Aug. 22, 1950 R. R. REEVES 2,520,059

FLUSH TANK BALL VALVE

Filed July 3, 1947

Fig. 1

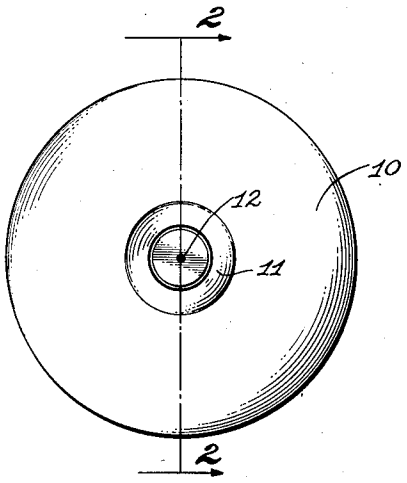


Fig. 2

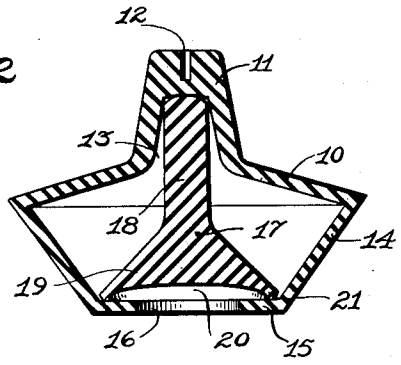
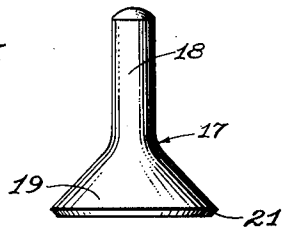


Fig. 3



INVENTOR.
Ray R. Reeves
BY Hazard & Miller
Attorneys

Patented Aug. 22, 1950 2,520,059

UNITED STATES PATENT OFFICE

2,520,059

FLUSH TANK BALL VALVE

Ray R. Reeves, San Clemente, Calif.

Application July 3, 1947, Serial No. 758,819

3 Claims. (Cl. 4—56)

1

This invention relates to improvements in flush tank ball valves such as are employed in flush tanks and the like.

An object of the invention is to provide an improved flush tank ball valve wherein there is a support or insert adapted to be positioned within the tank ball and which will resist collapse or distortion of the tank ball. In the conventional tank ball there is a top that is attachable to an operating rod or wire that lifts the tank ball from its seat at the time that the flush tank is operated. From this top there is normally a downwardly extending highly flexible skirt which, due to its flexibility, will readily accommodate itself to its seat. It is desirable that the skirt or side walls of the tank ball be highly flexible for this purpose. However, due to its high flexibility, the conventional tank ball, after being used over a long period of time has a tendency to collapse or distort. By means of the present invention an adequate support or strut is provided between the top and bottom of the tank ball which does not reduce or detract from the highly desirable flexible skirt but which at the same time will effectively prevent collapse or distortion.

Another object of the invention is to provide an insert which can be easily and quickly applied to a conventional type of tank ball and which will serve when applied to prevent collapse of the tank ball.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a top plan view of a tank ball embodying the present invention;

Fig. 2 is a vertical section through the same, taken substantially upon the line 2—2 upon Fig. 1; and

Fig. 3 is a view in side elevation of the insert.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the tank ball illustrated is of somewhat conventional design wherein there is a top 10 having an upstanding central boss 11 in the top of which there is a recess 12 adapted to receive the end of an operating rod or wire. The under side of this boss is recessed as at 13 to save material and to lighten the weight of the ball. From the sides of the top 10 there is a downwardly tapering flexible skirt 14 terminating in a horizontal inwardly extending flange 15 around a central aperture 16. In the usual construction

2

the walls of the skirt 14 are quite thin so that these walls will be highly flexible in accommodating themselves to the valve seat on which the tank ball is adapted to seat. The walls of the top 10 are frequently made somewhat thicker and consequently somewhat stiffer although they are still flexible. The walls of the boss 11 are usually made the thickest so that this boss will consequently be the stiffest part of the tank ball.

Although the highly flexible walls 14 are desirable in enabling the tank ball to properly fit its seat, these walls are so thin and flexible that in the course of time the entire tank ball is apt to collapse or to become distorted. In order to overcome such collapse or distortion the present invention contemplates the provision of an insert 17 having an upstanding stem or shank 18 of such a size and length as to enter and substantially fill the recess 13 to bear against the under side of the top of the boss 11. This insert terminates at its lower end in a head indicated at 19, the under side of which is preferably concaved as indicated at 20 and providing an edge 21 adapted to bear against the upper side of the flange 15. This insert is so proportioned that it may be inserted into the tank ball through the opening 16 by stretching the tank ball adjacent the opening. After it has been completely inserted in the tank ball, the insert is positioned so that its edges on the head 19 rest on the horizontal flange.

The tank ball itself is formed of a good grade of flexible rubber or rubber-like material and the insert is similarly formed of flexible rubber or rubber-like material. It is so proportioned as to be adequately stiff to hold the tank ball against vertical collapse. As the sides of the insert are spaced from the flexible walls 14, the insert does not interfere with any lateral deformation of these balls that may be required in accommodating themselves to the valve seat. In other words, the flexibility of the walls 14 is not altered by the presence of the insert. However, by the ability of the insert to maintain the flange 15 at the bottom of the ball in its initial spaced relation to the top 10, collapse or distortion of the ball is effectively prevented. The tank ball itself may be constructed in accordance with any conventional practice and the insert, after having been molded and vulcanized to shape, can be readily inserted therein. As the top of the shank 18 enters the recess 13, displacement of the insert is effectively prevented.

Various changes may be made in the details of construction without departing from the spirit

and scope of the invention as defined by the appended claims.

I claim:

1. A flush tank ball valve device comprising a yieldable rubber tank ball having a single opening therein located in the bottom thereof through which is receivable a separate solid rubber insert, the insert having a head which rests on the interior of the tank ball on the bottom thereof and a stem extending upwardly from the head receivable in a blind recess in the top of the tank ball to be confiined therein, said stem abutting against that portion of the tank ball forming the bottom of the recess.

2. A flush tank ball valve device comprising a yieldable rubber tank ball having a single opening therein located in the bottom thereof through which is receivable a separate insert made of resistant rubber or the like, the insert having a head larger than the opening in the tank ball which head rests on the interior of the tank ball on the bottom thereof, the insert having a stem smaller in cross section than the opening in the tank ball extending upwardly from the head and receivable in a blind recess in the top of the tank ball to be confined therein.

3. A flush tank ball valve device comprising a yieldable rubber tank ball having an imperforate top in the center of which there is an upstanding boss the under side of which is upwardly recessed and having downwardly tapering flexible side walls terminating in an inwardly extending flange about an aperture, a separate insert formed of resistant rubber or the like receivable through the aperture having an upstanding shank extending into the recess on the under side of the boss and having at the bottom a flared head the edge of which rests on the under side of the flange.

RAY R. REEVES.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,334,136	Delany	Mar. 16, 1920
1,688,877	Palmer	Oct. 23, 1928
1,812,388	Walker	June 30, 1931
1,946,267	Becker	Feb. 6, 1934