

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)

1/00	Gas-holders of variable capacity (large containers in general B65D 88/00; storing fluids in natural or artificial cavities or chambers in the earth B65G 5/00)	1/08	. . . using resilient materials for packing, e.g. leather
1/007	. with telescopically movable ring-shaped parts (F17B 1/10 takes precedence; sealing of rings F17B 1/04) [2]	1/10	. . Guiding moving parts
1/013	. with movables discs (F17B 1/10 takes precedence; sealing of discs F17B 1/04) [2]	1/12	. . Gas admission or discharge arrangements
1/02	. Details	1/14	. . Safety devices, e.g. prevention of excess pressure
1/04	. . Sealing devices for sliding parts (in general F16J 15/00)	1/16	. of wet type
1/06	. . . using sealing liquids	1/18	. . bell-shaped
		1/20	. . telescopic
		1/22	. . . spirally-guided
		1/24	. of dry type
		1/26	. . with flexible walls, e.g. bellows (connection of valves to inflatable elastic bodies B60C 29/00)

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

VESSLS UNDER PRESSURE; VESSELS	FILLING; DISCHARGING.....	5/00, 6/00;
NOT UNDER PRESSURE; DETAILS		7/00, 9/00
1/00; 3/00;	USE OF GAS-SOLVENTS OR GAS-	
13/00	ABSORBENTS	11/00

1/00	Pressure vessels, e.g. gas cylinder, gas tank, replaceable cartridge (pressurised apparatus for purposes other than storage, <u>see</u> the relevant subclasses such as A62C, B05B; associated with vehicles, <u>see</u> the appropriate subclass of classes B60 to B64; pressure vessels in general F16J 12/00)	3/08	. . by vacuum spaces, e.g. Dewar flask (for household use A47J 41/02)
1/02	. involving reinforcing arrangements [4]	3/10	. . by liquid-circulating or vapour-circulating jackets
1/04	. . Protecting sheatings	3/12	. with provision for protection against corrosion, e.g. due to gaseous acid (protection against corrosion in general C23F)
1/06	. . . built-up from wound-on bands or filamentary material, e.g. wires [4]	5/00	Methods or apparatus for filling pressure vessels with liquefied, solidified, or compressed gases (adding propellants to aerosol containers B65B 31/00)
1/08	. . Integral reinforcements, e.g. ribs	Note	
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]		This group <u>covers</u> :
1/12	. with provision for thermal insulation (thermal insulation in general F16L 59/00) [4]		– the filling of vessels for storage of compressed or liquefied gases;
1/14	. constructed of aluminium; constructed of non-magnetic steel		– the filling of pressurised apparatus insofar as it is not covered by a single other subclass, e.g. A62C, B05B.
1/16	. constructed of plastics materials	5/02	. for filling with liquefied gases
3/00	Vessels not under pressure	5/04	. . requiring the use of refrigeration, e.g. filling with helium or hydrogen
3/02	. with provision for thermal insulation (thermal insulation in general F16L 59/00)	5/06	. for filling with compressed gases
3/04	. . by insulating layers (F17C 3/08 takes precedence)	6/00	Methods or apparatus for filling vessels not under pressure with liquefied or solidified gases [3]
3/06	. . . on the inner surface, i.e. in contact with the stored fluid [4]		

7/00	Methods or apparatus for discharging liquefied, solidified, or compressed gases from pressure vessels, not covered by another subclass	13/00	Details of vessels or of the filling or discharging of vessels
7/02	. Discharging liquefied gases	13/02	. Special adaptations of indicating, measuring, or monitoring equipment (measuring in general G01)
7/04	. . with change of state, e.g. vaporisation [3]	13/04	. Arrangement or mounting of valves (valves <u>per se</u> F16K)
9/00	Methods or apparatus for discharging liquefied or solidified gases from vessels not under pressure	13/06	. Closures, e.g. cap, breakable member (closures for containers in general B65D)
9/02	. with change of state, e.g. vaporisation	13/08	. Mounting arrangements for vessels
9/04	. . Recovery of thermal energy [3]	13/10	. Arrangements for preventing freezing
11/00	Use of gas-solvents or gas-sorbents in vessels	13/12	. Arrangements or mounting of devices for preventing or minimising the effect of explosion (flame traps A62C 4/00)

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.

1/00	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]	1/18	. . . by heating [2]
1/02	. for gases or vapours	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]
1/04	. . for distribution of gas	3/00	Arrangements for supervising or controlling working operations
1/05	. . . Preventing freezing (by heating F16L 53/00)	3/01	. for controlling, signalling, or supervising the conveyance of a product [2]
1/06	. . for steam	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]
1/065	. . Arrangements for producing propulsion of gases or vapours [2]	3/05	. . the different products not being separated (separation of contaminants by distillation B01D 3/00) [2]
1/07	. . . by compression [2]	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]
1/075	. . . by mere expansion from an initial pressure level, e.g. by arrangement of a flow-control valve [2]	3/10	. for taking out the product in the line (investigating or analysing materials by determining their chemical or physical properties G01N) [2]
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]	3/12	. for injecting a composition into the line [2]
1/12	. . Conveying liquids or viscous products by pressure of another fluid [2]	3/14	. for eliminating water (separation of liquids B01D, e.g. B01D 17/00; separation of gases or vapours B01D 53/00) [2]
1/13	. . Conveying liquids or viscous products by gravity [2]	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]
1/14	. . Conveying liquids or viscous products by pumping [2]	3/18	. for measuring the quantity of conveyed product (measuring volume or volume flow, in general G01F) [2]
1/16	. . Facilitating the conveyance of liquids or effecting the conveyance of viscous products by modification of their viscosity [2]		
1/17	. . . by mixing with another liquid [2]		

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]