April 5, 1960 G. A. HARRISON, JR 2,931,050

TOILET FLUSH TANK BOWL VALVE GUIDE

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Fig.1

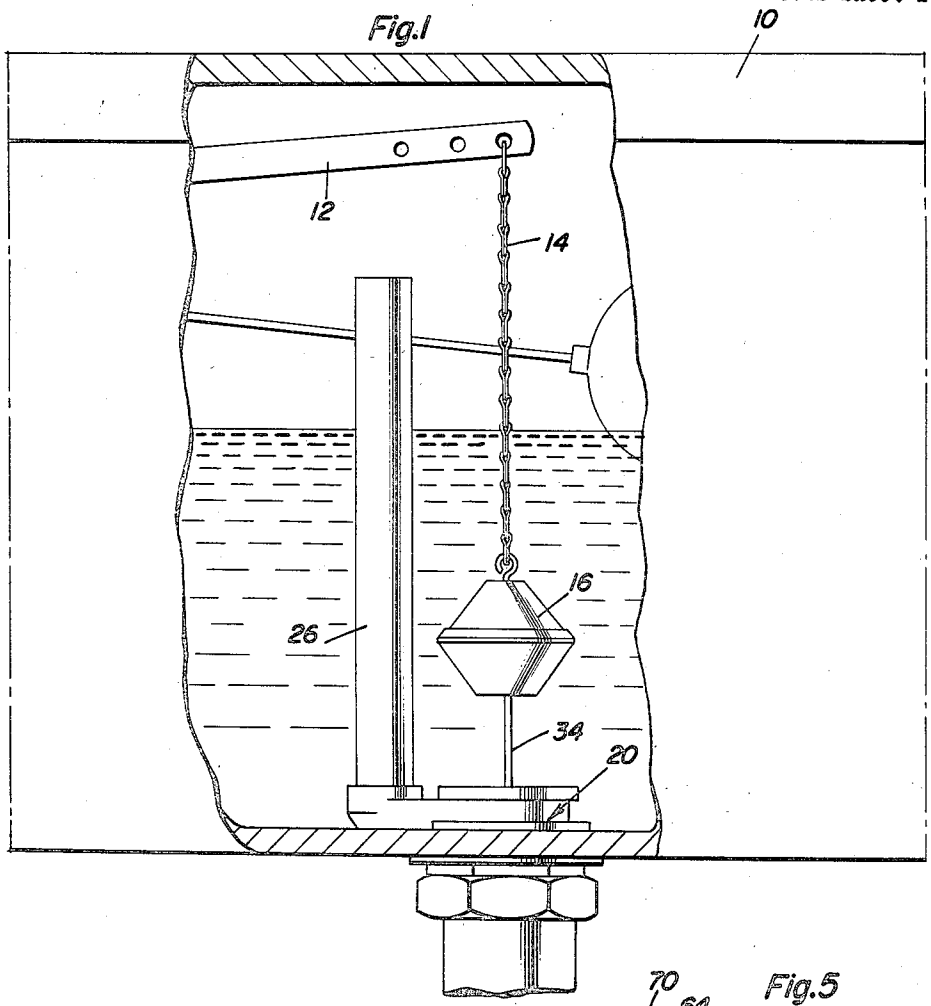


Fig.5

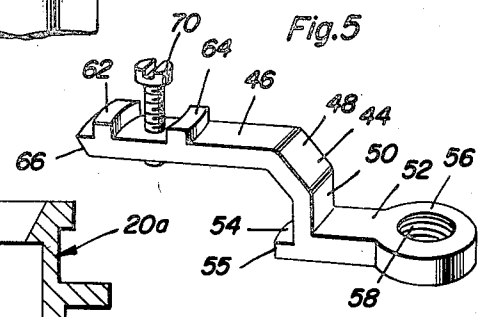
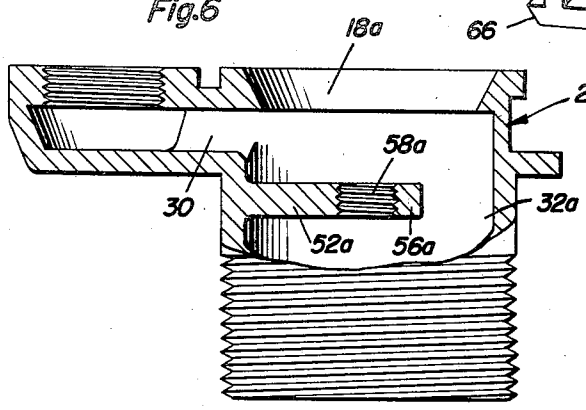


Fig.6



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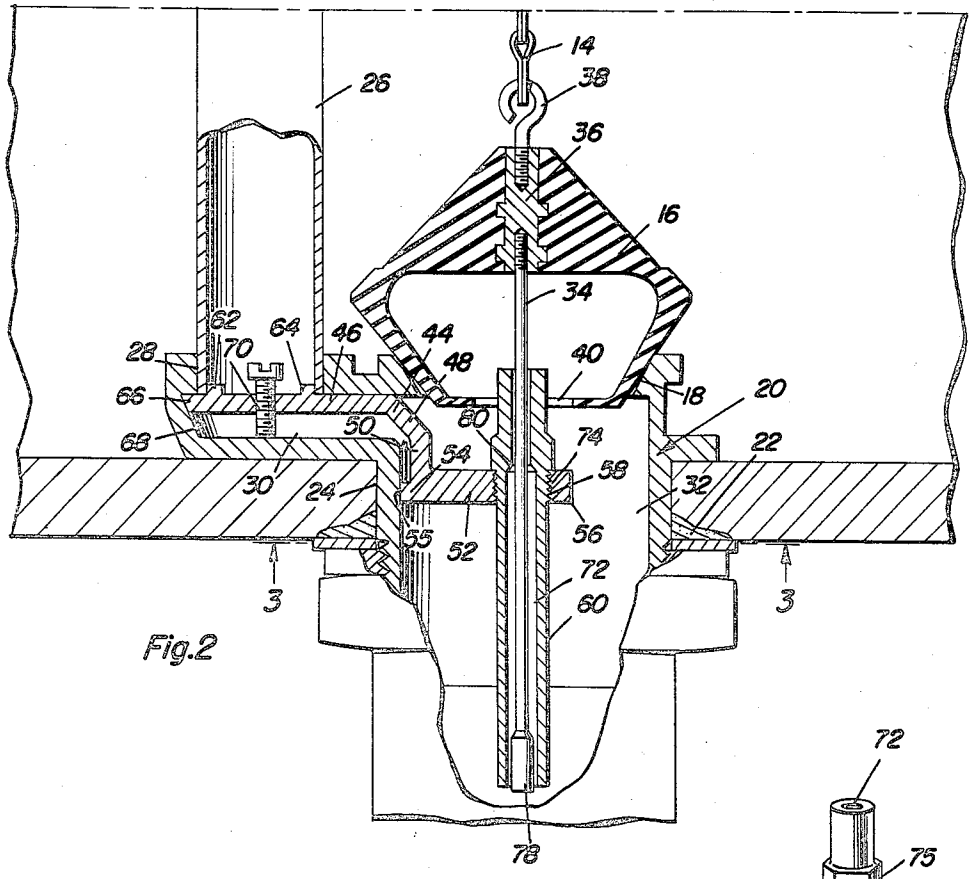

Fig.2

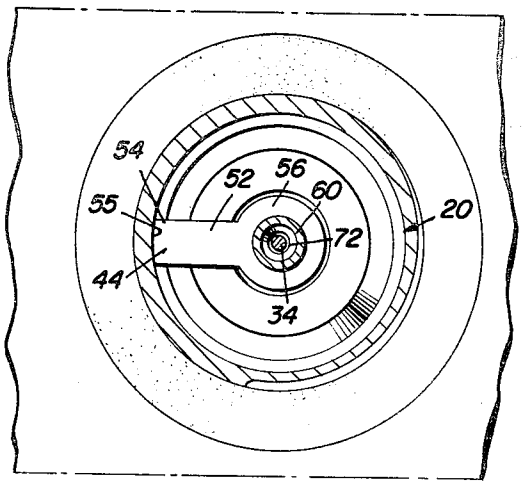

Fig.3

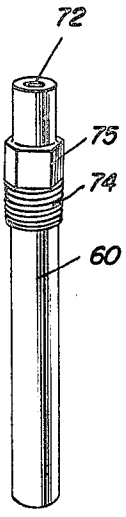

Fig.4

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TOILET FLUSH TANK BOWL VALVE GUIDE

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2 Claims. (Cl. 4—57)

This invention relates to plumbing equipment and more particularly to a valve guide for a flush tank used in connection with the flush mechanism of a flush tank.

An object of the invention is to provide a mechanically simple but effective device to guide the toilet water closet flush valve ball to seat correctly on its valve seat. This eliminates running water in toilets, water waste and annoyance that is usually attempted to be corrected by oscillating the water closet lever when the ball does not seat properly.

A more particular object of the invention is to provide an attachment in the outflow fitting of a flush tank, whereby an exceedingly mechanically simple attachment is fitted in the outflow fitting and held in place in a unique manner, using the space available at the overflow pipe as at least part of the means for holding the guide in place.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a front elevational view showing fragmentarily a typical flush tank and outflow fitting with which a guide constructed in accordance with the invention is applied.

Figure 2 is a largely sectional view on enlarged scale showing a guide constructed in accordance with the invention and its operative connection with the out flow fitting and flush ball of the flush tank mechanism.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a perspective view of a part of the guide.

Figure 5 is a perspective view of another part of the guide.

Figure 6 is a sectional view of the outflow fitting with which the attachment is connected, showing a modification of the invention.

In the accompanying drawings there is a flush tank 10 which is of standard construction. The flush mechanism includes a lever 12 that has a group of holes within which the flexible member 14, for instance, the chain is connected. Flush ball 16 ordinarily constructed of rubber or plastic, is attached to the chain and is adapted to be lifted and lowered onto and from seat 18 of outflow fitting 20.

The outflow fitting is sealed as at 22 in an opening 24 in the bottom of the flush tank. Overflow pipe 26 is attached to the outflow fitting, usually a casting, by being disposed in an opening 28 alongside of seat 18 and held in place by a friction fit or some other fastening expedient. Lateral passageway 30 is in the outflow fitting, registering the overflow pipe 26 with the main passage 32 of the outflow fitting and beneath seat 18.

The flush tank ball 16 has a rod 34 attached to the same member 36 as the supporting hook 38 thereof.

The rod 34 extends through the opening 40 in the bottom of the flush tank ball and protrudes downwardly an appreciable distance fitting into passage 32.

The guide in accordance with this invention consists of a body 44 (Figure 5) that has a first arm 46 to one end of which there is an angulated portion 48. The end of the angulated portion 48 has a portion 50 at right angles to arm 46. The second arm 52 is attached to the end of portion 50 and is parallel to arm 46. One end of arm 52 has a short projection 54 that functions as a stop, resting against a part of the inside surface of passage 32 (Figure 2). Therefore the stop 54 has a curved surface to fit flush against the part of the surface of passage 32. The opposite end of arm 52 has an eye 56 with internal threads 58 so as to accept and hold sleeve 60 (Figure 4).

Arm 46 has two arcuate opposite members 62 and 64 that rise from the top surface thereof near the outer end. The outer end of arm 46 has a surface 66 adapted to fit flush against surface 68, which is the outer surface of passageway 32 adjacent to overflow pipe 26. The two surfaces 66 and 55 on projection 54, form a two-point contact against the inner surfaces of the outflow fitting to aid in the support of the guide. Members 62 and 64 protrude upwardly into the overflow pipe 26 when the overflow pipe is inserted in its opening 28 thereby firmly supporting and helping to clamp the overflow pipe in place. This also helps to hold the guide in the outflow fitting. Setscrew 70 extends through a threaded opening between members 62 and 64 with the lower end of the setscrew adapted to bear against the bottom surface of passageway 32, even further helping to hold the guide in place and providing for adjustment of the guide with respect to the outflow fitting of the flush tank.

Sleeve 60 has an internal passageway 72 through which rod 34 is operable. External threads 74 are adapted to engage threads 58 of the eye 52. There is a nut 75 made on the sleeve 60 above thread 74 in order to receive a tool for the purpose of tightening the sleeve 60 in place in eye 56. As shown in Figure 2, the passageway 72 can be made by a bore and a counterbore. This would limit the extent of travel in an up direction of the rod 34 with the enlargement 78 on the rod bearing against shoulder 80 that separates the counterbore from the bore. As a result the rod 34 and hence ball 16 could not be separated from the guide.

In use of the invention, member 44 need not necessarily have sleeve 60 connected to it. In addition, the configuration of the sleeve can be altered, that is, it can be made longer or shorter. Other changes that fall within the scope and purview of the following claims may be resorted to without departing from the invention.

Figure 6 shows a very important modification of the invention in the sense that the outflow fitting could be made to practice the principles of the invention without the necessity of an attachment. Of course, the original manufacture of the outflow fitting would have to be altered to practice the invention as in Figure 6, whereas the attachment shown in Figures 5 and 4 can be installed on existing fittings.

In Figure 6 there is an arm 52*a* which responds to arm 52 and it may have an eye 56*a* at one end with threads 58*a* in the eye to accommodate the threads 74 of the sleeve in Figure 4. Arm 52*a* protrudes laterally into the main passage 32*a* of outflow fitting 20*a* and is located beneath the seat 18*a* for the flush ball (not shown). The constraining and guiding action of the ball is the same as that in the embodiment of Figure 2.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention

to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a flush tank that has a flush ball and an outflow fitting together with a seat on the outflow fitting and against which the flush ball is adapted to be disposed, and wherein the outflow fitting has a main passage and a passageway communicating with the main passage, a guide for the flush ball, said guide comprising a member having a part located in said passageway and a part in said passage, the part in said passage disposed beneath said seat of said outflow fitting and having an opening therein, means connected with the ball and movable in said opening for guiding said ball as it approaches said seat, the part of said guide in said passageway being in contact with an upper surface of said passageway to partially support said guide and having a setscrew therein bearing against a lower surface of said passageway and clamping the part in said passageway against said upper surface of the passageway, the part of said guide in said

passage having at least one surface engaging a portion of the side wall of said passage to further at least partially support the guide, the outflow fitting having a stand pipe in registry with said passageway, and means upstanding on the part of said guide that is located in said passageway for engaging and fitting in a portion of the stand pipe to further aid in supporting said guide in the outflow fitting.

2. The combination according to claim 1, said last named means comprising a pair of arcuate opposite members adapted to fit in said stand pipe.

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