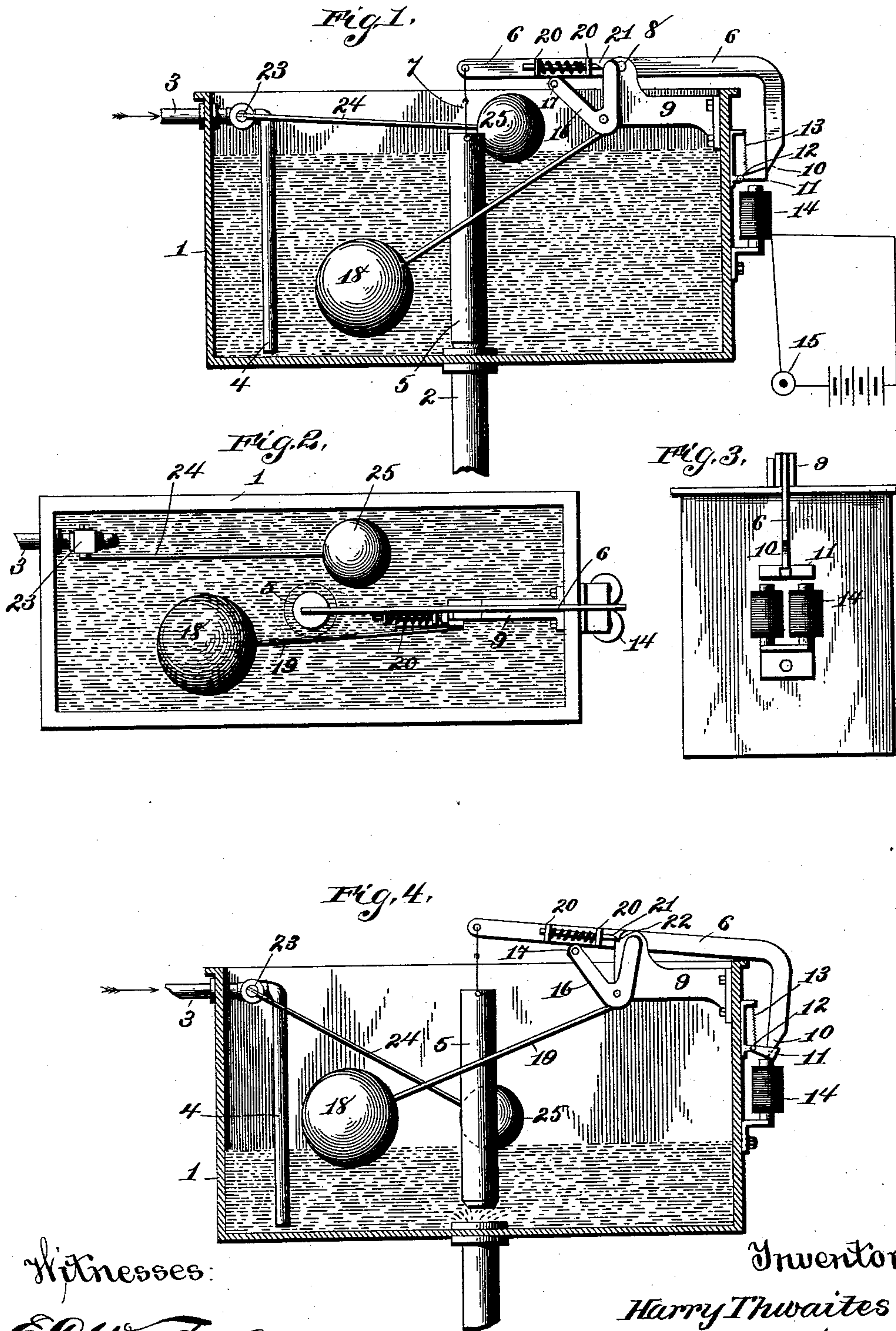


(No Model.)

H. THWAITES.
FLUSH TANK.

No. 568,995.

Patented Oct. 6, 1896.



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UNITED STATES PATENT OFFICE.

HARRY THWAITES, OF PHILADELPHIA, PENNSYLVANIA.

FLUSH-TANK.

SPECIFICATION forming part of Letters Patent No. 568,995, dated October 6, 1896.

Application filed March 25, 1896. Serial No. 584,742. (No model.)

To all whom it may concern:

Be it known that I, HARRY THWAITES, 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 Flush-Tanks, of which the following is a specification.

My invention relates to a new and useful improvement in flush-tanks, and has for its object to provide a device which will be under the control of an electric circuit operated by a push-button, and so arranged as to deliver a large quantity of water for flushing purposes and then automatically refill the tank and finally cut off the water supply.

With these ends in view my invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction and operation in detail, referring by number to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a central vertical section of a tank having my improvement applied thereto; Fig. 2, a plan view of the same; Fig. 3, an end view showing the relative position of the magnets and armature; and Fig. 4, a view similar to Fig. 1, showing the mechanism in the position assumed when the magnets have been vitalized and the stand-pipe withdrawn from its seat, permitting the water within the tank to flow to the exit-pipe.

Similar numbers denote like parts in the several views of the drawings.

Heretofore some difficulty has been experienced in the operation of flush-tanks by chain-pulleys from the fact that the chain or pull is liable to become entangled or caught with surrounding objects, which would prevent the operations of the several floats to bring about the desired results, and a further disadvantage to the tanks usually in use is that the pull may be held so as to cause a continuous flow of water after the tank has been emptied, which in many cases is very disadvantageous in that a large waste of water is occasioned, and when this has to be pumped

it becomes an item of expense. These disadvantages I have overcome in the following manner:

1 represents the tank, which may be of any ordinary construction and size, from which leads an outlet-pipe 2, and a supply-pipe 3 enters the tank at the top and terminates in an extension 4, the lower end of which leads to the bottom of the tank. The upper end of the outlet-pipe is flared to form a valve-seat adapted to receive the lower end of the stand-pipe 5, which is made cornucopia in shape, so as to serve as a valve. The upper end of the stand-pipe is connected to the lever 6 by means of the links 7, and this lever is pivoted at 8 to a suitable bracket 9, which is bolted to the tank. The outer end of the lever 6 is bent downward at right angles to the body thereof and is beveled to form a toe 10, which latter is adapted to engage the outer edge of the armature 11. This armature is pivoted at 12 to lugs projecting from the tank and given an upward tendency by means of the spiral spring 13, and is also within the magnetic field of the electromagnets 14. These magnets are included within an electric circuit provided with a suitable battery or other supply source and a push-button 15, which latter may be located in any convenient place within easy access of the operator.

16 is a bell-crank lever, which is also pivoted to the bracket 9 and having journaled in the end of one of its members a suitable roll 17, so arranged as to be swung into contact with the under side of the lever 6, and this bell-crank is operated by a float 18, connected thereto by the rod 19. Guided within the ears 20, projecting from one side of the lever 6, is a spring-actuated dog 21, the nose of which is adapted to engage with a suitable notch 22, formed in the bracket 9, and one of the members of the bell-crank lever in its swing is arranged to come in contact with the nose of the dog and force it out of engagement with the notch 22, for the purpose hereinafter set forth. The supply-pipe 3 is provided with a stop-valve 23, which is connected by the rod 24 to a float 25, so that as the water falls in the tank this float will open the valve and permit a new supply of water to flow within the tank, and the latter, as its level is increased therein, will raise the float and

finally cut off the supply, as is well understood.

From this description the operation of my improvement will be obviously as follows:

5 The stand-pipe 5 being in the position shown in Fig. 1 will serve as a valve to prevent the outflow of the water contained within the tank, and the engagement of the toe 10 with the armature will hold the lever 6 in its horizontal position, thereby preventing the upward movement of the float 18, since one member of the bell-crank lever, to which this float is attached, bears against the under side thereof, and when it is desired to permit the water to flow out of the tank for flushing purposes it is only necessary to close the circuit by pressing upon the push-button, which will energize the magnets, causing the armature to be attracted to the bolts thereof, which will free the lever 6 by the disengagement of the armature from its nose and permit said lever to be forced upward to the position shown in Fig. 2 by the buoyancy of the float 18, and this upward movement of the lever will lift the lower end of the stand-pipe, which serves as a valve, from off the seat formed in the upper end of the outlet-pipe, thereby permitting the water within the tank to flow rapidly through said outlet-pipe, accomplishing the usual results in flushing. When the lever 6 is first moved upward, as just described, the dog 21 will snap into engagement with the notch 22, thereby holding said lever in this position after the withdrawal of the support afforded by the bell-crank lever, and this support will be withdrawn when the level of the water has fallen sufficiently to permit the downward movement of the float 18, which by its continued downward movement will cause one of the members of the bell-crank lever to force back the spring-actuated dog 21, thereby releasing the lever 6, which will permit the stand-pipe to drop, and the lower end thereof will close the outlet-pipe, thus shutting off the flow of water. As the level of the water falls in the tank the float 25 will also descend, thus opening the valve 23 and permitting a fresh supply of water to enter the tank, which, after the outlet-pipe has been closed as just described, will refill the tank, during which process the float 25 will be carried upward, gradually closing the valve 23 and finally shut off the supply of water. Also, as the water rises in the tank, the float 18 will be carried upward, bringing the roll 17 into contact with the under side of the lever 6, but as the latter has been previously locked in its horizontal position by the armature springing upward into engagement with the nose thereof the float will be prevented from rising to a higher level until the circuit has been again closed, with the results before described.

One of the advantages of my improvement

is that when applied to a number of tanks, as in a large building, each tank may be brought into operation and caused to perform its function of flushing from a central station, such as the janitor's or engineer's room, by the movement of a single switch the advantages of which will be well understood. It is also adapted to be operated from the door and closet-seat.

Having thus fully described my invention, what I claim as new and useful is—

1. In combination with a flushing-tank, inlet and outlet pipes, a stand-pipe having its lower end serving as a valve to close the outlet-pipe, a lever to which the valve is attached, a bracket to which the lever is pivoted, a spring-pressed dog secured on the lever adapted to engage a notch in the bracket, a bell-crank lever pivoted to the bracket, a roll journaled in the end of one of its members to engage the under side, a float for operating the bell-crank lever and an electromagnet for releasing the lever, as and for the purpose described.

2. In combination with a flush-tank, an inlet-pipe and an outlet-pipe, a stand-pipe, the lower end of which serves as a valve to close the outlet-pipe, a lever to which said valve is attached, a float adapted to give said lever a tendency to swing, an armature for locking said lever against said tendency, an electromagnet for withdrawing said armature from said lever, a dog for locking said lever in an elevated position when swung upward, and means for returning the several parts to their normal position, as shown and described.

3. The herein-described combination of a flush-tank, the inlet and outlet pipes thereof, a float for controlling the inflow of water through said inlet-pipe, a stand-pipe having a valve formed upon its lower end, adapted to close said outlet-pipe, the lever 6, to which said stand-pipe is connected, a bracket to which said lever is pivoted, the bell-crank lever 16 pivoted to said bracket, a spring-actuated dog 21 secured to the lever 6 and adapted to engage a notch formed in said bracket, the float 18 connected to the said bell-crank lever whereby the latter is adapted to give the lever 6 a tendency to swing and to release said dog from said notch, a spring-actuated armature adapted to lock the lever 6 against its tendency to swing, an electromagnet for disengaging said armature from said lever, and an electric circuit for energizing said magnet, substantially as and for the purposes set forth.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

HARRY THWAITES.

Witnesses:

S. S. WILLIAMSON,
ALLISON W. McCURDY.