

3.21	<b>VORTEX-FLOW DRIVE AND CLUTCH</b>	219.1	...Hill-holder
3.22	..With means to effect torque reversal	219.2	....One-way brake
3.23	..With brake	219.3	.....Ball or roller
3.24	..Alternatively operative clutch and brake	219.4	...Emergency or parking brake
3.25	..With additional drive or clutch	219.5	....Parking pawl
3.26	..Simultaneously operative clutches	219.6	....With separate manual operator
3.27	..Alternatively operative clutches	219.7	.....Foot operated
3.28	..Including drive-lockup clutch	220	..Brake control affects transmission change
3.29	..Having fluid-pressure operator	220.1	...Brake application neutralizes transmission
3.3	...With auxiliary source of pressure	220.2	...Park-lock device
3.31	..Having speed-responsive operator	220.3	....Floor-mounted shift lever
3.32	..Alternatively operative drive and clutch	220.4	.....Solenoid operated lock
3.33	..Fluid-pressure operator for engaging clutch	220.5	.....Rotary bushing
3.34	<b>VORTEX-FLOW DRIVE AND BRAKE</b>	220.6	.....Override
3.51	<b>TRANSMISSION CONTROL AND CLUTCH CONTROL</b>	220.7	.....Override
3.52	..Planetary transmission and coaxial clutch	221	..Fluid operated
3.53	..Including separate, reversing pedal	221.1	...Brake and gearing at axle end
3.54	..Common control	222	..Electromagnetic
3.55	..Power-operated clutch	223	..Torque-responsive brake
3.56	...Electromagnetically operated	223.1	..Transversely engaged positive brake
3.57	...Fluid-press operated	223.2	..Ball or roller type brake
3.58	....Electrically triggered	223.3	..With cam mechanism for axially moving brake member
3.59	....Vacuum operated	223.4	..Wrap-spring brake
3.61	..Stepped ratio transmission	224	..Belt or chain transmission
3.62	..With control lever	224.1	..Belt tensioner affects brake operation
3.63	..Interrelated (e.g., with interlock)	224.2	..Belt failure operates brake
215	<b>TRANSMISSION AND BRAKE</b>	224.3	..Belt shipper affects brake operation
216	..Internal resistance brake	225	..Fluid operated
217	..Velocipede	226	..Electromagnetic
217.1	..Back-pedaling brake (e.g., coaster brake)	12 R	<b>CLUTCH AND BRAKE</b>
217.2	...Rotatable crank axle	13 R	..Vehicle type
217.3	...Wheel hub	13 A	..Clutch-released brake holder
217.4	....With change-speed transmission	14	..Same member
217.5	.....Plural sprockets	15	..Automatic check and release
217.6	....With screw operator	16	..Clutch and brake same member
217.7	....Multidisc brake	17 R	..Peripheral brake
218	..Motor vehicle	17 A	..Fluid operator
219	..Transmission control affects brake	17 C	..Electric
		17 D	..Coil
		18 R	..Sliding operation
		18 A	..Fluid operator
		18 B	..Electric and magnetic
		19	..Crank control
		12 A	..Internal resistance
		12 B	..One-way engaging
		12 BA	..Coil spring type
		12 C	..Fluid operator

12 D	.Electric	48.7	..With means to actuate or deactuate clutch-assemblages sequentially
20	<b>CLUTCH AND GEAR</b>		
21	.Reversing		
21.5	<b>FIELD RESPONSIVE FRICTIONAL MEDIA TYPE</b>	48.8	..Associated with three or more shafts
22	<b>LATCH OPERATED</b>	48.9	...Alternatively operative assemblages
23	.Corn-planter type		
24	.Longitudinally moving transmission member	48.91	...Having common clutch-element support
25	..Pin	48.92	..Including unirotationally engaging clutch-elements
26	.Transversely moving transmission member	49	..Parallel vehicle wheels
27	..Ball or roller	50	...Free wheel
28	..Positive	51	..Reversing
29	...Rotating key	52.1	.Progressive engagement
30 R	<b>CLUTCHES</b>	52.2	..Surface area
31	.Automatic	52.3	...Yielding
32	..Manual control	52.4	..Variable force
33 R	...Definite-position release	52.5	...Initial engagement causes increase in applied force
33 C	....Coil		
34	...Shaft thrust	52.6	..Yielding
35	...Pilot mechanism	53.1	..Frictional and positive
36	....Brake band	53.2	...Magnetic or electromagnetic operated friction clutch
37	...Transversely moving		
38	....Ball or roller	53.3	...With blocker
39	....Positive	53.31	....Self-energizing
40	...Electric	53.32	....Interposed friction members
41 R	..One-way engaging	53.33	....Member extending axially between friction surfaces
42	..Free-engine type		
43	...Reversible	53.331	....Blocker on axially extending stepped pin
43.1	....Pivoted pawls		
43.2	....Slidable pawls	53.332	.....Resilient detent pin
44	....Ball or roller	53.34	....Outward tooth or lug on friction member
45	...Ball or roller		
45.1	...Wedging pawl or block	53.341	....With thrust member
45.2	...Two-point gripper	53.342	.....Resilient thrust bar
46	...Positive	53.343	.....Resilient expander ring
47	...Manual control	53.35	....Inward tooth or lug on friction member
41 S	...Spring		
41 A	...Sprags	53.36	....Radially movable blocker
48.1	.Plural clutch-assemblage	53.361	....Detent acts as blocker
48.2	..Including electrically actuated clutch assemblage	53.362	.....Rocker lever actuates friction clutch
48.3	..Diverse clutch-assemblages	53.363	....Radially movable friction element acts as blocker
48.4	...Including three or more assemblages	53.364	.....Resilient friction element
48.5	...Including one clutch-assemblage having interdigitated clutch-elements	53.4	...Lock for positive clutch
48.6	....And another clutch-assemblage having unirotationally engaging clutch elements	53.5	...Axially projecting positive clutch
		53.51	....Cylindrical pin
		53.6	...Transversely moving positive clutch
		54.1	.Torque responsive

54.2	..Hub clutch	58.4	...Viscous shear
54.5	..Cam operated	58.41	....Multiple plate
54.51	...Screw operated	58.42	.....Variable gap or volume
54.52	...Ball or roller type	58.43	....Variable gap or volume
55.1	..With overload release coupling	58.5	....Separate reservoir
55.2	..With flexible shaft coupling permitting limited relative rotation	58.6	.....Automatic regulation
55.3	...Separate resilient member between clutch element and its shaft	58.61	.....Magnetic or electric
55.4	....Fluid damper	58.62	.....Temperature and speed
55.5	....Coil spring coaxial with rotation axis	58.63	.....Temperature
55.51	.....Radially overlapping convolutions	58.64	.....Coolant and clutching medium
55.6	....Plural resilient members	58.65	.....Ambient and clutching medium
55.61	.....Coil springs with center line spaced from rotational axis	58.66	.....Ambient and coolant
55.62	.....Center line of coil springs parallel to rotational axis	58.67	.....Clutching medium
55.7	....Coil spring with center line spaced from rotational axis	58.68	.....Ambient
56.1	..Overload release	58.681	.....Bi-metallic
56.2	...Coil	58.682	.....Spiral
56.3	...Fluid-operated clutch	58.683	.....Resilient or adjustable mounting feature
56.31	....Axially engaged	58.684	.....Mounting feature
56.32	.....Positive	58.7	....Pump-out feature
56.33	.....Ball or roller	58.8	....Specific valve
56.4	...Magnetic or electromagnetic	58.9	...Radial vane
56.41	....Axially engaged	58.91	...Vaness on inner member
56.42	.....Positive	58.92	....Spring-biased
56.43	.....Ball or roller	59	..Axially movable piston
56.5	...Clutch elements remain disengaged after overload corrected	60	..Transversely movable piston
56.51	....Having separate latch to hold clutch elements disengaged	61	..Gear-pump type
56.52	.....Axially engaged	62	.Plow-lifting type
56.53	.....Positive	63	.Free-engine type
56.54	.....Ball or roller	64	.Velocipede free wheel
56.55	....Axially engaged	65	.Axially and transversely engaging
56.56	.....Positive	66.1	.Axially engaging
56.57	.....Ball or roller	66.2	..Conical or frustoconical
56.6	...Axially engaged	66.21	...Plural radially spaced surfaces
56.61	....Positive	66.22	...Spring engaged
56.62	.....Ball or roller	66.23	...Spring released
54.3	..Fluid operated	66.3	..Planar radially extending
54.4	..Magnetic or electromagnetic	66.31	...Spring engaged
57	.Fluent material and mechanical	66.32	...Spring released
58.1	.Fluent material	69	..Positive
58.2	..Fluid	69.1	...Pivoting positive clutch element
58.3	...Vane clutch	69.2	...Plunger disconnect
		69.3	...Pilot pawl
		69.4	...Wheel hub clutched to axle
		69.41	....Fluid pressure
		69.42	....Electromagnetic
		69.43	....Manual
		69.5	...Ball or roller
		69.6	...Cylindrical pin

69.61	....Axial pin on only one member	70.28	....To separate engaged clutch-elements
69.62	.....Pin engages aperture in other member	70.29	....And actuator lever pivoted on pressure plate
69.63	....Radial pin	70.3	...With actuator lever pivoted on pressure plate or back plate to move clutch-element axially
69.7	...Axial-radial		.Transversely engaged
69.71	....Axially extending projection engages aperture	71	..Positive
69.8	...Axial-axial	72	..Interior and exterior
69.81	....Sawtooth	73	...Opposing
69.82	....Square tooth	74	..Interior
69.83	.....With lead-in	75	...Expanding
69.9	...Radial-radial	76	....Radial
69.91	....Outward projection on movable member	77	....Split ring
70	..Spreading	78	.....Cam operated
70.11	..Interposed, mating clutch-elements	79	..Exterior
70.12	...With means to cool or lubricate clutch parts	80	...Strap
70.13	...With removable or replaceable or interchangeable clutch parts	81 R	....Multiple folds
70.14	...Including surface characteristics of clutch-element	81 C	.....Coil
70.15	....Axially tapered mating surfaces	82 R	.Operators
70.16	...With torque connection between clutch-element and its shaft	83	..Multiple for same clutch
70.17	....Resilient torque connection (e.g., for damping vibration)	84.1	..Electric or magnetic
70.18	.....Including chordally disposed connection	84.2	...Plural coils
70.19	....Axially slidable connection	84.21	....Plural armatures
70.2	.....Spline connection for multiple clutch-elements	84.3	...Including permanent magnet
70.21	...With means to move multiple clutch-elements axially and sequentially	84.31	....And electromagnet
70.22	...With means to move clutch-element axially and latch into engaged or disengaged position	84.4	...Electrostatic
70.23	...With cam or wedge contacting clutch-element or pressure plate for axial movement thereof	84.5	...Air gap adjustment
70.24	....By cam surface on bell-crank	84.51	....Automatic
70.25	...With adjustable means to move clutch-element axially (e.g., to compensate for wear)	84.6	...Rotary electric motor is clutch actuator
70.26	....Including plural adjusting screws (e.g., to equalize pressure angularly)	84.7	...Mechanical force increasing means
70.27	...With spring means to move clutch-element axially	84.8	...Operator for transversely engaging elements
		84.81	....Coil spring
		84.9	...Operator for axially engaging elements
		84.91	....Interposed friction elements
		84.92	....Positively engaging elements
		84.93	....Magnetic flux path spaced from engaging elements
		84.94	....Specified torque transmitting spring
		84.941	.....Nonmetallic
		84.95	....With slip rings
		84.951	.....With pulley or gear
		84.96	....Fixed concentric coil
		84.961	.....With pulley or gear
		85 R	..Fluid pressure
		86	...Double acting
		87.1	...Multiple clutches
		87.11	....Having independent operators

87.12	.....Responsive to rotational speed of clutch-element	93 C	...Axially moving cam acting on transversely moving wedge or clutch member
87.13	.....With selective distributor for fluid pressure	94	..Screw
87.14	....Alternatively operative clutches	95	..Handwheel
87.15	.....Clutches coaxial with operators	96	..Central pin
87.16	.....Common or interconnected operator(s)	97	...Screw operated
87.17	.....Operator between clutches	98	..Shipper saddles
87.18	.....With selective distributor for fluid pressure	99 R	..Lever systems
87.19	.....Having neutral position	99 A	...Levers mounted on axially engaging clutch
88 R	...Flexible motor	99 B	...Levers mounted on transversely engaging clutch
88 A	...Flexible fluid motor-axially engaged	99 S	...Stationary levers
88 B	...Radially engaged	100	..Follow-up
85 A	...Axially engaging-rotating motor and clutch	101	..Releasing
85 AA	...Axially engaging clamping rotating motor and clutch	102	..Check of driven member
85 AB	...Axially engaging spreading rotating motor and clutch	103 R	..Speed responsive
85 AT	...Transversely engaging rotating motor and clutch	104 R	...Fixed-speed release
85 C	...Clutch and nonrotating motor	104 B	...Transversely engaged-interior
85 CA	...Clutch and nonrotating motor	104 C	...Transversely engaged-exterior
85 F	...Centrifugal fluid clutches	104 F	...Fluid clutches and operators
85 V	...Vacuum clutches and operators	105 R	...Fixed-speed engagement
89.1	..Weight operated	105 A	...Centrifugal (fluid or powder) nonpivoted weights (radially movably or slidable) i.e., mercury clutch
89.2	..Spring engaged	105 B	...Axially engaged with nonpivoted weights-weights movable radially or slidable
90	...Electric release	105 BA	...Transversely engaged with nonpivoted weights
91 R	...Fluid release	105 BB	...Transversely engaged positive with nonpivoted weights
91 A	...Motor concentric with clutch shaft	105 C	...Axially engaged with pivoted weights
89.21	...Cam release	105 CP	...Weights pivoted on axis parallel to clutch axis-axially engaged
89.22	...Belleville disc spring	105 CS	...Single pair clutching elements axially engaged with pivoted weights
89.23	....Push-type	105 CD	...Transversely expanding clutch with pivoted weights
89.24	....Pull-type	105 CE	...Transversely engaged-pivoted weights and clutching elements movable separately
89.25	....Geometric configuration	105 CF	...Transversely contracting
89.26	...Plural coil springs spaced from clutch axis	105 F	...Fluid controls for centrifugal clutches
89.27	...Coil spring coaxial to clutch axis	106 R	...Release
89.28	....Transversely engaged	106 F	...Devices to prevent fluid clutches from being operated by centrifugal forces acting on fluid
89.29	...Quick throw spring		
92	..One-direction apply and release		
93 R	..Cam		
93 A	...Axially thrusting cams rotatable about clutch axis		
93 B	...Axially moving cam acting on pivoted lever		

103 A	...Centrifugal operated, axially engaged	109 A	..Resilient operators and pressure plates
103 B	...Centrifugal operator transversely engaged	109 B	..Resilient backing plates
103 C	...Acceleration and inertia responsive	109 F	..Cushioning devices for fluid operators
103 F	...Fluid operated	109 D	..Dashpot
103 FA	...Fluid pressure engaged with centrifugal valve	110 R	.Shafts, bearings, and adjusting devices
82 P	..Rack and pinion operator	110 B	..Bearings
82 T	..Temperature operator	110 S	..Shafts for removable clutches or discs
30 W	.Warning, indicating, and signal devices	111 R	.Wear compensators
30 V	.Vibration dampers	111 A	..Automatic wear compensators
	<b>ELEMENTS</b>	111 B	..Manually, axially adjustable, threaded members rotatable around clutch axis
200	.Clutch element resiliently carried on hub	111 T	..Manual wear compensators for transversely engaged clutches
201	..Speed-responsive	112	.Casings
202	..Manually adjustable	113.1	.Lubricating, insulating, or cooling
203	..Coil spring detail	113.2	..Air cooling
204	..Specified bushing	113.21	...Heat radiating structure
205	..Separate seat detail	113.22	...Grooved surfaces
206	..Relatively axially movable hub sections	113.23	...Air directing structure
207	..Circumferential resilience	113.24	....Rotating cover
208	...With fluid damping	113.25	....Spring
209	...Nonmetallic	113.26	....Clutch plate
210	....Interposed friction element	113.3	..Liquid cooled or lubricated clutch surfaces
210.1	.....Biasing means	113.31	...Entire coolant path is spaced from clutch surfaces
211	....And coil spring	113.32	...Overrunning clutch
212	...Coil spring	113.33	...Positive
213	....Plural helical coil spring damping stages	113.34	...Lubricant or coolant between engaging surfaces
213.1	.....Plural axially spaced springs	113.35	...With change of coolant flow during disengagement
213.11	.....Interposed friction element	113.36	...Grooved surfaces
213.12	.....Biasing means	113.4	..Thermal insulating
213.2	.....Plural radially spaced springs in a common radial plane	113.5	..Lubrication of ancillary clutch parts
213.21	.....Interposed friction element	114 R	.Locks
213.22	.....Biasing means	114 T	..Interlocking clutch teeth or splines
213.3	.....Interposed friction element	115	.Supports
213.31	.....Biasing means	116.5	<b>STOP MECHANISM</b>
214	....Interposed friction element	125 R	.Material control
214.1	.....Biasing means	126	..Sheet material
107 R	.Engaging surfaces	127	...Electrical
108	..Positive	128	...Pneumatic
107 M	..Material	125 A	..Power stop-material control-electrical
107 T	..Transversely engaging	125 B	..Mechanical
107 C	..Clutch plate axially compressible		
109 R	.Thrust members, retarders, and stops		

125 C	..Pneumatic	FOR 104	...With change speed transmission (192/6 A)
125 D	..Granular material	FOR 105	...Rotatable axle (192/6 B)
125 E	..Work start	FOR 106	.Automatic brake (192/7)
125 F	..Length of material stop	FOR 107	..Responsive to drive release (192/8/R)
129 R	..Safety device	FOR 108	...Cable (192/8 A)
130	..Hand protector	FOR 109	...Coil brake (192/8 C)
131 R	...Two hand	FOR 110	.Electric control (192/9)
131 H	...Hand and foot	FOR 111	.Belt shipper (192/10)
132	...Delayed action drive	FOR 112	.Belt tightener (192/11)
133	..Automatic guard	FOR 113	.Automatic type (192/4 A)
134	...Punch-press type	FOR 114	.Internal resistance brake (192/4 B)
135	...Cover	FOR 115	.Forward and reverse gearing (192/4 C)
136	...Centrifugal-machine type		
137	...Disabled transmission		
129 A	..Electrical		
129 B	..Pneumatic		
138	.Limit stop		
139	..Rotary-member control		
140	...Speed responsive		
141	...Screw		
142 R	...Electrical		
142 A	...Radio tuner type		
143	..Reciprocating-member control		
144	.Drive release and brake		
145	..Multiple clutch		
146	..Change speed		
147	..Speed responsive		
148	..Positive stop		
149	...Cushioned		
150	.Overload release		

**DIGESTS**

DIG 1    **REMOVABLE MEMBERS**  
DIG 2    **UNIVERSAL JOINT**

**FOREIGN ART COLLECTIONS****FOR 000 CLASS-RELATED FOREIGN DOCUMENTS**

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

**CLUTCHES (192/30)**

.Operators (192/82 R)  
FOR 100 ..Electric (192/84 R)  
FOR 101 **TRANSMISSION CONTROL AND BRAKE  
(192/4 R)**  
FOR 102 .Back-pedaling brake (192/5)  
FOR 103 ..Hub brake (192/6 R)

