Jan. 28, 1958 B. A. FIGHTMASTER 2,820,968

FLUSH TANK VALVE CONTROLS

Filed Aug. 28, 1956

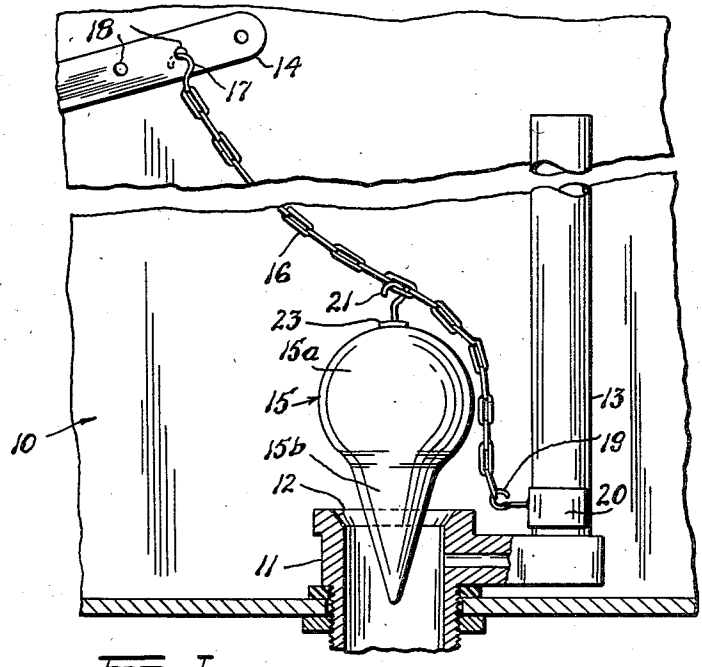


FIG. 1.

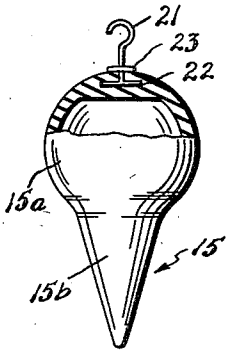


FIG. 3.

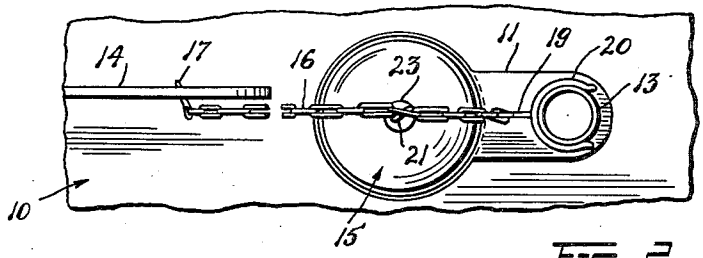


FIG. 2.

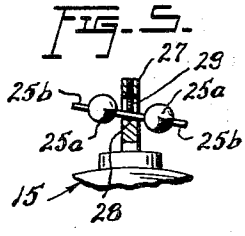


FIG. 5.

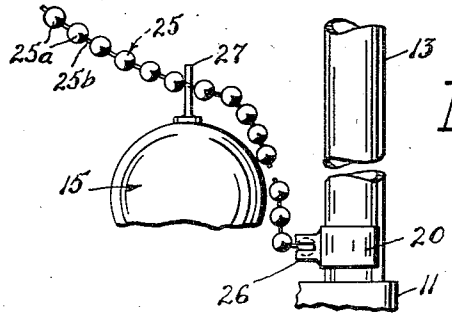


FIG. 4.

Inventor:

Bernard A. Fightmaster

United States Patent Office

2,820,968

Patented Jan. 28, 1958

2,820,968

FLUSH TANK VALVE CONTROLS

Bernard A. Fightmaster, Liberty, Mo.

Application August 28, 1956, Serial No. 606,670

5 Claims. (Cl. 4—57)

This invention relates to new and useful improvements and structural refinements in actuating means for flush tank valves, and the principal object of the invention is to properly control the operation of the flush valve ball so that the same is efficiently seated to prevent leakage, yet may be easily raised to facilitate flushing.

An important feature of the invention resides in the provision of a flexible element for operatively connecting the flush valve ball to the flushing lever of the tank and to the usual standpipe in the tank, the flexible connecting element permitting proper movement of the ball in seating and unseating, as above outlined.

Another important feature of the invention resides in the construction of the valve ball itself, the same including a cone-shaped base or lower portion which is movably disposed at all times within the flush valve port and functions as a guide in assuring proper seating of the ball.

Some of the advantages of the invention reside in its simplicity of construction, in its efficient operation and in its adaptability for installation in both new tanks and those already in existence.

With the foregoing more important objects and features in view and such other objects and features as may become apparent as this specification proceeds, the invention resides in the arrangement of parts and details of construction substantially as shown in the accompanying drawing, wherein like characters of reference are employed to designate like parts and wherein:

Figure 1 is a fragmentary vertical sectional view of a flush tank having the invention embodied therein;

Figure 2 is a fragmentary top plan view thereof;

Figure 3 is an elevational view, partly in section, of the valve ball per se;

Figure 4 is a fragmentary detail illustrating a slightly modified form of the invention; and

Figure 5 is a fragmentary detail showing the connecting means of the ball to the chain in the arrangement of Figure 4.

Referring now to the accompanying drawing in detail, particularly Figures 1–3 thereof, the general reference numeral **10** designates a conventional flush tank provided in the bottom thereof with a fitting **11** which is formed to provide a flush valve port **12** and which also supports a standpipe **13** in accordance with the usual practice. The flushing lever of the tank is illustrated at **14**.

The essence of novelty in the invention resides in the provision of novel means for actuating and controlling the movement of the flush valve ball **15**, these means being in the form of a flexible element such as a length of chain **16**. One end of this chain is provided with a hook **17** for adjustable connection to the lever **14**. For this purpose the lever **14** is provided with a plurality of apertures **18** to selectively receive the hook **17**, as will be clearly apparent.

The chain **16** may be of the elongated, closed link type as shown in Figures 1 and 2, and the link at the other or lower end of the chain is attached to a hook **19** secured to a resilient C-clamp **20** which, in turn, is frictionally mounted on the lower portion of the standpipe **13** adjacent the fitting **11**.

The valve ball **15** comprises a substantially spherical main body portion **15***a* and a substantially cone-shaped base portion **15***b* which is integral with and depends from the portion **15***a*, as shown. The base portion **15***b* is movable in and at all times extends into the flush valve port **12**, and thereby serves as a guide to assure proper seating and unseating of the valve ball.

The body portion **15***a* of the valve ball is provided at the top thereof with a hook **21** having a disc-shaped base **22** embedded in the material of the body portion **15***a*, the hook **21** also having a flange **23** which abuts the upper surface of the portion **15***a* and serves to firmly retain the hook in place on the ball. The hook **21** is attached to an intermediate portion of the chain **16** by passing the same through one of the links of the chain, as illustrated.

The chain **16** is of such length and the hook **21** is attached to the chain at such a point that when the lever **14** is raised to effect the flushing operation, the ball **15** is lifted and unseated from the valve seat **12**. Conversely, when the lever **14** is permitted to return to its initial position, the chain **16** is slackened and the valve ball returns to its seat.

It is to be noted that by virtue of its flexibility, the chain **16** affords the valve ball **15** a freedom of movement which is not restricted by friction or binding such as usually occurs when the ball is operatively connected to the flush lever with conventional rods or links. Moreover, the use of a sliding guide, conventionally employed for the valve ball, is completely eliminated and the freely movable ball assures easy unseating and proper seating in the instant invention.

Excessive raising of the ball **15** with respect to the seat **12** is prevented by the length or portion of the chain **16** extending between the hook **21** on the ball and the hook **19** on the clamp **20**, the length of this chain portion being sufficient to permit the ball to raise enough for proper flushing, but being insufficient to permit the ball to raise to an extent which would withdraw the base portion **15***b* of the ball from the valve port or seat **12**. As will be readily apparent, the point of attachment of the ball to the chain may be easily varied by simply engaging the hook **21** with the different links of the chain **16**. In addition, the location of the hook **19** relative to the ball **15** may be adjusted in a vertical direction by simply sliding the clamp **20** upwardly or downwardly on the standpipe **13**.

The slightly modified form of the invention shown in Figures 4 and 5 is similar to that already described, with exception that the elongated, closed link chain **16** is substituted by a ball type chain **25**, consisting of a plurality of ball elements **25***a* connected together by rod-shaped links **25***b*. In this instance the standpipe clamp **20** is provided with a suitable socket **26** to receive the ball element at the lower end of the chain **25**, and any suitable connection is employed for connecting the chain to the flush lever.

The attachment hook **21** in this instance is substituted by a plate-shaped connecting member **27** having a transverse aperture **28** therethrough to receive the chain **25** and also provided with a set screw **29** extending into the aperture **28** for clamping one of the chain links **25***b*, as is best shown in Figure 5. The point of attachment of the ball to the chain may be varied by simply loosening the set screw **29** and sliding the chain through the aperture **28**.

While in the foregoing there have been described and shown the preferred embodiments of the invention, various modifications may become apparent to those skilled in the art to which the invention relates. Accordingly, it is not desired to limit the invention to this disclosure and various modifications may be resorted to, such as may lie within the spirit and scope of the appended claims.

What is claimed as new is:

1. In a flush tank including a flush valve port, a standpipe adjacent thereto and a flush lever, the combination of a flush valve ball engageable with said port, and a flexible actuating element connected at one end thereof to said lever and connected at its other end to said standpipe, said valve ball being attached to an intermediate portion of said element.

2. The device as defined in claim 1 wherein said flush valve ball comprises a substantially spherical main body portion and a substantially cone-shaped base portion integral with and depending from said main body portion, said base portion being movably disposed in said valve port.

3. In a flush tank including a flush valve port, a standpipe adjacent thereto and a flush lever, the combination of a flush valve ball engageable with said port, a chain connected at one end thereof to said lever and connected at its other end to the lower portion of said standpipe, and connecting means provided at the top of said valve ball for attaching the same to an intermediate portion of said chain.

4. The device as defined in claim 3 together with a clamp provided at said other end of said chain for connecting the same to said standpipe.

5. The device as defined in claim 3 wherein said flush valve ball comprises a substantially spherical main body portion and a substantially cone-shaped base portion integral with and depending from said main body portion, said base portion being movably disposed in said valve port.

No references cited.