

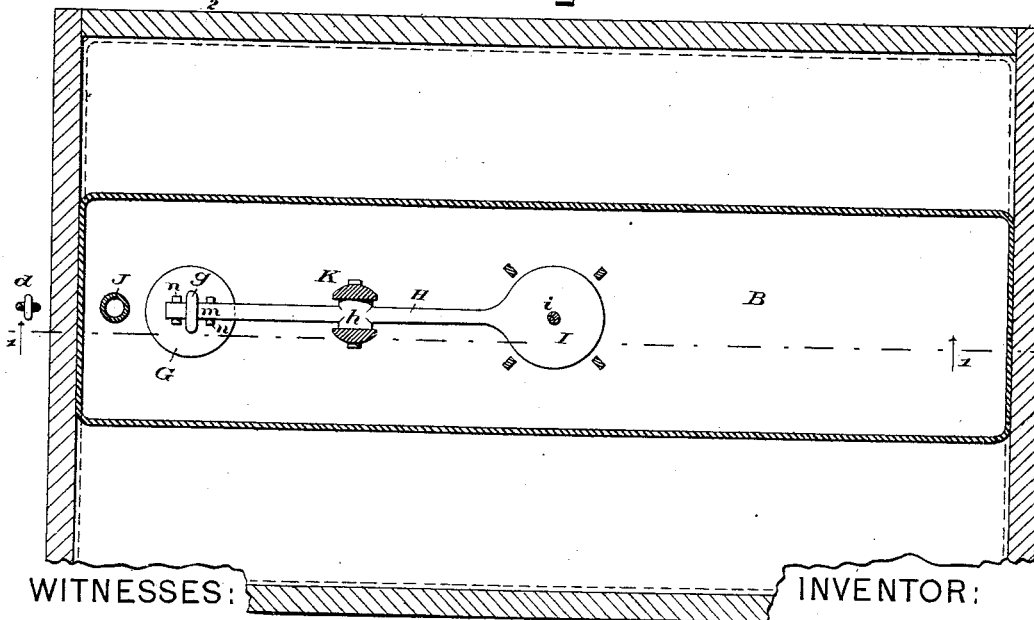
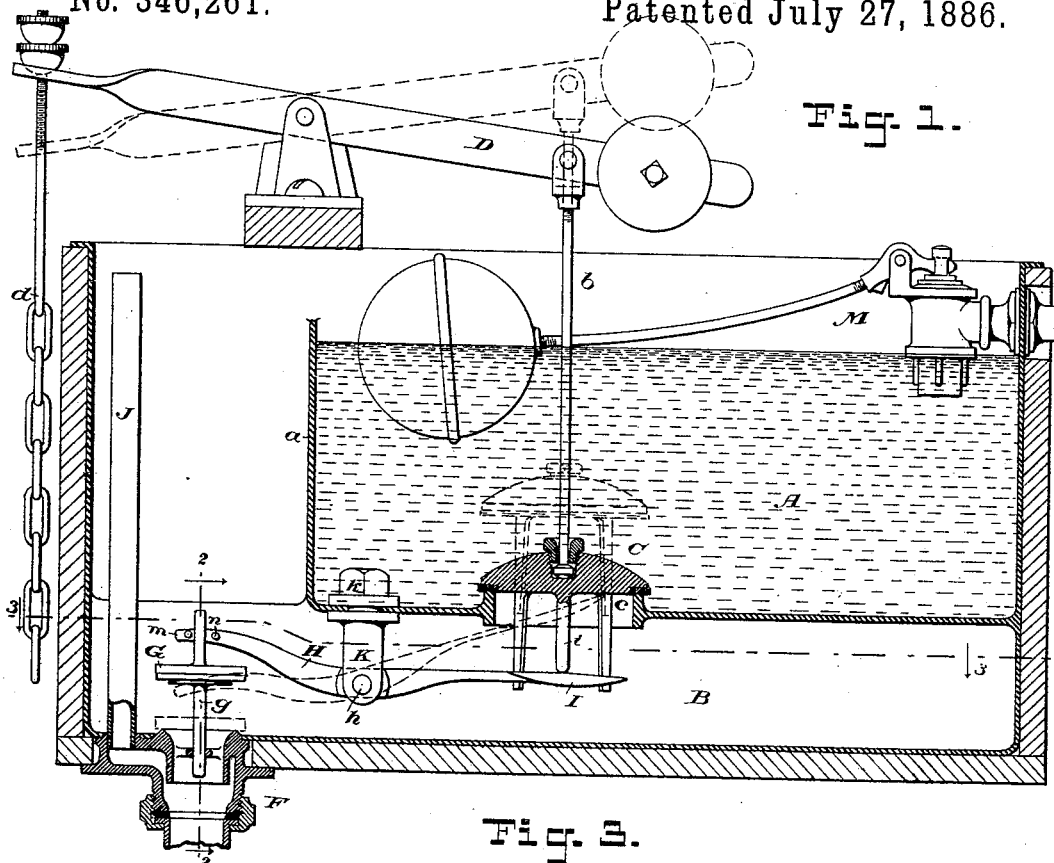
(No Model.)

2 Sheets—Sheet 1.

J. E. BOYLE.
FLUSHING TANK.

No. 346,261.

Patented July 27, 1886.



WITNESSES:

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Geo. Sinton

INVENTOR:

James E. Boyle
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Fig. 2.

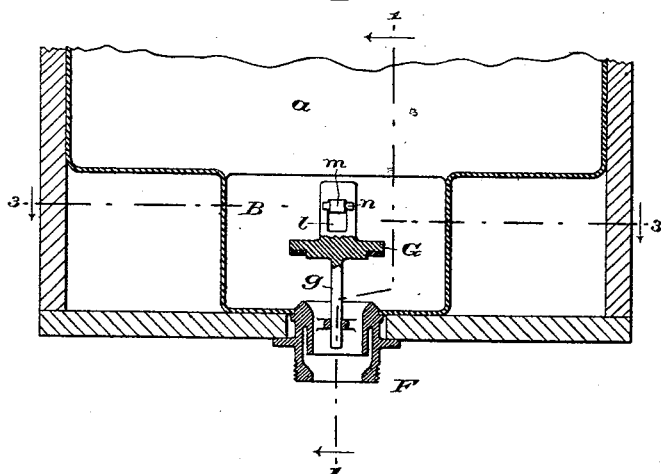


Fig. 4.

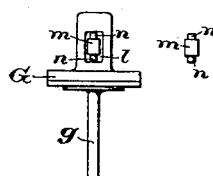
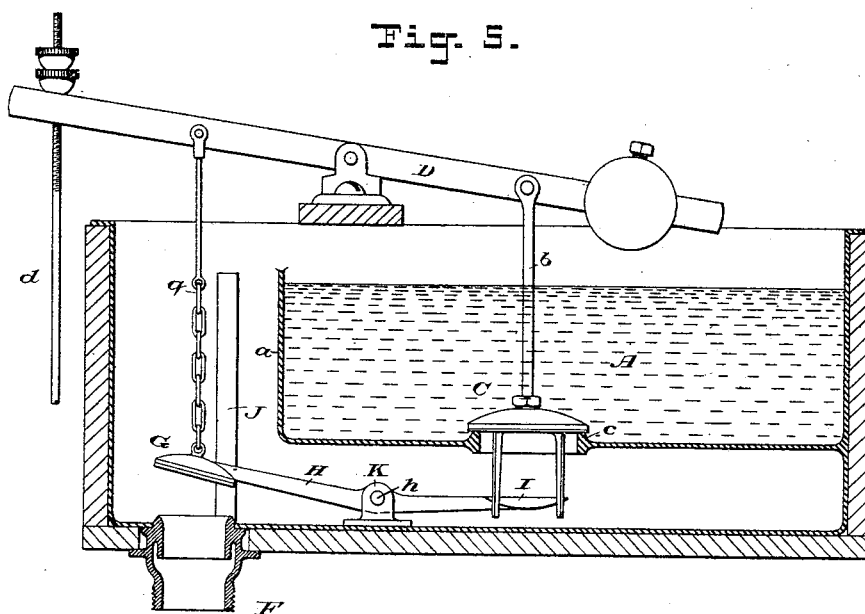


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES E. BOYLE, OF EAST NEW YORK, N. Y.

FLUSHING-TANK.

SPECIFICATION forming part of Letters Patent No. 346,261, dated July 27, 1886.

Application filed April 19, 1886. Serial No. 199,318. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. BOYLE, a citizen of the United States, residing in East New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Flushing-Tanks, of which the following is a specification.

This invention relates to tanks or cisterns for flushing water-closets, urinals, and other devices, giving first a short preliminary wash and afterward a prolonged flush. Such tanks have heretofore been made with one, two, or more valves and an operating-lever worked by a chain or other connection with the seat or door of the closet, or with a pull, or with a treadle for a urinal.

My improved tank possesses the distinguishing advantage that the duration of the preliminary wash is proportioned to the quantity of water in the tank at the time, so that when the tank is nearly empty a shorter preliminary wash is given than when the tank is full.

Figure 1 of the accompanying drawings is a vertical longitudinal section of my improved tank. Fig. 2 is a vertical transverse section in the plane of the line 2 2 in Fig. 1, and Fig. 3 is a horizontal section in the plane of the line 3 3.

Let A designate the reservoir tank or cistern proper, B the service-box or flushing-chamber, C the valve controlling the passage of water from tank A to service-box B, *c* the opening covered by this valve, and D the lever for operating this valve, connected to it through the medium of the valve-stem *b*. These parts are, in general, of the usual construction. The lever D carries a weight, W, on the same arm to which the valve C is connected, to keep the valve normally closed. At the end of its opposite arm a chain or wire, *d*, is connected, which extends down and is attached to the seat of the water-closet, or to a tilting-lever connected with the seat, or to the door of the closet, or is connected in any other known way by which the tank may be operated through it.

The service-box B extends beneath the middle portion of the tank A, from end to end, and also extends up the left-hand end thereof, as shown, being separated therefrom by a partition, *a*, the upper edge of which is somewhat lower than the top of the tank, to afford an

overflow over its top from the tank A. The tank is supplied with water through a float-valve, M, of usual construction.

The flushing-pipe F leads downward to the bowl from the service-box B, and the outlet from the service-box to this pipe is provided with a valve, G. This valve is mounted on a stem, *g*, which is hung from one end of a lever, H, which is fulcrumed at *h*, and is arranged in the lower portion of the service-box B. The opposite end of this lever has a dash-plate or disk, I, formed on or attached to it and arranged just beneath the valve C. The valve G and the left-hand arm of the lever are heavier than the plate I and the right-hand arm, so that the valve tends constantly to fall to its seat and close the outlet to the pipe F. While the valve C is seated, however, the plate I is kept depressed, and the valve G is held up by means of a tappet, *i*, which in this construction consists of a finger projecting down from the center of the valve C and striking the plate I.

The operation may now be understood. On the pulling of the chain *d* the valve C lifts, and the finger *i* ceases to hold down the plate I. The plate consequently rises with the valve and the valve G descends. Immediately, however, the water commences to enter through the opening *c*, and, striking the dash-plate I, forces it down and lifts the valve G. The water entering the service-box will then flow out through the pipe F, thus giving the preliminary wash. The water enters through *c* much more rapidly than it runs out through the pipe F, so that the service-box is quickly filled, the water rising in it to the same level as in the tank A, and the inflow through opening *c* then ceases. As soon as this inflow ceases, or as soon as the incoming current becomes too sluggish to hold the dash-plate depressed against the preponderating weight of the valve G, this valve closes and terminates the preliminary wash. The closing of this valve is also assisted by the suction of the descending column of water, which exerts some downward pull upon it, and to some extent accelerates its time of closing. The valve G remains closed all the time that the chain remains pulled; but when the parts are released and the valve C reseats itself the tappet *i*

forces down the plate I and the valve G is lifted. All the water in the service-box then runs out to give the final wash or flush.

An overflow-pipe, J, is provided, extending 5 somewhat above the top of the wall *a*, and communicating at its lower end with the flushing-pipe F beneath the seat of the valve G. This pipe, being open to the air at its upper end, serves to admit air to the pipe F, and 10 thus reduces the suction which the descending column of water exerts against the valve G.

If the chain should be pulled while the tank A is partly empty, the preliminary wash will be proportionately shortened, so that the 15 greater portion of the water will be saved for the final flush, instead of all or nearly all of it running out during the preliminary wash. This is an important advantage, and, so far as I am aware, is not possessed by any prior construction. This operation is due to the fact 20 that when the water-level is low the service-box fills more quickly to the same level, the inflow is hence more quickly checked, and the dash-plate I is not so long depressed.

The lever H is fulcrumed at *h* in a frame or 25 pendent standard, K, which is fastened to the bottom of the tank A by a nut, *k*, screwing on its threaded shank. The connection of the end of the lever with the stem of the valve G 30 is a loose articulation. The end *m* of the lever enters a vertical slot or eye, *l*, in the valve-stem, (shown best in Fig. 2,) and has two laterally-projecting pins or teeth, *n n*, on opposite sides of the eye to prevent displacement 35 of the latter. When it is desired to dismount the parts, the nut *k* is unscrewed, the standard K is dropped down with the lever, and the lever is turned a quarter around, thus bringing its end *m* and pins *n n* in line with 40 the slot or opening in the eye, as shown in Fig. 4, so that they may be withdrawn. The lever H is then lifted out, either through the opening *e* or through the open left-hand end of the service-box.

Fig. 5 shows a modified construction of tappet for unseating the valve G. The finger *i* 45 on the valve C in Fig. 1 is omitted. Instead the valve G is mounted on the lever H, and is connected by a chain, *g*, to the lever D, as shown, so that when the lever is in its normal position the valve G is unseated and hangs 50 suspended from the chain; but when the lever is tilted in use the chain is slackened and the valve G is free to seat itself.

Many other ways of unseating the valve G 55 may be readily devised, and the construction may be modified in this and other respects, as may be desired. The detailed description which I have given must not be construed as confining me to the precise construction shown, 60 as my invention introduces a new principle in the operation of flushing apparatus of this class.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, to form a flushing apparatus, of a supply-tank, a service-box, an inlet-opening from said tank to said box, an inlet-valve closing said opening, an outlet-opening from said box, an outlet-valve for 70 closing said outlet, and a dash-plate connected to said valve, adapted when deflected to unseat said valve, and arranged where it will receive the impact of the stream of water flowing in through said inlet-opening, substantially as set forth. 75

2. The combination of tank A, service-box B, inlet-valve C, outlet-valve G, lever H, connected to said outlet-valve, dash-plate I, connected to said lever and arranged where it 80 will receive the impact of the inflowing stream of water, and adapted when deflected thereby to tilt said lever and open said valve G, and a tappet-connection with said valve adapted to forcibly unseat it upon the seating of the inlet-valve C, substantially as set forth. 85

3. The combination of tank A, service-box B, inlet-valve C, outlet-valve G, lever H, dash-plate I on said lever arranged beneath the valve C, and tappet *i* on said valve, adapted 90 to depress said plate on the seating of said valve, substantially as set forth.

4. The combination of tank A, service-box B, valve C, valve G, eye *l*, connected to said valve, lever H, having one end, *m*, and projections *n n* adapted to enter said eye, and dash-plate I on the opposite arm of said lever, substantially as set forth. 95

In witness whereof I have hereunto signed my name in the presence of two subscribing 100 witnesses.

JAMES E. BOYLE.

Witnesses:

ARTHUR C. FRASER,
GEORGE H. FRASER.