Nov. 15, 1960 P. N. NELSON 2,959,790

WATER CLOSET FLUSH VALVE

Filed Sept. 18, 1958

Fig. 1.

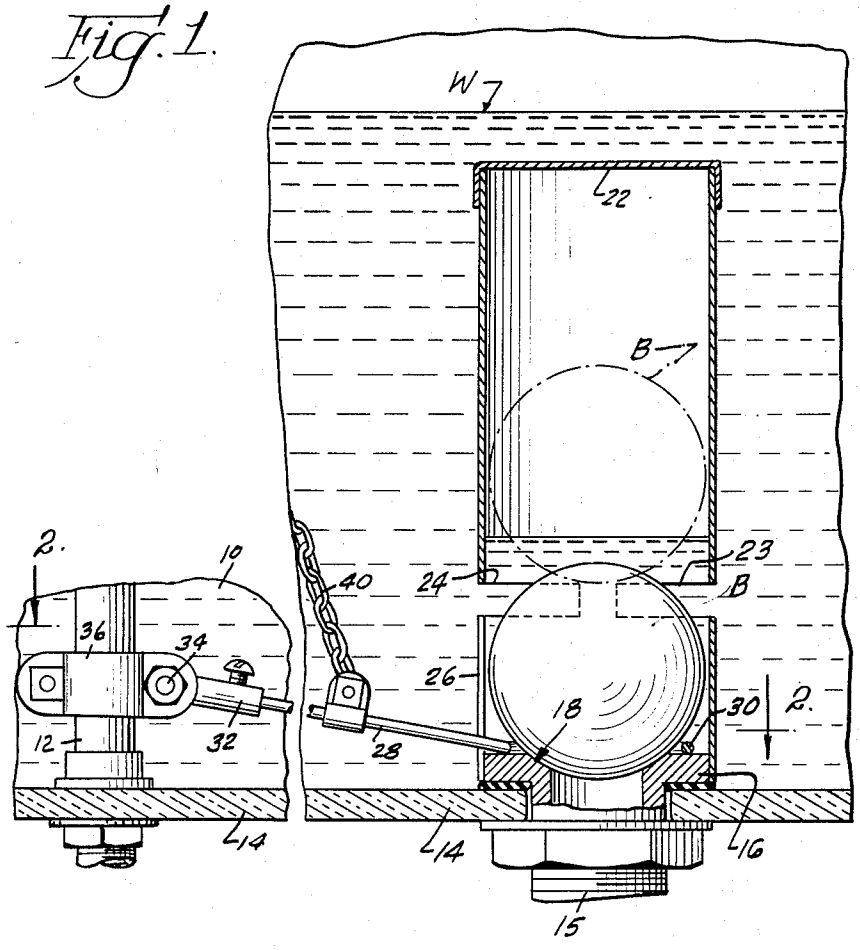
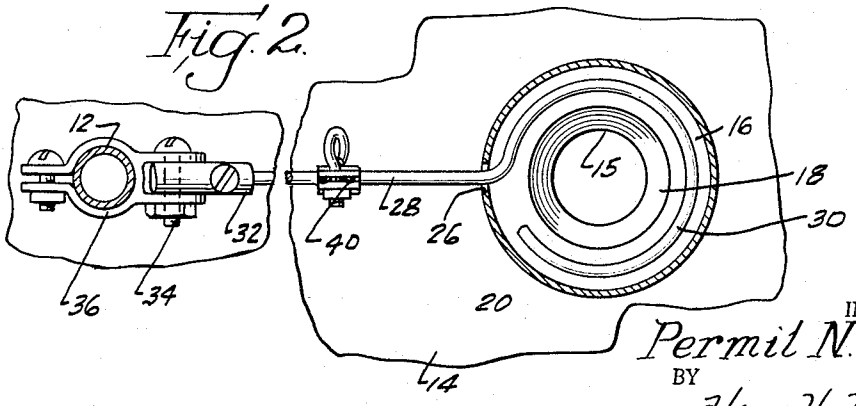


Fig. 2.



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WATER CLOSET FLUSH VALVE

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2 Claims. (Cl. 4—56)

My invention relates to improvements in flush valves and similar devices, and more particularly to the type of flush valve that is used in water closets throughout the country.

Most of the outlet pipes which lead from the water reservoir to the toilet are controlled by a flexible rubber semi-cylindrical valve, having a top portion with a rod or wire connected to the same so that it may be raised by the action of a flush lever usually having a handle on the outside of the water closet. The vertical rod from the flush ball usually has a sliding connection with the tripping lever so that while it is held up from the turbulence of the water escaping below the same through the outlet pipe, the valve will usually seat from the suction that is momentarily created as it descends, and a comparatively water-tight seal is thus obtained.

One of the disadvantages of this type of flexible valve is the fact that the seating will always take place in a certain annular area which will gradually become worn and will finally leak, requiring repair or replacement. Since these parts are not usually kept in the home, the toilet is normally used for some time in such handicapped condition before the repair or replacement takes place, thus adding greatly to the inconvenience of the people in the home.

The principal object of the present invention is to provide an improved type of flush valve, one in which a loosely confined rubber or other type ball forms a valve. Means for raising the ball are entirely separate therefrom, so that it may be raised and be bounced around in confinement above the escaping water, this turbulence causing the ball to generally revolve so that each time the ball seats, the seating area will be different on the circumference of the same.

For a more comprehensive understanding of the invention and the advantages thereof, reference is had to the following description and the accompanying sheet of drawings, upon which:

Fig. 1 is a fragmentary sectional view through a typical water closet with a portion of the view foreshortened showing the inlet standpipe and the outlet pipe to the toilet which is controlled by the ball valve; and

Fig. 2 is a plan view thereof.

In the embodiment of the invention which I have chosen to illustrate and describe the same, I have shown the usual inlet standpipe **12** which is fastened in the base **14** of a water closet **10** of the usual type found in the home in connection with toilets. The outlet pipe **15** which leads to the toilet is also connected through

the bottom wall **14** of the water closet **10** and has a lateral flange **16** at the top side thereof, having an annular arcuate valve seat **18** in the face of the same.

A hollow ball valve B is normally seated on the valve seat **18** and is held in position by reason of the pressure of the water W that is in the reservoir. The ball valve B is also confined in a cylindrical housing **20** provided with a cap **22** and mounted at its lower end around the peripheral edge of the flange **16** of the outlet pipe. The housing may also have openings **23** and **24** in the side walls of the same and a vertically disposed slot **26** through which the operating rod **28** of the valve paddle extends.

The valve paddle which is used for raising the ball valve for a toilet flushing operation may have a ring-shaped portion **30** which, when not in use, rests upon the top of the flange **16** with the ball spaced therefrom and seated on the seat **18**. The paddle may have the rod **28** extended to a level portion **32** pivotally mounted on a bolt **34** of a clamp **36** suitably fastened on the inlet pipe **12**. The flushing lever of the toilet may be connected to the valve paddle **30** by means of a chain **40**, as shown.

With the construction thus described, when a flushing operation is desired the flushing lever pulls on the chain **40**, raising the valve operating paddle and lifting the ball valve on the ring portion **30** thereof to a point generally near that shown in dot-dash lines in Fig. 1. Water will now rush through the openings **23** and **24** downwardly through the outlet pipe, causing the ball valve B to bounce around on top of the water in the housing **20**. As the level of the water recedes, the ball will gradually settle down and finally seat upon the valve seat **18**. The paddle will of course return to normal resting position upon releasing of the flush valve of the toilet.

While I have illustrated and described a specific embodiment of the invention, it will be apparent to those skilled in the art that changes and modifications may be made in the exact details shown, and I do not wish to be limited in any particular; rather what I desire to secure and protect by Letters Patent of the United States is:

1. In a flush valve for water closets, the combination of a water reservoir, an outlet pipe connected through the bottom wall of the same, said pipe having a lateral flange on the inside of said reservoir, a valve seat in said flange, a hollow ball valve positioned on said valve seat, a cylindrical housing fastened on said flange and enclosing said ball valve, a pair of narrow elongated transverse slots in the wall of said housing spaced from the lower end of the same, said housing also having a vertical slot extending from one of said transverse slots down to the lower end of said housing medially between the ends of said transverse slot, and a ball valve paddle for raising said valve when desired, said paddle comprising a rod pivoted adjacent said housing and extending through said transverse slot and having a ball-raising portion at one end thereof positioned below a portion of said ball valve for raising the same when desired said rod and ball-raising portion capable of being inserted or removed from said housing through said combined slots.

2. In a flush valve for water closets, the combination of a water reservoir, an outlet pipe connected through the bottom wall of the same, said pipe having a lateral

flange on the inside of said reservoir, a valve seat in said flange, a hollow ball valve positioned on said valve seat, a cylindrical housing fastened on said flange and enclosing said ball valve, a pair of narrow elongated transverse slots in the wall of said housing spaced from the lower end of the same, said housing also having a vertical slot extending from one of said transverse slots down to the lower end of said housing medially between the ends of said transverse slot, and a ball valve paddle for raising said valve when desired, said paddle comprising a rod pivoted adjacent said housing with a portion extending through said transverse slot and having a ball-raising portion at one end thereof positioned below a portion of said

ball valve for raising the same when desired, the portion of said paddle below said ball being a partial circle formed by the same said rod and ball-raising portion capable of being inserted or removed from said housing through said combined slots when the same is in a ball-raising position.

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