

**F17 STORING OR DISTRIBUTING GASES OR LIQUIDS (water supply E03B)**

**F17B GAS-HOLDERS OF VARIABLE CAPACITY** (self-acting gas cut-off devices A47J 27/62, G05D; flame traps A62C 4/00; gas mixers B01F, F16K 11/00, G05D 11/00; construction or assembling of bulk storage containers employing civil-engineering techniques E04H 7/00; gas compressors F04; valves F16K; damping pulsations in valves or pipes F16K, F16L; pipes F16L; stopping devices for gas mains F16L 55/10; vessels adapted for storing compressed, liquefied, or solidified gases F17C; gas distribution systems F17D 1/04; detecting leakage F17D 5/02, G01M; supervising or alarm devices F17D 5/02, G08B; control of combustion in burners F23N; gas flow or pressure regulators G05D)

<p><b>1/00 Gas-holders of variable capacity</b> (large containers in general B65D 88/00; storing fluids in natural or artificial cavities or chambers in the earth B65G 5/00)</p> <p>1/007 . with telescopically movable ring-shaped parts (F17B 1/10 takes precedence; sealing of rings F17B 1/04) [2]</p> <p>1/013 . with movables discs (F17B 1/10 takes precedence; sealing of discs F17B 1/04) [2]</p> <p>1/02 . Details</p> <p>1/04 . . Sealing devices for sliding parts (in general F16J 15/00)</p> <p>1/06 . . . using sealing liquids</p>	<p>1/08 . . . using resilient materials for packing, e.g. leather</p> <p>1/10 . . Guiding moving parts</p> <p>1/12 . . Gas admission or discharge arrangements</p> <p>1/14 . . Safety devices, e.g. prevention of excess pressure</p> <p>1/16 . of wet type</p> <p>1/18 . . bell-shaped</p> <p>1/20 . . telescopic</p> <p>1/22 . . . spirally-guided</p> <p>1/24 . of dry type</p> <p>1/26 . . with flexible walls, e.g. bellows (connection of valves to inflatable elastic bodies B60C 29/00)</p>
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**F17C VESSELS FOR CONTAINING OR STORING COMPRESSED, LIQUEFIED, OR SOLIDIFIED GASES; FIXED-CAPACITY GAS-HOLDERS; FILLING VESSELS WITH, OR DISCHARGING FROM VESSELS, COMPRESSED, LIQUEFIED, OR SOLIDIFIED GASES** (storing fluids in natural or artificial cavities or chambers in the earth B65G 5/00; construction or assembling of bulk storage containers employing civil-engineering techniques E04H 7/00; variable-capacity gas-holders F17B; liquefaction or refrigeration machines, plants, or systems F25)

**Subclass Index**

<p>VESSELS UNDER PRESSURE; VESSELS NOT UNDER PRESSURE; DETAILS ..... 1/00; 3/00; 13/00</p>	<p>FILLING; DISCHARGING ..... 5/00, 6/00; 7/00, 9/00</p> <p>USE OF GAS-SOLVENTS OR GAS- ABSORBENTS ..... 11/00</p>
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<p><b>1/00 Pressure vessels, e.g. gas cylinder, gas tank, replaceable cartridge</b> (pressurised apparatus for purposes other than storage, <i>see</i> the relevant subclasses such as A62C, B05B; associated with vehicles, <i>see</i> the appropriate subclass of classes B60 to B64; pressure vessels in general F16J 12/00)</p> <p>1/02 . involving reinforcing arrangements [4]</p> <p>1/04 . . Protecting sheatings</p> <p>1/06 . . . built-up from wound-on bands or filamentary material, e.g. wires [4]</p> <p>1/08 . . Integral reinforcements, e.g. ribs</p> <p>1/10 . with provision for protection against corrosion, e.g. due to gaseous acid (inhibiting corrosion of metallic material or incrustation in general C23F) [4]</p> <p>1/12 . with provision for thermal insulation (thermal insulation in general F16L 59/00) [4]</p> <p>1/14 . constructed of aluminium; constructed of non-magnetic steel</p> <p>1/16 . constructed of plastics materials</p> <p><b>3/00 Vessels not under pressure</b></p> <p>3/02 . with provision for thermal insulation (thermal insulation in general F16L 59/00)</p> <p>3/04 . . by insulating layers (F17C 3/08 takes precedence)</p> <p>3/06 . . . on the inner surface, i.e. in contact with the stored fluid [4]</p>	<p>3/08 . . by vacuum spaces, e.g. Dewar flask (for household use A47J 41/02)</p> <p>3/10 . . by liquid-circulating or vapour-circulating jackets</p> <p>3/12 . with provision for protection against corrosion, e.g. due to gaseous acid (protection against corrosion in general C23F)</p> <p><b>5/00 Methods or apparatus for filling pressure vessels with liquefied, solidified, or compressed gases</b> (adding propellants to aerosol containers B65B 31/00)</p> <p><b>Note</b></p> <p>This group <i>covers</i>:</p> <ul style="list-style-type: none"> <li>– the filling of vessels for storage of compressed or liquefied gases;</li> <li>– the filling of pressurised apparatus insofar as it is not covered by a single other subclass, e.g. A62C, B05B.</li> </ul> <p>5/02 . for filling with liquefied gases</p> <p>5/04 . . requiring the use of refrigeration, e.g. filling with helium or hydrogen</p> <p>5/06 . for filling with compressed gases</p> <p><b>6/00 Methods or apparatus for filling vessels not under pressure with liquefied or solidified gases</b> [3]</p>
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<p><b>7/00</b> Methods or apparatus for discharging liquefied, solidified, or compressed gases from pressure vessels, not covered by another subclass</p> <p>7/02 . Discharging liquefied gases</p> <p>7/04 . . with change of state, e.g. vaporisation [3]</p> <p><b>9/00</b> Methods or apparatus for discharging liquefied or solidified gases from vessels not under pressure</p> <p>9/02 . with change of state, e.g. vaporisation</p> <p>9/04 . . Recovery of thermal energy [3]</p> <p><b>11/00</b> Use of gas-solvents or gas-sorbents in vessels</p>	<p><b>13/00</b> Details of vessels or of the filling or discharging of vessels</p> <p>13/02 . Special adaptations of indicating, measuring, or monitoring equipment (measuring in general G01)</p> <p>13/04 . Arrangement or mounting of valves (valves <u>per se</u> F16K)</p> <p>13/06 . Closures, e.g. cap, breakable member (closures for containers in general B65D)</p> <p>13/08 . Mounting arrangements for vessels</p> <p>13/10 . Arrangements for preventing freezing</p> <p>13/12 . Arrangements or mounting of devices for preventing or minimising the effect of explosion (flame traps A62C 4/00)</p>
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**F17D** **PIPE-LINE SYSTEMS; PIPE-LINES** (pumps or compressors F04; fluid dynamics F15D; valves or the like F16K; pipes, laying pipes, supports, joints, branches, repairing, work on the entire line, accessories F16L; steam traps or the like F16T; fluid-pressure electric cables H01B 9/06)

**Note**

In this subclass, the following expression is used with the meaning indicated:

- “pipe-line systems” means systems described in flow sheets as well as arrangements of co-operating elements, the elements per se being covered by the relevant subclasses.

<p><b>1/00</b> Pipe-line systems (conveying articles or materials through a pipe-line by means of a fluid carrier B65G 51/00, B65G 53/00; dispensing, delivering or transferring liquids B67D; special devices for transferring liquids from bulk storage containers into vehicles or boats or <i>vice versa</i>, e.g. loading or unloading vehicles or portable containers B67D 5/00; conveying material which has been excavated by a dredger or soil shifter through a pipe-line E02F 7/10; sewer pipe-line systems E03F 3/00; thermal insulation of pipe-lines F16L 59/00; central heating systems F24D) [2]</p> <p>1/02 . for gases or vapours</p> <p>1/04 . . for distribution of gas</p> <p>1/05 . . . Preventing freezing (by heating F16L 53/00)</p> <p>1/06 . . for steam</p> <p>1/065 . . Arrangements for producing propulsion of gases or vapours [2]</p> <p>1/07 . . . by compression [2]</p> <p>1/075 . . . by mere expansion from an initial pressure level, e.g. by arrangement of a flow-control valve [2]</p> <p>1/08 . for liquids or viscous products (water-main or service pipe systems E03B 7/04; domestic hot-water supply systems F24D 17/00) [2]</p> <p>1/12 . . Conveying liquids or viscous products by pressure of another fluid [2]</p> <p>1/13 . . Conveying liquids or viscous products by gravity [2]</p> <p>1/14 . . Conveying liquids or viscous products by pumping [2]</p> <p>1/16 . . Facilitating the conveyance of liquids or effecting the conveyance of viscous products by modification of their viscosity [2]</p> <p>1/17 . . . by mixing with another liquid [2]</p>	<p>1/18 . . . by heating [2]</p> <p>1/20 . Arrangements or systems of devices for influencing or altering dynamic characteristics of the systems, e.g. for damping pulsations caused by opening or closing of valves (fluid dynamics F15D; damping pulsations in fluids in pipes in general F16L 55/04) [2]</p> <p><b>3/00</b> Arrangements for supervising or controlling working operations</p> <p>3/01 . for controlling, signalling, or supervising the conveyance of a product [2]</p> <p>3/03 . for controlling, signalling, or supervising the conveyance of several different products following one another in the same conduit, e.g. for switching from one receiving tank to another [2]</p> <p>3/05 . . the different products not being separated (separation of contaminants by distillation B01D 3/00) [2]</p> <p>3/08 . . the different products being separated by “go-devils”, e.g. spheres (cleaning devices moved along the inside of pipe-lines by a fluid B08B 9/053) [2]</p> <p>3/10 . for taking out the product in the line (investigating or analysing materials by determining their chemical or physical properties G01N) [2]</p> <p>3/12 . for injecting a composition into the line [2]</p> <p>3/14 . for eliminating water (separation of liquids B01D, e.g. B01D 17/00; separation of gases or vapours B01D 53/00) [2]</p> <p>3/16 . for eliminating particles in suspension (from liquids by sedimentation B01D 21/00; separation by filtration or otherwise B01D 24/00 to B01D 51/00; centrifugal apparatus B04) [2]</p> <p>3/18 . for measuring the quantity of conveyed product (measuring volume or volume flow, in general G01F) [2]</p>
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**5/00 Protection or supervision of installations**  
 (arrangements for protecting foundations E02D 31/00;  
 protecting pipes from damage or internal or external  
 wear F16L 57/00, against corrosion or scale F16L 58/00;  
 investigation of the fluid-tightness of structures  
 G01M 3/00) [2]

5/02 . Preventing, monitoring, or locating loss [2]

5/04 . . by means of a signalling fluid enclosed in a double  
 wall [2]

5/06 . . using electric or acoustic means [2]

5/08 . Protection of installations or persons from the effects  
 of high voltage induced in the pipe-line (emergency  
 protective circuit arrangements H02H) [2]