(No Model.)

H. H. CRAIGIE.

WATER CLOSET TANK.

No. 408,218. Patented Aug. 6, 1889.

Fig. 2.

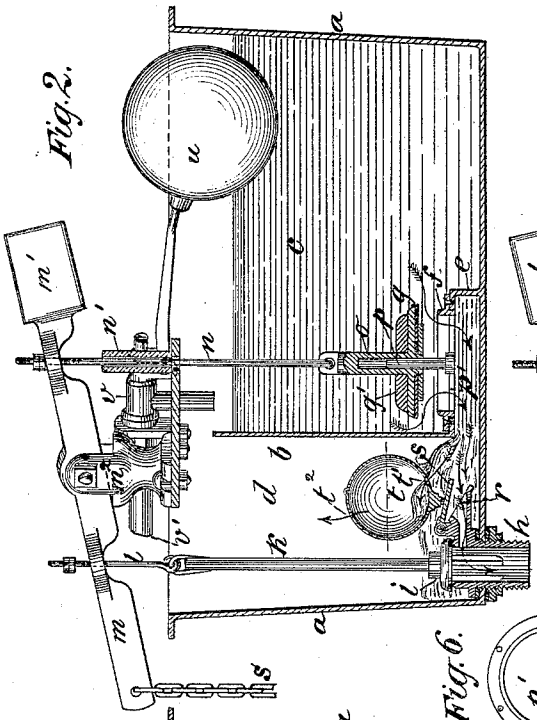


Fig. 3.

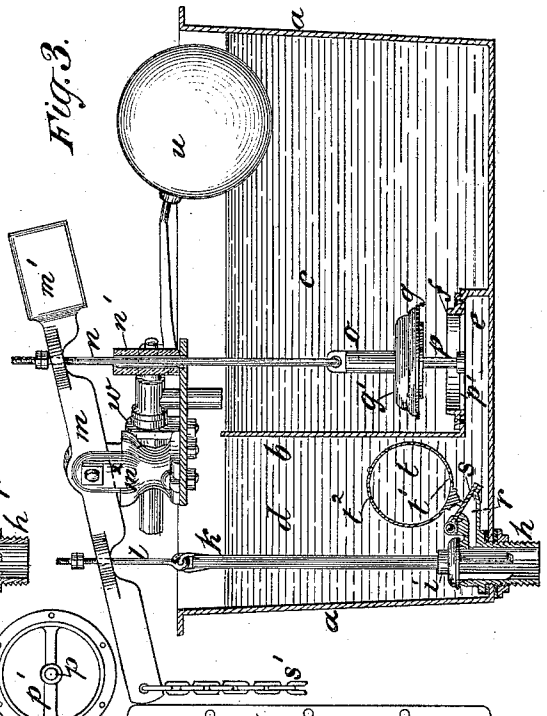


Fig. 6.

Fig. 1.

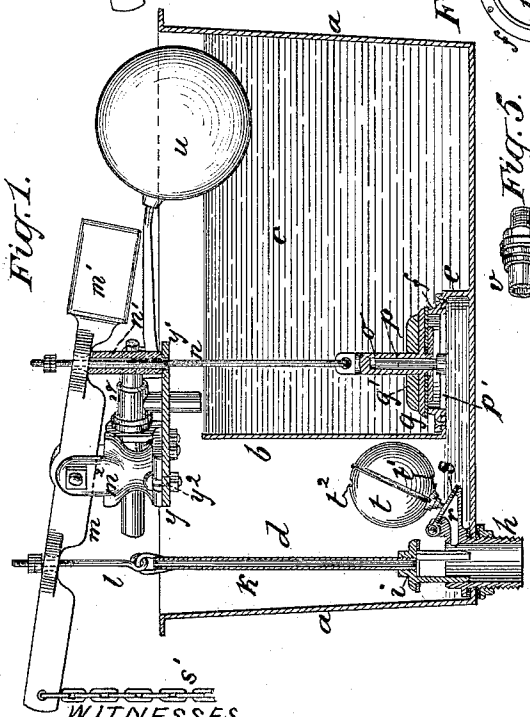


Fig. 5.

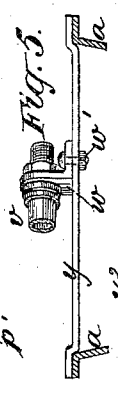
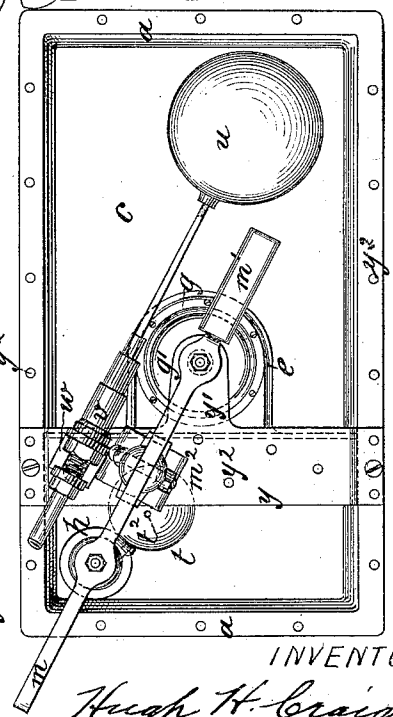


Fig. 4.



WITNESSES

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HUGH H. CRAIGIE, OF STAMFORD, CONNECTICUT.

WATER-CLOSET TANK.

SPECIFICATION forming part of Letters Patent No. 408,218, dated August 6, 1889.

Application filed November 17, 1887. Serial No. 255,451. (No model.)

To all whom it may concern:

Be it known that I, HUGH H. CRAIGIE, of Stamford, Fairfield county, Connecticut, have invented certain new and useful Improvements in Water-Closet Tanks, of which the following is a specification.

My invention relates to that class of water-closet tanks divided by a partition into main and minor chambers, the main chamber having a water-supplying float-valve and also a discharge-valve controlling a passage from one chamber to the other to control the transfer of the water from the main or reservoir chamber to the minor chamber or "service-box," while the flushing-pipe extends from the service-box to the closet and is provided with valve devices which admit both a fore and after wash to the closet.

My improvements lie chiefly in the valve mechanism attached to the flushing-pipe in the service-box, whereby the fore and after wash is produced in a simple and effective manner.

In the drawings annexed, Figure 1 is a longitudinal section of my improved tank shown in its charged condition, but with the parts in the normal position of rest. Fig. 2 is a similar section with the parts in the position assumed when the forewash occurs. Fig. 3 shows the parts in the same position after the forewash has taken place, with the service-box filled to the top, ready to emit the main or after wash as soon as the flushing-valve is raised and the transfer-valve closed. Fig. 4 is a plan view of the tank. Fig. 5 is an edge view of the tank-shelf supporting the supply-valve or ball-cock. Fig. 6 is a plan view of the seat of the transfer-valve.

Referring to the drawings, *a* indicates the tank, which is preferably made of cast-iron, as usual, and is divided by the partition *b* into a main chamber *c*, forming the accumulating-water reservoir, and a minor chamber *d*, forming the service-box or intermittent supply-chamber. A flat arch-shaped trunk or passage *e* (see Figs. 1 and 4) extends from the middle of the base of the partition along the base of the tank into the main chamber, and is provided with a circular port in the top thereof, forming a communicating passage between the two chambers. The port in this passage *e* is provided with an annular valve-seat *f*, preferably made of brass, with a flat rim screwed in place, as shown, and with a raised angular seating-edge, on which normally rests the valve *g*, which normally closes the passage between the two chambers, as seen in Fig. 1.

From the bottom of the service-box *d* extends the outlet *h*, adapted to connect to the flushing-pipe which leads to the bowl of the closet, the mouth of this outlet in the chamber *d* forming a seat for the flushing-valve *i*, which controls said outlet, as shown in Figs. 1, 2, and 3. This valve *i* has three or four guiding-prongs which enter the outlet *h*, as shown, to steady the motion of the valve, and is also provided with a tubular stem *k*, acting as a vent-tube, which vent-tube rises to a point above the normal water-level and has a loop on the top which connects to a link *l*, which is engaged with one arm of an operating-lever *m*, which is pivoted about the middle on a lug m^2, which is bolted to a supporting-shelf *y*, which is fastened across the top of the tank over the partition *b*, as best shown in Figs. 1, 2, and 5. The opposite arm of the lever connects by the link *m* to the stem *o* of the valve *g*, which stem, as shown, is tubular, but closed at the top and slides upon a guide-pin *p*, projecting centrally upward from a cross-bar or bridge *p'* in the valve-seat *f*, as fully shown in Figs. 1, 2, 3, and 6.

The arm of the lever which connects to the valve *g* is provided with a counterbalancing-weight *m'*, which normally causes that end to gravitate, so as to close the transfer-valve *g* and open the flushing-valve *i*, as seen in Fig. 1. The opposite arm of the lever connected with the flushing-valve *i* overhangs the end of the tank and is connected by a chain *s'* or other connection with the depressible seat of the closet, or with a pendent pull hanging near the seat, as usual in the operation of closets, so that when said chain is pulled the lever is swayed in opposition to the weight *m'*, so as to close the flushing-valve and open the transfer-valve, as seen in Figs. 2 and 3. Now the flushing-outlet *h* is formed with a lateral auxiliary valve orifice and seat *r* opening therefrom into the chamber *d* just below the seat of the flushing-valve *i*, said auxiliary orifice

having preferably a flat inclined seat which is fitted, preferably, with a hinged metallic flap-valve *s*, both seat and valve having ground faces.

Attached to the valve *s* is a hollow float *t*, preferably of ball shape and having a small inlet or flooding hole *t'* in the base and a small air hole or vent t^2 at the top. The weight of the valve *s* and the float *t* keeps the valve normally closed, as seen in Fig. 1—that is, when the chamber *d* is not flooded and the parts are in the normal position, where the transfer or flooding valve *g* is closed and the flushing-valve *i* open, as seen in Fig. 1. As soon, however, as the operating-lever *m* is depressed, so as to close the flushing-valve *i* and open the flooding-valve *g*, as seen in Fig. 2, the first rush of water into the chamber *d* will buoy up or raise the float *t*, and thus open the auxiliary valve *s*, which will thus admit a forewash to the closet, which wash will continue for a few seconds, or until the float *t* gradually fills through its flooding-hole *t'*, the buoyant air escaping from the hole t^2, and the float thus sinks, thereby closing the auxiliary valve and thus shutting off the forewash. The water will now continue to rise in the chamber *d* to its level in the main chamber, and will thus entirely fill and submerge the float *t*, which will continue to hold the valve *s* forcibly on its seat, as seen in Fig. 3. As the water-level falls in the chamber *c* to fill the chamber *d*, the descent of the float *u* will open the usual supply-valve *v*, connected with the water-supply pipe *v'*, and thus admit a supply of water to raise the water-level to its maximum height in both chambers, as seen in Fig. 3, when the rise of the float *u* will thus cut off further supply, as will be understood. When, therefore, the valve-lever *m* is allowed to drop back to its normal position, the flooding-valve *g* will be closed and the flushing-valve *i* opened, as seen in Fig. 1, and the entire charge of water in the chamber *d* will be thus discharged in an energetic stream down through the flushing pipe or outlet *h* into the closet to cleanse and flush the same, thus producing the main or after wash, and the parts will therefore now remain in the condition shown in Fig. 1 until the lever is again depressed, the water having of course all drained out of the float through the leak-hole *t'*.

It will therefore be seen that the auxiliary valve *r s*, with its submergible float *t*, with the flushing-valve *i* and flooding-valve *g* in the chambers *c d*, form a very simple and efficient means for producing a reliable fore and after wash, which is inexpensive in construction, not liable to derangement, and embodies few parts.

It will be understood that the tubular stem *k* on the flushing-valve *i* acts as an overflow-tube, when the valve is seated, to carry off any overflow above the normal level in the tank due to leakage from the supply-valve *v*, as will be understood from Fig. 3, and it also serves to vent the flushing-pipe and allow the descending column of water therein free vent after the valve has been seated on the top thereof, this being of course an old feature in tanks.

On reference to Figs. 1, 2, and 3 it will be understood that the guide-pin *p* projects centrally upward from the valve-seat into the tubular stem *o* of the valve *g*, and acts to guide and steady the valve in a simple and efficient manner, and it obviates the projection of any guiding devices below the valve-seat into the passage *e*, and also obviates all protrusions on the base of the tank to allow such guiding devices. Consequently, not only is the construction of the valve and seat rendered simpler, but the construction of the tank is also itself simplified, and a free and unobstructed water-way in the passage *e* is afforded from one chamber to the other, which renders the flow smooth and rapid and reduces noise or gurgling.

Referring to Figs. 1, 2, 3, and 4, it will be seen that the shelf *y* has a lateral lug *y'*, through which the rod *n* of the valve *g* is guided, and above this lug a cushion-tube *n'*, of rubber or other material, is slipped, forming a buffer or cushion, which cushions the fall of the lever *m'* and renders it noiseless, or nearly so.

Turning to Figs. 1, 4, and 5, it will be observed that the shelf *y* is secured at each end on the rim of the tank *a*, but the middle portion is depressed slightly down into the tank, or below the level of the rim, so that consequently any drip from the supply-valve will be sure to trickle into the tank. It may be also observed from these figures that the supply-valve *v'* is secured to a small metallic bracket *w*, which is secured to the shelf by a bolt *w'*, and it will be seen that the shelf is provided with a number of bolt-holes y^2 in different positions, so that the bracket, with its valve, may be attached at different positions on the shelf, according to that which will come most convenient in the location of the tank or suit the position of the water-supply pipe.

Bolt-holes y^2 are also shown at intervals on the rim of the tank, at any one of which the said bracket may be secured, thus providing great range in the position of attachment of the valve, which will be of great convenience in fixing the tank in place. The supply-valve *v* and its float *u* are presumed to be of any of the constructions usual in ball-cocks or float-valves.

The flooding-valve *g* is made in an ordinary way, as shown in the drawings, with a leather or other packing washer on its seating-face, with a thin nut below the same to hold it in place, and a weight *g'* on the top of the valve to render the valve sufficiently heavy to always tend to close firmly by its own weight.

It may be understood that the float *t* will operate with nearly as good effect if it were simply a hemispherical cup entirely open at the top, as indicated by dotted lines in Fig. 2,

instead of a sphere having a small leak or flooding hole at the bottom and an air-escape hole at the top. The essential thing, however, is to have an air-float secured to the valve, which is gradually filled and submerged by the water when the chamber *d* is flooded, with a leak-hole at the base and an air-escape at the top, and hence whether the air-escape is provided by an entirely open top or a small vent-hole is not very material; but the preferred construction is considered most efficient.

What I claim is—

1. In a water-closet tank, the combination, with a service box or chamber, of a flushing-pipe leading therefrom having a main and a minor orifice communicating with the service-box, with a manually-controlled valve governing the main orifice, and an auxiliary valve controlling the minor orifice governed by a perforated submergible air-chamber, substantially as herein shown and described.

2. In a water-closet tank, the combination, with a reservoir-chamber and a service-chamber, a valve controlling the passage of the water from one to the other, a flushing-outlet extending from the service-chamber to connect to the closet, and a main flushing-valve controlling said outlet, of an auxiliary flushing-outlet, a valve controlling the same, and a hollow submergible air chamber or float connected to said valve and having a leak-hole to permit the escape of air therefrom, substantially as and for the purpose set forth.

3. In a water-closet tank, the combination, with a flushing or service chamber, of the flushing-outlet *h*, having the main valve *i*, with the auxiliary outlet *r*, valve *s*, and perforated float *t*, substantially as and for the purpose set forth.

4. In a water-closet tank, the combination, with the chambers *c d*, having a communicating passage at the base, of a valve *g*, controlling said passage, a flushing-outlet *h* from chamber *d*, and valve *i* controlling the same, operative connections between said valves arranged to close one when the other is opened, auxiliary outlet *r*, valve *s*, and perforated float *t*, substantially as and for the purpose set forth.

5. In a water-closet tank, the combination, with a reservoir-chamber and a flushing-chamber, a valve for controlling the passage of water from one to the other, a flushing-outlet from the service-chamber, and a main flushing-valve controlling said outlet, of an auxiliary valve for producing a forewash, consisting of an outlet leading from the flushing-chamber to the flushing-pipe, with a hinged flap *s* covering said outlet, and a perforated air chamber or float *t* directly attached to said flap, substantially as herein shown and described.

6. In a water-closet tank, the flushing-outlet *h*, having its top adapted as a seat for the main flushing-valve, with the lateral auxiliary outlet *r*, an auxiliary valve controlling said outlet, and a perforated air-chamber connected to said auxiliary valve, substantially as set forth.

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Witnesses:
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JNO. E. GAVIN.