Sept. 27, 1949. C. S. GARRATT, JR 2,482,970

FLUSH VALVE MECHANISM

Filed July 31, 1946 2 Sheets-Sheet 1

FIG. 1.

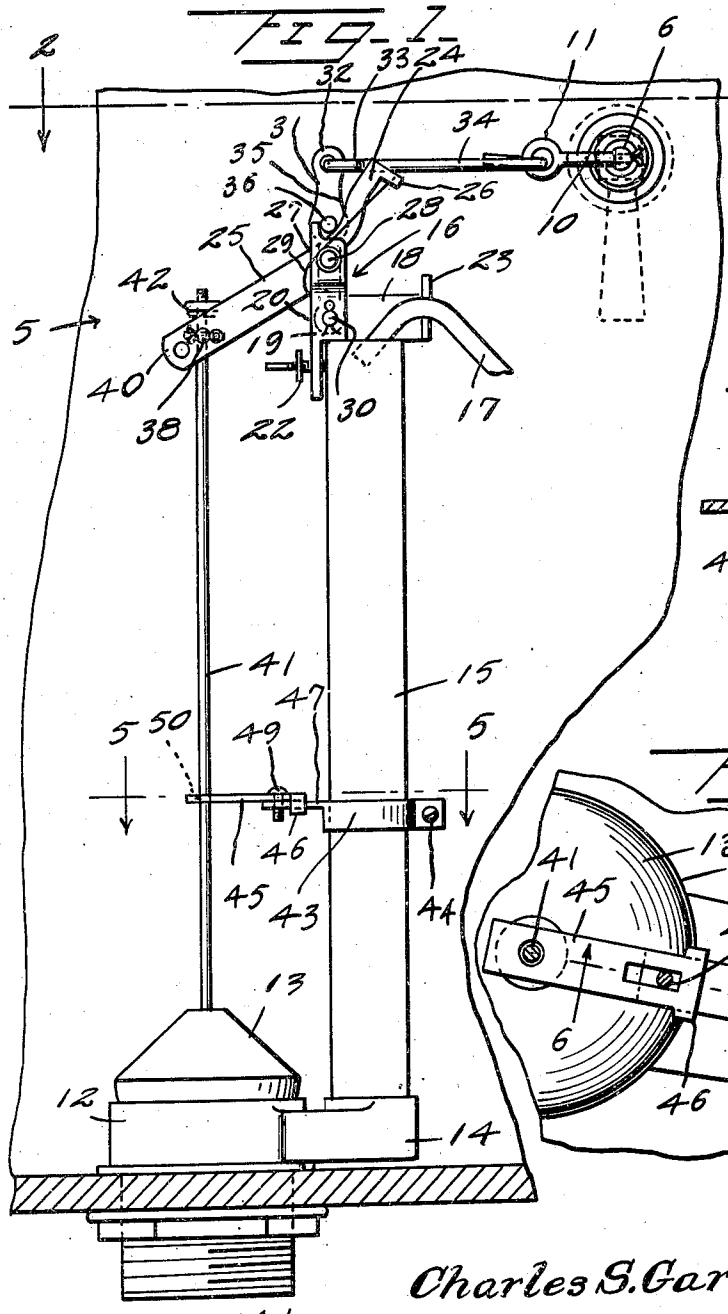


FIG. 8.

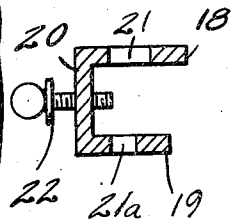


FIG. 6.

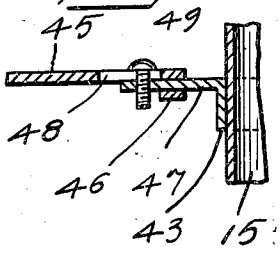
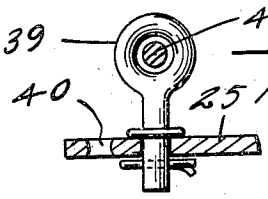


FIG. 5.

FIG. 7.



Inventor

Charles S. Garratt, Jr.

By Randolph & Beavers

Attorneys

Sept. 27, 1949. C. S. GARRATT, JR 2,482,970

FLUSH VALVE MECHANISM

Filed July 31, 1946 2 Sheets-Sheet 2

Fig. 2.

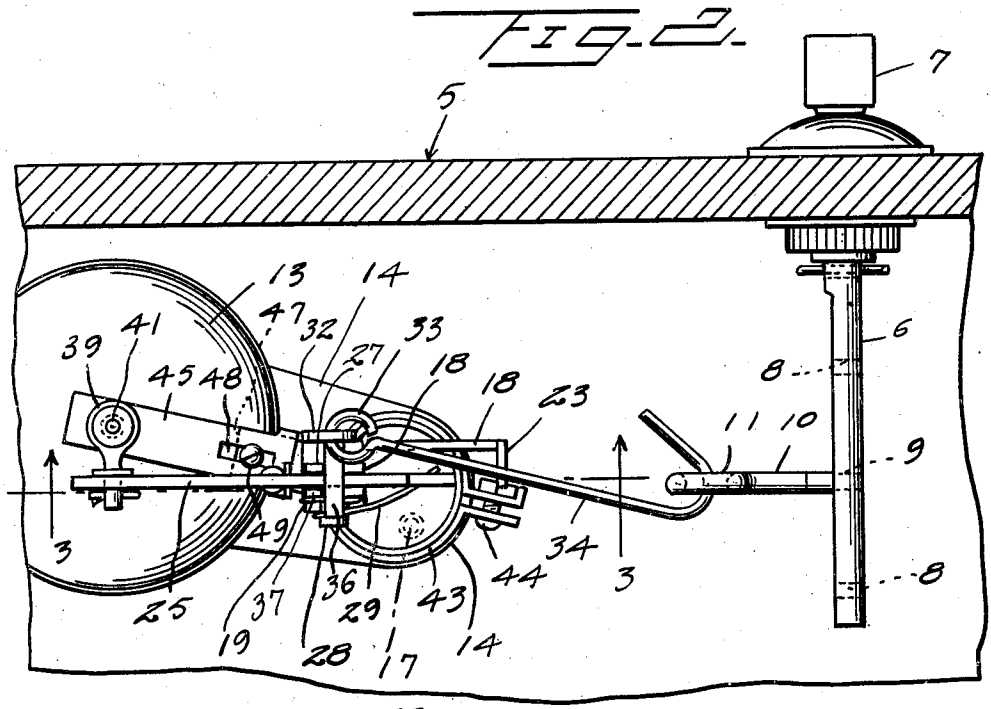


Fig. 3.

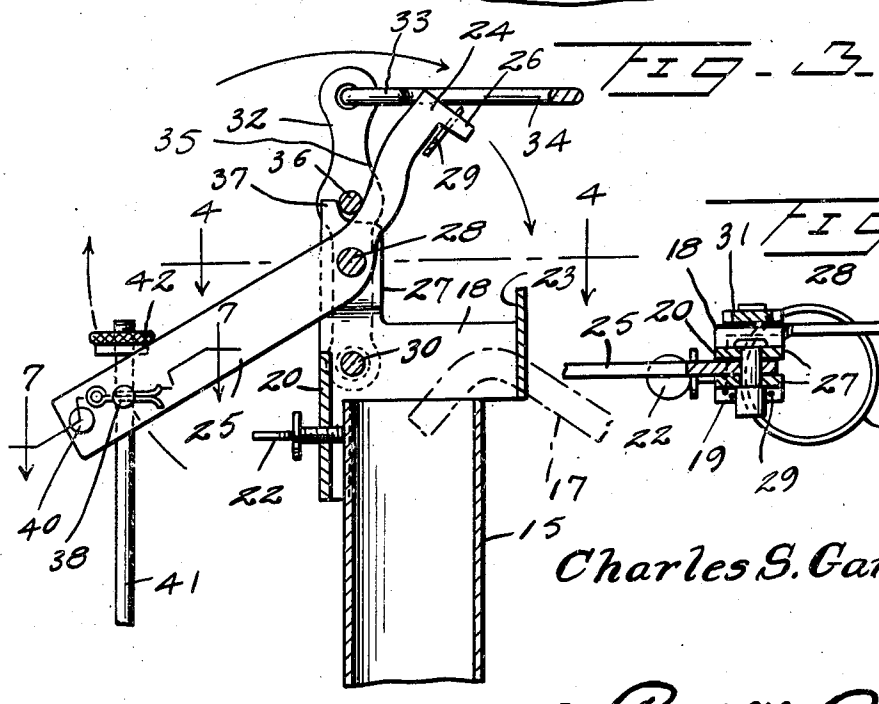


Fig. 4.

Inventor
Charles S. Garratt, Jr.

By Randolph & Beavers
Attorneys

Patented Sept. 27, 1949 2,482,970

UNITED STATES PATENT OFFICE

2,482,970

FLUSH VALVE MECHANISM

Charles S. Garratt, Jr., Suffolk, Va.

Application July 31, 1946, Serial No. 687,294

1 Claim. (Cl. 4—67)

1

The present invention relates to Flush valve mechanism and is an improvement on Patent No. 2,322,123, issued June 15, 1943.

The principal object of the present invention is to provide a flush valve mechanism wherein the usual two-wire interconnected suspension for the flush ball is substituted for by a single wire, supported and operated in a more simplified manner than in flush valve mechanisms heretofore designed.

Another important object of the invention is to provide an improved trip mechanism for the flush ball, capable of being mounted upon the usual overflow tube in a manner to allow sufficient space and accommodation for the usual after-fill tube.

Still another object of the invention is to provide a trip mechanism for flush valve ball, wherein the parts are capable of being easily and quickly disconnected for the purpose of ready repair or replacement of parts.

A further object of the invention is to provide a trip mechanism which can be quickly applied and removed with equal facility, with respect to the usual overflow tube of a flush valve mechanism.

Still a further object of the invention is to provide a single wire suspension for flush valve balls wherein simplified guide means is employed tending to reduce the cost of manufacture of such mechanism.

These and various other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings:

Figure 1 is a fragmentary elevational view showing the improved ball suspension and trip mechanism;

Figure 2 is a fragmentary horizontal sectional view taken substantially on line 2—2 of Figure 1;

Figure 3 is an enlarged detailed sectional view taken substantially on line 3—3 of Figure 2;

Figure 4 is a fragmentary horizontal sectional view taken substantially on line 4—4 of Figure 3;

Figure 5 is an enlarged horizontal fragmentary sectional view taken substantially on line 5—5 of Figure 1;

Figure 6 is a fragmentary detailed sectional view taken substantially on line 6—6 of Figure 5;

Figure 7 is a fragmentary detailed sectional view taken substantially on line 7—7 of Figure 3;

Figure 8 is a section through the bracket.

Referring to the drawings, numeral 5 generally refers to a flush tank, the front wall of which carries an elongated trip shaft 6, journaled there-

2

through and equipped at its outer end with a trip handle 7.

The inner portion of the shaft 6 has a plurality of longitudinally spaced and threaded openings 8, one of which is to receive the threaded portion 9 of an eye bolt 10, having an eye head 11.

The conventional flush tank has an outlet fitting 12 upon which the usual flush ball 13 seats. Laterally from the fitting 12 is disposed a neck 14, from which rises a vertical overflow tube 15 and upon the upper edge of the tube 15 is mounted the improved trip mechanism, generally referred to by numeral 16.

An after-fill tube 17, extending from the usual delivery valve (not shown), extends over the top of the overflow tube 15 so that water from the delivery valve can flow into the tube 15 and in this respect, consideration should be given to the special construction of the trip mechanism 16 to accommodate the positioning of the outlet end of the after-fill tube 17.

The trip mechanism 16 consists of a bracket including a long sidewall 18 and a short sidewall 19, these walls being connected by an end wall 20.

The walls 18, 19, and 20 have depending portions with the depending portions of the walls 18, 19 formed with slots 21*a*, 21, the slot 21*a* being substantially narrower than the slot 21 so that the bracket can be shifted to and retained in an offset position on the upper end of the overflow tube 15, as in the manner substantially shown in Figure 2. Reference should be made to Figure 8 to comprehend the relative relationship with said slots 21*a*, 21.

The bracket sets up on the upper end of the overflow tube with the slots 21*a*, 21 receiving the upper edge portion of the tube and a set screw 22 is disposed through the wall 20 and when fit inwardly will bite against the upper end of the overflow tube 15 to retain the trip mechanism in firm retained position on the upper end of the tube, in which position the trip mechanism supports the flush ball 13 and its operating parts.

The free end of the wall 18 has an upstanding back wall portion 23 which serves as a stop for the rear raised end portion 24 of a rocker arm 25, the portion 24 having a depending foot 26 adapted to abut the raised wall 23 of the bracket.

Risers 27 extend upwardly from the side walls 18, 19 of the bracket and are apertured to receive a horizontal pin 28, around which is disposed a wire spring 29, having one end anchored to the bracket, while the other end engages under the foot 26 to retain the rocker arm 25 tilted to the

position shown in Figure 1, which is the position in which the flush ball 13 is seated upon the fitting 12.

A pin 30 is disposed through the walls 18, 19 and has an upstanding arm 31 secured to the end thereof distal from the wall 19, the upper end of the arm 31 having an eye 32 for receiving the eye 33 of a hook 34, the bill of which is disposed through the aforementioned eye 11 of the eye bolt 10, carried by the trip shaft 6.

The upwardly offset portion 24 of the rocker arm 25 defines a cam surface 35 against which a laterally disposed pintle 36 on the upstanding arm 31 acts, when the arm 31 is tilted toward the right in Figure 1.

The upper ends of the side wall risers 27 are provided with lugs 37 to stop the arm 32 when it returns to its vertical position as shown in Figure 1, due to the weight of the ball 13 and the contributory force of the spring 27.

An eye bolt 38 having an eye or apertured head 39 is disposed through one of several openings 40 in the remaining end of the rocker arm 25 and this apertured head 39 receives the upper end portion of a unitary non-sectional rod or wire 41, the upper end of which has a stop or nut 42 for co-action with apertured head 39, when the rocker arm 25 is tilted upwardly in its operation to lift the ball 13.

In addition to the apertured head 39, one additional guide element is employed for the single wire suspension element 41, and this is composed of a split band 43 clamped by a screw 44 to a medial portion of the overflow tube 15. This guide includes an arm 45, having downwardly and inwardly bent lugs 46 at its inner end for embracing a tongue 47 projecting from the clamp band 43. The inner end of the arm 45 has a slot 48 matching a threaded opening in the tongue 47. A screw 49 is disposed downwardly through the slot 48 and into the threaded opening of the tongue 47 and there tightened to maintain the arm 45 in proper projecting relation with respect to the tongue 47. The outer end of the arm 45 has an opening 50 for slidably receiving the flush ball wire 41.

In the operation of the mechanism, it can be seen that in order to flush the closet, the shaft 6 is rotated by the handle 7, which actuates the eye bolt 10 and pulls on the hook link 34. This tilts the arm 31, to the right in Figure 1, with the pintle 36 riding against the cam surface 35 of the end portion 24 of the rocker arm 25. This forces the end portion 24 of the rocker arm downwardly until the foot 26 meets the raised end wall 23 of the bracket, this arrangement being provided so that there will be no contact with the after-fill tube 17. Further, it can be appreciated that the offset disposition of the entire trip mechanism and its bracket is for the accommodation of the after-fill tube 17.

In this action of the rocker arm 25, by the arm 31 and pintle 36, the rod 41 end of the arm 25 will be lifted, the apertured head 39 of the bolt 38 lifting the rod 41 so as to unseat the ball 13 from the outlet fitting 12.

It can be seen that through the employment of a single ball suspension wire 41, less guide

surfaces are necessary to permit proper seating of the ball, and further, due to the offset disposition of the bracket upon the overflow tube 15 and the provision of an arm 31, at only one side portion of this trip mechanism, ample space is made available for the after-fill tube 17.

Furthermore, it can be seen that the various parts are so connected and related as to permit ready disconnection thereof from component parts, in order that repairs or replacements can be easily made.

While the foregoing description sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

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

In a flush tank mechanism, an overflow tube, a bracket detachably mounted across the upper end of the overflow tube and having side walls connected by an end wall, standards rising from the side walls adjacent the end wall, a rocker arm pivotally mounted between said standards and projecting outwardly from the bracket and having its outer end portion adapted for connection with the rod of a flush valve, the inner end portion of the rocker arm being disposed at an upward incline and formed with a cam surface along its upper edge, a lever pivoted outwardly of one side wall of said bracket and extending upwardly against the standard carried by the said side wall and formed with an eye at its upper end, a hook having its inner end mounted through the eye of said lever and having a bill at its outer end for connection with a trip shaft, a pin extending laterally from said lever and across upper ends of said standards in position for engaging the cam surface of the ends of said standards in position for engaging the cam surface of the upwardly inclined inner end portion of the rocker arm and swinging the same downwardly and tilting the rocker arm in a direction to raise the flush valve when the lever is swung out of its normally upright position, lugs rising from upper ends of the standards in position for engagement by the pin when the lever is swung upwardly to its upright position to limit such upward movement, and a spring urging the rocker arm towards its normal position.

CHARLES S. GARRATT, JR.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,103,550	Stevens	July 14, 1914
1,520,863	Griffiths	Dec. 30, 1924
1,991,907	Platt	Feb. 19, 1935
2,322,123	Garratt	June 15, 1943

FOREIGN PATENTS

Number	Country	Date
19,347	Australia	Sept. 17, 1934