Railway Rolling Stock, subclasses 239+ for dump type car bodies and subclasses 358+ for tank cars.
- 114, Ships, subclass 74 for tankers and subclasses 232+ for oil distributors for ships.
- 222, Dispensers, subclasses 608+ for ambulant dispensers, and see the search notes to subclass 608.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 130+ and 146 for sprayers having ambulant supply and discharge, and subclasses 722+ for spraying devices having ambulant discharge and stationary supply.
- 244, Aeronautics and Astronautics, subclass 136 for material discharging and diffusing from aircraft.
- 258, Railway Mail Delivery, appropriate subclasses, especially subclasses 1.2+ for refueling aircraft in flight.
- 280, Land Vehicles, subclasses 830+ for tank type land vehicles.
- 291, Track Sanders, appropriate subclasses, especially subclasses 3+ for the fluid delivery type.

352 Steering post or wheel:

This subclass is indented under subclass 351. Apparatus in which a fluid control means or fluid delivery device is mounted on or associated with the steering post or steering wheel of the vehicle.

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclasses 491+ for hand controlled lever and linkage systems, and 552+ for hand wheels.
- 180, Motor Vehicles, subclass 78 for a motor vehicle having a controlling device which is mounted on the steering post or handle.

353 Dash:

This subclass is indented under subclass 351. Apparatus in which the fluid handling device is mounted on or associated with the dashboard of automobile.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 289 and 295 for valves provided with actuating means operable from stations more or less remote from the valve, and see the search notes to these subclasses.

354 Floor or frame:

This subclass is indented under subclass 351. Apparatus in which the fluid handling device is mounted on or associated with the floor or frame of the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 348, and 350, for fluid handling devices associated with the frame or floor of a railway car.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 295 for pedal operated valve devices, and see the search notes thereto.

355 Fender or running board:

This subclass is indented under subclass 351. Apparatus in which the fluid handling device is mounted on or associated with the fender or running board of the vehicle.

SEE OR SEARCH CLASS:

- 224, Package and Article Carriers, subclasses 42.32+ for vehicle fender attached package and article carriers.
- 251, Valves and Valve Actuation, subclasses 289 and 295 for valves provided with actuators having extensions or remote or plural terminals which might extend from a valve mounted on a vehicle to a fender or running board, and see the search notes to these subclasses.

355.12 With hose reel storage means:

This subclass is indented under subclass 899. Apparatus having a revolable means for storing a flexible flow line mounted on the vehicle or on a part thereof.

SEE OR SEARCH CLASS:

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclass 199 for ambulant reel and ground supported frame for flexible flow line storage including nozzle detail.

355.16 With hose storage or retrieval means:

This subclass is indented under subclass 343. Apparatus comprising a storage type, use and nonuse holding and supporting means, and/or rewind or retracting means for a flexible conduit combined with some element or elements of the fluid supply means.

- (1) Note. Included herein are hose brackets adapted to be released by distension or inflation of the hose under pressure of fluid contents.
- (2) Note. See Class 239, Fluid Sprinkling, Spraying, and Diffusing, Miscellaneous Class Notes and Lines, Flexible Flow Line Storage or Retrieval of the class definition for a statement regarding various subcombinations of the above subject matter as related to various classes.

SEE OR SEARCH CLASS:

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 195+ for combinations of this subject matter and specific nozzle or outlet arrangement at

- the terminus of the fluid handling elements.
- 242, Winding, Tensioning, or Guiding, subclasses 370+ for a reeling device for handling elongated material including a hose without a specified coupling between a fluid supply and hose.
- 355.17 With means for plural hoses:**
This subclass is indented under subclass 355.16. Apparatus provided with means for accommodating a plurality of flow line conduits.
- 355.18 With flow regulation responsive to hose movement:**
This subclass is indented under subclass 355.16. Apparatus provided with a connection between the flow control means for the fluid and the flow conduit or the storing means therefor whereby movement of the conduit or its storing means to flow discharging position actuates the flow control means to fluid transmitting position.
- (1) Note. Flow regulation does not include valves operated by the jettisoning or uncoupling of the flow line from the storage or fluid handling system.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 149.8 for a valve operated by motion of the flow path.
- 355.19 Reel type:**
This subclass is indented under subclass 355.18. Apparatus in which the flow line storing means is a spool or drum and movement of the storing means as a consequence of flow line movement actuates the flow regulating means.
- 355.2 With retrieval means:**
This subclass is indented under subclass 355.16. Apparatus provided with means in addition to the hose support or storage means and its associated support against gravity means whereby the flow line conduit is returned to its nonuse or stored position.
- (1) Note. A crank mechanism which is connected to the storing means by a force of speed varying mechanism is considered to be a return means for this subclass. A mere crank fixedly attached to a spool or reeling mechanism is considered as no different from direct contact with such retrieval mechanism and does not qualify as the additional means required in this subclass.
- SEE OR SEARCH CLASS:
239, Fluid Sprinkling, Spraying, and Diffusing, subclass 197 for a corresponding field of search involving a specific terminal member.
- 355.21 Power stop or brake:**
This subclass is indented under subclass 355.2. Apparatus provided with an arresting or checking means acting on the return mechanism.
- (1) Note. A dashpot which slows down the final movement of the return means is considered to be a power stop or brake for this subclass.
- 355.22 Responsive to position of hose in casing:**
This subclass is indented under subclass 355.21. Apparatus in which the actuation of the arresting or checking element for the return mechanism responds to the position of the flexible flow line conduit in its housing, or storage encasing means.
- 355.23 Biased to retracted position:**
This subclass is indented under subclass 355.2. Apparatus provided with additional means which tends to return the flexible conduit to its nonuse or stored position.
- 355.24 Boom type:**
This subclass is indented under subclass 355.23. Apparatus having a relatively long spar or beam to which at least a portion of the flexible conduit is attached and which is mounted for movement relative to its support.
- 355.25 Weighted:**
This subclass is indented under subclass 355.23. Apparatus in which the means tending to return the flexible flow line to nonuse or stored position is a weight.

355.26 Reel with support therefor:

This subclass is indented under subclass 355.16. Apparatus having a spool or drum on which the flow line is wound or coiled and provided with structure to support the spool or drum.

- (1) Note. The flow conduit which is ultimately connected to the flexible flow line conduit may also serve as part of or all the bearing or support surface for the spool or drum.

355.27 Ground supported:

This subclass is indented under subclass 355.26. Apparatus in which the spool or drum is carried by a frame in contact with and supported by the ground or floor or other similar substantially horizontal surface.

355.28 Basket or holder for folded coiled hose:

This subclass is indented under subclass 355.16. Apparatus in which the means for storing the flexible conduit comprises a frame having a bottom and sides whereby the conduit may be looped back and forth or convoluted on itself, in both cases each loop or convolution being contiguous to the next adjacent.

- (1) Note. For classification herein, the hose must not be suspended but must be in a housing having a bottom on which the first loop or coil is laid and must have upstanding walls or elements to retain the folded or coiled hose within the confines of the holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

335.16, where the hose is folded and suspended from a single peg or link.

356 Static constructional installations:

This subclass is indented under subclass 343. Apparatus in which the support is a structural member immovably joined to the ground, or in which the casing or protector is immovably joined to and partially or wholly embedded in the ground.

SEE OR SEARCH THIS CLASS, SUBCLASS:

219+, for Lerner-Johnson valves, which are commonly used in underground water systems.

236, for distribution systems involving geographic features.

272+, for hydrants and railway water cranes.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 173+ for dispenser supports and subclass 192 for dispensers combined with buildings.

357 Buildings:

This subclass is indented under subclass 356. Apparatus in which the fluid handling device is mounted in or associated with a building.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclasses 301+ for installed systems for air blast and suction cleaning.

52, Static Structures (e.g., Buildings), subclasses 11+ for a cover with an eave or valley gutter, subclasses 131+ for a burial vault with fluid guiding feature, subclass 168 for a building with a protective liquid supply, subclasses 192+ for a liquid or fluent material container with a single port, subclasses 198+ for an enclosure with fluid guiding port to a usable space, subclass 218 for a flue with a fluid directing feature, subclass 219 for a flue connected to a building structure, subclasses 220.1+ for a service duct within a barrier of a building construction, and subclasses 302.1+ for a residual building construction or component with a plugged vent or passage between its interior and the ambient.

169, Fire Extinguishers, appropriate subclasses, especially subclasses 16+ for fluid distributing systems.

222, Dispensing, subclass 192 for dispensers combined with building structures.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 200+, 225.1+ and 273+ for installed systems of that class, especially subclasses 209+ for

vehicle washers with overhead fixed supply pipes.

358 Outside access to portions of the system:
This subclass is indented under subclass 357. Apparatus in which the building has an external casing or pit connected to the building serving as a housing or a support for part or all of the fluent material device, and having an opening exterior of the building providing admittance to portions of the system.

359 Escutcheon type support:
This subclass is indented under subclass 357. Apparatus in which the fluid handling system includes a member which surrounds a pipe or pipes and covers the opening through which the pipe or pipes pass through a wall or floor.

- (1) Note. The supports, casings, or protectors found in this subclass close the opening around the pipe and provide an ornamental appearance for the arrangement, as well as supporting and/or centering the pipe in the opening.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 296, for caps or covers for hydrant casings.
371, for closures for valve and meter wells.
380, for covers for beer cooler faucet apertures.

SEE OR SEARCH CLASS:

- 220, Receptacles, subclasses 241+ for closures of the face plate type.
248, Supports, subclasses 49+ for pipe and cable supports, especially subclasses 56+ for the through-plate type.
292, Closure Fasteners, subclass 357 for escutcheon plates applied to closure latch devices.

360 Wall:
This subclass is indented under subclass 357. Apparatus in which the fluid handling device is mounted on or associated with the wall of a building.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 350, for fluid handling devices associated with the wall of a railway car.

359, for escutcheon type supports for pipes, etc.

361 Recessed gas outlet box:
This subclass is indented under subclass 360. Apparatus in which the support, casing or protector is a covered space in the wall of building used for concealing the outlet of a gas main.

362 Floor installation:
This subclass is indented under subclass 357. Apparatus in which the floor of the building or a part thereof acts as a support, casing or protector, the relation being other than that involved in merely setting the device on the floor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 247.43, for floor installed liquid seal traps.
350, and 354, for fluid handling systems mounted on or associated with the floor of a vehicle.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 295 for pedal type valve actuators passing through the floor of a building.

363 Ground supporting enclosure:
This subclass is indented under subclass 356. Apparatus in which the support, casing or protector is a means covering at least a portion of a fluent material system and acting as a support for the ground around the part.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 219+, for Larner-Johnson valves.
236, for distribution systems involving geographic features.
272+, for hydrants and railway water cranes, especially subclasses 291+ and 294+, for vertical casings enclosing a water column and/or a valve.

SEE OR SEARCH CLASS:

- 166, Wells, appropriate subclasses for wells comprising casings enclosing valves and/or tubing.
239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 201+ for ground installed or embedded spray systems.

- 404, Road Structure, Process, or Apparatus, subclasses 2+ for a drain associated with road structure and subclasses 25+ for a vault cover-closure associated with pavement structure.
- 405, Hydraulic and Earth Engineering, subclasses 36+ for below ground irrigation systems; subclasses 132+ for tunnels and methods and apparatus for constructing the same; subclass 154.1 for pipe and cable laying apparatus and methods; and subclass 272 for earth shoring structures.
- 364 Valve and meter wells:**
This subclass is indented under subclass 363. Apparatus in which the support, casing or protector is an apertured vertical casing partially or wholly surrounding and providing access to a valve or meter connected to a buried pipe line.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
291 through 293, for a hydrant having a valve actuator outside its riser.
294 through 297, for a hydrant having a casing.
- SEE OR SEARCH CLASS:
73, Measuring and Testing, subclass 201 for meter casings or supports, and subclass 277 for frostproof meter constructions.
- 365 With means to center well on valve:**
This subclass is indented under subclass 364. Apparatus in which the apertured vertical casing, valve or pipe line has a means to cause coincidence of the axis of the valve actuator and the casing, to enable a person applying a removable actuator to locate the valve connection easily.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 291+ for detachable actuators for valves, and see the search notes thereto.
- 366 Detachable base plate:**
This subclass is indented under subclass 365. Apparatus in which the vertical well-forming casing or tube rests on a base plate or section
- which lies beneath the valve in the pipe, the pipe being held in place between the base plate and the upper section of the casing with the valve centered in the well.
- 367 Vertical casing aligned by valve casing:**
This subclass is indented under subclass 365. Apparatus in which the top of the valve casing has means engaging the well-forming casing to insure assembly in proper alignment.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
277, and 287, for vertical fluid channels of the hydrant type with telescopic casings.
315.01 through 329.4, for a fluid handling system with repair, tapping, or assembly means, other than means to hold the system together or in alignment when in operative condition.
369, and 370, for telescoping valve and meter wells.
- 368 Combined with actuator:**
This subclass is indented under subclass 364. Valve wells in which an operating member for the valve extends through the vertical column and terminates at or near the surface of the ground.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
272+, for hydrants, most of which have a vertically extending actuator.
570, 596+ and 625.2+, for drain valves which have vertically extending actuators, especially pump drains and stop and waste devices located in inaccessible places.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 291+ for valves provided with detachable actuators and subclass 293 for valves with extensible actuators.
- 369 Telescopic well casing:**
This subclass is indented under subclass 368. Valve wells in which the vertical column is divided into sections slidable one within the other, which sections may be locked together to fix the height of the column.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

287, for vertically mounted fluid channels of the hydrant type having telescopic casings, movement of the conduit actuating the valve.

370, for telescopic casings comprising valve and meter wells, no valve actuator being claimed.

370 Telescopic well casing:

This subclass is indented under subclass 364. Valve wells in which the vertical column is divided into movable sections slidable one within the other, which sections may be locked together to fix the height of the casing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

277, for a rotatable water crane having a vertically movable riser.

369, for telescoping casing combined with valve actuator.

SEE OR SEARCH CLASS:

220, Receptacles, subclasses 3.92, 3.94, and 4.01+ for sectional and telescoping containers of general application.

371 Covers:

This subclass is indented under subclass 364. Devices comprising closures for the upper ends of the valve or meter wells.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

295, and 296, for hydrant casings flush with ground and/or covers or caps for hydrants.

800, for closures in fluid handling devices, and see the search notes thereto.

SEE OR SEARCH CLASS:

220, Receptacles, subclasses 200+ for receptacle closures of general application.

372 Pipe line transport:

This subclass is indented under subclass 363. Apparatus in which the fluent material system is a pipe line.

(1) Note. Pipe systems having means or arrangements to compensate for thermal expansion are found here.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

1+, for processes relating to pipe line flow.

236, for distribution systems including pipe lines where special accommodation to geographical features is involved.

317+, for pipe line repair involving tapping a line under pressure.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclass 105 for pipes in a trench; subclass 108 for underground conduits for supporting cables therein; subclass 113 for underground conduits for supporting pipes therein; and subclasses 124+, 131, 137+, and 140+ for composite pipes and conduits.

373 Tapering or tower type:

This subclass is indented under subclass 356. Apparatus in which the longitudinal dimension of the support, casing or protector extends upwardly and is reduced in cross-section at successively higher levels; or in which the support, casing or protector is designed primarily with a view to elevation by making its height greater than its diameter or making its height relatively great by positioning the support on another structure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

376, for tank supports of other types.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclass 40 for a specific tower or shaft supporting another device, e.g., a tank.

222, Dispensing, subclasses 173+ for dispenser supports.

374 Furniture and housing furnishings:

This subclass is indented under subclass 343. Apparatus in which the support, casing or protector is the whole or a part of one of the arti-

cles of convenience or decoration used to furnish a house or apartment.

- (1) Note. The term furniture refers to the movable articles such as chairs, tables, beds, desks, cabinets, stoves, used in a house or apartment as distinguished from the permanent fixtures such as plumbing, and the term house furnishings means small articles such as kitchen utensils or lamps.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 247.11+, especially subclasses 247.33, 247.35, 247.37, and 247.39 for liquid sealed refrigerator drains.
 312+, for fluid handling systems comprising refrigerator drip catchers.
 342, for fluid handling devices associated with items of furniture which claim article supporting surfaces other than a mere top surface, as a shelf.
 562, for distribution systems comprising faucet connected, sink drained devices.

SEE OR SEARCH CLASS:

- 62, Refrigeration, subclass 261 for a refrigerator combined with furniture.

375 **Jacketed:**

This subclass is indented under subclass 343. Apparatus in which the fluent material device is completely or partially surrounded by a layer of heat exchange or non conducting material to promote or prevent heat radiation or absorption, or by a protective cover or layer which may be either outside the fluid confining member or inside it, being in fact a liner in the latter case, the layer or cover being more or less similar in shape or proportions to the enclosed device.

- (1) Note. This subclass includes fluent material devices enclosed in a casing to confine air or a vacuum as a heat insulating material means for the fluent material device.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 264, for plural tanks having outlets which provide for flow other than from one

tank to another, one of which tanks may be a cooling or insulating jacket for another, but which must have a claimed outlet or inlet for fluent material.

- 334+, for heat exchange means involving jackets and casings, especially subclass 336 for flues extending through a casing for heating the contents and subclass 340 for jacket-type heat exchangers with means to cause or direct flow in the fluid heat exchange material.

SEE OR SEARCH CLASS:

- 150, Purses, Wallets, and Protective Covers, subclass 156 for a flaccid protective cover for a faucet.
 220, Receptacles, appropriate subclasses, especially subclasses 560.12+, 592.01+, and 903 for a container having an insulated wall or jacket and 495.01+, 23.9, 23.91, and 908.1+ for a container having a lining or jacket.
 222, Dispensing, subclass 131 for dispensers having a spaced, nondispensing jacket and subclass 183 for other jacketed dispensers.
 229, Envelopes, Wrappers, and Paperboard Boxes, subclasses 117.27+ and 164.2 for a paperboard box having a lining and 103.11 for a thermally insulated paperboard box.

376 **Tank supports:**

This subclass is indented under subclass 343. Apparatus in which the fluent material device includes a tank and the support, casing, or protector holds the tank in position with reference to an external area or point of reference.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 373, for tapering or tower type supports.
 374, for systems which are associated with furniture or other house furnishings.
 453+, for barometric type systems.
 899+, for vehicular supports, and see the search notes to subclasses 899 and 351 respectively.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 160+ for dispensers which are movably mounted

with respect to their supports, and subclasses 173+ for other dispenser supports.

377 Guards and shields:

This subclass is indented under subclass 343. Devices in which the fluent material handling device or a part thereof is totally or partially surrounded by a casing (1) to prevent damage to an object external to the device, (2) to seal the device against leakage to or from the device outside the normal fluid path, (3) to protect the device or parts thereof or the contents against damage or contamination by contact with external objects, dirt or germs, or (4) to prevent unauthorized use.

- (1) Note. The guard or protector must be external to the system, so that it does not serve to confine or control the material in the system nor to close the flow openings of the system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 294+, for hydrant casings, especially subclass 296 for a cap, cover or hood used as a guard on a hydrant.
 317, for antispash shields used to prevent escape of fluid when a pressure system is tapped.
 375, for casings which are close fittings or of a shape generally corresponding to that of the device, and substantially complete, and see the search notes thereto.
 383+, for locks or seals to prevent unauthorized use.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 182 for covers for the operating parts of dispensers; subclass 192 for bumpers and guards for dispensers.
 251, Valves and Valve Actuation, subclasses 89+ for valves provided with actuator disabling means to prevent unintentional operation.

378 Resilient abutment for preventing breakage:

This subclass is indented under subclass 377. Guards or shields in which a spigot or faucet of a fluent material device is provided with a shock absorbing fixture or attachment which

will be struck by a container when moved into position for filling from the spigot or faucet.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclass 149 for receiver lift means with additional cushioning means, subclass 289 for laterally shiftable vent tubes, and subclasses 351+ for receiver actuated discharge means.
 251, Valves and Valve Actuation, subclass 156 for receptacle operated nonstop valves.

379 Nozzle abutment for scratch or damage prevention:

This subclass is indented under subclass 377. Guards or shields in which a nozzle of a fluent material device is provided with an attachment or fixture to prevent scratching of the surface of a container into which the nozzle is inserted.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 801, for nozzles and spouts in fluid handling systems, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 566 for nozzles, spouts and pouring devices for dispensers.

380 Cover for beer cooler aperture for faucet:

This subclass is indented under subclass 377. Guards or shields in which a closure member seals the opening between the spigot and refrigerator casing of a beer cooler.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 317, for shields for sealing the opening between a beer keg and spigot of the tapping type.
 359, for escutcheon type supports for pipes passing through the walls of buildings.

SEE OR SEARCH CLASS:

- 292, Closure Fasteners, subclass 357 for escutcheons for closure fastener elements.

381 Sanitary covers or shields:

This subclass is indented under subclass 377. Guards and shields which comprise (1) a cylindrical or conical member attached to the spout of the fluent material device to prevent contamination of the spout either during or after the flow of fluent material; or (2) a movable shield that covers the outlet area or spout when not in use.

- (1) Note. Where the movable guard covers only the outlet end of the spout and actually closes it against flow, it is considered to be a valve or closure and classification is on that basis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

800, for closures in fluid handling systems, and see the search notes thereto.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 182 for guards or covers for operating parts of a dispenser.

251, Valves and Valve Actuation, subclass 155 for arrangements wherein a valve or closure covers a spout.

382 Valve guards:

This subclass is indented under subclass 377. Guards and shields in which the valve member of a fluent material device (1) is enclosed in a casing which is locked against unauthorized use of the valve; or (2) has an internal key which is fastened to another object to prevent movement of the valve to an unauthorized position; or (3) in which the valve is totally or partially enclosed in a casing or shield or has casings covering all or part of the operating handle or stem or a valve to protect the stem or operating handle against damage or unintentional movement to or from a desired position.

SEE OR SEARCH THIS CLASS, SUBCLASS:

312+, for valves combined with casings which act as drip catchers.

383+, for valves with locks but without casings totally or partially enclosing the valve.

586, for distribution systems in which there is an interlock between a valve actua-

tor and a closure for an access opening.

613+, for closures used in series with a valve in distribution systems.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 173+ for dispenser guards in the nature of casings.

251, Valves and Valve Actuation, subclasses 89+ for valve actuator holding means and subclass 297 for detents which are not enclosing devices.

382.5 With means for accommodating a detachable actuator:

This subclass is indented under subclass 382. Devices wherein there is a particularly shaped aperture in the casing to accommodate a detachable actuator having a particular shape and being adapted to engage the valve stem inside the casing.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 291+ for other valves with detachable actuators.

383 WITH LOCK OR SEAL:

This subclass is indented under the class definition. Apparatus including a lock means which prevents unauthorized use or adjustment or a sealing means the breaking of which indicates unauthorized use or adjustment.

- (1) Note. To be classified here the lock means must be a lock as defined in Class 70 and not merely a latch or detent.

SEE OR SEARCH THIS CLASS, SUBCLASS:

382, for valve guards and shields, including boxes which are locked.

SEE OR SEARCH CLASS:

70, Locks, appropriate subclasses for locks, per se.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 346+ for combined filling devices and receivers having interlocked discharge means, support or coupling, and subclasses

- 348+ for supply means carried receiver flow control opening means.
- 222, Dispensing, subclasses 153.01+ for dispenser locks or fastening seals.
- 292, Closure Fasteners, subclasses 307+, 327 and 328+ for seals of the closure fastening type.
- 384 With seal:**
This subclass is indented under subclass 383. Apparatus which uses a seal as a means for preventing and/or indicating unauthorized use or adjustment.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 153.05+ for dispenser fastening seals.
292, Closure Fasteners, subclasses 307+ for seals of the closure fastener type, subclass 327 for seal bolts and subclasses 328+ for shackles for seals.
- 384.2 Common lock and valve actuator:**
This subclass is indented under subclass 383. Devices in which the structure which is employed to actuate the lock also actuates the valve.
- 384.4 Combination lock:**
This subclass is indented under subclass 384.2. Devices in which the lock comprises an element which is, or a plurality of elements which are, manually manipulable in a predetermined sequence, or to a predetermined position to effect the operation of the lock.
- 384.6 Biased valve:**
This subclass is indented under subclass 384.2. Devices in which the valve head is biased to or from the open position.
- 384.8 Mechanical movement between lock and valve:**
This subclass is indented under subclass 384.2. Devices in which the valve head is connected to the lock and actuated therewith by means comprising two or more fixed and movable parts so combined that the motion of one compels or completely controls or constrains motion of the other according to a law of operation inherent in and depending on the nature of the combination.
- 385 Locks against rotary motion:**
This subclass is indented under subclass 383. Apparatus with a lock means the proximate effect of which is to prevent rotation of a rotatable element.
- 386 LIQUID LEVEL RESPONSIVE OR MAINTAINING SYSTEMS:**
This subclass is indented under the class definition. Apparatus which includes an element which senses the level of a liquid in means to receive an accumulation thereof and in response thereto exercises a control of the flow of fluid or acts to maintain that level of the liquid.
- (1) Note. Apparatus which maintains the liquid level by means of overflow pipes or arrangements only is excluded from this and indented subclasses, since there is not change in the operation or relative position of any of the parts of the system which is caused by or related to the maintenance of or failure to maintain the level.
- (2) Note. Valve actuating means operated by diverting a part of the flow into a metering device have been classified as valve actuators, even though the metering device is a level responsive type.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
101.25+, for a self-proportioning system with liquid level sensing.
132+, for periodic siphons, i.e., those which discharge as often as a certain level is reached in the supply container or receiver.
154+, for pressure systems containing diverse fluids which include a control of fluid in response to a liquid level, especially subclasses 197+ for the hygroscopic type of discriminating outlet for gas.
213+, for diverse fluid containing pressure systems having level responsive gas vents or whistles.
262, for flow dividing compartments, the outlet from one of which may be a level maintaining overflow.

561+, for apparatus which maintains a desired level in a container by a continuous over-supply, especially subclasses 563+ for such systems which return the overflow to the supply and 577+ for tanks with movable or adjustable overflow including float supported tank outlets in subclass 578. See (1) Note.

624.14, for repeating cycle valves actuated by line fluid only.

SEE OR SEARCH CLASS:

62, Refrigeration, subclass 188 and 218+ for refrigeration means having liquid level control.

222, Dispensing, subclasses 52+ for automatic dispensers, especially subclass 62 for those having a float controlled pressure liquid and subclasses 64+ for material level control.

251, Valves and Valve Actuation, subclasses 12+ for valves actuated by flow metering arrangements, and subclasses 15+ for valves having compulsory cutoff after a flow period. See (2) Note, above.

399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotos:graphic device.

417, Pumps, subclasses 36+ for control of a pump drive motor in response to liquid accumulation of pump fluid.

387 Washing machine cycle control:

This subclass is indented under subclass 386. Apparatus in which the cycle of operation of a washing machine is controlled in response to a change in liquid level.

SEE OR SEARCH THIS CLASS, SUBCLASS:

240, for the addition of separate material in an installed cleaning system.

268, for the addition of nonfluid material to a flow system.

331+, for cyclic or program type actuation of valves.

SEE OR SEARCH CLASS:

68, Textiles: Fluid Treating Apparatus, appropriate subclasses for automatic washing machines, especially subclasses 12.01+ for single tub machines with automatic sequential operation.

388 Liquid excluding devices for gas inlet or outlets:

This subclass is indented under subclass 386. Apparatus wherein a liquid level responsive device is provided to exclude an external liquid from a gas inlet or outlet such as a shipboard ventilator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

40+, for marine governors, i.e., control by position of a device relative to a body of water.

45+, for control by a pendulum or swinging member responsive to position or inertia of a system.

197+, for discriminating outlets for gas in fluid separating traps or vents for diverse fluid containing pressure systems.

SEE OR SEARCH CLASS:

49, Movable or Removable Closures, subclasses 21+ for a closure responsive to or directly actuated by ambient fluid.

114, Ships, subclass 212 for ship ventilating valves.

160, Flexible or Portable Closure, Partition, or Panel, subclass 5 for weather initiated automatic control of flexible closures and panels, e.g., screens, awnings, etc.

389 With second diverse control:

This subclass is indented under subclass 386. Apparatus wherein the level responding or maintaining flow is increased or diminished by an external means or in response to a change in condition other than liquid level, either by a means acting upon the liquid level responsive control means or by a second means in series or parallel therewith.

- (1) Note. See the class definition, section 3 for collected search notes on automatic and combined automatic and nonautomatic controls in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 410, for valves which are opened by external means and closed by float means.

390 Manual control:

This subclass is indented under subclass 389. Apparatus in which the second control is a manual control.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 181, for traps in diverse fluid containing pressure systems having automatic liquid discharge control with an auxiliary manual control.

391 Control of both inflow and outflow of tank:

This subclass is indented under subclass 386. Apparatus which includes means responsive to variations of the level of the accumulated liquid to control both the inflow to and outflow from an accumulation of liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 214, for high and low level response associated with gas vents or whistles in diverse fluid containing pressure systems.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 68 for plural float operated flow controllers in dispensers.

392 Electrical characteristic sensing:

This subclass is indented under subclass 386. Apparatus in which the liquid level is sensed by sensing an electrical characteristic of a liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 5, for processes of fluid mixing controlled by the conductivity of the mixture.

- 93, for self correlating systems controlled by optical or chemical properties of the ingredients.

393 With control fluid connection at desired liquid level:

This subclass is indented under subclass 386. Apparatus wherein the level to be controlled is in a pressure tank, as a boiler, and a separate control chamber is provided to control a liquid inflow or outflow line of the tank. The control chamber is provided with a connection to the tank at the desired liquid level so that when the liquid is above this level the chamber is filled with liquid by the tank pressure and when the liquid is below the desired level the liquid in the control chamber is drained to the pressure tank. The presence or absence of liquid in the control chamber causes the control of the liquid inflow or outflow line of the tank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 158, for other liquid level devices of this type which further control the application of a gas pressure to a feed trap to discharge the same to a boiler.

395 Control of outflow from tank:

This subclass is indented under subclass 386. Apparatus which include means to control the outflow from the accumulation thereof in response to an element sensing the level of the accumulated liquid.

- (1) Note. A patent to be classified in this or indented subclass must claim control of the outflow. Level responsive valve control which may control either an inflow or outflow and claimed broadly is classified in later subclasses of this group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 165+, for float operated discharge of liquid feed traps to boilers.
192+, for float operated discriminating outlets for liquids in diverse fluid containing pressure systems.
202, for float operated discriminating outlets for gas in diverse fluid containing pressure systems.

396 Self-emptying tanks:

This subclass is indented under subclass 395. Apparatus in which a means sensing a predetermined, usually high, liquid level or a full condition of a tank which is accumulating liquid controls the opening of the tank outlet, allowing the liquid to discharge, and the closing of the outlet at a low level or when the tank is empty, the cycle being repeated as long as liquid is supplied to the tank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 102+, for the supply and exhaust type of self-controlling system, e.g., hydraulic cycle devices and pulsators.
- 132+, for tanks which are periodically discharged by means of a siphon.
- 156+, for self emptying tanks, usually comprising boiler feed traps, emptied by gas pressure, especially subclasses 165+ for those controlled by floats.
- 391, for tanks with liquid level responsive control of both inflow and outflow.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 12+ for fluid actuated or retarded device receiving liquid diverted from the main line and controlling a valve in the main line in accordance with the quantity of diverted liquid accumulated.

397 By float:

This subclass is indented under subclass 396. Apparatus in which the means sensing the liquid level floats in the liquid and is buoyed up thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 398+, for float control of the outlet to an accumulation of liquid in tanks which are not self-emptying.
- 409, for float control of valves not necessarily outlet valves, and see the search notes thereto.

398 By float:

This subclass is indented under subclass 395. Apparatus which includes one or more floats responsive to a change in the level of the accumulated liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 391, for level responsive control of both inflow and outflow of a tank.
- 409+, for similar devices in which the valve is not necessarily an outlet valve, and see the search notes to subclass 409.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 9+ for water closet tanks and bowls having float control means, especially subclasses 331 and 353+.
- 222, Dispensing, subclasses 64+ for level responsive control of dispensers.

399 Low level safety cut-off:

This subclass is indented under subclass 398. Apparatus wherein the outflow is closed in response to the presence of a low level in the liquid accumulation.

- (1) Note. The float control in patents placed in this subclass is not intended to regulate liquid level but is designed to function as a safety control to prevent an undesired occurrence in the outlet pipe, such as entrance of air or sediment.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 66 for dispenser type material level control comprising an empty container cut-off.

400 With supplemental or safety closing means or bias:

This subclass is indented under subclass 386. Apparatus which (1) includes the application of a supplemental force or bias that will insure the closing of the valve controlled by the liquid level responsive means, or (2) is combined with means to insure that the flow is stopped, in case the valve fails to close properly when urged in closing position by the liquid level sensing means.

401 Sinking or bucket type float:

This subclass is indented under subclass 400. Apparatus in which the means sensing the liquid level is an open or bucket type float which floats to urge the valve closed, and in the event that the valve controlled thereby does not properly close the continued rise of liquid level will cause the float to fill with liquid and sink in the liquid to apply the supplemental safety closing bias or means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

404, for other open or bucket type floats, and see the search notes thereto.

402 Gravitating tank:

This subclass is indented under subclass 400. Apparatus wherein the supplemental closing bias or means responds to or is actuated by a gravitating tank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

403+, for level control by means of the weight of accumulated liquid, and see especially the search notes to subclass 408.

403 By weight of accumulated fluid:

This subclass is indented under subclass 386. Apparatus in which the liquid level is sensed by means responsive to the weight or pressure head of the accumulated liquid.

- (1) Note. The receptacle which accumulates the pressure head to be sensed must be specifically related to the particular sensing means. A general statement that the sensing means is responsive or is merely connected to some receptacle, e.g., a tank, is insufficient basis for classification here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

129, and 134, for weight or fluid operated devices associated with siphons.
161, 162+, 189+, and 204, for weight of fluid operated devices associated with diverse fluid containing pressure systems.

188+, for fluid separating traps with discriminating outlet for liquid controlled by weight or pressure of the accumulated liquid.

396, for apparatus controlling the outflow from a self-emptying tank by weight of accumulated liquid.

402, for gravitating tank as a supplemental or safety closing means or bias.

455+, for line pressure responsive valves not specifically related to a particular accumulating receptacle.

SEE OR SEARCH CLASS:

177, Weighing Scales, subclasses 60+ for weigher responsive material control of general application.

222, Dispensing, subclasses 52+ especially subclasses 56-58 for similar arrangements in dispensers.

251, Valves and Valve Actuation, subclasses 12+ for fluid pressure actuated valves which are not condition responsive.

417, Pumps, subclass 38 for a liquid pressure sensor for sensing liquid accumulation to control a pump drive motor.

404 In sinking or bucket type float:

This subclass is indented under subclass 403. Apparatus in which the liquid level is sensed by an open or bucket type element which floats on the liquid accumulation when empty and subsequently is filled with the liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

129, for plural siphons with the main siphon operated by a sinking or bucket type float.

163, for gas pressure discharge of liquid feed traps with the gas pressure controlled by sinking or bucket type float.

185, for an inverted bucket or gas collecting float controlling a discriminating outlet for liquid in a diverse fluid containing pressure system.

190+, for fluid separating traps with discriminating outlets with fluid responsive valve with sinking or bucket type float control.

401, for tank outflow control comprising supplemental or safety closing bias or means and a sinking float.

405 Oil burner fuel overflow preventing safety cut-offs:

This subclass is indented under subclass 403. Apparatus including a valve arranged to cut off the fuel supply to an oil burner or the like in response to a predetermined accumulation of unburned liquid fuel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 120, for control of branched flow by filling auxiliary tank.
- 121, for control of branched flow by filling outlet tank or receiver.
- 456+, for line condition responsive safety cut-offs requiring resetting.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coating Means, subclasses 198+ for filling devices having feed cut-off responsive to accumulation in the receptacle being filled.
- 431, Combustion, subclass 65 for a burner assembly having a control responsive to collected fuel overflow cutting off feed to the burner head.

406 In communicating measuring vessel:

This subclass is indented under subclass 403. Apparatus in which the weight or pressure head of the liquid is sensed in a vessel which is separate from the liquid accumulation but is in communication therewith.

- (1) Note. Both auxiliary gravitating tanks and stationary devices for measuring a static head are included.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 120, for alternate or successively substituted flows from a source with control by filling an auxiliary gravitating tank.
- 134, for an auxiliary receptacle accumulator for starting a siphon.
- 154+, for diverse fluid containing pressure system traps, which are in effect communicating measuring vessels, though not necessarily concerned with level.

- 393, for level responsive devices including a liquid weight or pressure sensing chamber connected to a tank at the desired liquid level.

407 Top and bottom connections:

This subclass is indented under subclass 406. Apparatus in which the separate measuring vessel is provided with connections with the liquid accumulation at both the top and bottom of the measuring vessel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 563+, for distribution systems of the closed circulation type.

408 In gravitating tank:

This subclass is indented under subclass 403. Apparatus in which a single gravitating tank, with or without its mounting means, constitutes both the liquid accumulating means and the liquid level sensing means.

- (1) Note. This subclass also takes the sub-combination in which the valve or flow controlling means operated by the gravitating tank is not claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 120, for control of branched flow by filling of an auxiliary gravity tank.
- 161, and 162+, for gas pressure discharge of liquid feed-traps with gas pressure controlled by amount of liquid in trap by gravitating vessel, and 189 for valves in diverse fluid containing pressure systems controlled by gravitating vessels.
- 189, for fluid separating traps with discriminating outlet for liquid controlled by gravitating vessel.
- 402, for gravitating tank controlled tank outflow when supplemental or safety closing bias or means is involved.
- 404, for sinking or bucket float type gravitating tanks, and see the search notes thereto.
- 406+, for level response control means comprising an auxiliary gravitating tank.

SEE OR SEARCH CLASS:

- 177, Weighing Scales, subclasses 60+ for a gravitating tank in an automatic weigher.
- 222, Dispensing, subclasses 52+ especially subclasses 56-58 for dispensing controlled by quantity or weight.
- 417, Pumps, subclass 37, for a movable liquid receptacle for sensing liquid accumulation to control a pump drive motor.

409 By float controlled valve:

This subclass is indented under subclass 386. Apparatus wherein the element which senses the liquid level floats on the liquid and is buoyed up thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 41, for float controlled marine governors.
- 131, for siphon discharge receiver with float control for siphon.
- 135, for float operated inlets to siphons.
- 137, for float operated vents in periodic siphons.
- 165+, 192+ and 202, for float controlled traps and valves in diverse fluid containing pressure systems.
- 247.21, for a ball-type float in combination with a liquid seal means.
- 397, for float control in self emptying tanks.
- 398+, for control of the outflow from the liquid accumulation in response to a float.
- 404, for bucket type floats, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, appropriate subclasses for float operated devices of that class.
- 73, Measuring and Testing, subclass 322.5 for floats, per se.
- 166, Wells, subclass 54 for automatically operated well apparatus comprising float controlled valves.
- 222, Dispensing, subclasses 62, 66 and 67+ for float controlled dispensers.
- 417, Pumps, subclasses 40+ for a float which senses liquid accumulation to control a drive motor.

410 Valve opened by external means, closing or closing control by float:

This subclass is indented under subclass 409. Apparatus wherein the flow controlling valve is opened by external means and its closing is in response to or is controlled by a float.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 389, for float controlled valves having external means either assisting or substituted for the float operation.
- 456+, for condition change responsive valves which must be reset by external means.

SEE OR SEARCH CLASS:

- 4, Baths, Closets, Sinks, and Spittoons, subclasses 381+ for tank outlet valves which are latched open and released by a float.
- 251, Valves and Valve Actuation, subclasses 15+ for apparatus for flush type valves which are opened by external means, the closing being delayed or controlled by fluid pressure operated member, and subclasses 66+ for biased trip valves which are not released or reset by condition responsive means.

411 Single float controls plural valves:

This subclass is indented under subclass 409. Apparatus in which a single float controls a plurality flow controlling means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 168, for float responsive unitary inlet and outlet valves in gas pressure discharge of liquid feed traps to boilers.
- 391, for the control of both the inflow and outflow from the liquid accumulation.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 67 for plural float operated flow controllers in dispensers.

412 Servo relay operation of control:

This subclass is indented under subclass 409. Apparatus in which the float controls the application of another source of power for operating

the flow controlling means rather than acting directly through a mechanical connection.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

191, and 195, for servo control with sinking type floats in pressure systems containing diverse fluids.

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, appropriate subclasses for fluid servo-motors.

251, Valves and Valve Actuation, subclasses 25+ for fluid pressure servo-motor operation of valves (and see the search notes to subclass 25), subclasses 68+ for electrical actuation of biased trip type valves, and subclasses 129+ for electrical actuation of valves, especially subclass 131 for remote control of such actuators.

413 Fluid pressure:

This subclass is indented under subclass 412. Apparatus in which the float controls the application of fluid pressure for operating the flow control means.

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, appropriate subclasses for fluid servo-motors.

251, Valves and Valve Actuation, subclasses 25+ for fluid pressure servo valve actuation which are operated by external means or in which the operating means is not specifically claimed, and see the search notes to subclass 25.

414 Flexible diaphragm valve:

This subclass is indented under subclass 413. Apparatus in which the flow control means is a valve comprising a flexible diaphragm.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

777+, for expansible chamber devices, especially subclasses 784+ for the flexible wall type, and subclasses 793+ for diaphragms, per se.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for fluid servo-motor actuation of valves, and especially subclasses 45 and 46 for those involving diaphragm valves and/or motors.

415 From tank:

This subclass is indented under subclass 413. Apparatus in which the source of fluid pressure is the tank holding the liquid accumulation to the level of which the float responds.

(1) Note. Many of the patents in this subclass utilize the steam pressure in a boiler for operating a valve controlling the flow of water into the boiler.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

156+, for gas pressure discharge of liquid feed traps to a boiler.

192+, and 202, for float controlled discriminating outlets for liquid and gas in diverse fluid containing pressure systems.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 33+ for valves actuated by fluid servo-motors deriving working fluid from the line controlled by the valve.

416 Quick acting:

This subclass is indented under subclass 409. Apparatus in which the float and/or the flow control means is operated during a shorter length of time than would be the case if the float and valve were free to respond continuously to the change in liquid level.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 75 for valve actuation of the snap action type, and see the search notes thereto, subclass 76 for valve actuators of the impact type, and see the search notes thereto, and subclasses 77+ for valve actuation involving lost motion, and see the search notes thereto.

417 Pilot float released:

This subclass is indented under subclass 416. Apparatus in which the float operating the flow controlling means is restrained from freely responding to the changing liquid level and is released from restraint by a second or auxiliary float.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

420+, for other trip mechanisms for float controlled valves.

418 Over center mechanism:

This subclass is indented under subclass 416. Apparatus in which the quick action of the flow controlling means is obtained by use of a mechanism which has a faster or accelerated rate of motion after it passes a center position than its rate of motion before attaining the center position.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 75 for snap acting valves not of level or condition responsive types, and see the search notes thereto.

419 Shifting weight:

This subclass is indented under subclass 418. Apparatus wherein the change in rate of motion is obtained by the use of a shifting weight.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

424+, for float controlled valves with counterbalance means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 338 for weight biased valves, and see the search notes thereto.

420 Trip mechanism:

This subclass is indented under subclass 416. Apparatus in which the flow control means is provided with a biasing means urging it in one direction which means is restrained by a latch or similar element, which latch is released by means of the float.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

463, for safety cut-offs responsive to a line condition and employing fluid released trips.

467, for fluid released latches responsive to a line condition to allow the valve to open.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 66+ for biased trips controlling valves and operated at will, and see the search notes to subclass 66.

421 Weight or spring bias:

This subclass is indented under subclass 420. Apparatus which includes a weight or spring as the biasing means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 66+ for biased trip actuated valves, especially subclass 72 for weight biased trips, and see the search notes to subclass 66.

422 Lost motion mechanism:

This subclass is indented under subclass 416. Apparatus in which during a part of its travel the float moves without producing a corresponding movement of the flow control means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 77+ for valve actuators including a lost motion mechanism, and see the search notes to subclass 77.

423 Plural floats:

This subclass is indented under subclass 409. Apparatus which includes a plurality of floats.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

391, for apparatus including plural floats which control the inlet to and outlet from a tank.

411, for a single float controlling plural valves.

417, for apparatus including a pilot or auxiliary float for releasing a float con-

trolling the flow control means to provide a quick acting mechanism.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 68 for plural float actuated valves in dispensers.

424 With counter-balance:

This subclass is indented under subclass 409. Apparatus in which the float is provided with means to apply a force which at least partially counterbalances the weight of the float and valve assembly or which partially counterbalances the buoyancy of the float.

SEE OR SEARCH THIS CLASS, SUBCLASS:

419, for quick acting float valves having an over center mechanism with a shifting weight.

425 Within tank:

This subclass is indented under subclass 424. Apparatus in which the counterbalancing means is within the tank holding the liquid accumulation.

426 Level adjustment or selection means:

This subclass is indented under subclass 409. Apparatus in which the valve operating mechanism can be preset to respond at any one of a plurality of levels, by making appropriate changes in the connections between the valve and the float or any intermediate linkage or mechanism.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 234 for adjustable lever type actuators for valves, and see the search notes thereto.

427 With float leakage disposal:

This subclass is indented under subclass 409. Apparatus in which means is provided for removing from the interior of a float material which may leak into it.

SEE OR SEARCH THIS CLASS, SUBCLASS:

312+, for means for collecting material which escapes from the desired flow path and either returning it to the sys-

tem or disposing of it, and see the search notes to subclass 312.

428 In separate communicating float chamber:

This subclass is indented under subclass 409. Apparatus where the float is in a chamber separate from the holder for the liquid accumulation, but which chamber is connected therewith so that the variation in liquid level in the chamber corresponds to that in the holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

406+, for communicating measuring vessels responding to weight or head of accumulated fluid.

571+, for plural tanks connected for serial flow, and see the search notes to subclass 571.

429 Rectilinearly traveling float:

This subclass is indented under subclass 409. Apparatus in which the float is guided or so constructed and mounted that its path of movement will necessarily be along a straight line.

430 Float co-axial with valve or port:

This subclass is indented under subclass 429. Apparatus in which the path of travel of the float is co-axial with the valve or part controlled in response to the float.

431 Float is spreader or anti-splash means:

This subclass is indented under subclass 430. Apparatus in which the float acts as spreading, distributing or anti-splash means for the liquid flow controlled thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

436+, for flow guides or restrictors for float arm operated valves.

582, for distribution systems having anti splash means not in the flow passage.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 118+ for valves combined with material guides or restrictors in the flow passage which may function to reduce turbulence or splashing.

432 Float surrounds inlet pipe:

This subclass is indented under subclass 430. Apparatus in which the float surrounds the inlet pipe for the fluid the flow of which is controlled by the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

431, for similar arrangements in which the float comprises a spreader or anti-splash means.

433 Float rigid with valve:

This subclass is indented under subclass 430. Apparatus in which the float and valve controlled thereby are rigidly connected together.

434 Float arm operated valve:

This subclass is indented under subclass 409. Apparatus in which the float responding to variations in liquid level is connected to the flow control means by means of a rod or arm which is pivoted at an end thereof and the arm turns about the pivot during operation.

SEE OR SEARCH CLASS:

4, Baths, Closets, Sinks, and Spittoons, appropriate subclasses for water closet tanks and bowls with float controlled valves.

222, Dispensing, subclasses 64+ for dispensers with float arm operated valves.

251, Valves and Valve Actuation, subclasses 213+ for mechanical movement valve actuators, especially subclasses 231+ for lever type mechanical movements.

435 With valve retarder or cushion means:

This subclass is indented under subclass 434. Apparatus which includes in addition to the float mechanism, means to retard or cushion the rate of closing or opening of the flow controlling valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

470, for line pressure responsive valves which have a reactor component tending to close them as soon as they open.

624.11+, for a time controlled valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 12+ for fluid retarded valves, subclass 64 for valves with nonfluid retarders, and subclasses 118+ for valves with material guides or restrictors which retard the operation of a valve to which they are connected.

436 With flow guide or restrictor:

This subclass is indented under subclass 434. Apparatus including means to restrict or act as a guide for the flow of liquid to or from the valve controlled by the float.

(1) Note. Many of these restrictors have the effect of silencing the fluid flow.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 117 and 118+ for other valves combined with flow guides or restrictors, and see the search notes to subclass 118.

437 External hood or deflector or annular outlet surrounding the inlet pipe:

This subclass is indented under subclass 436. Apparatus in which the restrictor or flow guide is an external hood or deflector or annular outlet surrounding the inlet pipe.

SEE OR SEARCH THIS CLASS, SUBCLASS:

431, and 432, for floats surrounding the flow pipe and acting as spreaders or deflectors.

438 Movable nozzle or inlet terminal:

This subclass is indented under subclass 434. Apparatus wherein the float means moves the nozzle or inlet terminal for controlling the flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

578, for float supported movable outlet elements.

592, for internally extending inlet pipes in distribution systems, and see the search notes thereto.

615+, for articulated or swinging flow conduits in distribution systems, and see the search notes to subclass 615.

439 Valve removable from outside container:
This subclass is indented under subclass 434. Apparatus in which the valve controlled by the float is removable from outside the container holding the liquid accumulation.

(1) Note. In the arrangements classifiable in this subclass the valve is usually removable for replacement or repair purposes, the float means and linkage remaining in the tank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

326, for a fluid handling system with repair, tapping, or assembly means to extract a foot valve from top of an enclosure.

440 With U-shaped inlet pipe having terminal valve:

This subclass is indented under subclass 434. Apparatus in which the inlet pipe is reversed upon itself in substantially a "U" shape and is provided with the float operated valve on the terminal thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

123+, for siphons.
215+, for back flow prevention in flow lines of inverted U shape which are not primarily intended to operate as siphons.
442+, for other inlet terminal float arm operated valves.
591, for tanks having internally extending flow pipes of inverted U shape.

441 With refill pipe:
This subclass is indented under subclass 434. Apparatus which includes a pipe carrying a part of the flow through the float arm controlled valve out of the tank holding the liquid accumulation the level of which controls the float.

(1) Note. Many of the patents in this subclass are for refilling a toilet trap.

SEE OR SEARCH THIS CLASS, SUBCLASS:

561+, for distribution systems involving branch flow, especially subclasses 608+ for those having a single inlet and plural outlets.

SEE OR SEARCH CLASS:

4, Baths, Closets, Sinks, and Spittoons, subclasses 300+ for water closets of the tank type.

442 Assembly mounted on and having reciprocating valve element coaxial with inlet pipe:

This subclass is indented under subclass 434. Apparatus in which the float arm, the valve operated thereby and the connections therebetween comprise an assembly which is mounted on the inlet pipe and in which the valve element reciprocates co-axially with respect to the inlet pipe.

SEE OR SEARCH THIS CLASS, SUBCLASS:

440, for U-shaped inlet pipes having terminal valves of this type.
592, for distribution systems having internally extending inlet pipes, and see the search notes thereto.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 147 for valve mountings of the terminal type, and subclasses 318+ for reciprocating valves of this class, and see the search notes thereto.

443 Horizontal or side entering pipe:

This subclass is indented under subclass 442. Apparatus in which the inlet pipe is horizontal or enters the tank holding the liquid accumulation laterally.

444 Vertical inlet riser:

This subclass is indented under subclass 442. Apparatus in which the inlet pipe is vertical and enters the tank holding the liquid accumulation from the bottom thereof.

- 445 With toggle or second lever connected to valve:**
This subclass is indented under subclass 434. Apparatus in which there is a second lever or toggle connecting the float arm with the valve controlled thereby.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 75 for valve actuators of the toggle or snap acting type, and subclasses 279+ for valve actuators comprising linkage.
- 446 With interposed cam, gear or threaded connection:**
This subclass is indented under subclass 434. Apparatus in which the connection between the float arm and the valve controlled thereby comprises a cam or gear or a screw thread type mechanical motion.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
447, for a rotary valve element screw threaded to the float arm, no motion of the valve relative to the valve casing resulting from the screw arrangement.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 213+ for mechanical movement valve actuators.
- 447 Rotary valve element:**
This subclass is indented under subclass 434. Apparatus including a valve which rotates on its axis to control the valve part or parts and is connected to the float arm for operation thereby.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
446, for valves which rotate only as a means to secure longitudinal valving motion of the valve as by a screw type mechanical movement.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 304+ for rotary valves, per se.
- 448 Pivoted valve:**
This subclass is indented under subclass 434. Apparatus in which the valve controlled by the float arm is pivoted to swing about an axis for controlling the fluid flow.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 84 for valve heads which are movably connected to their stem or actuator for accommodation to their seats, and subclasses 298+ for pivoted valves.
- 449 Ball valves:**
This subclass is indented under subclass 434. Apparatus in which the valve controlled by the float arm is spherical in shape.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
539+, for spring biased ball valves which yield to direct pressure, e.g., check or safety valves.
- 450 Balanced valves:**
This subclass is indented under subclass 434. Apparatus in which the valve controlled by the float arm is designed in such a manner that fluid pressure is exerted on opposing surfaces of the valve so that the forces acting on the valve as a result of flow or pressure in the line are neutralized or balanced, and thus a smaller force is necessary to actuate the valve.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclass 281 for balanced valves with or without actuators therefor, and see the search notes thereto.
- 451 Flexible valve:**
This subclass is indented under subclass 434. Apparatus in which the valve controlled by the float arm is made of or includes material which flexes during the closing action.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
525, for resilient material valves of the line condition responsive type.
793+, for diaphragms, per se, some of which constitute valve elements, and see the search notes to subclass 793.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 490 for dispenser outlets comprising slitted resilient diaphragms or nipples, and see the search notes thereto.
- 251, Valves and Valve Actuation, subclasses 4+ for valves comprising flexible tubes and collapsing means therefor.

453 Barometric:

This subclass is indented under subclass 386. Apparatus in which atmospheric pressure is utilized for maintaining a liquid level by balancing such pressure against a hydrostatic head.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 81, for apparatus intended to exercise a control of fluid flow in response to variations in atmospheric pressure.
- 261, for replenishment of liquid in a plurality of battery or electrolytic cells by barometric supply.
- 571+, for plural tanks or compartments connected for serial flow, and see the search notes to subclass 571.

SEE OR SEARCH CLASS:

- 62, Refrigeration, subclass 397 for a withdrawable liquid cooler with a barometric feed type container.
- 222, Dispensing, subclasses 437 and 457 for dispensers comprising a barometric trap chamber, and see the search notes to subclass 457.

454 With shut-off between supply tank and receiver:

This subclass is indented under subclass 453. Apparatus which includes means for closing the fluid connection between a supply container and a receiving vessel.

- (1) Note. Many of the devices classified in this subclass are provided with cut-offs which close where the connection between the supply and receiver is disassembled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 320+, for attached flow devices for tapping a source under pressure where the attachment comprises or carries means for opening a valve in the source container, which valve has no other actuator.
- 614.02+,614.05, for separable, valved, flow path sections wherein at least one of the valves is operated by the act of joining or disconnecting the sections.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 335, 336, 348+, and 351+ for a valved joint between a supply and a receiver, the valve being operated by the act of connecting or disconnecting them.
- 222, Dispensing, subclass 165 for dispensers which have the supply container removable for refilling, and subclasses 437 and 457 for barometric type trap chamber dispensers and see the search notes to subclass 457.
- 251, Valves and Valve Actuation, subclasses 89.5 and 149+ for valved pipe joints wherein the valve is operated by the coupling act.

454.2 REMOVABLE VALVE HEAD AND SEAT UNIT:

This subclass is indented under the class definition. Devices comprising one or more valve heads and their cooperating seats, with or without actuating means, formed in a sleeve, bonnet or similar structural unit which is removable as such from a valve body or housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 223+, particularly subclass 234.5 for inflatable article valves having a removable core unit provided with a head and seat.
- 283+, for removable units in hydrant valves.
- 315.13, for a fluid handling system with assembling, disassembling, mounting, or removing a domestic faucet having a unitized valve head and seat.

- 493.1+, 512.2 and 614.19, for one valve head and seat carried by, and therefore removable with, another valve head.
- 515+, for removable head and seat units in valve couplings or unions.
- 525.1, for combined lip-like heads and seats.

454.4 Pump type:

This subclass is indented under subclass 454.2. Devices which are designed to be used as inlet or outlet valves, or both, of fluid compressors or pumps.

SEE OR SEARCH CLASS:

- 417, Pumps, subclass 454 for an expandible chamber type pump having means for facilitating assembly or disassembly of a pump valve to or from the pump.

454.5 Threaded into valve casing:

This subclass is indented under subclass 454.2. Devices in which the seat carrying portion is threadably secured in the valve casing.

454.6 Retained by bonnet or closure:

This subclass is indented under subclass 454.2. Devices in which the unit is retained in position by a valve bonnet or access-opening closure.

455 LINE CONDITION CHANGE RESPONSIVE VALVES:

This subclass is indented under the class definition. Apparatus in which a valve is controlled in response to a change in the fluid condition, occurring within the system or line including the valve, which change has not been effected by external means for the express purpose of controlling the operation of the valve.

- (1) Note. The ultimate function of these devices is to control the flow by its own characteristics. Where the ultimate purpose of the system goes beyond this field, classification is in the subclass appropriate to the system, even though one or more line condition change responsive valves are included in it. For example, a closed circulating distribution system is classified in subclasses 563+ even if it has check valves in one of more flow passages.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 38+, for gravity or inertia operated flow controllers.
- 47+, for speed responsive valve control, and see the search notes to subclass 47.
- 59+, for freeze condition responsive valves.
- 67+, for fusible, frangible or soluble flow controllers.
- 78+, for atmospheric condition change responsive valves.
- 154+, for condition change responsive valves in diverse fluid containing pressure systems.
- 220, for condition responsive valves of the large streamlined co-axial needle type used in hydraulic engineering, i.e., Lerner-Johnson.
- 386+, for liquid level responsive or maintaining systems.

SEE OR SEARCH CLASS:

- 181, Acoustics, subclasses 212 and 237 for general fluid conducting and pressure relief valves.
- 222, Dispensing, subclasses 491+ for dispenser outlet valves operated by pressure of the material, and see the search notes thereto.
- 251, Valves and Valve Actuation, subclasses 15+ for flush type valves the closing of which is delayed by means of a pressure chamber in the line, and subclasses 25+ for fluid pressure pilot or servo operation of a valve.

456 Safety cut-off requiring reset:

This subclass is indented under subclass 455. Apparatus in which a valve closes in response to a change in internal condition of the line fluid but does not open when the line condition returns to its previous state, the necessary reopening or resetting operation being performed by an external operator, usually manually.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 50, and 57, for excess speed responsive cut-offs.

- 65+, for fuel safety cut-offs responsive to combustion failure in a burner.
- 405, for oil burner fuel overflow preventing safety cut-offs.
- 467, for line condition change opened valves which require resetting.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coating Means, subclasses 198+ for cut-off valves operated by means responsive to level in a receptacle being filled, said means not including mere increase in line pressure.
- 251, Valves and Valve Actuation, subclasses 15+ for valves which are opened by manual or mechanical means and closed by line fluid reaction after a predetermined flow period.

457 Thermal:

This subclass is indented under subclass 456. Apparatus in which the valve is closed in response to a change in temperature in the line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 59+, for freeze condition responsive valves.
- 65+, for fuel safety cut-offs responsive to combustion failure in a burner.
- 72+, for flow control devices which includes a heat fusible or destructible element for sensing the thermal condition.
- 79+, for valves controlled in response to variations in atmospheric temperature.
- 468, for valves operated in response to changes in thermal condition in the line but not requiring reset, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 236, Automatic Temperature and Humidity Regulation, appropriate subclasses, especially subclass 21 for safety cut-outs and subclass 89 for motor safety cut-outs in automatic temperature regulation.

458 Responsive to both high and low pressure or velocity:

This subclass is indented under subclass 456. Apparatus in which the valve member is provided with a means to close the valve in response to a predetermined low pressure or velocity of line fluid at a point in the line, and also with means to close the valve in response to a predetermined high internal pressure or velocity occurring in the line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 180, for diverse fluid containing pressure systems in which a liquid drain is provided responsive to abnormal pressures.
- 493+, for bi-directional flow responsive valves.

459 Responsive to change in rate of flow:

This subclass is indented under subclass 456. Apparatus which includes a mechanism which senses and is responsive to variations in the velocity of the fluid flowing through the line.

- (1) Note. This subclass includes apparatus in which the sensing means is inherently responsive to fluid velocity regardless of how the sensing means is described or claimed by the inventor.
- (2) Note. If a device is described as flow responsive but is equally responsive to static pressure, it is classified on the latter basis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 483, for suction flow governors with reactors sensing changes in flow or pressure differential in the line.
- 486, for pilot or servo controlled valves which sense changes in flow or pressure differential in the line.
- 497, for valves having a separate fluid reactor surface which responds to changes in flow or pressure differential in the line.

460 Excessive flow cut-off:

This subclass is indented under subclass 459. Apparatus in which the valve closes in response to an increased velocity beyond a predetermined value.

- (1) Note. Many of the patents classified in this subclass close in response to excess velocity occasioned by a break in the line beyond the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 57, for excess speed responsive valve control, and see the search notes thereto.
498, for valves having separate reactor surfaces and closing in response to excess velocity but not requiring reset.

461 High pressure cut-off:

This subclass is indented under subclass 456. Apparatus in which the valve is closed in response to an increase in pressure beyond a maximum.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 505+, for line condition responsive valves which have separate connected reactor surfaces and are biased open.
517+, for line condition responsive valves of the direct acting type which are biased open.

462 Reset by pressure equalization valve or bypass:

This subclass is indented under subclass 456. Apparatus in which the valve is reopened or reset by use of by-passes and/or valves which equalize the pressure on both sides of the main or cut-off valve, thereby permitting or causing the cut-off valve to open by fluid pressure alone.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 599.01 through 601.21, for systems dividing into parallel flow lines then recombining.
629+, for plural valve organizations of the pressure equalization type.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 281+ for balanced valves of general utility, and see the search notes thereto.

463 Fluid released trip:

This subclass is indented under subclass 456. Apparatus in which the valve is biased toward the closed or cut-off condition but is restrained from closing by a latch or similar means, which latch will release the valve for closing in response to a change in fluid condition within the apparatus.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 73 for fluid pressure trip actuation wherein the source of fluid for actuating the trip is not necessarily the line which is controlled, and see the search notes thereto.

464 Fluid counter-biased or unseated valve:

This subclass is indented under subclass 456. Apparatus in which the valve is urged or biased, as by gravity or a spring means, toward a closed or cut-off position and this bias is opposed by the fluid pressure within the apparatus, a lowering in the fluid pressure permitting the valve to seat or close, the arrangement being such that the valve does not return to open position on subsequent increase of fluid pressure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 511+, especially subclasses 522 to 543 for direct response valves opened by line flow and biased to closed position, where the valve shifts freely to and from closed position on change of fluid pressure condition.

465 With mechanical stop against reopening:

This subclass is indented under subclass 464. Apparatus including a mechanical means which prevents the valve from reopening after seating or closing in the event the fluid pressure is reestablished.

- (1) Note. In the valves classified herein the resetting operation must include the

removal of the mechanical means from the stop position.

- (2) Note. Magnetic detent is included herein.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

522+, for direct response valves with external means for opposing the bias.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 89+ for means for blocking or disabling an actuator for a valve which is not condition responsive.

466 With fluid pressure seating of valve:

This subclass is indented under subclass 464. Apparatus in which the incoming pressure urges the cut-off valve toward its seat or holds it closed after the valve has closed in response to the decrease in pressure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

462, for this type of safety cut-off valves including pressure equalization valves or by-passes or venting valves for resetting the valve.

467 Fluid opened valve requiring reset:

This subclass is indented under subclass 455. Apparatus in which a valve opens in response to a change in internal fluid condition and will not return to its closed operative position on removal of the change in condition until a closing or resetting of the valve and/or a trip device is performed by an external operator, usually manually.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

62, for valve in which the valve is opened in response to a freeze condition and remains open until reset.

456+, for valves which close in response to condition change and require resetting, and see the search notes to subclass 456.

467.5 Consistency responsive:

This subclass is indented under subclass 455. Apparatus which responds to a change in consistency of the fluent material in the line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

2+, for processes of this type.

92, for similar sensing means in mixture control.

109+, particularly subclasses 115.01+ and 118.01+, for line consistency responsive control in a system which includes a constant level overflow.

468 Thermal responsive:

This subclass is indented under subclass 455. Apparatus within ... in which a valve is controlled in response to a change in the thermal condition of the fluid within the apparatus.

- (1) Note. This subclass includes devices which sense changes in thermal conditions of the fluid and exercise a compensating effect so as to neutralize any effect the change in thermal condition of the fluid would otherwise have on the operation of the device.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

6, for processes of mixing controlled by heat of combustion of the mixture.

59+, for freeze condition responsive controls.

65+, for fuel safety cut-offs responsive to combustion failure.

72+, for similar apparatus which includes a heat fusible or destructible element for sensing the thermal condition.

79+, for valves controlled in response to variations in atmospheric temperature.

90, 118 and other appropriate subclasses of this group for self-proportioning systems having temperature responsive or maintaining aspects.

334+, for systems involving heating, heat exchange and cooling, and see the search notes to subclass 334.

457, for safety cut-off valves which respond to temperature changes in the line and require external reset.

SEE OR SEARCH CLASS:

236, Automatic Temperature and Humidity Regulation, appropriate subclasses for thermally controlled valves, per se, especially subclasses 53 through 60 for temperature responsive liquid separating traps.

469 Pop valves:

This subclass is indented under subclass 455. Valves which are biased closed and are forced open by fluid pressure, the fluid flowing through the valve after the initial opening movement thereof acting on an auxiliary reactor surface to affect the valve opening and/or closing motion.

- (1) Note. The auxiliary reactor surface may be either (a) a surface configuration of the valve sensitive to fluid flow, (b) a distinct surface affected by fluid which has passed through the valve or (c) a distinct surface located upstream of the relieved fluid flow and affected by the pressure condition created by the flow.
- (2) Note. Pop relief valves are classified in this and indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

494+, for condition responsive valves in which the initial opening movement of the valve is caused or assisted by pressure on a separate but connected reactor surface.

511+, for condition responsive valves of the check valve type, i.e., directly responsive.

470 Pop closing valves:

This subclass is indented under subclass 469. Valves in which the auxiliary reactor surface aids in valve closing.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 15+ for valves opened by external means with compulsory cut-off after a flow period by the effect of the flowing liquid on an auxiliary surface, and subclasses 48+ for valve

actuators with dashpot or fluid controlled retarders or timers.

471 Pop pressure reactor in inflow to valve:

This subclass is indented under subclass 469. Valves in which the reactor is in the inlet to the valve seat.

472 Pop pressure reactor in branched released path:

This subclass is indented under subclass 469. Valves in which the fluid is released in a plurality of paths, the reactor surfaces being located in one or more of the branches.

473 Separate relief valves or valves for each branch:

This subclass is indented under subclass 472. Valves in which the flow in each path is initiated or controlled by a separate valve or valve area, at least one of which is of the pop reactor and/or huddling chamber type.

474 Lost motion between pop pressure reactor and valve:

This subclass is indented under subclass 469. Valves in which the reactor moves relative to the valve parts and is capable of motion in some part of its range without causing movement of the valve.

- (1) Note. The movable reactor usually imparts a "hammer blow" to free the valve parts.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 76 for impact type valve actuators of general application, and see the search notes thereto, and subclasses 77+ for valves with lost motion between actuator and valve, and see the search notes to subclass 77.

475 Adjustable choke:

This subclass is indented under subclass 469. Valves in which the flow path giving access to the auxiliary reactor is controlled by an adjustable choke.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 118+ for flow restrictors or chokes in combination with valves of

general application, especially subclass 121 for the adjustable type; and see the search notes to subclass 119.

476 Annular lip or baffle:

This subclass is indented under subclass 475. Valves in which the adjustable member is an annular lip or baffle concentric with the valve inlet passage.

477 On movable valve part:

This subclass is indented under subclass 476. Valves in which the annular adjustable lip is on a movable valve part.

478 Screw threaded:

This subclass is indented under subclass 476. Valves in which the annular adjustable lip is screw threaded for axial adjustment along the valve inlet passage.

479 Combustion engine induction type:

This subclass is indented under subclass 455. Apparatus comprising governor valves or induction controlled inlets associated with internal combustion engines, in which a valve responds to a pressure differential proportional to changes to an outlet at sub-atmospheric pressure, i.e., the induction manifold of the engine.

SEE OR SEARCH THIS CLASS, SUBCLASS:

494+, for reactor surface controlled valves of this type controlled by super-atmospheric pressure rather than sub-atmospheric pressure.

511+, for condition responsive valves of the direct response type, especially subclasses 517+ for direct response valves which are biased open and subclass 526 for vacuum relief type, and see the search notes to subclass 517.

480 Valve in auxiliary inlet to induction line:

This subclass is indented under subclass 479. Apparatus in which the valve controlled is a second or auxiliary inlet to the line-carrying the suction induced flow.

- (1) Note. Many of patents classified in this subclass include valves for supplying additional fuel, air or other fluid to the flow through the intake passage of an internal combustion engine.

SEE OR SEARCH THIS CLASS, SUBCLASS:

111+, for self-correlating branched flow systems having plural inflows, especially subclass 114 for those in which one flow supplements another.

481 With manual modifier:

This subclass is indented under subclass 479. Apparatus which includes a manual means which modifies the action of the valve responsive to the flow of fluid.

- (1) Note. This does not include devices in which the manual or external means are mere setting or adjusting means. See section 5, of the class definition for search notes on manual actuation, resetting and adjustment of valves and valve actuators.

- (2) Note. See the class definition, section 3 for search notes on plural actuators including at least one automatic actuator and section 4, for plural valves and plural nonautomatic actuators.

482 With suction compensator:

This subclass is indented under subclass 479. Apparatus which includes means to compensate for atmospheric pressure differential in addition to flow responsive means within the flow line.

- (1) Note. The valves are usually an unbalanced butterfly with a pressure reactor in the wall of the flow line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

81, for system control responsive to changes in atmospheric pressure.

111+, for self-controlled branched flow systems having plural inflows.

484, for unbalanced butterfly valves without suction compensation means.

483 With separate reactor surface:

This subclass is indented under subclass 479. Apparatus which includes a separate reactor surface which is responsive to the pressure differential between the interior and exterior of the inlet manifold.

- (1) Note. See notes to subclass 494 for definition of "separate reactor surface".

SEE OR SEARCH THIS CLASS, SUB-CLASS:

494+, for condition responsive reactor surface controlled valves of general utility. See (1 Note).

484 Unbalanced pivoted valve (e.g., unbalanced butterfly type):

This subclass is indented under subclass 479. Apparatus in which a biased valve having at least a flat center area is mounted in the fluid flow path and moves about a pivot located between its edges, said valve having a dynamic unbalance to fluid flow causing a torque which proportionally governs the position of the valve.

- (1) Note. This subject matter comprises some modification of or addition to the conventional butterfly valve mounted at its center, designed to control or extend its quality of unbalance throughout its range of movement.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

482, for similar valves with means for compensating for atmospheric pressure differential.

484.2 Line flow effect assisted:

This subclass is indented under subclass 455. Devices in which the valve controlling forces are altered by a force resulting from a fluid pressure derived for variations in the flow of fluid in the line acting on a reactor surface other than the valve head.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 24 for similar structure in valves not responsive to line condition.

484.4 Reactor surface normal to flow:

This subclass is indented under subclass 484.2. Devices in which the reactor surface is normal to the line flow of fluid and is in a chamber offset from co-axial inlet and outlet flow ports so that the reactor movement is parallel to the line flow.

484.6 Reactor surface separated from flow by apertured partition:

This subclass is indented under subclass 484.2. Devices in which the reactor surface is in a chamber distinct from the outlet chamber and in direct fluid communication therewith by means of an aperture through a partition or wall through the chambers.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

505.26+, for similar structure in reactor surface operated valves unassisted by additional line flow effect.

484.8 Through separate aperture:

This subclass is indented under subclass 484.6. Devices having an additional aperture for the accommodation of the valve stem.

485 Pilot or servo controlled:

This subclass is indented under subclass 455. Apparatus within ... in which the means sensing a change in fluid condition within the apparatus controls the application of another source of power for operating the flow control valve rather than acting directly through a mechanical connection.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for fluid servo-motors for nonautomatic valve operation, and see the search notes to subclass 25.

486 Responsive to change in rate of fluid flow:

This subclass is indented under subclass 485. Apparatus in which the valve is operated in response to the sensing of the velocity of the fluid flow or to the pressure differential along the flow line under flow condition.

- (1) Note. This sensing may occur after the valve opens in response to line pressure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

458, and 459+, for flow responsive valves of the safety cut-off type.

483, for suction flow governor valves of the combustion engine type with a reactor responsive to flow or pressure differential along the line.

497+, for valves with separate connected fluid reactor surface sensing flow either directly or by determining pressure differential or drop along the line.

487 Control by pressures across flow line valve:
This subclass is indented under subclass 486. Apparatus in which the flow pressure drop across the flow line valve is used to control the flow line valve pilot or servo system.

(1) Note. The main line valve serves as a variable flow line restrictor for deriving a pressure difference proportional to rate of flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

503, for similar flow responsive means in line condition responsive valves having a reactor surface.

487.5 Electrically actuated valve:
This subclass is indented under subclass 485. Devices in which the valve is electrically actuated.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 129+ for electrically actuated valves.

488 Fluid pressure type:
This subclass is indented under subclass 485. Apparatus in which the means sensing a change in fluid condition controls the effectiveness of a fluid pressure which is employed for controlling the operation of the flow controlling valve.

(1) Note. The source of fluid pressure for operating the flow controlling valve may be external or may be the main flow line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

105, for suction operated pilot controlled valves where the pilot valve is itself responsive to line suction. These are mainly milker pulsators.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for fluid pressure servo type valve actuators which are operated by external means or do not include means sensing a change in fluid condition, and see the search notes to subclass 25.

489 Choked or throttled pressure type:
This subclass is indented under subclass 488. Apparatus which includes a pressure chamber having both a valved passage and an unvalved passage for ingress and egress of fluid, the relative sizes of the passages being such that a different pressure may be maintained in the chamber when the valve passage is open than is the case when it is closed.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 33+ for choked or throttled pressure type servo actuated valves which do not include means sensing a change in fluid condition in the line, and see the search notes to subclass 33.

489.3 Loose fitting piston:
This subclass is indented under subclass 489. Devices in which the unvalved passage is between the piston and the cylinder walls.

489.5 Pilot controls supply to pressure chamber:
This subclass is indented under subclass 489. Devices in which the valved passage is so positioned that the pilot valve controls the ingress of the pressure fluid to the pressure chamber.

490 Pilot valve within main valve head:
This subclass is indented under subclass 489. Apparatus in which the valve controlling the servo fluid pressure is physically located within the main or flow controlling valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 38 for this subject matter wherein the valve actuation is not responsive to line condition.

- 491 Choked passage through main valve head:**
This subclass is indented under subclass 489. Apparatus in which the restricted and unvalved passage passes through the main or flow controlling valve.
- 492 Single acting fluid servo:**
This subclass is indented under subclass 488. Apparatus in which the fluid pressure servomotor operates the flow controlling valve in one direction only, the valve being operated the other direction by a constantly acting pressure or bias.
- 492.5 Spring biased:**
This subclass is indented under subclass 492. Devices in which the constantly acting pressure or bias is a spring.
- 493 Bi-directional flow valves:**
This subclass is indented under subclass 455. Apparatus in which a valve means opens in response to excess pressure over a selected maximum and also opens in response to pressure below a selected minimum, usually to admit atmospheric air, or opens in response to a pressure applied to either side of the valve means.
- (1) Note. The valve means may comprise a simple valve to relieve both pressure and vacuum or reverse pressure or the combination of both a valve for relieving high pressure and a valve for relieving a vacuum, or pressure on the opposite side.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
180, for diverse fluid containing pressure systems having a discriminating and an abnormal pressure responsive liquid outlet.
226, for tire inflation stems and/or chucks having plural pressure responsive valves arranged on a common axis, one opening to admit inflation fluid under pressure and the other opening to relieve excess pressure in the chuck, stem or tire.
458, for safety cut-off valves requiring reset which are responsive to both high and low pressures or velocities.
- 512+, for other plural direct response valves, especially subclass 513 for those mechanically interconnected.
- 493.1 One head and seat carried by head of another:**
This subclass is indented under subclass 493. Apparatus wherein one valve head carries the head and seat of a second valve.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
512.2, for other plural direct response valves having this relationship.
599.16 through 599.18, for systems dividing into parallel flow lines then recombining where the valve flow control member has a valve or valve member.
614.17, for similar structure in serial flow valves.
- 493.2 Supporting valve only spring biased:**
This subclass is indented under subclass 493.1. Apparatus wherein only the carrying valve is provided with spring biasing means.
- 493.3 Supporting valve spring carried by supporting valve:**
This subclass is indented under subclass 493.1. Apparatus wherein the spring for the carried valve is mounted on the supporting valve.
- 493.4 Spring stop on supported valve stem:**
This subclass is indented under subclass 493.3. Apparatus wherein the spring of the carried valve abuts a stop (e.g., a collar) on the carried valve stem.
- 493.5 Spring abuts guide for supported valve stem:**
This subclass is indented under subclass 493.3. Apparatus wherein the spring of the carried valve abuts the guide for the stem of the carried valve.
- 493.6 Both valves spring biased:**
This subclass is indented under subclass 493.1. Apparatus wherein both the carried and carrying valves are spring biased.
- 493.7 Axes of ports perpendicular:**
This subclass is indented under subclass 493. Apparatus wherein the axis of one valve port is perpendicular to the axis of the second valve

port. Port as used herein is the inlet or outlet provided with the valve seat.

493.8 Axes of ports parallel:

This subclass is indented under subclass 493. Apparatus wherein the axis of one valve port is parallel to the axis of the second valve port. See the definition of valve port under subclass 493.7.

493.9 Axes of ports co-axial:

This subclass is indented under subclass 493. Apparatus wherein the axis of one valve port is co-axial with that of the second valve port.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

493.1, for coaxial ports where one valve assembly is carried by the head of another.

494 With separate connected fluid reactor surface:

This subclass is indented under subclass 455. Apparatus in which a flow controlling valve is connected to a separate movable nonvalving surface so as to be operated thereby, the fluid flowing in the apparatus and being controlled by the valve reacting on said surface, which moves in response to variations in fluid condition in the apparatus, the motion being transmitted to the valve.

- (1) Note. The separate reactor surface may be integral with the valving surface, as for example, in a valve with a surface greater than that necessary to provide its valving function, where the excess surface is subject to the pressure of the flowing material and acts as a reactor surface to operate or to assist in the operation of the valve.
- (2) Note. Surfaces which are subject to the line fluid for the purpose of retarding the operation of a valve (e.g., dashpots) are not treated as separate reactor surfaces. See search notes below to subclass 514.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

458, for safety cut-off valves requiring reset which are responsive to both high and low pressure or velocity.

461, for safety cut-off valves requiring reset which are beyond a maximum.

469+, for pop valves in which the initial flow of fluid after opening in response to fluid pressure reacts against a surface to effect the further opening or the closing operation.

479+, for governor valves which respond proportionally to induction pressures in internal combustion engines.

511+, for valves which respond to variations in fluid conditions acting directly on the valves, per se, especially subclass 513 for plural direct responsive valves mechanically connected, in which one valve may have an actuating effect on another, and subclass 514 for line condition direct responsive valves having dashpots using line fluid.

613+, for distribution systems comprising plural valves arranged in series in the flow line wherein manual or external means operate one valve which causes a change in the condition in the flow line in order to utilize such changed condition to effect automatic operation of the other valve in the flow line, i.e., for systems not primarily condition change responsive, which involve such response means incidentally.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 15+ for valves which are closed by fluid flow reacting means after an interval having been opened by other external means.

495 With manual or external control for line valve:

This subclass is indented under subclass 494. Apparatus which include in addition to the fluid actuated reactor surface, a manual or other external means for operating or for causing the operation of the same valve.

- (1) Note. Modifiers, which merely vary the loading or response of the reactor surface, are not deemed to constitute manual or other external means within this definition. For such modifiers search should be made in the subclass receiving the particular type of fluid actuator. See the class definition, section 3 for search

notes on plural actuators including at least one automatic actuator and section 5 for search notes on manual actuators and adjusting and resetting devices.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 115.01+, for systems having a valve controlled surge relief by-pass operated by a means to sense a change in pressure (surge) in the main flow line such as may be caused by the operation of a controlling valve.
- 481, for suction controlled valves which are manually modified or adjusted.
- 522+, for direct response valves in combination with external means for opposing the closing bias.
- 613+, for systems comprising plural valves arranged in series in the flow line wherein manual or external means operate one valve to produce a change in the condition in the flow line in order to utilize such changed condition to effect automatic operation of the other valve in the flow line.

496 Valve closes in responses to reverse flow:

This subclass is indented under subclass 494. Apparatus in which the flow controlling valve is disclosed or claimed as being closed in response to the reversal of the fluid flow or to its tendency toward reversal.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 106, for self-controlled branched flow systems having reversing valves.
- 198, for reverse flow stops in discriminating outlets for gas in diverse fluid containing pressure systems.
- 215+, for back flow prevention by vacuum breaking, especially subclasses 217+ for valved air vents.
- 239, for cleaning by reversing fluid flow.

497 Responsive to change in rate of fluid flow:

This subclass is indented under subclass 494. Apparatus in which the separate reactive surface which controls the valve is responsive to variations in the rate of flow of fluid through the apparatus or to variations in the pressure differential along the line under flow conditions.

- (1) Note. If a valve is described as flow responsive but is equally responsive to static pressure, it is classified on the latter basis. Typical examples of control means responsive to changes in the rate of fluid flow are: (a) a swinging vane or turbine subject to fluid flow, (b) comparison of the pressures or pressure differences across a fixed choke in the flow line or across the throttle valve which regulates the flow; (c) comparison of the pressures or pressure differences at the throat of a Venturi and at a point upstream or downstream from such throat, (d) a deflector subject to fluid flow and movable in a straight line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 10, for processes of fluid handling control by the speed of the flow.
- 115.03+, for self-controlled branch flow systems in which a by-pass or relief path is controlled by change in rate of main line flow.
- 220, for Larner-Johnson type valves which are condition responsive.
- 459+, for safety cut-offs responsive to changes in rate of flow and which require an external reset.
- 483, for suction flow governor valves of the internal combustion engine type with a reactor responsive to changes in rate of flow or pressure differential along the line as determined under flow conditions.
- 486+, for pilot or servo controlled valves responsive to variations in rate of flow or pressure differential along the line as determined under flow conditions, the pilot valves being the flow responsive member.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 15+ for valves which compulsorily close after a predetermined time or quantity of flow of fluid, which flow was initiated by other means.

498 Valve closes in response to excessive flow:
This subclass is indented under subclass 497. Apparatus in which the flow controlling valve is closed in response to an increase in the rate of flow beyond a predetermined maximum.

- (1) Note. The excessive flow is usually caused by a break in the flow line.
- (2) Note. The control mechanism herein, in addition to acting to close the valve in response to an excessive flow may also provide a pressure regulation in which the valve is moved toward closed position at fluid flows above normal but less than the maximum.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 460, for safety cut-off valves which are responsive to excessive flow and require resetting.
- 499, through 504, for fluid flow regulators in which there is not disclosure that the control valve closes in response to an excessive flow.

499 Turbine or swinging vane type reactor:
This subclass is indented under subclass 497. Apparatus wherein the separate reactor surface is a member pivoted for oscillation or rotation, having blades, vanes or surfaces which are exposed to the fluid flow and rotating or tending to rotate the member.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 47+, for speed responsive governors for valves having, as driving means for the governor, a turbine exposed to the fluid flow in a conduit, in which the turbine is not a prime mover.
- 332, for valves having a nonvalving motion imparted by a turbine on the valve, as for friction reducing or anti-fouling purposes.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 59+ for dispensers having cut-offs operated by rate of flow responsive means.

251, Valves and Valve Actuation, subclasses 15+ for valves which are closed after a flow period by fluid actuated means, and subclasses 48+ for valve retarders or timers of the fluid controlled type.

500 Expansible chamber subject to differential pressures:

This subclass is indented under subclass 497. Apparatus in which the valve is operated by a movable reaction member such as a piston or diaphragm working in an expansible chamber under the influence of two pressures taken at spaced points in the flow line which vary as a function of the rate of fluid flow through the line.

- (1) Note. The movable reaction member mentioned above may be integral with the controlling valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 777+, for expansible chamber devices, per se.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 861.42+ for pressure differential type meters.

501 Pressures across fixed choke:

This subclass is indented under subclass 500. Apparatus in which the pressures to which the movable reaction member is subject are taken on opposite sides of a fixed choke or flow restrictor placed in the flow line.

- (1) Note. The fixed choke or flow restrictor may be adjustable, either manually or by a condition unrelated to flow in the line.

502 With Venturi tube having a connection to throat:

This subclass is indented under subclass 500. Apparatus in which the pressures to which the movable reaction member is subject are taken at the throat of a Venturi placed in the flow line and at another point upstream or downstream of said throat.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

219+, for Larner-Johnson hydraulic valves, which are located at a point of line restriction.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 861.63+ for meters of the Venturi type.

251, Valves and Valve Actuation, subclass 24 for fluid actuated or retarded valves with Venturi assisting means, and subclasses 123+ for a valve located at a point of restriction in the line.

503 Pressures across flow line valve:

This subclass is indented under subclass 500. Apparatus in which the pressures to which the movable reaction member is subject are taken on opposite sides of the throttle valve which is operated by the reaction member and which valve regulates the fluid flow.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

487, for pilot or servo-controlled line condition responsive valves in which control is by differential pressures across the flow line valve.

504 Movable deflector or choke:

This subclass is indented under subclass 497. Apparatus in which the separate reactive surface which controls the valve includes a choke, restriction, or deflector, in the fluid flow line and subject to the flow of fluid, such choke, restriction, or deflector being mounted as to be moved by the fluid proportionally to the rate of fluid flow.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 40+ for flow restrictors in pipes, especially subclasses 43, 45 and 46 for variable restrictors.

251, Valves and Valve Actuation, subclasses 120+ for movable or resilient guides or deflectors combined with valves.

505 With opening bias (e.g., pressure regulator):

This subclass is indented under subclass 494. Apparatus in which the flow controlling valve is biased toward an open position and a change in fluid condition tends to close the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

224+, for pressure regulators of the tire inflation type.

479+, for biased open valves responsive to pressure differential caused by suction in a combustion engine flow line.

517+, for biased open valves responsive to variations of the fluid pressure acting directly on the valves, and see the search notes to subclass 517.

505.11 With relief valve:

This subclass is indented under subclass 505. Devices having a port leading from the low pressure side of the valve to waste and controlled by a normally closed pressure responsive valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

102, for correlated supply and exhaust valves.

116.3+, for correlated supply and by-pass or relief valves.

505.12 Multi-stage:

This subclass is indented under subclass 505. Devices in series with another line pressure responsive valve to produce plural stage reduction.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

512+, for plural serial direct response, reducing valves.

505.13 Senses inlet pressure:

This subclass is indented under subclass 505. Devices in which the fluid reactor surface, in communication with tie inlet side of the valve, responds to changes in inlet fluid pressure.

505.14 Bias variable during operation:

This subclass is indented under subclass 505. Devices with means for automatically varying the opening bias on the valve, so that a varia-

tion of fluid condition through the valve (without closing the valve) may be obtained, (e.g., gas supply regulators which permit a greater flow during the high demand period).

SEE OR SEARCH THIS CLASS, SUBCLASS:

468, for similar devices which vary the bias in response to change in thermal conditions of the fluid.

484.2, for similar devices which vary the bias by variation of flow.

505.15 Ancillary reactor surface responds to inlet pressure:

This subclass is indented under subclass 505.14. Devices in which the bias is varied by an ancillary reactor surface which responds to fluid pressure at the inlet.

505.16 Liquid transfer:

This subclass is indented under subclass 505.14. Devices in which the pressure of the fluid is exerted upon the surface of a liquid free to move in such manner that fluctuations in the pressure of the fluid will transfer the liquid from one receptacle to another or from one portion of a receptacle to another portion thereof, and thereby operate the regulating valve.

505.17 Weight:

This subclass is indented under subclass 505.14. Devices in which the means comprises a weight varied in accordance with the pressure of the line fluid.

505.18 Balanced valve:

This subclass is indented under subclass 505. Devices in which the valve is so related to the fluid controlled that the pressure bias imparted by the line pressure is balanced by means connected to but not forming a portion of the valve itself, so that the effect of line pressure tending to open or close the valve is cancelled out at least in part.

505.19 Liquid level responsive gas flow control:

This subclass is indented under subclass 505. Devices in which the reactor surface is a liquid transferable between plural chambers and in which the valve is actuated by means responsive to the variation of liquid level in one chamber.

505.2 With protective separator:

This subclass is indented under subclass 505. Devices relating to the control of gas or vapor and having a distinct reactor surface chamber and connecting passage to the flow line whereby a liquid seal is provided which prevents line gas or vapor from directly contacting the reactor surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

505.19, for liquid level type reactor surfaces which inherently protect the valve actuator.

505.21 Main flow through isolated reactor chamber:

This subclass is indented under subclass 505. Devices wherein the flow line comprises sequentially, the valve chamber, a flow line or passage distinct from the outlet of the valve chamber, and a remote isolated reactor surface chamber the reactor surface of which is mechanically connected to the valve.

505.22 Through external pipe:

This subclass is indented under subclass 505. Devices in which the pressure fluid is communicated to a chamber enclosing the reactor surface through a pipe external of the chamber.

505.23 Modified valve casing:

This subclass is indented under subclass 505.22. Devices in which the valve casing is modified to receive the external pipe.

505.24 Adjustable external lever:

This subclass is indented under subclass 505.22. Device in which a lever extending out of the casing provides the means of connecting the reactor and valve head, and also provides an adjustable biasing means.

505.25 Apertured reactor surface surrounds flow line:

This subclass is indented under subclass 505. Devices in which the flow line passes through the reactor surface.

505.26 Reactor surface separated by apertured partition:

This subclass is indented under subclass 505. Devices in which the reactor surface is in a chamber distinct from the outlet chamber and in direct fluid communication therewith by means of an aperture through a partition or wall between the chambers.

SEE OR SEARCH THIS CLASS, SUBCLASS:

484.6+, for similar devices, when combined with reactor chamber aspirating means.

505.27 In valve stem:

This subclass is indented under subclass 505.26. Devices in which the passage to the reactor surface chamber is through the valve stem.

505.28 Also through reactor surface:

This subclass is indented under subclass 505.27. Devices in which said passage further extends through the reactor surface so as to apply pressure to the rear of the reactor surface.

505.29 Valve stem passes through the aperture:

This subclass is indented under subclass 505.26. Devices in which the valve stem passes through the communicating aperture.

505.3 Plural reactor surfaces:

This subclass is indented under subclass 505.29. Devices wherein the reactor surface is in the form of an expansible chamber having at least two flexible walls.

505.31 Reactor is an inverted cup having liquid seal:

This subclass is indented under subclass 505.29. Devices wherein the reactor surface is in the form of a bell or inverted cup floating in a liquid which forms a liquid seal for the reactor surface chamber.

505.32 With movement dampener:

This subclass is indented under subclass 505.31. Devices in which the inverted cup has additional members, or is purposefully shaped, to dampen or retard its movement.

505.33 Valve head in inlet chamber:

This subclass is indented under subclass 505.31. Devices in which the valve head is in the inlet chamber.

505.34 Valve head in inlet chamber:

This subclass is indented under subclass 505.29. Devices in which the valve head is in the inlet chamber.

505.35 Rectilinear valve stem rigid with reactor surface:

This subclass is indented under subclass 505.34. Devices in which the valve stem through the aperture is straight and rigidly joins the reactor to the valve which has at least one head in the inlet chamber.

505.36 Reactor surface is diaphragm:

This subclass is indented under subclass 505.26. Devices in which the reactor surface is in the form of a flexible diaphragm.

505.37 With valve closing bias:

This subclass is indented under subclass 505.36. Devices in which the valve head is provided with a bias which opposes the opening bias but is of less strength.

505.38 Reactor surface closes chamber:

This subclass is indented under subclass 505. Devices in which the reactor surface is in the outlet chamber and forms an imperforate wall thereof.

505.39 Valve head in inlet chamber:

This subclass is indented under subclass 505.38. Devices in which the valve head is in the inlet chamber and has a stem, or connector, passing through the valve part and connected with and usually attached to, the reactor surface.

505.4 Reactor surface is inverted cup (float):

This subclass is indented under subclass 505.39. Devices in which the reactor surface is a bell or inverted cup floating in a liquid seal.

505.41 Rectilinear valve stem rigid with reactor surface:

This subclass is indented under subclass 505.39. Devices in which the valve stem comprises a rectilinear rod rigidly connected to the reactor surface.

505.42 With valve closing bias:

This subclass is indented under subclass 505.39. Devices in which the valve is urged towards its seat in opposition to the opening bias.

- (1) Note. The stem is usually not attached to the reactor surface, hence a valve returning force is required when fluid pressure moves the reactor surface from the stem.

505.43 In reactor chamber:

This subclass is indented under subclass 505.42. Devices in which the bias tending to close the valve is located in the reactor surface, or outlet, chamber.

505.44 Valve head on yoke:

This subclass is indented under subclass 505.38. Devices in which the valve head is connected to the reactor surface by a yoke.

505.45 Yoke has valve closing bias:

This subclass is indented under subclass 505.44. Devices wherein the valve is urged toward its seat in opposition to the opening bias by a force of less strength.

505.46 Reactor operatively connected to valve by mechanical movement:

This subclass is indented under subclass 505.38. Devices wherein a mechanical movement is interposed between the fluid pressure reactor and the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

685, for similar mechanical movements, and see the search notes therewith.

505.47 With mechanical movement between actuator and valve:

This subclass is indented under subclass 505. Devices wherein a mechanical movement is interposed between the actuator and the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

685, for similar mechanical movements, and see the search notes therewith.

506 Plural valves biased closed:

This subclass is indented under subclass 494. Apparatus which include a plurality of biased closed valves responsive to variations in fluid condition, at least one of which utilizes a separate connected reactor surface.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

512+, for plural line condition responsive valves of the direct response type.

631+, for cyclic valves or closures and their actuators, and see the search notes to subclass 631.

507 With means for mounting or connecting to system:

This subclass is indented under subclass 494. Apparatus combined with means for mounting the apparatus on or connecting it with the system from which the apparatus derives its fluid.

- (1) Note. Merely naming a conventional coupling such as an internally threaded collar is insufficient for classification in this subclass. There must be a recitation of the relationship of the mounting or connecting means to the system which is the fluid source.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 143+ for mountings or supports for valves, and see the search notes to subclass 143.

508 Valve seat or external sleeve moves to open valve:

This subclass is indented under subclass 494. Apparatus in which the separate reactor surface comprises a movable member in which is located an orifice to be controlled, the closure for which is either fixed with respect to the valve casing, or has movement which is different from or less than the possible movement of the orifice member, whereby the controlled orifice is opened by movement of the orifice member beyond a predetermined point.

- (1) Note. Certain valves included herein have a movable flow passage forming tubular member or sleeve, the end surface of which comprises a seat or passage closing part to control fluid entering the sleeve flow path, and also comprises the surface exposed to and reacting to the fluid pressure. Since these sleeves may or may not have the end surface extended by a flange or diaphragm without changing their other characteristics, all such devices have been classified together herein, regardless of the presence or absence of means to increase the exposed end area.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

511+, for annular type pressure responsive valves which have an annular cooperating seat or flow passage, but which do not meet the requirements of (1) Note as to reactor surface components; i.e., the exposed surface could not be extended by enlarging the casing and increasing the area of the exposed part of the movable member.

509 Valve seating in direction of flow:

This subclass is indented under subclass 494. Apparatus wherein the valve controlling the fluid flow is seated by moving in the direction of flow of the fluid.

510 Flexible diaphragm or bellows reactor:

This subclass is indented under subclass 509. Apparatus in which the reactor includes a member having a flexible wall which is subject to the pressure of the fluid in the line.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

784+, for flexible wall expansible chambers, and see the search notes thereto.

793+, for diaphragms or bellows, per se, and see the search notes thereto.

511 Direct response valves (i.e., check valve type):

This subclass is indented under subclass 455. Valves which are responsive to pressure of the line fluid on the face of the valve disc or plug itself.

- (1) Note. Since they have no other actuator, their movement from a normal or neutral or biased position is caused solely by change in the fluid flow or pressure in the line, and they return to their original position when the original condition is restored.

- (2) Note. Mere check valves are included in this group of subclasses, but a system which is not primarily condition change responsive is not classified herein merely because it includes one or more check valves. Instead, it is placed in a subclass appropriate to the system claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.33, for a check valve (e.g., non-return valve, etc.) with assembling or disassembling means.

508, for valves in which a tubular passage forming member moves in response to pressure of the line fluid and is biased closed, the tubular member having an exposed end comprising a separate reactor surface.

599.18, for systems dividing into parallel flow lines then recombining having a direct response valve (i.e., check valve).

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 490 and 491+ for dispenser outlet elements operated by pressure of the contents.

251, Valves and Valve Actuation, appropriate subclasses for valves which have motor, mechanical, fluid pressure or manual means for opening or closing, but are biased to the other position by springs, weights, internal fluid pressure, etc., particularly. See (1) Note above. See also subclasses 336+ for biased valves, per se, and see the search notes to subclass 336.

512 Plural:

This subclass is indented under subclass 511. Apparatus including more than one valve of the type.

- (1) Note. See the class definition, section 3 for search notes on plural automatic valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 247.17, for plural direct response valves combined with liquid seal means.
506+, for plural line condition responsive valves including at least one valve which has a separate connected fluid reactor surface.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 631+ for cyclic valves and their actuators, and see the search notes to subclass 631.

512.1 Dividing and recombining in a single flow path:

This subclass is indented under subclass 512. Devices in which the valves are arranged in a single flow path and divide the flow into parallel paths which recombine after passing through the valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 516.11, for dividing and recombining effected by plural ports in a seat and a single valve head.
599.11 through 599.15, for systems dividing into parallel flow lines then recombining having a bypass.

512.15 Integral resilient member forms plural valves:

This subclass is indented under subclass 512.1. Valves controlled by an integral resilient member mounted so that portions of the said member provide separate valve heads.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 512.4, for other plural direct response valves provided by an integral resilient member.

512.2 One valve carries head and seat for second valve:

This subclass is indented under subclass 512. Devices in which one of the valves carries the seat for at least one other valve and also serves as the support for the other valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 493.1, for bi-directional flow valves of this type.
599.16 through 599.18, for systems dividing into parallel flow lines then recombining where the valve flow control member having a valve or valve member.

512.3 Diverse types:

This subclass is indented under subclass 512. Devices in which the valves are of different types, e.g., disc valves and ball valves, or are of different size so that they operate at different pressures.

512.4 Integral resilient member forms plural valves:

This subclass is indented under subclass 512. Devices in which the valves are integral resilient members which are attached to the valve body in such a manner as to provide separately operating resilient portions which control separate ports in the valve body.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 512.15, for plural direct response valves provided by an integral resilient member characterized by dividing and recombining in a single flow path.
525, for single valves of this type.

512.5 With common biasing means:

This subclass is indented under subclass 512. Devices in which the valves are urged toward or away from their seats by the same biasing means.

513 Mechanically interconnected:

This subclass is indented under subclass 512. Apparatus in which there is a mechanical interconnection between two of the valves such that the movement of one valve relative to its seat in response to variation in the line condition is

transmitted to the other thereby to move it relative to its seat.

SEE OR SEARCH THIS CLASS, SUBCLASS:

493+, for valve means oppositely acting to open for either excessive pressures or pressures below standard.

494+, for condition responsive valves having a reactor surface which is not primarily a valve, though it may have the effect of a variable restrictor.

513.3 With leak passage:

This subclass is indented under subclass 511. Devices in which means are provided to permit limited flow through the valve when the valve is closed, or nominally closed.

513.5 Permits flow at valve interface:

This subclass is indented under subclass 513.3. Devices in which the nominally engaging surfaces of the head and/or seat elements are so constructed or arranged that when the valve is closed, a limited flow passage exists between said surfaces.

513.7 Bypass in valve casing:

This subclass is indented under subclass 513.3. Devices in which a passage permitting limited flow around the head and seat elements is provided in the valve body structure.

514 With retarder or dashpot:

This subclass is indented under subclass 511. Valves provided with a dashpot or other retarding means to prevent or reduce chattering or hunting of the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

494+, for valves having separate connected reacting surfaces which have a positive relation to the operation of the valve, i.e., assist in or cause either the opening or closing movement of the valve.

SEE OR SEARCH CLASS:

188, Brakes, subclasses 297+ for a dashpot of general utility.

251, Valves and Valve Actuation, subclasses 15+ for flow responsive valves having a timing retarding

chamber to cut off flow after a predetermined flow period, subclasses 48+ for valves with fluid operated retarding means, and see the search notes to subclass 48, and subclass 64 for valve actuators with retarding means other than the fluid type.

514.3 End of valve forms dashpot chamber:

This subclass is indented under subclass 514. Devices wherein the end of the valve has a dashpot chamber therein.

514.5 End of valve moves inside dashpot chamber:

This subclass is indented under subclass 514. Devices in which the end of the valve reciprocates in a dashpot chamber.

514.7 Enlarged piston on end of valve stem:

This subclass is indented under subclass 514.5. Devices wherein an enlarged member on the end of a valve stem reciprocates in a dashpot chamber.

515 In couplings for coaxial conduits, e.g., drill pipe check valves:

This subclass is indented under subclass 511. Valves in which the valve is associated with or mounted in a housing provided with means for joining it with pipe at both ends, the three elements being longitudinally aligned when connected.

(1) Note. Many of the patents classified in this subclass are for use in a drill string.

SEE OR SEARCH THIS CLASS, SUBCLASS:

155, for gas lift valves for wells.

SEE OR SEARCH CLASS:

166, Wells, subclasses 86.1+ for a well pipe having an anchor or seal with a valve, subclass 97.1 for a well cap or head with a valve, and subclasses 316+ for valves, closures, or changeable restrictors down in a well

251, Valves and Valve Actuation, subclasses 148+ for valves contained in a pipe line or coupling, and see the search notes to subclass 148.

515.3 Valve seat threaded into a coupling element:
This subclass is indented under subclass 515. Devices in which a separate valve seat element is threaded into one of the coupling elements

- (1) Note. The valve head may be carried by the removable seat element or may be attached elsewhere in the coupling.

515.5 Valve seat formed on or carried by a coupling element:

This subclass is indented under subclass 515. Devices in which the valve seat element is formed as an integral part of one of the coupling elements or is separate but carried by one of the coupling elements.

515.7 Valve seat clamped between coupling elements:

This subclass is indented under subclass 515. Devices in which the valve seat element is clamped between separable elements of the coupling means.

516 With means for selecting area of valve or seat:

This subclass is indented under subclass 511. Valves provided with means for selecting one of a plurality of diverse effective areas for the valve by selecting from a plurality of preselected valve elements, i.e., from a plurality of valves or from a plurality of valve seats to vary the responsiveness of the valve.

- (1) Note. The plurality of elements are usually present in the system at all times.

SEE OR SEARCH THIS CLASS, SUBCLASS:

329+, for devices embodying a plurality of alternate wear parts, one of which may be substituted for another when required by wear or injury.

512+, for means for varying the responsiveness of the condition response device by selecting one of plural valves of different responsiveness.

529, for selectively usable diverse biasing means for a single condition responsive valve.

516.11 Single head, plural ports in parallel:

This subclass is indented under subclass 511. Valves wherein a single valve head controls a plurality of ports in a single seat, whereby the flow is subjected to an action of dividing and recombining by its flow through the seat member.

SEE OR SEARCH THIS CLASS, SUBCLASS:

512.1, for plural direct response valves providing dividing and recombining a single flow line.

516.13 Concentric ports:

This subclass is indented under subclass 516.11. Valves wherein the ports are arranged concentrically.

516.15 Annular head:

This subclass is indented under subclass 516.11. Valves wherein the valve head is annular in form.

516.17 Central post on seat:

This subclass is indented under subclass 516.15. Valves wherein the seat supports a post, the said post being substantially concentric with the annular head.

516.19 Stop:

This subclass is indented under subclass 516.17. Valves wherein the post provides a valve stop or support such as a stop.

516.21 With guide:

This subclass is indented under subclass 516.19. Valves wherein the post also provides guide means for the valve.

516.23 Guide:

This subclass is indented under subclass 516.17. Valves wherein the post provides guide means for the valve head.

SEE OR SEARCH THIS CLASS, SUBCLASS:

516.21, for guides in combination with valve stops.

516.25 Plural seating:

This subclass is indented under subclass 511. Valves comprising a single flow path provided with a plurality of serially arranged sealing surfaces which cooperate with a single head element.

- (1) Note. A single sealing surface or head and seat interface comprises a single surface which is either planar or the resulting surface formed by the rotation of either a straight line or a smoothly curved line about the axis of the valved port.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247.17, for a plural seating valve combined with liquid seal means.

516.27 Sequential:

This subclass is indented under subclass 516.25. Valves wherein the seating is sequential.

516.29 Resilient gasket:

This subclass is indented under subclass 516.27. Valves wherein a resilient gasket is provided at the seating surface and the deformation of the gasket provides one seating.

517 Biased open:

This subclass is indented under subclass 511. Valves in which a bias means is provided to maintain the valve normally open against fluid pressure on the valve itself tending to close or partly close the valve. The bias means may be the weight of the valve body itself.

SEE OR SEARCH THIS CLASS, SUBCLASS:

409+, for normally open float valves.

479+, for governor valves biased normally open to control the flow in a combustion engine suction line.

505+, for valves with a separate connected fluid reactor surface in which the bias tends to open the valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 336+ for biased valves, per se, and see the search notes to subclass 336.

518 Oppositely swinging vanes:

This subclass is indented under subclass 517. Valves comprising a pair of edge-pivoted vanes biased in opposite directions, the pivot means comprising closely adjacent parallel axes or both vanes being pivoted on the same axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

499, for line condition change responsive valve with a swinging vane reactor.

519 Weight biased:

This subclass is indented under subclass 517. Valves in which the bias means is a weight which may be the weight of the valve body itself.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 338 for weight biased valves, per se, and see the search notes thereto.

519.5 Ball valves:

This subclass is indented under subclass 519. Valves wherein the moving element is substantially spherical.

SEE OR SEARCH THIS CLASS, SUBCLASS:

533.11, for normally closed ball valves.

520 Edge pivoted valve:

This subclass is indented under subclass 519. Valves in which the valve body is pivoted about an axis at or closely adjacent one of its edges.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247.19, for a liquid seal combined with a pivoted valve.

521, for other direct response pivoted valves which are biased to open position.

527, for pivoted condition responsive valves which are biased closed.

521 Pivoted valves:

This subclass is indented under subclass 517. Valves in which the valve body is pivotally mounted.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 247.19, for a pivoted valve combined with liquid seal means.
- 518, for oppositely swinging vanes comprising valve bodies.
- 520, for weight biased, edge pivoted condition responsive valves.
- 527, for pivoted condition responsive valves which are biased closed.

522 With external means for opposing bias:

This subclass is indented under subclass 511. Valves provided with means external to and independent of the flow path of the fluid controlled for opening the valve against its bias or for relieving the valve of the effect of the bias so that normal fluid pressure will open the valve.

- (1) Note. The relief of bias classifiable herein is for the purpose of permitting the valve to blow off a normal pressure which the valve would otherwise contain.
- (2) Note. Where a bias adjusting means positively opens the valve, classification is in this subclass.
- (3) Note. See the class definition, Lines With Other Classes and Within this Class, (1) Automatic Control, and Subclass References to the Current Class, for search notes on plural valves, at least one of which is automatic.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 456+, for safety cut-off valves requiring the use of external means to open them.
- 481, for suction flow governor valves with manual modifier for the valve.
- 495, for line condition responsive valves with separate connected fluid reactor surface and having manual or external control means.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, appropriate subclasses for valves which are regularly operated by means other than the pressure of fluid in the line, but where the fluid in the line may cause return to the original position, especially subclasses 12+ for fluid pressure actuators and retarders.

523 With means for retaining external means in bias opposing position:

This subclass is indented under subclass 522. Valves provided with means for maintaining the bias relieving or valve opening means in the bias relieving or valve opening position.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 89+ for valves with means for blocking or disabling the valve actuator, which means may hold the valve open, and see the search notes thereto.

524 With bias adjustment indicator:

This subclass is indented under subclass 511. Valves provided with means for indicating the adjustment of the biasing means, usually in terms of the pressure at which the valve will open.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 227+, for inflation valve combinations or subcombinations provided with indicators.
- 551+, for valves provided with indicating means, especially subclass 556 for indicator elements rigidly carried by the element position of which is indicated.

SEE OR SEARCH CLASS:

- 116, Signals and Indicators, subclass 227 for valve position indicators where the valve is not significantly claimed.

526 Vacuum relief type:

This subclass is indented under subclass 511. Valves which open in response to an excessive decrease in pressure, e.g., to admit atmospheric air.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 217, for back-flow prevention by vacuum breaking.
 479+, for suction flow governor valves associated with internal combustion engines.
 493+, for plural valves, one of which opens in response to excessive decrease in pressure.
- 527 Pivoted valves:**
 This subclass is indented under subclass 511. Valves in which the valve disc or plug swings around the means by which it is mounted in the valve seat or casing.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 247.19, for a pivoted valve and liquid seal means combined.
 448, for pivoted valves operated by float drains.
 484, for unbalanced pivoted valves of the combustion engine induction type.
 520, and 521, for pivoted direct response valves which are biased open.
- 527.2 Head retained by removable closure:**
 This subclass is indented under subclass 527. Devices in which the valve casing is provided with a removable closure element which retains the valve head in assembled relation with its seat.
- 527.4 Valve head movably connected for accommodation to seat:**
 This subclass is indented under subclass 527. Devices in which the mounting of the valve permits motion of the valve head, in addition to pivoting, in order to allow the head to adjust itself to the valve seat.
- 527.6 Valve mounted on end of pipe:**
 This subclass is indented under subclass 527. Devices which provide means for mounting the valve on the end of a pipe.
- 527.8 Weight biased:**
 This subclass is indented under subclass 527. Devices which are provided with means having sufficient mass to maintain the valve in the desired position in response to gravity.
- 528 Reciprocating valves:**
 This subclass is indented under subclass 511. Valves in which the movable member of the valve moves substantially rectilinearly between its extreme positions. Ball valves are included although their motion may not be strictly rectilinear.
- SEE OR SEARCH CLASS:
 251, Valves and Valve Actuation, subclasses 318+ for reciprocating valves of general utility, and see the search notes thereto.
- 529 Plural biasing means:**
 This subclass is indented under subclass 528. Valves in which the biasing means comprises more than one bias force providing element exclusive of the weight of the valve body itself.
- SEE OR SEARCH CLASS:
 251, Valves and Valve Actuation, subclasses 336+ for biased valves, and see the search notes to subclass 336.
- 530 Cam means for adjusting and fixing bias:**
 This subclass is indented under subclass 528. Valves having a cam member associated with a biasing means to determine the effect of the bias.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 524, for bias adjustment means and indicator for condition responsive valves.
- SEE OR SEARCH CLASS:
 251, Valves and Valve Actuation, subclasses 336+ for biased valves, and see the search notes thereto.
- 531 Varying effective lever arm:**
 This subclass is indented under subclass 528. Valves in which the bias is applied through a lever the effective length of which varies as the valve opens or closes.
- SEE OR SEARCH CLASS:
 251, Valves and Valve Actuation, subclass 233 for lever actuated valves in which the leverage varies during actuation.

532 Weight biased:

This subclass is indented under subclass 528. Valves in which the force of gravity is utilized to bias the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

519+, for valves of the check valve type which are weight biased to an open position.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 338 for valves having a mechanical actuator and weight biasing means for maintaining the valve in position.

533 Valve body is the weight:

This subclass is indented under subclass 532. Valves in which the weight of the valve itself is utilized as the biasing means.

533.11 Ball valves:

This subclass is indented under subclass 533. Valves in which the moving element is substantially spherical.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

247.21, for a ball valve combined with liquid seal means.

519.5, for normally open ball valves.

533.13 Removable cage:

This subclass is indented under subclass 533.11. Valves in which the means for controlling the movement of the valve element is separable from the valve body.

533.15 Separable seat:

This subclass is indented under subclass 533.11. Valves in which the valve seat is separable from the valve body.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

533.13, for separable seats combined with separable ball valve cages.

533.17 Guided head:

This subclass is indented under subclass 533. Devices in which means are provided to guide the head to or from its seat.

533.19 Cage:

This subclass is indented under subclass 533.17. Devices in which the valve head is guided by means stationary with respect to the seat and engagable with the outer periphery of the valve head.

533.21 Guide stem:

This subclass is indented under subclass 533.17. Devices in which there is provided a rod-like guiding element usually substantially smaller in diameter than the head.

533.23 With closing stop:

This subclass is indented under subclass 533.21. Devices in which nonvalving structure carried by the head engages a stop or abutment when the valve closes.

- (1) Note. Pump valves having a resilient or deformable head or seat sealing member are found here. Valves in which the stop structure is also a nonresilient valving structure which seats in sequence with a valve having a resilient seat are found elsewhere. See Search This Class, Subclass, below.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

516.29, for valves in which the stop structure is also a nonresilient valving structure which seats in sequence with a valve having a resilient seat.

533.25 Oppositely disposed:

This subclass is indented under subclass 533.21. Devices in which there are a plurality of rodlike elements projecting from opposite faces of the valve head.

533.27 Head slidable on guide rod:

This subclass is indented under subclass 533.21. Devices in which the valve head is apertured and slides on the stationary rod-like element extending through the aperture.

533.29 Guide and seat integral unit:

This subclass is indented under subclass 533.21. Devices in which the valve seat and the guide for the rod-like element constitute a unit.

533.31 Guide and closure integral unit:

This subclass is indented under subclass 533.21. Devices in which the casing closure and the guide for the rod-like element constitute a unit.

534 Weight coaxial with valve:

This subclass is indented under subclass 532. Valves in which the weight is coaxial with the valve disc or plug.

535 Spring biased:

This subclass is indented under subclass 528. Valves in which the elasticity of a resilient element is used to provide the biasing force.

SEE OR SEARCH THIS CLASS, SUBCLASS:

525, for resilient material valves of the direct response type and see the search notes thereto.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 336+ for spring biased valves of this class, and see the search notes thereto.

536 With means to protect spring from fluid:

This subclass is indented under subclass 535. Valves provided with means preventing or reducing the impingement of the pressure fluid on the spring, usually a flexible wall, deflecting baffles or a telescoping enclosure for the spring.

SEE OR SEARCH THIS CLASS, SUBCLASS:

790, for expansible chamber devices with additional biasing means.

793+, for diaphragms and bellows, per se.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 335.1 for valves provided with a hermetic flexible wall seal which separates the valve actuator from the controlled fluid.

537 Spring under tension:

This subclass is indented under subclass 535. Valves in which the resilient member is placed under tension to hold the valve normally closed.

SEE OR SEARCH CLASS:

267, Spring Devices, subclasses 69+ for elastic extension devices, per se, especially subclasses 73+ for tension springs.

538 Piston-type valves:

This subclass is indented under subclass 535. Valves in which the valve is a cylindrical plug cooperating with a hollow cylindrical valve seat, there being ports in the cylindrical wall of either piston or seat which are opened and closed by reciprocating movement of the piston in the cylindrical seat.

SEE OR SEARCH THIS CLASS, SUBCLASS:

792, for piston type expansible chamber devices.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 62+ for piston type fluid pressure actuators for valves, and subclasses 318+ for reciprocating valves of this class, and see the search notes thereto.

539 Ball valves:

This subclass is indented under subclass 535. Valves in which the moving element is substantially spherical.

SEE OR SEARCH THIS CLASS, SUBCLASS:

247.21, for a ball valve combined with liquid seal means.

449, for float arm operated ball valves.

519.5, for normally open ball valves.

539.5 With follower:

This subclass is indented under subclass 539. Valves wherein a follower (e.g., reciprocating rod) is interposed between the spring and the ball.

- 540 Spring coaxial with valve:**
This subclass is indented under subclass 535. Valves in which the spring is coaxial with the valve.
- 540.11 Broken valve parts retainer:**
This subclass is indented under subclass 540. Valves having retaining means for broken valve parts, e.g., an auxiliary chamber or stop on the valve stem by means of which broken valve parts are prevented from entering the cylinder of compressors, etc.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
343+, for means to protect a person or thing from injury through contact with the system or parts thereof.
- 541 Spring in inlet:**
This subclass is indented under subclass 540. Valves in which the spring is located on the side of the valve which is exposed to the fluid pressure to which the valve is to be responsive, i.e., the spring and valve are on opposite sides of the valve seat and the spring is in the fluid conduit or container.
- 542 Valve stem extends through fixed spring abutment:**
This subclass is indented under subclass 540. Valves in which the valve has a stem which passes through the biasing spring, which is mounted between abutments one of which is fixed and comprises a guide for the stem and the other of which is carried by or comprised in the valve head and/or stem.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
541, for valves of this type in which the spring is in contact with the pressure fluid, the spring and valve head being on opposite sides of the valve seat.
- 543 Yoke or cage-type support for valve stem:**
This subclass is indented under subclass 542. Valves which provide a transverse support for the valve stem, spaced from the valve and supported in its location by a plurality of elongated, circumferentially spaced members parallel to the valve stem, the support usually comprising a spring abutment.
- 543.13 Spring abuts removable valve stem guide:**
This subclass is indented under subclass 540. Valves wherein the head and spring are on the same side of the seat and the spring abuts a removable guide for the valve stem.
- 543.15 Head slides on guide-rod concentric with spring:**
This subclass is indented under subclass 540. Valves wherein the head slides on a guide-rod which is concentric with the spring.
- 543.17 Spring guides valve head:**
This subclass is indented under subclass 540. Valves wherein the spring guides the head to its seat.
- 543.19 Cage-type guide for stemless valves:**
This subclass is indented under subclass 540. Valves wherein the guide is cage-like and guides a stemless valve by sliding contact with the outer periphery thereof.
- 543.21 Guide means integral and coplanar with valve disk:**
This subclass is indented under subclass 540. Valves wherein a guide means integral and coplanar is provided on the stemless valve disk, said guide means contacting the walls of the valve casing.
- 543.23 Head between spring and guide:**
This subclass is indented under subclass 540. Valves wherein the head is provided with a guide and the spring is on the side of the head opposite the guide.
- 544 WITH MEANS FOR SEPARATING SOLID MATERIAL FROM THE FLUID:**
This subclass is indented under the class definition. Apparatus having means for separating one or more materials from a fluid mixture either by providing a physical barrier to the passage of particles over a given size or by providing a trap where heavier material may be deposited.
- (1) Note. Means for separating solid material from fluid in pressure fluid valve actuating means or in servo-motor supply lines are excluded from this subclass. Patents which include such separating means in pressure fluid valve actuation

or servo-motor operating systems are classified on the basis of those other features, for which classification has been provided, but cross referenced here when useful disclosures are present.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 140, for siphons with strainers, filters, separators or sediment traps.
- 237+, for distribution systems having positively acting cleaning means.
- 583+, for distribution systems with cleanout openings.
- 599.14 through 599.15, for systems dividing into parallel flow lines then recombining having a bypass including a cleaning, treating, or heat transfer feature.

SEE OR SEARCH CLASS:

- 138, Pipes and Tubular Conduits, appropriate subclasses for screens in pipes and conduits, especially subclass 41 for restrictors combined with screens.
- 210, Liquid Purification or Separation, subclasses 418+ for means to filter a liquid combined with a flow controller for the material being treated and see the search notes thereunder.
- 222, Dispensing, subclasses 189.06+ for dispensers combined with screens, strainers and foraminous guards.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotographic device.

545 Plural separating elements:

This subclass is indented under subclass 544. Apparatus in which the separating means includes plural elements.

- (1) Note. The separating means may be of similar or dissimilar types, and may be positioned in the same or in different flow passages.

546 Sediment chamber:

This subclass is indented under subclass 544. Apparatus in which the separating means includes a chamber for trapping sediment.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 237+, for distribution systems embodying positively acting cleaning means.
- 583+, for distribution systems in which there is an access opening for cleaning purposes.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 294+ for fluid handling means combined with diverse means for liquid separation, especially subclasses 302 and 313; and subclasses 513+ for flow controller combined with a gravitational separator, especially subclasses 533+.

547 Movable strainer:

This subclass is indented under subclass 544. Apparatus in which the separating means is a strainer which is movable with respect to the flow path without being removed from the apparatus.

- (1) Note. This subclass includes strainers which may be moved from one position to another in the system, e.g., may be selectively positioned in one flow path or in another.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 861+, for spouts, valves or deflectors at the junction of three flow paths, shiftable from one to another of two outlets.

549 Hollow strainer, fluid inlet and outlet perpendicular to each other:

This subclass is indented under subclass 544. Apparatus in which the separating means is a foraminated or porous body or hollow strainer arranged with the fluid inlet in an axial direction and the outlet in a generally radial direction or vice versa.

550 Planar strainer normal to flow path:

This subclass is indented under subclass 544. Apparatus in which the separating means is a strainer defining a substantially plane surface and disposed perpendicular to flow path.

551 WITH INDICATOR, REGISTER, RECORDER, ALARM OR INSPECTION MEANS:

This subclass is indented under the class definition. Apparatus comprising fluid handling means combined (1) with an indicator, register, recorder, or alarm responsive to a condition or position of a part of the apparatus or of the fluid in the apparatus or (2) with means which permits inspection of normally hidden parts of the apparatus or of the fluid inside the apparatus.

- (1) Note. A movable element performing a blocking, disabling or actuating function is not considered to be an indicator unless it or a cooperating member has some indicia with position indicating significance.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 213+, for liquid level responsive whistles in diverse fluid containing pressure systems.
 227+, for inflating stems and/or chucks with gauge or indicator.
 524, for direct responsive valves biased closed with bias adjustment indicator.
 586, for telltales which have no indicia associated therewith and which also serve as blocking means for access opening covers.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, appropriate subclasses for pressure, level, temperature, etc., measuring and indicating means, per se.
 116, Signals and Indicators, appropriate subclasses for mechanical signals and indicators.
 222, Dispensing, subclasses 23+ for recorders, signals indicators, etc., in dispensers and subclasses 154+ for inspection devices in dispensers.
 251, Valves and Valve Actuation, subclass 297 for detents that inherently give an audible signal or click.
 340, Communications: Electrical, subclasses 870.01+ for quantitative electric telemetering systems of general application, and subclasses 603+ for

nonquantitative electric alarms responsive to fluent material condition, such as level.

552 Plural:

This subclass is indented under subclass 551. Apparatus comprising more than one indicator, register, recorder, alarm or inspection means or more than one of the beforementioned types of subcombinations.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 25+ for plural indicators, etc., in dispensers.

552.5 Unobvious - 'combination lock' type:

This subclass is indented under subclass 552. Apparatus wherein the information conveyed by the indicators is in some code not obvious to an uninformed operator, whereby the operation is similar to that required by combination locks in that the indicators must be positioned in a predetermined relationship to allow flow through the system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 383+, for apparatus including a lock or seal.
 613+, for mere serial valves in a single flow path.

552.7 Time:

This subclass is indented under subclass 551. Apparatus calibrated in time.

SEE OR SEARCH CLASS:

- 368, Horology: Time Measuring Systems or Devices, appropriate subclasses for time indicators, per se.

553 Position or extent of motion indicator:

This subclass is indented under subclass 551. Apparatus comprising an indicator which gives information as to the position or range of motion of a movable or adjustable part of the apparatus, e.g., a valve or adjustable wall.

- (1) Note. Usually the indicator is a scale and pointer but an edge or other distinct line on an element of the apparatus may serve as the pointer.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
227+, for gauge or indicator with means for inflating or deflating inflatable articles.
524, for bias adjustment indicators for safety valves.
- SEE OR SEARCH CLASS:
116, Signals and Indicators, subclasses 200+ for scale and pointer subcombinations, especially subclass 277 for valve position indicators.
222, Dispensing, subclasses 41+ for means for indicating position and/or extent of motion in dispensers.
- 554 Electrical:**
This subclass is indented under subclass 553. Apparatus in which electrical signal system means are used to sense and/or indicate the position or extent of motion in valves.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
392, for electrical characteristic sensing in level responsive or maintaining systems.
- SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 870.01+ for quantitative electric telemetering systems of general application.
- 555 Selection from plural branches:**
This subclass is indented under subclass 553. Apparatus in which the indicator shows the position or selection for use of one of a plurality of paths.
- SEE OR SEARCH CLASS:
222, Dispensing, subclass 42 for indicators showing selection from plural dispenser outlets.
- 556 Indicator element rigidly carried by the movable element whose position is indicated:**
This subclass is indented under subclass 553. Apparatus in which an element of the indicator is an integral part of, or is rigidly carried by, the movable or adjustable part.
- SEE OR SEARCH CLASS:
222, Dispensing, subclasses 47+ for similar indicators in dispensers.
- 556.3 Movable indicator element is a pointer:**
This subclass is indented under subclass 556. Devices wherein the movable indicator element comprises a pointer.
- 556.6 Pointer integral with handle:**
This subclass is indented under subclass 556.3. Devices wherein the pointer is an integral part of the valve handle.
- 557 Fluid pressure responsive indicator, recorder or alarm:**
This subclass is indented under subclass 551. Apparatus provided with a visual indicator, audible alarm or recorder which is responsive to the pressure of the fluid in the flow path.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
213+, for liquid level responsive whistles in diverse fluid containing pressure systems.
227+, for pressure gauges or indicators combined with inflatable article (e.g., tire) filling chucks and/or stems.
524, for means for indicating the bias adjustment of a safety valve.
- SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 700+ for fluid pressure gauges, per se.
116, Signals and Indicators, subclasses 264+ for fluid flow indicators.
222, Dispensing, subclasses 23+ for dispensers having pressure responsive indicators, especially subclass 39 for audible signals.
- 558 Liquid level responsive indicator, recorder or alarm:**
This subclass is indented under subclass 551. Apparatus provided with a visual indicator, audible alarm or recorder which is responsive to the level of the liquid in some part of the apparatus.
- (1) Note. An indicator comprises means which has at least an indicating and a nonindicating position, or a plurality of

indicating positions, and does not require inspection of the material in the system to establish the distinction.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 213+, for whistles used as liquid level responsive indicators in systems involving gas pressure storage over or displacement of liquid.
559, for sight glasses. See (1) Note.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 290+ for liquid level and depth gauges, particularly subclass 322.5 for floats, per se.
116, Signals and Indicators, subclasses 227+ for liquid level indicators.
222, Dispensing, subclass 51 for float level indicators for dispensers.

559 Inspection means:

This subclass is indented under subclass 551. Apparatus which provides means which permit or facilitate observation or inspection of the fluid inside the apparatus or of normally invisible parts of the apparatus.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclass 323 for sight glasses, per se.
222, Dispensing, subclasses 154+ for dispenser combined inspection devices comprising gauge tubes, sight openings, transparent flow line sections or graduated transparent containers.

560 COMBINED:

This subclass is indented under the class definition. Apparatus which comprises devices or parts in addition to or combined with distribution systems and (1) having functions other than material handling or (2) which serve to perfect the material handling apparatus for its intended purpose.

- (1) Note. For a definition of a distribution system, see subclass 561.
(2) Note. Subcombinations otherwise classifiable in Class 251, Valves and Valve Actuation, have been included herein if combined with subject matter of the

types defined in (1) and (2) of the subclass definition above.

- (3) Note. This subclass includes for example, Fluid supply or valve actuation to or from diving bells, drinking troughs or cups not part of the flow system, carburetor mount protection, testing devices, anti-freeze liquid chambers and control means for devices or operations not a part of the material handling system.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 192 for dispensers with miscellaneous combined features and the preceding subclasses for particular combinations provided for therein.

561 SYSTEMS:

This subclass is indented under the class definition. Systems comprising means for confining flowable material during its flow or making it available for flow and either causing or controlling its flow or potential flow, which means is (1) a combination of material containing or confining means, such as tanks or conduits, in flow relation with flow causing means, such as pumps, (2) combinations of two or more material confining devices in flow relation, including branched flow lines and hydrostatic devices, such as standpipes or vertically adjustable outlet and overflow conduits in open communication with the confined body of flowable material; and (3) combinations of material confining devices with flow controlling means when more of the material confining device is claimed than is necessary to mount the flow controlling means.

- (1) Note. Flow controlling means comprise valves with or without actuating means, closures for flow passages, flow restrictors, baffles and guides.
(2) Note. Passages which divert material from the flow system for the purpose of actuating or controlling a pump or valve or similar part which is solely concerned with the mechanics of handling the main flow of the material are not considered flow confining means.

- (3) Note. This subclass provides for flow dividers of the nonautomatic nonvalved, nonaccumulating type.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 115.01+, and 118.01+, for self controlled branching systems having plural outflows. See (3) Note.
- 262, for flow dividing by passage through or overflow from plural compartments. See (3) Note.
- 597, for systems having a multiple inlet with a multiple outlet.
- 599.01 through 601.21, for systems dividing into parallel flow lines then recombining.
- 631+, for cyclically actuated valves. Lines With Other Classes and Within This Class, (2) Plural Valves, and Subclass References to the Current Class, for search notes on plural nonautomatic valves.
- 861 through 877, for systems having a flow control means for branched passages.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 863+ for a sampling system which obtains a predetermined portion of a mass of material to be tested.
- 222, Dispensing, appropriate subclasses, for subject matter which comprises distribution systems as defined above, but which has in most instances particular application to the problems of vending or handling fluent solids.
- 251, Valves and Valve Actuation, subclasses 12+ for valve actuators which divert and use a part of the material being handled in the system to actuate or retard valves controlling the fluid flow in such systems. See (2) Note, above.
- 399, Electrophotography, subclasses 237+ for liquid developer applied to a latent image within an electrophotographic device.

562 Faucet connected, sink drained:

This subclass is indented under subclass 561. Systems including means whereby a tank may be filled from a faucet and drained into a sink or basin associated with the faucet.

- (1) Note. The tank is usually a dish or clothes washer or some equivalent device which receives and discharges a quantity of water, which may be used either in the tank or during the process of discharge.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 357+, for static structural installations of fluent material handling means in buildings.
- 374, for fluent material handling means combined with house furnishings.
- 603, for distribution systems comprising attachments of the mixing type for two conventional faucets.

563 Closed circulating system:

This subclass is indented under subclass 561. Systems including a flow path in which at least a portion of the fluent material is continuously circulated in a closed circuit. Such system may comprise (1) one or more return by-passes in which a portion of the fluent material in a flow line is diverted from and returned to the flow line at a point upstream from the point of diversion, or (2) a system in which the main portion of a flow continuously returns to the starting point, and one or more branches are provided for tapping and removing from the circuit a portion of the fluent material or one or more branches are provided for admitting fluent material from an outside source into the circuit, or (3) all the material circulates in a confined path without addition or removal of material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 115.01+, for by-passes controlled by condition change in the main line.
- 407, for level responsive systems in which an auxiliary measuring chamber is connected at its top and bottom to the accumulation chamber the level in which is to be controlled or sensed.

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 318 for dispenser systems involving return of material to the supply.

564 With thermal circulating means (thermosiphons):

This subclass is indented under subclass 563. Systems comprising a circulating system in which the thermal characteristics of the system are such that temperature differences exist at spaced points in the device and cause flow of the fluent material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

334+, especially subclasses 337 and 340 for similar structure in which heat exchange is the primary consideration, and see the definition of subclass 334 for collected search notes on fluent material handling systems involving heat or heating means.

564.5 Main line as motive fluid for follower-type feeder:

This subclass is indented under subclass 561. System including an additive reservoir in a shunt on a main line, the reservoir including noncommunicating compartments defined by a blind follower actuated by main line pressure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

205.5, for an intermediate fluid layer as a follower in a similar shunt feeder system.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 386+ for a dispenser having a discharge assistant comprising a container with a follower. See the notes thereunder.

565.01 With pump:

This subclass is indented under subclass 561. Subject matter wherein the system includes a pump that supplies energy to a fluid by suction or pressure or both.

- (1) Note. The combination of a pump and a tank generally will be classified in this class (137). However, a single nominally recited tank reservoir, chamber, pump, or other similar fluid holding means will be classified elsewhere. See **SEARCH CLASS** notes below.

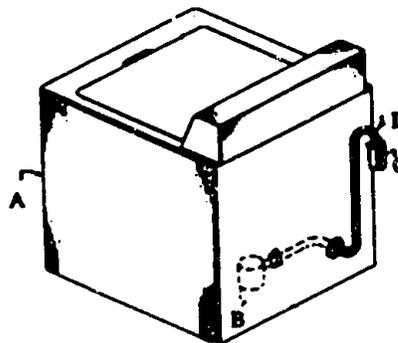


Figure 1: A typical example of the subject matter. A- Automatic washing machine system; B - Pump; C - Drain pipe; D- Drain hose.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 13, for a process wherein the addition of material or energy effects the flowing fluid.
- 147+, for a pump or liquid displacement device for starting a siphon-type fluid handling system.
- 206+, for a gas and liquid containing system wherein the gas under pressure is employed to displace liquid.
- 282, for a hydrant-type fluid handling system having a pump or an ejector.

SEE OR SEARCH CLASS:

- 222, Dispensing, Class Definition, (9)
Note for other pump-tank relationships; and subclasses 372+ for a material supply container and a discharge assistant with casing including a pump.
- 417, Pumps, for a single nominally recited tank reservoir, chamber, pump, or other similar fluid holding means; see Class Definition, (3) Note; subclasses 46+ for a condition responsive pump drive motor by controlling drive motor motive fluid; and subclasses

279+ for condition responsive control of pumped fluid.

- 418, Rotary Expansible Chamber Devices, appropriate subclasses for a rotary expansible chamber pump, per se.

565.11 Pumped fluid control:

This subclass is indented under subclass 565.01. Subject matter including regulating means for varying the flow of a gas or liquid.

- (1) Note. Patents for pump motor control are classified elsewhere. See SEARCH CLASS notes below.

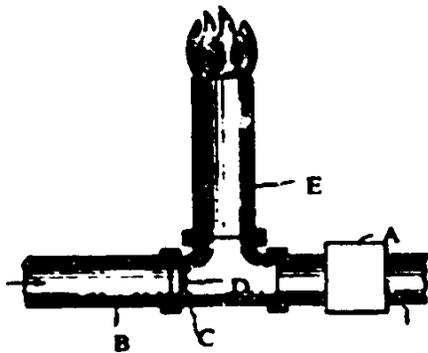


Figure 1: A typical example of the subject matter. A - Gas pump; B - Conduit; C - Barrier or restriction; D - Materially reduced opening; E - Branch pipe to burner.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 109+, for a self-controlled branched flow system.

SEE OR SEARCH CLASS:

- 415, Rotary Kinetic Fluid Motors or Pumps, subclasses 110+ for an internal fluid biased seal or packing.
- 417, Pumps, for pump motor control; subclass 270 for condition responsive fluid control; and subclasses 279+ for condition responsive control of pumped fluid.

565.12 Manual:

This subclass is indented under subclass 565.11. Subject matter including a nonautomatic valve mechanism for selectively regulating the fluid flow.

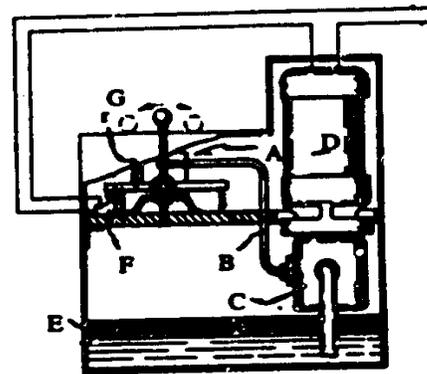


Figure 1: A typical example of the subject matter. A - Manual control; B - Connecting pipe; C - Hydraulic pump; D - Electric motor; E - Reservoir or tank; F - Normally open switch; G - Actuating lever.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 213+ for manually actuated mechanical movement actuator, subclasses 231+ for a lever-type mechanical movement actuator, and subclass 294 for a flexible actuator (e.g., Bowden cable or wire, chain).

565.13 Fluid pressure responsive:

This subclass is indented under subclass 565.11. Subject matter wherein means sensing the change in fluid force controls the effectiveness of pumped fluid flow.

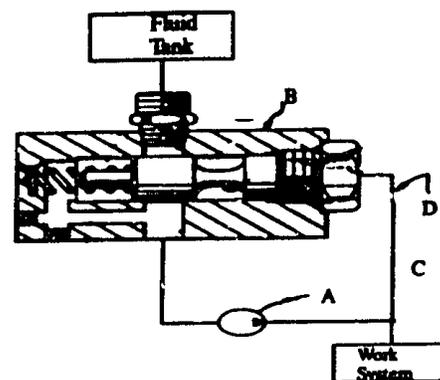


Figure 1: A typical example of the subject matter. A - Pump; B - Fluid pressure responsive valve; C - Pilot line; D - Fluid system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

455+, for a valve controlled in response to a change in the fluid condition occurring within the system or the line including the valve and list for a self-controlled branched flow system including a bypass relief controlled by a main line condition.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 28 for a fluid actuated pilot valve, subclasses 61+ for a flexible wall expansible chamber valve actuator, and subclasses 62+ for a piston-type expansible valve actuator.
 417, Pumps, subclass 295 for condition responsive pumped fluid control including inlet throttle or stop valve and subclasses 307+ for a pressure responsive relief or bypass valve.

565.14 And pilot valve:

This subclass is indented under subclass 565.13. Subject matter comprising an auxiliary controlling operation of a fluid pressure operator valve.

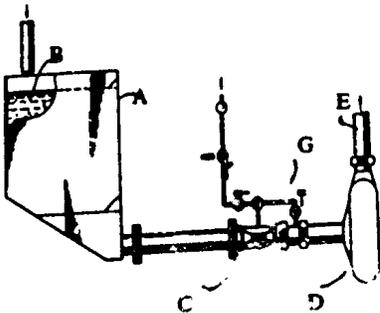


Figure 1: A typical example of the subject matter. A- Reservoir; B - Fluid; C - Main flowline; D - Pump; E - Discharge; F - Pilot valve; G - Control circuit.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for a pilot or servotype with an alternative pressure source or pilot valve, subclasses 28+ for a fluid actuated pilot valve, subclasses 30.01+ for an electrically actuated

valve, and subclasses 118+ for a material guide or restrictor.

417, Pumps, subclass 252 for a pressure responsive interstage discharge and subclass 428 for a bypass control.

565.15 Direct response valve:

This subclass is indented under subclass 565.13. Subject matter including (a) a valve head having a face and (b) a nonreturn element wherein the nonreturn element is responsive to pressure of a line fluid.

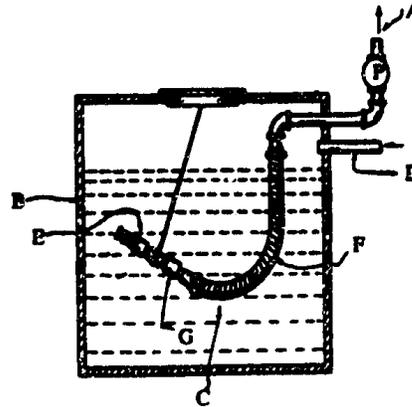


Figure 1: A typical example of the subject matter. A- Discharge; B - Tank or reservoir; C - Outlet hose assembly; D- Inlet; E - Inlet valve; F - Flexible hose; G - Check valve; P- Pump.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

511+, for a direct response check valve.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 136 for a fluid pressure or material level responsive flow control system including a check valve.

565.16 Electric:

This subclass is indented under subclass 565.11. Subject matter wherein the regulating means is an electrically operated valve.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 59+ for automatic control wherein the cutoff is operated by rate of flow responsive mechanism.

- 251, Valves and Valve Actuation, subclasses 129.01+ for an electrically actuated control valve.

565.17 Combined with fluid receiver:

This subclass is indented under subclass 565.01. Subject matter wherein the system includes a receptacle or container for accepting gas or liquid.

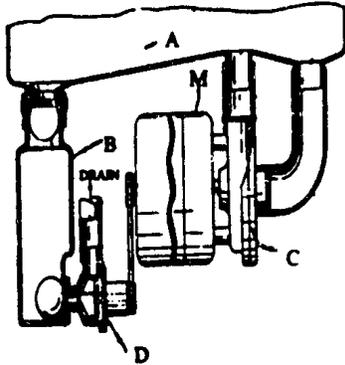


Figure 1: A typical example of the subject matter. A- Reservoir; B - Sump; C, D - Pumps; M - Motor.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 577+, for a system with a tank or reservoir with a movable or adjustable outlet or overflow pipe; subclasses 590+ for a system with a tank or reservoir having internally extending flow guide, pipe or conduit; and subclasses 896+ for a multiple inlet, single outlet system including means to promote mixing or combining of plural fluids.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 318 for a discharge assistant such as an impeller or a pump with a bypass or supply to a container and subclasses 333+ for a fluid motor operated discharge assistant.
- 261, Gas and Liquid Contact Apparatus, subclass 70 for a float controlled, valved fluid distribution system; and subclasses 72.1+ for a fluid distribution system including a liquid supply tank.

565.18 Compressed air supply unit:

This subclass is indented under subclass 565.17. Subject matter comprising means for supplying fluid at a pressure higher than the atmospheric pressure.

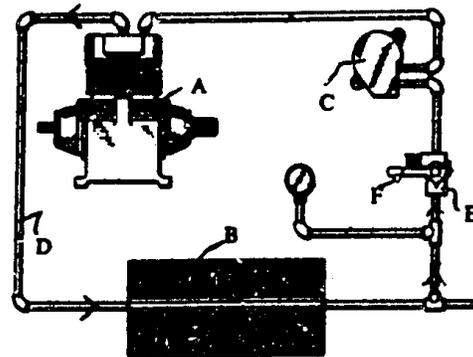


Figure 1: A typical example of the subject matter. A- Compressor unit; B - Storage reservoir; C - Unloader governor; D - Pipe supplies fluid under pressure from compressor to reservoir; E - Valve body; F - Operating handle (valve).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 571+, for a system wherein plural tanks or compartments are connected for a serial flow.
- 899.4, for a wheeled fluid compressor and fluid storage tank.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 3+ for gas or vapor dispensing and subclasses 401+ for a container-mounted fluid pressure generating pump or pulsator.
- 417, Pumps, subclasses 44.2+ for pressure responsive motor controls responsive to pumped fluid pressure.

565.19 Hydraulic power unit:

This subclass is indented under subclass 565.17. Subject matter comprising a fluid reservoir, a pump for withdrawing fluid from the reservoir, or further including one or more selector valves together with a fluid motor to supply high pressure fluid to another device.

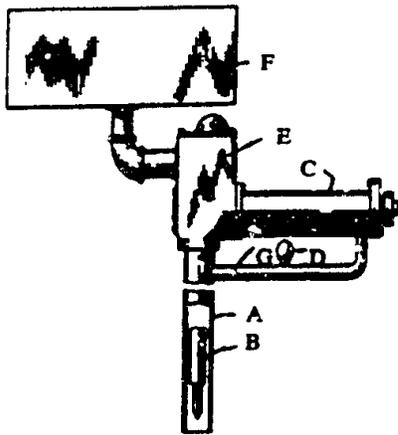


Figure 1: A typical example of the subject matter. A - Well casing; B - Impulse actuated pump; C - Hydraulic cylinder; D - Accumulator (load compensating reservoir); E - Housing; F - Liquid storage tank; G - One-way valve.

SEE OR SEARCH CLASS:

- 60, Power Plants, subclasses 413+ for controlling the structure storing the work driving energy such as an accumulator.
- 91, Motors: Expansible Chamber Type, subclasses 418+ for a hydraulic motor with a motive fluid valve.
- 222, Dispensing, subclasses 383.1+ for a container mounted pump or pulsator.
- 417, Pumps, subclass 287 for controlling the pumped fluid of the plural diverse capacity pump units and subclasses 440+ for an expansible chamber-type pump including a bypass valve for control of pumped fluid.

565.22 And jet-aspiration type pump:

This subclass is indented under subclass 565.01. Subject matter including a pump wherein a motive fluid and a driven fluid are brought into intimate contact in an enclosed flow path, the motive fluid having a higher velocity than the driven fluid and imparting energy to the driven fluid by the action of entrainment contact.

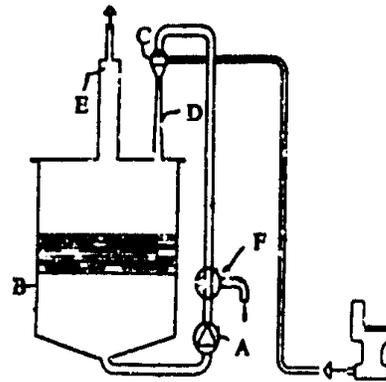


Figure 1: A typical example of the subject matter. A - Pump; B - Tank or reservoir; C - Jet-aspiration pump; D - Diffuser; E - Vent; F - Drain valve.

SEE OR SEARCH CLASS:

- 261, Gas and Liquid Contact Apparatus, subclasses 76+ for an injector-type gas and liquid contact apparatus where there is a mutual exchange of properties between the fluids.
- 417, Pumps, subclasses 65+ wherein one fluid is pumped by contact or entrainment with the other, subclasses 76+ for a jet pump having a motive fluid generating pump, subclasses 87+ for diverse pumps including a jet pump, and subclasses 151+ for a jet pump.

565.23 Vacuum pump:

This subclass is indented under subclass 565.01. Subject matter wherein the device or machine creates a system pressure lower than the ambient pressure.

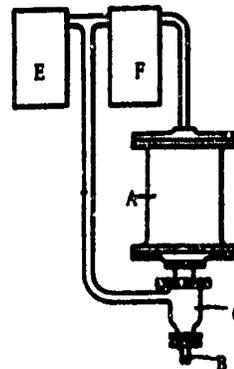


Figure 1: A typical example of the subject matter. A - Vacuum chamber; B - Movable member in chamber; C -

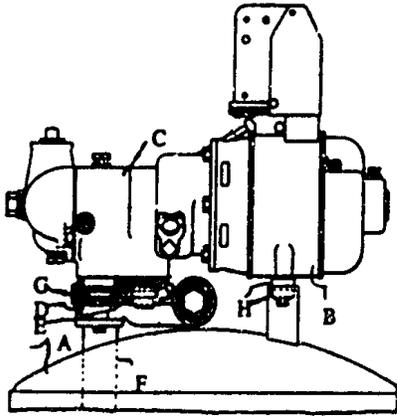
Casing with sealing liquid; E - Preliminary pump; F - Final pump.

SEE OR SEARCH CLASS:

417, Pumps, subclasses 148+ for a vacuum generator.

565.24 Resiliently mounted pump:

This subclass is indented under subclass 565.01. Subject matter wherein the device or machine is supported on a vibration dampening element.



A - Tank; B - Motor; C - Pump; D - Outlet manifold; E - Resilient washer; F - Tank pipe; G - Moulded resilient rings; H - Rubber plugs.

SEE OR SEARCH CLASS:

417, Pumps, subclass 363 for a resiliently mounted pump or motor.

565.25 Hand pump:

This subclass is indented under subclass 565.01. Subject matter wherein the device or machine for supplying energy is operated manually.

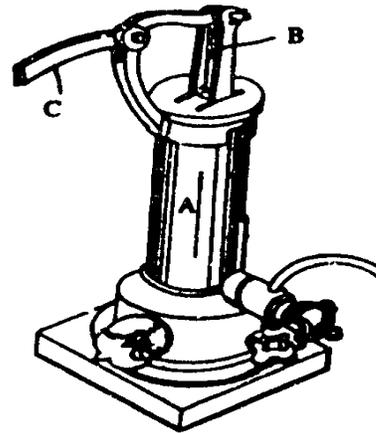


Figure 1: A typical example of the subject matter. A - Pump chamber; B - Plunger; C - Handle.

SEE OR SEARCH CLASS:

417, Pumps, subclass 374 for a manual actuation of pump with an additional motor drive and subclass 425 for a separate manual and motor driven pumping member.

565.26 Multiple inlet with multiple outlet:

This subclass is indented under subclass 565.01. Subject matter including a fluent material branched flow line having two or more admission passages and two or more exhaust passages, wherein the admission passages and the exhaust passages are joined by one or more fluent material flow lines.

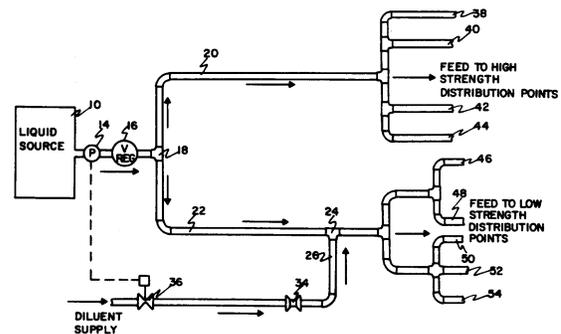


Figure 1: A typical example of the subject matter.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

597, for a fluid handling system with multiple inlets, multiple outlets; and subclasses 861+ for a system with individual flow control means for branched passages.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclasses 340+ for plural distinct separators having parallel filters with a flow controller.

565.27 Downstream cyclic distributor:

This subclass is indented under subclass 565.01. Subject matter including a distributing device receiving the discharge of the pump for sequentially establishing the communication with the pump fluid and operating to divide the fluid discharged by the pump into at least two separate flow paths leading to points of fluid utilization.

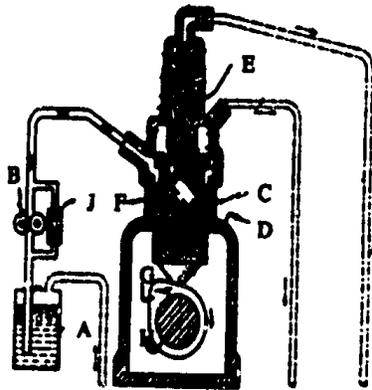


Figure 1: A typical example of the subject matter. A - Supply tank; B - Feed pump; C - Fuel injection pump; D - Pump casing; E, F - Plungers; G - Cyclic cam; H - Pump drive shaft; J - Relief valve.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 448+ for a fuel injection system with a fuel pump flow regulation including a sequential distributor.

565.28 Distributor part unitary with movable pump part:

This subclass is indented under subclass 565.27. Subject matter wherein an element of the distributing device is integral with a member of the device or machine which is in motion.

565.29 Plural:

This subclass is indented under subclass 565.01. Subject matter having at least two or more pumps.

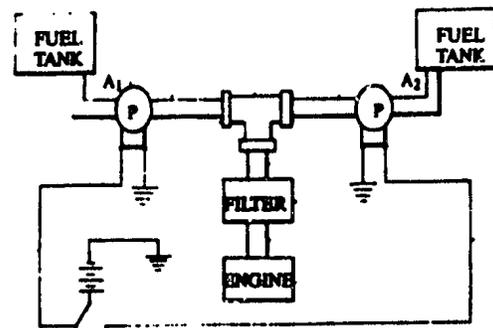


Figure 1: A typical example of the subject matter. A₁ - Pump one; A₂ - Pump two.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 255 for dispensers having plural discharge assistants all of which are pumps.
 417, Pumps, subclasses 2+ for plural motor driven pumps having control of a pump drive motor in response to a condition of the pump or pump fluid.

565.3 Serial:

This subclass is indented under subclass 565.29. Subject matter wherein two or more pumps are arranged in regular succession for fluid communication with each other.

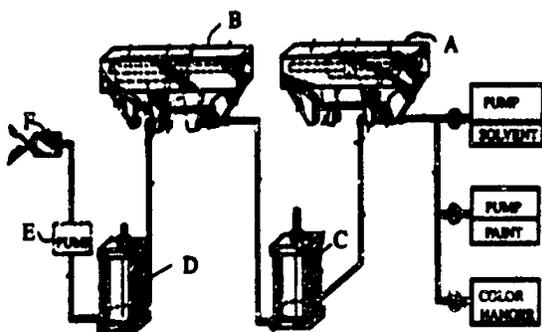


Figure 1: A typical example of the subject matter. A - First housing; B - Second housing; C - First pump; D - Second pump; E - Booster pump; F - Spray gun.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

571+, for plural tanks or compartments which are connected for serial flow.

SEE OR SEARCH CLASS:

417, Pumps, subclasses 201+ for a rotary nonexpansible pump in series with another diverse pump, subclasses 205+ for diverse pumps in series, subclasses 244+ for pumps with successive stages, subclasses 515+ for plural pumping chambers with mechanically actuated distributor, and subclasses 521+ for plural pumping chambers.

565.31 With single motive input:

This subclass is indented under subclass 565.3. Subject matter wherein two or more pumps are driven by one prime mover.

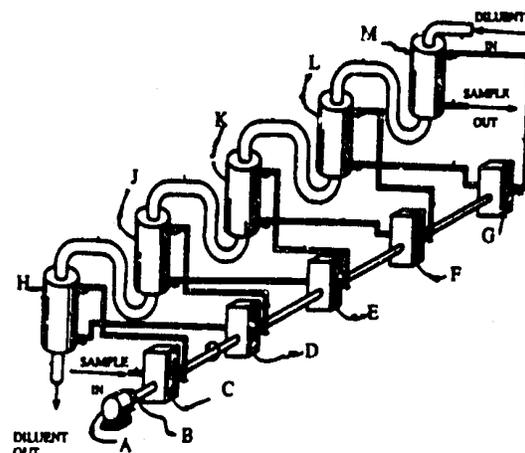


Figure 1: A typical example of the subject matter. A - Motor; B - Drive shaft; C, D, E, F, G - Series of pumps; H, J, K, L, M - Vessels in series.

SEE OR SEARCH CLASS:

417, Pumps, subclass 350 for pumping members oppositely disposed from a single motor.

565.32 One pump driven by motive fluid from the other:

This subclass is indented under subclass 565.31. Subject matter wherein one pump additionally supplies gas or liquid as a power source for a motor to drive another device.

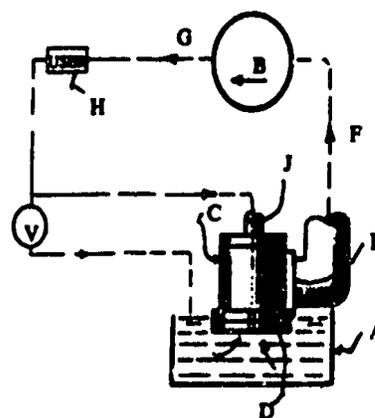


Figure 1: A typical example of the subject matter. A - Reservoir; B - Pressure pump; C - Supply motor pump; D - Supply inlet; E - Pressure outlet; F - Intake of pressure pump; G - Outlet of pressure pump; H - Fluid pressure user; J - Pressure inlet of supply motor pump.

SEE OR SEARCH CLASS:

- 417, Pumps, subclass 382 for plural pumping members with one additionally supplying motive fluid for the second.

565.33 Parallel:

This subclass is indented under subclass 565.29. Subject matter wherein the pumps discharge separate fluid flows to parts of the system other than one another.

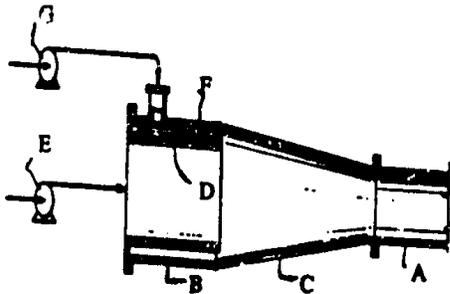


Figure 1: A typical example of the subject matter. A- Beginning of pipeline; B, C - Inlet piece; D - Central supply pipe for oil; E - Oil pump; F - Annular water supply channel; G- Water pump.

- (1) Note. This subclass takes plural parallel pump systems regardless of whether the pump outputs are supplied to separate devices or are combined.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 255+, for plural tanks or compartments with parallel flow.

SEE OR SEARCH CLASS:

- 415, Rotary Kinetic Fluid Motors or Pumps, subclass 155 for plural, independently adjustable vane or working fluid control means; and subclasses 198.1+ for plural rigidly related blade sets.

565.34 Reserve or surge receiver:

This subclass is indented under subclass 565.17. Subject matter including a pump and (a) a reservoir or a holding tank under atmospheric pressure usually at an elevation above the pump, and in open or check controlled communication with the pump outlet line to

receive surplus fluid for storage or to absorb sudden rise of pressure, or (b) a parallel supply from a different line or from a container supplied from a source other than the pump.

SEE OR SEARCH CLASS:

- 138, Pipes and Tubular Conduits, subclasses 26+ for a pressure compensator for a pipe or conduit.
- 222, Dispensing, subclasses 129+ for a dispenser having plural sources or supply containers.
- 417, Pumps, subclasses 540+ for an expandible chamber-type pump having a pulsation dampening fluid receiving space.

565.35 With pump bypass:

This subclass is indented under subclass 565.01. Subject matter having means whereby fluid in the system may either pass through the pump or be caused to flow around the pump.

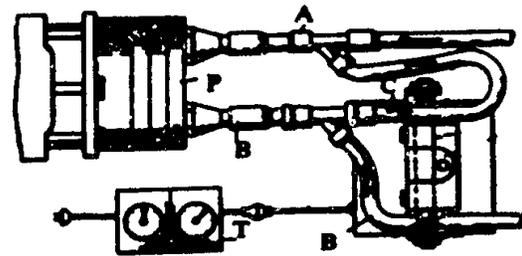


Figure 1: A typical example of the subject matter. A- Inlet conduit; B - Discharge conduit; C - Bypass connecting inletconduit to outlet conduit; P - Motor driven pump; T - Timer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 115.01+, for a self-controlled branched flow system including bypass or relief controlled by a main line condition.
- 563+, for a closed circulating system including one or more return bypasses wherein a portion of the fluent material in a flow line is diverted from and returned to the flow line at a point upstream from the point of diversion and subclass 599.1 for a flow passage with a bypass connection.
- 599+, for bypasses in distributing systems, and see the search notes to subclass 599.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 318 for a discharge assistant with a bypass or return to the supply.
- 417, Pumps, subclasses 283 and 284 for a condition responsive pumped fluid control with a bypass or relief valve and subclass 440 for an expansible chamber-type pump having a separate noncyclic bypass valve.

565.36 Drain valve actuator mounted on pump:

This subclass is indented under subclass 565.01. Subject matter having a pump associated with fluid delivery tubing, usually vertically positioned in a well, the tubing being provided with a drain valve which has an actuator mounted on or supported by the pump housing, the pump mounting, or a part thereof.

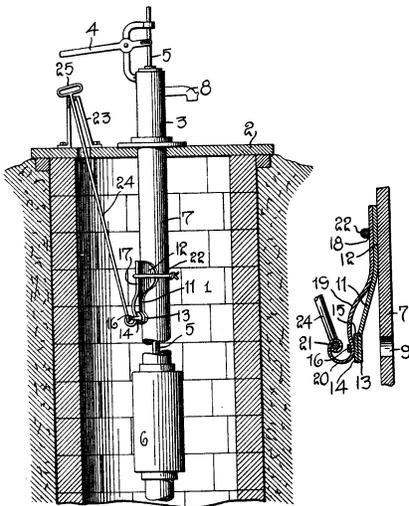


Figure 1: A typical example of the subject matter. Note: Drain valve for pump: Valve is attached to pump tube. The operating rod for valve extends through platform, and handle on the rod engages the housing on the platform.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 206+, for a gas pressure storage for displacement of liquid and subclass 593 for a head-establishing standpipe or expansion chamber (e.g., surge tanks).

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 145+ for an apparatus including a pipe having a valve mounted on the side thereof, including a structure disclosed for use as a well tube drain, and wherein an actuator for the valve is mounted on the tube.
- 417, Pumps, subclass 434 for a pump provided with a separate port on a non-cyclic valve for draining the pump portion.

565.37 Fluid sump:

This subclass is indented under subclass 565.17. Subject matter including pit, depression, or reservoir serving as (a) a drain or (b) a receptacle for liquid to be stored for a later use.

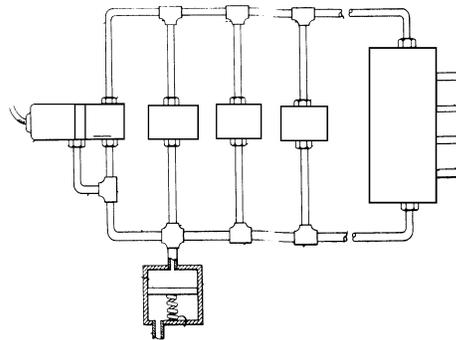


Figure 1: A typical example of the subject matter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 563, for a closed circulating system having a similar pump.

SEE OR SEARCH CLASS:

- 60, Power Plants, subclasses 477+ for a pressure fluid source as a motor including a ram driven by fluid which is pumped from the reservoir and having means for pressurizing, vacuumizing, or venting the reservoir.
- 222, Dispensing, subclasses 383.1+ for a discharge assistant such as a supply container and a pump including container mounted pump or pulsator.

571 Plural tanks or compartments connected for serial flow:

This subclass is indented under subclass 561. Systems in which two or more tanks or compartments are connected in such manner that all tanks except the last in the flow sequence deliver fluid only to one other tank and to no other type of receiver.

- (1) Note. The containers other than the last in the series may have plural outlets but all the outflow of one must be to one other container, and all may have additional inflow from sources other than a tank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 130+, for siphons with discharge controlling receivers.
 255+, for plural tanks of which two or more have outflows to receivers other than to successive tanks, and see subclasses 263 and 265 for plural tanks connected for series-parallel flow.
 406+, for communicating measuring vessels for sensing weight of accumulated fluid.
 428, for float valves in separate communicating float chambers.
 453+, for series flow by barometric feed between a supply tank and a receiver.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 133 for dispensers having a separate inflow line connected to a tank and measuring trap system, and subclasses 424.5+ for dispensers having plural series connected compartments where the second one is a trap, i.e., a measuring or separating means receiving or segregating material from the first.

572 Separable with valved-connecting passage:

This subclass is indented under subclass 571. Systems in which the plural tanks are so constructed that they may be separated from one another and in which the passage by which the tanks are connected contains a valve or closure.

- (1) Note. The separation is not in the normal use of the apparatus, but is usually

for cleaning or replacement of parts of a system without loss of the main body of fluid, as in a transformer radiator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 320+, for devices for tapping a pipe, keg or apertured tank under pressure, wherein the pipe, etc., has a valved outlet, the valve being actuated by the tapping device.
 454, for series tanks of the barometric type with a shut-off between the supply tank and receiver.
 614, for a flow device having serial valves and/or closures and a disconnectable coupling.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 22+ and 110+ for receivers removably associated with a filling supply for discharge.

573 Fluid progresses by zigzag flow:

This subclass is indented under subclass 571. Systems in which fluid passes through the tanks or compartments in a zigzag path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 334+, for heating exchange systems having convoluted flow paths.

SEE OR SEARCH CLASS:

- 193, Conveyors, Chutes, Skids, Guides, and Ways, subclasses 27+ for zigzag conveyor chutes.
 251, Valves and Valve Actuation, subclass 127 for flow paths with valves and zigzag type flow restrictors.

574 Plural compartments formed by baffles:

This subclass is indented under subclass 571. Systems comprising a container having plural compartments formed by plates or walls in the flow path but only partially closing it.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 262, for plural flow dividing compartments formed by weirs, baffles, etc.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 127 for baffles in a valve inlet or outlet for restricting flow through the valve.

575 Plural top-to-bottom connected tanks:

This subclass is indented under subclass 571. Systems in which a flow passage leads from the top of one tank to the bottom of the next tank in the series.

576 With communicating opening in common walls of tanks or compartments:

This subclass is indented under subclass 571. Systems in which the tanks or compartments are connected by an opening in a wall common thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

406+, for systems controlled by the weight of accumulated fluid which is sensed in a communicating chamber.
428, for liquid level responsive or maintaining systems having a control float in a separate communicating float chamber.

577 Tank with movable or adjustable outlet or overflow pipe:

This subclass is indented under subclass 561. Systems comprising a tank having a discharge passage which may be moved or adjusted with respect to the tank to (1) remove material from a particular part of the tank, or (2) determine the level of material retained in the tank and/or the amount withdrawn from the tank.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101.29, for a swinging outlet pipe controller in a self proportioning system.
152, for means for mounting siphons.
395+, for apparatus for controlling outflow from a tank which is liquid level responsive or liquid level maintaining.
438, for float arm operated valves associated with a movable nozzle or inlet terminal.

590+, for tanks with internally extending flow guides or pipes which are not movable.

615+, for articulated or swinging spouts or discharge outlets for distributing systems where the flow conduit is not mounted on a tank.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 434+ for adjustable overflow and/or outlet pipes for varying trap chamber volume in dispensers.

577.5 Horizontally traversing outlet:

This subclass is indented under subclass 577. Systems including a conduit placed or adapted to be placed within a receptacle, e.g., tank, reservoir or swimming pool, and means arranged to traverse the inlet end of the conduit in a generally horizontal direction, usually to remove sediment from the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

565+, for similar systems including pumps.
590.5, for nondraining overflow type liquid removers which have inlet conduits extending to the bottom of the receptacle.
899+, for vehicle mounted fluid handling means.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclass 1.7 for submerged devices having cleaning means for that class, and subclass 246.5 for tanks with attached cleaners for that class.
210, Liquid Purification or Separation, subclasses 523+ for gravitational separators and mechanical liquid removers.
294, Handling: Hand and Hoist-Line Implements, subclasses 68.22+ for hoisting buckets or bailers.

578 Float-supported outlet:

This subclass is indented under subclass 577. Systems in which the intake end of the movable outlet is supported by a float.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 152, for siphons in which the intake end is supported by a float in the supply tank.
- 386+, especially subclasses 409+ for float controlled valves in liquid level responsive or maintaining systems.

579 Swinging outlet pipe or spout:

This subclass is indented under subclass 577. Systems in which the movable outlet comprises a pipe or spout which is mounted to swing with respect to the tank to control the level within the tank.

- (1) Note. The outlet pipe may be external or internal with respect to the tank, but control of fluid flow depends on movement of the pipe rather than on valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 615+, for articulated or swinging flow conduits, and see the search notes to subclasses 615 and 616.

580 With running joint between movable parts of system:

This subclass is indented under subclass 561. Systems comprising a relatively movable fluid supply and fluid receiver normally joined by rotating or longitudinally sliding or telescoping elements forming a shifting flow passage at right angles to the direction of movement of the elements to allow fluid flow between the supply and receiver during relative movement.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 257+, for the combination of a relatively rotatable tank group and filling head in which the tank group and filling head are connected by a running joint.
- 277+, for hydrants of the water crane type having a rotatable riser which is also vertically movable the connection between the riser and its supply frequently including a running joint.
- 355.16+, for running joints between parts of the system, usually between the inlet and discharge portions of a hose wound on

a reel and permitting fluid flow during relative movement.

- 581, for distribution systems comprising a movable tank, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 195+ for sprinkler devices having a hose holder or reel and a running joint between parts of the system to permit fluid flow during relative movement.

581 Movable tank:

This subclass is indented under subclass 561. Systems, including a tank mounted for movement with respect to supporting means, the supporting means not being positively recited in the claims, but movement of the tank being inherent in the operation of the device or required in causing or controlling flow of material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 38+, for systems with flow control by inertia or change of position of the system.
- 170, for feed traps movable into discharge relationship with a pressurized receiver.
- 257, for rotatable tank groups for sequential filling and discharge.
- 313, for leakage or drip collectors comprising a relatively movable receptacle and drain pipe or outlet.
- 376, for tanks with supports.
- 408, for gravitating tanks in liquid level responsive systems, and see the search notes thereto.
- 899+, for systems with vehicular supports, and see the search notes to subclasses 351 and 899.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 160+ for dispensers having a movably mounted supply container, and subclasses 608+ for ambulant dispensing systems.

582 With antispash means not in flow passage:

This subclass is indented under subclass 561. Systems having means for preventing splashing of a liquid stream located in the path of flow of the liquid but not located in the conduit which carries the liquid, i.e., usually mounted in the tank receiving the liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

592, for tanks having internally extending inlet pipes, and see the search notes thereto.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 118+ for valves combined with a material guide or restrictor in the flow passage which may reduce turbulence of the liquid, and see the search notes to subclass 118.

583 System with plural openings, one a gas vent or access opening:

This subclass is indented under subclass 561. Systems having two or more openings at least one of which functions to vent gases to or from the system or serves as an opening permitting access thereto of persons or of tools other than those contributing to the intended fluid handling operation of the system.

(1) Note. An opening through which a valve actuator extends is not considered an opening in the system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

43, for vent opening or closing on tipping container.

136+, 143 and 144, for vents and air release means for siphons.

154+, especially subclasses 173+, 179+ and 197+, for gas release from diverse fluid containing pressure systems, and 213+ for liquid level responsive gas vents or whistles in systems having gas pressure stored or maintained over liquid.

216+, for back flow prevention by provision of air vents in liquid flow lines.

223+, for means to relieve excess pressure in tires, especially in connection with inflation means.

237+, for devices having openings for the introduction of cleaning fluids or claimed cleaning tools.

283+, for hydrants having removable valves and valve seats.

326, for containers in which a valve in the bottom can be removed through an opening in the top of the container.

327+, for devices having disassembly tool engaging features.

364+, for valve and meter wells.

597, for apparatus having a plurality of inlets with a plurality of outlets.

602+, for apparatus including tanks having a plurality of inlets and a single outlet.

613+, for tanks having an inlet and an outlet.

SEE OR SEARCH CLASS:

4, Baths, Closets, Sinks, and Spittoons, subclasses 209+, especially subclasses 211, 218 and 219+ for ventilation means for house plumbing or sewers.

222, Dispensing, subclass 442 for dispenser supply container and measuring trap combinations having a vent passage for the trap; subclasses 478+ for dispensers having plural fluid flow openings, including vents.

584 Access and outlet:

This subclass is indented under subclass 583. Systems in which one of the openings is an access opening and another is an outlet for fluid contents of the system.

(1) Note. The access opening admits tools other than those contributing to the intended operation of the device, as for cleaning or removal of parts, or allows workmen to reach into or enter the container.

(2) Note. Openings to admit an actuator or drain an actuator housing are not considered openings in the system nor access openings for this subclass.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 237+, for devices having openings for the introduction of cleaning fluids or claimed cleaning tools.
- 283+, for hydrants having removable valves and valve seats.
- 326, for containers having means by which a valve in the bottom can be removed through an opening in the top of the container or by which such removal is facilitated.
- 327+, for devices having disassembly tool engaging features.
- 342, for systems providing support for a workman.
- 364+, for valve and meter wells.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, sub-classes 291+ for detachable valve actuators, and see the search notes thereto and (2) Note, above.

585 Tank access opening and bottom outlet:

This subclass is indented under subclass 584. Systems in which the access opening is formed in a tank, such as a tank car, usually comprising a manhole, and in which the outlet is at the bottom of the tank.

- (1) Note. The patents herein are directed for the most part to structures comprising a tank car having a valved outlet in the bottom therein and a dome having a manhole at the top of the tank which allows manual access to the valve actuator and/or removal of valve parts.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 283+, for hydrants having the valve and valve seat removable through the casing.
- 326, for containers having means by which a valve at the bottom of a tank can be removed through an opening in the top or by which such removal is facilitated. See (1) Note.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 510 for tanks having an outlet element in the bottom

and a controller therefor extending through the tank and operated from the top.

- 251, Valves and Valve Actuation, sub-classes 144+ for tanks having the valve actuator passing through the tank, but not emerging through an inlet or manhole.

586 Access opening interlock or telltale on outlet valve actuator:

This subclass is indented under subclass 585. Systems in which the actuator for the valved outlet performs an additional function in the system by interengaging with or extending into the access opening in one position of the valve thereby preventing the application of a closure to the access opening while the bottom valve is open and/or indicating the open condition of the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 553+, for indicators for fluid delivery systems comprising means having indicia or attention attracting means other than the mere position of the part for indicating the position or extent of motion of valves or other system parts.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 483 for plural interlocked controllers and/or closures for plural openings in a dispensing system.

587 Tank with gas vent and inlet or outlet:

This subclass is indented under subclass 583. Systems in which one of the openings is a gas vent for a tank and another is a liquid inlet and/or outlet.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 136+, 143 and 144, for vents and air release means for siphons.
- 154+, for gas release from diverse fluid containing pressure systems, especially subclasses 197+ for discriminating outlets for gas in diverse fluid containing pressure systems.
- 213+, for gas vents in systems utilizing a gas pressure over a liquid in which the

vent opens or closes in response to liquid level, the gas escape frequently producing a signal whistle.

- 215+, for air vents in liquid lines comprising vacuum breakers for back flow prevention.
- 469+, and 511+, for safety valves, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 220, Receptacles, subclass 366.1 for vents in metallic and other receptacles, subclass 86.1+ for filling attachments for receptacles.
- 222, Dispensing, subclass 39 for audible signals in dispensers, subclasses 478+ for gas vents combined with other openings in dispensing systems, especially subclass 479 for vent pipes substantially coterminous with an outlet pipe, as in barometric devices, and subclass 481.5 for dispensing systems having movable, flexible or remotely connected vent pipes.

- 588 Vent and inlet or outlet in unitary mounting:**
This subclass is indented under subclass 587. Systems in which the vent and the liquid passage are formed in a common mounting adapted to be attached to or removed from the supply container as a unit.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 212, for unitary mountings for gas and liquid fluid flow passages where the liquid passage is an outlet and the vent is an inlet for gas under pressure.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 400.7+ for unitary mountings applied to dispensers, the vent being a gas inlet for a displacing fluid, and subclasses 478+, especially subclass 479 for vents combined with dispensed material inlets or outlets.

- 589 With vented outlet:**
This subclass is indented under subclass 583. Systems having a valved discharge conduit and means connecting such conduit with the atmosphere downstream of the valve, whereby the

conduit may be drained of liquid after the valve has been closed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 215+, for air vents in liquid lines comprising siphon breakers for back flow prevention.
- 312+, for apparatus for collecting leakage or drip.
- 596+, for apparatus comprising stop and waste valves, and see the search notes thereto.

590 Tank with internally extending flow guide, pipe or conduit:

This subclass is indented under subclass 561. Systems comprising a tank having a material guide or flow pipe extending into the interior of the tank.

- (1) Note. Valved flow conduits which extend into the tank only far enough to provide for lateral flow passages and/or receive fastening or mounting means are not included in this group of subclasses, but are classified on the basis of the valve and/or actuator in succeeding subclasses.
- (2) Note. Interiorly extending flow pipes and conduits are included when in addition to the fact of interior extension some result or function of the extension is expressed or is inherent, as (1) to prevent or minimize freezing, (2) for the purpose of decanting the liquid contained in the tank, (3) for deriving a representative sample of the fluid in the tank, (4) to admit fluid below the liquid level, (5) to provide an outlet for pump or fluid displacement discharge, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 434+, especially subclasses 437, 438, 440, and 442+ for float arm operated inlet valves at the inlet end of an internally extending inlet pipe.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 308+ for filters with upwardly extending internal flow guides.
- 222, Dispensing, subclasses 382 and 464.1+ for dispensers having an internally extending outlet pipe, and subclasses 547 and 564 for dispensers having a flow guide or restrictor within the supply container.
- 251, Valves and Valve Actuation, subclasses 118+ for valves with material guides in the flow line, subclass 144 for a tank comprising a single flow path device provided with a single valve, and subclass 339 for valved devices wherein the valve actuator extends through a fluid inlet or outlet.

590.5 Nondraining overflow type:

This subclass is indented under subclass 590. Systems in which the material flow or guide means has laterally spaced inlet and outlet portions with (1) the end of the outlet portion positioned above the end of the inlet portion, (2) means, such as a vent, positioned relative to the end of the outlet portion so as to cut-off flow at an upper level.

- (1) Note. These devices are intended to withdraw sediment and liquid from the bottom of the tank but to stop discharge when the liquid level drops to the outlet of the external portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 123+, for siphons.
- 577.5, for pipes having positioning means for a traversing inlet.

SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, subclass 1.7 for submerged cleaners there provided for, and subclass 246.5 for tanks and attached cleaners there provided for.
- 210, Liquid Purification or Separation, subclasses 523+ for gravitational separators and mechanical constituents movers, and subclasses 532.1+ for

gravitational separators having heavier constituent traps.

591 Inverted 'U' passage:

This subclass is indented under subclass 590. Systems in which the internally extending pipe comprises a conduit of inverted U-shape.

- (1) Note. In order that the conduit be considered U-shaped, the shorter leg must be of substantial length.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 123+, for siphon type fluid handling devices.
- 216+, for antisiphon devices wherein an inverted U-shaped pipe is provided with a vent at the highest point to prevent back flow, the normal use of the device not being as a siphon.
- 440, for float arm operated valve associated with a U-shaped inlet, usually mounted in a tank.

592 Inlet internally extending:

This subclass is indented under subclass 590. Systems in which the internally extending pipe is a fluid inlet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 434+, for float arm operated valves mounted on flush tank inlets, especially subclasses 437, 438, 440, and 442+.

SEE OR SEARCH CLASS:

- 220, Receptacles, subclasses 86.1+ for inlet attachments for receptacles.

593 Head-establishing standpipe or expansion chamber (e.g., surge tanks):

This subclass is indented under subclass 561. Systems comprising an expansion chamber or a vertically extending pipe or tank adapted to be placed in open communication with a source of liquid and functioning as a storage or pressure-maintaining reservoir or to increase the head against which liquid from the source must exert pressure.

- (1) Note. This subclass includes patents for extensions attached to the vertical outlets of irrigation pipelines whereby a greater

head of water to be discharged may be maintained without overflow, and risers to be attached to basement drains whereby the overflow level of water backing into the drain may be raised.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 207, for apparatus for suppressing surges in a liquid in which gas is trapped in a dome over the liquid.
- 272+, for valved vertically extending delivery risers of the hydrant type.
- 568, for distribution systems comprising pumps combined with means for reducing surge or pulsations in the liquid being pumped.
- 777+, for expandible chamber devices, per se.

SEE OR SEARCH CLASS:

- 138, Pipes and Tubular Conduits, subclasses 26+ for conduits combined with pressure compensators.
- 417, Pumps, subclasses 540+, for an expandible chamber type pump having fluid pulsation dampening means associated therewith.

594 Plural noncommunicating flow paths:

This subclass is indented under subclass 561. Systems involving two or more fluent material flow lines which do not unite within the scope of the combination of elements claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 87.01+, for systems involving plural noncommunicating flow paths with automatic control of one flow path in accordance with a condition in the other flow path.
- 127, for plural siphons discharging in parallel from plural tanks.
- 255+, for plural tanks with parallel outflows.
- 625.18+, for valve units having noncommunicating flow paths.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 129+ for dispensers having plural sources.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 418+ for fluid distributors having separately supplied

plural flow paths, the fluids combining downstream of the outlet, and subclass 549 for a distributor having plural outlet, each supplied by a separate fluid, the distributor being of general utility even though disclosed as a burner.

595 With common valve operator:

This subclass is indented under subclass 594. Systems having at least one valve in each of two or more noncommunicating flow lines, the valves in the noncommunicating flow lines being connected to a single operating means so as to be operated thereby.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 601.01 through 601.12, for systems dividing into parallel flow lines then recombining including valves having a common operator therefor.
- 607, for systems having a multiple inlet having a flow control valve in each inlet having a common valve operator.
- 627, for systems having a sequential distributor or collector type.
- 627.5, for systems having a sequentially closing and opening alternately seating flow controllers.
- 628 through 630.22, for systems having a sequentially progressive opening or closing of plural valves.
- 862 through 871, for systems having flow control means for branched passages including a common valve operator.

596 Supply and exhaust:

This subclass is indented under subclass 561. Device comprising a valve controlled flow line and valve controlled exhaust passage connected to the line downstream of the flow control valve, whereby the supply through the flow line may be cut off and the downstream portion of the line may be drained through the exhaust passage.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 61, for low temperature responsive supply and exhaust.
- 62, for low temperature responsive drains.

- 74, for drain outlets with heat fusible closures.
- 102+, for supply and exhaust type self-correlating systems, especially subclass 107 for waste valves responsive to flow stoppage.
- 143, for vent type siphon breakers.
- 216+, for air vents in liquid flow line for back flow prevention.
- 226, for coaxial inflation and relief valves for pressure controlled tire inflation.
- 281, and 302+, for supply and exhaust valves associated with hydrants.
- 312+, for apparatus for collecting leakage or drip.
- 570, and 733+, especially subclasses 735+ and 738+ for drain valves mounted on well pipes and similar valve mountings.
- 589, for outlet lines extending downwardly from a valve and vented for draining.
- 599.01 through 601.21, for systems dividing into parallel flow lines then recombining.
- 625.2+, for valve units of the supply and exhaust stop and vent or drain types.
- 627.5, for supply and exhaust valves having an intermediate position in which both valves are closed.
- 631+, for valves with cyclic action or actuators, and see the search notes to subclass 631.
- SEE OR SEARCH CLASS:
- 222, Dispensing, subclasses 424.5+ for measuring traps of the stationary type which are filled and drained through multiple or multiway valves.
- 251, Valves and Valve Actuation, appropriate subclasses, especially subclasses, 23, 89, 94, 110 for valves of the stop and waste, stop and vent, or drain types.
- 596.1 Biased exhaust valve:**
This subclass is indented under subclass 596. Devices in which the exhaust valve is biased toward one of its positions.
- 596.12 With bypass:**
This subclass is indented under subclass 596. Device including an additional valve to connect the upstream side of the main valve directly to exhaust so that the fluid does not pass through a downstream port of the main valve.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
599.01 through 601.21, for systems dividing into parallel flow lines then recombining.
- 596.13 Controlled by supply or exhaust valve:**
This subclass is indented under subclass 596.12. Device wherein the supply and exhaust valve controls the fluid flow to or through the by-pass valve.
- 596.14 Pilot-actuated:**
This subclass is indented under subclass 596. Device in which the valves are actuated by fluid pressure motive means controlled by an auxiliary or pilot valve.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 25+ for pilot valve controlled fluid actuated valves.
- 596.15 Common to plural valve motor chambers:**
This subclass is indented under subclass 596.14. Device in which a single pilot valve controls a plurality of valve actuating motor chambers.
- 596.16 Electric:**
This subclass is indented under subclass 596.14. Device in which the pilot valve is operated by electric motive means.
- 596.17 Motor:**
This subclass is indented under subclass 596. Device in which a valve is operated by a power driven actuating means.
- 596.18 Fluid motor:**
This subclass is indented under subclass 596.17. Device in which the motor is actuated by a fluid.
- 596.2 Biased closed:**
This subclass is indented under subclass 596.1. Devices in which the exhaust valve is biased to closed position.

597 Multiple inlet with multiple outlet:

This subclass is indented under subclass 561. Systems comprising a fluent material branched flow line having two or more inlets or admission passages and two or more outlets or exhaust passages, such admission passages and exhaust passages being joined by one or more fluent material flow lines, i.e., flow combining followed by flow dividing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

563+, for closed circulating systems which may be comprised of plural inlets, outlets and connecting flow lines.

599.03 through 599.04, for systems having inlets where one or more flow lines divide into parallel flow lines then recombine.

625+, for valve units having similar passages.

598 Hydraulic brake line (e.g., hill holders):

This subclass is indented under subclass 561. Systems comprising a liquid flow passage between the master cylinder and the brake or slave cylinder, including means in the line to control the flow of fluid between said cylinders.

- (1) Note. This is essentially a residual subclass for systems not provided for in Class 303, Fluid-Pressure and Analogous Brake Systems, and Class 60, Power Plants, subclasses 54.5+, and consists principally of flow control means, generally termed "hill holders", which trap a column of liquid in the brake line to maintain the brake cylinder in its expanded position with the brakes engaged, together with means to permit an increase in the volume of the trapped liquid to intensify the braking effort.

SEE OR SEARCH CLASS:

303, Fluid-Pressure and Analogous Brake Systems, appropriate subclasses for braking systems of the fluid pressure type. See (1) Note.

599.01 Dividing into parallel flow paths with recombining:

This subclass is indented under subclass 561.

Subject matter comprising a fluent material branched flow line having a single inlet or admission passage and a single outlet or exhaust passage, wherein the admission and the exhaust passages are being joined by two or more flow lines or valved controlled flow passages.

- (1) Note. All the parallel flow passages may not be open simultaneously. One may even be broken or severed for a repair purpose.
- (2) Note. Bypasses established for power or control purposes in the system are not considered to form a parallel flow line within the flow system.

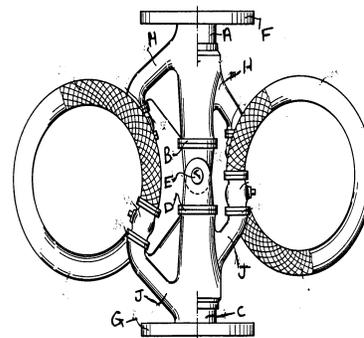


Figure 1: A typical example of the subject matter. A -Feed pipe with free end 'B'; C - Discharge pipe with free end 'D'; E - Joint for connecting pipe 'A' and 'C'; F - Connecting flange(feed pipe); G - Connecting flange (discharge pipe); H - Branchpipes (feed); J - Branch pipes (discharge).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 89, for mixture condition maintenance or sensing, self-correlating, or correlating system where flow is divided and recombined.
- 110, for a self proportioning or correlating system for a self-controlled branched flow system dividing and recombining.

- 115.01 through 115.28, for a self-correlating or correlating system having a bypass controlled by a main line condition.
- 170.5, for a diverse fluid containing pressure systems having a foam control in gas liquid having a conditioning trap or chamber for recarbonization.
- 170.6, for a diverse fluid containing pressure systems having a foam control in gas liquid having a conditioning trap or chamber including a bypass.
- 171 through 204, for a diverse fluid containing pressure systems having fluid separating traps or vents.
- 247.29, for a liquid seal in liquid flow line where flow liquid forms a seal in divided and recombined passages.
- 462, for a line condition change responsive valve having a safety cutoff reset by a pressure equalizing valve or bypass.
- 563 through 564.5, for systems having a closed circulating system.
- 569, for systems having a pump and a bypass for it.
- 596.12 through 596.13, for systems involving a pump bypass controlled by supply and exhaust valves.
- 625.28 through 625.39, for systems dividing into parallel flow lines then recombining having a multi way valve unit.
- 629 through 630.15, for systems having sequentially opening or closing of plural valves for pressure equalizing or auxiliary shunt flow.
- 801, for nozzles, spouts and terminal deflectors the mounting of which may involve a spider or bar in the flow line.
- SEE OR SEARCH CLASS:**
- 138, Pipes and Tubular Products, subclasses 40 through 46 for a flow line restrictor that may involve dividing the line longitudinally.
- 166, Wells, subclass 148 for a well conduit with a controllable passage between central chamber and space below a packer having an upwardly biased check valve and means for opening or bypassing it.
- 222, Dispensing, subclass 318 for a discharge assistant having a bypass or return to supply or subclass 443 for a discharge assistant having a trap chamber cut off and a bypass or free flow adjustment.
- 251, Valves and Valve Actuation, subclasses 12 through 63.6 for a valve actuated or retarded by fluid, especially subclass 51 for a retarder or timer controlled by a line pressure connected dashpot or choke chamber having a choke bypass or relief means, or subclass 55 for a retarder or timer controlled dashpot or choke chamber having a choke bypass or relief means.
- 599.02 With fluid coupling (e.g., railway car hose coupling, truck-trailer oil system coupling, etc.)**
- This subclass is indented under subclass 599.01. Subject matter comprising a self-sealing device or a separable flow joint wherein steam or air intervenes between moving members to transmit pressure and torque or a joint for a conduit adapted to carry steam or air under pressure such that the escape of steam or air from the conduit is prevented when the joint is made or broken.
- (1) Note. It is a device to couple or uncouple section of the conduit without loss of the fluid.
- (2) Note. Included in this subclass are patents wherein steam or air is used between cars of a train comprising a receiving portion and an inserting portion, wherein the inserting portion operates the means for opening or closing a valve of cooperating coupling as the inserting portion is received by the receiving portion of the cooperating coupling.

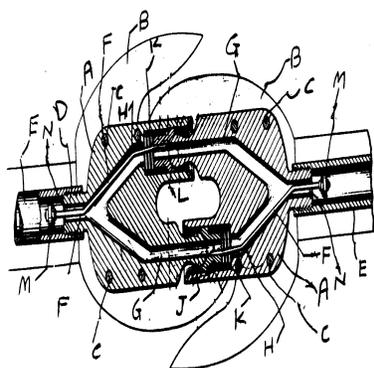


Figure 1: A typical example of the subject matter. A - Pair of complimentary members; B - Coupler heads; C - Fasteningbolts; D - Stems; E - Steam pipes or hose connections; F - Passagewith branches 'G' and 'H'; G, H - Branches; J - Head seats snuglyin socket 'L'; K - Expansion springs; L - Socket; M - Valve; N -Valve seat.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

614 through 614.06, for couplings having a valve in each of separable flow sections.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 149 through 149.7 for a valve operated by joining flow path sections or subclass 149.8 for a valve operated by the motion of a flow path.

285, Pipe Joints or Coupling, subclasses 65 through 79 for a coupling having identical halves (e.g., railway car hose coupling, etc.) or subclass 99 for a coupling with a fluid pressure seal having a coating opposing duplicate.

599.03 System having plural inlets:

This subclass is indented under subclass 599.01. Subject matter comprising a system having two or more entrance flow lines wherein at least one entrance flow passage is divided and recombined.

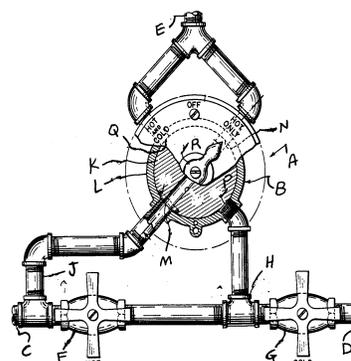


Figure 1: A typical example of the subject matter. A - Showervalue system; B - Selector valve; C, D - Inlets; E - Outlet; F,G - Flow control valves; H - Flow inlet; J - Bypass inlet; K - Valvedisc element; L - Valve body; M, N - Pair of opposite ports; P,Q - Pair of opposite ports; R - Valve operating handle.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

597, for systems having a multiple inlet with a multiple outlet.

602, for systems having a multiple inlet with a single outlet.

SEE OR SEARCH CLASS:

366, Agitating, subclasses 177.1 through 181.8 for plural related feeders having separate outlets to a mixing chamber.

454, Ventilation, subclasses 261 through 269 for a ventilation system having an inlet airway including a structure for mixing plural air streams together.

599.04 Having digital flow controller:

This subclass is indented under subclass 599.03. Subject matter wherein at least one of the parallel flow paths provide a specific flow rate controlled by a valve which is completely open or closed (the valve itself provides no adjustable metering). (1) Note. This subclass includes a flow controller that can be manually set to a numerical value. (2) Note. The flow rate determining means can be a serial restrictor or restricting means in the valve itself.

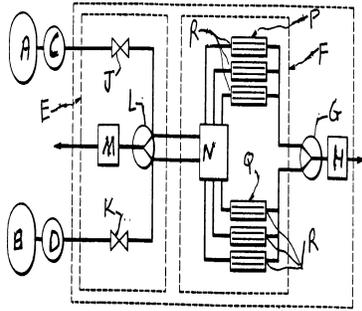


Figure 1: A typical example of the subject matter. A, B - Two sources of binary gas mixtures; C, D - Pressure reducing valves; E - Stabilizing unit; F - Unit for setting proportion between gas mixture from unit 'E'; G - Main mixer; H - Controller; J, K - Orificeplates; L - Additional mixer; M - Controller to effect stabilization of gas pressure upstream of final control element; N - Distributor; P, Q - Two sets of capillary tubes 'R'; R - Capillary tubes.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 556 through 556.6, for a position or extent of a motion indicator element rigidly carried by the movable element whose position is indicated.
- 625.3, for systems having a multi way valve unit where flow is divided into parallel flow lines then recombined including a metering feature.
- 886, for systems having flow control means for branched passages including a threaded actuator.

SEE OR SEARCH CLASS:

- 91, Motors, Expansible Chamber Type, subclass 31 wherein the fluid is supplied through diverse paths to a single expansible chamber and wherein one path includes restriction.
- 128, Surgery, subclass 205.24 for a respiratory means or method having a mixing treating agent with a respiratory gas having a valve or valve control structure.
- 166, Wells, subclass 91.1 for an above-ground apparatus with flow restrictors (e.g., chokes, beans, etc.).

- 251, Valves and Valve Actuation, subclass 117 for a valve with restrictor in parallel to a main valve or subclass 118 for a material guide or restrictor.

599.05 Having digital flow controller:

This subclass is indented under subclass 599.01. Subject matter wherein at least one of the parallel flow paths provide a specific flow rate controlled by a valve which is completely open or closed (the valve itself provides no adjustable metering).

- (1) Note. The flow rate determining means can be a serial restrictor or restricting means in the valve itself.
- (2) Note. This includes a flow controller that can be manually set to a numerical value.

SEE OR SEARCH CLASS:

- 91, Motors, Expansible Chamber Type, subclass 31 wherein the fluid is supplied through diverse paths to a single expansible chamber and wherein one path includes restriction.
- 128, Surgery, subclass 205.24 for a respiratory means or method having a mixing treating agent with a respiratory gas having a valve or valve control structure.
- 166, Wells, subclass 91.1 for an above ground apparatus with flow restrictors (e.g., chokes, beans, etc.).
- 251, Valves and Valve Actuation, subclass 117 for a valve with restrictor in parallel to main valve or subclass 118 for a material guide or restrictor.

599.06 Having plural branches under common control for separate valve actuators:

This subclass is indented under subclass 599.05. Subject matter comprising two or more unique flow restriction passageways, a valve associated with each passageway, and a single control for selectively opening any one of the valves and maintaining each additional valve closed.

- (1) Note. The single control can be a single actuator physically connected to separate valves or a central control means connected to physically independent valve actuators.

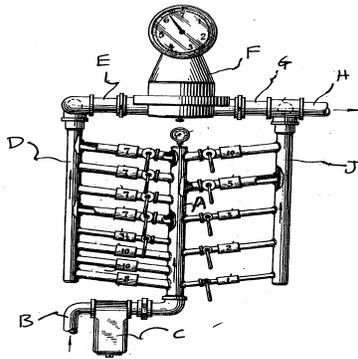


Figure 1: A typical example of the subject matter. A -Main header; B - Supply pipe; C - Filter; D - First riser; E - Pipecoupling; F - Meter or indicator; G - Pipe coupling; H - Discharge pipe;J - Second riser. Note: Main header 'A' is connected to risers'D' and 'J' by various orifices and shutoff valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

636.1, for systems having selective motion for plural valve actuator having oppositely movable cam surfaces.

SEE OR SEARCH CLASS:

- 138, Pipes and Tubular Conduits, subclass 46 for a flow regulator or baffle having variable restriction.
- 251, Valves and Valve Actuation, subclasses 121 through 122 for an adjustable material guide or restrictor.
- 604, Surgery, subclass 246 means for controlling or metering a predetermined dose or amount of treating material introduced or removed through a conduit, holder, or implantable reservoir inserted in a body from a body orifice, or inserted or removed subcutaneously, other than by diffusing through skin, for therapeutic purposes (e.g., medicating, irrigating, aspirating, etc.).

599.07 Electromagnetic or electric control (e.g., digital control, bistable electro control, etc.):

This subclass is indented under subclass 599.06. Subject matter wherein at least one valve is operated by electricity.

- (1) Note. The electric signals can be direct to solenoid actuators or indirect, such as through solenoid pilot valves.

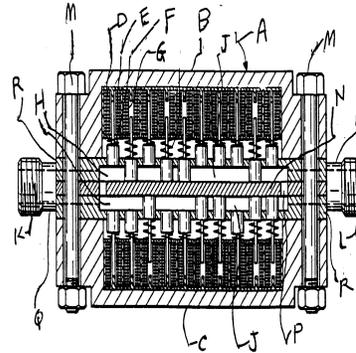


Figure 1: A typical example of the subject matter. Valvehousing formed of recessed parts 'B' and 'C'; B, C -Recessed partssealed by bolts 'M'; D - Electromagnets composed of 'E', 'F', and'G'; E - Coil body; F - Armatures; G - Coil windings; H - Flow channels;J - Sub-chambers; K - Inlet; L - Outlet; M - Sealing bolts; N - Planner plates for passages 'P'; P - Passages; Q - Tubular stems;R - Spaced recessed circular plates.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 601.14, for systems dividing into parallel flow lines then recombining having an electrical valve actuator.
- 883, for systems having a single inlet and flow control means for branched passages having multiple distinctly valved outlets.
- 884, for systems having a flow control means for branched passages in a sectional block structure.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclasses 30.01 through 30.05 for a fluid actuated or retarded valve controlled by an electrically actuated pilot valve, subclass 65 for a permanent or constantly energized magnet actuator, subclass 129.05 for an electrically actuated valve having means to produce digital pulses, or subclasses 129.15-129.22 for an electrically actuated valve including a solenoid.

- 335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 234 for a magneto mechanical motive device (e.g., electromagnet having an armature, etc.) having a permanent magnet, a polarized electromagnet, and a reversible magnetic flux-type movement (e.g., bistable type, etc.).

599.08 With multi way valve having serial valve in at least one branch:

This subclass is indented under subclass 599.01. Subject matter comprising a single flow regulating or controlling element at a point where plural lines divide or recombine and further includes additional flow regulating or controlling elements in at least one of the parallel flow paths.

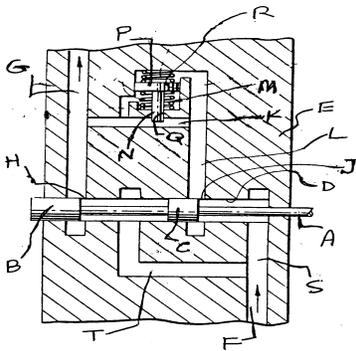


Figure 1: A typical example of the subject matter. A - Valve casing; B - Inlet; C - Outlet; D - Passage (communicates with 'B' and 'C'); E - Valve body; F - Pressure governor valve; G - Control rod; H - Valve seat; J - Piston; K - Chamber for sliding 'J'; L - Spring (acts on valve body 'E' through piston 'J' and rod 'G'); N - Pressure governing screw; P - Flow control valve; Q - Valve body; R - Valve seat; S - Pressure source; T - Direction switch valve; V - Valve bores; S - Branch leading to valve bore 'D'.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 613 through 614.21, for system shaving a flow path having serial valves or closures.
- 625.12 through 625.16, for a multi way valve with sequentially progressive opening or closing of plural lines.
- 625.28 through 625.39, for systems dividing into parallel flow lines then recombining having a multi way valve unit.

SEE OR SEARCH CLASS:

- 91, Motors, Expansive Chamber Type, subclasses 32 through 33 for fluid supplied through diverse paths to a single expansive chamber where activation of one path disables a second path.

599.09 Fluid pressure regulator in at least one branch:

This subclass is indented under subclass 599.01. Subject matter wherein at least one flow passageway includes a biased open valve that is responsive to its outlet pressure in a manner that tends to maintain a constant outlet pressure.

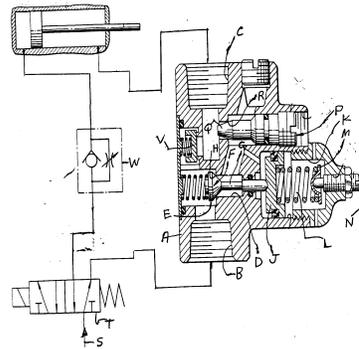


Figure 1: A typical example of the subject matter. A - Valve casing; B - Inlet; C - Outlet; D - Passage (communicates with 'B' and 'C'); E - Valve body; F - Pressure governor valve; G - Control rod; H - Valve seat; J - Piston; K - Chamber for sliding 'J'; L - Spring (acts on valve body 'E' through piston 'J' and rod 'G'); N - Pressure governing screw; P - Flow control valve; Q - Valve body; R - Valve seat; S - Pressure source; T - Direction switch valve; V - Valve bores; W - Throttle valve with pressure compensator.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 315.04 through 315.05, for a fluid handling system with repair, tapping, assembly, or disassembly means for a pressure regulator, pressure-regulating valve, or reducing valve.
- 488 through 492.5, for a line condition change responsive fluid pressure type pilot or servo controlled valves.
- 505 through 505.47, for a line condition change responsive valve having a sep-

arate connected fluid reactor surface with an opening bias (e.g., pressure regulator, etc.).

- 510, for a line condition change responsive valves with separate connected fluid reactor surface valve seating in direction of flow having a flexible diaphragm or bellows reactor.

SEE OR SEARCH CLASS:

- 165, Heat Exchange, subclass 285 for a flow of one heat exchange material controlled by the pressure of another, subclass 286 for flow of one heat exchange material controlled by its own pressure, subclass 299 for flow of one heat exchange material controlled by temperature of another, or subclass 300 for flow of one heat exchange material controlled by its own temperature.
- 237, Heating Systems, subclass 65 for a water heating system having a pressure regulator.

599.11 Flow passage with bypass connection:

This subclass is indented under subclass 599.01. Subject matter comprising a pipe or conduit, in addition to those for inlet and outlet, for diverting the flow to a device other than a valve and a connection for returning the flow to the main pipe or conduit.

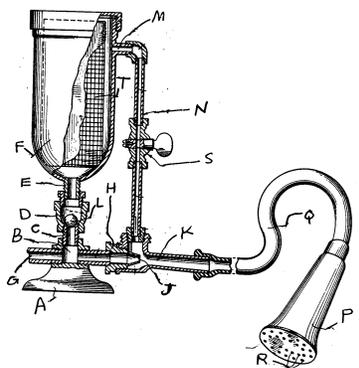


Figure 1: A typical example of the subject matter. A - Supportbase; B - Chamber; C - Nipple carries valve housing 'D'; D - Housing for valve mechanism; E - Hollow stem connected to chamber 'F'; F - Cleaning agent chamber (other device) with pervious receptacle 'T'; G - Fluid inlet; H - Nozzle with discharge orifice 'J'; J - Discharge orifice; K - Mixing chamber; L - Ball check valve; M - Container outlet; N - Valve controlled con-

duit; P - Dispensing nozzle; Q - Flexible hose; R - Nozzle 'P' perforations; S - Manually operated restrictor; T - Pervious receptacle.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 565.01 through 565.36, for a fluid system having a pump.
- 625.28 through 625.39, for systems having multi way valve unit having divided parallel flow paths with recombining.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclass 204.21 for a thermal type volume or rate of flow measuring with fluid flow deflector or restrictor (e.g., baffle, constriction, etc.).
- 138, Pipes and Tubular Conduits, subclasses 40 through 46 for flow regulators or baffles with restrictors.
- 165, Heat Exchange, subclass 103 for an adjuster for a branched flow for heat or exchange material having a bypass of heating or cooling means.
- 210, Liquid Purification or Separation, subclass 434 for divided filtered and unfiltered liquid passages including recombining.

599.12 Including mixing feature:

This subclass is indented under subclass 599.11. Subject matter wherein at least one branch includes a device or arrangement for adding another fluid to the branch fluid.

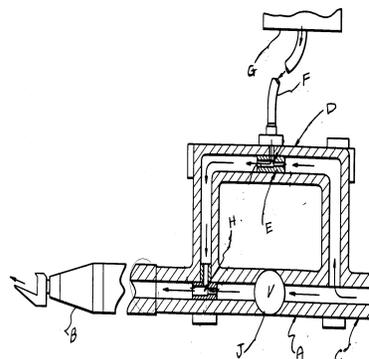


Figure 1: A typical example of the subject matter. The fluid flows from right to left through main conduit 'A' and out of a nozzle 'B'. A by-pass conduit 'D' is connected to inlet 'C' and the main conduit 'A'. A chemical mixture 'E' is disposed in the by-pass conduit 'D'. A con-

duit 'F' is connected between mixing solution tank 'G' and the mixture 'E'. 'H' (a power mixture) together with the control valve 'J' further regulates amount of liquid by-passed.

599.13 Including flowmeter:

This subclass is indented under subclass 599.11. Subject matter wherein at least one branch includes an instrument for measuring the rate of fluid passing through the branch.

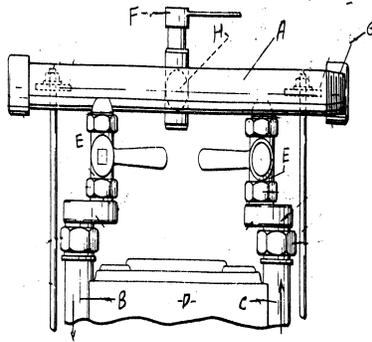


Figure 1: A typical example of the subject matter. A - Manifold; B - Inlet; C - Outlet; D - Gas meter; E - Junction stop cocks; F - Stop cock (by-pass); G - To gas service pipe; H - Gas by-pass junction. Note: The gas by-pass junction 'H' fitted with a stopcock 'F' interconnects with manifold 'A' and this, together with the junction stop cocks 'E', enables the meter to be by-passed.

599.14 Including cleaning, treating, or heat transfer feature:

This subclass is indented under subclass 599.11. Subject matter comprising a porous article or mass that serves as a medium for separating from a fluid passed through it, matter held in suspension, dissolved impurities or coloring matter, or means for subjecting the fluid to an agent or process, or means for moving energy in transit due to a temperature difference between the source and the sink.

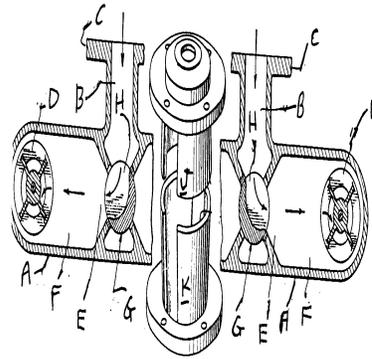


Figure 1: A typical example of the subject matter. CLEANING DEVICE. A - Strainer body portion; B - Fluid inlet; C - Connection flanges; D - Strainer cartridges; E - Passageway connects 'F' withinlet 'B'; F - Upper chamber; G - Plug valve (controls fluid to strainer); H - Plug valve lateral passageway; J - Upper support yoke; K - Lower support yoke.

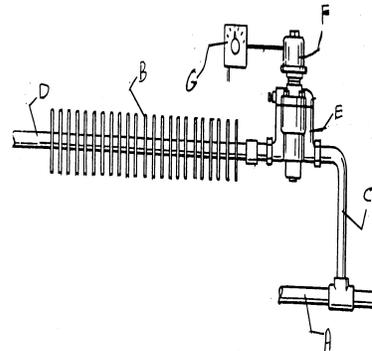


Figure 2: A typical example of the subject matter. HEAT TRANSFER DEVICE. A - Main conduit; B - Radiator (heat transfer device); C - Inlet for radiator; D - Outlet for radiator; E - Control valve; F - Electromagnetic control device; G - Thermostat.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 334 through 341, for systems with heating or cooling of the system.
- 544 through 550, for systems with means for separating solid material from the fluid.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 323.1 through 347 for a filter or subclass 424 for a multi way valve flow that selectively directs

flow relative to the filter for the material being treated.

237, Heating Systems, subclass 12.3 for a vehicle heat and power plant.

599.15 Water treatment feature:

This subclass is indented under subclass 599.14. Subject matter comprising means for subjecting water supplied for commercial and domestic use to the action of an agent or process to make it safely potable.

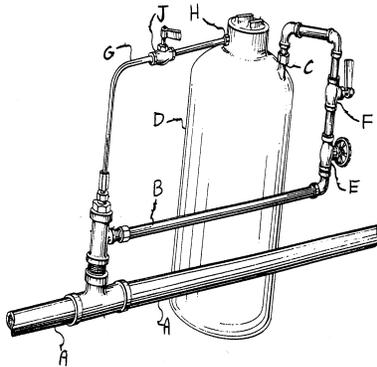


Figure 1: A typical example of the subject matter. A - Water under pressure; B - Treatment device inlet tubing; C - Inlet to treatment device; D - Treatment device (holds chemical); E - Flow rate valve; F - Inlet shut off valve; G - Treatment device outlet tubing; H - Outlet from treatment device; J - Outlet shut off valve.

SEE OR SEARCH CLASS:

- 122, Liquid Heaters and Vaporizers, subclasses 379 through 405 for cleaning.
- 210, Liquid Purification and Separation, subclasses 198.1 through 221.2 with means to add treating material, or subclass 444 for a system with a filter within a flow line and the filter being suspended from a head of a casing.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 256 for a physical type apparatus for liquid-liquid contact means for separating or dissolving a material constituent.

599.16 Second valve assembly carried by first valve head:

This subclass is indented under subclass 599.01. Subject matter wherein a valve head carries the head and seat of another valve.

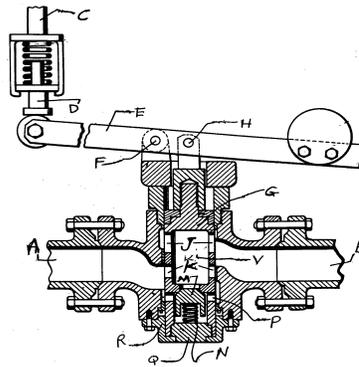


Figure 1: A typical example of the subject matter. A - Fluid inlet; B - Fluid outlet; C - Movable accumulator rod; D - Yieldable foot engages lever 'E'; E - Lever; F - Valve lever pivot; G - Accumulator control valve; H - Control valve pivot; J, K - Control valve ports; L - Control valve hollow interior; M - Self contained check valve (built within valve 'G'); N - Spring seated upon plug 'Q'; P - Series of ports in check valve; Q - Plug; R - Packing gland.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 493.1 through 493.6, for a line condition change responsive bi-directional flow valves where one head and seat carried by head of another.
- 512.2, for plural direct response valves (i.e., check valves) where one valve carries the head and seat for the second valve.

599.17 With rotary plug having variable restrictor:

This subclass is indented under subclass 599.16. Subject matter wherein the first valve head revolves about its own axis and includes means to adjust parallel flow path.

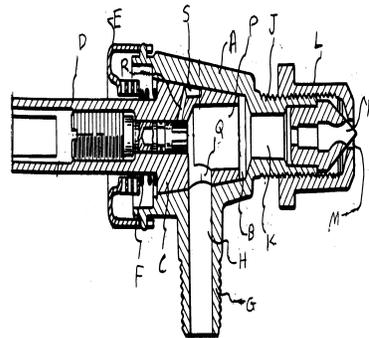


Figure 1: A typical example of the subject matter. A - Firstvalve body; B - Tapered valve chamber; C - Tapered plug valve element; D - Hollow valved stem; E - Valve cap; F - Coiled spring acts upon the valve member to keep it seated; G, H - Threaded valve body extension with inlet passage; J, K - Thread valved body extension with outlet passage; L, M, N, - Second orifice valve assembly; P - Axial passage in plug element to provide flow to 'K'; Q - Axial passage in registry with 'H'; R, S - Variable restrictor.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 117 for a restrictor in parallel to a main valve or subclasses 118-127 for a material guide or restrictor.

599.18 Carried valve is direct response valve (e.g., check valve, etc.):

This subclass is indented under subclass 599.16. Subject matter wherein the other flow regulating means comprises a device which automatically limits the flow to a single direction and is sensitive to the pressure of the fluid.

- (1) Note. Since the check valve has no other actuator, its movement from a normal, neutral, or biased position is caused solely by a change in the fluid flow or pressure in the line, and the valve returns to its original position when the original condition is restored.

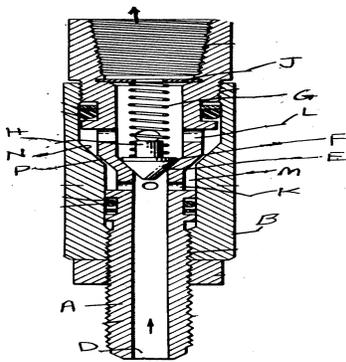


Figure 1: A typical example of the subject matter. A - Valve body; B - Valve sleeve; C - Lock nut; D - Passageway; E - Annular valve seat; F - Check valve element held against by 'G'; H - Boss; J - Spring retainer; K - Valve port (upstream side); L - Valve ports (downstream side); M - Annular passageway cocentric with

'D'; N, P - Shoulders serve as cooperating valve elements.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

511 through 543.23, for a direct response valve (i.e., check valve type).

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 402.1 through 402.25 for a fluid pressure type discharge assistant wherein the valve is actuated by a nozzle or through an outlet of the valve.
417, Pumps, subclass 296 for a condition responsive pumped fluid control where the bypass or relief valve part is carried by or carries a distributor part.

600 With foam controlling means (e.g., beer, soda faucets):

This subclass is indented under subclass 599.01. Subject matter having a dividing and obstructing member in the flow path to cause and/or control foaming of the fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

896+, for foam controlling devices having plural inlet passages.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 40+ for flow restrictors in pipes.
239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 463+ and 552 for sprayer devices having an obstructing element inserted in the fluid line for the purpose of inducing or minimizing rotation of the fluid.
251, Valves and Valve Actuation, subclasses 118+ for valved flow passages having a restrictor in the flow passage.

601.01 With common operator:

This subclass is indented under subclass 599.01. Subject matter having at least one valve in each parallel flow path and wherein both valves are controlled by a single operating means.

- (1) Note. The common operator can be a single actuator physically connected to separate valves or central control means connected to physically independent valve actuators.

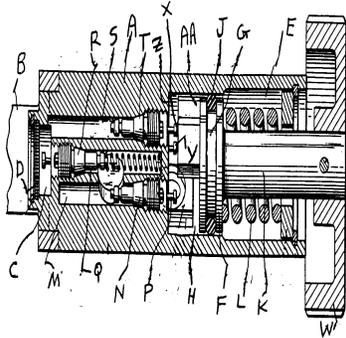


Figure 1: A typical example of the subject matter. A -Housing; B - Yoke; C - Input chamber connected to 'H' by passages'M', 'Q', and 'S'; D - Filter; E - Cylinder bore for piston 'F'; F- Piston; G - Groove for 'O'-ring 'J'; H - Expansible chamber; J- Resilient 'O'-ring for sealing chamber 'C'; K - Piston rod; L- Spring disposed around 'F'; M - First passage; N - Valve; P - Valve actuator; Q - Second passage; R - Spring controlled valve; S - Third passage; T, V - Valves with actuators 'X' and 'Y'; W - Hand-Wheel; X, Y - Valve actuators; Z - Wall for locating 'X' and 'Y'; AA - Common valve operator. Note (1): Valve 'V' is behind valve 'T'. Note (2): Common valve operator 'AA' selectively operates actuators'X' and 'Y'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 599.06 through 599.07, for systems having separately actuated valves operated in common by a digital flow controller and their flow lines.
- 595, for systems having plurally noncommunicating flow paths having a common valve operator.
- 607, for systems having a multiple inlet having a flow control valve in each inlet having a common valve operator.
- 614.11 through 614.15, for systems having a flow path having serial valves or closures and a common actuator.
- 627, for systems having a sequential distributor or collector type.

- 627.5, for systems having a sequentially closing and opening alternately seating flow controllers.
- 628 through 630.22, for systems having a sequentially progressive opening or closing of plural valves.
- 636, for systems having a selective motion for a plural valve actuator.
- 862 through 871, for systems having flow control means for branched passages including a common valve operator.

SEE OR SEARCH CLASS:

- 236, Automatic Temperature and Humidity Regulation, subclass 80 for a fluid-operated motor controlled by a relay including a shunt for plural pilots having a single actuator.
- 431, Combustion, subclass 90 for a timer, programmer, retarder, or condition responsive control by condition of burner feed or feed means where a sensor of one feed controls another feed.

601.02 Balanced valve:

This subclass is indented under subclass 601.01. Subject matter wherein the flow regulating means in each branch is so related to the fluid controlled that the pressure bias imparted by the line pressure is in equilibrium with respect to opposing surfaces of the regulating means.

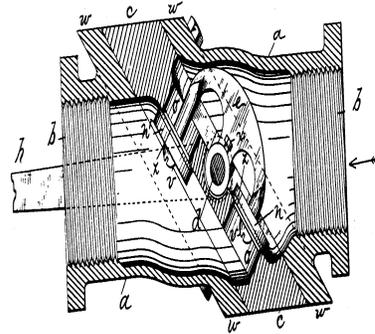


Figure 1: A typical example of the subject matter. In operation, fluid is permitted to pass through the valve by operating lever 'H' to rock the shaft 'D', thereby lifting each valve 'n n' simultaneously from its seat allowing the fluid to flow through passages 'o o'; since the fluid pressure acts on one valve to force it against its seat and to

the other valve to force it from its seat, valves are balanced between opposing pressures.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 281 through 283 for a balanced valve.

601.03 Single resilient member actuates or forms plural passages:

This subclass is indented under subclass 601.01. Subject matter wherein a device consisting of an element capable of returning freely to a previous position, shape, or condition operates valves in response to the control pressure in parallel flow paths or the element is a valve means for parallel flow paths.

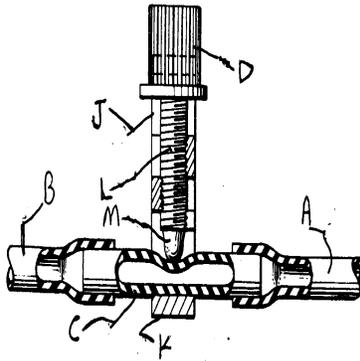
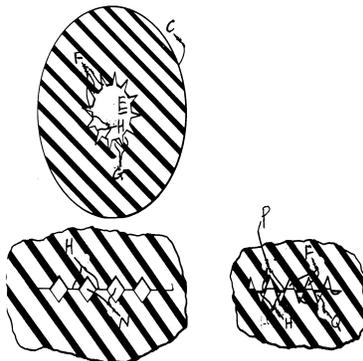


Figure 1: A typical example of the subject matter. IN GENERAL. A - First conduit; B - Second conduit; C - Third conduit; D - Clamping mechanism; E - Interior passage whose wall defines a plurality of serrations.



Figures 2, 3, and 4: Typical examples of the subject matter. F - 'V'-shaped grooves; G - Projections; H - Flat surfaces (wall of 'E' (see Figure 1) defines serrations consisting of 'V'-shaped grooves ('F') having projections ('G') and inner flat surfaces ('H')); J - Clamp body; K -

Bottom wall; L - Shaft; M - Cam; N - Passages; P - Passages (Passages 'N' and 'P' formed due to clamping action until the fluid is completely stopped); Q - Passages formed due to clamping action for flow of fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

512.15, for plural direct response valves provided by an integral resilient member characterized by dividing and recombining in a single flow path.

SEE OR SEARCH CLASS:

91, Motors, Expansible Chambers Type, subclasses 514 through 516 wherein the pressure responsive valve divides motive fluid between motors.
251, Valves and Valve Actuation, subclasses 4 through 10 for tube compressors.

601.04 Valves deform to close passage:

This subclass is indented under subclass 601.01. Subject matter wherein the flow regulating means with the help of the increased external pressure alters the shape of the collapsible and expansible flow paths or conduits by varying degrees to complete closure.

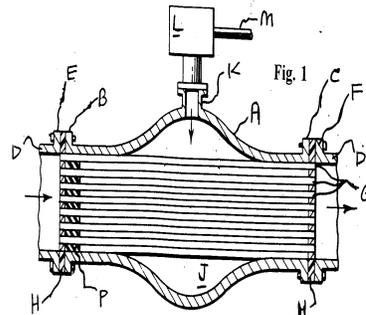
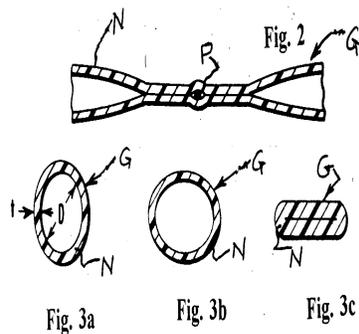


Figure 1: A typical example of the subject matter. A - Valve housing (exterior); B, C - Pair of flanged ends; D - Fluid line inlet end; E, F - Fluid line flanged ends; G - Plurality of fluid-tight tubes; H - tube sheets; J - Space for control fluid; K - Control fluid inlet; L - Valve with a pump; M - Control fluid line; N - Tubewall (uniform); P - Elastomer.



Figures 2, 3a, 3b, and 3c: Typical examples of the subject matter. G - Plurality of fluid type tubes; N - Tube wall (uniform); P - Elastomer.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

489 through 489.5, for a line condition responsive pilot or servo controlled valve choked or throttled fluid pressure type.

SEE OR SEARCH CLASS:

160, Flexible or Portable Closure, Partition, or Panel, subclasses 220 through 221 for movable plural strips, slats, or panels interconnected for plural relative motions.

251, Valves and Valve Actuation, subclass 5 for fluid pressure actuated tube compressor or subclass 212 for relatively movable valve elements forming single port closure (e.g., an iris diaphragm, etc.).

454, Ventilation, subclasses 333 through 336 for an inlet airway having an adjustable valve or damper or subclasses 358-364 for an outlet airway having a readily movable air regulating louver, damper, or cover.

601.05 Rotary valve:

This subclass is indented under subclass 601.01. Subject matter wherein at least one flow regulating means includes the head which turns or revolves about its axis to open and close the regulating means. (1) Note. Valves having rotary actuator motion to reciprocate a valve or compound rotary and reciprocal motions (helical or screw thread) are found in other appropriate subclasses under 601.01.

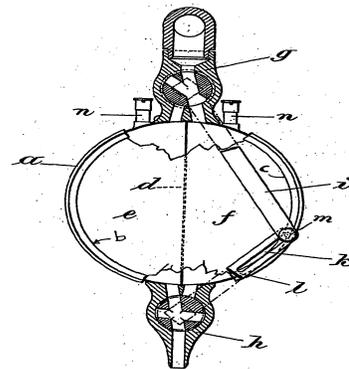


Figure 1: A typical example of the subject matter. A - Measuring vessel; B, C - Opposite glass walls; D - Vertical partition forming chambers 'E' and 'F'; G - Cock; H - Tapping-cock; M - Handle which operates both 'G' and 'H'. Note: Handle 'M' is fixed to the key 'I' and passes through slot 'K' in the key 'L'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

625.31, for systems characterized by dividing into parallel flow paths with recombining having a rotary multi way valve.

865, for flow control means for branched passages with a gear operated common valve operator that may be rotary.

601.06 Including rigid plate with flexible or resilient seal:

This subclass is indented under subclass 601.05. Subject matter wherein the valve head is made of a substantially flat plate and having an element which is intended to stop leakage between the plate and an adjacent plate or the housing of the valve and wherein the element comprises material that deflects under pressure or under force exerted during the operation of the valve, but returns to its original state when the pressure or force is removed.

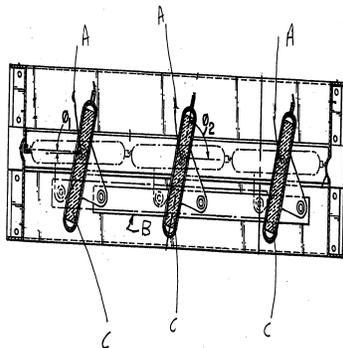


Figure 1: A typical example of the subject matter. A - Damperblades; B - Linkage mechanism to operate 'A'; C - Seals.

601.07 Axes of rotation of valves intersect at point:
 This subclass is indented under subclass 601.05. Subject matter wherein a straight line about which each flow regulating means of a plurality of flow means is conceived to revolve, cut into one another to share a narrow, localized spot.

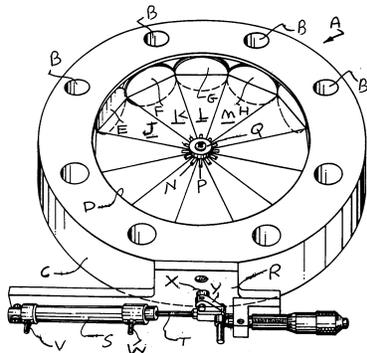


Figure 1: A typical example of the subject matter. A - Valvehousing; B - Mounting holes; C - Outer peripheral surface; D - Innerperipheral surface; E, F, G, H - Rotatable shims, each occupies a space between corresponding vanes J, K, L, and M; J, K, L, M- Connected vanes; N, P - Vane tips rotate within hub 'Q'; Q - Hub; R - Bracket carrying actuator 'S'; S - Actuator; T - Plunger; V, W - Orifices for fluid inputs to control 'T'; X - Shaft controller turned by 'T'; Y - Crank. In operation, servo controller supplies fluid to the orifices 'V' and 'W' so that piston within the actuator 'S' is moved back and forth, controlling plunger 'T' to obtain desired valveopening.

SEE OR SEARCH CLASS:

- 60, Power Plants, subclasses 226.1 through 226.3 for interrelated reaction motors where air and diverse fluid discharge from separate discharge outlets (e.g., fan jet, etc.).
- 415, Rotary Kinetic Fluid Motors or Pumps, subclasses 77 through 79 for an axial flow runner with blades extending radially inward and outward from a common annulus or subclasses 159-166 for a selectively adjustable vane or working fluid control means upstream of runner having plural and arcuately or circularly arranged around a runner axis.
- 431, Combustion, subclasses 182 through 184 for a plural fuel disperser means extending to a common wall opening of a furnace and a duct with air whirling means surrounds disperser.
- 454, Ventilation, subclass 308 for an inlet airway including a specific air distributor (e.g., register, etc.) having vanes or elongated output slots extending radially.

601.08 Axes of rotation parallel:

This subclass is indented under subclass 601.05. Subject matter wherein a line about which each flow regulating means of a plurality of flow means is conceived to revolve, extends in the same direction, and is equidistant everywhere.

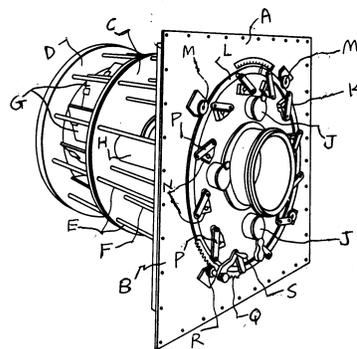


Figure 1: A typical example of the subject matter. A - Airflow regulating assembly for a burner; B - Front main plate; C -Circular center plate; D - Circular rear plate; E - Spacer rods joining all plates; F - Control rods; G - Secondary air vanes; H- Observation tubes; J - Tube

cover; K - Flow control mechanism consisting of operating ring 'L', central rollers 'M', actuating arm 'N', link 'P', rack segment 'Q', pinion gear 'R', and crank handle 'S'.

SEE OR SEARCH CLASS:

- 165, Heat Exchange, subclass 101 for an adjuster for heat or exchange material branched flow that controls flow through parallel heating or cooling means.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclass 590.5 for a rigid fluid confining distributor having interior filter or guide and plural parallel fluid directing means.

601.09 Adjacent plate valves always parallel:

This subclass is indented under subclass 601.08. Subject matter wherein the flow regulating means comprising a substantially flat sheet of uniform thickness and the one immediately preceding or following are equidistant from each other.

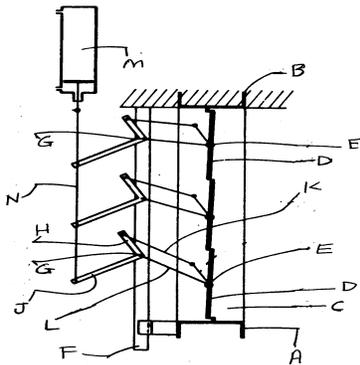


Figure 1: A typical example of the subject matter. A, B - Lower and upper frame members; C - Lateral members; D - Damper blades; E - Blade shafts; F - Support member to actuate blades; G, H, J, K, L - Bell crank levers, operating links, and tie link mechanism form a parallelogram; M - Air cylinder; N - Coupling rod connected to bell crank levers.

SEE OR SEARCH CLASS:

- 49, Movable or Removable Closures, subclasses 73.1 through 123 for closures interconnected for concurrent movement.
- 454, Ventilation, subclasses 319 through 320 for an inlet airway having a louvered air distributor including moveable plural vanes pivoting about

individual axes or subclasses 335-336 for an adjustable valve (e.g., damper, etc.) having plural blades pivoting along parallel axes.

601.11 Adjacent plate valves counter rotate:

This subclass is indented under subclass 601.08. Subject matter wherein the flow regulating means comprising a substantially flat sheet of uniform thickness and one immediately preceding or following revolve in opposite direction to each other or move toward and away from each other.

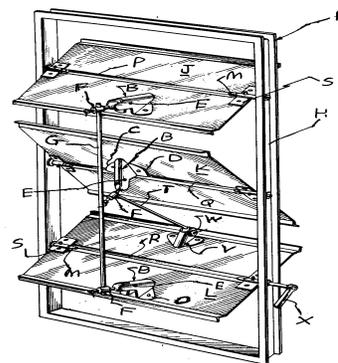


Figure 1: A typical example of the subject matter. A - Damper assembly; B - Socket swivel unit; C, D - Flanges; E - Cross bar; F - Shank; G - Actuating rod element; H - Damper frame; J, K, L - Damper blades; M - Bearing pins; P, Q, R - Lateral channels; S - Bearing strap; T - Connecting rod; V - Trunion support; W - Rotatable trunion; X - Blade actuating means.

SEE OR SEARCH CLASS:

- 49, Movable or Removable Closures, subclasses 116 through 123 for closures interconnected for concurrent movement having opposed similar movement.
- 138, Pipes and Tubular Conduits, subclass 46 for flow regulators or baffles having a variable restriction.
- 454, Ventilation, subclass 336 having an inlet airway with adjustable blades pivoting along parallel axes where adjacent blades pivot in opposing directions.

601.12 Mechanical movement between actuator and non-rotary valve:

This subclass is indented under subclass 601.01. Subject matter wherein the significance is attributed to moving parts of the mechanism that transmit definite motion to the non-revolving component of the flow regulating means or to the regulating means itself, such that the motion provided at the input (actuator) end of the mechanism is different in direction or distance traveled than the motion at the output (valve) end of the mechanism.

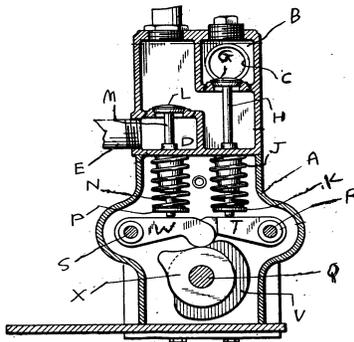


Figure 1: A typical example of the subject matter. A - Controller casing; B - Steam inlet chamber; C - Steam pipe; D - Exhaust chamber; E - Steam outlet; G - Non-rotary poppet valve; H - Lifting stem; J - Valve spring; K - Washer; L - Non-rotary poppet valve; M - Valve stem; N - Valve spring; P - Washer; Q - Cam shaft; R, S - Spindles affording bearing for valve levers; T - Valve lever; V - Lever support cam; W - Valve lever; X - Rotary cam.

SEE OR SEARCH THIS CLASS, SUBCLASS:

315.35 through 315.4, for a particular mechanical actuator of a valve with repair, tapping, assembly, or disassembly means.

434 through 451, for a float arm operated valve.

628 through 630.22, for systems having sequentially progressive opening or closing of plural valves.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 90.1 through 90.67 for various poppet valve operating mechanisms.

- 236, Automatic Temperature and Humidity Regulation, subclass 1 for miscellaneous multistage multiple valve staging valve controls that may include mechanical actuating means or for miscellaneous multistage single valve staging valve controls that may include mechanical actuating means.
- 251, Valves and Valve Actuation, subclasses 213 through 280 for a mechanical movement actuator.

601.13 Fluid actuated or retarded:

This subclass is indented under subclass 599.01. Subject matter wherein the significance is attributed to a valve device in which the opening or closing movement of the valve is produced or modified by the relative force of gas, liquid, or a mixture of a solid and liquid in a flowable form acting against a portion of the valve actuating means.

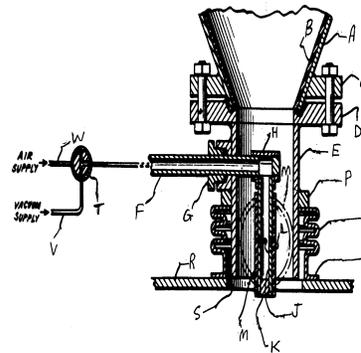


Figure 1: A typical example of the subject matter. A - Supplyhopper; B - Resistant coating; C, D - Flanges; E - Valve body; F - Air-vacuum line; G - Compression fitting; H - 'T' fitting; J - Tube; K - Tube plug; L - Perforations; M - Close fitting rubbertube; N - Flexible coupling; P - Flange; R - Pressure vessel; S - Opening in vessel; T - Three-way valve; V - Line through which vacuum is pulled; W - Air supply line. In operation, air pressure is supplied through 'F', 'H', 'J', and 'L', causing the rubber tube 'M' to expand into the position shown by dotted lines, thus closing the opening in 'E' and cutting off flow through 'A'. When 'T' is opened, vacuum is pulled through 'V', quickly collapsing the tube 'M' against 'J'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.19, for a process of assembling, disassembling, or repairing a fluid actuated or retarded valve.

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, subclasses 418 through 470 for a motive fluid valve.

222, Dispensing, subclasses 481 through 489 for plural openings or discharge guides having flow controllers or closures.

251, Valves and Valve Actuation, subclasses 12 through 63.6 for a fluid actuated or retarded valve actuating means or subclass 175 for means to increase head and seat contact by fluid pressure.

267, Spring Devices, subclasses 64.16 through 64.21 for a vehicle spring having a compressible fluid with a retarder leveling device.

601.14 Electrical actuator:

This subclass is indented under subclass 599.01. Subject matter wherein the position of the valve is moved by a mechanism powered by electricity, such as a solenoid, motor, or piezoelectric actuator.

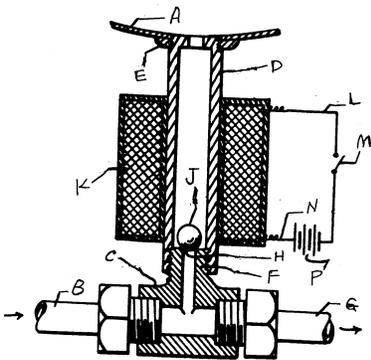


Figure 1: A typical example of the subject matter. A - Fuel tank; B - Inlet; C - 'T' coupling; D - Tank drain; F - Valve stem; G - Outlet; H - Valve seat; J - Ball check valve; K - Electromagnetic coil; L, N - Conductors; M - Switch; P - Power source.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

66, for a thermoelectric combustion failure responsive fuel safety cut off for burners.

599.07, for systems having separately actuated valves operated in common by an electrically actuated digital flow controller and their flow lines.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 30.01 through 30.05 for a fluid actuated or retarded valve controlled by an electrically actuated pilot valve or subclasses 129.15-129.22 for an electrically actuated valve including a solenoid.

601.15 Mechanical movement between actuator and valve:

This subclass is indented under subclass 599.01. Subject matter wherein the significance is attributed to moving parts of the mechanism that transmit definite motion to the component of the flow regulating means or to the flow regulating means itself, such that the motion provided at the input (actuator) end of the mechanism is different in direction or distance traveled than the motion at the output (valve) end of the mechanism.

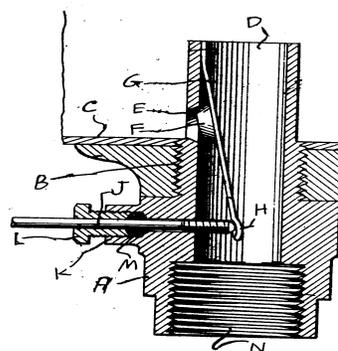


Figure 1: A typical example of the subject matter. RESERVE VALVE FOR FUEL TANK: A - Cylindrical casting; B - Screw threadsmatches internal threads of 'C'; C - Supply tank; D - Central passage; E - Port; F - Tapered valve to close port 'E'; G - Leaf spring; H - Leaf spring free end engaged to screw threaded rod 'J'; J - Screw threaded rod; K - Packing gland; L - Packing screw; M - Packing material; N - Internal screw head of

lower flow passage. In operation, port 'E' is opened by mechanical actuator (screw threaded rod 'J'), thereby allowing the fuel to feed from tank 'C' through port 'E' to inlet passage 'D'.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

315.35 through 315.4, for a particular mechanical actuator of a valve with repair, tapping, assembly, or disassembly means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 213 through 280 for a mechanical movement actuator.

601.16 Rotary valve:

This subclass is indented under subclass 599.01. Subject matter wherein at least one flow path has flow regulating means which turns on or revolves about its axis that passes through the regulating means itself.

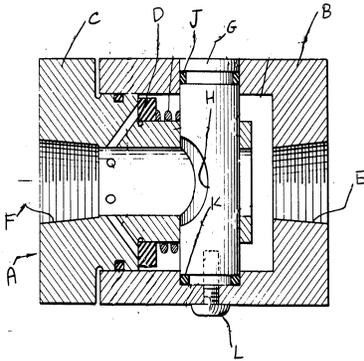


Figure 1: A typical example of the subject matter. A - Rotary control valve assembly; B - First body member; C - Second body members; D - Axially movable valve; E - Inlet passage; F - Outlet passage; G - Rotary flow-through valve; H - Cross slot in valve 'G' to align with 'F'; J, K - Rotary valve seal rings; L - Set screw (loosened when valve 'G' is rotatably adjusted). In operation, valve 'G' is rotatable whereby the position of cross slot 'H' relative to 'F' is selectively adjusted between valve-closed position and valve-open position.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

887, for systems having a flow control means for branched passages containing a rotary valve.

901, for biased rotary ball valves with operators.

905, for rotary valves for multiple gas burners.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 304 through 317.01 for a rotary valve.

601.17 Butterfly valve:

This subclass is indented under subclass 601.16. Rotary valve wherein the movable flow control member has a disk or semicircular clappers shape that rotate centrally and perpendicularly to open or close the flow passage to regulate the flow of fluid.

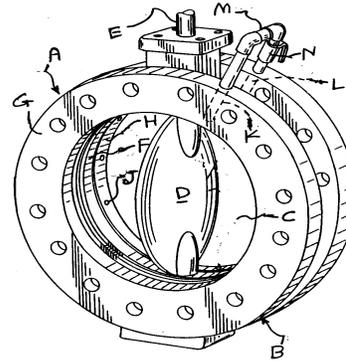


Figure 1: A typical example of the subject matter. A - Butterfly valve; B - Valve housing; C - Flow passage; D - Valve disc; E - Disc support shaft; F - Resilient seal; G - Flange (to secure pipe sections); H - Distribution ring; J - Jet orifices; K - Upstream radial port; L - Downstream radial port; M - Fluid conduit; N - Valve to control fluid movement.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15.25, for a process of assembling, disassembling, or repairing a butterfly valve.

315.22 through 315.24, for a butterfly valve with repair, assembly, or tapping means.

SEE OR SEARCH CLASS:

49, Movable or Removable Closures, subclasses 74.1 through 92.1 for a louver-type closure (e.g., slats, panels, etc.).

- 123, Internal-Combustion Engines, subclass 337 for a specific throttle valve structure.
- 220, Receptacles, subclasses 810 through 849 for a closure mounted for swinging (e.g., hinged, etc.).
- 251, Valves and Valve Actuation, subclasses 305 through 308 for a butterfly valve.
- 454, Ventilation, subclasses 333 through 336 for an adjustable damper type valve.

601.18 Having guide or restrictor:

This subclass is indented under subclass 599.01. Subject matter wherein at least one flow path has means to change flow direction or impede it without having the intention of blocking it completely during normal use.

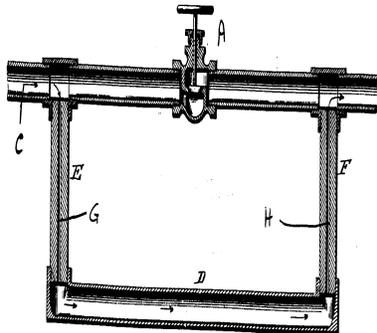


Figure 1: A typical example of the subject matter. A - Control valve; C - Inlet (discharge from boiler); D - Steam trap; E, F - Branch pipes; G, H - Contracted or constricted passages. Note: To insure the perfect operation of the steam trap, the passages 'G' and 'H' in the branch pipes 'E' and 'F' are contracted or constricted to such an extent in their diameter as to prevent the escape of steam with the water.

SEE OR SEARCH CLASS:

- 251, Valves and Valve Actuation, subclass 117 for a restrictor in parallel to a main valve or subclasses 118-127 for a material guide or restrictor.

601.19 Manually variable:

This subclass is indented under subclass 601.18. Subject matter wherein the guide or restrictor can be adjusted by a human being.

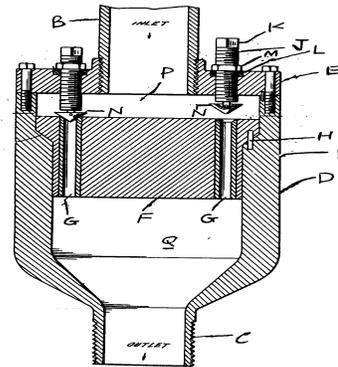


Figure 1: A typical example of the subject matter. A - Coupling device; B - Inlet; C - Outlet; D - Body of the device; E - Annular closing head; F - Removable adapter plate; G - Tubular insert; H - Dovel pins; J, K, L, M - Manually adjustable restrictor assembly; N - Restrictor valve; P - Inlet chamber; Q - Outlet chamber. In operation, fluid flowing into the device 'A' by way of the inlet pipe 'B' is trapped in the chamber 'P' and its passage into the outlet chamber 'Q' is regulated by the restrictor 'N'.

SEE OR SEARCH CLASS:

- 251, Valves and valve actuation, subclasses 121 through 122 for a movable or resilient adjustable guide or restrictor.

601.2 Having direct response valve (e.g., check valve, etc.):

This subclass is indented under subclass 599.01. Subject matter wherein at least one flow path has a flow regulating means comprising a device which automatically limits the fluid flow to a single direction and is sensitive to the pressure of the fluid.

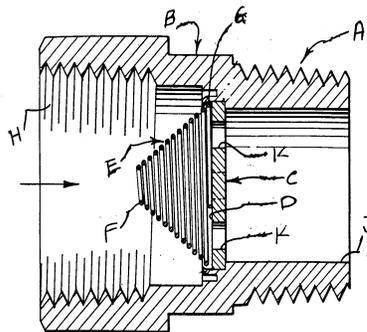


Figure 1: A typical example of the subject matter. A - Directresponse valve; B - Valve housing; C - Orifice member; D - Flatupstream face of 'C'; E - Orifice regulating spring; F - Apex coil;G - Base coil; H - Inlet port; J - Outlet port; K - Plurality ofequally spaced orifices. In operation, to maintain uniform flowthrough valve 'A', orifices 'K' are closed and opened with increases anddecreases in the pressure differential between 'H' and 'J'. Thiscontrol is provided by closure of 'F' against upstream face 'D'of the plate 'C' with changes in the pressure differential.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

526, for a line condition direct response vacuum relief type valve (i.e., check valve).

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 336 through 338 for a biased valve.

601.21 With reverse flow direction:

This subclass is indented under subclass 601.2. Subject matter wherein the direct response valve is provided with means causing the stream of fluid to turn completely in opposite path.

- (1) Note. The term 'reversible' refers, in this case, to a valve whose function of permitting the fluid to pass through it at a governed velocity in but one direction can be reversed in either direction at the will of the operator, without dismemberment of the valve.

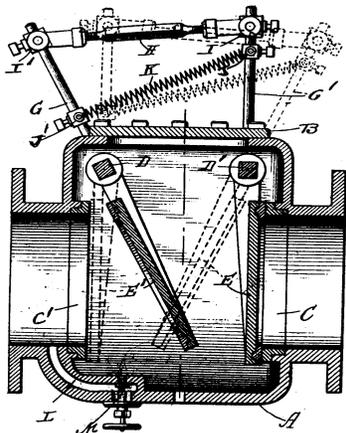


Figure 1: A typical example of the subject matter. A -Valve body; B - Body cover; C, C' - opposed valve seats;D, D' -Oscillating cross shafts; E, E' - Valves;G, G' - Levers; H - Adjusting rod flexibly joined to G,G'; I, I' - Adjustable collars; J, J' -Setcollars connecting G, G'; K - Spring connecting set collars;L - Bypass controlled by valve 'M'; M - Auxiliary valve.

SEE OR SEARCH CLASS:

137, Fluid Handling, subclasses 15.08 through 15.17 for a process of securing, replacing, or servicing a pipe, joint, valve, or tank, or subclasses 315.01-329.4 for a fluid handling system with repair, tapping, assembly, or disassembly means.

602 Multiple inlet with single outlet:

This subclass is indented under subclass 561. Systems including a fluent material branched flow line having two or more inlets or admission passages connected to a single outlet or exhaust passage.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 88+, and 111+, for systems which include a self proportioning or correlating feature and have plural inlets and a single outlet.
- 155, for gas lift devices for liquid columns which include a gas injecting means.
- 247.27, for liquid seal devices with plural inlets.
- 263, and 266+, for plural tanks having a common outflow path.
- 564.5, for a follower type feeder responsive to main line flow.
- 597, for multiple inlet systems with multiple outlets.
- 625.4+, for valve units performing this function.

SEE OR SEARCH CLASS:

- 48, Gas: Heating and Illuminating, subclasses 180+ for a device mixing gases, the mixed product being a heating or illuminating gas.
- 222, Dispensing, subclasses 145.1+ for dispensers comprising plural sources having a common discharge.

- 239, Fluid Sprinkling, Spraying, and Diffusing, appropriate subclasses under 303, 310, 340, 398, and 486 for spray devices having plural fluid inlets, where the mixing is effected prior to discharge through a single outlet nozzle passage.
- 261, Gas and Liquid Contact Apparatus, appropriate subclass for apparatus specially adapted to produce an intimate contact between gases and liquids to exchange properties or mutually modify conditions.
- 431, Combustion, subclasses 159+ for a furnace comprising a combustion chamber element with structure feeding fuel and air to form a shaped, distributed or directed flame within the chamber, and subclass 354 for a fuel and air mixer with an immediately associate unshaped flame holding fuel discharge structure.

603 Faucet attachment:

This subclass is indented under subclass 602. Systems comprising means at each inlet for attachment to a faucet, whereby the efflux from the respective faucets, usually hot and cold water, may be mixed prior to discharge from the single outlet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 337, for hot and cold water systems having a connection from the hot to the cold channel, usually for antifreeze purposes.
- 342, for mixing valves with soap dish, etc., supports.
- 562, for systems comprising a receiving means, usually a dish washer or clothes washer, to be filled from a sink faucet arrangement and emptied into the sink.
- 599.03 through 599.04, for systems having inlets where one or more flow lines divide into parallel flow lines then recombine.

605 With flow control:

This subclass is indented under subclass 602. Systems having means to stop or to regulate the flow of fluent material in one or more branches.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 631+, for valves of the cyclical type and see the search notes to subclass 631.

606 Valve in each inlet:

This subclass is indented under subclass 605. Systems in which the flow control means comprises one or more valves in each inlet branch.

- (1) Note. Mixing faucets for hot and cold water, which do not claim additional means to promote mixing, are classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 603, for valve devices of the plural inflow-single outflow type attachable to conventional hot and cold water faucets, i.e., mixing attachments for faucets.
- 888+, for valve devices comprising means for promoting mixing of the plural inflows. See (1) Note.
- 896+, for valve devices comprising means for promoting mixing of the plural inflows.

607 With common valve operator:

This subclass is indented under subclass 606. Systems in which at least one valve in each inlet branch is connected to a single operating means so as to be operated thereby.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 631+, for cyclical valves and actuators, and see the search notes thereto.
- 862+, for distribution systems plural branches and plural valves having a single actuator, and see the search notes thereto.

613 Flow path with serial valves and/or closures:

This subclass is indented under subclass 561. Systems comprising a single flow path for a fluent material having two or more spaced valves, flow controllers or closures therein through which the fluent material passes serially.

- (1) Note. A tank with claimed inlet and outlet, each with valve or closure, is here.

- (2) Note. See the class definition, Lines With Other Classes and Within this Class, (2) Plural Valves, and Subclass References to the Current Class, for search notes on plural valves and their actuators.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 232, for tire stems with inflation check valve and cap.
 247.17, for plural serial valves combined with liquid seal apparatus.
 269, for serially arranged valves, flow controllers, or closures, wherein one of these is a removable closure which is entirely separated from the remaining structure in order that a flow section may be attached in place thereof.
 285, 299 and 300, for hydrants including a main valve and a serially arranged supplemental valve.
 391, for liquid level control of both inflow and outflow of a tank.
 583+, for systems with plural openings, one of which is an access opening or a gas vent.
 596+, for drain and stop and waste valves, and see the search notes thereto.
 599.06 through 599.07, for systems where flow is divided into parallel flow lines then recombined having a digital flow controller for separately actuated valves and their flow lines.
 599.08, for systems where flow is divided into parallel flow lines then recombined having a multi way serial valve at dividing or recombining of the flow lines.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 445+ and 450+ for measuring traps with valved inlets and outlets and subclasses 478+ for dispensing containers with plural openings.
 251, Valves and Valve Actuation, subclass 118 for a valve in series with a restrictor.

614 Separable flow path section, valve or closure in each:

This subclass is indented under subclass 613. Systems in which the flow path includes joined, disconnectible, sections; one of the valves, flow controllers or closures being retained with each section.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 572, for series connected tanks with valved separable connections, and see the search notes thereto.
 637.05, for serial valves with actuators correlated across a separable joint in the flow path.

614.01 Common joint and valve seat faces, or sections joined by closing members:

This subclass is indented under subclass 614. Systems in which (1) the faces which seat the valves, flow controllers, or closures, when the sections are disjoined, abut each other when the sections are joined, (2) the valves, flow controllers, or closures, have integral with them that structure which joins the flow path sections.

614.02 Each valve and/or closure operated by coupling motion:

This subclass is indented under subclass 614. Systems in which actuation of each of the valves, flow controllers, or closures is simultaneous with the joining or disconnecting of the flow path sections.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 223+, for systems including coupling operated serial valves in which one of the valves is an inflation stem for a pneumatic tire or other inflatable article.

SEE OR SEARCH CLASS:

- 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 348+ for supply means carried receiver flow control opening means wherein receiver actuated supply discharge means may also be included.

244, Aeronautics and Astronautics, subclass 135 for arrangements for storing and feeding fuel on aircraft, or for supplying fuel to or removing fuel from aircraft.

614.03 Linear motion of flow path sections operates both:

This subclass is indented under subclass 614.02. Systems in which the joining or disconnecting includes a linear component of motion of the flow path sections with respect to each other, which linear component results in the operation of both valves, flow controllers or closures.

614.04 Valves actuate each other:

This subclass is indented under subclass 614.03. Systems in which the force which moves the valves, flow controllers, or closures is transmitted from one to the other and vice versa.

614.05 Valve- or closure-operated by coupling motion:

This subclass is indented under subclass 614. Systems in which actuation of one of the valves, flow controllers or closures is simultaneous with the joining or disconnecting of the flow path sections.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 89.5 for a valve related to separable flow path sections wherein blocking of the valve actuator is related to the joint between the sections, and subclass 149.9 for a valve related to separable flow path sections wherein blocking of the coupling operation is related to the valve or its actuator.

614.06 Coupling interlocked with valve, or closure or actuator:

This subclass is indented under subclass 614. Systems in which the act of joining the flow path sections and the act of operating one of the valves, flow controllers, or closures must be performed in a predetermined sequence.

SEE OR SEARCH CLASS:

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 335, 336, 348+, and 351+ for a valved joint between a portable supply and a receiver, the valve being operated by the act of connecting or disconnecting them.

251, Valves and Valve Actuation, subclasses 89.5 and 149+ for a valve operated by coupling motion of flow path sections, subclass 89.5 also including features of the coupling which may block or disable the valve actuator.

614.11 Common actuator:

This subclass is indented under subclass 613. Systems in which the several valves are operated by a single actuator.

614.12 Delivery cock with terminal valve:

This subclass is indented under subclass 614.11. Systems comprising a faucet-type cock having a closure which coacts with either the inlet or outlet end of the cock and is connected with the main cock valve for simultaneous actuation therewith.

614.13 Alternately seating:

This subclass is indented under subclass 614.11. Systems wherein as one valve is moved toward its closed position, another valve is simultaneously moved toward its open position.

SEE OR SEARCH THIS CLASS, SUBCLASS:

329.1, and 329.2+, for valves having a supplementary valve which is normally held open but closes upon disassembly of the main valve to prevent loss of fluid during repair of the main valve.

614.14 Biased valve:

This subclass is indented under subclass 614.13. Systems in which at least one valve is biased by spring means, gravity or fluid pressure.

614.15 Opposed screw:

This subclass is indented under subclass 614.11. Systems in which the valve heads are simultaneously moved toward or away from oppositely directed seats by a common actuator through a right and left hand screw relationship.

614.16 One valve head provides seat for other head:

This subclass is indented under subclass 613. Systems in which the movable element of one valve forms the seat for the movable element of another valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

637.5, for concentric rotary plug type valves having co-axial stems, the inner valve being removable without disturbing the outer valve.

614.17 Also carries head of other valve:

This subclass is indented under subclass 614.16. Systems in which a valve comprising a head and seat is carried by and movable with the head of another valve.

614.18 One valve head carries other valve head:

This subclass is indented under subclass 613. Systems in which the head portion of one valve is carried by and movable with the head of another valve.

614.19 Biased valve with external operator:

This subclass is indented under subclass 613. Systems in which at least one of the valves is biased by spring means, gravity or fluid pressure and which is also provided with an operator therefor which is manually actuatable from outside the system.

614.2 Direct response normally closed valve limits direction of flow:

This subclass is indented under subclass 613. Systems in which at least one of the valves is of the check valve type, thereby preventing flow in one direction.

614.21 Coaxial oppositely directed seats:

This subclass is indented under subclass 613. Systems in which two valve seats are provided in coaxial relationship, each seat having a separately actuatable head associated therewith.

615 Articulated or swinging flow conduit:

This subclass is indented under subclass 561. Systems comprising a spout, nozzle or similar fluid flow conduit having two or more sections joined for relative angular movement in one or more planes whereby the device may be swung or otherwise caused to assume various delivery or nonuse positions.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

274, for water cranes having a valve operated by the spout.

276, for water cranes having a spout articulated to a rotating riser.

279, for water cranes having a spout articulated to nonrotating risers.

438, for movable inlet terminals in float arm operated valve control of liquid level.

577+, for tanks combined with a movable outlet pipe or spout when level or quantity discharged is regulated thereby, especially subclass 579 for swinging spouts or pipes, and see the search notes to subclass 577.

801+, for fixed or flexible nozzles or spouts.

SEE OR SEARCH CLASS:

193, Conveyors, Chutes, Skids, Guides, and Ways, appropriate subclasses, especially subclasses 16, 17+, 22, and 23 for swinging conveyor chutes.

222, Dispensing, subclasses 526+ for dispensers having movable material discharge guides, especially subclasses 533+ for swingable discharge guides.

406, Conveyors: Fluid Current, subclasses 113+ and 114+ for a fluid current conveyor having a movable inlet or movable outlet, respectively.

616 Actuates valve:

This subclass is indented under subclass 615. Systems in which relative movement of the sections of the flow conduit actuates a valve which controls flow through the conduit.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

274, for water cranes having a valve operated by the spout.

286+, for hydrants having a valve actuated by movement of the riser.

SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, subclass 318 for air blast cleaners in which the air supply control is interlocked with nozzle motion means.
- 222, Dispensing, subclasses 519+, 522+ and 526+, especially subclasses 528, 529, 531+, 536, and 537 for dispensers having movable material discharge guides associated with closures.
- 251, Valves and Valve Actuation, subclass 149 for single flow path devices having a single valve contained in a pipe coupling or union in which the valve is operated by motion of the coupling or conduit, and subclasses 341+ and 349+ for valves having a casing, inlet or outlet which is also an actuator for the valve.

616.3 Plural motions of valve:

This subclass is indented under subclass 616. Devices wherein the movement of the flow conduit produces plural motions of the valve or valve components.

SEE OR SEARCH THIS CLASS, SUBCLASS:

315.36, for a particular mechanical actuator providing plural motions of a valve flow control member with repair, tapping, assembly, or disassembly means.

616.5 Reciprocating valve:

This subclass is indented under subclass 616. Devices wherein the movement of the flow conduit produces reciprocating motion of the valve or valve components.

616.7 Rotary valve:

This subclass is indented under subclass 616. Devices wherein the movement of the flow conduit produces rotary motion of the valve or valve components.

624.11 Programmer or timer:

This subclass is indented under subclass 561. Subject matter in which an actuating means provides (1) a continuously repetitive operation of one or more valves, (2) a single cycle of operation terminating in a position to restart an additional cycle, which cycle is more complex than a mere opening and closing of a single valve, or (3) a valve operation brought about at a particular time of day, or after a particular time delay period, following initiation of a nonfluid timer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 169, for cyclic gas pressure control of liquid feed traps to boilers.
- 387, for washing machine cycle control by level responsive means.

SEE OR SEARCH CLASS:

- 62, Refrigeration, subclass 231 for time or program actuation of a refrigeration device.
- 110, Furnaces, subclass 55 for timer control of a furnace door.
- 119, Animal Husbandry, subclasses 51.11+ for a timer controlled feeding device.
- 126, Stoves and Furnaces, subclass 285.5 for a timer controlled damper.
- 210, Liquid Purification or Separation, subclasses 138+ for timer controlled liquid treatment and subclasses 141+ for programmer controlled liquid treatment.
- 222, Dispensing, subclasses 14+ for a dispenser having a cut-off operated by a selectively preset volume or rate of flow responsive mechanism, and subclasses 638+ for a timer controlled dispenser. Class 222 takes those patents which significantly claim a supply container.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclass 66 for serially operated means distributing fluid to a diffuser, and subclasses 67+ for selectively preset means serving to cut off flow to a diffuser.
- 251, Valves and Valve Actuation, subclasses 48+ for a fluid dashpot, controlled valve or fluid controlled valve timer.

431, Combustion, subclasses 18+ for a burner assembly having a timer, programmer, or condition responsive control.

624.12 With independent valve controller:

This subclass is indented under subclass 624.11. Subject matter with means utilized for valve control independent of the programmer or timer.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 289 for a valve actuatable from any of a plurality of positions.

624.13 Repeating cycle:

This subclass is indented under subclass 624.11. Subject matter in which the actuating means is capable of causing a cycle of operation of one or more valves to be repeated.

624.14 Self-cycling:

This subclass is indented under subclass 624.13. Subject matter powered by the fluid controlled by the valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for a periodically operated siphon.
386+, for a liquid level responsive or maintaining system where the control is related to an accumulated quantity of the main flow.
396+, for a tank which empties itself as often as filled to a given level.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 232+ for a material operated expansible chamber self cycling valve in a meter.

624.15 Variable:

This subclass is indented under subclass 624.13. Subject matter in which means is provided for changing the cycle of operation.

624.16 Attachable and removable element:

This subclass is indented under subclass 624.15. Subject matter in which the change is brought about by either attaching or removing an element of the device.

624.17 Adjustable cam:

This subclass is indented under subclass 624.15. Subject matter in which the change is brought about by shifting the position of a cam element with respect to another portion of the device.

624.18 Plural, sequential, valve actuations:

This subclass is indented under subclass 624.11. Subject matter in which the actuating means causes sequential operations of a single valve or an operation of each of a plurality of valves in sequence.

624.19 Plural trips or trip actuations:

This subclass is indented under subclass 624.18. Subject matter in which the valve or valves, are each biased toward one position and are latched against the bias, and a trip or trips, are controlled for releasing the latch.

(1) Note. Where a single trip is involved, the trip must be operated a plurality of times.

624.2 Variable cycle:

This subclass is indented under subclass 624.18. Subject matter in which the sequential operations complete a single cycle of operation (e.g., open and close a valve) and means is provided for changing the cycle.

624.21 Clock alarm mechanism controlled:

This subclass is indented under subclass 624.11. Subject matter in which the actuating means includes the alarm mechanism of an alarm clock.

624.22 Biased latch, cam operated:

This subclass is indented under subclass 624.11. Subject matter including means biasing the valve in one direction, biased means latching the valve against its bias, and a cam for moving the latching means against its bias to free the valve for movement under its bias.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 66+ for a biased valve latched against the bias and having means to trip the latch so as to release the valve.

624.27 Line condition change responsive release of valve:

This subclass is indented under subclass 561. Device wherein an impediment means is provided to maintain a valve in one position of adjustment, and wherein a means responsive to a change in the fluid condition is effective, upon such change, to remove or disable the impediment means or to override its holding action to permit movement of the valve from the one position.

625 Multi-way valve unit:

This subclass is indented under subclass 561. Subject matter in which a single valve controlling communication with three or more flow lines, has its actuator or actuator so arranged or related as to determine or aid in the determination of the relative order, duration or magnitude of flow through each of the several flow lines.

- (1) Note. See the class definition, Lines With Other Classes and Within this Class, (2) Plural Valves, and Subclass References to the Current Class, for collected search notes on plural actuators for valves and actuators for plural valves.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 15.21, for a process of assembling, disassembling, or repairing a multi way valve or valve member.
 506, for plural condition responsive valves, at least one of which has a separate reactor surface.
 512+, for plural condition responsive valves of the direct acting type.
 561+, for distribution systems involving plural valves, with or without their actuators, in combination with flow containing means more extensive than that required to mount the valves.

625.11 Sequential distributor or collector type:

This subclass is indented under subclass 625. Devices in which a valve unit has a number of outlet ports and a lesser number of inlet ports, usually one, or a number of inlet ports and a lesser number of outlet ports, some of the ports being opened or closed as others close or open.

625.12 Sequentially progressive opening or closing of plural ports:

This subclass is indented under subclass 625. Devices in which a plurality of ports are sequentially progressively opened or closed by a valve unit.

625.13 With subsequent closing of first port:

This subclass is indented under subclass 625.12. Devices in which the first opened port is subsequently closed by continued movement of the valve unit.

625.14 Flow combining with flow dividing:

This subclass is indented under subclass 625.13. Devices comprising two or more inlets or admissions passages and two or more outlets or discharge passages wherein there is flow combining followed by flow dividing.

625.15 Rotary:

This subclass is indented under subclass 625.13. Devices which comprise valve units which only rotate.

625.16 Plug:

This subclass is indented under subclass 625.15. Devices comprising rotary plugs.

625.17 Selective reciprocation or rotation:

This subclass is indented under subclass 625. Devices in which control of flow passages may be obtained by reciprocation or rotation of the valve.

625.18 Plural noncommunicating flow paths:

This subclass is indented under subclass 625. Devices having a plurality of distinct conduits or passages, flow through which is so controlled by a single valve unit that flow lines never unite.

625.19 Rotary plug:

This subclass is indented under subclass 625.18. Devices wherein the valve unit is of the rotary type.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 587+, for tank systems where one passage is a vent.

625.2 Supply and exhaust:

This subclass is indented under subclass 625. Devices comprising a flow line controlled by a valve unit which has a passage connectible between atmosphere and the downstream portion of the line, whereby that portion may be completely drained or fluid therein may escape to waste.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

307+, for similar structure in hydrant valves.
589, and 596+, for systems which are vented or drained.

625.21 Rotary valve:

This subclass is indented under subclass 625.2. Devices in which the valve unit rotates.

625.22 Plug type:

This subclass is indented under subclass 625.21. Devices in which the valve unit is a rotary plug.

625.23 For plural lines:

This subclass is indented under subclass 625.22. Subject matter wherein a plurality of lines downstream of the valve will be drained.

625.24 Axial and radial flow:

This subclass is indented under subclass 625.22. Subject matter having radially and longitudinally extending passages in the plug.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 310 for plugs with axial and radial flow in a single flow line.

625.25 Reciprocating valve:

This subclass is indented under subclass 625.2. Devices wherein the valve unit reciprocates rectilinearly.

625.26 Combined disk or plug and gate or piston:

This subclass is indented under subclass 625.25. Devices wherein the valve unit comprises a disk or plug for controlling one port and a gate or piston for controlling another port.

625.27 Plural disk or plug:

This subclass is indented under subclass 625.25. Devices wherein the valve unit comprises a plurality of disk or plug faces, each controlling a different port.

625.28 Dividing into parallel flow paths with recombining:

This subclass is indented under subclass 625.2. Devices comprising a single inlet or admission passage and a single outlet or exhaust passage, the passages being joined by a plurality of flow lines or passages controlled by a valve unit.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

309, for regenerative furnace reversing valves which similarly control flow.

599.08, for systems where flow is divided into parallel flow lines then recombined having a multi way serial valve at dividing or recombining of the flow lines.

625.29 Valve with bypass connections:

This subclass is indented under subclass 625.28. Devices in which the valve has connections in addition to those for the inlet and outlet to provide for dividing and recombining, e.g., a main passage with a connection for diverting flow to a device other than a valve and a connection for returning the flow to the main passage.

625.3 With metering feature:

This subclass is indented under subclass 625.28. Devices having means to vary the flow through the parallel paths.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

599.04, for system shaving flow inlets that divide into parallel flow lines then recombining having a digital flow controller.

599.05 through 599.07, for systems where flow is divided into parallel flow lines then recombining having a digital flow controller.

625.31 Rotary:

This subclass is indented under subclass 625.28. Devices in which the valve unit rotates.

625.32 Plug:

This subclass is indented under subclass 625.31. Devices in which the valve unit is a rotary plug.

625.33 Reciprocating:

This subclass is indented under subclass 625.28. Devices wherein the valve has a linear motion to and from flow obstructing position.

625.34 Spool:

This subclass is indented under subclass 625.33. Devices having a spool type valve (i.e., two port controllers immovably mounted on a single valve stem, said controllers coacting with co-axial seats).

SEE OR SEARCH THIS CLASS, SUBCLASS:

628+, especially subclasses 630.19+ for spool type valves having heads with relative movement with respect to each other.

625.35 With internal passage:

This subclass is indented under subclass 625.34. Devices wherein one flow path is through the longitudinal axis of the spool, e.g., a hollow spool with flow therethrough.

625.36 Unequal heads:

This subclass is indented under subclass 625.34. Devices having port controllers of unequal size generally to partially balance the valve.

625.37 Piston:

This subclass is indented under subclass 625.33. Subject matter wherein the valve is of the piston type.

SEE OR SEARCH THIS CLASS, SUBCLASS:

538, for line condition change responsive piston valves.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 190 for piston valves with means to increase the head and seat contact pressure to reduce wear upon operation.

625.38 With internal flow passage:

This subclass is indented under subclass 625.37. Subject matter wherein the piston provides an internal flow passage for the line fluid.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 325 for other piston valves providing an internal flow passage.

625.39 Sequential opening or closing of serial ports in single flow line:

This subclass is indented under subclass 625.38. Subject matter including sequential opening or closing of serial ports in a single flow line.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 210 for sequential opening or closing of serial ports without dividing and recombining the flow.

625.4 Multiple inlet with single outlet:

This subclass is indented under subclass 625. Devices wherein a branched flow line has two or more controlled inlets connected to a single outlet.

625.41 Rotary valve:

This subclass is indented under subclass 625.4. Devices comprising a rotary valve.

625.42 Selective opening of plural ports:

This subclass is indented under subclass 625. Devices in which one direction or kind of movement of the valve unit from an intermediate closed position will open one or a reduced number of a plurality of ports, and another direction or kind of movement of the valve unit will open another, the remaining, or all the ports.

625.43 Four port reversing valves:

This subclass is indented under subclass 625. Devices comprising four way valves having an inlet port, an outlet port and two intermediate ports, the valve being selectively movable into two positions, in one position the inlet port being connected to the first intermediate port and the second intermediate port being connected to the outlet port, and in the other position the inlet being connected to the second intermediate port and the first intermediate port being connected to the outlet port.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

309+, for reversing valves, regenerative furnace type.

625.29, for this structure when used in dividing and recombining structures.

625.44 Pivoted valve unit:

This subclass is indented under subclass 625. Devices in which the valve disk or plug unit swings around the means by which it is mounted with respect to the valve seats or casing and thereby controls two or more branched flow passages.

625.45 Gate:

This subclass is indented under subclass 625.44. Devices in which the valve moves transversely of the controlled flow passages.

625.46 Rotary valve unit:

This subclass is indented under subclass 625. Devices comprising a valve head which rotates about its axis and has a flow passage within it, and wherein two or more branched flow passages are controlled.

625.47 Plug:

This subclass is indented under subclass 625.46. Devices comprising a plug type body in which the flow passage has an inlet or outlet transverse to the axis of rotation and which forms a seat contacting portion.

625.48 Reciprocating valve unit:

This subclass is indented under subclass 625. Devices in which the valve unit moves rectilinearly to and from seats of controlled passages and thereby controls two or more branched flow passages.

625.49 Combined disk or plug and gate or piston:

This subclass is indented under subclass 625.48. Devices wherein the valve unit comprises a disk or plug for closing one port and a gate or piston for closing another.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

625.17, for similar structure wherein the operation is by selective reciprocation or rotation.

625.5 Plural disk or plug:

This subclass is indented under subclass 625.48. Devices comprising oppositely facing seating surfaces for co-axially aligned seats.

625.6 Pilot-actuated:

This subclass is indented under subclass 625.2. Device in which the valve unit is actuated by a fluid pressure motive means controlled by an auxiliary or pilot valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 25+ for pilot valve controlled fluid actuated valves.

625.61 Variable orifice-type modulator:

This subclass is indented under subclass 625.6. Device wherein the valve actuating mechanism is connected to a fluid pressure line and responsive to pressure differentials therein to move the valve, and wherein the pilot includes a constantly discharging opening connected to the line, and a modulating restrictor adjacent the opening and movable to and from the opening to vary the rate of flow and modify the pressure to thereby actuate the valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

83, for a jet control modulator, per se.

625.62 Opposed orifices; interposed modulator:

This subclass is indented under subclass 625.61. Device having two lines, each having an opening discharging toward the other, and wherein the restrictor is located between the orifices and movable to lower the pressure in one line and increase the pressure in the other.

625.63 Common to plural valve motor chambers:
This subclass is indented under subclass 625.6. Device in which a single pilot valve controls a plurality of valve actuating motor chambers.

625.64 Electric:
This subclass is indented under subclass 625.6. Device in which the pilot valve is operated by electric motive means.

625.65 Motor-operated:
This subclass is indented under subclass 625.2. Device in which the valve unit is operated by a power driven actuating mechanism.

625.66 Fluid motor:
This subclass is indented under subclass 625.65. Device in which the motor is actuated by a fluid.

625.67 Piston valve:
This subclass is indented under subclass 625.25. Device wherein the valve unit is a reciprocating piston.

625.68 With internal flow passage:
This subclass is indented under subclass 625.67. Device wherein the piston has a flow passage within it for the line fluid.

625.69 With annular passage (e.g., spool):
This subclass is indented under subclass 625.67. Device wherein an annular exterior flow passage for the line fluid is provided between adjacent seat engaging heads.

626 Plural petcocks:
This subclass is indented under subclass 561. Subject matter in which two or more valves of the type normally actuated by turning a relatively small thumb piece have means interrelating the motions of these thumb pieces.

- (1) Note. The pet cocks may be arranged at different levels on a fluid receptacle to serve as a test for maximum and minimum fluid levels in the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

595, for distribution systems having a common valve operator for valves in non-communicating flow paths.

861+, for distribution systems having a single inlet and plural outlets in which at least one flow control means is provided and at least two passages are controlled.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 485+ for dispensers having plural discharge outlets with interconnected or integral flow controllers.

627 Sequential distributor or collector type:
This subclass is indented under subclass 561. Subject matter in which the plural valves are of the distributor type, i.e., comprise a number of valve-controlled outlets and a lesser number of inlets, usually one, or a number of valve-controlled inlets and lesser number of outlets, some of the valves of the larger number opening or closing as others close or open.

SEE OR SEARCH THIS CLASS, SUBCLASS:

255+, for plural tanks with parallel flow, especially subclass 256 for sequentially filled and emptied tanks.

262, for plural tanks comprising flow dividing compartments.

263, and 266, for manifold type flow.

602+, for distribution systems having plural inlets and a single outlet.

861+, for distribution systems having a single inlet and plural outlets, in which at least one flow control means is provided and two or more passages are controlled.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 449 and 450 for rotary distributing valves for fuel to internal-combustion engines.

239, Fluid Sprinkling, Spraying, and Diffusing, subclass 66 for sprinkling and spraying devices having serial discharge.

627.5 Sequentially closing and opening alternately seating flow controllers:

This subclass is indented under subclass 561. Devices wherein an actuator moves one valve from an open to a closed position after which

the same actuator moves another valve from a closed to an open position.

SEE OR SEARCH THIS CLASS, SUBCLASS:

627, for sequential alternately seating valves of the mixing or distributing type.

628 **Sequentially progressive opening or closing of plural valves:**

This subclass is indented under subclass 561. Subject matter in which two or more valves are so arranged or actuated that one valve starts to open or close prior to another concurrently opening or closing valve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

184, for successively opened fluid responsive valves for venting liquid in a diverse fluid containing pressure system.

625.12, for mixing valves in which sequential flow is produced by a valve unit.

SEE OR SEARCH CLASS:

222, Dispensing, subclass 486 for plural outlet valves in a dispenser having actuating means for variable operation of the valves.

251, Valves and Valve Actuation, subclasses 77+ for lost motion arrangements between a single valve and its actuator.

629 **Pressure equalizing or auxiliary shunt flow:**

This subclass is indented under subclass 628. Subject matter in which the valves are located in flow passages which are connected in parallel.

- (1) Note. The effect of the prior opening of one valve may be to admit fluid pressure to the down stream side of the other valve to more nearly balance the pressure acting on the same and thus reduce the effort required to open the same.

SEE OR SEARCH THIS CLASS, SUBCLASS:

513.3, for direct response valves having a permanently open bleed port.

599.01 through 601.21, for systems dividing into parallel flow lines then recombining.

630 **One valve seats against other valve (e.g., concentric valves):**

This subclass is indented under subclass 629. Subject matter in which one valve is arranged to control a passage through the other valve element.

- (1) Note. The valves are frequently arranged so that they are concentric and the smaller valve, which is the first to open, seats against the larger valve.

- (2) Note. Frequently, the initially opened supplemental valve is mounted on and seats against the main valve and is termed a "pilot" valve although no servo-motor action is present because the supplemental valve merely tends to partly equalize the pressures on opposite sides of the main valve so that the main valve may be opened more easily against line pressure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

630.21, and 637.5, for other concentric valves.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 38+ for fluid actuated or retarded valves in which a pilot valve is seated on the motor or valve element.

630.11 **Locomotive throttle:**

This subclass is indented under subclass 630. Systems which are disclosed, or structurally limited, for use in steam locomotives to control the feeding of steam to the motor means.

630.12 **Gate:**

This subclass is indented under subclass 630. Systems in which at least one of the valves has a reciprocatory, rectilinear motion substantially normal to the fluid path.

630.13 **With balancing chamber:**

This subclass is indented under subclass 630. Systems in which a pilot valve controls line pressure in a separate chamber which balances,

or tends to balance the pressure differential across the second opened valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 38+ for pilot valve controlled choked pressure type servo-motor valve actuators in which the pilot valve is seated in the motor or main valve element.

630.14 First valve moves second valve:

This subclass is indented under subclass 630. Systems in which a structure rigidly connected to a first opened valve head engages structure rigidly connected to a second valve head so that continued motion of the first valve operator subsequently causes the second valve head to be positively opened.

630.15 Actuator moves both valves:

This subclass is indented under subclass 630. Systems in which a continuous motion of the actuator causes the actuator to engage and open one valve and then to engage and open a second valve.

630.16 With subsequent closing of first opened port:

This subclass is indented under subclass 628. Systems in which, after the sequentially actuated valves are opened, the first opened valve is closed.

630.17 Simultaneously moved port controllers:

This subclass is indented under subclass 630.16. Systems in which the valves are so related to each other that motion of one is necessarily accompanied by motion of the other, or others.

630.18 Screw-actuated differential valves:

This subclass is indented under subclass 628. Systems in which (1) at least one of the valves is screw actuated and the remaining valve or valves are biased so that as the screw is actuated one of the valves is moved to or from its seated position and further actuation of the screw in the same direction then moves the remaining valve or valves, against the bias, to or from the seated position, or (2) both valves are screw actuated by a common operator and a lost motion connection is provided between the

two movable valve elements or between one of the valve elements and its screw actuator.

630.19 Lost motion:

This subclass is indented under subclass 628. Systems in which there is provided a lost motion connection between the actuating means and one or more of the valves so that a continuous motion of the actuating means causes first one and then other valves to sequentially open or close.

SEE OR SEARCH THIS CLASS, SUBCLASS:

630.16, for sequentially progressive opening of plural valves with subsequent closing of the first opened passage in which there is lost motion between the actuator and the valves.

630.2 Cam determines sequence:

This subclass is indented under subclass 630.19. Systems in which cam means, usually between the actuator and the valves, compels the sequential actuation of the valves.

SEE OR SEARCH THIS CLASS, SUBCLASS:

630.16+, for cam actuated sequentially operated valves in which the first opened port is subsequently closed after another port has been opened.

630.21 Rotary concentric valves:

This subclass is indented under subclass 630.19. Systems in which the valves rotate about a common axis, one valve having relative motion with respect to and within the other, and having a lost motion connection between one of the valves and the actuator, or the other valve.

630.22 First valve actuates second valve:

This subclass is indented under subclass 630.19. Systems in which a subsequently operated valve is actuated by being contacted by the first or prior actuated valve, but not by the prior valve's actuator.

635 With preselecting means for plural valve actuator:

This subclass is indented under subclass 561. Subject matter in which a preliminary adjustment of the actuator mechanisms, not a part or

its actuating motion, determines the number or sequence of valves to be actuated.

- (1) Note. See the class definition, section 5 for search notes on manual valve actuating, selecting and adjusting mechanism.

636 With selective motion for plural valve actuator:

This subclass is indented under subclass 561. Subject matter in which one direction or kind of movement given a single actuator will operate one or a reduced number of a plurality of valves in either an opening or closing direction and another direction or kind of movement given the actuator will operate another, the remaining or all the valves in either an opening or closing direction.

636.1 Oppositely movable cam surfaces:

This subclass is indented under subclass 636. Devices which select by means of oppositely movable or usable cam or eccentric surfaces.

SEE OR SEARCH THIS CLASS, SUBCLASS:

599.06 through 599.07, for systems where flow is divided into parallel flow lines then recombined having a digital flow controller for separately actuated valves and their flow lines.

636.2 Rotation about either of two pivotal axes:

This subclass is indented under subclass 636. Devices in which the movements are rotation of the actuator arm about either of two pivots or pivotal axes.

636.3 Rotation of actuator arm about its pivot and its axis:

This subclass is indented under subclass 636. Devices in which one movement is rotation of the actuator arm about its pivot and another is rotation about its axis.

636.4 Reciprocation along and rotation about same axis:

This subclass is indented under subclass 636. Devices in which the movements are reciprocation of the actuator along, and rotation of it, about its axis.

637 Valves with separate, correlated, actuators:
This subclass is indented under subclass 561. Subject matter in which a plurality of valves or valve groups each are provided with individual, but particularly related actuator mechanisms.

637.05 Correlated across separable flow path joint:

This subclass is indented under subclass 637. Subject matter wherein the valves, or valve groups, are located at opposite sides of a separable joint in the flow path, and the particular relationship between the actuators includes a feature of separability of the joint.

SEE OR SEARCH THIS CLASS, SUBCLASS:

614.02+, for similar structure wherein the parts which cause the valves to operate are so intimately related to the separable joint structure that the joining and disconnecting action both cause simultaneous actuation of the valve.

637.1 Interlocked:

This subclass is indented under subclass 637. Devices having plural actuators with interlocking means therebetween, whereby the actuation of one valve is prerequisite to the actuation of another or additional valves, or whereby the opening of one valve precludes the opening of another until such time as the first opened valve has been closed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

383+, for valves in combination with a lock or seal.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 89+ for valves with means for blocking or disabling the actuator.

637.2 Coaxial stems:

This subclass is indented under subclass 637. Subject matter in which at least two independently actuable valves are provided with stem type actuators, each of which move about or along a common axis.

637.3 Rotary:

This subclass is indented under subclass 637.2. Subject matter in which at least one of the coaxial stem valves pivots about a fixed axis to open or close a fluid path or paths (e.g., plug valves, butterfly valves, etc.).

637.4 And reciprocating:

This subclass is indented under subclass 637.3. Subject matter in which the other coaxial stem valve has a rectilinear motion with respect to its seat or port.

637.5 Concentric, central valve removable:

This subclass is indented under subclass 637.3. Subject matter in which a rotary plug valve is within an outer concentric, separately actuated, rotary plug valve and so constructed that the central valve may be removed for repair or other purposes without disturbing the outer valve.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

614.16+, for a single flow path having plural serial valves in which one valve head provides a seat for another valve head.

797 FRANGIBLE:

This subclass is indented under the class definition. Subject matter wherein the device includes an element designed to rupture or break where a force of a magnitude greater than a predetermined value is applied thereto.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

68.11+, for devices in which some operation to control the system is caused by failure of the frangible part.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 541.1+ for dispensers with frangible outlet elements.

798 WITH COUPLING:

This subclass is indented under the class definition. Subject matter wherein the device includes a connecting means to join two or more flow lines in fluid conducting relation.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 148 for couplings combined with valves and see the search notes to subclass 148.

285, Pipe Joints or Couplings, for pipe couplings, per se.

799 Flexible:

This subclass is indented under subclass 798. Subject matter wherein the coupling is capable of flexing, bending or bowing.

(1) Note. This subclass includes articulated and swivelly mounted couplings.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

615+, for articulated or swiveled conduits in distribution systems, and see the search notes to subclass 615.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclass 150 for valve devices associated with a flexible or expansible coupling.

800 WITH CLOSURE:

This subclass is indented under the class definition. Subject matter wherein the device is provided with removable cap or similar closing means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

232+, for tire valve stems with cap.
296, and 371, for covers for hydrants and valve and meter wells.

377+, for guards and shields associated with distribution systems, especially subclass 382 for valve guards which prevent access to the valve but do not cut off fluid flow.

583+, for closures for access openings for distribution systems.

613+, for single flow path devices with serial valves and/or closures.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 89+ for closures and plugs for pipes.

- 220, Receptacles, subclasses 200+ for receptacle closures and see the notes collected in the definition of subclass 200 for a complete search on closures.
- 222, Dispensing, subclasses 544+, especially subclasses 546, 551, 552, and 554 for flow controllers or closures for dispenser openings.

801 FAUCETS AND SPOUTS:

This subclass is indented under the class definition. Subject matter wherein the device is provided with a fluid inlet or outlet in the form of a nozzle or spout which discharges the effluent in a desired direction or with a desired pattern or admits and directs it into a receiver of which it forms a part.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 615+, for articulated or swiveled nozzles or spouts, and see the search notes thereto for movable devices of this type.
- 800, for nozzles or spouts provided with a removable closure member.
- 861+, for deflector type spouts forming a branch outlet.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 519+, 522+, 526+, and 565+ for dispensing nozzles and spouts, and see section 19, of the class definition of Class 222 and search notes therein.
- 239, Fluid Sprinkling, Spraying, and Diffusing, appropriate subclasses for specific nozzle structures for sprinkling or spraying fluids.
- 251, Valves and Valve Actuation, subclasses 153+ for valves combined with inlet or outlet structure comprising a single flow path, especially 155 for valves associated with nozzles or spouts, subclass 340 for a valve actuator surrounding a nozzle, and subclass 349 for inlet or outlet element which serves as a valve actuator.

802 MISCELLANEOUS:

This subclass is indented under the class definition. Devices not hereinbefore provided for.

- (1) Note. For example, in this subclass are found dummy valves and outlet and conduit forms and materials, including valve bodies, per se.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 561, for systems for branch flow without valves.
- 594+, for plural noncommunicating flow path systems.
- 799, for flexible couplings for conduits, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 575 for miscellaneous dispenser devices, especially for particular outlet shapes.

803 FLOW AFFECTED BY FLUID CONTACT, ENERGY FIELD OR COANDA EFFECT (E.G., PURE FLUID DEVICE OR SYSTEM):

This subclass is indented under the class definition. Subject matter wherein movement of a stream of fluid is controlled by one or more devices, at least one of the devices having the following characteristics:(A) the stream is caused to flow into the device through a passage or along a path of flow, or the stream is caused to flow in a predetermined condition or amount of flow into the device; (B) the stream is caused to flow out of the device through a passage or along a path of flow, and the stream is diverted to flow out of the device through a different passage or along a different path of flow, or the stream is caused to flow in an altered condition or amount of flow out of the device; (C) the diversion of alteration (referred to in (B) above) is caused by one or more of the following,(1) direct contact of at least one other stream of fluid with the inflow stream, or (2) application of an energy field directly to the inflow stream, or (3) application of the Coanda effect.

- (1) Note. Devices known in the art as "pure fluid devices" or "fluid amplifiers" and which act to control or vary high energy flows by relatively low energy flow or fields are here included.

- (2) Note. The phenomenon known as the Coanda effect occurs when a jet of fluid is injected into a wide container and due to some disturbance in flow or shape of the container the jet stream moves to one wall or other of the container and continues to flow along that wall. As long as the flow is not otherwise disturbed the flow remains “locked” onto the wall of the container. Patents having claims directed to subject matter involving this effect will be found in this subclass even though no means is claimed to provide for an additional control of the stream by another stream or an energy field.
- (3) Note. As a general rule, the device of this and indented subclasses have no moving parts for effecting the control function. Necessary exceptions to the “no-moving-parts” rule are in the use of valves to regulate the amount or direction of control input fluid, or in the use of mechanism to cause the generation of control input energy field, or in the use of a surface or element extending generally along or adjacent the path of any of the streams in the device, which surface or element is moved to cause a diversion or variance of the power output relative to the power input by the “Canada” or “locking” effect referred to in (2) Note above. See subclasses 829+ for devices referred to herein.
- (4) Note. Line between Class 235 subclass 200+ and Class 137 subclasses 803+. Patents in Class 235 subclasses 200 and 201 were screened for inclusion into these subclasses (803+) as original patents. Those patents having structural characteristics of a fluidic device as defined in this subclass (803) and/or provided for in the subclasses hereunder were transferred into the appropriate subclasses in accordance with their structure. The functional characteristics of said patents were further indexed into the coordinate index dual system in accordance with their named function(s). Patents claiming significant computer structure or function were excluded from Class 137 and were retained in Class

235. Examples of what is “not significant” and “significant” will help to clarify the line dividing the classes. The mere statement in a claim of “a binary counter” or “a half-adder”, or “converter” comprising one or more fluidic devices is “not-significant” (and thus is proper for subclasses 803+) even though the fluidic devices are described by such exemplary fluidic terms as “logic element”, “bi-stable or flip-flop element”, “and element” (as well as similar “logic” terms) and “amplifier”.

Such terms have acquired acceptance in the fluidic arts as well as the electronic and computer arts. However, the further inclusion in such a claim of mathematical functions performed by the circuit, (e.g., “exponential function”, “square-root”, “integration”) or mathematical equations or numerical values of results achieved by the device or circuit, would be “significant” computer terminology, and thus be not proper for Class 137. Note, however that a claimed equation defining the configuration of fluidic passages or walls does not define a mathematical result achieved, thus the patent containing such equation is proper for Class 137; and further note that the specific binary numbers “one” and “zero” define merely conditions of “on” and “off” in a fluidic device, thus the patent containing such numbers is also proper for Class 137.

SEE OR SEARCH CLASS:

- 60, Power Plants, subclasses 231+ for a reaction motor having fluidic means to deflect the jet stream of the motor.
- 91, Motors: Expansible Chamber Type, subclass 3 for an expansible chamber motor controlled by a fluidic device or system.
- 116, Signals and Indicators, especially subclasses 137+ for sound generating apparatus including a fluidic device or system therein.
- 123, Internal-Combustion Engines, especially subclasses 378+ for an engine having a fuel supply and a fluidic device for controlling the fuel supply to thereby regulate the engine speed.

- 128, Surgery, especially subclass 204.24 for a forced-inhalation respirator having a fluidic device to control the respirator.
- 138, Pipes and Tubular Conduits, especially subclasses 37+ for a flow regulator.
- 200, Electricity: Circuit Makers and Breakers, especially subclasses 81+ for an electric switch actuated by fluid pressure.
- 235, Registers, subclasses 200+ for a computer using a fluidic device or system, and see (5) Note above for a line between Class 235 and Class 137.
- 239, Fluid Sprinkling, Spraying, and Diffusing, especially subclasses 265.19+, 398+, and 533.1 for apparatus having a discharge nozzle from which nozzle a discharge stream issues and the discharge stream is varied, (e.g., as to its direction or amount) by a stream of control fluid, wherein the discharge stream and the control fluid, or the control fluid alone, pass through a fluidic device. The fluidic device, per se, is found in Class 137 subclasses 803+, but the combination of fluidic device and discharge nozzle is properly in Class 239.
- 251, Valves and Valve Actuation, subclasses 12+ for a valve that is actuated by a fluidic device.
- 261, Gas and Liquid Contact Apparatus, especially subclass 36 for an apparatus having a carburetor for mixing liquid fuel and air to form a fuel vapor, in which carburetor either fluid passes through a fluidic device.
- 417, Pumps, especially subclasses 151+ for a jet pump used for pumping fluid.

GLOSSARY

For purposes of simplification, the following terms will be used in the definitions hereafter, and the definitions of these used terms will not require repetition in the subclass definitions that follow:

CONTROL INPUT

Stream or energy field, referred to in the subclass definition, (C) (1) and (C) (2) above, that causes the diversion or alteration of the output stream.

PASSAGE

Channel or duct that surrounds and guides a stream of fluid or energy in a desired path or direction.

POWER INPUT

Stream, referred to in the subclass definition, (A), above, that flows into the devices.

POWER OUTPUT

Stream, referred to in in the subclass definition, (B), above, that flows out of the device;

804 **Responsive to condition external of system:**

This subclass is indented under subclass 803. Device or system which senses or detects or which is provided with additional means to sense or detect, a characteristic or state of the environment outside of said device or system, and which generates a signal or impulse as a result of such sensing or detecting.

- (1) Note. This and indented subclasses provide a locus for patents wherein a condition of fluid is sensed, such as, for example, the level of liquid in a tank, or the speed of fluid flow, or the temperature of fluid (as reflected in the frequency of pulses therein). In the patents of this subclass (804) a signal indicating the condition is sent. In the patents of the indented subclass (805) the signal activates mechanism to change or correct the sensed condition. Thus, it is apparent that this subclass (804) and the indented subclass (805) provide for a fluid-handling system classifiable in Class 137 which system includes a subcombination (e.g., a valve, tank, etc.) that, per se, is not proper for original classification in subclasses 803+. However, the patent to the system is classifiable herein due to the inclusion of a fluidic device as a subcombination of a fluid-handling system.

SEE OR SEARCH CLASS:

- 374, Thermal Measuring and Testing, subclass 118 for a temperature responsive fluidic oscillator combined with an indicating device.

805 And causing change or correction of sensed condition:

This subclass is indented under subclass 804. Device or system wherein the signal or impulse activates said device or system or activates another mechanism for the purpose of varying the characteristic or state of the environment or for the purpose of restoring the characteristic or state of the environment to that which is desired.

806 Utilizing diverse fluids:

This subclass is indented under subclass 803. Device or system involving the use therein of two or more different fluids or of fluids having different characteristics.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

815+, and 822+, for a device or system involving use of two or more sources of the same kind of fluid.

SEE OR SEARCH CLASS:

261, Gas and Liquid Contact Apparatus, subclass 36 for apparatus having a carburetor for mixing liquid fuel and air to form a fuel vapor, in which carburetor either fluid passes through a fluidic device, and subclasses 75+ for a device producing intimate contact between gases and liquids.

807 Utilizing particular fluid:

This subclass is indented under subclass 803. Device or system involving the use therein of a specific fluid or a fluid having specific characteristics.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

806, for a device or system involving use of two or more different fluids.

808 Means to cause rotational flow of fluid (e.g., vortex generator):

This subclass is indented under subclass 803. Device or system provided with means to compel any of the streams of fluid to turn about an axis in a generally circular (i.e., "vortex") path.

(1) Note. The "means to compel" referred to above is usually a circular or elliptical

interior wall of a chamber through which the fluid stream passes, but may also comprise a helical or spiral passage for the fluid.

809 Plural vortex generators:

This subclass is indented under subclass 808. Device or system provided with two or more of said means for a corresponding number of streams.

(1) Note. This subclass is for disclosures of two or more vortex generators regardless of whether the plural generators are applied to a single device or are applied to plural devices of a fluidic system.

810 Vortex generator as control for system:

This subclass is indented under subclass 808. Device or system wherein said means is a sub-combinational element in an array of fluidic devices forming a fluidic system, and said means regulates the inflow or outflow of fluid to or from said array.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

814+, for a system comprising two or more fluidic devices or stages.

811 Vortex generator in interaction chamber of device:

This subclass is indented under subclass 808. Device wherein said means is part of the common zone referred to in the definition of subclass 834 or subclass 841.

(1) Note. See (1) Note of subclass 834 for further discussion of "interaction chamber".

SEE OR SEARCH THIS CLASS, SUB-CLASS:

839, for a fluidic device having an enlarged interaction chamber.

812 By tangential input to axial output (e.g., vortex amplifier):

This subclass is indented under subclass 808. Device wherein the flow of fluid into the device is along a straight line that is substantially perpendicular to a radius line from said axis, and the flow of fluid out of the device is along said axis.

- (1) Note. The term “input” includes a stream of subatmospheric pressure (i.e., suction) that causes fluid to enter the device tangentially.
- 813 With means to vary input or output of device:**
This subclass is indented under subclass 812. Device provided with means to alter the flow of any of the streams of fluid into or out of the device.
- (1) Note. The alteration is usually of the amount of fluid flow, but may also be an alteration of path or direction or other condition of flow.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
825+, for a fluidic device having means to vary the operation of the device.
- 814 System comprising plural fluidic devices or stages:**
This subclass is indented under subclass 803. Subject matter provided with two or more devices of the type defined there, or provided with a housing having therein two or more groups of passages for fluid flow, each of which groups acts as a fluidic device.
- (1) Note. Included in this subclass (814) are patents wherein plural devices are arranged in series or cascaded array and are supplied by a single power input.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
806, for a device or system using two or more different kinds of fluids.
810, for a system wherein a vortex generator is used as a control therefor.
- 815 Plural power inputs (e.g., parallel inputs):**
This subclass is indented under subclass 814. System provided with two or more passages for a corresponding number of streams of power input fluid, each said passage leading to its own device.
- (1) Note. Included in this subclass 815 are systems wherein a power stream supplied from a source is split by a passage common to all the devices supplied therefrom.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
803, Glossary, for the term “power input”.
- 816 Variable or different-value power inputs:**
This subclass is indented under subclass 815. System wherein at least one of the streams of power input fluid can be regulated or altered relative to another, or wherein at least one of the streams is unequal to another.
- (1) Note. The regulation of, or difference between, the streams can be with respect to degree of flow, frequency of pulsation, amplitude, phase relationships, etc., these being only exemplary of the characteristics found in the systems of this subclass.
- 817 Pulsating power input and continuous-flow power input:**
This subclass is indented under subclass 816. System wherein at least one of the streams of power input fluid is in the form of a series of short bursts of fluid timed in a predetermined sequence or duration, and at least another of the streams is an uninterrupted stream of power input fluid, the two different streams being applied simultaneously to the system.
- 818 With variable or selectable source of control-input signal:**
This subclass is indented under subclass 815. System provided with a supply of control input fluid for at least one of said devices, which supply can be regulated or altered, or wherein the supply that is used for control purposes can be chosen from a plurality of supplies available.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
803, Glossary, for a definition of “Control input”.
- 819 To cascaded plural devices:**
This subclass is indented under subclass 815. System provided with two or more fluidic devices arranged in a series array, and also provided with a connection from a power output passage of a first of said devices to a control

input passage of a second of said devices that is downstream of said first device.

- (1) Note. The connection described may be direct (as via a passage with two ends, one to a power output and the other to a control input) or may be indirect (as via a restrictor or storage tank) or may be supplemental (as via a second passage to the second device that adds to the effect of a primary control input to the second device).

820 With feedback passage(s) between devices of cascade:

This subclass is indented under subclass 819. System further provided with a connection from a power output passage of said second (i.e., downstream) device to a control input passage of said first device, whereby at least a portion of the power output fluid of the second device will affect the control input of the first device.

- (1) Note. The comments relative to the cascade connection referred to in (1) Note of subclass 819 apply also to the feedback connection of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 835, for a fluidic device having feedback means internal to the device.

821 With pulsed control-input signal:

This subclass is indented under subclass 819. System wherein at least one of the fluidic devices has control input that is in the form of a series of short bursts of fluid timed in a predetermined sequence or duration.

- (1) Note. Many of the devices of this subclass are known as “fluidic oscillator” devices or systems.

822 Plural power inputs to single device:

This subclass is indented under subclass 803. Device provided with only one (as claimed in the patent thereto) fluidic device, and further provided with two or more passages each supplying a stream of power input fluid to that device.

- (1) Note. A careful distinction should be made between patents disclosing a stream of power input fluid and at least one stream of control input fluid, and patents (provided for in this and indented subclasses) disclosing two streams of power input fluid. The first category is usual and found in many subclasses, see especially subclasses 834+ and 841. To fit the second category and be proper for original classification herein, the claimed disclosure of the patent should be clear that two power input streams are provided. Further disclosure of a control input will not bar classification herein. For further comment on this point, see (2) Note in the definition of subclass 824.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 806, for a device or system using two or more different kinds of fluid.

SEE OR SEARCH CLASS:

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 543+ for a fluid sprinkling system wherein one fluid stream impinges upon another.

823 Intersecting at interaction region (e.g., comparator):

This subclass is indented under subclass 822. Device wherein each said passage lies along a separate line, and said lines converge at a zone common to all the lines, and the streams are directed toward said common zone.

- (1) Note. The device of this subclass is sometimes referred to as a “comparator”, especially if the characteristics of two power streams are compared. Such characteristics may include pressure, density, temperature, velocity, viscosity, etc., of the fluid of the streams.
- (2) Note. See (1) Note of subclass 834 for further discussion of “interaction region”.

824 Co-linear, oppositely-directed power inputs (e.g., impact modulator):

This subclass is indented under subclass 823. Device wherein said separate lines merge into a single line common to both said passages, and said streams impinge against one another coaxially in said common zone.

- (1) Note. The device of this subclass is usually referred to as “impact modulator”.
- (2) Note. This subclass provides for an exception to the statement in (1) Note of subclass 822 that two power input streams are provided. A patent having claimed disclosure of only two co-linear passages for input of oppositely-directed fluid will be originally classified in this subclass 824 even if one of such inputs is termed a “control stream”, since it is clear that the “control stream” is effectively equivalent to a power input.

825 Means to regulate or vary operation of device:

This subclass is indented under subclass 803. Device provided with means that is additional to the fluidic device, which means causes a change in the output stream of the device.

- (1) Note. The regulation is usually applied to the control input passage, but is not limited thereto. In some instances the regulating means is applied to a feedback passage, or to an output passage, or within an interaction chamber. To be proper for this and indented subclasses, however, it should be clear that the regulating means is not inherent in the passages of the device or their configuration but rather is added to the device for purpose of regulation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

813, for a fluidic device comprising a vortex generator and means to vary operation of the device.

826 To vary frequency of pulses or oscillations:

This subclass is indented under subclass 825. Device wherein the output stream of the device is in the form of a succession of bursts of fluid

issuing from a single outlet or issuing alternatively from two or more outlets, and wherein the change that is produced is a change in the time interval of or between said bursts of fluid.

827 By non-fluid energy field affecting input (e.g., transducer):

This subclass is indented under subclass 825. Device wherein said means causes the generation of force other than the force of a stream of fluid, said force causing a change in the output stream.

- (1) Note. In this subclass (827) the power or energy is often that of electricity. See (1) Note to the definition of subclass 831 for a distinction between the subclasses involved.
- (2) Note. The described device, which converts electrical energy or signals into fluid energy or signals, is often termed a “transducer”.

828 Acoustical or thermal energy:

This subclass is indented under subclass 827. Device wherein the force comprises sound waves or heat waves.

- (1) Note. The generation of “compressional” waves by a vibrating diaphragm has been considered as equivalent to the generation of sound waves, and patents have been placed herein on that basis.

SEE OR SEARCH CLASS:

181, Acoustics, for means generating acoustical signals.

829 By movable element:

This subclass is indented under subclass 825. Device wherein said means is a member that can move relative to the passages provided for flow of fluid.

- (1) Note. This and the indented subclasses are those which provide for the exceptions to the “no-moving-parts” rule referred to in (4) Note to the definition of subclass 803.

830 Operating at timed intervals (e.g., to produce pulses):

This subclass is indented under subclass 829. Device wherein the movement of said member occurs at a particular frequency to cause a succession of bursts of fluid to be emitted.

831 Electrically-actuated element (e.g., electro-mechanical transducer):

This subclass is indented under subclass 829. Device wherein the movement of the member is caused by electrical energy.

- (1) Note. The distinction between the patents of this subclass (831) and those of subclass 827 above is that in subclass 827 energy is directly applied to the fluid with no intervening structure, and in this subclass (831) the electrical energy causes the movement of a member which affects the fluid.

832 Means (e.g., valve) in control input:

This subclass is indented under subclass 829. Device wherein said member is a means located in or adjacent to the control input passage that supplies fluid for diverting the power input stream (referred to in definition of subclass 803).

- (1) Note. the term “control input” and “power input” are defined in (3) Note to the definition of subclass 803.
- (2) Note. The member is often a valve that turns on or shuts off the flow of control input fluid, but can also be a piston in a chamber through which the control input fluid passes before entry into the interaction chamber, the movement of the piston thus causing regulation of frequency of resonant pulses in the control input stream.

833 Structure of body of device:

This subclass is indented under subclass 803. Device wherein the device is provided with a housing having passages therein for guiding the flow of fluid from input to output and wherein the claimed disclosure of the patent pertains to the manufactured elements that comprise the device or the manner in which the elements are assembled to form the device.

- (1) Note. In the patents of this subclass (833) it is clear from the disclosure that a fluidic device is involved, but in many patents the emphasis of the claims is more on the component parts that comprise the device than on the way the device operates fluidically.

SEE OR SEARCH CLASS:

- 29, Metal Working, especially subclasses 890 through 890.15 for a process of making a gas and water device.

834 Device including passages having V over T configuration:

This subclass is indented under subclass 803. Device provided with at least five passages joined at a zone common to all the passages, including a first passage permitting entry into said common zone of a power input stream of fluid, a second passage and a third passage permitting entry into said common zone of control input signals (i.e., stream of fluid or energy field), said second and third passages being substantially opposed to one another and substantially perpendicular to said first passage and the three passages thus forming approximately a letter “T”; and also including a fourth passage and a fifth passage permitting exit from said common zone of power output fluid, said fourth and fifth passages diverging substantially oppositely away from said first passage and said common zone and thus forming approximately a letter “V”; the overall arrangement of passages thus forming a “V” joined to a “T” at the common juncture of zone.

- (1) Note. The common zone described is known as an “interaction chamber” or “interaction region”, and is referred to in subclasses 811 and 823 above, as well as being the subject matter of subclass 839 below.
- (2) Note. The arrangement defined permits a control-input signal to enter the interaction chamber via either the second passage or the third passage thereby to divert or deflect a stream of fluid that is entering the common zone via the first passage. The stream, which has been exiting via one of the passages (i.e., either the fourth or the fifth) is thus

caused to switch (in full or in part) to thereafter exit via the other of the passages (i.e., either the fifth or the fourth) until another control input signal causes another switch.

835 And feedback passage(s) or path(s):

This subclass is indented under subclass 834. Device further provided with means permitting at least a portion of the fluid exiting from said common zone via said fourth or fifth passage to be diverted from its exit passage and returned to said common zone.

- (1) Note. The feedback fluid may flow via a passage provided therefor, or may flow in a path along one of the walls of an enlarged interaction chamber. Moreover, the feedback fluid may enter the interaction chamber via a port in the chamber, or may enter the chamber via a port in the control input passage. Both “negative” feedback and “positive” feedback are provided for in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 820, for a fluidic system having feedback means from a downstream (i.e., succeeding) device to an upstream (i.e., preceding) device.

836 With particular characteristics of control input:

This subclass is indented under subclass 834. Device wherein said second and third passages have special structure or configuration or peculiarity of operation.

- (1) Note. Included in this subclass (836) are patents claiming the control inlet as being supplied with subatmospheric or suction pressure, or claiming an elongated passage to produce a delayed signal.

837 Multiple control-input passages:

This subclass is indented under subclass 836. Device wherein the special structure includes a plurality of second passages or a plurality of third passages, the number of passages permitting control-input signal to enter the common zone thus being three or more.

838 And multiple or joined power-outlet passages:

This subclass is indented under subclass 834. Device provided with a plurality of fourth passages or a plurality of fifth passages, the number of passages diverging away from said common zone permitting fluid to exit from said zone being three or more, or provided with fourth and fifth passages that come to a second common zone downstream of the first common zone.

- (1) Note. In the case of the rejoined outlet passages, one of the passages is usually longer than the other so that a pulse of fluid through the longer passage will be delayed in its arrival at the second zone relative to the pulse through the shorter passage.

839 And enlarged interaction chamber:

This subclass is indented under subclass 834. Device wherein said common zone is greater in size than would normally be required for passage of fluid therethrough, or wherein the walls forming the common zone are particularly disclosed as having a specified configuration.

- (1) Note. The enlargement in the interaction chamber is often disclosed as being for the purpose of preventing boundary-layer attachment or “lock-on” of the fluid passing therethrough.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 811, for a fluidic device having a vortex generator in the interaction chamber.

840 And vent passage(s):

This subclass is indented under subclass 834. Device further provided with a sixth passage joining any of said other passages or said common zone to ambient surroundings for the purpose of “bleeding” excess pressure within the device.

841 Device including passages having V over gamma configuration:

This subclass is indented under subclass 803. Device provided with at least four passages joined at a zone common to all the passages, including a first passage permitting entry into

said common zone of a power input stream of fluid and a second passage permitting entry into said common zone of control input signals (i.e., stream of fluid or energy field), said first and second passages being angularly related and thus forming approximately an (Greek letter "Gamma") or an inverted letter "L"; and also including a third passage and a fourth passage permitting exit from said common zone of power outlet fluid, said third and fourth passages diverging substantially oppositely away from said first passage and said common zone and thus forming approximately a letter "V"; the overall arrangement of passages thus forming a "V" joined to an at the common juncture or zone.

- (1) Note. The common zone described is known as an "interaction chamber" or "interaction region", as discussed in (1) Note to subclass 834.
- (2) Note. The arrangement defined is similar to that defined in subclass 834, and further discussed in (1) Note to that subclass, with the exception that devices in this subclass have control-input signal applied from only one side of the power input. Thus it is often used as a "monostable amplifier", especially when the power output "locks on" to a wall of one passage only when a control-input signal is applied.

842 Device including linearly-aligned power stream emitter and power stream collector: This subclass is indented under subclass 803. Device provided with at least two passages joined at a zone common to both passages, including a first passage permitting entry into said common zone of a power input stream of fluid and a second passage permitting exit from said common zone of a power output stream of fluid, said passages each extending along a line common to both passages.

- (1) Note. The diversion or alteration required by the definition of subclass 803 is not referred to in the definition of this subclass because there are many different ways of accomplishing the diversion in the devices of this subclass, but the diversion nevertheless is present. Among the ways of accomplishing the

diversion are an enlarged interaction chamber, a passage for control-input signal, a plurality of power output passages lying in a common plane and a passage for control-input signal perpendicular to said common plane, and a restricted interaction region to which control-input signal is applied, these being only exemplary of devices found.

SEE OR SEARCH CLASS:

417, Pumps, especially subclasses 151+ for a jet pump used for pumping fluid.

843 Resilient material valve:

This subclass is indented under subclass 511. Valve in which the valve member or the valve seat is made of resilient easily deformable material which yields in response to pressure to open the valve. The restoring force of the resilient material constitutes a major component of the biasing means.

- (1) Note. The use of resilient sealing means (e.g., rubber washer) at the valve seat does not make the arrangement classifiable herein. The use of such sealing means is conventional throughout the class.

844 Having expansible port:

This subclass is indented under subclass 843. Valve wherein the valve member comprises a resilient body which has a passage therethrough which passage expands to an open position when fluid pressure is applied to the body and retracts upon itself into a closed position when pressure is removed to thus seal the passage against fluid flow.

845 Apertured plate:

This subclass is indented under subclass 844. Valve wherein the resilient body is a substantially flat plate-like member having an expansible orifice formed therethrough.

846 Having exit lip:

This subclass is indented under subclass 844. Valve wherein the resilient body has a fluid passage therethrough a portion of which is substantially nondeformable, which passage terminates in an expansible port at the point where the fluid flows from the body.

- 847 With biasing means:**
This subclass is indented under subclass 846. Valve wherein closing of the exit lip is effected or facilitated by an additional force applying means.
- 848 Side vent:**
This subclass is indented under subclass 846. Valve wherein the fluid passage is provided with a laterally disposed outlet port.
- 849 Multiple slit:**
This subclass is indented under subclass 846. Valve wherein the expansible port is formed as a plurality of cuts in the resilient body.
- (1) Note. The cuts may intersect one another thus forming multiple exit flaps or the cuts may be spaced from and open independently of one another.
- 850 Internally extending mount:**
This subclass is indented under subclass 846. Valve wherein the nondeformable portion of the passage has a rigid tubular supporting element inserted therein.
- 851 Center flexing strip:**
This subclass is indented under subclass 843. Valve wherein the resilient material valve includes an elongated member which is confined or retained at each of its ends to thus limit deformation to its central region.
- 852 With valve member flexing about securement:**
This subclass is indented under subclass 843. Valve wherein a portion of the resilient member is fixed to a substantially rigid mounting means about which at least part of the remainder of the resilient member bends or distorts towards or away from contact with a valve seat with which the resilient member coacts to produce a desired valving action upon variations in fluid pressure.
- 853 Sleeve:**
This subclass is indented under subclass 852. Valves in which the resilient member is an axially extending tubular element which flexes radially with respect to its mounting means.
- 854 Central mount:**
This subclass is indented under subclass 852. Valves in which the resilient member is secured at its center and the periphery flexes about said securement.
- 855 Flap or reed:**
This subclass is indented under subclass 852. Valve wherein the resilient member is fixed at a single location along its periphery and wherein the free portion of the member bends about this location to produce the desired valving action.
- 856 With stop:**
This subclass is indented under subclass 855. Valve wherein an abutment is located in close proximity to said resilient member to restrict the travel of said member as it moves from a closed to an open position.
- 857 With spring:**
This subclass is indented under subclass 855. Valve wherein a resilient, energy storing, bias means is provided.
- 858 With weight:**
This subclass is indented under subclass 855. Valve which, in addition to the restoring force of the resilient material is provided with a mass of material which due to the force of gravity acts to bias the resilient member towards its valve seat.
- 859 Peripherally secured diaphragm:**
This subclass is indented under subclass 852. Valve wherein said valve member is in the form of a resilient disc which is secured around its entire periphery.
- 860 Annulus:**
This subclass is indented under subclass 843. Valve wherein the resilient member is in the form of a ring which is carried by but not secured to a mounting and which either slides along or freely expands with respect to the mounting.
- (1) Note. The ring does not need to be continuous, thus valves employing expansible or contractable split rings will be found herein.

861 With flow control means for branched passages:

This subclass is indented under subclass 561. System wherein an array of branched fluent material flow passages is provided with means to stop or regulate the flow in more than one branch, which means may comprise (1) multiple valves, (2) a deflector or valve located at a junction and operable to open one passage and close or restrict the flow from the other, or (3) a single valve controlling one outlet flow path, the hydrostatic characteristics of the system being such that the entire flow passes through the valved line when it is fully open.

- (1) Note. See the class definition, Lines With Other Classes (2) Plural Valves, and Subclass References to the Current Class 4 for search notes of plural valves and their actuators.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 255+, for plural tanks or compartments having parallel outflows.
 280, and 299, for hydrants having plural risers and/or outlets.
 594+, for distribution systems comprising two or more noncommunicating flow paths.
 602+, for distribution systems having plural inflows and a single outflow.
 625+, for valves and valve actuation involving multiway valve units in which there is a pattern or special flow relation, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 482+ for dispensers having plural openings or discharge guides with discharge control means for plural outlets.

862 With common valve operator:

This subclass is indented under subclass 861. Systems wherein a plurality of branches in the branched array are each provided with a separate flow control means and means to coordinate the actuation of the separate flow control means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 595, for systems having plurally noncommunicating flow paths with a common valve operator.
 601.01 through 601.12, for systems dividing into parallel flow lines then recombining including valves having a common operator therefor.
 607, for systems having a multiple inlet having a flow control valve in each inlet having a common valve operator.
 631+, for valves of the cyclical type, and see the search notes thereto.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 485+ for interconnected or integral flow controllers for plural dispenser outlets, and subclasses 488+ for controllers for a single passage into which plural passages merge.

863 For valve having a flexible diaphragm valving member:

This subclass is indented under subclass 862. Systems in which at least one flow control means comprises a pliant member which flexes relative to a rigid surface to control flow therebetween.

864 For valve having a ball head:

This subclass is indented under subclass 862. Systems comprising at least one flow control means which employs a substantially spherical member to regulate flow.

865 With gearing:

This subclass is indented under subclass 862. Systems wherein the means to coordinate the actuation of the flow control means includes relatively movable toothed members which transmit motion to the flow control means by meshing of the teeth during travel of the members.

866 Threaded actuator:

This subclass is indented under subclass 862. Systems wherein the means to coordinate the actuation of the flow control means includes a member having a helical rib, which member reciprocates as a result of rotary motion applied thereto.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 248+ for gear-actuated valves, per se.

867 Pivoted or rotary motion converted to reciprocating valve head motion:

This subclass is indented under subclass 862. System comprising a flow control means in which swinging or turning motion of a member is mechanically converted to rectilinear movement of a flow control member.

868 Spring biased:

This subclass is indented under subclass 867. System wherein a resilient mass is provided to urge either the flow control means or coordinating means to a desired position.

869 Having fluid actuator:

This subclass is indented under subclass 862. System wherein the coordinating means includes a hydraulic or pneumatic motor.

870 With electrical actuation:

This subclass is indented under subclass 862. System wherein the coordinating means includes means utilizing electrical energy to effect actuation of a flow control means.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 129+ for electrically actuated valves, per se.

871 Spring biased:

This subclass is indented under subclass 862. System wherein a resilient mass is provided to urge either the flow control means or coordinating means to a desired position.

872 With valve or movable deflector at junction:

This subclass is indented under subclass 861. System wherein a fluent material flow regulating means or fluent material diverting means is provided at the junction of the inlet branch with two or more outlet branches, the fluent material flow regulating means or movable diverting means being selectively operable to direct the effluent from the inlet branch into an desired outlet branch or branches.

(1) Note. The deflector, when discharging directly to the ambient space or atmosphere, is also considered an outlet passage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

119.01+, for downspouts having automatic means to shift the flow between branches, especially subclass 120 for valves or deflectors at the junction of a rain downspout in which the valve or deflector is shifted in response to the collection of a predetermined quantity of rainfall in an auxiliary timing tank.

SEE OR SEARCH CLASS:

193, Conveyors, Chutes, Skids, Guides, and Ways, subclasses 13, 14, 23, 28, 29, and 31 for switches and multiple point discharge for chutes.
406, Conveyors: Fluid Current, subclasses 117+ for a conveyor having plural intakes; subclasses 155+ for a conveyor having plural outlets; and subclasses 181+ for a flow diverter, divider, or combiner, per se.

873 Movable deflector spout in lateral port:

This subclass is indented under subclass 872. System in which an opening in the side wall of the fluent material flow line provides a branched discharge line, there being provided a pipe which may be moved into position in the flow line to deflect the fluent material through the opening in the side wall, the pipe being effective to guide or to conduct the diverted fluent material to a point beyond the opening.

874 Valve or deflector is tubular passageway:

This subclass is indented under subclass 872. System in which the fluent material flow control means or diverting means comprises, at least in part, a movable tubular switching passageway.

875 Pivoted valve or deflector:

This subclass is indented under subclass 872. System in which fluent material flow control or diverting means swings about an axis other than its axis of symmetry.

- 876 Rotary valve or deflector:**
This subclass is indented under subclass 872. System in which at least one fluent material flow control or diverting means only rotates about its axis of symmetry.
- 877 Biased valve:**
This subclass is indented under subclass 861. System in which at least one of the flow passages is provided with a fluent material flow control means which is urged by a spring, gravity, or fluid pressure means either toward or away from its seat.
- 878 Spring bias:**
This subclass is indented under subclass 877. System wherein a resilient mass is provided to urge the flow control means to a desired position.
- 879 For valve having a ball head:**
This subclass is indented under subclass 878. System wherein fluent material flow control means employs a substantially spherical member to regulate flow.
- 880 With threaded actuator:**
This subclass is indented under subclass 878. System wherein the means to actuate the fluent material flow control means has a helical rib by which the actuating means reciprocates as a result of rotary motion applied thereto.
- 881 Spring coaxial with valve:**
This subclass is indented under subclass 878. System wherein the axis along which the resilient mass is compressed is coincident with the axis along which the fluent material flow control means moves.
- 882 Biased open:**
This subclass is indented under subclass 881. System wherein the resilient means is provided to urge the flow control means to an open position.
- 883 Single inlet with multiple distinctly valved outlets:**
This subclass is indented under subclass 861. System having two or more outlets or exhaust passageways connected to a single inlet or admission passage, there being a separate, distinct, and independently operable material flow regulating means in each outlet.
- 884 Sectional block structure:**
This subclass is indented under subclass 861. System wherein the flow passages are formed in modular pieces facilitating assembly or disassembly of the array.
- 885 With fluid actuator:**
This subclass is indented under subclass 861. System in which a fluent material flow regulating means is actuated, at least in part, by a fluid pressure motive means.
- 886 With threaded actuator:**
This subclass is indented under subclass 861. System comprising a fluent material flow regulating means having an operator with a helical rib, which operator reciprocates as a result of rotary motion applied thereto.
- 887 Containing rotary valve:**
This subclass is indented under subclass 861. System in which a fluent material flow control means rotates about its axis of symmetry.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
602+, for system with plural inflow and a single outflow.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
269+, for valves convertible by reassembling or by adding or omitting a part.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 12+ for fluid-actuated valves, per se.
- SEE OR SEARCH CLASS:
251, Valves and Valve Actuation, subclasses 213+ for valves with threaded actuators, per se.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
601.16 through 601.17, for systems dividing into parallel flow lines then recombining having a rotary valve.

SEE OR SEARCH CLASS:

251, Valves and Valve Actuation, subclasses 304+ for rotary valves, per se.

888 Combining by aspiration:

This subclass is indented under subclass 602. System in which a fluid flowing from a first inlet flow line causes or facilitates the flow of a fluid from a second inlet flow line so that the fluids are combined prior to leaving the single outlet or exhaust passage, the fluid flowing from the first inlet flow line serves as the motivating or aspirating fluid while the fluid in the second inlet flow line serves as the aspirated fluid; whereby, the motivating or aspirating fluid imparts energy to the aspirated fluid by the action of entrainment.

- (1) Note. In regard to the classification of an aspirator between Class 417, Pumps, and this class (137), subclasses 888+, and aspirator in which the disclosed function is to mix or combine together two or more fluids is classified in Class 137, whereas an aspirator in which the sole disclosed function is to pump one fluid by means of entrainment with another is classified in Class 417. In the case of dual disclosed functions, if an aspirator has a disclosed function of pumping one fluid by entraining it with another and a disclosed function of mixing or combining together two or more fluids to produce a mixture, the classification is in Class 137.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101.11, 205.5, and 564.5, for mixing or combining of fluids in which one fluid is added to another by means of differential pressure existing along a main line which has a shunt line leading to a reservoir containing a fluid to be added to the main line downstream of the shunt line; many of these devices may include an aspirating effect.

268, for devices including a holder for solid, flaky, or pulverized material to be dissolved or entrained.

896+, for mixing or combining of plural fluids by means other than aspiration.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 129+ for dispensers comprising plural sources which may also have a common discharge, and particularly indented subclasses 145.1+ for dispensers comprising plural sources having a common discharge.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 310+, 335+, 337+, and 398+ for spraying devices having additional means to promote mixing of a plurality of different streams.

261, Gas and Liquid Contact Apparatus, appropriate subclasses for apparatus for mixing a liquid with a gas.

366, Agitating, appropriate subclasses for devices adapted to promote mixing of plural fluent materials by means other than aspiration.

417, Pumps, appropriate subclasses for aspirators having a sole disclosed function of pumping of one fluid by entrainment with another, and see Note (1) above.

889 Combining of three or more diverse fluids:

This subclass is indented under subclass 888. System wherein the branched flow line has three or more inlets or admission passages connected to the single outlet or exhaust passage; and wherein the system includes three or more fluids, each fluid having a characteristic which is diverse from or different from the characteristic of at least two other of the fluids such as different composition, different phase (i.e., gas and liquid), different temperature, or different viscosity.

- (1) Note. All of the three or more diverse fluids do not necessarily need to be flowing simultaneously; the system may include means to selectively control one or more of the flow paths.

890 Plural motivating fluid jets:

This subclass is indented under subclass 888. System in which the fluid flowing from the motivating fluid inlet line is divided into a plurality of streams prior to combining with the aspirated fluid; or in which the motivating fluid acts to entrain the aspirated fluid and then, the motivating fluid again, or the combined moti-

vating and aspirated fluid stream acts to further entrain additional fluid to be aspirated at a point downstream of the first entrainment.

891 Flow control by varying position of a fluid inlet relative to entrainment chamber:

This subclass is indented under subclass 888. System wherein at least one of the inlets or admission passages is movable relative to the portion of the system in which the fluids are entrained and combined so that, by altering the position of the movable inlet relative to the entraining portion of the system, the flow of one or more of the incoming fluids may be controlled.

892 With selectively operated flow control means in inlet:

This subclass is indented under subclass 888. System including means located in an inlet flow line or in an admission passage to selectively control the flow of fluid flowing from the inlet flow line into the portion of the system in which the fluids are entrained and combined.

- (1) Note. The means for selectively controlling flow in an inlet flow line or admission passage may comprise control means for venting the inlet flow line or admission passage, as, for example, for allowing a portion of the motivating fluid located upstream of the admission passage to escape from the motivating fluid inlet line or for allowing air to be admitted into the aspirated fluid inlet line.

893 Flow control means is located in aspirated fluid inlet:

This subclass is indented under subclass 892. System wherein the means to selectively control the flow of fluid is located in the aspirated fluid inlet flow line or in the aspirated fluid admission passage so as to control the flow of aspirated fluid from the aspirated fluid admission passage into the entraining and combining portion of the system.

894 Single actuator operates flow control means located in both motivating fluid and aspirated fluid inlets:

This subclass is indented under subclass 893. System wherein additional means to selectively control the flow of fluid is located in the moti-

vating fluid inlet flow line or admission passage so as to control the flow of motivating fluid from the motivating fluid admission passage into the entraining and combining portion of the system; and wherein a single, selectively controlled actuator is operatively connected to both the flow control means located in the aspirated fluid inlet flow line or passage and to the flow control means located in the motivating fluid inlet flow line or passage, so that whenever the actuator is selectively operated, the flow control means located in both the aspirated and motivating fluid inlet flow lines or admission passages are operated to alter the flows of the respective fluids into the entraining and combining portion of the system.

895 With condition responsive valve:

This subclass is indented under subclass 888. System including a movable valve connected to a flow line, which valve is operated to move in response to a change in the condition of the fluid located within the system.

896 With means to promote mixing or combining of plural fluids:

This subclass is indented under subclass 602. System including means to promote admixing or combining together of the fluids leaving the admission passages prior to discharge from the single outlet so as to provide a single, combined, or uniformly mixed output stream.

- (1) Note. Mere plural inlets to a combining chamber is insufficient for causing classification in this subclass. The means to promote combining of plural fluids must include structure for bringing the fluids into contact in a particular manner such as baffles or other means to cause turbulence, flow-shaping or fluid-guiding means to cause the fluids to be combined in a particular manner, etc.

- (2) Note. In regard to the classification of a system having two or more inlets connected to a single outlet, which system including means to promote "mixing" of two or more fluids, classification in Class 366, Agitating, is proper if the plural fluids to be mixed are liquids and the means to promote mixing of the liquids is something other than an aspirator. A mixing system is properly classified in

this class (137), either (a) in subclasses 888+ if the fluids (including liquids) are mixed by aspiration, or (b) in these subclasses 896+ if the fluids to be mixed are other than two or more liquids. A system including means to promote “combining” of two or more fluids, as opposed to means to promote “mixing” of two or more fluids, is classifiable in this class (137), subclasses 888+ or 896+ even if the fluids are liquids since Class 366 requires a means to promote “mixing” of the fluids.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 603, for faucet attachments wherein water from hot and cold water faucets is mixed or combined to provide a single output stream of intermediate temperature.
- 605+, for mixing faucets for hot and cold water which do not claim additional means to promote mixing.
- 888+, for mixing or combining of plural fluids by aspiration means wherein a fluid is mixed or combined with another by the action of entrainment, and see the search notes under subclass 888.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclasses 129+ for dispensers comprising plural sources which may also have a common discharge, and particularly indented subclasses 145.1+ for dispensers comprising plural sources having a common discharge.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 310+, 335+, 337+, and 398+ for spraying devices having additional means to promote mixing of a plurality of different streams.
- 261, Gas and Liquid Contact Apparatus, appropriate subclasses for apparatus for mixing a liquid with a gas.
- 366, Agitating, appropriate subclasses for devices adapted to promote mixing of plural fluent materials by means other than aspiration, and see note (2) above.

897 With selectively operated flow control means:

This subclass is indented under subclass 896. System including means located in a flow line, admission passage, or the outlet passage to selectively control the flow of the fluid in one or more of the flow lines.

898 Single actuator operates plural flow control means:

This subclass is indented under subclass 897. System wherein there are a plurality of means to selectively control the flow of fluid within the system, which means to control the flow of fluid is located in any combination of two or more locations including the flow lines, admission passages, or the outlet passage; and wherein a single, selectively controlled actuator is operatively connected to the plural flow control means, so that whenever the actuator is selectively operated, the plural flow control means are operated to alter the flows of the fluids within the system.

899 Vehicle:

This subclass is indented under subclass 343. Apparatus in which the casing, support, or protector is a vehicle or a part thereof, which vehicle or part thereof supports and enables movement of the fluid-handling device or part thereof relative to means external to the fluid-handling device or part thereof.

- (1) Note. The term “vehicle” includes water, rail, and airborne carriers as well as land vehicles.
- (2) Note. In regard to the line between Class 137 and Class 239 (as specified in the class definition of Class 239, Lines With Other Classes, Miscellaneous Class notes and Lines, Slow Diffusers), the placement of documents within Class 137, these subclasses (899+) and Class 239, subclasses 726+, represents an exception to the specified class line. This exception to the line between Classes 137 and 239 relates “only “ to the placement of documents between subclasses 899+ of Class 137 and subclasses 726+ of Class 239. Specifically, any document which discloses a portable, overhead type of irrigating or other sprinkling

apparatus, which is supported upon vehicular means, which has some form of sprinkler or other spray outlet means secured thereto for sprinkling or spraying fluid onto a surface supporting the apparatus, and which claims subject matter encompassed by the definitions of Class 239, subclasses 726+, has been placed in the appropriate subclass of Class 239, subclasses 726+, regardless of whether or not a sprinkler or other spray outlet means was specified in the claims.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 38+, for movable systems controlled by the position or inertia of the system, especially subclass 43 for tanks having means for closing vents if the tank overturns.
- 125, for tank truck mounted plural siphons.
- 223+, for tire filling chucks or stems.
- 267, for tank truck mounted plural tanks.
- 580, for transfer of fluid to a moving receiver by means of a running joint.

SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, subclass 313 for vacuum cleaners installed in vehicles.
- 114, Ships, subclass 74 for tankers; and subclasses 232+ for oil distributors for ships.
- 180, Motor Vehicles, appropriate subclasses, especially subclasses 54.1+ for power plants.
- 222, Dispensing, subclasses 608+ for ambulant dispensers, and see the search notes to subclass 608.
- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 726+ for portable, overhead-type of irrigating apparatus supported upon vehicular means, and see the search notes to subclasses 726+, and see (2) Note above.
- 244, Aeronautics and Astronautics, subclass 136 for material discharging and diffusing from aircraft.
- 280, Land Vehicles, appropriate subclasses, especially subclasses 830+ for tanks or boilers associated with land vehicles.

- 291, Track Sanders, subclasses 3+ for fluid delivery in track sanders.

899.1 Guided by means of track or guideway:

This subclass is indented under subclass 899. Apparatus including rail means, guide wire means, or some other predetermined and established pathway which constrains the vehicle or a part thereof to be bodily movable along the rail means, guide wire means, or other pathway.

899.2 Aerial or water-supported (e.g., airplane or ship, etc.):

This subclass is indented under subclass 899. Apparatus in which the casing, support, or protector is either (a) an aerial vehicle or part thereof, which aerial vehicle is freely movable through the air, or (b) a buoyant vehicle or a part thereof, which buoyant vehicle is buoyantly supported by a body of water.

- (1) Note. The buoyant vehicle may be submerged within the body of water during use of the fluid-handling device attached thereto or supported thereon, but must be also capable of being buoyantly supported by a body of water.

899.3 With retractable or nonuse-positionable support wheel:

This subclass is indented under subclass 899. Apparatus in which the vehicle or a part thereof comprises a wheel which is positionable between an in-use supporting position and a storage position, so that (a) in the in-use position, the wheel supports and enables movement of the fluid-handling device or part thereof relative to the means external to the device, and (b) in the storage position, the wheel no longer supports or enables movement of the fluid-handling device or part thereof relative to the means external to the device.

899.4 Vehicle supports fluid compressor and compressed fluid storage tank:

This subclass is indented under subclass 899. Apparatus in which the fluid-handling device or a part thereof comprises (a) a compressing means to induct and to compress an ambient, compressible fluid, such that the resulting compressed fluid is at a greater pressure than the ambient, uncompressed fluid, and (b) a tank or receiver means, adapted to be fluidly con-

ected to the compressing means, to receive and store the compressed fluid under a higher-than-ambient pressure; and wherein both the compressing means and the tank or receiver means are supported as a whole by and movable as a whole by means of the vehicle or part thereof.

- (1) Note. These fluid-handling devices are generally ambulant air compressor units mounted upon wheeled trucks.

CROSS-REFERENCE ART COLLECTIONS

The documents in the following collections contain only cross-references which have been placed without regard to their original classification or to their claimed subject matter and therefore are only representative of the art or subject matter. Consequently, a complete search for art or subject matter provided for here would require a review of the higher portions of the classification schedule.

- 900 BUMPLESS MANUAL TO AUTOMATIC RELAYS:**
This subclass is indented under the class definition. Art collection drawn to bumpless manual to automatic relays.
- 901 BIASED BALL VALVES WITH OPERATORS:**
This subclass is indented under the class definition. Art collection drawn to biased ball valves with operators.
- 902 SLUSH PUMP CHECK VALVES:**
This subclass is indented under the class definition. Art collection drawn to slush pump check valves.
- 903 RUBBER VALVE SPRINGS:**
This subclass is indented under the class definition. Art collection drawn to rubber valve springs.
- 904 CUSHION CHECK VALVES:**
This subclass is indented under the class definition. Art collection drawn to cushion check valves.

SEE OR SEARCH THIS CLASS, SUBCLASS:

315.33, for a check valve (e.g., non-return valve, etc.) with assembling or disassembling means.

- 905 ROTARY VALVES FOR MULTIPLE GAS BURNERS:**
This subclass is indented under the class definition. Art collection drawn to rotary valves for multiple gas burners.
- 906 VALVES BIASED BY FLUID "SPRINGS":**
This subclass is indented under the class definition. Art collection drawn to valves biased by fluid "springs".
- 907 VACUUM-ACTUATED VALVES:**
This subclass is indented under the class definition. Art collection drawn to vacuum-actuated valves.
- 908 RESPIRATOR CONTROL:**
This subclass is indented under the class definition. Art collection drawn to respirator control.
- 909 MAGNETIC FLUID VALVE:**
This subclass is indented under the class definition. Art collection drawn to magnetic fluid valve.
- 910 DESTRUCTIBLE OR DEFORMABLE ELEMENT CONSTRUCTED OF SPECIFIC MATERIAL:**
This subclass is indented under the class definition. Art collection drawn to destructible or deformable elements constructed from a unique material to enable the element to destruct under specified temperature or pressure constraints.

END