

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 }

F16K

(continued)

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

F16K

(continued)

[{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](#) " " [G05D](#)
[F16K 31/66](#) " " [F16K 31/06](#) ; [H01F](#)
[F16K 31/68](#) " " [G05D](#)
[F16K 31/70](#) " " [F16K 31/002](#)
[F16K 31/72](#) " " [F16K 31/00](#)

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

In groups [F16K 1/00](#) to [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.

F16K 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](#))

- [F16K 1/02](#) . with screw-spindle ([F16K 1/12](#) to [F16K 1/28](#) take precedence; actuating mechanisms with screw-spindles [F16K 31/50](#))
- [F16K 1/04](#) .. with a cut-off member rigid with the spindle, e.g. main valves
- [F16K 1/06](#) .. Special arrangements for improving the flow, e.g. special shape of passages or casings
- [F16K 1/08](#) ... in which the spindle is perpendicular to the general direction of flow
- [F16K 1/10](#) ... in which the spindle is inclined to the general direction of flow

F16K 1/12	. . .	with streamlined valve member around which the fluid flows when the valve is opened
F16K 1/123	. . .	{with stationary valve member and moving sleeve}
F16K 1/126	. . .	{actuated by fluid}
F16K 1/14	. . .	with ball-shaped valve member (check valves F16K 15/04)
F16K 1/16	. . .	with pivoted closure-members
F16K 1/165	. . .	{with a plurality of closure members}
F16K 1/18	. . .	with pivoted discs or flaps
F16K 1/20	. . .	with axis of rotation arranged externally of valve member

WARNING

Subgroups of [F16K 1/20](#) are not complete pending a reorganisation, see also [F16K 1/20](#)

F16K 1/2007	. . . .	{specially adapted operating means therefor (operating means per se F16K 31/00)}
F16K 1/2014	. . . .	{Shaping of the valve member}
F16K 1/2021	. . . .	{with a plurality of valve members}
F16K 1/2028	. . . .	{Details of bearings for the axis of rotation}
F16K 1/2035	. . . . .	{the axis of rotation having only one bearing}
F16K 1/2042	. . . .	{Special features or arrangements of the sealing}
F16K 1/205	. . . . .	{the sealing being arranged on the valve member}
F16K 1/2057	. . . . .	{the sealing being arranged on the valve seat}
F16K 1/2064	. . . . .	{with a channel- or U-shaped seal covering a central body portion}
F16K 1/2071	. . . . .	{and being forced into sealing contact with the valve member by a spring or a spring-like member}
F16K 1/2078	. . . . .	{Sealing means for the axis of rotation}
F16K 1/2085	. . . . .	{Movable sealing bodies}
F16K 1/2092	. . . . .	{the movement being caused by the flowing medium}
F16K 1/22	. . .	with axis of rotation crossing the valve member, e.g. butterfly valves
F16K 1/221	. . . .	{specially adapted operating means therefor (operating means per se F16K 31/00)}
F16K 1/222	. . . .	{Shaping of the valve member}
F16K 1/223	. . . .	{with a plurality of valve members}
F16K 1/224	. . . .	{Details of bearings for the axis of rotation}
F16K 1/225	. . . . .	{the axis of rotation having only one bearing}
F16K 1/226	. . . .	Shaping or arrangements of the sealing
F16K 1/2261	. . . . .	{the sealing being arranged on the valve member}
F16K 1/2263	. . . . .	{the sealing being arranged on the valve seat}
F16K 1/2265	. . . . .	{with a channel- or U-shaped seal covering a central body portion}
F16K 1/2266	. . . . .	{and being forced into sealing contact with the valve member by a spring or a spring-like member}
F16K 1/2268	. . . . .	{Sealing means for the axis of rotation}

F16K 1/228	.....	Movable sealing bodies
F16K 1/2285	.....	{the movement being caused by the flowing medium}
F16K 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
F16K 1/26	..	Shape or arrangement of the sealing {Not used}
F16K 1/28	...	Movable sealing bodies {Not used}
F16K 1/30	.	specially adapted for pressure containers
F16K 1/301	..	{only shut-off valves, i.e. valves without additional means}
F16K 1/302	...	{with valve member and actuator on the same side of the seat}
F16K 1/303	...	{with a valve member, e.g. stem or shaft, passing through the seat}
F16K 1/304	..	{Shut-off valves with additional means}
F16K 1/305	...	{with valve member and actuator on the same side of the seat}
F16K 1/306	...	{with a valve member, e.g. stem or shaft, passing through the seat}
F16K 1/307	..	{Additional means used in combination with the main valve}
F16K 1/308	..	{Connecting means}
F16K 1/32	.	Details (details of more general applicability F16K 25/00 to F16K 51/00)
F16K 1/34	..	Cutting-off parts, e.g. valve members, seats (F16K 1/06 , F16K 1/12 , F16K 1/14 , F16K 1/26 take precedence)
F16K 1/36	...	Valve members (for double-seat valves F16K 1/44 { for butterfly valves F16K 1/222 , F16K 1/223 })
F16K 1/38	....	of conical shape
F16K 1/385	.....	{contacting in the closed position, over a substantial axial length, a seat surface having the same inclination}
F16K 1/40	....	of helical shape
F16K 1/42	...	Valve seats (for double-seat valves F16K 1/44)

WARNING

Subgroups of [F16K 1/42](#) are not complete pending a reorganisation, see also [F16K 1/42](#)]

F16K 1/422	....	{attachable by a threaded connection to the housing}
F16K 1/425	....	{Attachment of the seat to the housing by plastical deformation, e.g. valve seat or housing being plastically deformed during mounting}
F16K 1/427	....	{Attachment of the seat to the housing by one or more additional fixing elements}
F16K 1/44	...	Details of seats or valve members of double-seat valves
F16K 1/443	....	{the seats being in series}
F16K 1/446	.....	{with additional cleaning or venting means between the two seats}
F16K 1/46	...	Attachment of sealing rings
F16K 1/465	....	{to the valve seats}

WARNING

F16K 1/465
(continued)

Not yet complete, see also [F16K 1/46](#)

- F16K 1/48 .. Attaching valve members to screw-spindles
- F16K 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}
- F16K 1/485 {with a groove in the spindle}
- F16K 1/487 ... {by a fixing element extending in the axial direction of the spindle, e.g. a screw}
- F16K 1/50 .. Preventing rotation of valve members
- F16K 1/52 .. Means for additional adjustment of the rate of flow
- F16K 1/523 ... {for limiting the maximum flow rate, using a stop}
- F16K 1/526 ... {for limiting the maximum flow rate, using a second valve}
- F16K 1/54 .. Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve

F16K 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](#))

- F16K 3/02 . with flat sealing faces; Packings therefor
- F16K 3/0209 .. {the valve having a particular passage, e.g. provided with a filter, throttle or safety device}
- F16K 3/0218 .. {with only one sealing face}
- F16K 3/0227 .. {Packings}
- F16K 3/0236 ... {the packing being of a non-resilient material, e.g. ceramic, metal}
- F16K 3/0245 .. {Curtain gate valves}
- F16K 3/0254 .. {being operated by particular means}
- F16K 3/0263 .. {using particular material or covering means}
- F16K 3/0272 .. {permitting easy assembly or disassembly}
- F16K 3/0281 .. {Guillotine or blade-type valves, e.g. no passage through the valve member}
- F16K 3/029 .. {with two or more gates}
- F16K 3/03 .. with a closure member in the form of an iris-diaphragm
- F16K 3/04 .. with pivoted closure members
- F16K 3/06 ... in the form of closure plates arranged between supply and discharge passages ([F16K 3/10](#) takes precedence)
- F16K 3/08 with circular plates rotatable around their centres
- F16K 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}
- F16K 3/10 ... with special arrangements for separating the sealing faces or for pressing them together
- F16K 3/12 .. with wedge-shaped arrangements of sealing faces
- F16K 3/14 ... with special arrangements for separating the sealing faces or for pressing them together
- F16K 3/16 .. with special arrangements for separating the sealing faces or for pressing them together ([F16K 3/10](#) , [F16K 3/14](#) take precedence)
- F16K 3/18 ... by movement of the closure members

F16K 3/182	.... {by means of toggle links}
F16K 3/184	.... {by means of cams}
F16K 3/186	..... {by means of cams of wedge form}
F16K 3/188	.... {by means of hydraulic forces}
F16K 3/20	... by movement of the seats
F16K 3/202	.... {by movement of toggle links}
F16K 3/205	.... {by means of cams}
F16K 3/207	.... {by means of hydraulic forces}
F16K 3/22	. with sealing faces shaped as surfaces of solids of revolution (F16K 13/02 takes precedence; with resilient valve members F16K 3/28)
F16K 3/24	.. with cylindrical valve members
F16K 3/243	... {Packings (F16K 3/246 takes precedence)}
F16K 3/246	... {Combination of a sliding valve and a lift valve}
F16K 3/26	... with fluid passages in the valve member
F16K 3/262	.... {with a transverse bore in the valve member}
F16K 3/265	.... {with a sleeve sliding in the direction of the flow line}
F16K 3/267	.... {Combination of a sliding valve and a lift valve (F16K 3/262 , F16K 3/265 take precedence)}
F16K 3/28	. with resilient valve members
F16K 3/30	. Details
F16K 3/312	.. Line blinds
F16K 3/314	.. Forms or construction of slides; Attachment of the slide to the spindle
F16K 3/316	.. Guiding of the slide
F16K 3/3165	... {with rollers or balls}
F16K 3/32	.. Means for additional adjustment of the rate of flow
F16K 3/34	.. Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve
F16K 3/36	.. Features relating to lubrication
F16K 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)
F16K 5/02	. with plugs having conical surfaces; Packings therefor
F16K 5/0207	.. {with special plug arrangement, e.g. special shape or built in means}
F16K 5/0214	.. {Plug channel at 90 degrees to the inlet}
F16K 5/0221	.. {Fixed plug and turning sleeve}
F16K 5/0228	.. {with a conical segment mounted around a supply pipe}
F16K 5/0235	.. {with the angle the spindle makes housing being other than 90 degrees}
F16K 5/0242	.. {Spindles and actuating means}
F16K 5/025	.. {Particular coverings or materials}
F16K 5/0257	.. {Packings}

F16K 5/0264	...	{in the housing}
F16K 5/0271	...	{between housing and plug}
F16K 5/0278	...	{on the plug}
F16K 5/0285	...	{spindle sealing}
F16K 5/0292	..	{Easy mounting or dismounting means}
F16K 5/04	.	with plugs having cylindrical surfaces; Packings therefor
F16K 5/0407	..	{with particular plug arrangements, e.g. particular shape or built-in means}
F16K 5/0414	..	{Plug channel at 90 degrees to the inlet}
F16K 5/0421	..	{Fixed plug and turning sleeve}
F16K 5/0428	..	{with a cylindrical segment mounted around a supply pipe}
F16K 5/0435	..	{the angle the spindle makes with the housing being other than 90 degrees}
F16K 5/0442	..	{Spindles and actuating means}
F16K 5/045	..	{Particular coverings and materials}
F16K 5/0457	..	{Packings}
F16K 5/0464	...	{in the housing}
F16K 5/0471	...	{between housing and plug}
F16K 5/0478	...	{on the plug}
F16K 5/0485	...	{Spindle sealing}
F16K 5/0492	..	{Easy mounting or dismounting means}
F16K 5/06	.	with plugs having spherical surfaces; Packings therefor
F16K 5/0605	..	{with particular plug arrangements, e.g. particular shape or built-in means}
F16K 5/061	..	{knee-joint}
F16K 5/0615	..	{the angle the spindle makes with the housing being other than 90 degrees}
F16K 5/0621	..	{with a spherical segment mounted around a supply pipe}
F16K 5/0626	..	{Easy mounting or dismounting means}
F16K 5/0631	...	{between two flanges}
F16K 5/0636	...	{the spherical plug being insertable from the top of the housing}
F16K 5/0642	...	{the spherical plug being insertable from one and only one side of the housing}
F16K 5/0647	..	{Spindles or actuating means}
F16K 5/0652	...	{for remote operation}
F16K 5/0657	..	{Particular coverings or materials}
F16K 5/0663	..	{Packings}
F16K 5/0668	...	{Single packings}
F16K 5/0673	...	{Composite packings}
F16K 5/0678	{in which only one of the components of the composite packing is contacting the plug}

WARNING

not yet complete, see also [F16K 5/0673](#)

F16K 5/0684	...	{on the plug}
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F16K 5/0689	...	{between housing and plug}
F16K 5/0694	...	{Spindle sealings}
F16K 5/08	.	Details
F16K 5/10	..	Means for additional adjustment of the rate of flow
F16K 5/103	...	{specially adapted for gas valves}
F16K 5/106	....	{with pilot flame}
F16K 5/12	..	Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve
F16K 5/14	..	Special arrangements for separating the sealing faces or for pressing them together
F16K 5/16	...	for plugs with conical surfaces
F16K 5/161	....	{with the housing or parts of the housing mechanically pressing the seal against the plug}
F16K 5/162	....	{with the plugs or parts of the plugs mechanically pressing the seal against the housing}
F16K 5/163	.....	{adjustable in height}
F16K 5/165	.....	{Means pressing on the small diameter}
F16K 5/166	.....	{Means pressing on the large diameter}
F16K 5/167	.....	{Means pressing radially}
F16K 5/168	....	{Sealing effected by the flowing medium}
F16K 5/18	...	for plugs with cylindrical surfaces
F16K 5/181	....	{with the housing or parts of the housing mechanically pressing the seals against the plugs}
F16K 5/182	.....	{by means of conical surfaces}
F16K 5/184	....	{with the plugs or parts of the plugs mechanically pressing the seals against the housing}
F16K 5/185	.....	{by means of conical surfaces}
F16K 5/187	.....	{with rolling action}
F16K 5/188	....	{Sealing effected by the flowing medium}
F16K 5/20	...	for plugs with spherical surfaces
F16K 5/201	....	{with the housing or parts of the housing mechanically pressing the seal against the plug}
F16K 5/202	.....	{with conical surfaces}
F16K 5/204	....	{with the plugs or parts of the plugs mechanically pressing the seals against the housing}
F16K 5/205	....	{Sealing effected by the flowing medium}
F16K 5/207	.....	{using bellows}
F16K 5/208	.....	{with tongue-shaped means}
F16K 5/22	..	Features relating to lubrication
F16K 5/222	...	{for plugs with conical surfaces}
F16K 5/225	...	{for plugs with cylindrical surfaces}
F16K 5/227	...	{for plugs with spherical surfaces}

F16K 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}
F16K 7/02	. with tubular diaphragm
F16K 7/04	.. constrictable by external radial force
F16K 7/045	... {by electric or magnetic means}
F16K 7/06	... by means of a screw-spindle, cam, or other mechanical means {(F16K 7/045 takes precedence)}
F16K 7/061	.... {Screw clamps}
F16K 7/063	.... {Lever clamps}
F16K 7/065	.... {Cam clamps}
F16K 7/066	.... {Wedge clamps}
F16K 7/068	.... {by bending the hose}
F16K 7/07	... by means of fluid pressure
F16K 7/075	.... {a rigid body being located within the tubular diaphragm}
F16K 7/08	.. constrictable by twisting
F16K 7/10	. with inflatable member
F16K 7/12	. with flat, dished, or bowl-shaped diaphragm
F16K 7/123	.. {the seat being formed on the bottom of the fluid line}
F16K 7/126	.. {the seat being formed on a rib perpendicular to the fluid line}
F16K 7/14	.. arranged to be deformed against a flat seat
F16K 7/16	... the diaphragm being mechanically actuated, e.g. by screw-spindle or cam
F16K 7/17	... the diaphragm being actuated by fluid pressure
F16K 7/18	. with diaphragm secured at one side only, e.g. to be laid on the seat by rolling action
F16K 7/20	. with a compressible solid closure member
F16K 11/00	Multiple-way valves, e.g. mixing valves; Pipe fittings incorporating such valves
F16K 11/02	. with all movable sealing faces moving as one unit
F16K 11/022	.. {comprising a deformable member}
F16K 11/025	... {with an O-ring}
F16K 11/027	... {the fluid flowing through a constrictable tubular diaphragm}
F16K 11/04	.. comprising only lift valves
F16K 11/044	... with movable valve members positioned between valve seats
F16K 11/0445	.... {Bath/shower selectors}
F16K 11/048	... with valve seats positioned between movable valve members
F16K 11/052	... with pivoted closure members, e.g. butterfly valves
F16K 11/0525	.... {the closure members being pivoted around an essentially central axis}
F16K 11/056	... with ball-shaped valve members
F16K 11/0565	.... {moving in a combined straight line and rotating movement}

F16K 11/06	..	comprising only sliding valves,{i.e. sliding closure elements}
F16K 11/065	...	with linearly sliding closure members
F16K 11/0655	....	{with flat slides}
F16K 11/07	....	with cylindrical slides
F16K 11/0704	.....	{comprising locking elements}
F16K 11/0708	.....	{comprising means to avoid jamming of the slide or means to modify the flow}
F16K 11/0712	.....	{comprising particular spool-valve sealing means}
F16K 11/0716	.....	{with fluid passages through the valve member (F16K 11/0704 , F16K 11/0708 , F16K 11/0712 take precedence)}
F16K 11/072	...	with pivoted closure members
F16K 11/074	....	with flat sealing faces
F16K 11/0743	.....	{with both the supply and the discharge passages being on one side of the closure plates}
F16K 11/0746	.....	{with two or more closure plates comprising a single lever control}
F16K 11/076	....	with sealing faces shaped as surfaces of solids of revolution
F16K 11/078	...	with pivoted and linearly movable closure members
F16K 11/0782	....	{Single-lever operated mixing valves with closure members having flat sealing faces}
F16K 11/0785	.....	{the movable closure member being pivotally supported at one point and being linked to the operating lever at only one other point}
F16K 11/0787	.....	{with both the supply and the discharge passages being on the same side of the closure members (F16K 11/0785 takes precedence)}
F16K 11/08	..	comprising only taps or cocks
F16K 11/083	...	with tapered plug
F16K 11/0833	....	{having all the connecting conduits situated in a single plane perpendicular to the axis of the plug}
F16K 11/0836	....	{having all the connecting conduits situated in more than one plane perpendicular to the axis of the plug}
F16K 11/085	...	with cylindrical plug
F16K 11/0853	....	{having all the connecting conduits situated in a single plane perpendicular to the axis of the plug}
F16K 11/0856	....	{having all the connecting conduits situated in more than one plane perpendicular to the axis of the plug}
F16K 11/087	...	with spherical plug
F16K 11/0873	....	{the plug being only rotatable around one spindle}
F16K 11/0876	.....	{one connecting conduit having the same axis as the spindle}
F16K 11/10	.	with two or more closure members not moving as an unit
F16K 11/105	..	{Three-way check or safety valves with two or more closure members}
F16K 11/12	..	with one plug turning in another
F16K 11/14	..	operated by one actuating member, e.g. a handle (with one plug turning in another F16K 11/12)
F16K 11/16	...	which only slides, or only turns, or only swings in one plane

F16K 11/161	....	{only slides}
F16K 11/163	....	{only turns}
F16K 11/165	.....	{with the rotating spindles parallel to the closure members}
F16K 11/166	.....	{with the rotating spindles at right angles to the closure members}
F16K 11/168	....	{only swings}
F16K 11/18	...	with separate operating movements for separate closure members
F16K 11/185	....	{with swinging shafts}
F16K 11/20	..	operated by separate actuating members (with one plug turning in another F16K 11/12)
F16K 11/202	...	{with concentric handles}
F16K 11/205	...	{with two handles at right angles to each other}
F16K 11/207	...	{with two handles or actuating mechanisms at opposite sides of the housing}
F16K 11/22	...	with an actuating member for each valve, e.g. interconnected to form multiple-way valves
F16K 11/24	...	with an electromagnetically-operated valve, e.g. for washing machines
F16K 13/00		Other constructional types of cut-off apparatus (means for plugging pipes or hoses F16L 55/10); Arrangements for cutting-off
F16K 13/02	.	with both sealing faces shaped as small segments of a cylinder and the moving member pivotally mounted
F16K 13/04	.	with a breakable closure member
F16K 13/06	..	constructed to be ruptured by an explosion
F16K 13/08	.	Arrangements for cutting-off {not used}
F16K 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.

F16K 15/00	Check valves (valves specially adapted for inflatable balls A63B 41/00)
F16K 15/02	. with guided rigid valve members
F16K 15/021	.. {the valve member being a movable body around which the medium flows when the valve is open (F16K 15/025 to F16K 15/12 take precedence)}

WARNING

not yet complete

F16K 15/023 ... {the valve member consisting only of a predominantly disc-shaped flat element}

WARNING

not yet complete

F16K 15/025 .. {the valve being loaded by a helicoidal spring ([F16K 15/03](#) to [F16K 15/12](#) take precedence)}

F16K 15/026 ... {the valve member being a movable body around which the medium flows when the valve is open}

F16K 15/028 {the valve member consisting only of a predominantly disc-shaped flat element}

F16K 15/03 .. with a hinged closure member

F16K 15/031 ... {the hinge being flexible ([F16K 15/035](#) takes precedence)}

F16K 15/033 ... {spring-loaded ([F16K 15/035](#) takes precedence)}

F16K 15/035 ... {with a plurality of valve members}

F16K 15/036 {Dual valve members with hinges crossing the flow line substantially diametrical}

F16K 15/038 {having a common hinge}

F16K 15/04 .. shaped as balls

F16K 15/042 ... {with a plurality of balls}

F16K 15/044 ... {spring-loaded ([F16K 15/042](#) takes precedence)}

F16K 15/046 {by a spring other than a helicoidal spring}

F16K 15/048 ... {Ball features}

WARNING

not yet complete, see also [F16K 15/04](#)

F16K 15/06 .. with guided stems

F16K 15/063 ... {the valve being loaded by a helicoidal spring}

WARNING

not yet complete, see also [F16K 15/06](#)

F16K 15/066 {with a plurality of valve members}

F16K 15/08 .. shaped as rings

F16K 15/10 ... integral with, or rigidly fixed to, a common valve plate

F16K 15/12 ... Springs for ring valves

F16K 15/14 . with flexible valve members

F16K 15/141 .. {the closure elements not being fixed to the valve body}

F16K 15/142 ... {the closure elements being shaped as solids of revolution, e.g. toroidal or cylindrical rings}

F16K 15/144 .. {the closure elements being fixed along all or a part of their periphery}

- F16K 15/145 . . . {the closure elements being shaped as a solids of revolution, e.g. cylindrical or conical}
- F16K 15/147 . . . {the closure elements having specially formed slits or being of an elongated easily collapsible form}
- F16K 15/148 . . {the closure elements being fixed in their centre}
- F16K 15/16 . . with tongue-shaped laminae
- F16K 15/18 . with actuating mechanism; Combined check valves and actuated valves
- F16K 15/181 . . {for check valves with a hinged closure member (F16K 15/188 takes precedence)}
- F16K 15/183 . . {for ball check valves (F16K 15/186 , F16K 15/188 take precedence)}
- F16K 15/185 . . {for check valves with flexible valve members (F16K 15/188 takes precedence)}
- F16K 15/186 . . {Check valves which can be actuated by a pilot valve}
- F16K 15/188 . . {Check valves combined with valves having a rotating tap or cock}
- F16K 15/20 . specially designed for inflatable bodies, e.g. tyres (connecting valves to inflatable bodies B60C 29/00)
- F16K 15/202 . . {and with flexible valve member}
- F16K 15/205 . . {and with closure plug}
- F16K 15/207 . . {and combined with other valves, e.g. safety valves}

F16K 17/00**Safety valves; Equalising valves,{e.g. pressure relief valves}**

- F16K 17/003 . {reacting to pressure and temperature}
- F16K 17/006 . {specially adapted for shelters}
- F16K 17/02 . opening on surplus pressure on one side; closing on insufficient pressure on one side (check valves F16K 15/00)
- F16K 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](#)

- F16K 17/04 . . spring-loaded
- F16K 17/0406 . . . {in the form of balls}
- F16K 17/0413 . . . {in the form of closure plates}
- F16K 17/042 . . . {with locking or disconnecting arrangements}
- F16K 17/0426 . . . {with seat protecting means}
- F16K 17/0433 . . . {with vibration preventing means}
- F16K 17/044 . . . {with more than one spring}
- F16K 17/0446 . . . {with an obturating member having at least a component of their opening and closing motion not perpendicular to the closing faces}
- F16K 17/0453 {the member being a diaphragm}
- F16K 17/046 {the valve being of the gate valve type or the sliding valve type}

WARNING

not yet complete, see also [F16K 17/0446](#)

F16K 17/0466	...	{with a special seating surface}
F16K 17/0473	...	{Multiple-way safety valves}
F16K 17/048	...	{combined with other safety valves, or with pressure control devices}
F16K 17/0486	...	{with mechanical actuating means}
F16K 17/0493	...	{with a spring other than a helicoidal spring}
F16K 17/06	...	with special arrangements for adjusting the opening pressure
F16K 17/065	....	{with differential piston}
F16K 17/08	...	with special arrangements for providing a large discharge passage
F16K 17/082	....	{with piston}
F16K 17/085	....	{with diaphragm}
F16K 17/087	....	{with bellows}
F16K 17/10	...	with auxiliary valve for fluid operation of the main valve
F16K 17/105	....	{using choking or throttling means to control the fluid operation of the main valve}
F16K 17/12	..	weight-loaded
F16K 17/14	..	with fracturing member
F16K 17/16	...	with fracturing diaphragm;{Rupture discs}
F16K 17/1606	....	{of the reverse-buckling-type (F16K 17/1633 takes precedence)}
F16K 17/1613	.....	{with additional cutting means}
F16K 17/162	....	{of the non reverse-buckling-type (F16K 17/1633 takes precedence)}
F16K 17/1626	.....	{with additional cutting means}
F16K 17/1633	....	{made of graphite}
F16K 17/164	..	and remaining closed after return of the normal pressure
F16K 17/168	..	combined with manually-controlled valves, e.g. a valve combined with a safety valve
F16K 17/18	.	opening on surplus pressure on either side
F16K 17/19	..	Equalising valves predominantly for tanks {(when combined with safety valve by change of position F16K 17/36)}
F16K 17/192	...	with closure member in the form of a movable liquid column
F16K 17/194	...	weight-loaded
F16K 17/196	...	spring-loaded
F16K 17/20	.	Excess-flow valves (actuated in consequence of shock or similar extraneous influence F16K 17/36)
F16K 17/205	..	{specially adapted for flexible gas lines}
F16K 17/22	..	actuated by the difference of pressure between two places in the flow line
F16K 17/24	...	acting directly on the cutting-off member
F16K 17/26	....	operating in either direction
F16K 17/28	....	operating in one direction only
F16K 17/285	.....	{the cutting-off member being a ball (F16K 17/30 takes precedence)}
F16K 17/30	.....	spring-loaded
F16K 17/32	...	acting on a servo-mechanism or on a catch-releasing mechanism

- F16K 17/34 . . . in which the flow-energy of the flowing medium actuates the closing mechanism
- F16K 17/36 . . . actuated in consequence of extraneous circumstances, e.g. shock, change of position
- F16K 17/363 . . . {the closure members being rotatable or pivoting (F16K 17/386 takes precedence)}
- F16K 17/366 . . . {the closure member being a movable ball (F16K 17/38 takes precedence)}

WARNING

not yet complete, see also [F16K 17/36](#)

- F16K 17/38 . . . of excessive temperature
- F16K 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)}
- F16K 17/386 . . . {the closure members being rotatable or pivoting}
- F16K 17/40 . . . with a fracturing member, e.g. fracturing diaphragm, glass, fusible joint (valves opening on surplus pressure [F16K 17/14](#))
- F16K 17/403 . . . {with a fracturing valve member}
- F16K 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}
- F16K 17/42 . . . Valves preventing penetration of air in the outlet of containers for liquids

F16K 19/00 Arrangements of valves and flow lines specially adapted for mixing fluids
(multiple-way valves [F16K 11/00](#))

- F16K 19/003 . . . {Specially adapted for boilers}
- F16K 19/006 . . . {Specially adapted for faucets}

F16K 21/00 Fluid-delivery valves, {e.g. self-closing valves} (for liquid handling [B67D](#) ; for flushing devices for water-closets or the like [E03D](#))

- F16K 21/02 . . . providing a continuous small flow
- F16K 21/04 . . . Self-closing valves, i.e. closing automatically after operation {(pneumatic tools [B25B 9/00](#))}
- F16K 21/06 . . . in which the closing movement, either retarded or not, starts immediately after opening
- F16K 21/08 . . . with ball-shaped closing members
- F16K 21/10 . . . with hydraulic brake cylinder acting on the closure member
- F16K 21/12 . . . with hydraulically-operated opening means; with arrangements for pressure relief before opening
- F16K 21/14 . . . with special means for preventing the self-closing
- F16K 21/16 . . . closing after a predetermined quantity of fluid has been delivered ([F16K 21/10](#) takes precedence)
- F16K 21/165 . . . {with means sensing the weight of said fluid quantity}

WARNING

not yet complete, see also [F16K 21/16](#)

F16K 21/18 . . closed when a rising liquid reaches a predetermined level ([float-actuated valves F16K 31/18](#))

F16K 21/185 . . . {with electrical or magnetical means, e.g. with magnetic floats, for sensing the liquid level}

WARNING

not yet complete, see also [F16K 21/18](#)

F16K 21/20 . . . by means making use of air-suction through an opening closed by the rising liquid

F16K 23/00 Valves for preventing drip from nozzles

F16K 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](#))

F16K 24/02 . the enclosure being itself a valve, tap, or cock

F16K 24/04 . for venting only ([F16K 24/02](#) takes precedence)

F16K 24/042 . . {actuated by a float}

F16K 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}

WARNING

not yet complete, see also [F16K 24/042](#)

F16K 24/046 {the assembly of float and valve element being a single spherical element}

F16K 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}

F16K 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.

F16K 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](#))

F16K 25/005 . {Particular materials for seats or closure elements}

F16K 25/02 . Arrangements using fluid issuing from valve members or seats

F16K 25/04 . Arrangements for preventing erosion, not otherwise provided for

F16K 27/00**Construction of housing (methods for welding housings [B23K](#)); Use of materials therefor**

- F16K 27/003 . {Housing formed from a plurality of the same valve elements}
- F16K 27/006 . {of hydrants}
- F16K 27/02 . of lift valves (for reducing the flow resistance of screw-spindle lift-valves [F16K 1/06](#))
- F16K 27/0209 .. {Check valves or pivoted valves}
- F16K 27/0218 ... {Butterfly valves}
- F16K 27/0227 ... {with the valve members swinging around an axis located at the edge of or outside the valve member}
- F16K 27/0236 .. {Diaphragm cut-off apparatus}
- F16K 27/0245 .. {with ball-shaped valve members}
- F16K 27/0254 .. {with conical shaped valve members}
- F16K 27/0263 .. {multiple way valves}
- F16K 27/0272 .. {valves provided with a lining}
- F16K 27/0281 .. {Housings in two parts which can be orientated in different positions}
- F16K 27/029 .. {Electromagnetically actuated valves}

WARNING

This group is not complete pending a reorganisation, see also [F16K 27/02](#)

- F16K 27/04 . of sliding valves
- F16K 27/041 .. {cylindrical slide valves}
- F16K 27/042 ... {Hydraulic fluid leak traps}
- F16K 27/044 .. {slide valves with flat obturating members}
- F16K 27/045 ... {with pivotal obturating members}
- F16K 27/047 ... {with wedge-shaped obturating members}
- F16K 27/048 .. {Electromagnetically actuated valves}

WARNING

This group is not complete pending a reorganisation, see also [F16K 27/04](#)

- F16K 27/06 . of taps or cocks
- F16K 27/062 .. {with conical plugs}
- F16K 27/065 .. {with cylindrical plugs}
- F16K 27/067 .. {with spherical plugs}
- F16K 27/07 . of cutting-off parts of tanks, e.g. tank-ears

WARNING

This group is not complete pending a reorganisation, see also [F16K 51/00](#)

- F16K 27/08 . Guiding yokes for spindles; Means for closing housings; Dust caps, e.g. for tyre valves

- F16K 27/10 . Welded housings
- F16K 27/102 . . {for lift-valves}
- F16K 27/105 . . {for gate valves}
- F16K 27/107 . . {for taps or cocks}
- F16K 27/12 . Covers for housings

F16K 29/00 Arrangements for movement of valve members other than for opening and closing the valve, e.g. for grinding-in, for preventing sticking

- F16K 29/02 . providing for continuous motion

F16K 31/00 {Actuating devices;} Operating means; Releasing devices {(regulating means G05D)}

- F16K 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)}
- F16K 31/002 . {actuated by temperature variation (thermo-electric F16K 31/025)}
- F16K 31/003 . {operated without a stable intermediate position, e.g. with snap action (F16K 31/56 takes precedence)}
- F16K 31/004 . {actuated by piezo-electric means}
- F16K 31/005 . . {Piezo-electric benders}
- F16K 31/006 . . . {having a free end}
- F16K 31/007 . . {Piezo-electric stacks}
- F16K 31/008 . . . {for sliding valves}

WARNING

This group is not complete pending a reorganisation, see also [F16K 31/007](#)

- F16K 31/02 . electric {(F16K 31/004 takes precedence)}; magnetic
- F16K 31/025 . . {actuated by thermo-electric means}
- F16K 31/04 . . using a motor
- F16K 31/041 . . . {for rotating valves (F16K 31/055 takes precedence)}

WARNING

Subgroups [F16K 31/042](#) to [F16K 31/045](#) are not complete pending a reorganisation, see also [F16K 31/041](#)

- F16K 31/042 {with electric means, e.g. for controlling the motor or a clutch between the valve and the motor}
- F16K 31/043 {characterised by mechanical means between the motor and the valve, e.g. lost motion means reducing backlash, clutches, brakes or return means}
- F16K 31/045 {with torque limiters}
- F16K 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)}

F16K 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)}
F16K 31/048	....	{with torque limiters (F16K 31/041 takes precedence)}
F16K 31/05	...	specialy adapted for operating hand-operated valves or for combined motor and hand operation
F16K 31/055	....	{for rotating valves}
F16K 31/06	..	using a magnet {e.g. diaphragm valves, cutting off by means of a liquid}
F16K 31/0603	...	{Multiple-way valves}
F16K 31/0606	....	{fluid passing through the solenoid coil}
F16K 31/061	....	{Sliding valves}
F16K 31/0613	.....	{with cylindrical slides}
F16K 31/0617	.....	{with flat slides}
F16K 31/062	....	{the valve element being at least partially ball-shaped}
F16K 31/0624	....	{Lift valves}
F16K 31/0627	.....	{with movable valve member positioned between seats}
F16K 31/0631	.....	{with ball shaped valve members}
F16K 31/0634	.....	{with fixed seats positioned between movable valve members}
F16K 31/0637	.....	{with ball shaped valve members}
F16K 31/0641	....	{the valve member being a diaphragm}
F16K 31/0644	...	{One-way valve}
F16K 31/0648	....	{the armature and the valve member forming one element (F16K 31/0651 takes precedence)}
F16K 31/0651	....	{the fluid passing through the solenoid coil}
F16K 31/0655	....	{Lift valves}
F16K 31/0658	.....	{Armature and valve member being one single element}
F16K 31/0662	.....	{with a ball-shaped valve member}
F16K 31/0665	.....	{with valve member being at least partially ball-shaped (F16K 31/0662 takes precedence)}
F16K 31/0668	....	{Sliding valves}
F16K 31/0672	....	{the valve member being a diaphragm}
F16K 31/0675	...	{Electromagnet aspects, e.g. electric supply therefor}
F16K 31/0679	....	{with more than one energising coil}
F16K 31/0682	...	{with an articulated or pivot armature}
F16K 31/0686	...	{Braking, pressure equilibration, shock absorbing}
F16K 31/0689	....	{Braking of the valve element}
F16K 31/0693	....	{Pressure equilibration of the armature}
F16K 31/0696	....	{Shock absorbing, e.g. using a dash-pot}
F16K 31/08	...	using a permanent magnet
F16K 31/082	....	{using a electromagnet and a permanent magnet}

F16K 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)}
F16K 31/086	....	{the magnet being movable and actuating a second magnet connected to the closing element}
F16K 31/088	.....	{the movement of the first magnet being a rotating or pivoting movement}
F16K 31/10	...	with additional mechanism between armature and closure member
F16K 31/105	....	{for rotating valves}
F16K 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)
F16K 31/122	..	{the fluid acting on a piston (F16K 31/143 , F16K 31/163 , F16K 31/363 , F16K 31/383 take precedence)}
F16K 31/1221	...	{one side of the piston being spring-loaded}
F16K 31/1223	...	{one side of the piston being acted upon by the circulating fluid}
F16K 31/1225	...	{with a plurality of pistons}
F16K 31/1226	...	{the fluid circulating through the piston}
F16K 31/1228	...	{with a stationary piston}
F16K 31/124	...	servo actuated
F16K 31/1245	....	{with more than one valve}
F16K 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)}
F16K 31/1262	...	{one side of the diaphragm being spring loaded}
F16K 31/1264	....	{with means to allow the side on which the springs are positioned to be altered}
F16K 31/1266	...	{one side of the diaphragm being acted upon by the circulating fluid}
F16K 31/1268	...	{with a plurality of the diaphragms}
F16K 31/128	...	servo actuated
F16K 31/14	..	for mounting on, or in combination with, hand-actuated valves
F16K 31/143	...	the fluid acting on a piston
F16K 31/145	...	the fluid acting on a diaphragm
F16K 31/16	..	with a mechanism, other than pulling-or pushing-rod, between fluid motor and closure member (with float F16K 31/18)
F16K 31/163	...	the fluid acting on a piston
F16K 31/1635	....	{for rotating valves}
F16K 31/165	...	the fluid acting on a diaphragm
F16K 31/1655	....	{for rotating valves}
F16K 31/18	..	actuated by a float (floats F16K 33/00 ; float-actuated valves in steam-traps F16T 1/20 , in boilers F22D 5/08)
F16K 31/20	...	actuating a lift valve
F16K 31/22	....	with the float rigidly connected to the valve
F16K 31/24	....	with a transmission with parts linked together from a single float to a single valve

F16K 31/26	.....	with the valve guided for rectilinear movement and the float attached to a pivoted arm
F16K 31/265	.....	{with a second lever or toggle between the pivoted arm and the valve}
F16K 31/28	....	with two ore more floats actuating one valve
F16K 31/30	...	actuating a gate valve or sliding valve
F16K 31/32	...	actuating a tap or cock
F16K 31/34	...	acting on pilot valve controlling the cut-off apparatus
F16K 31/36	..	in which fluid from the circuit is constantly supplied to the fluid motor
F16K 31/363	...	the fluid acting on a piston (F16K 31/38 takes precedence)
F16K 31/365	...	the fluid acting on a diaphragm
F16K 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)
F16K 31/383	....	the fluid acting on a piston
F16K 31/3835	.....	{the discharge being effected through the piston and being blockable by a mechanically-actuated member making contact with the piston}
F16K 31/385	....	the fluid acting on a diaphragm
F16K 31/3855	.....	{the discharge being effected through the diaphragm and being blockable by a mechanically-actuated member making contact with the diaphragm}
F16K 31/40	...	with electrically-actuated member in the discharge of the motor
F16K 31/402	....	{acting on a diaphragm}
F16K 31/404	.....	{the discharge being effected through the diaphragm and being blockable by an electrically-actuated member making contact with the diaphragm}
F16K 31/406	....	{acting on a piston}
F16K 31/408	.....	{the discharge being effected through the piston and being blockable by an electrically-actuated member making contact with the piston}
F16K 31/42	..	by means of electrically-actuated members in the supply or discharge conduits of the fluid motor (F16K 31/40 takes precedence)
F16K 31/423	...	{the actuated members consisting of multiple way valves}
F16K 31/426	....	{the actuated valves being cylindrical sliding valves}
F16K 31/44	.	Mechanical actuating means
F16K 31/445	..	{with exterior sleeve}
F16K 31/46	..	for remote operation
F16K 31/465	...	{by flexible transmission means, e.g. cable, chain, bowden wire}

WARNING

not complete, see also [F16K 31/46](#)

F16K 31/48	..	actuated by mechanical timing-device, e.g. with dash-pot (self-closing valves F16K 21/16)
F16K 31/485	...	{and specially adapted for gas valves}
F16K 31/50	..	with screw-spindle {or internally threaded actuating means}
F16K 31/502	...	{actuating pivotable valve members}

- F16K 31/504 ... {the actuating means being rotatable, rising, and having internal threads which co-operate with threads on the outside of the valve body}
- F16K 31/506 ... {with plural sets of thread, e.g. with different pitch}

WARNING

not yet complete, see also [F16K 31/50](#)

- F16K 31/508 ... {the actuating element being rotatable, non-rising, and driving a non-rotatable axially-sliding element}

WARNING

not yet complete, see also [F16K 31/50](#)

- F16K 31/52 .. with crank, eccentric, or cam
- F16K 31/521 ... {comprising a pivoted disc or flap}
- F16K 31/522 ... {comprising a tap or cock}
- F16K 31/523 ... {comprising a sliding valve}
- F16K 31/524 ... with a cam
- F16K 31/52408 {comprising a lift valve}
- F16K 31/52416 {comprising a multiple-way lift valve}
- F16K 31/52425 {with a ball-shaped valve member}
- F16K 31/52433 {with a streamlined or helically shaped valve member, e.g. for reducing flow losses or guiding the fluid flow}
- F16K 31/52441 {with a pivoted disc or flap}
- F16K 31/5245 {with a valve member of conical shape}
- F16K 31/52458 {comprising a tap or cock}
- F16K 31/52466 {comprising a multiple-way tap or cock}
- F16K 31/52475 {comprising a sliding valve}
- F16K 31/52483 {comprising a multiple-way sliding valve}
- F16K 31/52491 {comprising a diaphragm cut-off apparatus}
- F16K 31/528 ... with pin and slot
- F16K 31/5282 {comprising a pivoted disc or flap}
- F16K 31/5284 {comprising a tap or cock}
- F16K 31/5286 {comprising a sliding valve}
- F16K 31/5288 {comprising a diaphragm cut-off apparatus}
- F16K 31/53 .. with toothed gearing
- F16K 31/535 ... {for rotating valves ([F16K 31/54](#) takes precedence)}
- F16K 31/54 ... with pinion and rack
- F16K 31/56 .. without stable intermediate position, e.g. with snap action
- F16K 31/563 ... {for rotating or pivoting valves}
- F16K 31/566 ... {using a bistable spring device arranged symmetrically around the actuating stem}

- F16K 31/58 . . comprising a movable discharge-nozzle
- F16K 31/60 . . Handles {(form, features or function of taps or faucet handles for domestic plumbing installations [E03C 1/04](#))}
- F16K 31/602 . . . {Pivoting levers, e.g. single-sided ([F16K 31/605](#) takes precedence)}
- F16K 31/605 . . . {for single handle mixing valves}
- F16K 31/607 . . . {characterised by particular material, by special measures to obtain aesthetical effects, or by auxiliary functions, e.g. storage}

WARNING

not complete, see also [F16K 31/60](#)

- F16K 31/62 . . Pedals or like operating members, e.g. actuated by knee or hip

F16K 33/00 **Floats for actuation of valves or other apparatus** {(float actuated valves [F16K 31/18](#))}

F16K 35/00 **Means to prevent accidental or unauthorised actuation**

- F16K 35/02 . to be locked or disconnected by means of a pushing or pulling action
- F16K 35/022 . . {the locking mechanism being actuated by a separate actuating element}
- F16K 35/025 . . . {said actuating element being operated manually (e.g. a push-button located in the valve actuator)}
- F16K 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}
- F16K 35/04 . Yieldingly resisting the actuation
- F16K 35/06 . using a removable actuating or locking member, e.g. a key ([F16K 35/10](#) , [F16K 35/12](#) take precedence)
- F16K 35/08 . requiring setting according to a code, e.g. permutation locks
- F16K 35/10 . with locking caps or locking bars
- F16K 35/12 . with sealing wire
- F16K 35/14 . interlocking two or more valves
- F16K 35/16 . with locking member actuated by magnet

F16K 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**

- F16K 37/0008 . {Mechanical means ([F16K 37/0075](#) takes precedence)}
- F16K 37/0016 . . {having a graduated scale}
- F16K 37/0025 . {Electrical or magnetic means ([F16K 37/0075](#) takes precedence)}
- F16K 37/0033 . . {using a permanent magnet, e.g. in combination with a reed relays}
- F16K 37/0041 . . {for measuring valve parameters ([F16K 37/0033](#) takes precedence)}
- F16K 37/005 . . {for measuring fluid parameters ([F16K 37/0033](#) takes precedence)}
- F16K 37/0058 . {Optical means, e.g. light transmission, observation ports ([F16K 37/0075](#) takes precedence)}
- F16K 37/0066 . {Hydraulic or pneumatic means ([F16K 37/0075](#) takes precedence)}

- F16K 37/0075 . {For recording or indicating the functioning of a valve in combination with test equipment}
- F16K 37/0083 . . {by measuring valve parameters}
- F16K 37/0091 . . {by measuring fluid parameters}

F16K 39/00**Devices for relieving the pressure on the sealing faces**

- F16K 39/02 . for lift valves
- F16K 39/022 . . {using balancing surfaces}
- F16K 39/024 . . {using an auxiliary valve on the main valve}
- F16K 39/026 . . {using an external auxiliary valve}
- F16K 39/028 . . {with pivoted closure members, e.g. butterfly valves}
- F16K 39/04 . for sliding valves
- F16K 39/045 . . {of rotating or pivoting type}

WARNING

Not yet complete, see [F16K 39/04](#)]

- F16K 39/06 . for taps or cocks

F16K 41/00**Spindle sealings**

- F16K 41/003 . {by fluid}
- F16K 41/006 . {by establishing an under-pressure}
- F16K 41/02 . with stuffing-box;{Sealing rings}
- F16K 41/023 . . {for spindles which only rotate, i.e. non-rising spindles ([F16K 41/043](#) , [F16K 41/063](#) and [F16K 41/083](#) take precedence)}
- F16K 41/026 . . . {for rotating valves}
- F16K 41/04 . . with at least one ring of rubber or like material between spindle and housing
- F16K 41/043 . . . {for spindles which only rotate, i.e. non-rising spindles}
- F16K 41/046 {for rotating valves}
- F16K 41/06 . . with at least one ring attached to both spindle and housing
- F16K 41/063 . . . {for spindles which only rotate, i.e. non-rising spindles}

WARNING

Not yet complete, see also [F16K 41/06](#)]

- F16K 41/066 {for rotating valves}

WARNING

Not yet complete, see also [F16K 41/06](#)]

- F16K 41/08 . . with at least one ring provided with axially-protruding peripheral closing-lip
- F16K 41/083 . . . {for spindles which only rotate, i.e. non-rising spindles}

WARNING

F16K 41/083
(continued)

Not yet complete, see also [F16K 41/08](#)]

F16K 41/086 {for rotating valves}

WARNING

Not yet complete, see also [F16K 41/08](#)]

- F16K 41/10 . with diaphragm, e.g. shaped as bellows or tube
- F16K 41/103 . . {the diaphragm and the closure member being integrated in one member}
- F16K 41/106 . . {for use with rotating spindles or valves ([F16K 41/125](#) takes precedence)}
- F16K 41/12 . . with approximately flat diaphragm
- F16K 41/125 . . . {the part of the spindle traversing the diaphragm being rotatable or pivotable}
- F16K 41/14 . with conical flange on the spindle which co-operates with a conical surface in the housing
- F16K 41/16 . with a flange on the spindle which rests on a sealing ring
- F16K 41/18 . . sealing only when the closure member is in the opened position

- F16K 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**
- F16K 43/001 . {an auxiliary valve being actuated independently of the main valve}
- F16K 43/003 . . {the auxiliary valve being a rotary valve}
- F16K 43/005 . {an auxiliary valve closing automatically when the main valve is being disassembled}
- F16K 43/006 . . {the auxiliary valve being held open by the main valve}
- F16K 43/008 . {the main valve having a back-seat position, e.g. to service the spindle sealing}

- F16K 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](#))**
- F16K 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)}
- F16K 47/023 . . {for preventing water-hammer, e.g. damping of the valve movement}
- F16K 47/026 . . {preventing noise in a single handle mixing valve}
- F16K 47/04 . for decreasing pressure {or noise level}, the throttle being incorporated in the closure member
- F16K 47/045 . . {and the closure member being rotatable}
- F16K 47/06 . . with a throttle in the form of a helical channel
- F16K 47/08 . for decreasing pressure {or noise level} and having a throttling member separate from the closure member, {e.g. screens, slots, labyrinths}
- F16K 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
- F16K 47/12 . . the throttling channel being of helical form
- F16K 47/14 . . the throttling member being a perforated membrane

F16K 47/16	.. the throttling member being a cone
F16K 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)
F16K 49/002	. {Electric heating means}
F16K 49/005	. {Circulation means for a separate heat transfer fluid}
F16K 49/007	.. {located within the obturating element}
F16K 51/00	Other details not peculiar to particular types of valves or cut-off apparatus
F16K 51/02	. specially adapted for high-vacuum installations
F16K 99/00	Subject matter not provided for in other groups of this subclass
F16K 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)}
F16K 99/0003	.. {Constructional types of microvalves; Details of the cutting-off member}
F16K 99/0005	... {Lift valves}
F16K 99/0007	.... {of cantilever type}
F16K 99/0009	.... {the valve element held by multiple arms}
F16K 99/0011	... {Gate valves or sliding valves}
F16K 99/0013	... {Rotary valves}
F16K 99/0015	... {Diaphragm or membrane valves}
F16K 99/0017	... {Capillary or surface tension valves, e.g. using electro-wetting or electro-capillarity effects}
F16K 99/0019	... {Valves using a micro-droplet or micro-bubble as the valve member}
F16K 99/0021	... {No-moving-parts valves}
F16K 99/0023	... {with ball-shaped valve members}
F16K 99/0025	... {Valves using microporous membranes}
F16K 99/0026	... {Valves using channel deformation}
F16K 99/0028	... {Valves having multiple inlets or outlets}
F16K 99/003	... {Valves for single use only}
F16K 99/0032	... {using phase transition or influencing viscosity}
F16K 99/0034	.. {Operating means specially adapted for microvalves}
F16K 99/0036	... {operated by temperature variations}
F16K 99/0038	.... {using shape memory alloys}
F16K 99/004	.... {using radiation}
F16K 99/0042	... {Electric operating means therefor}
F16K 99/0044	.... {using thermo-electric means}
F16K 99/0046	.... {using magnets}
F16K 99/0048	.... {using piezoelectric means}
F16K 99/0049	.... {using an electroactive polymer (EAP)}
F16K 99/0051	.... {using electrostatic means}

F16K 99/0053	....	{using magnetostrictive means}
F16K 99/0055	...	{actuated by fluids}
F16K 99/0057	....	{the fluid being the circulating fluid itself, e.g. check valves}
F16K 99/0059	....	{actuated by a pilot fluid}
F16K 99/0061	....	{actuated by an expanding gas or liquid volume}
F16K 99/0063	...	{using centrifugal forces}
F16K 99/0065	...	{using chemical activation}
F16K 99/0067	....	{actuated by a pyrotechnical charge}
F16K 2099/0069	..	{Bistable microvalves}
F16K 2099/0071	..	{with latching means}
F16K 2099/0073	.	{Fabrication methods specifically adapted for microvalves}
F16K 2099/0074	..	{using photolithography, e.g. etching}
F16K 2099/0076	..	{using electrical discharge machining (EDM), milling or drilling}
F16K 2099/0078	..	{using moulding or stamping}
F16K 2099/008	..	{Multi-layer fabrications}
F16K 2099/0082	.	{Microvalves adapted for a particular use}
F16K 2099/0084	..	{Chemistry or biology, e.g. "lab-on-a-chip" technology}
F16K 2099/0086	..	{Medical applications}
F16K 2099/0088	...	{Implanted devices}
F16K 2099/009	..	{Fluid power devices}
F16K 2099/0092	..	{Inkjet printers}
F16K 2099/0094	..	{Micro-pumps}
F16K 2099/0096	..	{Fuel injection devices}
F16K 2099/0098	..	{Refrigeration circuits, e.g. for cooling integrated circuits}