

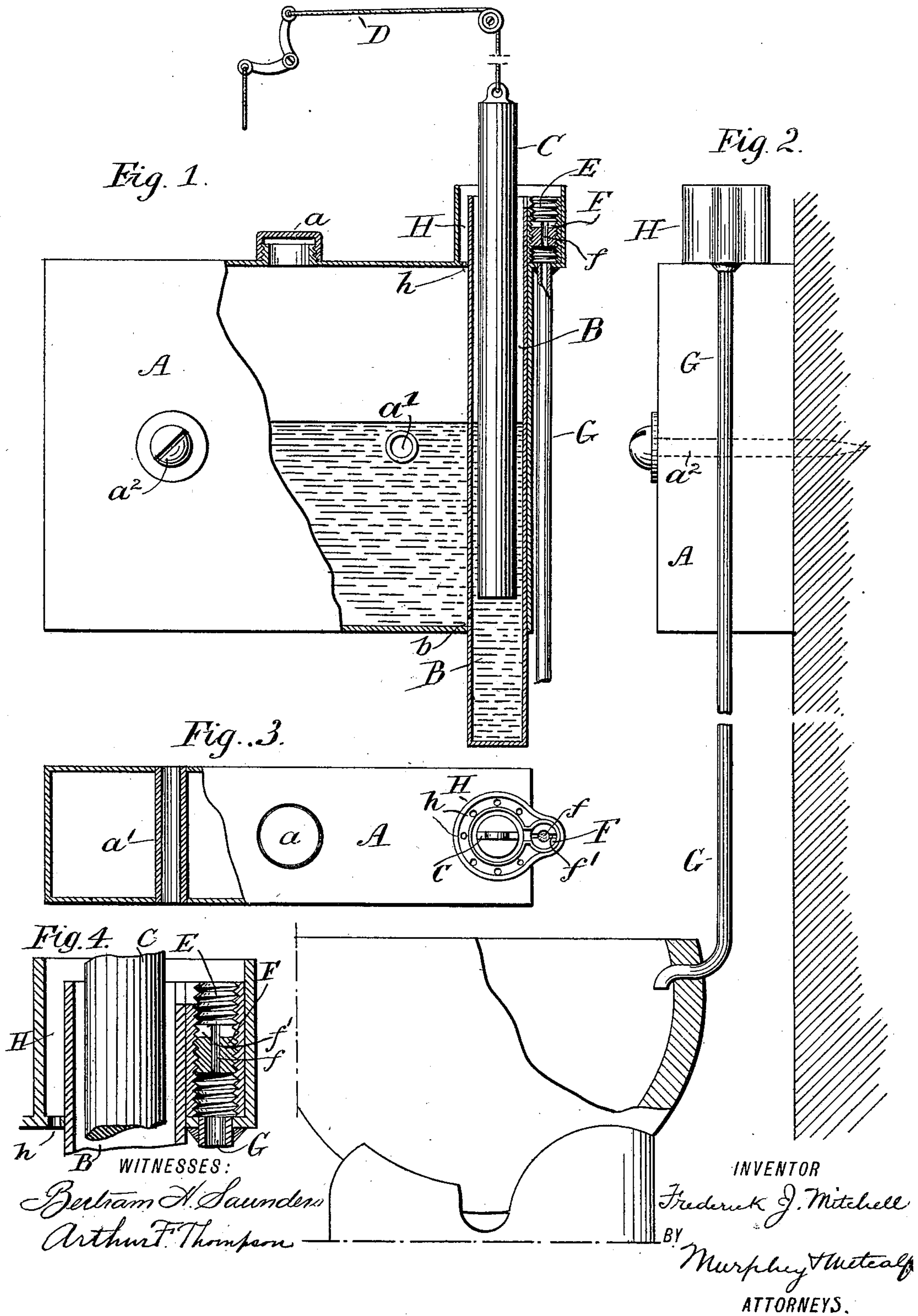
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F. J. MITCHELL.
APPARATUS FOR DELIVERING LIQUIDS.

(Application filed Aug. 18, 1898.)

(No Model.)



UNITED STATES PATENT OFFICE.

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APPARATUS FOR DELIVERING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 622,249, dated April 4, 1899.

Application filed August 18, 1896. Serial No. 603,120. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK J. MITCHELL, a citizen of the United States, and a resident of the city, county, and State of New York, have made certain new and useful Improvements in Apparatus for Delivering Liquids, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide an apparatus by which liquid may be distributed in a certain predetermined amount at intervals which may be periodic or which may be determined by the operation of other apparatus.

My device is particularly adapted for use in disinfecting systems wherein a small quantity of the liquid disinfectant is desired to be carried to some certain point, such as the bowl of a closet, at intervals which may be determined, for instance, by the frequency with which the closet or other device is used.

To this end it consists in a reservoir adapted to contain the requisite amount of liquid, an auxiliary reservoir connected therewith, a plunger working in said auxiliary reservoir and arranged to be released by the movement of some mechanism, which may be either a pull-cord or a door or other part of the structure, and a discharge-pipe communicating with the auxiliary reservoir.

It also consists in means for measuring or varying the amount of liquid supplied at each operation of the apparatus.

It consists, further, in the combination and arrangement of parts and details herein shown, and pointed out in the claims.

Referring to the drawings, Figure 1 is a front elevation, partly in section, of the apparatus. Fig. 2 is a side elevation showing the discharge-pipe connected with the bowl of a closet. Fig. 3 is a plan view of the apparatus from the top; and Fig. 4 is a detailed sectional view of the chamber from which the discharge-pipe preferably leads, showing the preferred means which I adopt for measuring or varying the quantity of the discharge.

In said drawings, A is a reservoir adapted to contain the required amount of liquid, which can be poured into the reservoir through the

aperture at the top, which is covered by the screw-cap *a*. The auxiliary reservoir B, as shown, is placed at one end of the reservoir A and is cylindrical in form. It communicates with the reservoir A through the small aperture *b*, which is preferably placed near the bottom of the reservoir A, and the auxiliary reservoir B also preferably extends well below the bottom of the reservoir A, so as to enable all the liquid in said reservoir to be utilized. A loaded plunger or piston C is arranged to work loosely in the auxiliary reservoir B. This is normally supported at some distance from the bottom of the auxiliary reservoir B by a connection D, actuated, as may be preferred, either by connecting it with the door or seat of the closet or by a hand-pull or by any other suitable moving part of the structure, so that when such door or other operating device is moved in one direction or the other, as will be readily understood, the plunger will be released and will descend to the bottom of the auxiliary reservoir B. At or near the top of the auxiliary reservoir B, so as to be above the highest liquid-level, is the discharge or measuring chamber E, which is by preference internally screw-threaded to receive the screw-threaded plug F. The discharge-pipe G of the apparatus is connected directly with this chamber. The plug F is provided with an aperture *f*, which is of sufficiently small size to permit a very small flow of the liquid through it, and the top of the plug F is provided with a slot *f'*, so that the plug can be screwed up and down in the chamber E by the manipulation of an ordinary screw-driver. Surrounding the upper part of the auxiliary reservoir B and the chamber E is an overflow-cup H, which communicates with the reservoir A through the openings *h*.

For the purpose of securing the structure in operative position I provide the reservoir A with two or more tubes *a'*, which extend through the reservoir from side to side. Through these tubes screws or bolts *a''* are inserted and pass into the wall or other structure to which it is desired to secure the apparatus. It is essential that the apparatus should be placed above the point of supply in order that the liquid may be delivered by gravity thereto through the pipe G, and the

special means which I show for permitting the same to be so secured possess the advantage of permitting either side of the reservoir to be turned toward the wall. In this manner the apparatus may be secured at either side of the closet.

I will now describe the operation of my device as it is used by me in supplying a liquid disinfectant to a water-closet bowl, although I do not intend to limit my invention to that specific use. The reservoir A is secured in proper position above the closet-bowl, so that the discharge-pipe G can be led into the bowl. The reservoir A is filled with the liquid disinfectant to be used, which may, for instance, be a solution of chlorid of zinc. From the reservoir A the liquid will slowly flow into the auxiliary reservoir B, through the aperture *f*. The plunger is then arranged in the auxiliary reservoir B, some distance above the bottom of said reservoir, and is, by the connection D, secured to the door by which the closet is entered, or to the seat of the closet, or to any other moving member of the structure by which the requisite movement may be obtained to cause the plunger to descend to the bottom of the auxiliary reservoir B when the operating member of the structure is moved. If, for instance, the plunger be connected with the door of the closet, the connections are so arranged and adjusted that when the door is opened the plunger C by its weight will descend quickly to or very near the bottom of the auxiliary reservoir B. The reverse of this arrangement may be employed, if desired, so that the closing of the door will cause the plunger to descend, and although I prefer that the plunger should be heavy enough to descend by gravity, yet it is obvious that a spring may be used to cause or assist in causing its descent. The screw-plug F is then adjusted in the chamber E, so that that portion of said chamber above the plug would contain if filled substantially the amount of liquid required to be delivered at each operation.

Owing to the restricted area of the aperture *b* the descent of the plunger C, released as above described, will force the liquid in the auxiliary reservoir up around the sides of said plunger and cause it to flow over the top of said auxiliary reservoir B, a portion thereof (enough to entirely fill it) entering the chamber E and the remainder passing into the overflow-cup H, whence it will drain back into the reservoir A, so that it is not wasted. As the supply is sudden and the aperture in the plug F is comparatively restricted, this sudden overflow of the liquid will completely fill the chamber E, which thus serves to measure the amount of the discharge. From the chamber E the liquid will gradually flow through the restricted aperture *f* in said plug and the discharge-pipe G to the closet-bowl.

It is obvious that the space between the sides of the auxiliary reservoir B and the

plunger C should be just sufficient to permit the required amount of liquid to be forced up readily without materially retarding the descent of the plunger. If desired, also, the flow through the aperture *f* may be restricted by placing therein any suitable porous substance, as shown in Fig. 3.

The advantages of my apparatus are its simplicity and reliability, due in a great measure to the fact that I am enabled to dispense entirely with valves, and also to the fact that the quantity of liquid discharged at each operation does not depend at all on the amount of liquid in the reservoir A, since the delivery when the apparatus is once adjusted is constant whether the said reservoir A is full or nearly empty.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus for delivering liquid the combination of a reservoir adapted to contain liquid, an auxiliary reservoir connected therewith, a plunger arranged in said auxiliary reservoir, a discharge-pipe connecting with the upper part of the auxiliary reservoir, means for operating said plunger to cause it to descend in the auxiliary reservoir, and a passage by which said liquid may rise in the auxiliary reservoir and enter the discharge-pipe as the plunger descends, substantially as shown and described.

2. In apparatus for delivering liquid the combination of a reservoir adapted to contain liquid, an auxiliary reservoir connected therewith, a loosely-fitting plunger arranged in said auxiliary reservoir, a discharge-pipe connecting with the upper part of said auxiliary reservoir, and means for actuating said plunger so as to displace the liquid in the auxiliary reservoir and cause it to rise therein and flow into the discharge-pipe as the plunger descends, substantially as shown and described.

3. In apparatus for delivering liquid, the combination of the reservoir A, the auxiliary reservoir B communicating therewith, a plunger arranged in said auxiliary reservoir, means for actuating the same, a discharge-pipe communicating with the upper part of said auxiliary reservoir and an overflow-cup communicating with the reservoir A, around the top of the auxiliary reservoir, substantially as shown and described.

4. In apparatus for delivering liquid, the combination of a chamber, formed to receive the liquid, and an apertured adjustable plug forming the bottom of said chamber, substantially as shown and described.

5. In apparatus for delivering liquid, the combination of the reservoir A, the auxiliary reservoir B, the plunger C working therein, connections for actuating said plunger and causing it to descend, the chamber E communicating with the upper part of the auxiliary reservoir B, an adjustable apertured plug in said chamber for regulating the discharge of

the liquid and a discharge-pipe connected with said chamber, substantially as shown and described.

5 6. In apparatus for delivering liquid the combination of a chamber formed to receive the liquid and a screw-threaded apertured plug working in said chamber for regulating the quantity of liquid discharged, substantially as shown and described.

10 7. In apparatus for delivering liquid the combination of the supply-reservoir, an auxiliary reservoir extending below the bottom of the supply-reservoir, an opening between

the two reservoirs near the bottom of the supply-reservoir, a plunger arranged in the auxiliary reservoir, a discharge-pipe connected with the auxiliary reservoir and means for operating said plunger, to displace the liquid in the auxiliary reservoir and cause it to enter the discharge-pipe as the plunger descends, 20 substantially as shown and described.

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Witnesses:

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W. J. HANDOVER.