

**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](#) )