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FLOAT VALVE FOR FLUSH TANKS

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WITNESSES

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FLOAT VALVE FOR FLUSH TANKS.

To all whom it may concern:

Be it known that I, JOSEPH M. FLEMING, a citizen of the United States, and a resident of Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Float Valves for Flush Tanks, of which the following is a specification.

This invention relates to flush tanks and bas for its object the provision of a device which is simple in construction and noiseless in operation.

A further object of the invention is the provision of a device having a float controlled valve for admitting water to a flush tank and adapted to control an inlet port, the inlet port being of sufficient proportions to freely admit water to the tank with the valve having an instantaneous closing action as it nears the closing position.

Another object of the invention is the provision of a device having the valve seat for the inlet valve constructed of glass and the supporting parts for the inlet valve so formed that said valve and the supporting parts are bodily removable from the tank.

A still further object of the invention is the provision of a noiseless float valve and an improved bowl refilling pipe which may be readily substituted for similar parts of the well-known constructions now in use.

Other objects and advantages will appear during the course of the following description.

The invention is illustrated by way of example in the accompanying drawings, in which,—

Figure 1 is a sectional view of the tank showing a flush ball in closing position.

Figure 2 is a transverse horizontal section of the same.

Figure 3 is a sectional view of the supply pipe and the inlet valve casing.

Figure 4 is a fragmentary view in section of the flush ball valve seat.

Figure 5 is a view in perspective of the removable bracket for supporting the trip lever.

Referring to the drawings, 1 designates a flush tank and 2 a cover for the same.

A threaded inlet pipe 3 is integrally formed with a valve chamber 4 and is screwed into a threaded opening in the bottom 5 of the tank 1. A plug 6 forming a baffle is threaded into the upper open end of the inlet pipe and provided with diametrically disposed perforations 7. A central passage 8 in the plug connects the perforations with the inlet pipe 3.

The chamber 4 where integrally formed with the inlet pipe 3 forms a shoulder which engages the bottom 5 of the tank. Nuts 9 and 10 draw the chamber 4 tight against the bottom 5 and lock the members 3 and 4 to the tank.

A union 11 connects the threaded end of the inlet pipe 3 with the threaded end of a supply pipe 12 which is in turn connected with a source of water supply.

The extreme upper end of the valve chamber 4 is open and externally threaded to receive the internally threaded nut 13 which has upwardly extending arms 14 and 15 forming a bracket. The arms 14 and 15 are provided with laterally extending and integrally formed members 16 in which is mounted a pin 17. A bridge 18 connects the upper ends of the arms 14 and 15 where the laterally extending members are formed integrally with the said arms.

The nut 13 is provided with an annular flange 19 adapted to engage the horizontal flange of the conical glass seat 19 and clamp the same on the upper end of the valve chamber 4. The lower end of the conical seat 19 is open and adapted to be engaged by a rubber gasket 20 of the cup-shaped valve 21 which threadedly engages the stem 22. The stem is slidable in a guide 23 formed at the center of a web connected to the inner wall of the nut 13. The gasket is of sufficient diameter to embrace the open end of the cone 19 and prevent water from entering the tank 1 when the tank has a sufficient depth of water to raise the float 24.

A trip lever 25 is pivotally mounted on the pin 17 intermediate its ends and is provided at one end with a yoke 26 straddling the valve stem 22 and engageable with a stop or trip ring 27 rigidly secured to said stem.

The outer end of the trip lever is connected by a link 28 to a flush ball lever 29. This lever is pivotally mounted at 30 on a side wall of the tank 1. The outer end of the lever is extended parallel to said side wall and is adapted to be engaged by an angular extension of an operating shaft 31. A hand grip 32 is connected to that portion of the shaft 31 which extends outside of the flush tank. On the extreme upper end of the shaft 31 which extends outside of the flush tank. On the extreme upper end of the shaft 31.
is adapted to be elevated or lowered as the water in the tank rises or falls. An outlet port is formed in the bottom of the tank and is connected with a flush pipe. A flaring flush ball seat is connected with the port upon which is adapted to seat the usual flush ball. The seat is provided with a shoulder which passes through and is seated on a washer. Nuts lock the seat to the flush pipe and to the bottom of the flush tank.

An overflow pipe is connected to an offset socket formed integrally with the seat and its axis is parallel with the axes of the outlet port and the inlet pipe. A passage connects the overflow pipe with the outlet port. As shown in Figure 1, the upper end of the overflow pipe is located at the water level in the tank. A perforation is provided in the overflow pipe to admit water to said pipe for filling the usual bowl of a toilet. The flush ball is provided with a stem which has a sliding connection with a link, the link being connected to the inner end of the flush ball lever. As shown more particularly in Figure 2, the lever is curved inwardly towards the overflow pipe whereby the link will have a vertical movement in order to properly seat the flush ball.

The operation of my device is as follows: As shown in Figure 1, the tank is filled with water with the flush ball valve located on its seat and the valve member is held against the glass seat of the inlet pipe by the pressure of the water in said pipe. When the handle is actuated and one end of the lever is depressed, the gasket will be forced away from the seat since elevation of the inner end of the lever will raise the link, the outer end of the trip lever and cause the yoke of the trip lever to force the valve stem downwardly by reason of the engagement of the yoke with the stop. A continued elevation of the inner end of the lever will cause the eye of the link to engage the eye of the stem and raise the flush ball from its seat thereby releasing water from the tank. Continued lowering of the water in the tank will permit the ball to return to its seat and close the main outlet from the tank to the pipe. Since valve 20 has been removed from its seat in the lower end of member 19, water from the usual source of supply to the house is flowing into tank 1 through the opening in the member 19. The float 24 is elevated with the rise of the water in the tank and when the float reaches the position shown in Figure 1 and the water is at the level 40 and at the top of the pipe the valve will be closed upon its seat on the cone-shaped member 19 and thereby prevent any other water from entering the tank. The perforation which is located below the upper end of pipe 37 will permit water to drain from the tank and flow into the bowl thereby providing a positive means for filling said seal. As soon as the level of the water reaches the perforation 41 the water from the tank will stop flowing while the valve 20 will be maintained on its seat at the lower reduced end of the member 19 and maintain the float 24 in an elevated position above the level of the water which is now at the perforation 41; the sides of the valve 20, the weight of the parts connected with the valve, and the pressure of the water in the valve cage is sufficient to maintain the valve upon its seat.

It will be seen from such a construction that as soon as the handle is operated for operating the lever 29 the valve 20 will be instantly released from its seat on the member and permit water to flow into the tank, and since the valve is operated to open position water will be rapidly discharged from the tank.

The quick closing action of the valve on the glass seat provides a noiseless operation of the tank and prevents the sing noise which usually accompanies such constructions where water is allowed to force its way past the valve seat of the flushing valve, when the float has reached its most elevated position in the flush tank.

What I claim is:

1. In a device of the character described, a tank, a supply pipe, a valve chamber connected with the supply pipe, an outlet port, a valve having a vertical stem adapted to close the outlet port, a float connected at the opposite end of the stem, an outlet port for the tank, a flush ball adapted to close the outlet port, a vertically disposed conduit having its upper end open projecting above the normal level of the water when the tank is full and in communication with the outlet port, said conduit being provided with a perforation to permit the water in the tank to be lowered through the perforation so that the float is maintained above the level of the water by the pressure of the water on the inlet valve whereby said inlet valve may be easily actuated, and means operatively connected with the valve stem and the flush ball for causing the valve to be opened and the flush ball removed from the outlet port.

2. In a device of the character described, a tank, a supply pipe, a valve chamber connected with the supply pipe, an outlet port, a valve having a vertical stem adapted to close the outlet port, a float connected at the opposite end of the stem, an outlet port for the tank, a flush ball adapted to close the outlet port, a vertically disposed conduit.
having its upper end open projecting above the normal level of the water when the tank is full and in communication with the outlet port, said conduit being provided with a perforation to permit the water in the tank to be lowered through the perforation so that the float is maintained above the level of the water by the pressure of the water on the inlet valve whereby said inlet valve may be easily actuated, and means operatively connected with the valve stem and the flush ball for causing the valve to be opened and the flush ball removed from the outlet port, said inlet valve being of sufficient diameter to maintain the inlet valve closed.

3. In a flush tank, a valve chamber, an inlet pipe formed integrally with the valve chamber, a perforated plug in the inlet pipe forming a restricted communication between the inlet pipe and valve chamber, said plug projecting into the valve chamber, a nut screwed to the upper threaded end of the valve chamber and provided with a central bearing, a valve stem slidable in the bearing, a valve mounted intermediate the ends on the valve stem, a glass valve seat mounted on the upper end of the valve chamber, held thereon by said nut and adapted to be engaged by the valve on the slidable stem, a float connected with the stem, means for forcing the valve away from its seat, an outlet port, means for controlling said port, said means for forcing the valve away from its seat adapted to move the controlling means for the outlet port away from said port.

JOSEPH M. FLEMING.