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A. J. SMITH & D. LIVINGSTON.

MEANS FOR DRAINING MANHOLES OF ELECTRIC CONDUIT SYSTEMS.

APPLICATION FILED NOV. 5, 1907.

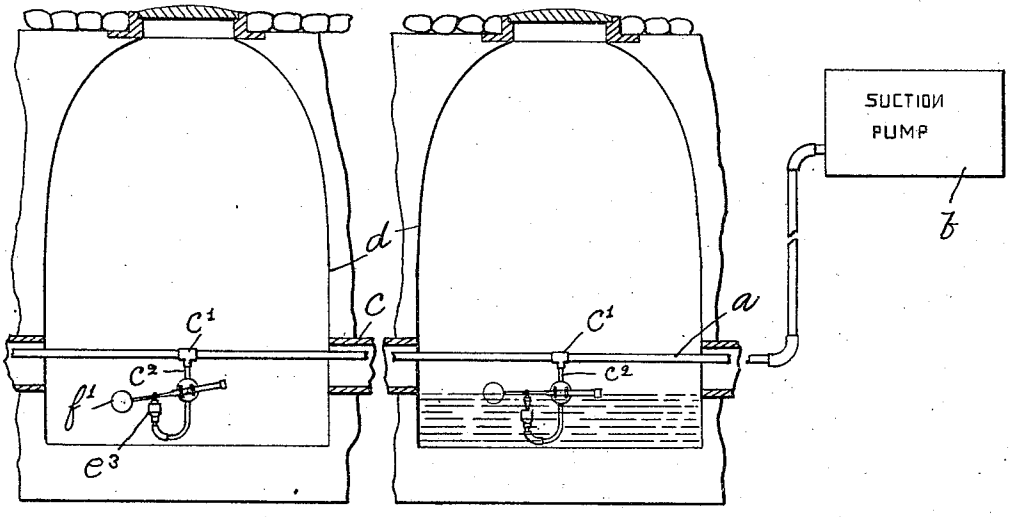


Fig. 1.

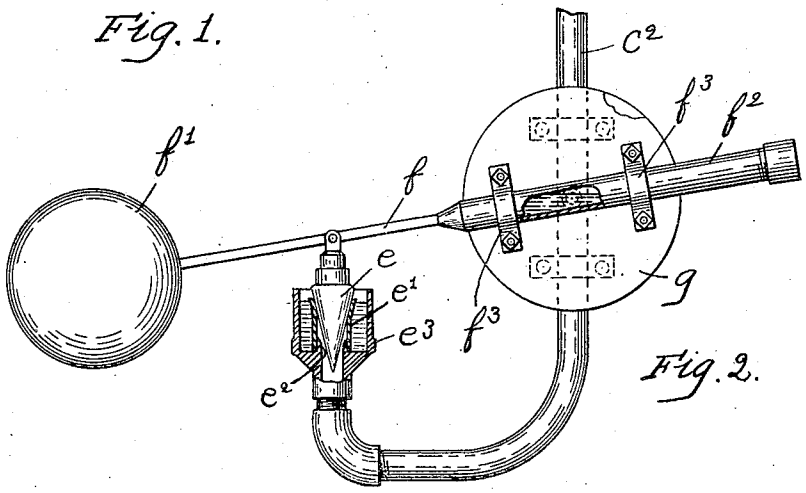


Fig. 2.

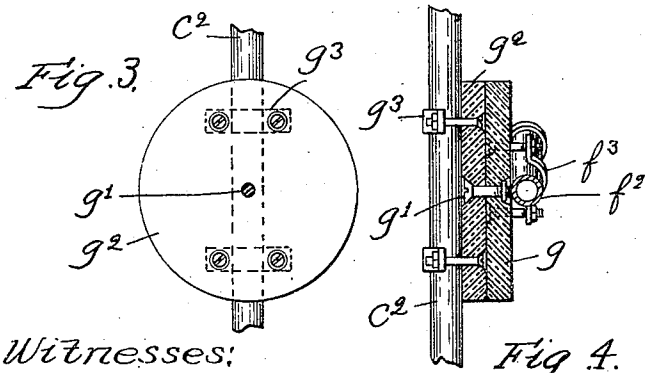


Fig. 3.

Fig 4.

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MEANS FOR DRAINING MANHOLES OF ELECTRIC CONDUIT SYSTEMS.

No. 880,761. Specification of Letters Patent. Patented March 3, 1908.

Application filed November 5, 1907. Serial No. 400,892.

To all whom it may concern:

Be it known that we, ANGUS J. SMITH, of Boston, county of Suffolk, State of Massachusetts, and DANIEL LIVINGSTON, of Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Means for Draining Manholes of Electric Conduit Systems, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to means for draining the manholes of an electric conduit system, and has for its object to provide means whereby all of the manholes of the system may be drained by means located at a central station. Such a system possesses many advantages, as for instance, all of the manholes may be at all times kept drained in order that they may be accessible at any time; and no time is required of the men to perform this work; no manual power required to drain them; and no expensive automatic means required at each manhole which is connected with the city water main for the purpose of operating it.

Figure 1 shows in diagram a portion of an electric conduit system having means embodying this invention for draining the manholes. Fig. 2 is an enlarged side elevation and partial section of the controlling valve for the branch pipes in the manholes. Figs. 3 and 4 are details of the support for the actuating-member of the valve.

a represents the main suction pipe which is connected at the central power station with a suction pump indicated at *b*. This pipe or branches leading therefrom extend throughout the electric conduit system, crossing the manholes which are included therein. *c* represents the conduits and *d* the manholes. Within each manhole or in one or more of the manholes of the system which it is necessary or desirable to drain, a branch T-fitting c' is connected in the main pipe *a* to which a branch pipe c^2 is connected, which extends downward to the bottom of the manhole or thereabouts, and the end of said branch pipe is preferably turned upwards and is open.

The open end of the branch pipe serves as a means for establishing open communication between the interior of the manhole and the main pipe *a*. A valve is employed for opening and closing the open end of the branch pipe c^2, which, so far as our invention is concerned may be of any suitable construction. Herein we have shown one form of valve for the purpose of illustrating our invention which consists of a tapered plug *e*, movable into and out of engagement with a valve-seat. The valve-seat consists of a flexible tube e' attached to a nipple or flange e^2 rising from the bottom of a cup e^3 around an orifice which extends through said cup, and said cup is adapted to be secured to the end of the branch pipe so that the orifice through the cup is in continuation of the opening in the branch pipe. The valve *e* is movable into and out of this tube. The valve *e* is loosely connected with an arm *f* which carries at one end a ball or other float f', and which is secured at its opposite end to a pivoted support.

The pivotally supported end f^2 of the float-bearing arm is made tubular, and said tubular portion is sealed at its ends and contains a small quantity of mercury which partially fills it. A movable counterbalance for the arm is thus provided. The tubular portion of the arm is rigidly connected by clips f^3 with a supporting-plate *g* which may be made of glass and said supporting-plate is connected by a pivot-pin g' with a base-plate g^2, likewise made of glass, which is rigidly attached to the branch pipe c^2 by clips g^3 or otherwise. We do not desire to limit our invention to thus supporting the float-bearing arm, or to attaching its supports to the branch pipe, but the construction shown provides an efficient support for the float-bearing arm which is not liable to corrode or get out of order.

In operation, as the water rises in the manholes the float-bearing arms will be raised and the valves opened, and when the suction pump is started the water will be pumped out until all of the opened valves are closed. The pump will be started at intervals whenever desired.

Among other uses to which our invention may be put, the main pipe *a* may be used as a return for any one of the electric circuits. Furthermore, in case the manholes become filled with gas, steam may be forced through the main pipe and by pressure lift the valves in order that the steam may enter the manholes and expel the gas which is contained therein.

The suction pipe may be extended by

branches or otherwise to any other manholes which are not inclosed directly in the electric conduit system.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In a system of draining the manholes of an electric conduit system, the combination of a main suction pipe connected with a suction pump and extending throughout the conduit system, crossing the manholes, branch pipes depending therefrom, in the manholes, which extend to the bottoms thereof, and which have open ends provided with valve-seats, valves movable toward and from said seats, automatic means, operated by the rise and fall of water in the manholes, for opening and closing said valves and supports for said means in the manholes arranged on one of the pipes therein substantially as described.

2. In a system of draining the manholes of an electric conduit system, the combination of a main suction pipe connected with a suction pump and extending throughout the conduit system, crossing the manholes, branches depending therefrom in the manholes which extend to the bottoms thereof, valves controlling the inlets to said branches, supports secured to said branches, float-bearing arms pivotally connected to said supports which are connected with said valves, and floats borne by said arms, substantially as described.

3. In a system of draining the manholes of an electric conduit system, the combination of a main suction pipe connected with a suction pump and extending throughout the conduit system, crossing the manholes, branches depending therefrom in the manholes which extend to the bottoms thereof, valves controlling the inlets to said branches, base-plates secured to said branches, supporting-plates pivoted to said base-plates, float-bearing arms secured to said supporting-plates which are connected with said valves and floats borne by said arms, substantially as described.

4. In a system of draining the manholes of an electric conduit system, the combination of a main suction pipe connected with a suction pump and extending throughout the conduit system, crossing the manholes, branches depending therefrom in the manholes which extend to the bottoms thereof, valves controlling the inlets to said branches, base-plates secured to said branches, supporting-plates pivoted to said base-plates, float-bearing arms secured to said supporting-plates which are connected with the valves, movable counterbalancing means for said arms and floats borne by said arms, substantially as described.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

ANGUS J. SMITH.
DANIEL LIVINGSTON.

Witnesses:
B. J. NOYES,
H. B. DAVIS.