

CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

ENGINEERING IN GENERAL

F17 STORING OF DISTRIBUTING GASES OR LIQUIDS (water supply [E03B](#))

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

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| <p>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; 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 7/00; 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)</p> | <p>1/18 . . . by heating</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)</p> |
| <p>1/005 . {for a two-phase gas-liquid flow}</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 53/30)</p> <p>1/06 . . for steam</p> <p>1/065 . . Arrangements for producing propulsion of gases or vapours</p> <p>1/07 . . . by compression</p> <p>1/075 . . . by mere expansion from an initial pressure level, e.g. by arrangement of a flow-control valve</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)</p> <p>1/082 . . {for cold fluids, e.g. liquefied gas (F17D 1/086 takes precedence)}</p> <p>1/084 . . {for hot fluids (F17D 1/086 takes precedence)}</p> <p>1/086 . . {for explosives}</p> <p>1/088 . . {for solids or suspensions of solids in liquids, e.g. slurries (F17D 1/086 takes precedence)}</p> <p>1/12 . . Conveying liquids or viscous products by pressure of another fluid</p> <p>1/13 . . Conveying liquids or viscous products by gravity</p> <p>1/14 . . Conveying liquids or viscous products by pumping</p> <p>1/16 . . Facilitating the conveyance of liquids or effecting the conveyance of viscous products by modification of their viscosity {(changing the flow or the viscosity by adding a chemical agent C09K 3/00, C10M)}</p> <p>1/17 . . . by mixing with another liquid {, i.e. diluting}</p> | <p>3/00 Arrangements for supervising or controlling working operations</p> <p>3/01 . for controlling, signalling, or supervising the conveyance of a product</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</p> <p>3/05 . . the different products not being separated (separation of contaminants by distillation B01D 3/00)</p> <p>3/08 . . the different products being separated by "go-devils", e.g. spheres (cleaning devices moved along inside a pipe-lines by fluid pressure B08B 9/04; {pigs or moles <u>per se</u>, their launching and detection F16L 55/26})</p> <p>3/10 . for taking out the product in the line (sampling in general, examining the physical or chemical properties of materials G01N)</p> <p>3/12 . for injecting a composition into the line</p> <p>3/14 . for eliminating water (separation of liquids B01D, e.g. B01D 17/00; separation of gases or vapours B01D 53/00)</p> <p>3/145 . . {in gas pipelines}</p> <p>3/16 . for eliminating particles in suspension (from liquids by sedimentation B01D 21/00; separation by filtration or otherwise B01D 24/00 - B01D 51/00; centrifugal apparatus B04)</p> <p>3/18 . for measuring the quantity of conveyed product (measuring volume or volume flow, in general G01F)</p> |

- 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 and scale
[F16L 58/00](#); investigation of the fluid-tightness of
structures [G01M 3/00](#))
- 5/005 . {of gas pipelines, e.g. alarm}
 - 5/02 . Preventing, monitoring, or locating loss
 - 5/04 . . by means of a signalling fluid enclosed in a
double wall
 - 5/06 . . using electric or acoustic means
 - 5/08 . Protection of installations or persons from the
effects of high voltage induced in the pipe-line
(emergency protective circuit arrangements [H02H](#))