Sept. 22, 1964 J. J. HARRIS 3,149,345

TOILET FLUSH VALVE AND TRIP LEVER

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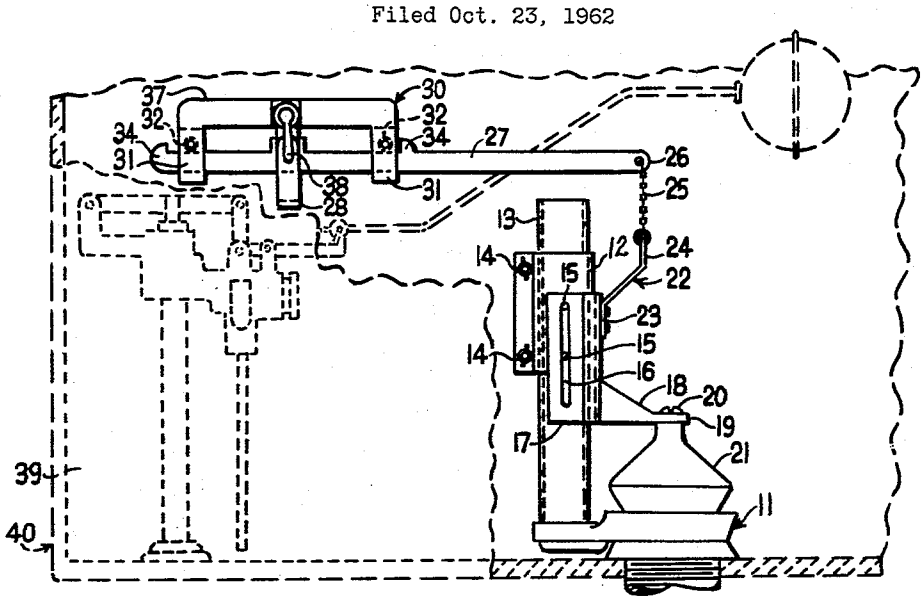


Fig. 1

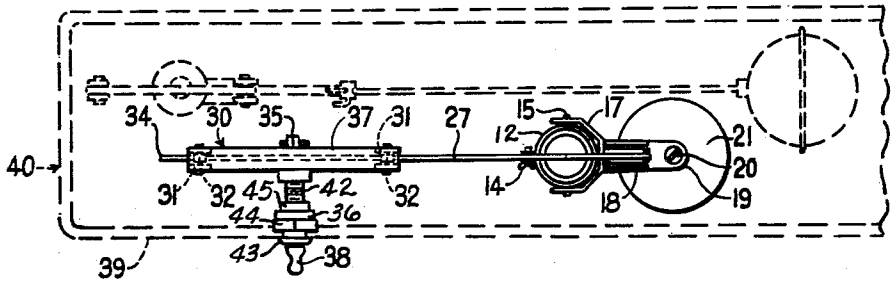


Fig. 2

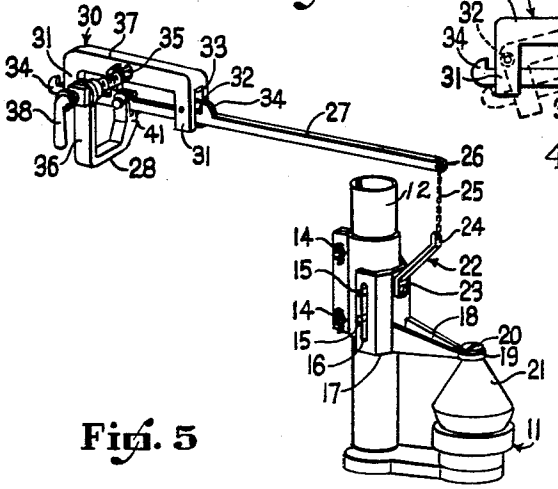


Fig. 5

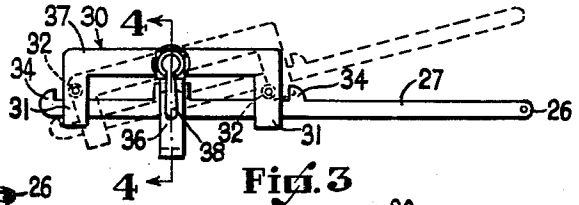


Fig. 3

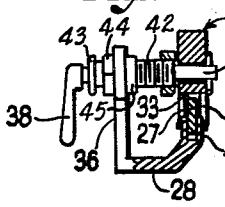


Fig. 4

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TOILET FLUSH VALVE AND TRIP LEVER

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This invention relates to plumbing fixtures and more particularly to that plumbing fixture known as a "toilet," and to be still more specific, to that part of a toilet known as a flush valve and its trip lever.

While there are, of course, any number of good flush valves and trip levers on the market, they all at one time or other become jammed, break or otherwise fail to operate. Any failure, no matter what the cause, of a flush valve and its operating mechanism is a critical one as this mechanism is not used until necessary.

It is, therefore, an object of this invention to provide a toilet flush valve and trip lever that will not jam or otherwise fail under normal usage by reason of its improved and simplified design and rugged construction.

Another object of this invention is to provide a toilet flush valve and trip lever that is assembled in part from standard parts already on the market.

Another object of this invention is to provide a toilet flush valve and trip lever that is positive in its operation and as near perfect in design as man can produce.

Another object of this invention is to provide a toilet flush valve and trip lever that can readily be installed in any toilet in a minimum of time and by people having limited plumbing experience.

Another object of this invention is to provide a toilet flush valve and trip lever of the character described that can readily be adjusted for wear and thus increasing its useful life.

Still another object of this invention is to provide a toilet flush valve and trip lever that can readily be packaged for retailing in any hardware, plumbing supply, or department, or mail order store.

Other and further objects and advantages of this toilet flush valve and trip lever will be hereinafter described, and the novel features thereof defined in the appended claims.

Referring to the drawing:

FIGURE 1 is a side view of a portion of a typical toilet bowl broken open to show this invention assembled and ready for use.

FIGURE 2 is a top view of a portion of a typical toilet bowl with this invention assembled in the same.

FIGURE 3 is a front view of that portion of this invention known as the trip lever.

FIGURE 4 is a sectional view of the trip lever taken substantially along line 4—4 of FIGURE 3 as viewed in the direction indicated by the arrows.

FIGURE 5 is a pictorial view of this invention.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Having reference now to the drawing in detail, there is generally indicated by the character 11 a typical flush valve having an overflow pipe 13. A sleeve 12 is clamped over the over-flow pipe 13 by means of a pair of spaced wing nuts 14. There are four lugs 15 suitably secured to the aforesaid sleeve 12. Two of these lugs 15 are on one side of the sleeve 12, and the other two lugs diametrically opposite on the same sleeve as is clearly shown in FIGURE 2 of the appended drawing. The aforesaid lugs 15 project through the elongated openings 16 in the slide valve 17 which is provided with an arm 18 extending at right angle to the over-flow pipe 13. The outer end 19 of the arm 18 has a screw 20 projecting vertically therethrough and firmly securing the top of the tank ball 21. A pull brace 22 has one end 23 firmly secured to the front of the aforesaid slide valve 17 while the upper end 24 of the same brace is secured to the lower end of the chrome

chain 25 that in turn has its upper end connected to the outer end 26 of the horizontally mounted trip lever 27. A brace 28 that is U-shaped when viewed from either end pivotally supports the aforesaid trip lever 27. An inverted U-shaped rocker arm 30 has at each end 31 a roller 32 rotatably mounted in the elongated recess 33. The rollers 32 rest on top of the aforesaid trip lever 27 which is provided with an upturned stop 34 on each side of the aforesaid rollers 32. The stops are cast or otherwise formed integral with the trip lever, as is clearly seen on examination of FIGURES 1, 3 and 5 of the appended drawing. As shown in FIGURES 2 and 4, a threaded sleeve 42 extends through the front 39 of tank 40 and through the upper end of upturned end 36, of brace 28. This threaded sleeve 42 has a flange 43 to bear on the outer surface of the tank and a square portion 44 to fit the square opening in the front of the tank. A jam nut 45, threaded on threaded sleeve 42, rigidly secures the front of the tank 39, threaded sleeve 42, and brace 28, together. A rod 35 extends through threaded sleeve 42. The rod 35, which is at right angle to the aforesaid trip lever 27, has a square end which passes through a centrally located square opening in the horizontal portion 37 of the aforesaid inverted U-shaped rocker arm 30, thus providing a means of swingably operating the aforesaid trip lever 27, and raising the tank ball 21 from its seat in the flush valve 11, as will be understood by anyone having experience in the plumbing fixture art. A handle 38 is suitably secured to the outer end of the aforesaid rod 35 which, of course, projects through the side 39 of the tank 40 of the toilet. The upturned end 41 of the already described brace 28 is suitably pinned to the trip lever 27, which it swingably supports. This construction is clearly understood after examination of FIGURE 5 of the appended drawing, and, therefore, nothing need be said as to the actual method by which this novel invention operates.

Although the ball cock is shown in phantom lines in FIGURES 1 and 2 of the appended drawing, no description is given of this part of a toilet, as it is not a part of the invention, and is only shown in the drawing in order to associate the less experienced people in the plumbing fixture art with this invention and where it is located in a toilet. No claims are, of course, made for any part of the ball cock.

From the foregoing it will now be seen that there is herein provided a toilet flush valve and trip lever which accomplishes all of the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it will be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

In accordance with the provisions of the United States patent statutes, as stated in the United States Code Title 35, Patents, I have now described the principle of construction and operation of my invention of toilet flush valve and trip lever in the form which I personally consider the best embodiment thereof, and what I now claim as my invention and desire to secure by Letters Patent is:

1. A toilet flush valve and trip lever mechanism comprising, a toilet tank, the usual flush valve, including a vertically mounted overflow pipe and a tank ball, the tank having an opening for a sleeve to extend through, a sleeve extending through said opening and secured in the opening, a brace that is substantially U-shaped, means rigidly connecting the upper end of one side of the U-shaped brace to the sleeve with the U upright, an elongated trip lever pivotally secured to the other end of the U-shaped brace, intermediate of the ends of the said

trip lever, and extending across said opening, with the trip lever substantially horizontal, means connecting the tank ball to one end of the trip lever and means extending through said sleeve for rotating said trip lever about said pivot to trip said flush valve.

2. The combination of claim 1 in which the means connecting the trip lever to the tank ball comprises a sleeve clamped over the overflow pipe, vertically spaced lugs secured to said sleeve on diametrically opposite sides of the sleeve, a slide which is substantially U-shaped when viewed from either end, to fit around said sleeve and having elongated slots to receive said lugs, a bracket securing the lower end of said slide to the tank ball and a flexible connection connecting the slide to one end of the trip lever.

3. The combination of claim 1 in which the means for rotating the trip lever comprises a rod extending through said sleeve, a handle secured to the outer end of said rod, a rocker arm having the configuration of an inverted letter U, rigidly secured to the inner end of said rod, the inverted U-shaped member being in the same plane as the

trip lever and the ends of said inverted U-shaped member in contact with the trip lever at opposite sides of the pivot.

4. The combination of claim 1 in which the means for rotating the trip lever comprises a rod extending through said sleeve, a handle secured to the outer end of said rod, a rocker arm having the configuration of an inverted letter U, rigidly secured to the inner end of said rod, the ends of the inverted U-shaped member having aligned slots which are wide enough to fit over the trip lever, a roller in each slot, whereby the rollers will contact the trip lever on opposite sides of the pivot.

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