May 23, 1950 H. E. FULTON 2,508,667

TOILET FLUSHING DEVICE

Filed Oct. 31, 1945

Fig. 1.

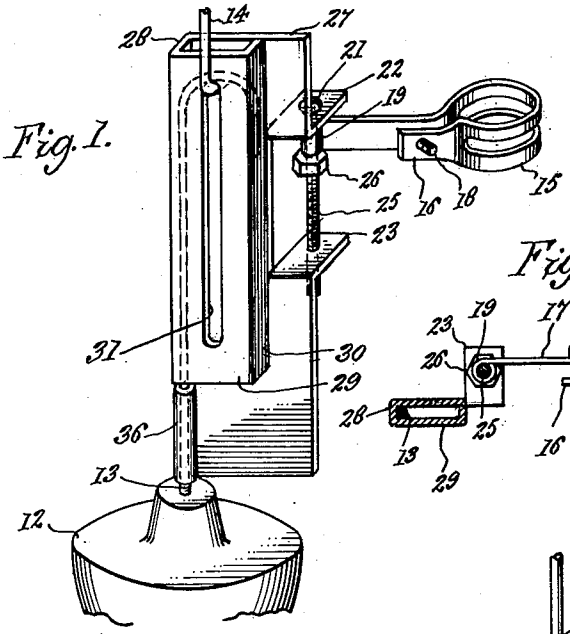


Fig. 6.

Fig. 2.

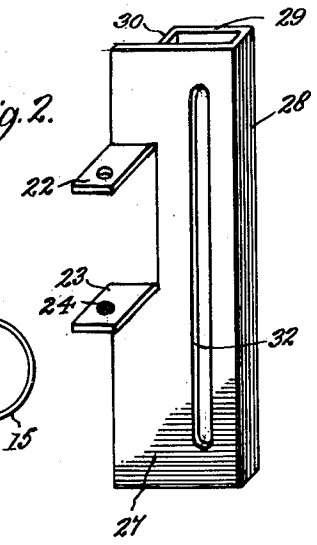


Fig. 4.

Fig. 3.

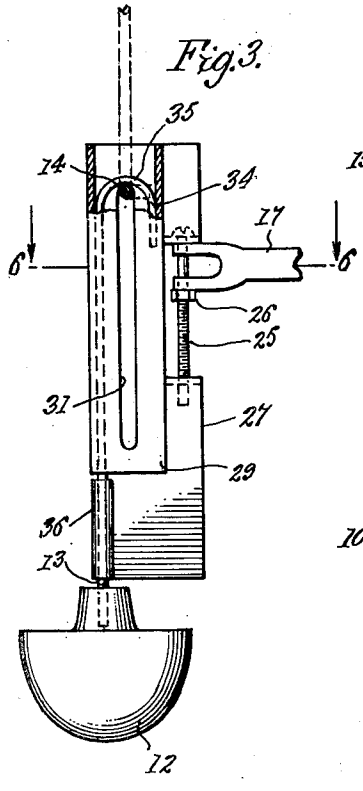
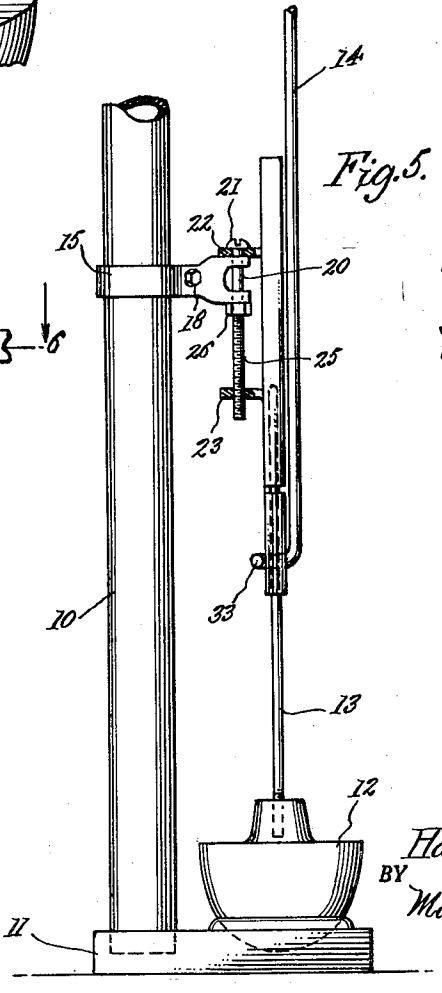
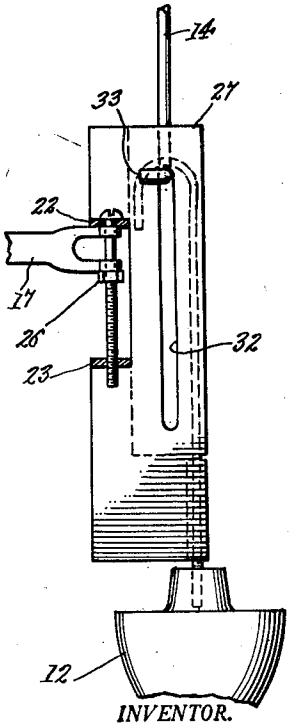


Fig. 5.





INVENTOR.

Harry E. Fulton

BY Mawhinney & Mawhinney

Attorneys

Patented May 23, 1950

2,508,667

UNITED STATES PATENT OFFICE

2,508,667

TOILET FLUSHING DEVICE

Harry E. Fulton, Bernardsville, N. J.

Application October 31, 1945, Serial No. 625,719

8 Claims. (Cl. 4—57)

1

The present invention relates to improvements in toilet flushing devices, and has for its primary objects to correct certain imperfections in the operation of existing apparatus having to do more particularly with the correct and faithful guiding of the outlet valve to and from its seat and to align the guide bracket for the valve stem in a correct position with reference to the valve seat to assure the tight closing of the valve when lowered to avoid all leakage.

Another object of the invention is to improve the construction of the guide bracket and to modify the construction of the valve stem so that it cooperates in a novel manner with the guide bracket to the end of compelling a true vertical non-wobbling movement of the valve toward and from its seat.

A further object of the invention is to provide a novel form of guide bracket having a double or twofold guide cooperation with the valve stem to assure the true rectilinear movement of the valve.

A still further object of the invention is to provide an improved form of collar which suspends the guide bracket from the overflow pipe to promote strength and economy of construction and which will cooperate in a novel manner with parts carried by the guide bracket whereby there is a mutual adjustment of the collar angularly about the overflow pipe and of the bracket angularly about its point of connection and support with the collar arms; all to the end that the guideway of the bracket in which the valve stem slides may be made to assume a closely correct position over the outlet valve seat, thus causing the rubber outlet valve to rise and fall in a correct vertical line accurately coincident with its seat; in this way avoiding leakage when closed.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a perspective view of a toilet flushing device constructed in accordance with the present invention with the rubber outlet valve shown partly in section and the lift rod broken away.

Figure 2 is a perspective view of the improved bracket taken from the rear face thereof.

Figure 3 is a front elevation of the improved device with parts broken away and parts shown in section.

2

Figure 4 is a rear elevation of the improved device with parts broken away and parts shown in section.

Figure 5 is a side elevation of the overflow pipe and outlet to the bowl and with the improved device shown in end elevation with parts broken away and parts shown in section.

Figure 6 is a horizontal section taken along the line 6—6 of Figure 3.

Referring more particularly to the drawings 10 designates the conventional overflow pipe found in the standard flushing device and 11 is the outlet to the bowl. The ordinary rubber valve 12 is carried by the usual valve stem 13 except that this valve stem is somewhat modified at its upper end as hereinafter described in order to cooperate in a novel manner with the improved form of bracket and with the lower end of the lift rod 14. This lift rod is connected with the rotary handle on the exterior of the flush tank for the operation of the device in flushing the toilet bowl all as will be well understood by those skilled in this art.

A collar 15 usually surrounds the overflow pipe 10 and is clamped thereto for the purpose of supporting a type of bracket in which the valve stem 13 has a sliding movement. The old form of collar may be retained if desired and employed in conjunction with the present invention; or a new collar 15 according to the invention may be clamped about the overflow pipe 10 by means of a bolt 18 passing through ears 16 and 17 one of which 16 may be threaded to engage the threads of the bolt while the perforation of the other ear is plain to receive an unthreaded portion of such bolt 18. One of the ears 17 is elongated into an arm having a rolled sleeve 19 thereon.

This sleeve 19 is adapted to support the bracket and for this purpose engages about the plain unthreaded shank 20 of a screw bolt, the head 21 of which is shown as wider than the plain unthreaded perforation through an upper lug 22 of the bracket. The lower lug 23 of the bracket is provided with a threaded hole 24 to take the threads 25 on the bolt 20. A lock nut 26 is also run on the threads 25 below the sleeve 19.

The bracket is advantageously formed of a piece of sheet metal of appropriate gauge constituting the bracket plate 27 forming the rear wall of the bracket. At one edge of this rear wall the metal stock is bent forwardly to provide a side wall 28 and thence rearwardly upon itself to form a front wall 29 lying in substantial parallelism with a portion of the rear wall 27.

From the front wall the material is bent at substantially right angles toward and substantially to the rear wall 27 to constitute a second side wall 30 in substantial parallelism with the first mentioned side wall 28. This arrangement of walls 27, 28, 29 and 30 forms a substantially rectangular guideway into which is received the upper portion of the valve stem 13 against the side wall 28 thereof. The front wall 29 and the rear wall 27 are provided with registering vertically elongated slots 31 and 32 to receive therethrough the angled end 33 of the lift rod 14. This angled end 33 engages beneath a curved cross bar 35 of the valve stem formed by returning the upper end 34 of such valve stem 13 in a substantially U-shaped open loop with the major length of the valve stem 13 in guided engagement with the side wall 28 of the guideway and with the returned end 34 in similar engagement with the opposite wall 30.

The guideway or rectangular box formed by the walls 27, 28, 29 and 30 terminates short of the lower edge of the bracket plate 27 and short of the free side edge of the plate 27. Below the guideway box or enclosure a lateral extension of the plate 27 is rolled over into a guide sleeve 36 for snugly yet slidably receiving the valve stem 13 at a point below the guide box.

In Figures 1 and 6 is shown the improved form of collar according to the present invention. In Figures 3, 4 and 5 an old form of collar with bifurcated arm is illustrated.

In the use of the device either the bifurcated arm or the sleeve 19 is engaged by bolt 20. The bolt 20 is screwed down into lug 23 and until its head 21 abuts against the upper surface of the top lug 22. Assuming that the collar 15 is tight on the overflow pipe 10, the bracket is dropped down until the top lug 22 rests upon the bifurcated collar arm or upon the sleeve 19. Thereupon a lock nut 26 is rotated in a direction to raise the same upwardly against the lower end of the bifurcated arm or against the lower end of the sleeve 19.

The collar 15 may be rotated or adjusted angularly about the overflow pipe 10 by loosening the bolt 18 and subsequently tightening the same after the adjustment has been effected to bring the bifurcated arm or the sleeve 19 to a correct angular position for holding the bracket accurately above the valve seat of the outlet 11. A second adjustment is provided by means of the bolt 20 which enables the bracket to be rotated about the vertical axis of this bolt 20 in order to bring the bracket to a correct position over the valve seat of outlet 11. When this position is arrived at the lock nut 26 is tightened upwardly against the collar arm or sleeve 19.

The above two adjustments are for the purpose of bringing the guide sleeve 36 and the end wall 28 of the guide box into such accurate alignment with the center of the valve seat 11 that the rubber valve 12 will be guided faithfully in alignment with this valve seat so as to close accurately thereagainst.

In this the returned end 34 of the valve stem assists as it engages and slides up and down in contact with the opposite end wall 30 of the guide box. Thus at the upper end of the guide stem 13 there are two opposed members of the stem engaging the two opposed walls 28 and 30 of the guide box. This will prevent any lateral or horizontal incidental movement of the guide stem 13 at least at its upper end. This arrangement in combination with the elongated contact

of the main portion of the valve stem 13 with the side wall 28 will further reduce incidental lateral or horizontal movement in the valve stem such as would tend to inaccurately seat the valve 12. The two factors above mentioned for resisting incidental vibration or lateral movement of the valve stem 13 are further supplemented and reinforced by the guide sleeve 36 which confines the valve stem 13 in all circumferential directions which is spaced below the returned end 34 and which has substantial axial length of its own so as to resist therein and in combination with the other factors any such incidental lateral motion. With such a true guide arrangement for the valve stem 13 it becomes highly necessary to provide ample and correct adjustment for bringing this valve stem 13 into the vertical center line of the valve seat 11 to secure accurate seating of the valve 12 at all times and this accurate adjustment is provided by the conjoint angular movement of collar 15 about overflow pipe 10 and of the concomitant angular adjustment of the bracket 27 about the vertical axis of the screw bolt 20.

The operation of the device proceeds in a manner which will be well understood. With the valve 12 seated as shown in Figure 5, the lift rod 14 is lifted when the external handle on the flush tank is rotated. The angled end 33 thus rides up in slots 31 and 32 and lifts the curved cross bar 35 therewith, thus unseating and raising the valve 12; whereupon the handle being released, the lift rod 14 will drop back to initial position without interfering with the future operation of the valve 12 and its valve stem 13. As the water lever falls the valve 12 will return downwardly and will automatically seat upon 11 when the water is substantially evacuated. In its raising and lowering movements the valve stem 13 and incidentally the valve 12 will be guided in a true vertical rectilinear path. The seating of the valve 12 will therefore be at all times accurate. Moreover the construction and arrangement is such that the angled end 33 of the lift rod will have no effect in any of its lateral swinging movements to cause jamming of the valve stem 13 for the reason that this valve stem is guided at so many points against just such lateral or horizontal movements.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:

What is claimed is:

1. For use with a toilet flushing device having a support, an outlet valve and valve stem, and a lift rod, an improved guide bracket for the valve stem carried by the support and having an enclosed box for receiving the valve stem in contacting guiding arrangement at one side wall, said valve stem having a returned portion engaging and sliding upon an opposite side wall of the enclosed box, and means constructed and arranged to restrain said valve stem from lateral movement in a direction angularly to a plane connecting said walls, said means comprising a guide sleeve on the bracket through which the valve stem reciprocates.

2. For use in a toilet flushing device having a support, an outlet valve and valve stem and a lift device, an improved guide bracket carried by said support and having an enclosed guide box

with one wall disposed in contact with the vertically moving valve stem, said valve stem having a returned portion in vertically sliding engagement with an opposite wall of said guide box, said valve stem having a cross bar connecting the same with the returned end, said guide box having a slot to receive an end of the lift device for engaging said cross bar, and means by which the valve stem is restrained from lateral movement in response to an off-center force exerted by a pull on the lift device.

3. An improved bracket as claimed in claim 1 characterized by the fact that the guide sleeve is rolled from an edge of the bracket below the guide box and is positioned to slidably and snugly receive therethrough the valve stem.

4. An improved bracket as claimed in claim 1 characterized by the fact that said enclosed box is formed from a sheet metal plate having its major portion arranged to provide a rear wall and with an extension of the sheet metal overturned upon itself to form the enclosed box with said side walls and with a rear wall formed by said plate and a front wall, said plate having a further lateral extension rolled over to form said guide sleeve about the valve stem having its opening in alignment with the vertical space adjacent the first mentioned side wall of the box against which the major portion of the valve stem engages.

5. A bracket as claimed in claim 1 in which spaced lugs project from the bracket, a fastening element engaging said lugs, and a supporting arm for the bracket having a part engaging about said fastening element.

6. In a flushing device for toilets having an overflow pipe arranged close to the valve seat of an outlet controlled by a valve having an upstanding valve stem, the combination of a collar angularly movable about said overflow pipe, means to clamp said collar to said pipe, a supporting arm on the collar, a sleeve on said supporting arm, a guide bracket having a guideway for said valve stem and also having a part for resting on said sleeve, and having a second part extending under the sleeve and having a threaded opening therethrough, and a bolt slidable through

the first mentioned part and through said sleeve and threaded into the opening in said second part and a lock nut on said threaded bolt to abut the lower portion of said sleeve.

7. An improved bracket for use in a flushing device for toilets in cooperation with a supporting arm comprising a rear wide plate having lugs cut and bent therefrom with a plain hole in one lug and a threaded hole in the other, a bolt passing through the unthreaded lug with a head to confine the same and having a threaded portion to engage in the threaded hole after passing through such supporting arm, a lock nut on the bolt to lock the arm against the upper lug, a guide box on the front of the plate for the valve stem of the flushing apparatus, and a guide sleeve also on the front of the plate offset laterally from the center of the guide box for receiving the valve stem.

8. For use with a toilet flushing device having a support, an outlet valve and valve stem, and a lift rod, an improved guide bracket for the valve stem carried by the support and having an enclosed box for receiving the valve stem in contacting guiding arrangement at one side wall, said valve stem having a returned portion engaging and sliding upon an opposite side wall of the enclosed box, said box composed of sheet material arranged to form a rear wall with said side walls and a front wall bent therefrom and with the free edge of the last mentioned side wall engaging said rear wall and with the enclosed space of the box open at its top and bottom, said front and rear walls having slots therein to receive the lift rod.

HARRY E. FULTON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,803,603	Dodson	May 5, 1931
2,016,840	Schubert	Oct. 8, 1935
2,098,687	Kinsfather	Nov. 9, 1937
2,217,320	Romaine	Oct. 8, 1940