

(No Model.)

C. F. PIKE.
MERCURY SEAL TRAP.

No. 302,584.

Patented July 29, 1884.

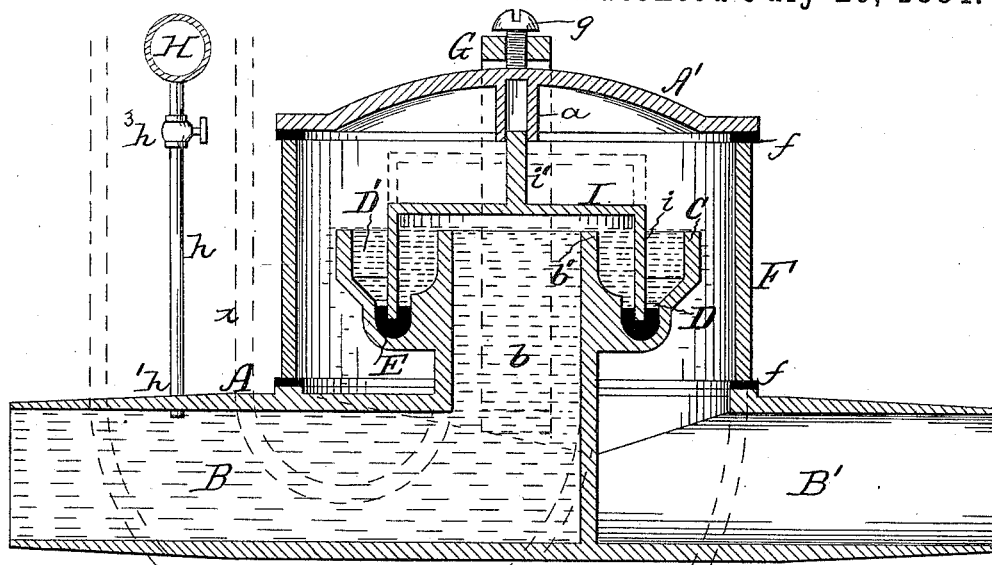


Fig. 1

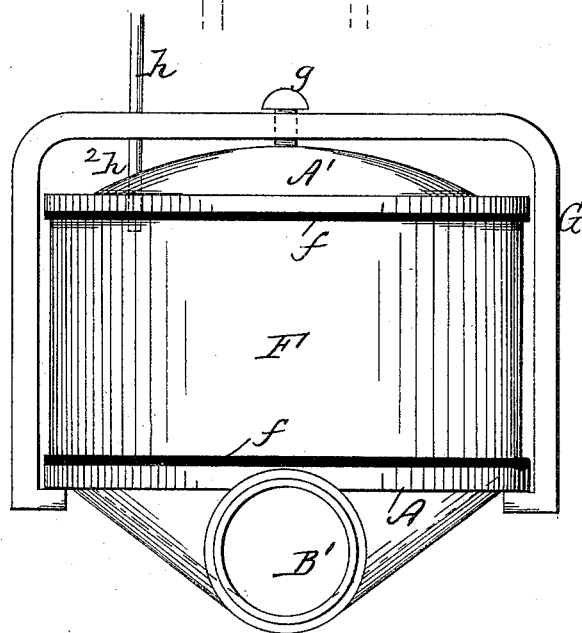


Fig. 2

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UNITED STATES PATENT OFFICE.

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MERCURY-SEAL TRAP.

SPECIFICATION forming part of Letters Patent No. 302,584, dated July 29, 1884.

Application filed January 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Mercury-Seal Traps, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

Figure 1 is a longitudinal vertical section of a trap embodying my improvements, and Fig. 2 is an end elevation of the same.

My invention has relation to mercury-seal traps for wash-stands, bath-tubs, &c., and has for its object to provide a simple and inexpensive trap, which is so arranged that the mercury cannot be forced into the eduction-pipe by the pressure of water in the induction-pipe or forced back into the latter by the back-pressure of gas from the sewer. By projecting the pipe above the bottom plate I am enabled to place the cup upon the outside of the vertical pipe, the bore of which is free from any protuberance which would cause the solids to form in a mass and clog up the pipe.

My invention has for its further object to provide a running stream of water for mercury-seal traps for preventing the accumulation of fungus growth on the inner walls of the trap and the fouling of the mercury.

My invention accordingly consists in the novel combination, construction, and arrangement of the parts composing the trap, as hereinafter described and claimed; and it further consists in the combination, with a mercury-seal trap, of a pipe, one end of which leads into the trap and the other connects with a source of continuous water-supply, which may be a cistern or a water-pipe, all as will hereinafter be described, and pointed out in the claims.

Referring to the accompanying drawings, A represents the bottom plate or base of the trap, having induction and eduction pipes B and B', respectively. The induction-pipe has a bend or chamber, *b*, located in the center of the plate A, and projects above the edge of the same. Said bend *b* is formed with an external flange, C, so configured that two annu-

lar communicating chambers or troughs, D D', are formed between the edge or wall *b'* of said bend and the flange C. The chamber D is designed to hold the mercury, (represented at E,) and is made much smaller than the chamber D', as illustrated:

F represents a transparent or opaque cylinder surrounding the bend *b*, having gaskets or packing *f* interposed between it and the bottom and top plates, A and A', respectively. Said cylinder and plates are connected together and held firmly in position by means of the yoke G and set-screw *g*.

H represents a water-pipe, cistern, or other vessel, into or through which water is continually flowing, so as to form a constant source of water-supply for pipe *h*, which leads therefrom, and connects with the induction-pipe B, as shown at *h'*, Fig. 1. The flow of water through pipe *h* may be regulated by a cock, *h'*; or its bore may be so proportioned to that of the pipe H that only the necessary flow or volume of water will pass therethrough to form the running stream for the trap, in which case the cock *h'* is dispensed with.

I represents a cap surrounding the outlet of the bend *b*, having a flange, *i*, which dips or seals in the mercury E, and a guide-rod, *i'*, which slides or moves up and down in a socket or bearing, *a*, in a plate, A'. Said bearing is represented as depending from plate A'; but it may be otherwise arranged, as desired.

When the component parts of the trap are constructed and arranged as shown in Fig. 1, the lower edge of flange *i* is sealed by the mercury E in chamber D; consequently no sewer-gas can gain admission to the induction-pipe B. The water from the waste-pipe of the wash-stand or other fixture to which said trap is attached, flowing into the induction-pipe B, raises the cap or valve I. Its flange *i* is thereby unsealed, and an escape is provided for the water in the induction-pipe, whereupon the valve I descends by gravity to seal its flange *i* in the mercury E.

The chamber D being centrally located with respect to chamber D', the latter is divided into two compartments by the valve-flange *i*,

which are each proportionately of a larger area than that of the mercury in chamber D, or that of the latter itself. It follows, therefore, that when the mercury is subjected to pressure from the induction-pipe or back-pressure from sewer-gas, it will, as it is forced into either of the compartments of chamber D', spread itself over the increased area thereof, and soon give vent to either such pressures before it can be thereby elevated to and forced over the top edges of flange C or bend *b*. As often as the wash-stand, &c., is used such automatic operation of the trap will take place; but where the interval between successive use of the wash-stand is prolonged the small body of water usually remaining in the induction-pipe stagnates and soon becomes foul. A fungus growth is thereby generated within and adheres to the walls of the induction-pipe. In course of time such fungus growth accumulates to such extent that it extends to the wash-stand, and under certain favorable conditions, which are constantly occurring, particles of such growth find their exit from the waste-pipe of the fixture and enter the air of the apartment wherein the fixture is located. To prevent such fungus growth it is necessary to keep the water in the induction-pipe B in constant agitation or prevent it stagnating. I accomplish such result by means of the water-pipe *h*, from which a stream of water is continuously flowing to the induction-pipe B, accumulating therein until its pressure is sufficient to unseat the valve I, and escaping therethrough. Said water-pipe therefore serves as a flushing device for the trap, and by the repeated action thereof the fouling of the water in pipe B is avoided. Another advantage arising from the use of such flowing water is that it always flushes the chamber D' or keeps a fresh body of water on the top of the mercury E, thereby preventing the latter becoming fouled or evaporating, while in mercury-seal traps as heretofore constructed and used the infrequent use of the wash-stand or other fixture allows the water resting on the mercury to evaporate, thereby depositing its contained filth on the mercury, which, commingling therewith, renders the latter so foul that it must be removed and cleansed or replaced by fresh mercury. Again, when such waste water located above the mercury evaporates, as described, the mercury is also evaporated, thereby breaking the seal of the trap and exposing the occupants of the apartments wherein such fixtures are located to the danger of salivation. In my improved trap said disadvantages are avoided by reason of the use of the running water from pipe *h*. When the trap is connected to vertically-arranged pipes, the induction and eduction pipes B B' are formed, as represented by dotted lines *x y*, respectively; but when joined to horizontally-arranged pipes said induction and eduction ends are made as indicated by the full lines, Fig. 1. Again, the

cylinder F and top plate, A', may, if desired, be formed in one piece and screwed, bolted, or otherwise connected to the bottom plate, A, in which case the yoke G and set-screw *g* are dispensed with. So, too, a reservoir containing a disinfectant may be arranged in the path of the pipe *h*, to provide a disinfecting running-water flow for the trap, as fully explained and claimed in my prior patents. Again, the cup or valve I may be permanently fixed or formed on the top A', in which case the mercury will be displaced by the hydrostatic pressure in the induction-pipe, and thereby break the seal of the trap, to permit the passage of water or other fluid therethrough.

It will be noted that the flow or discharge from pipe *h* is entirely independent of the movement of the sealing mechanism or fluid for the trap, and that it operates to flush the latter when the seal therefor is broken.

In pending applications of even date of filing herewith I have shown and described pipe *h* applied to traps having sealing-valves, for effecting a flushing of the traps when said valves are opened by the discharge from said pipe, and to traps having a loose ball-sealing valve. My present invention comprises a trap having a mercury-seal in which the water from pipe *h* keeps the mercury from fouling or evaporating and prevents the growth of vegetable organism therein. I do not broadly claim a plate having induction and eduction openings and a casing, as such a device is old. My device, however, differs from that form, in that the bottom of the casing is below the top of the induction-pipe outlet, so that when the casing is removed the valve mechanism will be fully exposed. Nor do I broadly claim a trap for wash-stands, basins, &c., having an induction-tube provided at its outlet with a valve disconnected from the other parts of the trap, and a running seal, as such a device forms the subject-matter of a separate application filed on an even date with this.

What I claim is—

1. In a trap, the combination of a bottom plate having an induction-pipe extending above the bottom plate, and provided with a valve and an eduction-opening, with a removable casing inclosing the extension of the induction-tube, substantially as described.

2. In a seal-trap, the combination of a bottom plate having an eduction and an induction pipe, the outlet-opening of which is above the bottom plate, and provided with a flange and a cap seated on said flange, with a casing inclosing the extension of the induction-pipe, and fastened to the bottom, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHAS. F. PIKE.

Witnesses:

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CHAS. F. VAN HORN.