

CPC COOPERATIVE PATENT CLASSIFICATION

F16K VALVES; TAPS; COCKS; ACTUATING-FLOATS; DEVICES FOR VENTING OR AERATING {(devices for emptying and evacuating the excess liquid in valves or conduits F16L 55/07)}

NOTE

Attention is drawn to the following places:

A47J 27/09	Safety devices for pressure cookers
A47J 31/46	Dispensing spouts, drain valves or like beverage-making apparatus
A61B 5/0235	Valves specially adapted for measuring pressure in heart or blood vessels
A61F 2/24	Heart valves
A61M 16/20	Valves specially adapted for medical respiratory devices
A61M 39/00	Tube connectors, tube couplings, valves or branch units specially adapted for medical use in general
A62B 9/02	Valves for respiratory apparatus
A62B 18/10	Valves for breathing masks or helmets
A62C	Fire extinguishers
{B01D 35/04}	{Plug, tap, or cock filters}
B05B	Nozzles, spray heads or other discharge apparatus for spraying or atomising
B60C 29/00	Arrangements of tyre-inflating valves relative to tyres or wheel rims; Connection of valves to wheel rims, tyres or other inflatable elastic bodies
B60G 17/048	Valves specially adapted for adjusting vehicle fluid-spring characteristics
B60T	Valves specially adapted for vehicle brake control systems
B62D 5/08	Vehicle power-assisted steering characterised by the type of valve used
B63B 7/00, B63C 9/00	Arrangement of inflating valves for floatable life-saving equipment
B65D 47/04	Container closures with discharging valves
B65D 90/32	Safety valves for large containers
B65D 90/54	Gates or closures on large containers
B67C 3/28	Flow control devices for bottling liquids
B67D	Dispensing, delivering or transferring liquids
{C21B 9/12}	{Hot-blast valves for blast furnaces}
E02B 8/00	Details, e.g. valves, of barrages or weirs
E02B 13/02	Closures for irrigation conduits
{E03C 1/04}	{Water-basin installations specially adapted for wash-basins or baths}
{E03C 1/05}	{Arrangements on wash-basins for the remote control of taps}
E03D	Flushing valves for water-closets or urinals
{E03F 7/04}	{Valves for preventing return flow in sewer systems}
E05F 3/12	Valve arrangements in door closers
E21B 21/10	Valve arrangements in drilling-fluid circulation systems
E21B 34/00	Valve arrangements for boreholes or wells
{E21D 15/51}	{Arrangement of relief valves in hydraulic mine props}
F01B 25/10	Working-fluid valves for controlling machines or engines in general or of positive-displacement type
F01D 17/10	Final actuators for controlling non-positive displacement machines or engines
F01L	Cyclically operated valves for machines or engines
F02D 9/08	Throttle valves for controlling combustion engines
F02K 9/58	Propellant feed valves for rocket-engines
F02M	Carburettors, fuel injection
F02M 59/46	Valves for fuel injection pumps
F04	Pumps
F16F 9/34	Valves for shock absorbers
F16L 29/00, F16L 37/28	Pipe joints or quick-acting couplings with fluid cut-off means
F16L 55/00	Arrangement of valves in pipes
F16L 55/055	Valves specially adapted to prevent or minimise the effect of water hammer
F16L 55/46	Launching devices for pigs or moles
F16N 23/00	Check valves for lubrication systems
{F16T}	{Draining-off liquids from steam traps}
F17C 13/04	Arrangement of valves in pressure vessels
F22B 37/44	Arrangement of safety valves on steam boilers
F22D 5/34	Application of valves to automatic water-feed in boiler
F23L 13/00	Valves for air supply control to burners
{F23Q 2/16}	{Valves for lighters with gaseous fuel and adjustable flame}
F24C 3/12, F24C 5/16	Arrangement of valves on stoves or ranges
F24F	Air conditioning; Ventilation

F25B 41/04	Disposition of fluid circulation valves in refrigeration machines
G05D	Controlling non-electric variables
G10B 3/06	Valves for organs
G10D 9/04	Valves for other wind-actuated musical instruments
{G21C 9/06}	{Safety valves structurally associated with nuclear reactors}
{H01M 2/12}	{Vent plugs in batteries or cells}

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

F16K 31/11	covered by	F16K 31/06 , F16K 31/08 , F16K 31/10
F16K 31/64	covered by	G05D
F16K 31/66	covered by	F16K 31/06 ; H01F
F16K 31/68	covered by	G05D
F16K 31/70	covered by	F16K 31/002
F16K 31/72	covered by	F16K 31/00

Constructional types (check valves [F16K 15/00](#))

NOTE

In groups [F16K 1/00](#) - [F16K 13/00](#), an initial seal breaking or final sealing movement which is different from the opening or closing movement of the valve is not considered in determining the movement to be classified.

- 1/00 Lift valves {or globe valves}, i.e. cut-off apparatus with closure members having at least a component of their opening and closing motion perpendicular to the closing faces** ({in combination with sliding valves [F16K 3/246](#), [F16K 3/267](#)} ; diaphragm valves [F16K 7/00](#))
- 1/02 . with screw-spindle ([F16K 1/12](#) - [F16K 1/28](#) take precedence; actuating mechanisms with screw-spindles [F16K 31/50](#))
 - 1/04 . . with a cut-off member rigid with the spindle, e.g. main valves
 - 1/06 . . Special arrangements for improving the flow, e.g. special shape of passages or casings
 - 1/08 . . . in which the spindle is perpendicular to the general direction of flow
 - 1/10 . . . in which the spindle is inclined to the general direction of flow
 - 1/12 . with streamlined valve member around which the fluid flows when the valve is opened
 - 1/123 . . {with stationary valve member and moving sleeve}
 - 1/126 . . {actuated by fluid}
 - 1/14 . with ball-shaped valve member (check valves [F16K 15/04](#))
 - 1/16 . with pivoted closure-members
 - 1/165 . . {with a plurality of closure members}
 - 1/18 . . with pivoted discs or flaps
 - 1/20 . . . with axis of rotation arranged externally of valve member
 - 1/2007 . . . {specially adapted operating means therefor (operating means per se [F16K 31/00](#))}
 - 1/2014 . . . {Shaping of the valve member}
 - 1/2021 . . . {with a plurality of valve members}
 - 1/2028 . . . {Details of bearings for the axis of rotation}
 - 1/2035 {the axis of rotation having only one bearing}
 - 1/2042 {Special features or arrangements of the sealing}

- 1/205 {the sealing being arranged on the valve member}
- 1/2057 {the sealing being arranged on the valve seat}
- 1/2064 {with a channel- or U-shaped seal covering a central body portion}
- 1/2071 {and being forced into sealing contact with the valve member by a spring or a spring-like member}
- 1/2078 {Sealing means for the axis of rotation}
- 1/2085 {Movable sealing bodies}
- 1/2092 {the movement being caused by the flowing medium}
- 1/22 . . . with axis of rotation crossing the valve member, e.g. butterfly valves
- 1/221 {specially adapted operating means therefor (operating means per se [F16K 31/00](#))}
- 1/222 {Shaping of the valve member}
- 1/223 {with a plurality of valve members}
- 1/224 {Details of bearings for the axis of rotation}
- 1/225 {the axis of rotation having only one bearing}
- 1/226 Shaping or arrangements of the sealing
- 1/2261 {the sealing being arranged on the valve member}
- 1/2263 {the sealing being arranged on the valve seat}
- 1/2265 {with a channel- or U-shaped seal covering a central body portion}
- 1/2266 {and being forced into sealing contact with the valve member by a spring or a spring-like member}
- 1/2268 {Sealing means for the axis of rotation}
- 1/228 Movable sealing bodies
- 1/2285 {the movement being caused by the flowing medium}
- 1/24 . with valve members that, on opening of the valve, are initially lifted from the seat and next are turned around an axis parallel to the seat
- 1/26 . . Shape or arrangement of the sealing {Not used}
- 1/28 . . . Movable sealing bodies {Not used}
- 1/30 . specially adapted for pressure containers
- 1/301 . . {only shut-off valves, i.e. valves without additional means}

1/302	. . . {with valve member and actuator on the same side of the seat}	3/0209	. . {the valve having a particular passage, e.g. provided with a filter, throttle or safety device}
1/303	. . . {with a valve member, e.g. stem or shaft, passing through the seat}	3/0218	. . {with only one sealing face}
1/304	. . {Shut-off valves with additional means}	3/0227	. . {Packings}
1/305	. . . {with valve member and actuator on the same side of the seat}	3/0236	. . . {the packing being of a non-resilient material, e.g. ceramic, metal}
1/306	. . . {with a valve member, e.g. stem or shaft, passing through the seat}	3/0245	. . {Curtain gate valves}
1/307	. . {Additional means used in combination with the main valve}	3/0254	. . {being operated by particular means}
1/308	. . {Connecting means}	3/0263	. . {using particular material or covering means}
1/32	. Details (details of more general applicability F16K 25/00 - F16K 51/00)	3/0272	. . {permitting easy assembly or disassembly}
1/34	. . Cutting-off parts, e.g. valve members, seats (F16K 1/06 , F16K 1/12 , F16K 1/14 , F16K 1/26 take precedence)	3/0281	. . {Guillotine or blade-type valves, e.g. no passage through the valve member}
1/36	. . . Valve members (for double-seat valves F16K 1/44 {for butterfly valves F16K 1/222 , F16K 1/223 })	3/029	. . {with two or more gates}
1/38	. . . . of conical shape	3/03	. . with a closure member in the form of an iris-diaphragm
1/385	. . . . {contacting in the closed position, over a substantial axial length, a seat surface having the same inclination}	3/04	. . with pivoted closure members
1/40	. . . . of helical shape	3/06	. . . in the form of closure plates arranged between supply and discharge passages (F16K 3/10 takes precedence)
1/42	. . . Valve seats (for double-seat valves F16K 1/44)	3/08	. . . . with circular plates rotatable around their centres
1/422	. . . . {attachable by a threaded connection to the housing}	3/085	. . . . {the axis of supply passage and the axis of discharge passage being coaxial and parallel to the axis of rotation of the plates}
1/425	. . . . {Attachment of the seat to the housing by plastical deformation, e.g. valve seat or housing being plastically deformed during mounting}	3/10	. . . with special arrangements for separating the sealing faces or for pressing them together
1/427	. . . . {Attachment of the seat to the housing by one or more additional fixing elements}	3/12	. . with wedge-shaped arrangements of sealing faces
1/44	. . . Details of seats or valve members of double-seat valves	3/14	. . . with special arrangements for separating the sealing faces or for pressing them together
1/443	. . . . {the seats being in series}	3/16	. . with special arrangements for separating the sealing faces or for pressing them together (F16K 3/10 , F16K 3/14 take precedence)
1/446	. . . . {with additional cleaning or venting means between the two seats}	3/18	. . . by movement of the closure members
1/46	. . . Attachment of sealing rings	3/182	. . . . {by means of toggle links}
1/465	. . . . {to the valve seats}	3/184	. . . . {by means of cams}
1/48	. . Attaching valve members to screw-spindles	3/186	. . . . {by means of cams of wedge form}
1/482	. . . {with a collar on the spindle or a groove in the spindle, by which a fixing element is supported, the spindle reaching into the valve member}	3/188	. . . . {by means of hydraulic forces}
1/485	. . . . {with a groove in the spindle}	3/20	. . . by movement of the seats
1/487	. . . {by a fixing element extending in the axial direction of the spindle, e.g. a screw}	3/202	. . . . {by movement of toggle links}
1/50	. . Preventing rotation of valve members	3/205	. . . . {by means of cams}
1/52	. . Means for additional adjustment of the rate of flow	3/207	. . . . {by means of hydraulic forces}
1/523	. . . {for limiting the maximum flow rate, using a stop}	3/22	. with sealing faces shaped as surfaces of solids of revolution (F16K 13/02 takes precedence; with resilient valve members F16K 3/28)
1/526	. . . {for limiting the maximum flow rate, using a second valve}	3/24	. . with cylindrical valve members
1/54	. . Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve	3/243	. . . {Packings (F16K 3/246 takes precedence)}
3/00	Gate valves or sliding valves, i.e. cut-off apparatus with closing members having a sliding movement along the seat for opening and closing (F16K 5/00 takes precedence; in barrages or weirs E02B 8/04)	3/246	. . . {Combination of a sliding valve and a lift valve}
3/02	. with flat sealing faces; Packings therefor	3/26	. . . with fluid passages in the valve member
		3/262	. . . . {with a transverse bore in the valve member}
		3/265	. . . . {with a sleeve sliding in the direction of the flow line}
		3/267	. . . . {Combination of a sliding valve and a lift valve (F16K 3/262 , F16K 3/265 take precedence)}
		3/28	. with resilient valve members
		3/30	. Details
		3/312	. . Line blinds
		3/314	. . Forms or construction of slides; Attachment of the slide to the spindle
		3/316	. . Guiding of the slide
		3/3165	. . . {with rollers or balls}

3/32	. . Means for additional adjustment of the rate of flow	5/0647	. . {Spindles or actuating means}
3/34	. . Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve	5/0652	. . . {for remote operation}
3/36	. . Features relating to lubrication	5/0657	. . {Particular coverings or materials}
5/00	{Plug valves;} Taps or cocks comprising only cut-off apparatus having at least one of the sealing faces shaped as a more or less complete surface of a solid of revolution, the opening and closing movement being predominantly rotary (taps of the lift-valve type F16K 1/00)	5/0663	. . {Packings}
5/02	. with plugs having conical surfaces; Packings therefor	5/0668	. . . {Single packings}
5/0207	. . {with special plug arrangement, e.g. special shape or built in means}	5/0673	. . . {Composite packings}
5/0214	. . {Plug channel at 90 degrees to the inlet}	5/0678	. . . . {in which only one of the components of the composite packing is contacting the plug}
5/0221	. . {Fixed plug and turning sleeve}	5/0684	. . . {on the plug}
5/0228	. . {with a conical segment mounted around a supply pipe}	5/0689	. . . {between housing and plug}
5/0235	. . {with the angle the spindle makes housing being other than 90 degrees}	5/0694	. . . {Spindle sealings}
5/0242	. . {Spindles and actuating means}	5/08	. Details
5/025	. . {Particular coverings or materials}	5/10	. . Means for additional adjustment of the rate of flow
5/0257	. . {Packings}	5/103	. . . {specially adapted for gas valves}
5/0264	. . . {in the housing}	5/106	. . . . {with pilot flame}
5/0271	. . . {between housing and plug}	5/12	. . Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve
5/0278	. . . {on the plug}	5/14	. . Special arrangements for separating the sealing faces or for pressing them together
5/0285	. . . {spindle sealing}	5/16	. . . for plugs with conical surfaces
5/0292	. . {Easy mounting or dismounting means}	5/161	. . . . {with the housing or parts of the housing mechanically pressing the seal against the plug}
5/04	. with plugs having cylindrical surfaces; Packings therefor	5/162	. . . . {with the plugs or parts of the plugs mechanically pressing the seal against the housing}
5/0407	. . {with particular plug arrangements, e.g. particular shape or built-in means}	5/163	. . . . . {adjustable in height}
5/0414	. . {Plug channel at 90 degrees to the inlet}	5/165	. . . . . {Means pressing on the small diameter}
5/0421	. . {Fixed plug and turning sleeve}	5/166	. . . . . {Means pressing on the large diameter}
5/0428	. . {with a cylindrical segment mounted around a supply pipe}	5/167	. . . . . {Means pressing radially}
5/0435	. . {the angle the spindle makes with the housing being other than 90 degrees}	5/168	. . . . . {Sealing effected by the flowing medium}
5/0442	. . {Spindles and actuating means}	5/18	. . . for plugs with cylindrical surfaces
5/045	. . {Particular coverings and materials}	5/181	. . . . {with the housing or parts of the housing mechanically pressing the seals against the plugs}
5/0457	. . {Packings}	5/182	. . . . . {by means of conical surfaces}
5/0464	. . . {in the housing}	5/184	. . . . . {with the plugs or parts of the plugs mechanically pressing the seals against the housing}
5/0471	. . . {between housing and plug}	5/185	. . . . . {by means of conical surfaces}
5/0478	. . . {on the plug}	5/187	. . . . . {with rolling action}
5/0485	. . . {Spindle sealing}	5/188	. . . . . {Sealing effected by the flowing medium}
5/0492	. . {Easy mounting or dismounting means}	5/20	. . . for plugs with spherical surfaces
5/06	. with plugs having spherical surfaces; Packings therefor	5/201	. . . . {with the housing or parts of the housing mechanically pressing the seal against the plug}
5/0605	. . {with particular plug arrangements, e.g. particular shape or built-in means}	5/202	. . . . . {with conical surfaces}
5/061	. . {knee-joint}	5/204	. . . . . {with the plugs or parts of the plugs mechanically pressing the seals against the housing}
5/0615	. . {the angle the spindle makes with the housing being other than 90 degrees}	5/205	. . . . . {Sealing effected by the flowing medium}
5/0621	. . {with a spherical segment mounted around a supply pipe}	5/207	. . . . . {using bellows}
5/0626	. . {Easy mounting or dismounting means}	5/208	. . . . . {with tongue-shaped means}
5/0631	. . . {between two flanges}	5/22	. . Features relating to lubrication
5/0636	. . . {the spherical plug being insertable from the top of the housing}	5/222	. . . {for plugs with conical surfaces}
5/0642	. . . {the spherical plug being insertable from one and only one side of the housing}	5/225	. . . {for plugs with cylindrical surfaces}
		5/227	. . . {for plugs with spherical surfaces}

7/00	Diaphragm {valves or} cut-off apparatus, e.g. with a member deformed, but not moved bodily, to close the passage (container gates or closures operating by deformation of flexible walls B65D 90/56; means for plugging pipes or hoses F16L 55/10) {Pinch valves}	11/0712	. . . . . {comprising particular spool-valve sealing means}
7/02	. with tubular diaphragm	11/0716	. . . . . {with fluid passages through the valve member (F16K 11/0704, F16K 11/0708, F16K 11/0712 take precedence)}
7/04	. . constrictable by external radial force	11/072	. . . with pivoted closure members
7/045	. . . {by electric or magnetic means}	11/074	. . . . . with flat sealing faces
7/06	. . . by means of a screw-spindle, cam, or other mechanical means {(F16K 7/045 takes precedence)}	11/0743	. . . . . {with both the supply and the discharge passages being on one side of the closure plates}
7/061	. . . . {Screw clamps}	11/0746	. . . . . {with two or more closure plates comprising a single lever control}
7/063	. . . . {Lever clamps}	11/076	. . . . . with sealing faces shaped as surfaces of solids of revolution
7/065	. . . . {Cam clamps}	11/078	. . . with pivoted and linearly movable closure members
7/066	. . . . {Wedge clamps}	11/0782	. . . . {Single-lever operated mixing valves with closure members having flat sealing faces}
7/068	. . . . {by bending the hose}	11/0785	. . . . . {the movable closure member being pivotally supported at one point and being linked to the operating lever at only one other point}
7/07	. . . by means of fluid pressure	11/0787	. . . . . {with both the supply and the discharge passages being on the same side of the closure members (F16K 11/0785 takes precedence)}
7/075	. . . . {a rigid body being located within the tubular diaphragm}	11/08	. . comprising only taps or cocks
7/08	. . constrictable by twisting	11/083	. . . with tapered plug
7/10	. with inflatable member	11/0833	. . . . {having all the connecting conduits situated in a single plane perpendicular to the axis of the plug}
7/12	. with flat, dished, or bowl-shaped diaphragm	11/0836	. . . . {having all the connecting conduits situated in more than one plane perpendicular to the axis of the plug}
7/123	. . {the seat being formed on the bottom of the fluid line}	11/085	. . . with cylindrical plug
7/126	. . {the seat being formed on a rib perpendicular to the fluid line}	11/0853	. . . . {having all the connecting conduits situated in a single plane perpendicular to the axis of the plug}
7/14	. . arranged to be deformed against a flat seat	11/0856	. . . . {having all the connecting conduits situated in more than one plane perpendicular to the axis of the plug}
7/16	. . . the diaphragm being mechanically actuated, e.g. by screw-spindle or cam	11/087	. . . with spherical plug
7/17	. . . the diaphragm being actuated by fluid pressure	11/0873	. . . . {the plug being only rotatable around one spindle}
7/18	. with diaphragm secured at one side only, e.g. to be laid on the seat by rolling action	11/0876	. . . . . {one connecting conduit having the same axis as the spindle}
7/20	. with a compressible solid closure member	11/10	. with two or more closure members not moving as an unit
11/00	Multiple-way valves, e.g. mixing valves; Pipe fittings incorporating such valves	11/105	. . {Three-way check or safety valves with two or more closure members}
11/02	. with all movable sealing faces moving as one unit	11/12	. . with one plug turning in another
11/022	. . {comprising a deformable member}	11/14	. . operated by one actuating member, e.g. a handle (with one plug turning in another F16K 11/12)
11/025	. . . {with an O-ring}	11/16	. . . which only slides, or only turns, or only swings in one plane
11/027	. . . {the fluid flowing through a constrictable tubular diaphragm}	11/161	. . . . {only slides}
11/04	. . comprising only lift valves	11/163	. . . . {only turns}
11/044	. . . with movable valve members positioned between valve seats	11/165	. . . . . {with the rotating spindles parallel to the closure members}
11/0445	. . . . {Bath/shower selectors}	11/166	. . . . . {with the rotating spindles at right angles to the closure members}
11/048	. . . with valve seats positioned between movable valve members	11/168	. . . . {only swings}
11/052	. . . with pivoted closure members, e.g. butterfly valves	11/18	. . . with separate operating movements for separate closure members
11/0525	. . . . {the closure members being pivoted around an essentially central axis}		
11/056	. . . with ball-shaped valve members		
11/0565	. . . . {moving in a combined straight line and rotating movement}		
11/06	. . comprising only sliding valves, {i.e. sliding closure elements}		
11/065	. . . with linearly sliding closure members		
11/0655	. . . . {with flat slides}		
11/07	. . . . with cylindrical slides		
11/0704	. . . . . {comprising locking elements}		
11/0708	. . . . . {comprising means to avoid jamming of the slide or means to modify the flow}		

- 11/185 {with swinging shafts}
- 11/20 . . operated by separate actuating members ([with one plug turning in another F16K 11/12](#))
- 11/202 {with concentric handles}
- 11/205 {with two handles at right angles to each other}
- 11/207 {with two handles or actuating mechanisms at opposite sides of the housing}
- 11/22 . . . with an actuating member for each valve, e.g. interconnected to form multiple-way valves
- 11/24 . . . with an electromagnetically-operated valve, e.g. for washing machines
- 13/00 Other constructional types of cut-off apparatus (means for plugging pipes or hoses [F16L 55/10](#)); Arrangements for cutting-off**
- 13/02 . with both sealing faces shaped as small segments of a cylinder and the moving member pivotally mounted
- 13/04 . {with a breakable closure member}
- 13/06 . . {constructed to be ruptured by an explosion}
- 13/08 . Arrangements for cutting-off {not used}
- 13/10 . . by means of liquid or granular medium

Functional types

NOTE

Attention is drawn to Note (2) following the title of subclass [G05D](#) and also the subdivisions of that subclass, according to which pressure regulators and flow regulators, e.g. flow regulating valves with pressure compensator, even with the whole regulating system contained in a valve, operating with or without auxiliary power, are covered by groups [G05D 16/00](#) or [G05D 7/00](#), respectively. However, details of the valve parts, *per se*, are classified in the appropriate groups of this subclass.

- 15/00 Check valves (valves specially adapted for inflatable balls [A63B 41/00](#))**
- 15/02 . with guided rigid valve members
- 15/021 . . {the valve member being a movable body around which the medium flows when the valve is open ([F16K 15/025](#) - [F16K 15/12](#) take precedence)}
- 15/023 {the valve member consisting only of a predominantly disc-shaped flat element}
- 15/025 . . {the valve being loaded by a helicoidal spring ([F16K 15/03](#) - [F16K 15/12](#) take precedence)}
- 15/026 {the valve member being a movable body around which the medium flows when the valve is open}
- 15/028 {the valve member consisting only of a predominantly disc-shaped flat element}
- 15/03 . . with a hinged closure member
- 15/031 {the hinge being flexible ([F16K 15/035](#) takes precedence)}
- 15/033 {spring-loaded ([F16K 15/035](#) takes precedence)}
- 15/035 {with a plurality of valve members}
- 15/036 {Dual valve members with hinges crossing the flow line substantially diametrical}
- 15/038 {having a common hinge}
- 15/04 . . shaped as balls
- 15/042 {with a plurality of balls}
- 15/044 {spring-loaded ([F16K 15/042](#) takes precedence)}
- 15/046 {by a spring other than a helicoidal spring}

- 15/048 {Ball features}
- 15/06 . . with guided stems
- 15/063 {the valve being loaded by a helicoidal spring}
- 15/066 {with a plurality of valve members}
- 15/08 . . shaped as rings
- 15/10 . . . integral with, or rigidly fixed to, a common valve plate
- 15/12 . . . Springs for ring valves
- 15/14 . with flexible valve members
- 15/141 . . {the closure elements not being fixed to the valve body}
- 15/142 {the closure elements being shaped as solids of revolution, e.g. toroidal or cylindrical rings}
- 15/144 . . {the closure elements being fixed along all or a part of their periphery}
- 15/145 {the closure elements being shaped as a solids of revolution, e.g. cylindrical or conical}
- 15/147 {the closure elements having specially formed slits or being of an elongated easily collapsible form}
- 15/148 . . {the closure elements being fixed in their centre}
- 15/16 . . with tongue-shaped laminae
- 15/18 . with actuating mechanism; Combined check valves and actuated valves
- 15/181 . . {for check valves with a hinged closure member ([F16K 15/188](#) takes precedence)}
- 15/183 . . {for ball check valves ([F16K 15/186](#), [F16K 15/188](#) take precedence)}
- 15/185 . . {for check valves with flexible valve members ([F16K 15/188](#) takes precedence)}
- 15/186 . . {Check valves which can be actuated by a pilot valve}
- 15/188 . . {Check valves combined with valves having a rotating tap or cock}
- 15/20 . specially designed for inflatable bodies, e.g. tyres ([connecting valves to inflatable bodies B60C 29/00](#))
- 15/202 . . {and with flexible valve member}
- 15/205 . . {and with closure plug}
- 15/207 . . {and combined with other valves, e.g. safety valves}

17/00 Safety valves; Equalising valves, {e.g. pressure relief valves}

- 17/003 . {reacting to pressure and temperature}
- 17/006 . {specially adapted for shelters}
- 17/02 . opening on surplus pressure on one side; closing on insufficient pressure on one side ([check valves F16K 15/00](#))
- 17/025 . . {and remaining open after return of the normal pressure}

WARNING

This group is not complete pending a reorganisation, see also [F16K 17/02](#)

- 17/04 . . spring-loaded
- 17/0406 {in the form of balls}
- 17/0413 {in the form of closure plates}
- 17/042 {with locking or disconnecting arrangements}
- 17/0426 {with seat protecting means}
- 17/0433 {with vibration preventing means}
- 17/044 {with more than one spring}

- 17/0446 . . . {with an obturating member having at least a component of their opening and closing motion not perpendicular to the closing faces}
- 17/0453 {the member being a diaphragm}
- 17/046 {the valve being of the gate valve type or the sliding valve type}
- 17/0466 . . . {with a special seating surface}
- 17/0473 . . . {Multiple-way safety valves}
- 17/048 . . . {combined with other safety valves, or with pressure control devices}
- 17/0486 . . . {with mechanical actuating means}
- 17/0493 . . . {with a spring other than a helicoidal spring}
- 17/06 . . . with special arrangements for adjusting the opening pressure
- 17/065 {with differential piston}
- 17/08 . . . with special arrangements for providing a large discharge passage
- 17/082 {with piston}
- 17/085 {with diaphragm}
- 17/087 {with bellows}
- 17/10 . . . with auxiliary valve for fluid operation of the main valve
- 17/105 {using choking or throttling means to control the fluid operation of the main valve}
- 17/12 . . weight-loaded
- 17/14 . . with fracturing member
- 17/16 . . . with fracturing diaphragm; {Rupture discs}
- 17/1606 {of the reverse-buckling-type (F16K 17/1633 takes precedence)}
- 17/1613 {with additional cutting means}
- 17/162 {of the non reverse-buckling-type (F16K 17/1633 takes precedence)}
- 17/1626 {with additional cutting means}
- 17/1633 {made of graphite}
- 17/164 . . and remaining closed after return of the normal pressure
- 17/168 . . combined with manually-controlled valves, e.g. a valve combined with a safety valve
- 17/18 . opening on surplus pressure on either side
- 17/19 . . Equalising valves predominantly for tanks
{(when combined with safety valve by change of position F16K 17/36)}
- 17/192 . . . with closure member in the form of a movable liquid column
- 17/194 . . . weight-loaded
- 17/196 . . . spring-loaded
- 17/20 . Excess-flow valves (actuated in consequence of shock or similar extraneous influence F16K 17/36)
- 17/205 . . {specially adapted for flexible gas lines}
- 17/22 . . actuated by the difference of pressure between two places in the flow line
- 17/24 . . . acting directly on the cutting-off member
- 17/26 operating in either direction
- 17/28 operating in one direction only
- 17/285 {the cutting-off member being a ball (F16K 17/30 takes precedence)}
- 17/30 spring-loaded
- 17/32 . . . acting on a servo-mechanism or on a catch-releasing mechanism
- 17/34 . . in which the flow-energy of the flowing medium actuates the closing mechanism
- 17/36 . . actuated in consequence of extraneous circumstances, e.g. shock, change of position
- 17/363 . . {the closure members being rotatable or pivoting (F16K 17/386 takes precedence)}
- 17/366 . . {the closure member being a movable ball (F16K 17/38 takes precedence)}
- 17/38 . . of excessive temperature
- 17/383 . . . {the valve comprising fusible, softening or meltable elements, e.g. used as link, blocking element, seal, closure plug (F16K 17/386 takes precedence)}
- 17/386 . . . {the closure members being rotatable or pivoting}
- 17/40 . . with a fracturing member, e.g. fracturing diaphragm, glass, fusible joint (valves opening on surplus pressure F16K 17/14)
- 17/403 . . {with a fracturing valve member}
- 17/406 . . {the fracturing member being a generally elongated member, e.g. rod or wire, which is directly connected to a movable valve member, the breaking or buckling of the elongated member allowing the valve member to move to a closed or open position}
- 17/42 . Valves preventing penetration of air in the outlet of containers for liquids
- 19/00 {Arrangements of valves and flow lines specially adapted for mixing fluids (multiple-way valves F16K 11/00)}**
- 19/003 . {Specially adapted for boilers}
- 19/006 . {Specially adapted for faucets}
- 21/00 Fluid-delivery valves, {e.g. self-closing valves} (for liquid handling B67D; for flushing devices for water-closets or the like E03D)**
- 21/02 . providing a continuous small flow
- 21/04 . Self-closing valves, i.e. closing automatically after operation {(pneumatic tools B25B 9/00)}
- 21/06 . . in which the closing movement, either retarded or not, starts immediately after opening
- 21/08 . . . with ball-shaped closing members
- 21/10 . . . with hydraulic brake cylinder acting on the closure member
- 21/12 . . . with hydraulically-operated opening means; with arrangements for pressure relief before opening
- 21/14 . . with special means for preventing the self-closing
- 21/16 . . closing after a predetermined quantity of fluid has been delivered (F16K 21/10 takes precedence)
- 21/165 . . . {with means sensing the weight of said fluid quantity}
- 21/18 . . closed when a rising liquid reaches a predetermined level (float-actuated valves F16K 31/18)
- 21/185 . . . {with electrical or magnetical means, e.g. with magnetic floats, for sensing the liquid level}
- 21/20 . . . by means making use of air-suction through an opening closed by the rising liquid
- 23/00 Valves for preventing drip from nozzles**
- 24/00 Devices, e.g. valves, for venting or aerating enclosures (equalising valves F16K 17/00; arrangement or mounting in pipes or pipe systems F16L 55/07; venting or aerating as an additional function of steam traps or like apparatus F16T; ventilation of rooms, vehicles, see the appropriate subclass, e.g. F24F)**

- 24/02 . the enclosure being itself a valve, tap, or cock
- 24/04 . for venting only ([F16K 24/02](#) takes precedence)
- 24/042 . . {actuated by a float}
- 24/044 . . . {the float being rigidly connected to the valve element, the assembly of float and valve element following a substantially translational movement when actuated, e.g. also for actuating a pilot valve}
- 24/046 {the assembly of float and valve element being a single spherical element}
- 24/048 . . . {a transmission element, e.g. arm, being interposed between the float and the valve element, the transmission element following a non-translational, e.g. pivoting or rocking, movement when actuated}
- 24/06 . for aerating only ([F16K 24/02](#) takes precedence)

Details

NOTE

Details not provided for in the following groups are classified in the preceding groups.

- 25/00** **Details relating to contact between valve members and seat (sealing constructions, see the appropriate groups according to the type of valve; movement of valve members other than for opening and closing [F16K 29/00](#))**
 - 25/005 . {Particular materials for seats or closure elements}
 - 25/02 . Arrangements using fluid issuing from valve members or seats
 - 25/04 . Arrangements for preventing erosion, not otherwise provided for
- 27/00** **Construction of housing (methods for welding housings [B23K](#)); Use of materials therefor**
 - 27/003 . {Housing formed from a plurality of the same valve elements}
 - 27/006 . {of hydrants}
 - 27/02 . of lift valves (for reducing the flow resistance of screw-spindle lift-valves [F16K 1/06](#))
 - 27/0209 . . {Check valves or pivoted valves}
 - 27/0218 . . . {Butterfly valves}
 - 27/0227 . . . {with the valve members swinging around an axis located at the edge of or outside the valve member}
 - 27/0236 . . {Diaphragm cut-off apparatus}
 - 27/0245 . . {with ball-shaped valve members}
 - 27/0254 . . {with conical shaped valve members}
 - 27/0263 . . {multiple way valves}
 - 27/0272 . . {valves provided with a lining}
 - 27/0281 . . {Housings in two parts which can be orientated in different positions}
 - 27/029 . . {Electromagnetically actuated valves}
 - 27/04 . of sliding valves
 - 27/041 . . {cylindrical slide valves}
 - 27/042 . . . {Hydraulic fluid leak traps}
 - 27/044 . . {slide valves with flat obturating members}
 - 27/045 . . . {with pivotal obturating members}
 - 27/047 . . . {with wedge-shaped obturating members}
 - 27/048 . . {Electromagnetically actuated valves}
 - 27/06 . of taps or cocks
 - 27/062 . . {with conical plugs}
 - 27/065 . . {with cylindrical plugs}

- 27/067 . . {with spherical plugs}
- 27/07 . of cutting-off parts of tanks, e.g. tank-ears
- 27/08 . Guiding yokes for spindles; Means for closing housings; Dust caps, e.g. for tyre valves
 - 27/10 . Welded housings
 - 27/102 . . {for lift-valves}
 - 27/105 . . {for gate valves}
 - 27/107 . . {for taps or cocks}
 - 27/12 . Covers for housings
- 29/00** **Arrangements for movement of valve members other than for opening and closing the valve, e.g. for grinding-in, for preventing sticking**
 - 29/02 . providing for continuous motion
- 31/00** **{Actuating devices;} Operating means; Releasing devices {(regulating means [G05D](#))}**
 - 31/001 . {actuated by volume variations caused by an element soluble in a fluid or swelling in contact with a fluid (life-boats [B63C 9/24](#))}
 - 31/002 . {actuated by temperature variation (thermo-electric [F16K 31/025](#))}
 - 31/003 . {operated without a stable intermediate position, e.g. with snap action ([F16K 31/56](#) takes precedence)}
 - 31/004 . {actuated by piezo-electric means}
 - 31/005 . . {Piezo-electric benders}
 - 31/006 . . . {having a free end}
 - 31/007 . . {Piezo-electric stacks}
 - 31/008 . . . {for sliding valves}
 - 31/02 . electric {([F16K 31/004](#) takes precedence)}; magnetic
 - 31/025 . . {actuated by thermo-electric means}
 - 31/04 . . using a motor
 - 31/041 . . . {for rotating valves ([F16K 31/055](#) takes precedence)}
 - 31/042 {with electric means, e.g. for controlling the motor or a clutch between the valve and the motor}
 - 31/043 {characterised by mechanical means between the motor and the valve, e.g. lost motion means reducing backlash, clutches, brakes or return means}
 - 31/045 {with torque limiters}
 - 31/046 . . . {with electric means, e.g. electric switches, to control the motor or to control a clutch between the valve and the motor ([F16K 31/041](#) takes precedence)}
 - 31/047 . . . {characterised by mechanical means between the motor and the valve, e.g. lost motion means reducing backlash, clutches, brakes or return means ([F16K 31/043](#) takes precedence)}
 - 31/048 {with torque limiters ([F16K 31/041](#) takes precedence)}
 - 31/05 . . . specially adapted for operating hand-operated valves or for combined motor and hand operation
 - 31/055 {for rotating valves}
 - 31/06 . . using a magnet {, e.g. diaphragm valves, cutting off by means of a liquid}
 - 31/0603 {Multiple-way valves}
 - 31/0606 {fluid passing through the solenoid coil}
 - 31/061 {Sliding valves}
 - 31/0613 {with cylindrical slides}

31/0617	. . . . . {with flat slides}	31/1245	. . . . . {with more than one valve}
31/062	. . . . . {the valve element being at least partially ball-shaped}	31/126	. . . the fluid acting on a diaphragm, bellows, or the like (F16K 31/145 , F16K 31/165 , F16K 31/365 , F16K 31/385 take precedence)
31/0624	. . . . . {Lift valves}	31/1262	. . . {one side of the diaphragm being spring loaded}
31/0627	. . . . . {with movable valve member positioned between seats}	31/1264	. . . . . {with means to allow the side on which the springs are positioned to be altered}
31/0631	. . . . . {with ball shaped valve members}	31/1266	. . . {one side of the diaphragm being acted upon by the circulating fluid}
31/0634	. . . . . {with fixed seats positioned between movable valve members}	31/1268	. . . {with a plurality of the diaphragms}
31/0637	. . . . . {with ball shaped valve members}	31/128	. . . servo actuated
31/0641	. . . . . {the valve member being a diaphragm}	31/14	. . . for mounting on, or in combination with, hand-actuated valves
31/0644	. . . {One-way valve}	31/143	. . . the fluid acting on a piston
31/0648	. . . . . {the armature and the valve member forming one element (F16K 31/0651 takes precedence)}	31/145	. . . the fluid acting on a diaphragm
31/0651	. . . . . {the fluid passing through the solenoid coil}	31/16	. . . with a mechanism, other than pulling-or pushing-rod, between fluid motor and closure member (with float F16K 31/18)
31/0655	. . . . . {Lift valves}	31/163	. . . the fluid acting on a piston
31/0658	. . . . . {Armature and valve member being one single element}	31/1635	. . . . . {for rotating valves}
31/0662	. . . . . {with a ball-shaped valve member}	31/165	. . . the fluid acting on a diaphragm
31/0665	. . . . . {with valve member being at least partially ball-shaped (F16K 31/0662 takes precedence)}	31/1655	. . . . . {for rotating valves}
31/0668	. . . . . {Sliding valves}	31/18	. . . actuated by a float (floats F16K 33/00 ; float-actuated valves in steam-traps F16T 1/20 , in boilers F22D 5/08)
31/0672	. . . . . {the valve member being a diaphragm}	31/20	. . . actuating a lift valve
31/0675	. . . {Electromagnet aspects, e.g. electric supply therefor}	31/22	. . . . . with the float rigidly connected to the valve
31/0679	. . . . . {with more than one energising coil}	31/24	. . . . . with a transmission with parts linked together from a single float to a single valve
31/0682	. . . {with an articulated or pivot armature}	31/26	. . . . . with the valve guided for rectilinear movement and the float attached to a pivoted arm
31/0686	. . . {Braking, pressure equilibration, shock absorbing}	31/265	. . . . . {with a second lever or toggle between the pivoted arm and the valve}
31/0689	. . . . . {Braking of the valve element}	31/28	. . . . . with two ore more floats actuating one valve
31/0693	. . . . . {Pressure equilibration of the armature}	31/30	. . . actuating a gate valve or sliding valve
31/0696	. . . . . {Shock absorbing, e.g. using a dash-pot}	31/32	. . . actuating a tap or cock
31/08	. . . using a permanent magnet	31/34	. . . acting on pilot valve controlling the cut-off apparatus
31/082	. . . . . {using a electromagnet and a permanent magnet}	31/36	. . . in which fluid from the circuit is constantly supplied to the fluid motor
31/084	. . . . . {the magnet being used only as a holding element to maintain the valve in a specific position, e.g. check valves (F16K 31/082 , F16K 31/086 take precedence)}	31/363	. . . the fluid acting on a piston (F16K 31/38 takes precedence)
31/086	. . . . . {the magnet being movable and actuating a second magnet connected to the closing element}	31/365	. . . the fluid acting on a diaphragm
31/088	. . . . . {the movement of the first magnet being a rotating or pivoting movement}	31/38	. . . in which the fluid works directly on both sides of the fluid motor, one side being connected by means of a restricted passage and the motor being actuated by operating a discharge from that side (F16K 31/40 takes precedence)
31/10	. . . with additional mechanism between armature and closure member	31/383	. . . . . the fluid acting on a piston
31/105	. . . . . {for rotating valves}	31/3835	. . . . . {the discharge being effected through the piston and being blockable by a mechanically-actuated member making contact with the piston}
31/12	. . . actuated by fluid ({ fluid-actuated lift valves F16K 1/126 }; fluid-actuated check valves F16K 15/00 ; fluid-actuated safety valves F16K 17/00)	31/385	. . . . . the fluid acting on a diaphragm
31/122	. . . the fluid acting on a piston (F16K 31/143 , F16K 31/163 , F16K 31/363 , F16K 31/383 take precedence)	31/3855	. . . . . {the discharge being effected through the diaphragm and being blockable by a mechanically-actuated member making contact with the diaphragm}
31/1221	. . . {one side of the piston being spring-loaded}	31/40	. . . with electrically-actuated member in the discharge of the motor
31/1223	. . . {one side of the piston being acted upon by the circulating fluid}	31/402	. . . . . {acting on a diaphragm}
31/1225	. . . {with a plurality of pistons}		
31/1226	. . . {the fluid circulating through the piston}		
31/1228	. . . {with a stationnary piston}		
31/124	. . . servo actuated		

- 31/404 {the discharge being effected through the diaphragm and being blockable by an electrically-actuated member making contact with the diaphragm}
- 31/406 {acting on a piston}
- 31/408 {the discharge being effected through the piston and being blockable by an electrically-actuated member making contact with the piston}
- 31/42 . . by means of electrically-actuated members in the supply or discharge conduits of the fluid motor ([F16K 31/40 takes precedence](#))
- 31/423 . . . {the actuated members consisting of multiple way valves}
- 31/426 {the actuated valves being cylindrical sliding valves}
- 31/44 . Mechanical actuating means
- 31/445 . . {with exterior sleeve}
- 31/46 . . for remote operation
- 31/465 . . . {by flexible transmission means, e.g. cable, chain, bowden wire}
- 31/48 . . actuated by mechanical timing-device, e.g. with dash-pot ([self-closing valves F16K 21/16](#))
- 31/485 . . . {and specially adapted for gas valves}
- 31/50 . . with screw-spindle {or internally threaded actuating means}
- 31/502 . . . {actuating pivotable valve members}
- 31/504 . . . {the actuating means being rotatable, rising, and having internal threads which co-operate with threads on the outside of the valve body}
- 31/506 . . . {with plural sets of thread, e.g. with different pitch}
- 31/508 . . . {the actuating element being rotatable, non-rising, and driving a non-rotatable axially-sliding element}
- 31/52 . . with crank, eccentric, or cam
- 31/521 . . . {comprising a pivoted disc or flap}
- 31/522 . . . {comprising a tap or cock}
- 31/523 . . . {comprising a sliding valve}
- 31/524 . . . with a cam
- 31/52408 {comprising a lift valve}
- 31/52416 {comprising a multiple-way lift valve}
- 31/52425 {with a ball-shaped valve member}
- 31/52433 {with a streamlined or helically shaped valve member, e.g. for reducing flow losses or guiding the fluid flow}
- 31/52441 {with a pivoted disc or flap}
- 31/5245 {with a valve member of conical shape}
- 31/52458 {comprising a tap or cock}
- 31/52466 {comprising a multiple-way tap or cock}
- 31/52475 {comprising a sliding valve}
- 31/52483 {comprising a multiple-way sliding valve}
- 31/52491 {comprising a diaphragm cut-off apparatus}
- 31/528 . . . with pin and slot
- 31/5282 {comprising a pivoted disc or flap}
- 31/5284 {comprising a tap or cock}
- 31/5286 {comprising a sliding valve}
- 31/5288 {comprising a diaphragm cut-off apparatus}
- 31/53 . . with toothed gearing
- 31/535 . . . {for rotating valves ([F16K 31/54 takes precedence](#))}
- 31/54 . . . with pinion and rack
- 31/56 . . without stable intermediate position, e.g. with snap action
- 31/563 . . . {for rotating or pivoting valves}
- 31/566 . . . {using a bistable spring device arranged symmetrically around the actuating stem}
- 31/58 . . comprising a movable discharge-nozzle
- 31/60 . . Handles {(form, features or function of taps or faucet handles for domestic plumbing installations [E03C 1/04](#))}
- 31/602 . . . {Pivoting levers, e.g. single-sided ([F16K 31/605 takes precedence](#))}
- 31/605 . . . {for single handle mixing valves}
- 31/607 . . . {characterised by particular material, by special measures to obtain aesthetical effects, or by auxiliary functions, e.g. storage}
- 31/62 . . Pedals or like operating members, e.g. actuated by knee or hip
- 33/00 Floats for actuation of valves or other apparatus {(float actuated valves [F16K 31/18](#))}**
- 35/00 Means to prevent accidental or unauthorised actuation**
- 35/02 . . to be locked or disconnected by means of a pushing or pulling action
- 35/022 . . {the locking mechanism being actuated by a separate actuating element}
- 35/025 . . . {said actuating element being operated manually (e.g. a push-button located in the valve actuator)}
- 35/027 . . {the locking mechanism being actuated by pushing or pulling the valve actuator, the valve actuator being rotated subsequently to bring the valve closure element in the desired position}
- 35/04 . Yieldingly resisting the actuation
- 35/06 . using a removable actuating or locking member, e.g. a key ([F16K 35/10](#), [F16K 35/12 take precedence](#))
- 35/08 . requiring setting according to a code, e.g. permutation locks
- 35/10 . with locking caps or locking bars
- 35/12 . with sealing wire
- 35/14 . interlocking two or more valves
- 35/16 . with locking member actuated by magnet
- 37/00 Special means in or on valves or other cut-off apparatus for indicating or recording operation thereof, or for enabling an alarm to be given**
- 37/0008 . {Mechanical means ([F16K 37/0075 takes precedence](#))}
- 37/0016 . . {having a graduated scale}
- 37/0025 . {Electrical or magnetic means ([F16K 37/0075 takes precedence](#))}
- 37/0033 . . {using a permanent magnet, e.g. in combination with a reed relays}
- 37/0041 . . {for measuring valve parameters ([F16K 37/0033 takes precedence](#))}
- 37/005 . . {for measuring fluid parameters ([F16K 37/0033 takes precedence](#))}
- 37/0058 . {Optical means, e.g. light transmission, observation ports ([F16K 37/0075 takes precedence](#))}
- 37/0066 . {Hydraulic or pneumatic means ([F16K 37/0075 takes precedence](#))}
- 37/0075 . {For recording or indicating the functioning of a valve in combination with test equipment}
- 37/0083 . . {by measuring valve parameters}

- 37/0091 . . {by measuring fluid parameters}
- 39/00 Devices for relieving the pressure on the sealing faces**
 - 39/02 . for lift valves
 - 39/022 . . {using balancing surfaces}
 - 39/024 . . {using an auxiliary valve on the main valve}
 - 39/026 . . {using an external auxiliary valve}
 - 39/028 . . {with pivoted closure members, e.g. butterfly valves}
 - 39/04 . for sliding valves
 - 39/045 . . {of rotating or pivoting type}
 - 39/06 . for taps or cocks
- 41/00 Spindle sealings**
 - 41/003 . {by fluid}
 - 41/006 . {by establishing an under-pressure}
 - 41/02 . with stuffing-box; {Sealing rings}
 - 41/023 . . {for spindles which only rotate, i.e. non-rising spindles ([F16K 41/043](#), [F16K 41/063](#) and [F16K 41/083](#) take precedence)}
 - 41/026 . . . {for rotating valves}
 - 41/04 . . with at least one ring of rubber or like material between spindle and housing
 - 41/043 . . . {for spindles which only rotate, i.e. non-rising spindles}
 - 41/046 {for rotating valves}
 - 41/06 . . with at least one ring attached to both spindle and housing
 - 41/063 . . . {for spindles which only rotate, i.e. non-rising spindles}
 - 41/066 {for rotating valves}
 - 41/08 . . with at least one ring provided with axially-protruding peripheral closing-lip
 - 41/083 . . . {for spindles which only rotate, i.e. non-rising spindles}
 - 41/086 {for rotating valves}
 - 41/10 . with diaphragm, e.g. shaped as bellows or tube
 - 41/103 . . {the diaphragm and the closure member being integrated in one member}
 - 41/106 . . {for use with rotating spindles or valves ([F16K 41/125](#) takes precedence)}
 - 41/12 . . with approximately flat diaphragm
 - 41/125 . . . {the part of the spindle traversing the diaphragm being rotatable or pivotable}
 - 41/14 . with conical flange on the spindle which co-operates with a conical surface in the housing
 - 41/16 . with a flange on the spindle which rests on a sealing ring
 - 41/18 . . sealing only when the closure member is in the opened position
- 43/00 Auxiliary closure means in valves, which in case of repair, e.g. rewashing, of the valve, can take over the function of the normal closure means; Devices for temporary replacement of parts of valves for the same purpose**
 - 43/001 . {an auxiliary valve being actuated independently of the main valve}
 - 43/003 . . {the auxiliary valve being a rotary valve}
 - 43/005 . {an auxiliary valve closing automatically when the main valve is being disassembled}
 - 43/006 . . {the auxiliary valve being held open by the main valve}
- 43/008 . {the main valve having a back-seat position, e.g. to service the spindle sealing}
- 47/00 Means in valves for absorbing fluid energy {, e.g. cushioning of opening or closure movement, eliminating of vibrations of the valve member} (for pipes [F16L 55/00](#))**
 - 47/02 . for preventing water-hammer or noise {, e.g. for sanitary applications, toilet flush reservoirs ([F16K 47/04](#) and [F16K 47/08](#) take precedence)}
 - 47/023 . . {for preventing water-hammer, e.g. damping of the valve movement}
 - 47/026 . . {preventing noise in a single handle mixing valve}
 - 47/04 . for decreasing pressure {or noise level}, the throttle being incorporated in the closure member
 - 47/045 . . {and the closure member being rotatable}
 - 47/06 . . with a throttle in the form of a helical channel
 - 47/08 . for decreasing pressure {or noise level} and having a throttling member separate from the closure member, {e.g. screens, slots, labyrinths}
 - 47/10 . . in which the medium in one direction must flow through the throttling channel, and in the other direction may flow through a much wider channel parallel to the throttling channel
 - 47/12 . . the throttling channel being of helical form
 - 47/14 . . the throttling member being a perforated membrane
 - 47/16 . . the throttling member being a cone
- 49/00 Means in or on valves for heating or cooling (for pipes [F16L 53/00](#); thermal insulation in connection with pipes or pipe systems [F16L 59/16](#))**
 - 49/002 . {Electric heating means}
 - 49/005 . {Circulation means for a separate heat transfer fluid}
 - 49/007 . . {located within the obturating element}
- 51/00 Other details not peculiar to particular types of valves or cut-off apparatus**
 - 51/02 . specially adapted for high-vacuum installations
- 99/00 Subject matter not provided for in other groups of this subclass**
 - 99/0001 . {Micro-valves ([micro-devices B81B 1/00](#); manufacture or treatment of devices or systems in or on a substrate [B81C 1/00](#); micro-fluidic structures [B01L 3/5027](#); micro-pumps [F04B 19/006](#))}
 - 99/0003 . . {Constructional types of microvalves; Details of the cutting-off member}
 - 99/0005 . . . {Lift valves}
 - 99/0007 {of cantilever type}
 - 99/0009 {the valve element held by multiple arms}
 - 99/0011 . . . {Gate valves or sliding valves}
 - 99/0013 . . . {Rotary valves}
 - 99/0015 . . . {Diaphragm or membrane valves}
 - 99/0017 . . . {Capillary or surface tension valves, e.g. using electro-wetting or electro-capillarity effects}
 - 99/0019 . . . {Valves using a micro-droplet or micro-bubble as the valve member}
 - 99/0021 . . . {No-moving-parts valves}
 - 99/0023 . . . {with ball-shaped valve members}
 - 99/0025 . . . {Valves using microporous membranes}
 - 99/0026 . . . {Valves using channel deformation}
 - 99/0028 . . . {Valves having multiple inlets or outlets}

99/003	. . . {Valves for single use only}
99/0032	. . . {using phase transition or influencing viscosity}
99/0034	. . {Operating means specially adapted for microvalves}
99/0036	. . . {operated by temperature variations}
99/0038	. . . . {using shape memory alloys}
99/004	. . . . {using radiation}
99/0042	. . . {Electric operating means therefor}
99/0044	. . . . {using thermo-electric means}
99/0046	. . . . {using magnets}
99/0048	. . . . {using piezoelectric means}
99/0049	. . . . {using an electroactive polymer [EAP]}
99/0051	. . . . {using electrostatic means}
99/0053	. . . . {using magnetostrictive means}
99/0055	. . . {actuated by fluids}
99/0057	. . . . {the fluid being the circulating fluid itself, e.g. check valves}
99/0059	. . . . {actuated by a pilot fluid}
99/0061	. . . . {actuated by an expanding gas or liquid volume}
99/0063	. . . {using centrifugal forces}
99/0065	. . . {using chemical activation}
99/0067	. . . . {actuated by a pyrotechnical charge}
2099/0069	. . {Bistable microvalves}
2099/0071	. . {with latching means}
2099/0073	. {Fabrication methods specifically adapted for microvalves}
2099/0074	. . {using photolithography, e.g. etching}
2099/0076	. . {using electrical discharge machining [EDM], milling or drilling}
2099/0078	. . {using moulding or stamping}
2099/008	. . {Multi-layer fabrications}
2099/0082	. {Microvalves adapted for a particular use}
2099/0084	. . {Chemistry or biology, e.g. "lab-on-a-chip" technology}
2099/0086	. . {Medical applications}
2099/0088	. . . {Implanted devices}
2099/009	. . {Fluid power devices}
2099/0092	. . {Inkjet printers}
2099/0094	. . {Micro-pumps}
2099/0096	. . {Fuel injection devices}
2099/0098	. . {Refrigeration circuits, e.g. for cooling integrated circuits}