

**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

F16K

(continued)

|   |  |
|---|--|
| <a href="#">{C21B 9/12</a>                                | Hot-blast valves for blast                 |
| <a href="#">furnaces</a>                                  | }  |
| <a href="#">E02B 8/00</a>                                 | Details, e.g. valves, of barrages or weirs |
| <a href="#">E02B 13/02</a>                                | Closures for irrigation conduits           |
| <a href="#">{E03C 1/04</a>                                | Water-basin installations specially        |
| <a href="#">adapted for wash-basins or baths</a>          | }  |
| <a href="#">{E03C 1/05</a>                                | Arrangements on wash-basins for the        |
| <a href="#">remote control of taps</a>                    | }  |
| <a href="#">E03D</a>                                      | Flushing valves for water-closets or       |
| <a href="#">urinals</a>                                   |  |
| <a href="#">{E03F 7/04</a>                                | Valves for preventing return flow in       |
| <a href="#">sewer systems</a>                             | }  |
| <a href="#">E05F 3/12</a>                                 | Valve arrangements in door closers         |
| <a href="#">E21B 21/10</a>                                | Valve arrangements in drilling-fluid       |
| <a href="#">circulation systems</a>                       |  |
| <a href="#">E21B 34/00</a>                                | Valve arrangements for boreholes or wells  |
| <a href="#">{E21D 15/51</a>                               | Arrangement of relief valves in            |
| <a href="#">hydraulic mine props</a>                      | }  |
| <a href="#">F01B 25/10</a>                                | Working-fluid valves for controlling       |
| <a href="#">machines or engines in general or of</a>      |  |
| <a href="#">positive-displacement type</a>                |  |
| <a href="#">F01D 17/10</a>                                | Final actuators for controlling non-       |
| <a href="#">positive displacement machines or engines</a> |  |
| <a href="#">F01L</a>                                      | Cyclically operated valves for machines or |
| <a href="#">engines</a>                                   |  |
| <a href="#">F02D 9/08</a>                                 | Throttle valves for controlling combustion |
| <a href="#">engines</a>                                   |  |
| <a href="#">F02K 9/58</a>                                 | Propellant feed valves for rocket-engines  |
| <a href="#">F02M</a>                                      | Carburettors, fuel injection               |
| <a href="#">F02M 59/46</a>                                | Valves for fuel injection pumps            |
| <a href="#">F04</a>                                       | Pumps                                      |
| <a href="#">F16F 9/34</a>                                 | Valves for shock absorbers                 |
| <a href="#">F16L 29/00,</a>                               |  |
| <a href="#">F16L 37/28</a>                                | Pipe joints or quick-acting couplings      |
| <a href="#">with fluid cut-off means</a>                  |  |
| <a href="#">F16L 55/00</a>                                | Arrangement of valves in pipes             |
| <a href="#">F16L 55/055</a>                               | Valves specially adapted to prevent or     |
| <a href="#">minimise the effect of water hammer</a>       |  |
| <a href="#">F16L 55/46</a>                                | Launching devices for pigs or moles        |
| <a href="#">F16N 23/00</a>                                | Check valves for lubrication systems       |
| <a href="#">{F16T</a>                                     | Draining-off liquids from steam traps}     |
| <a href="#">F17C 13/04</a>                                | Arrangement of valves in pressure vessels  |
| <a href="#">F22B 37/44</a>                                | Arrangement of safety valves on steam      |
| <a href="#">boilers</a>                                   |  |
| <a href="#">F22D 5/34</a>                                 | Application of valves to automatic water-  |
| <a href="#">feed in boiler</a>                            |  |

## F16K

(continued)

|                             |   |
|-----------------------------|---|
| <a href="#">F23L 13/00</a>  | Valves for air supply control to burners  |
| <a href="#">{F23Q 2/16</a>  | Valves for lighters with gaseous fuel     |
| and adjustable flame        | }   |
| <a href="#">F24C 3/12</a> , |   |
| <a href="#">F24C 5/16</a>   | Arrangement of valves on stoves or ranges |
| <a href="#">F24F</a>        | Air conditioning; Ventilation             |
| <a href="#">F25B 41/04</a>  | Disposition of fluid circulation valves   |
| in refrigeration machines   |   |
| <a href="#">G05D</a>        | Controlling non-electric variables        |
| <a href="#">G10B 3/06</a>   | Valves for organs                         |
| <a href="#">G10D 9/04</a>   | Valves for other wind-actuated musical    |
| instruments                 |   |
| <a href="#">{G21C 9/06</a>  | Safety valves structurally associated     |
| with nuclear reactors       | }   |
| <a href="#">{H01M 2/12</a>  | 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:

|                              |                            |   |
|------------------------------|----------------------------|---|
| <a href="#">F16K 31/11</a>   | covered by                 | <a href="#">F16K 31/06</a> ,                      |
| <a href="#">F16K 31/08</a> , | <a href="#">F16K 31/10</a> |   |
| <a href="#">F16K 31/64</a>   | " "                        | <a href="#">G05D</a>                              |
| <a href="#">F16K 31/66</a>   | " "                        | <a href="#">F16K 31/06</a> ; <a href="#">H01F</a> |
| <a href="#">F16K 31/68</a>   | " "                        | <a href="#">G05D</a>                              |
| <a href="#">F16K 31/70</a>   | " "                        | <a href="#">F16K 31/002</a>                       |
| <a href="#">F16K 31/72</a>   | " "                        | <a href="#">F16K 31/00</a>                        |

**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](#))

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

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}



|             |   |
|-------------|---|
| 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}   |

|                   |   |
|-------------------|---|
| <b>F16K 7/00</b>  | <b>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}</b> |
| F16K 7/02         | <ul style="list-style-type: none"> <li>with tubular diaphragm</li> </ul>  |
| F16K 7/04         | <ul style="list-style-type: none"> <li>constrictable by external radial force</li> </ul>  |
| F16K 7/045        | <ul style="list-style-type: none"> <li>by electric or magnetic means</li> </ul>   |
| F16K 7/06         | <ul style="list-style-type: none"> <li>by means of a screw-spindle, cam, or other mechanical means {(F16K 7/045 takes precedence)}</li> </ul>   |
| F16K 7/061        | <ul style="list-style-type: none"> <li>Screw clamps</li> </ul>  |
| F16K 7/063        | <ul style="list-style-type: none"> <li>Lever clamps</li> </ul>  |
| F16K 7/065        | <ul style="list-style-type: none"> <li>Cam clamps</li> </ul>  |
| F16K 7/066        | <ul style="list-style-type: none"> <li>Wedge clamps</li> </ul>  |
| F16K 7/068        | <ul style="list-style-type: none"> <li>by bending the hose</li> </ul>   |
| F16K 7/07         | <ul style="list-style-type: none"> <li>by means of fluid pressure</li> </ul>  |
| F16K 7/075        | <ul style="list-style-type: none"> <li>a rigid body being located within the tubular diaphragm</li> </ul>   |
| F16K 7/08         | <ul style="list-style-type: none"> <li>constrictable by twisting</li> </ul>   |
| F16K 7/10         | <ul style="list-style-type: none"> <li>with inflatable member</li> </ul>  |
| F16K 7/12         | <ul style="list-style-type: none"> <li>with flat, dished, or bowl-shaped diaphragm</li> </ul>   |
| F16K 7/123        | <ul style="list-style-type: none"> <li>the seat being formed on the bottom of the fluid line</li> </ul>   |
| F16K 7/126        | <ul style="list-style-type: none"> <li>the seat being formed on a rib perpendicular to the fluid line</li> </ul>  |
| F16K 7/14         | <ul style="list-style-type: none"> <li>arranged to be deformed against a flat seat</li> </ul>   |
| F16K 7/16         | <ul style="list-style-type: none"> <li>the diaphragm being mechanically actuated, e.g. by screw-spindle or cam</li> </ul>   |
| F16K 7/17         | <ul style="list-style-type: none"> <li>the diaphragm being actuated by fluid pressure</li> </ul>  |
| F16K 7/18         | <ul style="list-style-type: none"> <li>with diaphragm secured at one side only, e.g. to be laid on the seat by rolling action</li> </ul>  |
| F16K 7/20         | <ul style="list-style-type: none"> <li>with a compressible solid closure member</li> </ul>  |
| <b>F16K 11/00</b> | <b>Multiple-way valves, e.g. mixing valves; Pipe fittings incorporating such valves</b>   |
| F16K 11/02        | <ul style="list-style-type: none"> <li>with all movable sealing faces moving as one unit</li> </ul>   |
| F16K 11/022       | <ul style="list-style-type: none"> <li>comprising a deformable member</li> </ul>  |
| F16K 11/025       | <ul style="list-style-type: none"> <li>with an O-ring</li> </ul>  |
| F16K 11/027       | <ul style="list-style-type: none"> <li>the fluid flowing through a constrictable tubular diaphragm</li> </ul>   |
| F16K 11/04        | <ul style="list-style-type: none"> <li>comprising only lift valves</li> </ul>   |
| F16K 11/044       | <ul style="list-style-type: none"> <li>with movable valve members positioned between valve seats</li> </ul>   |
| F16K 11/0445      | <ul style="list-style-type: none"> <li>Bath/shower selectors</li> </ul>   |
| F16K 11/048       | <ul style="list-style-type: none"> <li>with valve seats positioned between movable valve members</li> </ul>   |
| F16K 11/052       | <ul style="list-style-type: none"> <li>with pivoted closure members, e.g. butterfly valves</li> </ul>   |
| F16K 11/0525      | <ul style="list-style-type: none"> <li>the closure members being pivoted around an essentially central axis</li> </ul>  |
| F16K 11/056       | <ul style="list-style-type: none"> <li>with ball-shaped valve members</li> </ul>  |

|              |   |
|--------------|---|
| 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)}

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|--------------|--|
| 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 ( <a href="#">F16K 31/043 takes precedence</a> )} |
| F16K 31/048  | . . . . {with torque limiters ( <a href="#">F16K 31/041 takes precedence</a> )}  |
| F16K 31/05   | . . . specially 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 ( <a href="#">F16K 31/0651 takes precedence</a> )}  |
| 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 ( <a href="#">F16K 31/0662 takes precedence</a> )}   |
| 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 or 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**

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

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| <b>F16K 49/00</b> | <b>Means in or on valves for heating or cooling</b> (for pipes <a href="#">F16L 53/00</a> ; thermal insulation in connection with pipes or pipe systems <a href="#">F16L 59/16</a> )   |
| 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}  |
| <b>F16K 51/00</b> | <b>Other details not peculiar to particular types of valves or cut-off apparatus</b>   |
| F16K 51/02        | • specially adapted for high-vacuum installations  |
| <b>F16K 99/00</b> | <b>Subject matter not provided for in other groups of this subclass</b>  |
| F16K 99/0001      | • {Micro-valves (micro-devices <a href="#">B81B 1/00</a> ; manufacture or treatment of devices or systems in or on a substrate <a href="#">B81C 1/00</a> ; micro-fluidic structures <a href="#">B01L 3/5027</a> ; micro-pumps <a href="#">F04B 19/006</a> )} |
| 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}        |