No. 642,165. Patented Jan. 30, 1900.

W. H. SCHULTE.

FLUSH TANK VALVE MECHANISM.

(Application filed Mar. 31, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

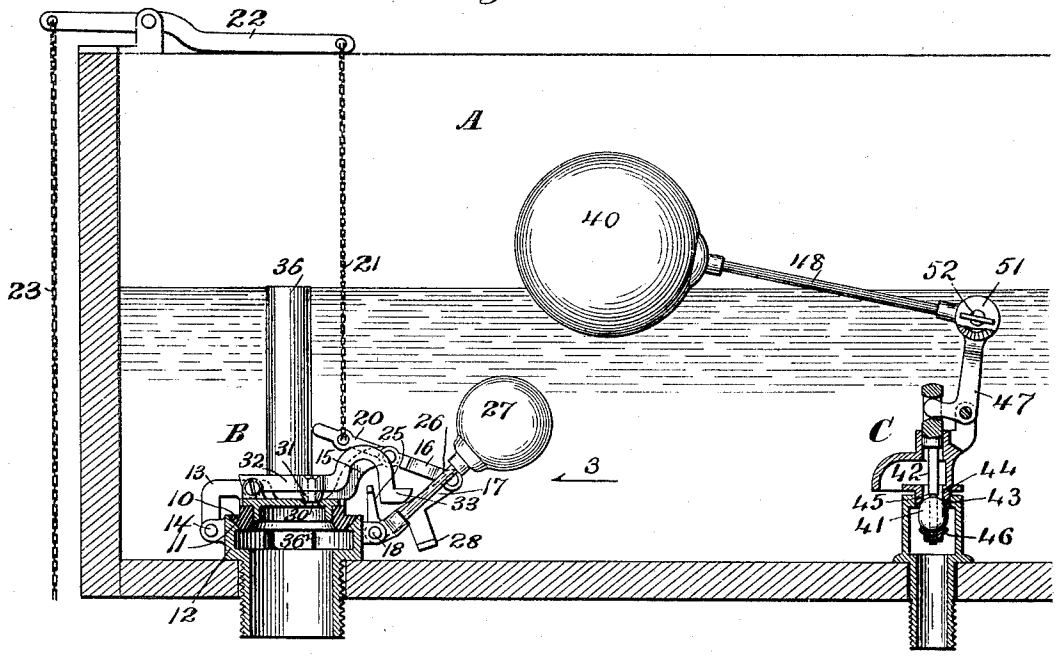


Fig. 2.

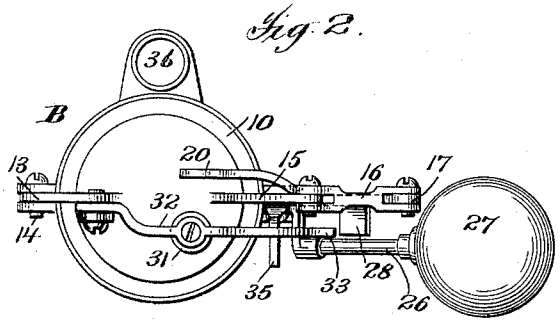
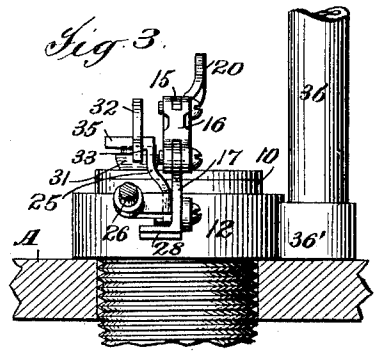


Fig. 3.



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No Model.) 2 Sheets—Sheet 2.

Fig. 4.

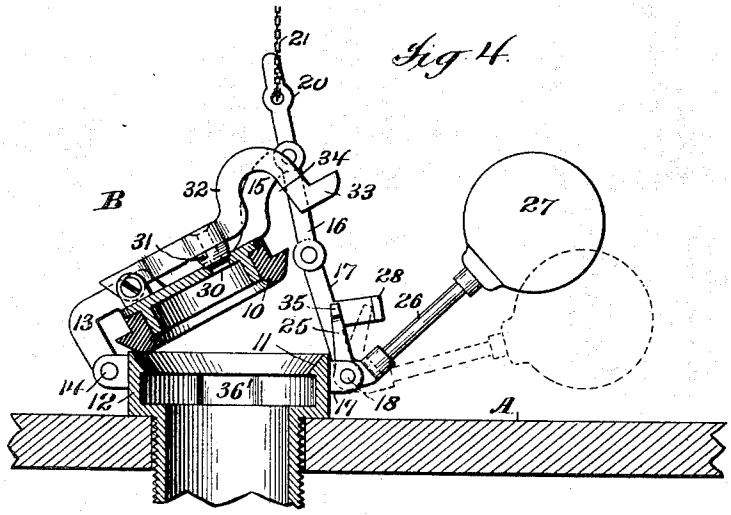


Fig. 5.

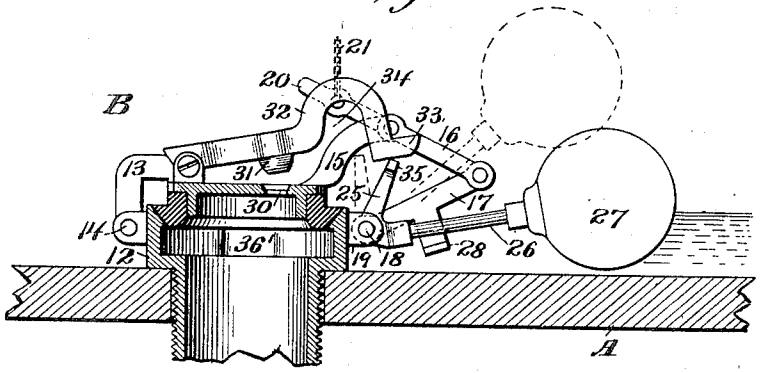
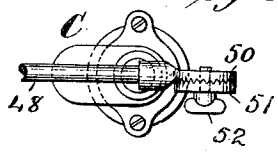


Fig. 6.



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UNITED STATES PATENT OFFICE.

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FLUSH-TANK VALVE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 642,165, dated January 30, 1900.

Application filed March 31, 1899. Serial No. 711,206. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SCHULTE, a citizen of the United States, residing at Trenton, county of Mercer, and State of New Jersey, have invented certain new and useful Improvements in Flush-Tank Valve Mechanisms, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is generally to provide a simple and efficient valve mechanism for flush-tanks for water-closets or for use in other connections.

The invention aims especially to provide an improved means for holding the outflow-valve open during the main outflow without the use of catches or parts likely to be uncertain in operation or to become worn in use and to provide an improved means of securing a supplementary reduced outflow after the closing of the main outflow-valve.

To these ends the invention consists in various constructions, arrangements, and combinations of parts, all of which will be fully described in connection with the accompanying drawings, showing a preferred construction embodying the various features of the invention, and afterward specifically pointed out in the claims.

Referring to said drawings, Figure 1 is a sectional view of a flush-tank provided with my improved valve mechanism. Fig. 2 is a plan view of the flushing-valve mechanism. Fig. 3 is an elevation of the same looking in the direction of the arrow 3 in Fig. 1. Fig. 4 is a side veiw, partly in section, of the same, showing the main valve open. Fig. 5 is a similar view showing the main valve closed and the supplementary flow-opening open. Fig. 6 is a plan view of the adjustable float connection.

Referring to said drawings, A represents a tank of any suitable construction, B the flush-valve mechanism, and C the inlet-valve mechanism. Of the flush-valve mechanism, 10 is the main valve, which closes on a seat 11 on the upper end of the fitting 12, forming the outlet. The main valve is carried by an arm 13, pivoted at 14, and carries at its opposite side a forwardly-extending arm 15, to which is pivoted a link 16, which in turn is pivotally connected to a link 17, the other end of which is pivoted at 18 to a stationary part, as to lugs 19 on the fitting 12. The links 16 and 17 are preferably arranged as shown, so as to form a toggle-like connection between the pivoted valve and a stationary part of the mechanism, which when the valve is in its closed position, as shown in Figs. 4 and 5, is broken outward and which when straightened opens the valve, throwing it upward to the position shown in Fig. 4, and the parts are arranged so that the links when straightened may be moved slightly past the dead-center, as shown in Fig. 4, so as to lock the valve open until force is applied to the links to break the toggle outward. Too great a movement of the links inward after passing the dead-center is prevented by means of a suitable stop, as the edge of the fitting 12, with which the link 17 contacts, as shown. For straightening the toggle for opening the valve the link 16 is preferably extended above the point of connection with the valve-arm 15, and this extension 20 is connected, as by the chain 21, to one arm of a lever 22, to the other arm of which is connected the pull-chain 23, so that a pull on the chain 23 will draw the links 16 and 17 from the position shown in Fig. 1 to that shown in Fig. 4, the arm 20 extending in such direction from the point of the connection of the link 16 with the valve-arm 15 that when the toggle has been straightened the pull of the connecting-chain 21 will still tend to throw connecting ends of the links 16 and 17 inward, so as to move them past the center, and thus lock the valve open.

The toggle is broken for the closing of the valve after the desired outflow by means of a lever-arm 25, preferably pivoted at 18, to which is connected the arm 26, carrying a float 27, so that as the float descends the arm 25 will be moved outward and engaging a lug or offset 28 of the link 17 will break the toggle outward and the valve will fall onto its seat 11.

The valve 10 has a supplementary flow-opening 30, which is normally closed by means of a valve 31, carried by an arm 32, which moves with the valve 10, being preferably pivoted thereto, as shown, and this arm 32 has at its outer end a toe 33, in the rear of which the arm is cut away or extended upward, as shown at 34, and which toe 33 is in position to en-

gage a stop 35, carried by the arm 25, as the main valve moves downward and just before it has reached its seat 11.

36 is a safety overflow-pipe connecting with the outlet at 36′ below the valve-seat 11.

The operation of this valve mechanism is as follows: The parts being in the position shown in Fig. 1, when the chain 23 is pulled for opening the valve the toggle formed by the links 16 and 17 will be straightened and the valve 10 thrown upward to and be locked in the position shown in Fig. 4 to permit the water to flow from the tank. The valve will remain open until the level of the water in the tank has dropped so as to permit the float 27 to fall from the position shown in full lines in Fig. 4 to that shown in dotted lines. The arm 25 will then have engaged the lug 28 on the link 17, and the outflow of water continuing further downward movement of the float 27 will cause the arm 25 to move the link 17 to carry the point of connection of the links 16 and 17 past the dead-center and to permit the valve to close, as before explained. As the valve moves downward the toe 33 on the arm carrying the supplementary valve 31 will before the main valve reaches its seat come onto engagement with the stop 35 and be held in the position shown in Fig. 5, so that when the main valve 10 has dropped onto its seat 11 the supplementary valve-opening 30 will be opened to permit a reduced supplementary flow of water through the outlet. Meanwhile the inlet-valve has been opened, as hereinafter described, and the water now begins to rise in the tank, the inflow being greater than the outflow, through the valve-opening 30. The supplementary outflow through opening 30 will continue until the water has risen in the tank so as to carry the float 27 upward far enough to move the arm 25 to carry the stop 35 beyond the toe 33, as shown in dotted lines in Fig. 5, whereupon the arm 32 will drop and the opening 30 be closed by the valve 31. The parts will thus be returned to the position shown in Fig. 1 and the outflow entirely stopped.

So far as the flushing-valve construction is concerned the inlet-valve mechanism may be of any suitable construction, but is shown as controlled by means of a float 40, arranged to close the valve when the water has risen to the desired level in the tank. The valve proper, 41, is carried by a reciprocating stem 42 and closes on a seat 43 on the inlet side of the valve-opening 44 and is preferably formed of a bulb of suitable elastic material having a central bore to receive the end of the stem 42, on which it is held against a shoulder 45 by a nut 46. The stem 42 is reciprocated for opening and closing the valve by a bell-crank lever 47, one arm of which extends within an opening in the upper end of the valve-stem and to the other arm of which is secured the stem 48 of the float 40 by an adjustable connection permitting the float to be adjusted with relation to the lever 47, so that the valve may be set to close when the water has reached any desired level in the tank. For securing such an adjustable connection the valve-stem 48 and the bell-crank lever 47 are provided with opposed engaging plates or disks 50 and 51, respectively, having their engaging surfaces formed with radial serrations and held in engagement with their serrations interlocking by means of a clamping-screw 52. By loosening the screw 52 the float and float-stem may be readily moved into the desired position with relation to the lever 47 and when the screw is tightened will be securely held in this position.

It will be understood that I am not to be limited to the exact construction and arrangement of parts shown for the purpose of illustrating the invention and to which the foregoing description has been mainly confined, but that the construction includes changes and modifications thereof within the claims.

What is claimed is—

1. The combination of a pivoted valve 10, links 16 and 17 forming a toggle, the link 16 being connected to the valve and having an extended end 20, connections between the end 20 and an operating member, a movable member, and a float for controlling the movement of said movable member to cause it to engage one of said links as the float moves downward to break the toggle for the closing of the valve, substantially as described.

2. The combination of a pivoted valve 10, links 16 and 17 forming a toggle, the link 16 being connected to the valve, means for straightening the toggle to open the valve and for moving the joint of the toggle past the center to lock the valve in its open position, pivoted arm 25, float 27 for moving the arm to cause it to engage the link 17 as the float moves downward to break the toggle for the closing of the valve, substantially as described.

3. The combination of a main outflow-valve having a supplementary flow-opening through the valve, a valve for closing said opening mounted to move with the main valve, means for opening and closing the main valve, a member for engaging a part connected with the supplementary valve as the main valve closes, and a float for moving said member to release said part for the closing of the supplementary valve, substantially as described.

4. The combination of a main outflow-valve having a supplementary flow-opening through the valve, a valve for closing said opening mounted to move with the main valve, means for opening and closing the main valve, a member for engaging a part connected with the supplementary valve as the main valve closes, and means for automatically moving said member to release said part for the closing of the supplementary valve, substantially as described.

5. The combination of a pivoted valve 10 having a supplementary flow-opening 30, supplementary valve 31 for closing said opening

carried by a pivoted arm 32 having a toe 33, means for opening and closing the valve 10, a movable stop for engaging the toe 33 as the valve 10 moves toward its seat, and a float and connections for moving said stop out of engagement with the toe 33, substantially as described.

6. The combination of a pivoted valve 10 having a supplementary flow-opening 30, supplementary valve 31 for closing said opening carried by a pivoted arm 32 having a toe 33, links 16 and 17 forming a toggle, the link 16 being connected to the valve 10, means for straightening the toggle to open the valve and for moving the joint of the toggle past the center to lock the valve in its open position, pivoted arm 25 having a member forming a stop to engage the toe 33 as the valve 10 moves toward its seat, and a float and connections for moving the arm 25 to engage the link 17 as the float moves downward to break the toggle for the closing of the valve 10 and for moving said arm in the opposite direction as the float moves upward to carry the stop out of engagement with the toe 33 for the closing of the supplementary valve, substantially as described.

7. In a flush-tank valve mechanism, the combination of pivoted outflow-valve 10, operating-links 16, 17 between said valve and a support, connections between said links and an operating member for opening the valve and moving the joint of the links past the center to lock the valve in its opened position, a float, and connections between said float and the links for moving the links to unlock the valve for closing the latter as the float moves downward, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. H. SCHULTE.

Witnesses:
E. L. FINE,
WM. H. KNOWLES.