June 24, 1930. E. L. DELANY 1,766,491

FLUSH VALVE OPERATING LEVER

Filed Sept. 28, 1926

Fig. 1.

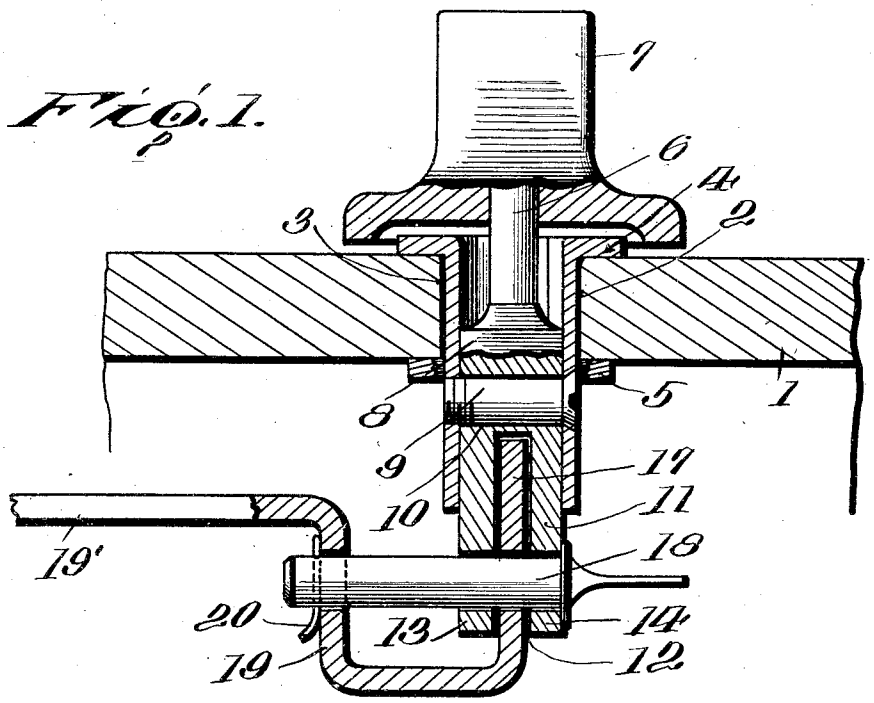
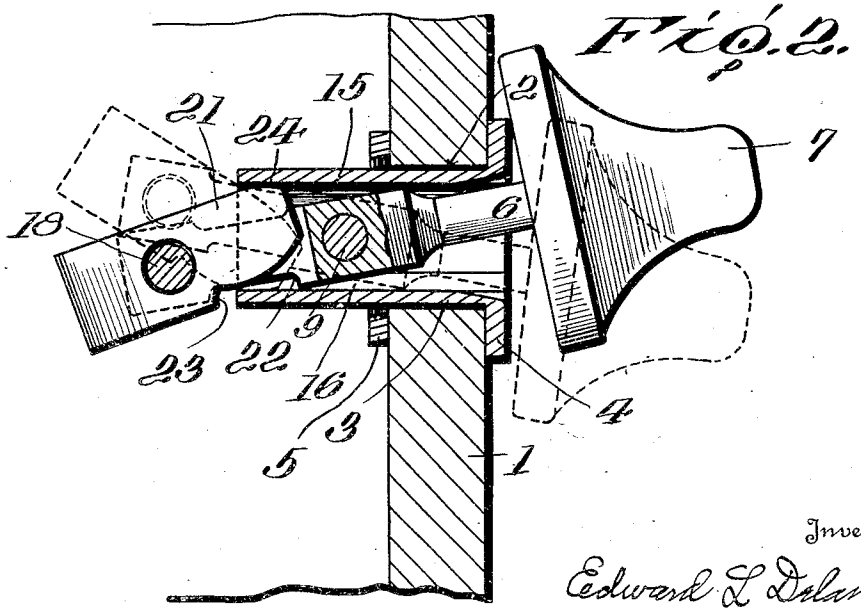


Fig. 2.



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UNITED STATES PATENT OFFICE

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FLUSH-VALVE OPERATING LEVER

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My invention relates to improvements in flush valve operating levers.

The object of my invention is to provide a flush valve operating lever which can be readily attached and removed from the flush tank and in which a good strong fulcrum for the operating lever is obtained, and at the same time providing means whereby the knob is permanently attached to the operating lever and the same inserted and removed from the outside of the tank.

Another object of my invention is to provide a flush tank operating lever of this character in which the ball valve lever is directly carried by the operating lever and in which there is an increased throw imparted to the ball valve lever so that the ball valve will be unseated a sufficient distance to cause it to float upwardly, all of which is well understood by those skilled in the art.

A further object of my invention is to provide a strong and durable connection and fulcrum between the ball valve lever and operating lever, and at the same time providing a very simple, cheap and effective structure in which the several parts can be readily separated for insertion and removal from the tank and replacement of any broken parts.

In the accompanying drawings:—

Figure 1 is a horizontal sectional view through the front wall of the flush tank, showing my improved operating lever applied thereto.

Figure 2 is a vertical longitudinal sectional view taken on the line 2—2 of Figure 1.

Referring now to the drawings, 1 represents the flush tank which is provided with an opening 2, preferably of a rectangular form and through which a correspondingly shaped sleeve 3 passes. This sleeve, at its outer end, is provided with an annular flange 4, adapted to engage the outer face of the flush tank to limit the inward movement of the sleeve. The corners of the sleeve are rounded off and are threaded, and upon which is screwed the nut 5, which engages the inner face of the wall of the tank and tightly locks the same to the tank. Passing into the sleeve 3 is the operating lever 6, having permanently attached to its outer end the operating knob 7. This knob can be porcelain, glass or any other desired material and is spaced a slight distance from the wall of the tank, so that the lever can have its desired vertical movement, as shown in Figure 1 of the drawings. The operating lever 6 is enlarged as indicated at 8, and removably carried by the sleeve 3 is a pin 9 which passes transversely through the sleeve, and through an opening 10 in the enlarged portion 8 of the lever 6. The enlarged portion 8 of the lever 6 extends a considerable distance beyond the sleeve 3, as indicated at 11, and is bifurcated at 12, forming the two arms 13 and 14. The enlarged portion 8 of the lever 6 closely fits the vertical walls of the sleeve 3, so that there is very little lateral movement of the lever on the pivot 9. The enlarged portion 8 is of such a dimension that the spaces 15 and 16 are left above and below the lever so that it is free to rock on the pivot 9 as clearly shown in Figure 2 of the drawings. Extending within the bifurcated portion 12 of the enlarged portion 8 of the lever 6 is the ball valve lever 17, and passing through the enlarged portion 8 of the lever 6 is a pivot 18, which also passes through the portion 17 of the ball lever within the bifurcated portion of the operating lever. This pivot 18 extends a considerable distance beyond one side of the enlarged portion 8, and passes through the portion 19 of the ball valve lever, and is held in place by the cotter pin 20. By this structure it will be seen that the ball lever 9 has two fulcrum points on the pivot 18. The portion 17 of the ball lever within the bifurcated portion 12 of the operating lever is of a width greater than the vertical thickness of the enlarged portion 8 of the operating lever 6. The enlarged portion 8 of the lever 6 is cut away at its upper and lower ends, as indicated at 21 and 22, and the lower edge of the portion 17 of the ball lever is cut away as indicated at 23. The portion 17 of the ball lever has its upper and lower edges beveled as indicated at 24 and 25, shown in Figure 2 of the drawings. The portion 19 carries the ball valve lever 19′, to which is

attached the ball valve, and the weight of the ball and the ball valve lever rocks the operating lever 6 on the pivot 9 to its downward position, shown, in Figure 2. The ball valve lever also rocks independently on the pivot 18 and assumes the position shown in Figure 2 of the drawings, that is, the ball lever swings down at a greater angle than the operating lever, beyond a plane with the enlarged portion 8 of the operating lever.

The downward pressure upon the knob 7 rocks the operating lever 6 upon its pivot 9, which throws the outer end of the lever upwardly, and carrying with it the ball valve lever, and at the same time causing the beveled end 24 of the ball lever to engage the inner face of the sleeve 3, and cause the ball valve lever to move more rapidly than the lever 6, and thus the continued downward movement of the lever 6 causes the ball valve lever to have moved at a considerable angle to the enlarged portion 8 of the lever 6 when the operating lever has reached its limit of downward movement. This position is shown in dotted lines in Figure 2.

By this structure it will be seen that I have provided a very simple construction of flush valve operating lever in which a desired throw is imparted to the ball valve lever to unseat the ball valve and whereby the sleeve may be of a less diameter, as will be readily understood.

Having thus fully described my invention what I claim is:—

1. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein, and a valve lever pivoted to the end of the operating lever and cooperating with the sleeve and adapted to have a greater throw than the operating lever.

2. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein, a pivot carried by the sleeve and passing through the lever, and a valve lever pivoted to the end of the operating lever and having its inner end cooperating with the sleeve and adapted to have a greater throw than the operating lever.

3. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein to have a vertical movement, and a valve lever pivotally mounted on the inner end of the operating lever and having its outer end extending within the sleeve and engaging the inner wall thereof on the inside of the pivot of the operating lever, whereby an increased throw is imparted to the valve lever.

4. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein, a valve lever pivotally carried by the inner end of the operating lever beyond the sleeve and having one end extending within the sleeve and engaging the inner wall thereof on the inside of the pivot of the operating lever whereby an increased movement is imparted to the valve lever.

5. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot, a valve lever pivotally mounted on the inner end of the operating lever and extending at right angles thereto, and extending within the sleeve and engaging the inner wall thereof on the inside of the pivot of the operating lever, whereby a greater throw is imparted to the valve lever.

6. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot, a valve lever pivotally mounted on the inner end of the operating lever and having one end extending within the sleeve and cooperating therewith on the inside of the pivot of the operating lever to impart a greater throw to the valve lever.

7. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot, a valve lever pivotally carried by the inner end of the operating lever and having one end beyond the pivot adapted to engage the sleeve to impart an increased throw to the valve lever.

8. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot, said lever having a bifurcated inner end extending within the sleeve, a valve lever pivoted within the bifurcated end and having the end extending within the sleeve and adapted to engage the same for imparting an increased throw to the valve lever.

9. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot, said lever having a bifurcated end extending within the sleeve a ball valve lever extending at right angles to the operating lever and having a laterally turned end pivoted within the bifurcated end of the operating lever and having one end extending within the sleeve and adapted to engage the same on the inside of the pivot of the operating lever, whereby an increased throw is imparted to the valve lever.

10. A flush valve operating mechanism

comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot, the inner end of the operating lever being bifurcated from a point within the sleeve and the upper and lower faces of the lever cut away to permit a greater throw thereof, a valve lever pivoted within the bifurcated end of the lever and extending within the sleeve and adapted to engage the sleeve and impart an increased throw to the valve lever.

11. A flush valve operating mechanism comprising a sleeve adapted to be secured to the flush tank, an operating lever passing through the sleeve and pivoted therein on a horizontal pivot and having an enlarged inner bifurcated end and extending beyond the side walls thereof, a valve lever extending at right angles to the operating lever and having a hooked end, said valve lever being pivotally mounted on the operating lever and having one end extending within the sleeve within the bifurcated end of the lever and adapted to engage the inner face of the sleeve on the inside of the pivot of the operating lever, whereby an increased throw is imparted to the valve lever.

In testimony whereof, I have signed this specification.

EDWARD L. DELANEY.