

UNITED STATES PATENT OFFICE.

WILLIAM McSHANE, OF ST. JOHN, CANADA, ASSIGNOR TO THOMAS McAVITY,
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FLUSHING-TANK.

SPECIFICATION forming part of Letters Patent No. 564,156, dated July 14, 1896.

Application filed May 7, 1894. Serial No. 510,421. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM McSHANE, a subject of the Queen of Great Britain, residing at St. John, Province of New Brunswick, and Dominion of Canada, have invented certain new and useful Improvements in Flushing-Tanks, of which the following is a specification.

My invention relates to improvements in tank-flushing apparatus designed for use in connection with water-closets, urinals, &c.; and it has for one of its objects to provide a novel, simple, and efficient means for controlling the discharge of water from the tank, so that said discharges will take place intermittently in an improved manner at definite periods.

Another object of the invention is to provide novel means whereby the flushing operation can take place automatically in an improved manner and at definite periods, or can take place at the will of the operator.

My improvements for effecting the above-mentioned objects will be fully understood from the following specification and claims, in connection with the drawings which form a part of the specification.

In the drawings, Figure 1 is a side elevation of my improved flushing apparatus, the water-tank being shown in section, and the valve, which by opening starts the siphon, closed, and the lower lever, which operates this valve directly, locked. Fig. 2 represents a similar view, the said valve being open and the said lower lever unlocked; and Fig. 3 is a transverse section of the water-tank, showing my improved apparatus in end elevation.

In carrying out my invention, I employ a water-tank A of usual or any improved pattern. Leading into this tank is a water-supply pipe *a*, provided with a cock *a'*, by means of which the flow of water into the tank can be regulated, and in this manner the period of time between the discharges of water from the tank is also regulated. A discharge-pipe *a²* leads from the tank to the closet or urinal, and connected with this discharge-pipe and with the tank is a siphon ejector-tube B, consisting of a U-shaped tubular portion *b* and an enlarged base portion *b'*, said base portion being formed with a tubulure *b²*, having a

valve *b³*, which is located below the water-level. It is necessary to raise and open this valve in order to start the siphon. The valve *b³* is applied on the side of the enlarged base portion *b'*, it being hinged to the plate D by means of an arm *b⁴*, the lower free end of which is curved upward and provided with an eye *b⁵*. The valve *b³* is connected to a float-lever C, having a float *c²* of any approved construction at one of its ends, and being hinged at its other end to a cylindrical arbor which extends out from one side of the tank-wall, as shown in Fig. 3. Connection is made between the valve and the lever C by means of a screw-threaded rod *c*, which is provided with a hook *c'* at its lower end, said rod being engaged by its hooking end with the eye *b⁵* of the valve, and having its screw-threaded shaft passed through the lever and adjustably secured to the same by nuts *c⁴*. In order to prevent the float *c²* rising until desired with the water, and thus prematurely discharging the tank, an upper locking and releasing lever E is employed. This lever is provided with a float *e*, adjustably connected to the lever by means of a threaded shank *e'*.

The lever E is of elbow form, and is provided with a stop-nose *e³*. This lever is pivoted at its angle on an arbor *d'*, which also extends from the wall of the tank, and adjacent to said arbor a stop-plate *d²* is provided, and against which the vertical arm of the lever E and also the nose *e³* respectively abut, and thus limit the upward and downward movement of said lever. The nose abuts against the stop-plate when the parts are in the position shown in Fig. 2, and the vertical arm of the lever abuts against it when the parts are in the position shown in Fig. 1. The lower end of the vertical arm of said lever is bifurcated or slotted, as shown at *e²*, so as to straddle the lever C in the manner illustrated in Fig. 3, and within the slot of said vertical arm, and above the lever C, is pivoted a self-adjusting locking-cam F, the lower end of which is curved, as indicated by *f*, and thereby is adapted to adjust itself and rest in a curved seat *c³*, formed in the upper edge of the curved depressed portion of the lever C. The arm of the lever E, by being slotted, guides the movements of the lever C, and likewise of

the cam F, and thus keeps them always in proper relation to each other.

The normal position of the various parts is as shown in Fig. 1, wherein the valve is closed, both levers are in their lowermost positions, and the lower one is locked with the cam F. Under this condition the water is introduced through the inner pipe *a* and rises in the tank until it is on a level with the upper float, whereupon it begins to elevate the upper float, and, as the lower lever is held down by the upper lever and cam, it will not be affected by the rising of the water until at this stage, when the upper float, by being thus elevated, causes the lever E to move on its pivot, so that its upper arm is thrown up on a greater inclination to the horizon, and its inner arm out of a vertical line. By this means the pivoted point of the cam is moved beyond the line of the vertical upward thrust of the lever C, and the locking device F caused to automatically adjust itself from the position shown in Fig. 1 to the position shown in Fig. 2, and thus release the lever C, so that the float at its end will be free to carry it up by the pressure of the water. This operation causes the valve *b*³ to open and start the ejector, which, when once started, will continue in operation until the entire tank is emptied, the ejection being effected by the siphon B, the lower end of which reaches near the bottom of the tank. The water having fallen in the tank by reason of the flushing action having taken place, the upper and lower levers assume their original positions, and the locking-cam drops into its seat and holds the lever C down for another flushing operation. The float *e* of lever E can be adjusted to regulate the level of the water in the tank, and the cock *a'* can be regulated to supply the water either slowly or rapidly, and thus the time between the discharges can be regulated as desired.

In Fig. 2 I have shown a lever G pivoted on a suitable support *g* of the tank A, and having its outer end connected by a chain *g'* to the locking-lever E, and its other end provided with an operating-chain *g*², which latter in practice will extend down within reach of a person using the closet or urinal. The chain *g*² may be provided at its lower end with a suitable handle or knob. By means of the auxiliary lever G and its adjuncts it will be seen that the closet or urinal can be flushed at the will of the user, which is very desirable, as it avoids the necessity of waiting for the water to rise in the tank to a sufficient height for raising the float *e*, attached to the locking-lever E, in order to flush the closet or urinal, for on unlocking the lever C and moving the lever E with the chain *g*² and lever G the float *e*² and lever C will open the valve *b*³ and effect the flushing of the closet when the tank is only partly filled.

When the auxiliary operating-lever G is employed, the locking-lever E might, disadvantageously, however, be dispensed with by

directly connecting said operating-lever G to the float-lever C. This latter construction is not so desirable as that in which the locking-lever is employed, for when the locking-lever E is provided the tank will not be emptied until it is almost filled with water, unless found desirable or necessary, and the flushing operation will not cease until the tank is almost entirely emptied.

It has also been found in actual practice that when the locking-lever is not employed the float on the operating-lever will begin to rise the moment the water reaches it, so that the valve by which the siphon is started will not be fully opened, but will be simply caused to leak, and consequently a sufficient volume of water is thereby not secured to cause the siphon to act suddenly and empty the tank; whereas by the use of the locking-lever E the float on the operating-lever C cannot rise until it is released by the water raising the float *e* on the said locking-lever, and when this occurs the float *e*² on the lever C will be raised forcibly, and the valve which enables the siphon to act completely opened at once.

What I claim is—

1. The combination of a siphon ejector-tube having a tubulure in its base portion, a lever provided with a float an adjustable rod connecting said lever with a valve which closes the tubulure, an auxiliary float-lever pivoted above the first-named lever and provided with a float at one end, a locking-cam pivoted to the vertical arm of the said auxiliary lever, and adapted to bear upon the lever which operates the valve, substantially as described.

2. The combination of a water-tank, a siphon ejector-tube, a valve, an upper lever, a locking-cam pivoted thereto a lower lever connected to the valve and formed with a seat to receive the locking-cam, substantially as described.

3. In a flushing apparatus, the combination of a water-tank, a siphon ejector-tube, a valve, an upper elbow-lever having its vertical arm slotted, a locking-cam pivoted therein, a lower float-lever upon which the locking-cam is adapted to bear, and to which the valve is connected, substantially as described.

4. The combination of a tank having inlet and outlet passages, a siphon ejector-tube provided with a valve, an upper locking float-lever bifurcated at or near its lower end and provided with a pivoted cam, a lower float-lever connected to the valve of the siphon-tube and moving in the bifurcation of the locking-lever, and means connected to the locking-lever and extended down within reach of the user of the apparatus whereby the apparatus can be operated either automatically or by hand, substantially as described.

5. The combination of a water-tank, a siphon-pipe within the tank connected by one of its ends to an enlarged tubular base-support and in direct communication through said

support with the outflow-passage of the tank, a tubulure in the side of the said base-support, a valve for closing the tubulure, a lever having a float applied to it and constructed
5 with a seat for a locking-cam, an elbow-lever having a float applied to it, a self-adjusting locking-cam applied to the elbow-lever and adapted for seating itself upon the first-mentioned lever, substantially as described.

10 6. The combination with a tank, of a float-lever provided with a nose, a stop-plate adapted to be engaged by said nose, a siphon-

tube, a valve for starting the siphon, a float-lever connected to the valve and having a seat formed therein, a connecting-link between 15 the float-levers, and a pivoted cam carried by said link and adapted to adjust itself in and out of the seat in the lever connected to the valve, substantially as described.

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Witnesses:

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