

## CLASS 48, GAS: HEATING AND ILLUMINATING

### SECTION I - CLASS DEFINITION

This class relates only to gas for heating and illuminating purposes and includes apparatus, processes, and compositions for the manufacture of such gas and means for the purification, distribution, and storage thereof.

- (1) Note. Every plant for producing gas from the combustion of fuel necessitates the use of a furnace of some sort, and where the invention alleged includes more than the furnace and extends into apparatus for treating the gases or modifications of the furnace, adapting it to treat them, the application belongs in Class 48, whether the furnace, per se, be a limekiln or a smelting-furnace. In either case the furnace is merely an element of the plant and if divided out may be sent to its proper class.

### SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

This class does not include the manufacture of gas--such as, for example, oxygen, ozone, nitrous oxide, carbonic acid gas, and chemical gases in general. These are not heating or illuminating gases. Gases consisting of a single "pure" carbon compound and a process for synthesizing such a compound where the intent is to recover the compound, per se, are in Class 260, Chemistry of Carbon Compounds, its daughter Classes 530-570, or Class 585, Chemistry of Hydrocarbon Compounds.

This class does not include charging and discharging devices for retorts, nor does it include charging devices for cupola-generators, such as the well-known bell-and-hopper type. For these two classes of inventions see Class 202, Distillation: Apparatus, and Class 266, Metallurgical Apparatus, respectively, and Class 414, Material or Article Handling, subclasses 147+.

This class does not provide for the destruction of gaseous hazardous or toxic waste. See Class 423, Chemistry of Inorganic Compounds, subclasses 210-215.5 for the chemical destruction of gaseous hazardous or toxic waste. Note that subclasses 245.1-245.3 provide for an organic component.

## SECTION III - REFERENCES TO OTHER CLASSES

### SEE OR SEARCH CLASS:

- 44, Fuel and Related Compositions, appropriate subclasses for a solid or liquid fuel composition or a method for making or purifying such composition which may incidentally produce a burnable gas.
- 123, Internal-Combustion Engines, appropriate subclasses for devices for the purpose set forth above that are claimed in combination with an internal combustion engine or with any element thereof. This is not intended to apply to claims which, while in the form of a combination, state merely the intended use of the device--as, for example, "The combination, with an internal-combustion engine, of" followed by words defining the structure of a mixture-producing device not itself classified in internal-combustion engines.
  - (a) Devices for producing an explosive mixture from a liquid hydro-carbon and air or for producing the combustible constituent for such an explosive mixture, in which the operation of the mixture-producing device does not necessarily depend upon the suction produced by an internal-combustion engine, which mixture-producing device is capable of operation independent of the engine and if continued in operation would continue to produce an explosive mixture whether or not the engine continued to operate, go in appropriate subclasses in this class (48), notwithstanding the fact that the device may be actually designed for the purpose of supplying an internal-combustion engine with an explosive mixture and may be operated by such engine.
  - (b) Devices in which it does not positively appear whether they are operated by suction produced by an internal-combustion engine or not, which could be so operated, but which do not necessarily depend upon suction for their operation, go in appropriate subclasses in this class (48). These devices ordinarily consist, essentially, of a chamber containing a liquid hydrocarbon over or through which air flows, it not positively appearing whether such air is forced through such chamber as by a pump or is caused to

- flow therethrough by suction produced by an engine.
- 126, Stoves and Furnaces, subclass 44 for a stove structure in which carbureted gas is burned.
- 201, Distillation: Processes, Thermolytic, appropriate subclass for a process directed to the production of both coke and gas.
- 202, Distillation: Apparatus, appropriate subclass for apparatus for the production of both coke and gas.
- 208, Mineral Oils: Processes and Products, subclasses 15+ for a mineral oil fuel, and other appropriate subclasses for a process of deriving or treating a mineral oil in which process no burnable gas composition is intended to be recovered.
- 220, Receptacles, subclasses 581+ for a high-pressure-gas tank.
- 423, Chemistry of Inorganic Compounds, subclasses 210 through 215.5 for the chemical destruction of gaseous hazardous or toxic waste, and subclasses 237+ and 352+ for processes of purifying or producing ammonia involving a chemical reaction.
- 431, Combustion, subclass 11 for a combustion process involving a gas mixing or generating step, subclasses 36+ for a burner fed by a generator with automatic control of the generator; subclasses 203+ for a generating fuel tank and an associated burner; subclasses 233+ for a system in which a generator feeds generated gas to an external structure without purification, fixation or storage of the gas and also feeds gas to the burner heating the generator; subclasses 207+ for a generator feeding an immediately associated burner; and subclasses 354+ for a combined burner and mixer.
- 585, Chemistry of Hydrocarbon Compounds, subclass 6 for a blend of gaseous hydrocarbons, subclass 14 for a hydrocarbon fuel and other appropriate subclasses for a process of deriving or treating a hydrocarbon in which process no burnable gas composition is intended to be recovered.
- 588, Hazardous or Toxic Waste Destruction or Containment, subclasses 249 through 260 for the containment of a hazardous or toxic gas.

## SUBCLASSES

- 1 Generation and liquefaction:**  
Apparatus and processes for the combined generation and liquefaction of acetylene gas.
- SEE OR SEARCH CLASS:  
62, Refrigeration, subclasses 600+ for processes and apparatus, per se, specialized to the manufacture of a solidified or liquefied product from a gas by physical treatment.
- 2 Generator and holder:**  
Connected generators and gas-holders, the pressure in the generator regulating the supply of water in a to-and-fro or ebb-and-flow movement to the carbid.
- SEE OR SEARCH CLASS:  
441, Buoys, Rafts, and Aquatic Devices, subclass 98 for inflatable devices combined with an acetylene generator.
- 3 Generator and mixer:**  
Apparatus and processes in which the acetylene gas is generated and combined with some aeriform or gaseous fluid. It includes those in which acetylene gas and another gas are simultaneously generated in the same or adjacent apparatus or gas is generated and passed over calcium carbid or mingled with acetylene gas.
- 4 Water feed:**  
Structures whereby water is fed to the carbid. The water is fed by gravity and controlled by the pressure of the gas in the generator or by the operation of the gas-holder. It also includes structures for feeding the water to the carbid by capillary attraction. This subclass includes generators in which water is fed by gravity to the top of the carbid and automatically regulated by the gas-pressure in the generator. A hand-valve is employed to turn on and off the water-feed.
- 5 Holder operated:**  
This subclass is indented under subclass 4. Generators in which the water-feed is regulated by the movement of the gas-holder. This subclass includes structures whereby the gas-holder operates a valve which feeds water to the top of the carbid in the generator.

- 6 Series:**  
This subclass is indented under subclass 5. Generators in series of two or more and in which the water-feed is controlled by the gas-holder.
- 7 Automatic switch:**  
This subclass is indented under subclass 6. Generators in series of two or more in which the water-feed is controlled by the gas-holder and automatically directed from one generator to another.
- 8 Cell series:**  
This subclass is indented under subclass 5. Receptacles for carbid divided into communicating compartments to which water, fed successively, is controlled by the holder.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
42, for dip carbid-feed generators.
- 9 Gasometer and high-pressure holder:**  
This subclass is indented under subclass 5. Receivers to which the after-generation is conducted--that is, when the gasometer has been filled with gas.
- 10 Interior valve:**  
This subclass is indented under subclass 5. Structures feeding water from the gas-holder tank to the generator, the gas-holder operating a valve located within the tank. It also includes structures wherein a valved water-tank is located within or on the gas-holder bell.
- 11 Rotary cylinder:**  
This subclass is indented under subclass 5. Cylinders, slatted or otherwise, for carbid which are caused to rotate by the gas-holder and in which the water-feed is controlled by the action of the gas-holder. This subclass also includes cylinders rotated by gravity or hand in which the water-feed is operated by the gas-holder.
- 12 Underfeed:**  
This subclass is indented under subclass 5. Generators to which the water is supplied beneath the upper surface of the carbid and regulated by the movement of the gas-holder.
- 13 Valveless:**  
This subclass is indented under subclass 5. Apparatus in which no valve is employed to regulate the feed of water to the generator. It includes means for displacing water, a flexible tube, a siphon or tilting vessel operated by the gasholder.
- (1) Note. In this subclass, the feed of water is controlled by the gas-pressure in the generator or holder acting upon the column of water to be fed. It also includes means carried by the gas-holder not otherwise classified under the subclasses of "Valveless feed".
- 14 Displacer:**  
This subclass is indented under subclass 13. Devices, such as a wedge, piston, bucket, float, etc., carried by the gas-holder for displacing water contained in a tank, causing it to overflow and pass to the generator.
- 15 Flexible tube:**  
This subclass is indented under subclass 13. Flexible tubes for feeding water to the generator carried by the gas-holder connected to and elevated and depressed within or above and below the water-supply.
- 16 Generator supported:**  
This subclass is indented under subclass 13. Generators directly connected to the interior of the gas-holder and caused to dip in and out of the water in the gasholder tank to feed water to the interior of the generator.
- 17 Siphon:**  
This subclass is indented under subclass 13. Siphon-tubes carried by the gas-holder for making connections between the water-tank and the generator for feeding water.
- 18 Tilting:**  
This subclass is indented under subclass 13. Trunnioned or pivoted vessels operated by the gas-holder so as to discharge water into a pipe leading to the generator.
- 19 Ebb and flow:**  
This subclass is indented under subclass 4. Generators containing carbid to which the water is admitted by an ebb-and-flow move-

- ment produced by the gas-pressure in the generator.
- 20 Series:**  
This subclass is indented under subclass 19. Two or more generators having means for supporting carbid to which a body of water is supplied from beneath in an ebb-and-flow movement produced by the pressure of the gas in the generator.
- 21 Cell series:**  
This subclass is indented under subclass 19. Receptacles for carbid divided into separate compartments or superposed and to which water fed successively from below in a body is controlled by the pressure of the gas in the generator.
- 22 Concentric:**  
This subclass is indented under subclass 19. Receptacles in the form of a bell and tank stationary one within the other, and means provided within the bell for supporting the carbid to which water is fed from beneath by a to-and-fro or ebb-and-flow motion controlled by the pressure of the gas in the bell.
- 23 Series:**  
This subclass is indented under subclass 4. Structures in which two or more generators are employed and which are used successively.
- 24 Cell series:**  
This subclass is indented under subclass 4. Receptacles for carbid divided into communicating compartments to which water is fed successively. The receptacles may be in series. In this subclass, the water is fed drop by drop to the top of each successive cell and controlled by the pressure of the gas in the generator.
- 25 Capillary:**  
This subclass is indented under subclass 4. Generators in which water is supplied to the carbid by capillary attraction. In this subclass, an absorbent is used to conduct the water.
- 26 Adjustable:**  
This subclass is indented under subclass 25. Structures whereby the absorbent, through which the water is fed by capillary attraction, may be adjusted to and from the carbid.
- 27 Percolating:**  
This subclass is indented under subclass 4. Generators wherein means and materials are employed, except capillary feed, through which water seeps in its passage to the carbid.  
  
SEE OR SEARCH THIS CLASS, SUBCLASS:  
59, for structures in which a small quantity of carbid is placed.
- 28 Pressure valves:**  
This subclass is indented under subclass 27. Percolating water-feed generators having valves operated by the pressure of the gas in the generator to regulate the flow of water.
- 29 Expansible carbide container:**  
This subclass is indented under subclass 4. Cans or cases for carbid constructed of telescopic sections, each having a closed end, one of which sections may be spring-pressed or it may be an open-top can containing carbid in which is placed a follower which may be spring or weight-pressed.
- 30 Expansible water holder:**  
This subclass is indented under subclass 4. Vessels constructed of flexible elastic material for feeding water to the carbid, the pressure in the generator causing a to- and-fro movement.
- 31 Inexpansible gas holder and water feed:**  
This subclass is indented under subclass 4. Vessels divided by a partition-wall into two communicating compartments, one of the compartments connecting with the generator to supply water thereto and receive gas therefrom, the pressure of the gas in the generator and compartment regulating the water-feed to the generator and causing the water to flow to and from the second compartment.
- 32 Oscillating:**  
This subclass is indented under subclass 4. Trunnioned receptacles provided with a support for the carbid and means to oscillate the same, whereby water in the lower part of the receptacle may be intermittently brought in contact with the carbid.

- 33 Rotary cylinder:**  
This subclass is indented under subclass 4. Cylinders of or for containing carbid, caused to rotate or oscillate, whereby the hydrate, due to decomposition of the carbid and water, is removed by agitation. This subclass includes cylinders, slatted or otherwise, rotated or oscillated by hand or gravity, also cylinders composed of carbid, and cylindrical carriers for carbid-packages.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
11, for rotating carbid cylinders, slatted or otherwise.
- 34 Rotary grate:**  
This subclass is indented under subclass 4. Generators having a rotary grate for supporting the carbid and removing the hydrate.
- 35 Underfeed:**  
This subclass is indented under subclass 4. Generators to which the water is supplied within and beneath the upper surface of the carbid, drop by drop.
- 36 Interlocking devices:**  
This subclass is indented under subclass 4. Devices for preventing accidents in the handling of the generator, including means for interlocking two or more valves or means which extend over or secure the cover to the generator and simultaneously operate either one or more of the following valves: the gas-outlet valve, the water-inlet valve, or the sludge-valve; or vent the generator.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
58, for generators in which valves controlling the water-feed and gas outlet open and close simultancously.
- 37 Pressure valves:**  
This subclass is indented under subclass 4. Means for operating the water-feed valve by gas-pressure in the generator.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
28, for percolating water-feed generators.
- 38 Carbide feed:**  
Generators containing water into which the carbid is fed. This subclass contains generators to which the carbid is fed not otherwise classified under the various subclasses of "Carbid-feed".
- SEE OR SEARCH CLASS:  
221, Article Dispensing, appropriate subclasses for article feeding subcombination, per se, Class 48 having only significant generator combinations or feeding subcombinations so specialized to the performance of the generating function as to preclude classification in a general dispensing art.  
222, Dispensing, appropriate subclasses for fluent material feeding, per se, not combined with generator structure or not specialized for use with generators.
- 39 Apron or belt:**  
This subclass is indented under subclass 38. Generators in which an endless belt or an apron is employed to feed the carbid to the water. It does not include aprons or belts carrying buckets containing measured charges of carbid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
48, and 49, for aprons or belts carrying buckets containing measured charges of carbid.
- 40 Cock:**  
This subclass is indented under subclass 38. Generators containing water to which the feed or carbid is regulated by means of a cock.
- 41 Dip:**  
This subclass is indented under subclass 38. Generators in which the carbid is caused to dip in and out of the water. In this subclass the carbid may be suspended from or held in suitable means supported by the gas-holder or supported by a piston or supported by yielding means within the tank.

- 42 Cell series:**  
This subclass is indented under subclass 41. Dip carbid-feed generators wherein the carbid-receptacle is composed of a number of chambers or compartments which are successively brought in contact with the water.
- 43 Flap valve:**  
This subclass is indented under subclass 38. Carbid-feed generators having flap valves hinged at or near the mouth of the chute or hopper through which the carbid passes, automatically operated to feed the carbid.
- 44 Hand:**  
This subclass is indented under subclass 38. Generator-tanks to which the carbid is fed by hand. In this subclass, the carbid may be fed loosely or put in holders; does not include cartridges.
- 45 Dip:**  
This subclass is indented under subclass 44. Generators provided with suitable means for supporting carbid which is caused to dip in and out of the water, the carbid being fed through a hand-operated valve.
- 46 Measured charges:**  
This subclass is indented under subclass 38. Means for feeding definite charges of carbid. In this subclass will be found devices not otherwise classified under "Measured charges". This subclass includes those structures caused to reciprocate and discharge in the tank.
- 47 Cartridges:**  
This subclass is indented under subclass 46. Devices for feeding cartridges containing carbid.  
  
SEE OR SEARCH THIS CLASS, SUBCLASS:  
59, for construction of the cartridge.
- 48 Rotary carrier:**  
This subclass is indented under subclass 46. Includes a series of receptacles arranged on the same horizontal plane supported by means caused to rotate and discharge the receptacles successively. The receptacles may be provided with hinged bottoms and means for securing and releasing the same, or the receptacles may be trunnioned and provided with means for dumping the same or an endless belt provided with pockets.  
  
SEE OR SEARCH CLASS:  
221, Article Dispensing, subclasses 82+ for article dispensers not otherwise provided for having similar structures and modes of operation.
- 49 Vertical:**  
This subclass is indented under subclass 48. Pocket-wheels arranged to rotate on a vertical plane and discharge successively. The pocket may be provided with lids and means for opening and closing the same. It also includes an endless belt having cups or carriers.
- 50 Stationary:**  
This subclass is indented under subclass 46. Receptacles for carbid which have a fixed relation with the generator. They may be hinged and caused to dump, or they may be receptacles provided with hinged or sliding bottoms with catches and releasing means or a receptacle divided by a series of hinged or sliding shelves with catches and releasing means.
- 51 Piston:**  
This subclass is indented under subclass 38. Generators where a piston is used to feed the carbid.
- 52 Plate valve:**  
This subclass is indented under subclass 38. Carbid feed generators having a plate arranged beneath the discharge-opening of the carbid-hopper with an intervening space, the carbid resting upon the plate. The plate may be in the form of a disk or curved.
- 53 Pop valve:**  
This subclass is indented under subclass 38. Carbid feed generators having valves caused to pass to and fro or through the discharge-opening of the carbid-hopper in a vertical plane.
- 53.1 Bell operated:**  
This subclass is indented under subclass 53. Carbid feed pop-valves operated by the rising and falling movement of the bell.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
53.2, for pop valves in which the carbid holder is carried by the bell.
- 53.2 Bell and holder combined:**  
This subclass is indented under subclass 53.1. Bell-operated carbid feed pop-valves in which the carbid holder is carried by the bell.
- 53.3 Diaphragm operated:**  
This subclass is indented under subclass 53. Carbid feed pop-valves operated by the movement of the diaphragm.
- 53.4 Float operated:**  
This subclass is indented under subclass 53. Carbid feed pop-valves operated by the movement of the float.
- 54 Screw:**  
This subclass is indented under subclass 38. Generators having a screw conveyer to feed the carbid thereto.
- 55 Slide valve:**  
This subclass is indented under subclass 38. Carbid feed generators in which the valve slides upon its seat distinguished from the structure in ... , in that there is no intervening space between the valve and the mouth of the hopper or seat.
- 56 Automatic safety escape:**  
Structures used in connection with the generator whereby excess pressure in the generator permits gas to escape.
- 57 Sludge remover:**  
Means located in and attached to the generator for stirring and removing the hydrate.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
47, for devices for feeding cartridges containing carbid.
- 58 Valves, gas and water feed:**  
Generators in which the valves controlling the water-feed and the gas outlet are connected so as to open or close simultaneously. It also includes the simultaneous venting of the generator.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
36, for interlocking devices for preventing accidents in generator handling.
- 59 Carbide cartridges:**  
Structures such as cans or cases to be used in generators and in which a small quantity of carbid is placed.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
29, for expansible carbide containers.
- SEE OR SEARCH CLASS:  
206, Special Receptacle or Package, particularly subclass .6, subclass .7 and subclass 524.1, and the places specified in the notes to such class and subclasses for other packages of chemicals.
- 60 Conglomerate:**  
This subclass is indented under subclass 59. Cartridges in which the carbid is combined with an agglutinating and protecting substance and formed into briquets, tablets, sticks, etc.
- 61 GENERATORS:**  
This subclass is indented under the class definition. Miscellaneous generators that are not otherwise classifiable.
- SEE OR SEARCH CLASS:  
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 30 for processes directed to furnace lining formation or repair and the search notes thereto, and subclasses 31+ for forming structural installations in situ.  
422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 305 and subclass 306 for gas-generating apparatus.  
429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclasses 408 through 427 for fuel cell operation including methods or means for producing, recycling, or treating reactant, feedstock, product, or electrolyte.

- 62 Cupola:**  
This subclass is indented under subclass 61. Miscellaneous generators, having an upright, substantially cylindrical body.
- SEE OR SEARCH CLASS:  
266, Metallurgical Apparatus, subclasses 171+, for means for treating ores or for extracting metals by applying heat to work, e.g., furnace, etc.
- 63 Air and steam injected:**  
This subclass is indented under subclass 62. Cupola structures wherein air and steam are simultaneously injected for the continuous production of gas.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
64, for means to superheat air or steam before entering cupola.
- 64 Superheated:**  
This subclass is indented under subclass 63. Means for superheating the air or steam, or both, before entering the cupola.
- 65 Electric:**  
This subclass is indented under subclass 62. Structures of the cupola type in which an electric current is used or produced for heating purposes.
- SEE OR SEARCH CLASS:  
204, Chemistry: Electrical and Wave Energy, appropriate subclasses, and other related classes for electrical or wave energy apparatus, excepting radiant energy apparatus provided for in Class 250, Radiant Energy, specialized for the preparation of gaseous compounds or elements and involving chemical reactions which are caused by more than the mere thermal effects of the electrical or wave energy.
- 66 Rotary bottom:**  
This subclass is indented under subclass 62. Cupola structures provided with a bottom for supporting the fuel, constructed to rotate or rock. Does not include rotary grates.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
68, for water-jacketed cupola structures with rotary bottom.
- 67 Water jacket:**  
This subclass is indented under subclass 62. Cupola structures having a water-jacket.
- 68 Rotary bottom:**  
This subclass is indented under subclass 67. Water-jacketed cupola structures having a rotary bottom for supporting the fuel.
- 69 Water-seal pit:**  
This subclass is indented under subclass 62. Cupola structures having an open bottom and a basin or trough for water, forming a seal for closing said open bottom and through which the ash is removed.
- 71 Coal, oil and water:**  
This subclass is indented under subclass 62. Cupola structures in which coal is distilled or gasified and into which steam or water is injected and decomposed and into which oil or oil-vapor is also injected. The oil-vapor may be added to the coal and water gas outside of the distilling chamber.
- 72 Coal and oil:**  
This subclass is indented under subclass 62. Generators in the form of a cupola or shaft in which coal is distilled or gasified and into which oil or oil-vapor is introduced or oil-gas is added.
- 73 Coal and water:**  
This subclass is indented under subclass 62. Cupola structures in which coal is distilled or gasified and into which steam is injected and decomposed. Water-gas may be made separately and added to the coal-gas.
- 74 Refractory filling:**  
This subclass is indented under subclass 62. Cupola structures having a filling of refractory material, such as brick, so as to be heated to a high temperature.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
80, for an alternate process of producing water-gas.
- 75 Oil and steam injected:**  
This subclass is indented under subclass 62. Cupola structures adapted for injection of oil or oil-vapor and steam into incandescent coal.
- 76 Producers:**  
This subclass is indented under subclass 62. Cupola structures wherein ignited fuel is subjected to an air-blast.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
67, 68, and 69, for cupola structures.
- 77 Coal:**  
This subclass is indented under subclass 62. Generators in the form of a cupola or shaft in which coal is distilled or gasified.
- 78 Water:**  
This subclass is indented under subclass 62. Cupola structures for containing a bed of incandescent fuel to which steam is admitted. This subclass includes the alternate process of first blasting with air and then decomposing steam.
- 79 Carburetor:**  
This subclass is indented under subclass 78. Cupola structures for producing water-gas by the alternate process by first blasting and then decomposing steam. The water-gas thus produced is then carbureted by the addition of a hydrocarbon fluid, oil vapor, or oil-gas. In this subclass, the water-gas is passed through an ordinary carbureting vessel containing oil.
- 80 Fixer:**  
This subclass is indented under subclass 79. Containing in addition to the cupola structure for the production of water-gas by the alternate process a chamber filled with refractory material to be highly heated and into which a hydrocarbon oil is admitted. Oil-gas may be admitted into this chamber, the oil or oil-gas combining with the water-gas.
- 81 Retort:**  
This subclass is indented under subclass 79. Combining with the well known cupola structure for the production of water-gas a retort to and through which the water-gas passes and to which a hydrocarbon oil or vapor is simultaneously admitted.
- 82 Up-and-down run:**  
This subclass is indented under subclass 78. Cupola structures containing a body or bodies of incandescent fuel through which the steam is caused to pass first upwardly and then downwardly, or vice versa.
- 83 Interlocking valves:**  
This subclass is indented under subclass 82. Cupola structures for making water-gas by the up-and-down run provided with connected valves for changing the direction of the run.
- 84 Oil gas:**  
This subclass is indented under subclass 78. Combined cupola structure for the production of water-gas and a means for producing oil-gas and combining the two gases.
- 85 Carbon monoxide:**  
This subclass is indented under subclass 62. Apparatus for making and carbureting and processes for carbureting or making carbureted carbon monoxide.
- SEE OR SEARCH CLASS:  
423, Chemistry of Inorganic Compounds, subclasses 246+ and subclass 418.2 for processes of purifying or making carbon monoxide wherein a chemical reaction is involved.
- 85.1 Movable wall:**  
Cupola generators in which the cupola body or a section thereof is movable for the purpose of agitating the fuel to prevent "scaffolding" and the like.
- (1) Note. This subclass is not intended to include structures of the cupola or cylindrical type wherein the bottom or the cover, per se, is caused to rotate, such as are found in this class, subclasses 66 and 68.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
66, and 68, for rotary bottom cupola structures.
- SEE OR SEARCH CLASS:  
34, Drying and Gas or Vapor Contact With Solids, subclasses 108+ for rotary drums or receptacles.
- 85.2 Stirrer:**  
Cupola generators having means within the cupola for stirring the fuel.
- SEE OR SEARCH CLASS:  
432, Heating, subclass 98 for a residual shaft furnace having an agitator for the heated material.
- 86 Chargers:**  
This subclass is indented under subclass 62. Miscellaneous means for feeding fuel to the cupola gas-generator.
- (1) Note. Does not include the bell-and-hopper structure, such being classified in Class 266, Metallurgical Apparatus, appropriate subclasses, and in Class 414, Material or Article Handling, subclasses 147+.
- 87 Accessories:**  
This subclass is indented under subclass 62. Means applied to cupola structures, such as pressure-indicators, means for distributing steam, means for switching the blast or run, removable bottoms, fuel-rammers, poke-holes, peep-holes, oil-spraying devices, etc.
- SEE OR SEARCH CLASS:  
266, Metallurgical Apparatus, for pertinent subclass(es) as determined by schedule review.
- 89 Retort:**  
This subclass is indented under subclass 61. Closed heated retorts for the gasification of carbonaceous material not otherwise classifiable.
- 90 Domestic plants:**  
This subclass is indented under subclass 89. Individual plants consisting of a retort, purifier, condenser, and holder. The retort may be placed in an ordinary cookstove. They may omit the purifier, condenser, or holder.
- 92 Metal bath:**  
This subclass is indented under subclass 89. Retorts containing heated molten metal into which materials to be gasified are injected.
- SEE OR SEARCH CLASS:  
202, Distillation: Apparatus, subclass 219 for a retort containing a mass of fusible material through which heat is conveyed.
- 93 Oil and gas injected:**  
This subclass is indented under subclass 89. Retorts into which oil and gas are injected.
- 94 Oil and steam injected:**  
This subclass is indented under subclass 89. Retorts into which oil and steam or water are injected.
- 95 Air:**  
This subclass is indented under subclass 94. Retorts into which oil, steam, or water and air are injected to be gasified. The air may be added to the gas produced from the oil and steam or water.
- 96 Carburetor:**  
This subclass is indented under subclass 94. Retorts into which oil and steam or water are injected and the resultant gas passed through a vessel containing hydrocarbon fluid.
- 98 Coal, oil and water:**  
This subclass is indented under subclass 89. Combined retorts for gasifying coal and means for introducing steam or water and oil. The water or steam may be converted into CO, H, and the oil gasified in separate retorts and combined with the coal-gas.
- 99 Coal and water:**  
This subclass is indented under subclass 89. Combined retorts for the gasification of coal and means for introducing water, steam, or water-gas.

**100 Coal and oil:**

This subclass is indented under subclass 89. Combined retorts for gasifying coal and means for introducing oil therein or for combining the coal and oil gas.

**101 Coal:**

This subclass is indented under subclass 89. Retorts for producing gas from coal.

**102 Oil:**

This subclass is indented under subclass 89. Retorts containing a body of oil or into which oil is injected.

**SEE OR SEARCH CLASS:**

- 123, Internal-Combustion Engines, subclasses 568.11+ for a vapor generator forming a part of an explosive engine.  
431, Combustion, subclasses 207+ for a burner fed by a retort and for a retort utilizing heat derived from the generated gas. However, where an unburned portion of the gas generated in the retort is purified, fixed, or stored, classification is in appropriate subclass of Class 48.

**103 Electric heater:**

This subclass is indented under subclass 102. Retorts in which is located an electric heater for gasifying the oil.

- (1) Note. This subclass does not include apparatus or processes where an electrolytic action is effected upon the material gasified, for example.

**SEE OR SEARCH CLASS:**

- 204, Chemistry: Electrical and Wave Energy, appropriate subclasses for electrical or wave energy generators, excepting radiant energy apparatus provided for in Class 250, Radiant Energy, specialized for the preparation of gaseous compounds or elements, and involving chemical reactions which are caused by more than the mere thermal effects of the electrical or wave energy.  
392, Electric Resistance Heating Devices, subclasses 301+ for borehole-type heating devices.

- 431, Combustion, subclass 208 for a burner fed by gas generated by an electrical heating means.

**104 Jet mixers:**

This subclass is indented under subclass 102. Retorts in which oil is gasified with the gas-pressure being used to entrain air on its way to the gasometer. In this subclass, the gas is purified or fixed on its way to the storage-gasometer. The retort is heated by a portion of the gas generated.

- (1) Note. This subclass does not include similar devices where a portion or all of the gas is burned to heat the retort, in which there is no fixation, purification, or storage of the gas.

**105 Steam injected:**

This subclass is indented under subclass 102. Vessels containing a body of oil into which steam is injected; also includes devices feeding oil for gasification into a highly-superheated jet of steam for decomposition.

**106 Automatic feed:**

This subclass is indented under subclass 102. Devices whereby the oil fed to the retort is regulated by the pressure of the gas either in the retort or gasometer.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 104, for retorts in which oil is gasified.

**107 Air injected:**

This subclass is indented under subclass 102. Combined retorts for gasifying oil and means for introducing air or oxygen. The air or oxygen may be added to the oil-gas after it leaves the retort or in the gasometer.

**SEE OR SEARCH CLASS:**

- 431, Combustion, subclasses 210+ for a fuel burner fed by a retort supplied with both fuel and air.

**108 Water:**

This subclass is indented under subclass 89. Retorts constructed to contain incandescent coal and into which steam is injected.

- 109 Carburetor:**  
This subclass is indented under subclass 108. Retorts constructed to contain incandescent coal for making water-gas, which is thereafter carbureted.
- 110 Oil gas:**  
This subclass is indented under subclass 108. Retorts for separately making water and oil gases, which may afterward be mixed.
- 111 Wood:**  
This subclass is indented under subclass 89. Retorts in which wood, peat, sawdust, or other vegetable matter is distilled for making gas and to which steam may be added and decomposed.
- SEE OR SEARCH CLASS:  
202, Distillation: Apparatus, for pertinent subclass(es) as determined by schedule review.
- 112 Oil:**  
This subclass is indented under subclass 111. Retorts in which wood, etc., is distilled for making gas and into which oil is injected or separately gasified and added to the wood-gas. Steam may also be injected.
- 113 Furnaces:**  
This subclass is indented under subclass 89. Furnace structures to generate for producer-gas for heating benches of retorts. The furnace may have flues for the passage of air, and also flues for the passage of the products of combustion whereby the air is heated. This subclass includes settings for the retorts and processes for heating the retorts.
- 116 Carburetor:**  
Combined hydrogen-generators and means for carbureting the hydrogen by passing the same in contact with or through a hydrocarbon liquid.
- 117 Air:**  
This subclass is indented under subclass 116. Combined hydrogen-generators and means for carbureting air and mixing the two gases, which may further carburet the mixture.
- 118 Floating oil:**  
This subclass is indented under subclass 116. Generators in which a hydrocarbon oil floats on the surface of the acid solution and through which the generated hydrogen passes.
- 118.5 Portable:**  
This subclass is indented under subclass 61. Generators constructed to be transported from place to place for the purpose of filling local gasometers.
- 119 RETORTS:**  
This subclass is indented under the class definition. Vessels constructed of metal, clay etc., for gasifying materials by heat applied thereto. This subclass includes retorts of various designs arranged on a horizontal plane.
- SEE OR SEARCH CLASS:  
432, Heating, subclasses 253+ for residual means for holding, shielding, or supporting work within a furnace while being heated.
- 120 Compounds:**  
This subclass is indented under subclass 119. Retorts divided or formed into two or more chambers.
- 122 Inclined:**  
This subclass is indented under subclass 119. Retorts constructed to be placed in the furnace in an inclined position.
- 123 Vertical:**  
This subclass is indented under subclass 119. Retorts vertically arranged within the furnace.
- 124 Lids:**  
This subclass is indented under subclass 119. Doors for closing the mouth of retorts. Includes special fastening means.
- SEE OR SEARCH CLASS:  
110, Furnaces, subclasses 173+ for doors relating to openings in furnace walls.  
202, Distillation: Apparatus, subclasses 242+ for retort closures.  
220, Receptacles, subclasses 200+ for removable closures.

**126 Attachments:**

This subclass is indented under subclass 119. Auxiliary devices applied to retorts, such as mouthpieces, door-seats, stoppers, etc.

**127.1 CONVERSION OF HYDROCARBON GAS AND BLENDING OF PRODUCT WITH FURTHER HYDROCARBON GAS, PROCESS:**

This subclass is indented under the class definition. Process in which a normally gaseous hydrocarbon or gaseous mixture containing predominantly such hydrocarbon is subjected to a chemical reaction and a normally gaseous hydrocarbon or gaseous mixture is mixed with the reaction product.

- (1) Note. The unreacted hydrocarbon gas may have the same composition as the gas fed to the reaction or a different composition.
- (2) Note. The process often has for its purpose the lowering of the BTU value of a batch of natural gas, which is split, one part treated, and recombined.

SEE OR SEARCH THIS CLASS, SUBCLASS:

197, and 198.1+, for the conversion of a hydrocarbon gas to a different combustible gas composition.

**127.3 METHANE (NATURAL GAS)-CONTAINING PRODUCT, OR TREATMENT OR RECOVERY PROCESS:**

This subclass is indented under the class definition. Subject matter in which a gaseous product composition containing methane is claimed or in which a process is claimed which results in such a product.

SEE OR SEARCH THIS CLASS, SUBCLASS:

197, for a combustible gas product composition other than one containing methane.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 372+ for a gaseous composition in general or a method for manufacturing it.

585, Chemistry of Hydrocarbon Compounds, subclass 6 for mixture of gases containing only hydrocarbons.

**127.5 Process including chemical reaction:**

This subclass is indented under subclass 127.3. Process in which a compound included in the feedstock to the process is changed to another compound.

- (1) Note. The resulting compound may be methane or the entire reaction may be concerned with a compound other than methane, for example, an impurity compound in a mainly-methane stream may be reacted to remove it or make it less objectionable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

198.3, for a process wherein an impurity is removed after chemical conversion of methane to a different gaseous composition.

SEE OR SEARCH CLASS:

585, Chemistry of Hydrocarbon Compounds, subclasses 700+ for synthesis of methane as a relatively pure compound.

**127.7 Catalytic:**

This subclass is indented under subclass 127.5. Subject matter which employs an extraneous accelerator or retarder for the reaction.

- (1) Note. This subclass (127.7) serves as a collection place for cross-reference copies of patents wherein a methane-containing mixture is recovered from an enzyme-catalyzed reaction.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, subclass 603 for a process in which methane is collected incidental to sewage or other waste liquid treatment.

435, Chemistry: Molecular Biology and Microbiology, subclass 167 for the manufacture of methane by fermentation, that is, bacterial or other enzyme-catalyzed synthesis.

**127.9 APPARATUS FOR CONVERTING OR TREATING HYDROCARBON GAS:**

This subclass is indented under the class definition. Apparatus which uses a hydrocarbon gas as a feedstock or in which a hydrocarbon gas is an effluent.

SEE OR SEARCH THIS CLASS, SUBCLASS:

127.1, 127.3+, 197, and 198.1+, for the corresponding processes.

SEE OR SEARCH CLASS:

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses for chemical reactors in general.

429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclasses 408 through 427 for fuel cell operation including methods or means for producing, recycling, or treating reactant, feedstock, product, or electrolyte.

**128 PURIFIERS:**

This subclass is indented under the class definition. Means not otherwise classifiable wherein gas is subjected to the action of a medium capable of removing impurities.

**144 CARBURETORS:**

This subclass is indented under the class definition. Vessels for containing liquid hydrocarbon through or over which air or gas is passed.

(1) Note. See also main class definition under this class.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 568.11+ for a vapor generator forming a part of an explosive engine.

**160 Gravity:**

This subclass is indented under subclass 144. Vessels constructed to contain hydrocarbon liquid, or to which the same is fed drop by drop, and to which air is admitted under atmospheric pressure, and from which the carbureted air passes by gravity.

**170 CENTER AND BY-PASS VALVES:**

This subclass is indented under the class definition. Means for directing the passage of the gas through two or more purifiers and for bypassing one or more.

**173 EXHAUSTERS:**

This subclass is indented under the class definition. Means for drawing the gas from the generator, regulating the action of the same, and preventing the formation of a vacuum.

**174 HOLDERS:**

This subclass is indented under the class definition. Vessels for the storage of gas. This subclass includes stationary vessels and independent parts to be used in the construction of the holder.

SEE OR SEARCH CLASS:

105, Railway Rolling Stock, subclass 358 for freight cars designed to carry fluid material.

220, Receptacles, for pertinent subclass(es) as determined by schedule review.

405, Hydraulic and Earth Engineering, subclasses 53+ for underground storage of fluids.

**175 High-pressure safety escape:**

This subclass is indented under subclass 174. Means combined with the holder so related that on excessive pressure in the holder the gas escapes.

**176 Bell and tank:**

This subclass is indented under subclass 174. Structures consisting of an open-top tank and an inverted bell. The tank may be provided with a purifier through which the gas passes on its way to the bell; or with a chamber for storing oil or various utensils used around the works.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, for holders in which the water-feed is regulated by the movement of the gas-holder.

104, for retorts in which oil is gasified.

- SEE OR SEARCH CLASS:  
417, Pumps, subclasses 93+ for gas pumps having a moving contracting chamber in a liquid tank.
- 177 Sectional bell:**  
This subclass is indented under subclass 176. Structures where the bell is divided horizontally into sections having water-seal joints and telescoping.
- 178 Collapsible:**  
This subclass is indented under subclass 174. Holders comprising a plurality of sections of which one or more is flexible and so related that the holder may collapse.
- 179 Tank:**  
This subclass is indented under subclass 174. Open-top chambers within which the bell moves.
- SEE OR SEARCH CLASS:  
220, Receptacles, subclasses 581+ for a high-pressure-gas tank.
- 180.1 MIXERS:**  
This subclass is indented under the class definition. Processes and apparatus for mixing combustible gases or a gas and a supporter of combustion.
- SEE OR SEARCH CLASS:  
73, Measuring and Testing, subclasses 195+ for meters for feeding gases in definite proportions.  
123, Internal-Combustion Engines, subclasses 568.11+ for mixers peculiar to explosive engines.  
137, Fluid Handling, subclass 3 for a process of general utility involving control of the mixing of diverse fluids, subclasses 98+ for a self-proportioning flow system of general utility and subclasses 602+ for a fluid handling system having plural inlets and a single outlet for fluids other than heating or illuminating gas.  
239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 8+ for a sprinkling, spraying or diffusing process of general utility involving mixing; and subclasses 398+ for a combined mixing
- and spraying structure of general utility including a flow modifying terminal outlet means.
- 431, Combustion, subclasses 354+ for a fuel-oxidizer mixing and flame holding assembly where the flame holder is no more than an abruptly terminated flow means.
- 181 Bell and tank:**  
This subclass is indented under subclass 180.1. Mixers comprising a bell and tank within which the gases are mixed, the movement of the bell controlling the supply of gases or air and gas.
- 182 Anterior:**  
This subclass is indented under subclass 181. Devices where the mixture of gases or gas and air takes place before entering the bell and is controlled thereby.
- 183 Posterior:**  
This subclass is indented under subclass 181. Devices where the mixture of gases or air and gas is made beyond the bell and controlled thereby.
- 184 Diaphragm:**  
This subclass is indented under subclass 180.1. Devices where a diaphragm operates the valves controlling the supply of gases or gas and air, the pressure of the gas operating the diaphragm.
- 185 Gravity:**  
This subclass is indented under subclass 180.1. Devices where a body connected to and operating the supply-valves for the gases or gas and air is made buoyant by the specific gravity of the gas.
- 186 Pump:**  
This subclass is indented under subclass 180.1. Devices where pumps are employed to deliver the gases or air and gas to a mixing-chamber.
- 187 Rotary drum:**  
This subclass is indented under subclass 180.1. Bladed rotary drums located within a casing for drawing in the gases or air and gas and mixing them.

- 188 Anterior:**  
This subclass is indented under subclass 187. Devices where the air and gas or gases are mixed before entering the drum.
- 189 Posterior:**  
This subclass is indented under subclass 187. Devices where the air and gas or gases are mixed beyond the drum, the drum being used to force one or both of the elements.
- 189.1 Three or more different fluids entering apparatus:**  
This subclass is indented under subclass 180.1. Apparatus having provision for three or more different combustible gases or gases which support combustion to separately enter the apparatus.
- (1) Note. Any difference in the gases is sufficient to make them different.
- (2) Note. This subclass includes for example devices which mix a high calorific fuel gas, a low calorific fuel gas and air.
- 189.2 With heating means:**  
This subclass is indented under subclass 180.1. Apparatus additionally including means to heat the mixture produced or component thereof.
- 189.3 Auxiliary air inlet:**  
This subclass is indented under subclass 180.1. Apparatus having means for adding air to an existing mixture of air and a combustible gas.
- 189.4 Mixer in flow path of existing mixture:**  
This subclass is indented under subclass 180.1. Apparatus in the flow path of an existing mixture which improves the extent of mixing.
- (1) Note. Apparatus in this or indented subclasses is characterized by adding no additional component to the mixture.
- 189.5 Rotating mixer:**  
This subclass is indented under subclass 189.4. Apparatus wherein an element rotates in the flow path of the existing mixture.
- (1) Note. The rotation may be caused either by the motion of the mixture itself or by external force.
- 189.6 Includes element made of engaged strands or fibers, e.g., screen, fabric, etc.:**  
This subclass is indented under subclass 189.4. Apparatus which includes an element made of fibers or strands which cross and touch each other, including a single strand which loops and touches itself.
- (1) Note. This subclass includes for example screen, woven or nonwoven fabric, a mass of steel wool, etc. The fibers or strands may or may not be attached together where they cross as by adhesive, etc.
- 190 DISTRIBUTION:**  
This subclass is indented under the class definition. Means and methods for the distribution of gas.
- (1) Note. This subclass contains miscellaneous patents not otherwise classified, such as those for preventing the freezing in the pipes, charging distributing holders on trains, ships, etc.
- SEE OR SEARCH CLASS:  
137, Fluid Handling, particularly subclasses 561+ for fluid handling and distribution systems not otherwise provided for.  
138, Pipes and Tubular Conduits, appropriate subclasses for pipes and tubes, especially subclasses 32+ for devices of general application for the prevention of fluid in pipes from freezing.
- 191 Regulating pressure:**  
This subclass is indented under subclass 190. Means for reducing and regulating the pressure of gas in a distributing system.
- SEE OR SEARCH CLASS:  
137, Fluid Handling, subclasses 494+, particularly subclasses 505+ for fluid-pressure regulators, per se.
- 192 Safety devices:**  
This subclass is indented under subclass 190. Means for preventing, also localizing and confining, explosions in a gas-distributing system.

**193 Leakage:**

This subclass is indented under subclass 190. Means for detecting and providing for the escape of leakage gas from mains.

## SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclass 40.5 for positively creating a condition to produce leakage of defective mains.  
252, Compositions, subclass 68, subclasses 299.01+ and subclass 408.1 for gas leak testing compositions.

**194 Preventing:**

This subclass is indented under subclass 193. Means for preventing the leakage of gas from the mains at their couplings.

## SEE OR SEARCH CLASS:

- 285, Pipe Joints or Couplings, subclasses 13+ for a coupling combined with leakage disposal means, and subclasses 148.6+ for compound joints. See the Search Notes thereunder.

**195 Odorizers:**

This subclass is indented under subclass 193. Means for charging gas with an odorous substance.

**197 PROCESSES:**

This subclass is indented under the class definition. Processes not otherwise classifiable for the manufacture and accessory treatment of gas.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 127.1, for a process in which a hydrocarbon gas feedstock is converted to fuel gas of a different composition and this latter composition is blended with hydrocarbon gas.  
127.3+, for a fuel gas product containing methane or a process for treating or recovering such a product.

## SEE OR SEARCH CLASS:

- 44, Fuel and Related Compositions, subclasses 300 through 459 for liquefied, normally gaseous fuel compositions, classified principally on the

basis of nonhydrocarbon additives thereto.

- 204, Chemistry: Electrical and Wave Energy, for production of gaseous compounds or elements involving chemical reactions which are caused by more than the mere thermal effects of electrical or wave energy, especially subclasses 170+ for a process involving a chemical reaction brought about by an electrostatic field or electrical discharge to produce a gaseous hydrocarbon.  
205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, for electrolysis, especially subclasses 334+ for electrolytic synthesis of a chemical compound or element.  
423, Chemistry of Inorganic Compounds, subclasses 210 through 215.5 for the chemical destruction of gaseous hazardous or toxic waste. Note that subclasses 245.1-245.3 provide for an organic component.  
518, Chemistry: Fischer-Tropsch Processes; or Purification or Recovery of Products Thereof, for processes of producing nonfuel gases, which are not specifically set forth as being useful as fuels, by the reaction of hydrogen with carbon oxides.  
585, Chemistry of Hydrocarbon Compounds, particularly subclass 14, for liquified, normally gaseous fuel compositions which are mixtures of hydrocarbons only.  
588, Hazardous or Toxic Waste Destruction or Containment, appropriate subclasses for the use of heat, vacuum, or chemical agents when destroying or containing hazardous or toxic waste.

**198.1 Manufacture from methane (natural gas):**

This subclass is indented under subclass 197. Subject matter in which the feedstock to the process includes a significant amount of methane gas.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

- 127.9, for the corresponding apparatus.

**198.2 Employing carbon particles, porous barrier element or molten material:**

This subclass is indented under subclass 198.1. Subject matter in which the conversion process employs a normally solid material in its liquid state or carbon particles (which may be carbon particles produced in the same or a different stage of the process) or self-sustaining element having pores which permit the passage of some, but not all, components of a gaseous composition.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

200, 201, 202 and 210, for the production of fuel gas from coal or other carbon particles without the use of methane-containing gas.

**198.3 With specified treatment of converted product, e.g., purification, particular cooling, testing, etc.:**

This subclass is indented under subclass 198.1. Subject matter in which the gaseous product of the process is subjected to a further treatment which does not change the chemical nature of the finished desired product.

SEE OR SEARCH CLASS:

62, Refrigeration, appropriate subclasses for a process for purifying or separating gas compositions via the liquefaction or solidification of normally gaseous materials.

73, Measuring and Testing, for testing methods in general, and the main class definition thereto for a directory of other loci for the testing art.

95, Gas Separation: Processes, appropriate subclasses for processes, per se, for the separation of gas from a fluid mixture.

165, Heat Exchange, for cooling methods and apparatus, in general.

423, Chemistry of Inorganic Compounds, subclasses 210+ for gas purification by a method involving a chemical reaction.

**198.5 Employing oxygen donor particles or carbidable metal particles:**

This subclass is indented under subclass 198.1. Subject matter in which a feedstock or an intermediate mixture contacts particles of a metal which can be converted to a carbide of the metal or oxygen-containing particles which can give up their oxygen to another gas used in the process.

(1) Note. The particles involved must be described as carbidable or oxygen-donating or the carbiding or oxygen-donating reaction must be described as taking place.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

198.7, for a process including contact with particles described as catalytic.

**198.6 Specified direction of gas travel through particle mass, e.g., fluidization, flow reversal, etc.:**

This subclass is indented under subclass 198.1. Subject matter in which a gas involved in the process is described as traveling through a particle mass in a specified direction, e.g., vertically, downwardly, etc., or in opposite directions through the same particle mass at different stages of the process.

(1) Note. The mere statement that the particle mass is fluidized, or words to that effect, is sufficient for placement in this subclass.

**198.7 Employing catalytic particles:**

This subclass is indented under subclass 198.1. Subject matter in which a gas contacts a reaction accelerating or retarding material in particle form.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

198.2, for a similar process in which carbon particles may act as a catalyst.

198.5, for a similar process in which metal or oxide particles, ordinarily considered a catalyst, chemically combine with carbon or yield oxygen to a reactant.

198.6, for a similar process in which a mass of catalytic particles is fluidized.

- 198.8 With specified reactant velocity, angle of entry to reactor or mechanical energy production, e.g., use of internal combustion engine, etc.:**  
This subclass is indented under subclass 198.1. Subject matter in which an internal combustion engine or other producer of mechanical energy is used as a reactor apparatus, or where the speed of gas flow to, through or from the reactor is specified or where the angle of the path of gas flowing into a reactor is specified.
- 199 Carbureting:**  
Processes wherein hydrogen gas is brought in contact with a liquid hydrocarbon.
- 200 Coal, oil and water:**  
This subclass is indented under subclass 197. Processes for gasifying coal and oil and decomposing water and combining the resultant gases. These elements may be separately gasified and united or conjointly gasified.
- 201 Coal and oil:**  
This subclass is indented under subclass 197. Processes for making and combining coal and olefiant gases. They may be made separately and united or made combined.
- 202 Coal and water:**  
This subclass is indented under subclass 197. Processes for gasifying coal and combining therewith water-gas or simultaneously gasifying coal and decomposing steam in the same retort.
- SEE OR SEARCH CLASS:  
201, Distillation: Processes, Thermolytic, subclass 38 for a process of carbonizing coal in the presence of steam.
- 203 Producer:**  
This subclass is indented under subclass 197. Processes for making the well-known Siemens producer gas, which consists in blasting with air an ignited bed of fuel.
- 204 Water:**  
This subclass is indented under subclass 197. Processes whereby a body of fuel is first heated to incandescence and then steam injected.
- SEE OR SEARCH CLASS:  
201, Distillation: Processes, Thermolytic, subclass 38 for a process of carbonizing coal in the presence of steam.
- 205 Carbureting:**  
This subclass is indented under subclass 204. Processes whereby steam is decomposed by being passed through a body of incandescent fuel and then carbureted by means of a volatile hydrocarbon either in the form of a liquid, vapor, or gas.
- 206 Continuous:**  
This subclass is indented under subclass 204. Processes for the continuous manufacture of water-gas by bringing steam into contact with coal maintained at a decomposing temperature either by internal combustion or heat applied.
- 207 Down run:**  
This subclass is indented under subclass 204. Processes wherein steam is admitted to the top of a bed of incandescent fuel, passes through, and the resultant gas drawn off at the bottom.
- 208 Up-and-down run:**  
This subclass is indented under subclass 204. Processes in which steam is caused to pass upwardly and downwardly, or vice versa, through a body or separate bodies of incandescent fuel.
- 209 Wood:**  
This subclass is indented under subclass 197. Processes for gasifying wood, sawdust, peat, or other vegetable matter. The gas generated may be carbureted or have added to it oil or oil gas or other gas.
- SEE OR SEARCH CLASS:  
201, Distillation: Processes, Thermolytic, appropriate subclasses for a process of destructive distillation of wood, sawdust, peat or other vegetable matter.
- 210 Coal:**  
This subclass is indented under subclass 197. Methods for generating gas from coal.

- 211 Oil:**  
This subclass is indented under subclass 197. Processes for gasifying oil.
- SEE OR SEARCH CLASS:  
208, Mineral Oils: Processes and Products, particularly subclasses 106+ for the production of both a gas and a mineral oil from a mineral oil unless the oil produced is merely incidental to the production of a gas from the oil feed.
- 212 Air injected:**  
This subclass is indented under subclass 211. Processes where oil and air are injected into a heated retort. The air may be added to the gas produced from the oil.
- 213 Gas injected:**  
This subclass is indented under subclass 211. Processes wherein oil and gas are injected into a highly heated retort.
- 214 Oil and steam injected:**  
This subclass is indented under subclass 197. Processes wherein oil and steam or water are injected into a highly heated retort.
- 215 Air:**  
This subclass is indented under subclass 214. Processes wherein oil, steam, and air are injected into a highly heated retort. The air may be added to and mixed with the gas resulting from the decomposition of the oil and steam or water.
- 216 Acetylene:**  
Processes for generating acetylene gas by the mutual decomposition of calcium carbide and water and for preparing calcium carbide for such use. This subclass covers processes of the first type.
- SEE OR SEARCH CLASS:  
204, Chemistry: Electrical and Wave Energy, subclass 171 for processes of producing acetylene gas by a chemical reaction brought about by an electrostatic field or an electrical discharge.
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, for electrolysis, especially subclass 462 for electrolytic synthesis of a hydrocarbon.
- 585, Chemistry of Hydrocarbon Compounds, subclasses 534+ for a process of synthesizing acetylene or a hydrocarbon derivative thereof where the intent is to produce a relatively pure organic compound.
- 217 Slow:**  
This subclass is indented under subclass 216. Processes in which a retarded generation of acetylene is produced in contra-distinction to the usual rapid generation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
60, for conglomerate carbide cartridges.
- 219 Carbureting:**  
This subclass is indented under subclass 197. Processes for carbureting air or gas generally by passing the same in contact with hydrocarbon liquid.
- END