

**CPC****COOPERATIVE PATENT CLASSIFICATION****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.

**F17D 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 vice versa, 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](#) )

**F17D 1/005**

. { for a two-phase gas-liquid flow }

**F17D 1/02**

. for gases or vapours

**F17D 1/04**

.. for distribution of gas

**F17D 1/05**

... Preventing freezing ( by heating [F16L 53/00](#) )

**F17D 1/06**

.. for steam

**F17D 1/065**

.. Arrangements for producing propulsion of gases or vapours

**F17D 1/07**

... by compression

**F17D 1/075**

... by mere expansion from an initial pressure level, e.g. by arrangement of a flow-control valve

**F17D 1/08**

. for liquids or viscous products ( water-main or service pipe systems [E03B 7/04](#); domestic hot-water supply systems [F24D 17/00](#) )

**F17D 1/082**

.. { for cold fluids, e.g. liquified gas ( [F17D 1/086](#) takes precedence ) }

**F17D 1/084**

.. { for hot fluids ( [F17D 1/086](#) takes precedence ) }

**F17D 1/086**

.. { for explosives }

**F17D 1/088**

.. { for solids or suspensions of solids in liquids, e.g. slurries ( [F17D 1/086](#) takes precedence ) }

**F17D 1/12**

.. Conveying liquids or viscous products by pressure of another fluid

**F17D 1/13**

.. Conveying liquids or viscous products by gravity

**F17D 1/14**

.. Conveying liquids or viscous products by pumping

**F17D 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](#) ) }

**F17D 1/17**

... by mixing with another liquid, { i.e. diluting }

**F17D 1/18**

... by heating

- F17D 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](#) )
- F17D 3/00 Arrangements for supervising or controlling working operations**
- F17D 3/01 . for controlling, signalling, or supervising the conveyance of a product
- F17D 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
- F17D 3/05 . . the different products not being separated ( separation of contaminants by distillation [B01D 3/00](#) )
- F17D 3/08 . . the different products being separated by "go-devils", e.g. spheres ( cleaning devices moved along inside a pipe-line by fluid pressure [B08B 9/04](#); { pigs or moles per se, their launching and detection [F16L 55/26](#) } )
- F17D 3/10 . for taking out the product in the line ( sampling in general, examining the physical or chemical properties of materials [G01N](#) )
- F17D 3/12 . for injecting a composition into the line
- F17D 3/14 . for eliminating water ( separation of liquids [B01D](#) , e.g. [B01D 17/00](#); separation of gases or vapours [B01D 53/00](#) )
- F17D 3/145 . . { in gas pipelines }
- F17D 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](#) )
- F17D 3/18 . for measuring the quantity of conveyed product ( measuring volume or volume flow, in general [G01F](#) )
- F17D 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](#) )
- F17D 5/005 . { of gas pipelines, e.g. alarm }
- F17D 5/02 . Preventing, monitoring, or locating loss
- F17D 5/04 . . by means of a signalling fluid enclosed in a double wall
- F17D 5/06 . . using electric or acoustic means
- F17D 5/08 . Protection of installations or persons from the effects of high voltage induced in the pipe-line ( emergency protective circuit arrangements [H02H](#) )