Aug. 23, 1960 C. S. EDDOWES 2,949,614

FLUSH MECHANISM FOR TOILETS

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Fig. 1

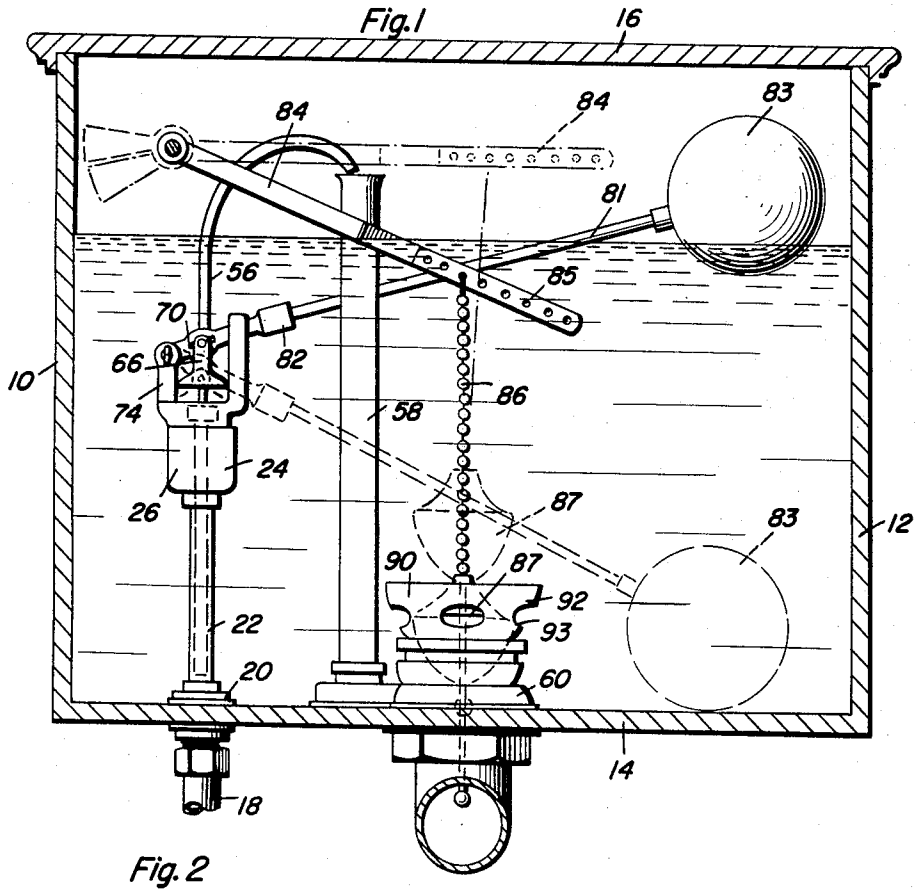
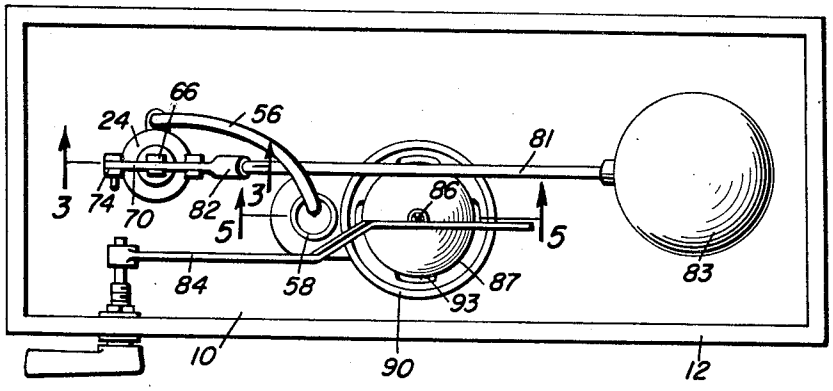


Fig. 2



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Fig. 3

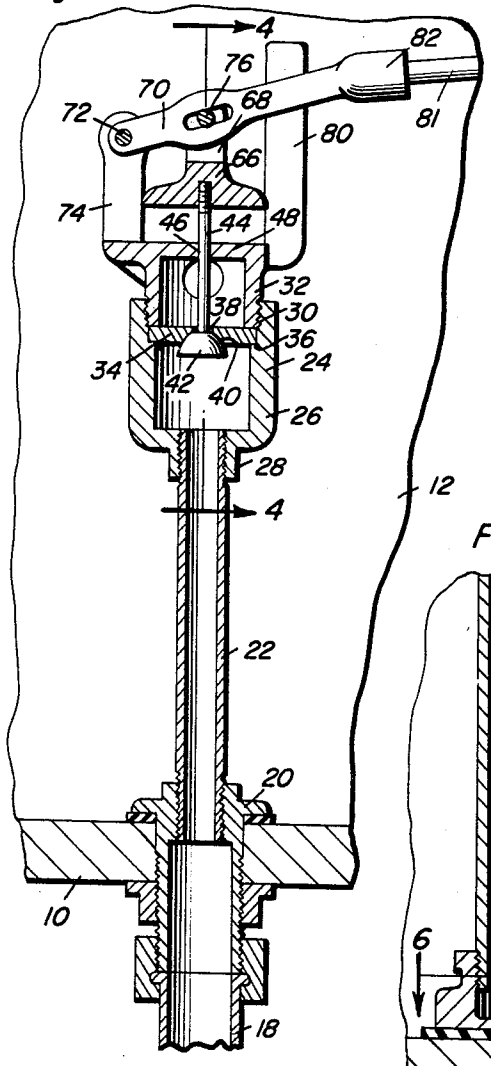


Fig. 4

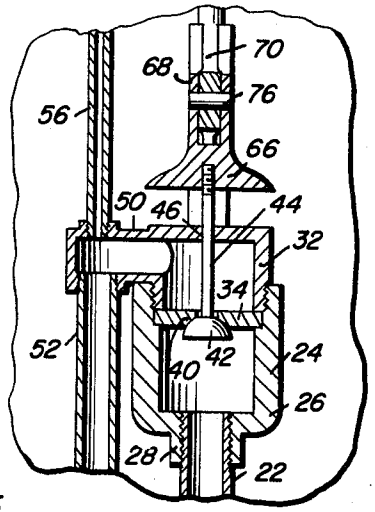


Fig. 5

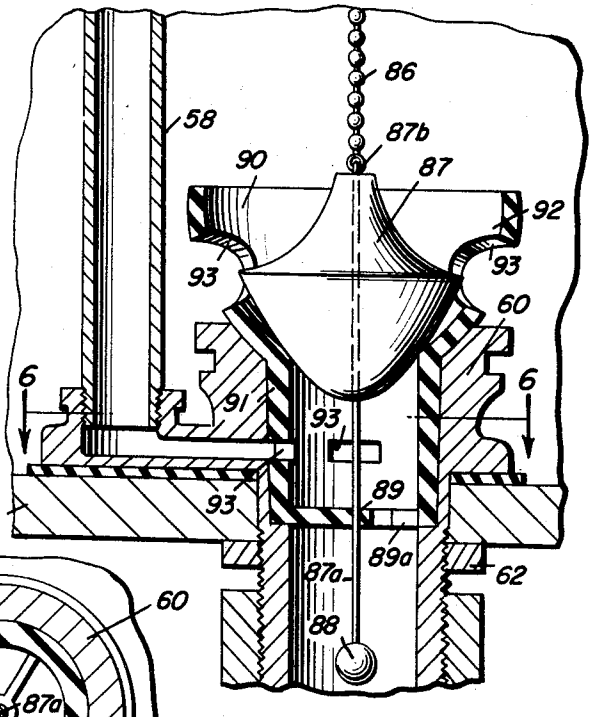
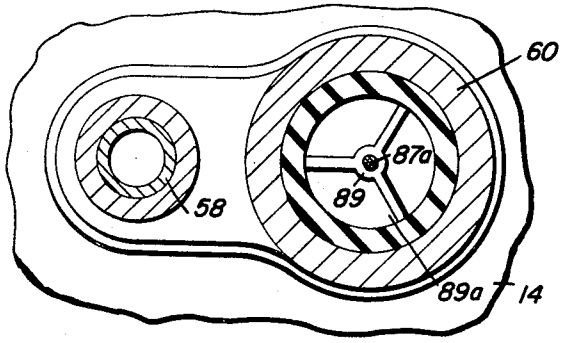


Fig. 6



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FLUSH MECHANISM FOR TOILETS

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4 Claims. (Cl. 4—57)

This invention relates to a flush mechanism for toilets and more particularly to improvements in portions thereof.

This application is copending with my application U.S. Serial No. 539,544 which was filed on October 10, 1955 (now Patent No. 2,836,829) and, for all significant subject matter common to this and the referenced copending application, I claim the benefit of the early filing date thereof.

An object of the present invention is to provide structural improvements and functional advantages in flush tank mechanisms and more particularly to the valves thereof.

Other objects and features of importance will become apparent in following the description of the illustrated form of the invention.

In the drawing:

Figure 1 is a vertical sectional view of a typical flush tank having a mechanism constructed in accordance with my invention disposed therein.

Figure 2 is a top view of the structure in Figure 1.

Figure 3 is an enlarged sectional view taken on the line 3—3 of Figure 1 and showing principally one of the valves of the flush tank mechanism.

Figure 4 is an enlarged sectional view taken on the line 4—4 of Figure 3.

Figure 5 is an enlarged sectional view taken on the line 5—5 of Figure 2 and showing principally the discharge valve of the flush tank.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

In the accompanying drawings there is a flush tank **10** of standard construction. This flush tank has side walls **12**, a bottom **14** and a lid **16** and exemplifies but one of the several types of conventional flush tanks. The principles of the invention are applicable equally well in all types of commercially available flush tanks. As in the majority of flush tanks, there is a water inlet pipe **18** connected by a sealed fitting **20** to an inlet stand pipe **22** in the flush tank **10**. Valve **24** is attached to the top of the stand pipe **22** and is made of a housing **26** that has a nipple **28** at its lower end threaded on the upper threaded end of stand pipe **22**. Housing **26** has internal threads **30** at the open top thereof within which water conducting bonnet is threaded. Plate **34** is interposed between the threaded end of bonnet **32** and a shoulder **36** in housing **26**. Passage **38** is in the plate **34** and a tapered seat **40** is formed as a continuation of passage **38**. Valve member **42** at the end of valve stem **44** is movable in the chamber enclosed by housing **26** and is adapted to be seated and unseated from seat **40**. Stem **44** is passed through passage **38** and through an aligned passage **46** in the top wall **48** of bonnet **32**.

The bonnet has a short conductor of water **50** by which refill pipe **52** is registered with the interior of the water conducting bonnet. A smaller diameter pipe **56** is attached to conduit **50** and extends to overflow pipe **58** which operatively connects to overflow fitting **60** (Figure 5) adjacent to the couplings which connect the fitting **60** with the bottom of the flush tank.

Valve stem **44** is actuated by a yoke **66** whose arms **68** straddle lever **70** and whose body has the stem **44** threaded thereinto. Lever **70** has one end mounted on a pivot pin **72** that is located between the upstanding brackets **74** of bonnet **32**. The yoke has its side **68** flanking the lever **70**, and pivot pin **76** is passed through sides of the yoke **66** and through an opening in the lever. A pair of guides **80** are attached to bonnet **32** and are located on opposite sides of lever **70**, constraining the travel of the lever. Arm **81** is fitted in a socket **82** at the outer end of lever **70** and forms a continuation of the lever. The float **83** of the flush mechanism is on the outer end of the arm.

The flush operating rod **84** has a number of holes **85** in it to which chain **86** is secured. The chain is connected to the valve element **87** and has a rod **87***a* passed through the valve element and connected to the chain, as by ring **87***b*. A weight, for example, ball **88** is at the end of rod **87***a* and is adapted to contact the guide **89** that is supported by three arms extending transversely across the outflow fitting **60**. Ball **88** prevents inadvertent separation of the valve element **86** from the outflow fitting **60**.

I have an improved rubber or elastomeric valve seat **90** in the outflow fitting. The valve seat has a cylindrical lower portion **91** which has arms **89***a* and it fitted deeply into the outflow fitting **60**, and a cup-shaped upper portion **92** with a number of holes **93** in the side wall thereof. The lower cylindrical portion **91** has apertures **93***a* that register with pipe **58** to permit possible overflow water to escape without obstruction. Element **87** is fitted in this portion of the seat. Accordingly, the valve element **86** which is a standard flush ball, has smooth rubber or rubber-like seating. This offers the advantage of no corrosion or development of uneven encrustations which damage the flush ball and eventually prevent a perfect closure. The seat **90** is easily removed for cleaning.

I consider the seat **90** as a distinct improvement over commercially available equipment and also the extension of rod **87***a* through the flush ball or valve element **86** and through the guide **89** for the purposes described. I also consider my valve construction shown in Figure 3 to be novel and much more dependable and smoothly operative than others which I have experienced.

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 which includes a stand pipe, a float operated valve operatively connected with said stand pipe, the improvement comprising an outflow fitting which has a seat disposed in it, said seat composed of a resilient material and having a cylindrical portion and a cup-shaped portion whose side wall is flared outwardly, a circular edge at the juncture of said liner portions, a flush ball having an outwardly sloped lower wall and movable between seated and unseated positions in the seat, said ball when seated making a line contact on said edge, said flush ball having side walls sloped in the same direction as said ball with the angle of slope being more acute than the slope of said seat side walls so that a portion only thereof contacts a portion of the laterally adjacent side walls of the cup-shaped portion of said seat.

2. The improvement of claim 1 wherein there is a transverse group of radial arms integral with the lower

part of said resilient seat and having an aperture at the juncture of said arms, a flexible mechanical element supporting said flush ball, said element having an extension thereof passed through said flush ball and through said aperture in the arms of the outflow fitting, and means on said extension adapted to contact a part of said fitting for limiting the extent of travel of said extension and flush ball with respect to said fitting thereby preventing inadvertent separation of the flush ball from the fitting.

3. In a flush tank which has an outflow fitting, a flush ball having a convex side wall, a resilient liner in said outflow fitting and having a lower cylindrical portion disposed in said fitting, said liner having an upwardly opening cup-shaped upper portion adapted to accommodate said ball, said upwardly opening cup-shaped portion having a concave side wall forming a circumferential edge at the juncture of said cup-shaped portion and cylindrical portions, said convex side wall of the flush ball seating on said edge in the valve closed position and establishing a line contact between said edge of said liner and said convex side wall, a plurality of radially disposed and transversely extending arms constructed of resilient material and integral with the lower end of said cylindrical portion of said liner, said arms having an approximately central juncture provided with an aperture, guide and stop means extending downwardly from said ball and extending through said aperture so that said arms resiliently guide the travel of said ball as it is lifted and lowered from said liner and constitute a yielding stop to limit the extent of upward motion of said ball when said ball is being lifted from said liner.

4. The combination of claim 3 wherein said concave side wall of said liner has a water passage opening therein located above said circumferential edge at the juncture of said cup-shaped portion and said cylindrical portion.

References Cited in the file of this patent

UNITED STATES PATENTS

290,204	Boyle	Dec. 18, 1883
1,576,600	Haas	Mar. 16, 1926
2,614,263	Kass	Oct. 21, 1952
2,760,206	Loyd	Aug. 28, 1956
2,832,963	Minella	May 6, 1958