Feb. 6, 1934. N. BECKER 1,946,266

FLOAT TANK BULB

Filed Sept. 23, 1931

FIG. 1.

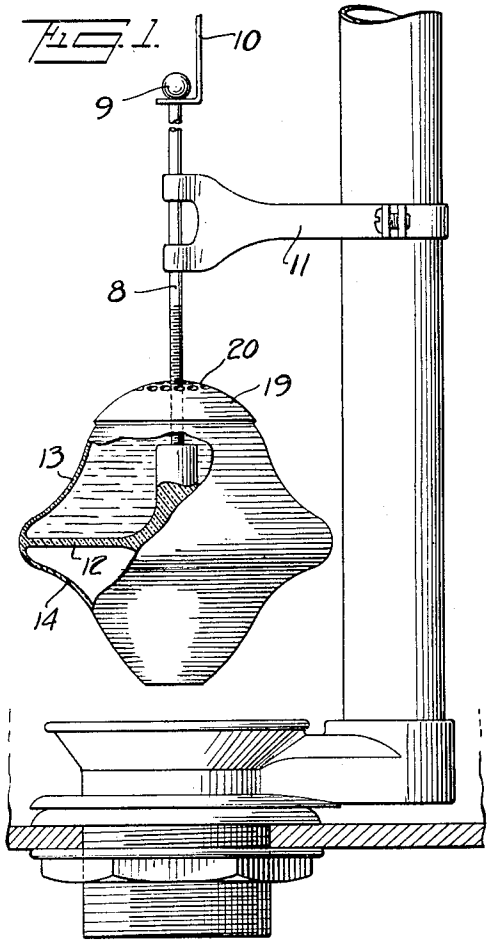


FIG. 2.

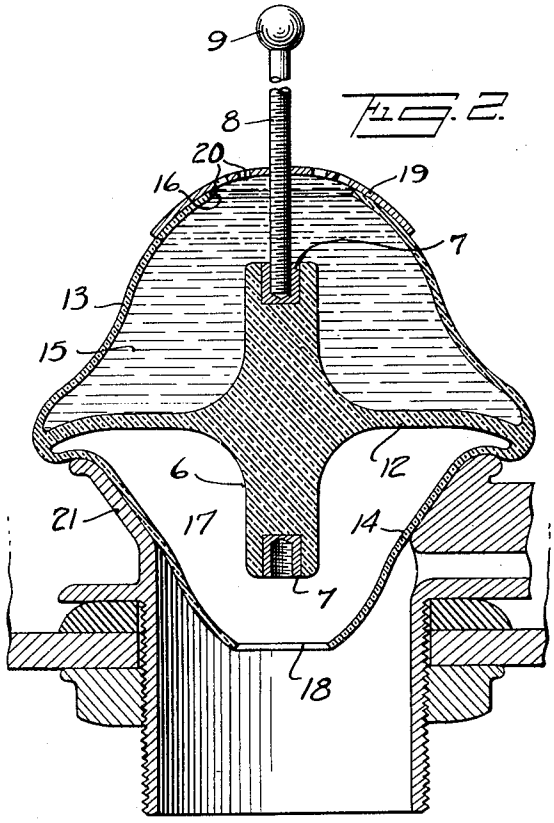


FIG. 3.

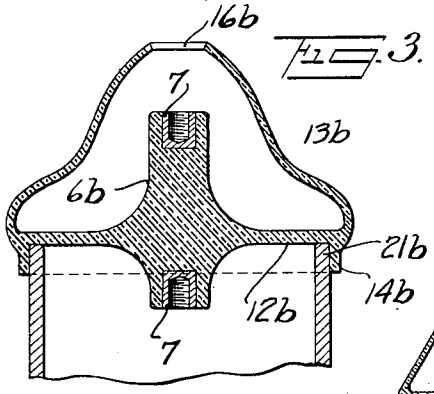
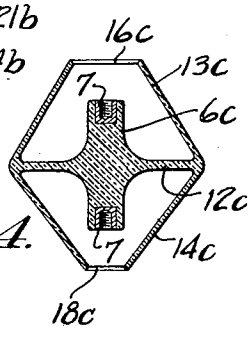


FIG. 4.



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FLOAT TANK BULB

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Serial No. 564,522

14 Claims. (Cl. 4—56)

My invention relates to balls or bulbs adapted for use for closing the outlet valves of float tanks and ordinarily the device is so formed as to comprise a web or septum provided with means for engaging a valve seat and with a chamber having an inlet opening to permit influx of water to substantially fill the chamber and thereby increase the weight of the bulb. The chamber is of variable volume, and the amount of water permitted to enter thereinto may also be varied so as to fit the bulb for use under different conditions of installation. The increased weight improves the action of the bulb in two respects, viz.

It increases the certainty with which the bulb drops from its elevated position to close the valve, and it increases the pressure of the bulb upon the valve seat at the time it seats thereon, whereby the bulb is more effectively seated to prevent leakage.

The variability in the weight of the bulb will better adapt to for use under different conditions of rate of water flow and amount of water pressure, as follows: In an installation where the pressure is high and the rate quite rapid, resistance must be provided against the downward rush of water carrying with it the bulb so that the outlet valve is not sealed by the bulb prematurely, before the flushing action is complete. In such case, the volume of the water receiving chamber of the bulb is decreased, so that little or no water is permitted to enter thereinto, to hamper or interfere with efficient flushing action. In installations where the water flow rate is fairly slow and the pressure low, the weight of the bulb can be increased by permitting more water to enter thereinto. This additional weight will materially aid the bulb in its sealing action, under the stated conditions.

The invention also includes the formation of a bulb of the type described with a pair of oppositely disposed walls so formed that the bulb by a reversal or movement through an angle of 180° may be used in either of two positions. Such construction is advantageous in that in case the two are adapted to fit the same valve seat, the life of the bulb is prolonged since it may be reversed when unduly worn or distorted at its valve closing end, or preferably by making the two walls of different size or configuration the ball is adapted to be used to close valves having valve seats of different size or configuration.

The invention may be embodied in various forms, some of which are shown, and includes all such modifications thereof as are defined by the claims.

Reference is hereby made to the accompanying drawing of which

Figure 1 is a side elevation of a flush tank valve, including seat, bulb and the operating rod and guide, with the bulb in elevated position;

Fig. 2 is a central vertical section on an enlarged scale showing bulb of Fig. 1 seated upon the valve seat;

Fig. 3 is a similar view of another modification, the bulb being seated upon a valve seat; and

Fig. 4 is a similar view of a third modification.

Referring to Figs. 1 and 2, the bulb shown is of suitable yielding material, for example soft rubber, and comprises a vertically disposed boss or support 6 having seated in its upper and lower ends internally threaded cups 7 preferably of copper. Either of the cups 7 is adapted to receive a metal operating rod 8 which is threaded to engage the thread of said cup. The upper end of said rod is provided with a ball 9 which engages a circular opening in a plate or bent wire 10 by which the bulb is lifted in the usual manner. The rod 8 with ball 9 by reason of the curvature of said ball in all lateral directions is much more effective in centering the flush tank bulb with respect to the valve seat than is the usual construction of vertical rod with upper end bent to engage the wire 10. The usual guide 11 is preferably provided to insure vertical movement of the rod 8.

A web or septum 12, is integral with the boss 6 and extends outwardly therefrom. This web is also integral with the outer walls 13 and 14 of the bulb. The upper wall 13 forms a chamber 15 having an opening 16 and the lower wall 14 forms a chamber 17 having an opening 18. A dished plate 19 is threaded on the rod 8 in contact with the upper wall 13 and is provided with perforations or apertures 20 which permit the influx of water into the chamber 15 which fills the same. Plate 19 is adapted to be adjusted on the threaded rod 8 in such manner that the volume of the chamber 15 can be varied, for the purposes set forth above. Such body of water as is retained in the chamber during the emptying of the tank increases the weight of the bulb and causes the bulb to center with more certainty and accuracy than an air-filled hollow bulb. A bend is provided, preformed in the walls of the seating portions of the bulb, creating an air cushion shoulder around the base of the seating portion, adjacent the web, so that as the bulb drops upon the valve seat 21, a perfect seal of the valve outlet is obtained. After the bulb has been seated, the weight of the bulb itself, plus the weight of the

water within the chamber, will increase the curvature of the wall 14 and the web 12, and make even more certain the sealing action, see Fig. 2.

The upper and lower walls 13 and 14 of the bulb are preferably of different configuration, as shown in Fig. 1, for the purpose of adapting the bulb to coact with valve seats of different size or shape. For example, the bulb shown, when used as in Fig. 1, will fit a valve seat of smaller diameter than when the bulb is reversed to cause the wall 13 to engage a valve seat.

The bulb shown in Fig. 3 is reversible and is adapted for use for closing either a valve having a seat of the type of Figs. 1 and 2 or one having the type of seat shown in Fig. 3.

This bulb has a base 6*b* with upper and lower threaded cups 7, and a horizontal web 12*b*. An integral upper wall 13*b* with opening 16*b* forms a water receiving chamber. An integral flange 14*b* surrounds the pipe or valve seat 21*b* when the bulb is seated as shown. When the bulb is used in an inverted position the flange 14*b* acts as the wall of a shallow water containing chamber to increase the weight of the bulb when the tank is empty.

The bulb of Fig. 4 is similar to that of Fig. 1 but differs therefrom in that the upper and lower walls are of conical form. This bulb comprises a base 6*c*, horizontal web 12*c*, threaded cups 7, conical upper wall 13*c* with opening 16*c* and conical lower wall 14*c* with opening 18*c*. It may be used in the position shown to fit a small valve seat, or in an inverted position to fit a larger seat.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. A reversible float tank bulb comprising a web transverse to its axis, and on either side of said web an apertured flexible wall adapted to act either as seat engaging means or to enclose a water receiving chamber, said web being provided with oppositely facing means for the securing thereto of bulb operating means.

2. The device of claim 1 in which the flexible walls are integral with the web.

3. The device of claim 1 in which the flexible walls differ from each other in configuration to adapt them to coact with valve seats of different form.

4. A float tank bulb comprising a flexible member provided with means for securing a rod thereto, and flexible cup portions above and below said flexible member, each of said cup portions having an opening remote from said flexible member, in which bulb oppositely disposed rod securing means are so placed as to permit the device to be used in either of two positions one of which is inverted with respect to the other.

5. A float tank bulb comprising a flexible member provided with means for securing a rod thereto, and flexible cup portions above and below said flexible member, each of said cup portions having an opening remote from said flexible member, in which bulb the cup portions are of different sizes and adapted to cooperate with valve seats of different size.

6. A float tank bulb comprising a web transverse to the axis of said bulb, seat engaging portions above and below said web, and rod engaging means on said web.

7. A float tank bulb comprising a web transverse to the axis of said bulb, seat engaging portions above and below said web and rod engaging means on said web, certain of said seat engaging portions having an opening therein to allow access to said rod engaging means.

8. A float tank bulb as in claim 7, in which the seat engaging portions are of different character to cooperate with seats of different character.

9. A float tank bulb comprising opposing seat engaging portions and water retaining chambers, and an intermediate web portion having integrally formed therewith rod engaging means.

10. In a float tank bulb as in claim 9, one of said seat engaging portions comprising the said web portion and a shoulder extending downward therefrom.

11. A reversible float tank bulb comprising a web transverse to its axis, yielding seat engaging means above and below said web, and a water retaining chamber above and below said web, said web being provided with oppositely facing means for the securing thereto of bulb operating means.

12. The device of claim 11, in which the seat engaging means comprises the said web and a depending flexible wall formed with an opening at its lower edge.

13. A float tank bulb comprising a transverse web provided with means for securing a rod thereto, and flexible cup portions above and below said web, each of said cup portions having an opening remote from said web and being provided with a preformed bend therein defining air-pocket shoulders extending therearound adapted to more effectively engage and seal tank outlets.

14. A float tank bulb comprising a web transverse to the axis of said bulb, seat engaging portions above and below said web, rod engaging means on said web, and a bend provided in said seat engaging portions defining an air-pocket shoulder extending therearound adapted to more effectively engage and seal tank outlets.

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