M. AINSWORTH.

FLUSHING TANK.

APPLICATION FILED DEC. 21, 1914.

1,151,148. Patented Aug. 24, 1915.

Fig. 1.

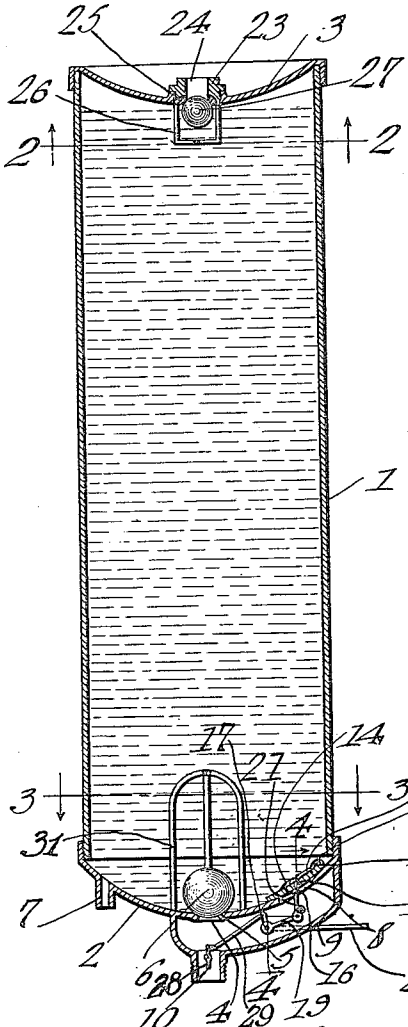


Fig. 2.

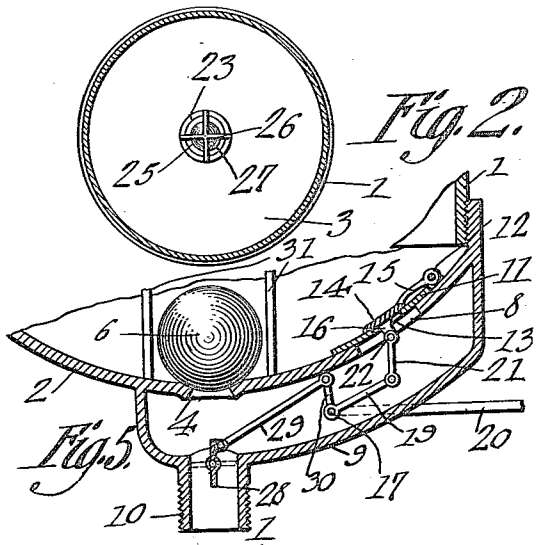


Fig. 5.

Fig. 3.

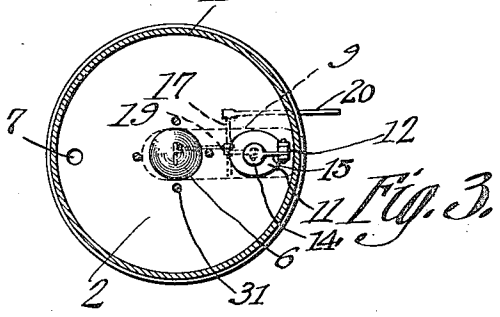
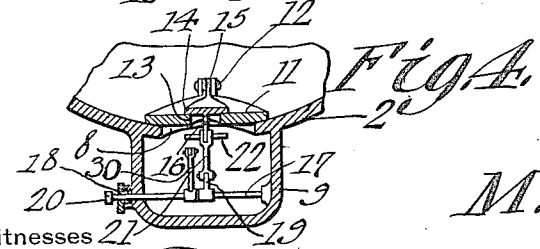


Fig. 4.



Witnesses

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FLUSHING-TANK.

1,151,148. Specification of Letters Patent. Patented Aug. 24, 1915.

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To all whom it may concern:

Be it known that I, MARK AINSWORTH, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Flushing-Tank, of which the following is a specification.

The present invention appertains to flushing tanks, and aims to provide a novel and improved flushing tank for water closets.

This invention contemplates the provision of a flushing tank of simple construction and operation, which will be comparatively noiseless in operation, and which will not be likely to get out of order, the present invention aiming to avoid the objections existing in ordinary flushing tanks.

Another object of the invention, is to provide a flushing tank having unique means for controling the discharge of the water therefrom.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in its preferred embodiment in the accompanying drawing, wherein:—

Figure 1 is a central vertical or longitudinal section of the improved flushing tank. Figs. 2 and 3 are cross sections taken on the lines 2—2 and 3—3, respectively, of Fig. 1. Fig. 4 is an enlarged sectional detail taken on the line 4—4 of Fig. 1. Fig. 5 is a sectional detail illustrating the parts at the lower portion of Fig. 1 on an enlarged scale.

In carrying out the invention, the body 1 of the tank is preferably of cylindrical form, and is also preferably in the form of a sheet metal shell, although the tank may be of various constructions. The bottom and top, or upper and lower ends, of the tank, designated 2 and 3, respectively, are preferably dished or rounded, and have their rims threaded or otherwise engaged over the ends of the body or shell 1.

The dished or concaved bottom 2 is provided with a central outlet opening 4, the edge portion of which is bent downwardly to provide a valve seat 5, for the buoyant hollow ball valve 6 confined within the tank. The concavity or curvature of the bottom 2 facilitates the movement or rolling of the ball valve 6 to opening 4 when the tank is emptied, and in order that the opening 4 will then be closed by the valve. The bottom 2 is also provided at one side of the opening 4, with a depending inlet nipple 7 for the attachment of the end of the water supply pipe, the water being supplied into the tank under pressure, and without the necessity of employing a valve in the water supply pipe.

Opposite to the inlet nipple 7, the bottom 2 is provided with an opening 8 at the opposite side of the outlet opening 4, and a discharge or outlet chamber 9 is secured to the lower side of the bottom 2 below the opening 4 and aperture or opening 8, the chamber 9 being provided with a depending outlet or spout 10 below the opening 4, to serve as a means for connecting the outlet of the tank to the hopper or bowl. The chamber 9 is preferably curved downwardly from below the opening or aperture 8, to a point below the opening 4, so that the chamber 9 will be lowest below the outlet opening 4 of the tank.

A flap valve 11 is hinged, as at 12, to the bottom 2 adjacent the aperture 8 and is arranged to swing snugly upon the bottom 2 over the said aperture, for providing a check valve closure for the said aperture, which is seatable downwardly to be normally closed by the pressure of the water within the tank. The valve 11 is provided with an aperture or opening 13 over which a supplemental or auxiliary flap valve 14 is pivotally mounted to seat upon the valve 11 over the aperture 13 for normally closing the said aperture. The valve 14 is provided with a stem 15 pivotally connected to the hinge 12, so that the valves 11 and 14 swing about the same center or axis. The supplemental or auxiliary valve 14 in reality constitutes a portion of the valve 11, to close the opening or aperture 8. The auxiliary valve 14, however, enables the aperture 13 of the valve 11 to be opened for bringing the apparatus into operation, the valve 14 being of relatively small area so that it can readily

be swung open against the pressure of the water within the tank, and which will then enable the valve 11 to be readily opened.

The valve 14 is provided with a projection 16 depending therefrom and extending through the aperture 13 of the valve 11. An actuating mechanism is provided for opening or unseating the secondary valves 11 and 14, and to this end, a rock shaft 17 is journaled through the intermediate portion of the chamber 9, the chamber 9 having packing means 18 surrounding the shaft 17 to prevent leakage, and lever arms 19 and 20 are secured to the shaft 17 interiorly and exteriorly of the chamber 9, respectively. The arm 19 of the actuating lever is operatively connected to the valves 11 and 14, and to this end, a link 21 is pivoted to the inner arm 19 of the lever, and to the lower or free end of the projection 16 of the valve 14, the pivot pin 22 between the link 21 and connection 16 being extended, as clearly seen in Fig. 4, and being normally spaced below the valve 11 when the valves 11 and 14 are seated, so that the pin 22 provides means engageable with the valve 11 when the valve 14 is raised, so as to then raise the valve 11 with the valve 14.

The upper end of the tank may be provided with any suitable means for admitting air thereinto, when the water is to be discharged during the flushing action, and as a simple means for carrying out this result, a plug 23 having an air vent opening or bore 24 is threaded or otherwise engaged through the top 3 of the tank, and has a lower valve seat 25, and a depending spider or cage 26 inclosing and guiding a buoyant hollow ball 27. Thus, when the tank is filled with water, the buoyant ball valve 27 will be raised when the level of the water reaches the upper end of the tank, so that the valve 27 will be seated under the opening or aperture 24, for preventing the escape of the water and further escape of air and to thereby prevent the further filling of the tank and create an air cushion at the upper end of the tank for assisting in the rapid discharge of the water when the lower valves are opened.

As a means for retaining the water within the chamber 9 when the valves 11 and 14 are opened, a butterfly valve 28 is journaled or pivotally mounted within the outlet spout 10 of the chamber 9, and is operatively connected to the lever 19—20 by means of a link 29 pivoted at one end to one wing of the valve 28, and pivoted at its other end to an arm 30 secured properly upon the rock shaft 17. When the shaft 17 is swung to close the valves 11 and 14, the valve 28 will be swung to open position, as seen in Figs. 1 and 5, and when the lever is swung to open the valves 11 and 14, the valve 28 will be swung to closed position for impeding the discharge of water from the chamber 9 through the outlet spout 10 thereof. An upstanding cage 31 is secured upon the bottom 2 over the outlet 4 and incloses the ball valve 6 to hold the same adjacent the valve seat 5, and to enable the ball valve 6 to raise for a limited distance above the outlet 4.

In operation, supposing the inlet nipple 7 of the tank to be connected to a water supply pipe, the ball valve 6 and flap or check valves 11 and 14 will normally be seated over the respective openings 4, 8 and 13, to prevent the discharge of the water, and the tank being filled with water, will cause the valve 27 to be seated for closing the aperture or vent 24. The pressure of the water within the tank will hold the valves seated to prevent any accidental or premature discharge of the water. When it is desired to discharge the water from the tank, for the flushing operation, the outer arm 20 of the actuating lever is raised or swung upwardly, which will raise the link 21 to thereby raise or unseat the auxiliary secondary valve 14, and allow the water to start down through the aperture 13 and thereby fill the chamber 9, the valve 28 being closed, so as to relieve the valve 11 of the pressure of the water. The valve 14 being small, may be readily forced against the pressure of the water, and when the pressure of the water is relieved, by the unseating of the valve 14, the valve 11 will be readily opened or unseated by the engagement of the pin 22 therewith during the upward movement of the link 21 through the opening or aperture 8. As a result of the opening of the valves 14 and 11, the water will flow downwardly through the secondary opening or aperture 8 into the chamber 9, and will be momentarily held in the said chamber by the valve 28, and this will result in relieving the pressure upon the main valve 6, so that the same will rise within the cage 31. The lever is then released so that the valves 11 and 14 will return to closed position and the valve 28 to open position, and the water will then be discharged through the outlet 4 and spout 10. It is to be noted in this connection, that when the water is being discharged, the valve 27 will drop within the cage 26, to admit air through the aperture 24, so as to enable the water to flow rapidly from the tank. As soon as the tank is emptied, the ball valve 6 will be brought to the opening 4, and the water in rushing into the tank through the nipple 7, will fill the tank, and the pressure or weight of the water will hold the valve 6, as well as the valves 11 and 14, seated.

The present device operates in a simple and practically noiseless manner, and is not liable to get out of order, as is the ordinary flushing tank. The present flushing tank is also comparatively inexpensive to manufac-

ture, and is otherwise desirable for practical reasons.

Having thus described the invention, what is claimed as new is:—

A flushing tank having main and secondary outlets and a discharge chamber below said outlets having an outlet spout, a buoyant valve seatable over the main outlet, a flap valve normally seated over the secondary outlet, a normally opened butterfly valve pivoted within said spout, and a rock shaft journaled through one side of said chamber and linked to the flap and butterfly valves for simultaneously opening one of them and closing the other.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MARK AINSWORTH.

Witnesses:

B. BETZER,

C. BETZER.