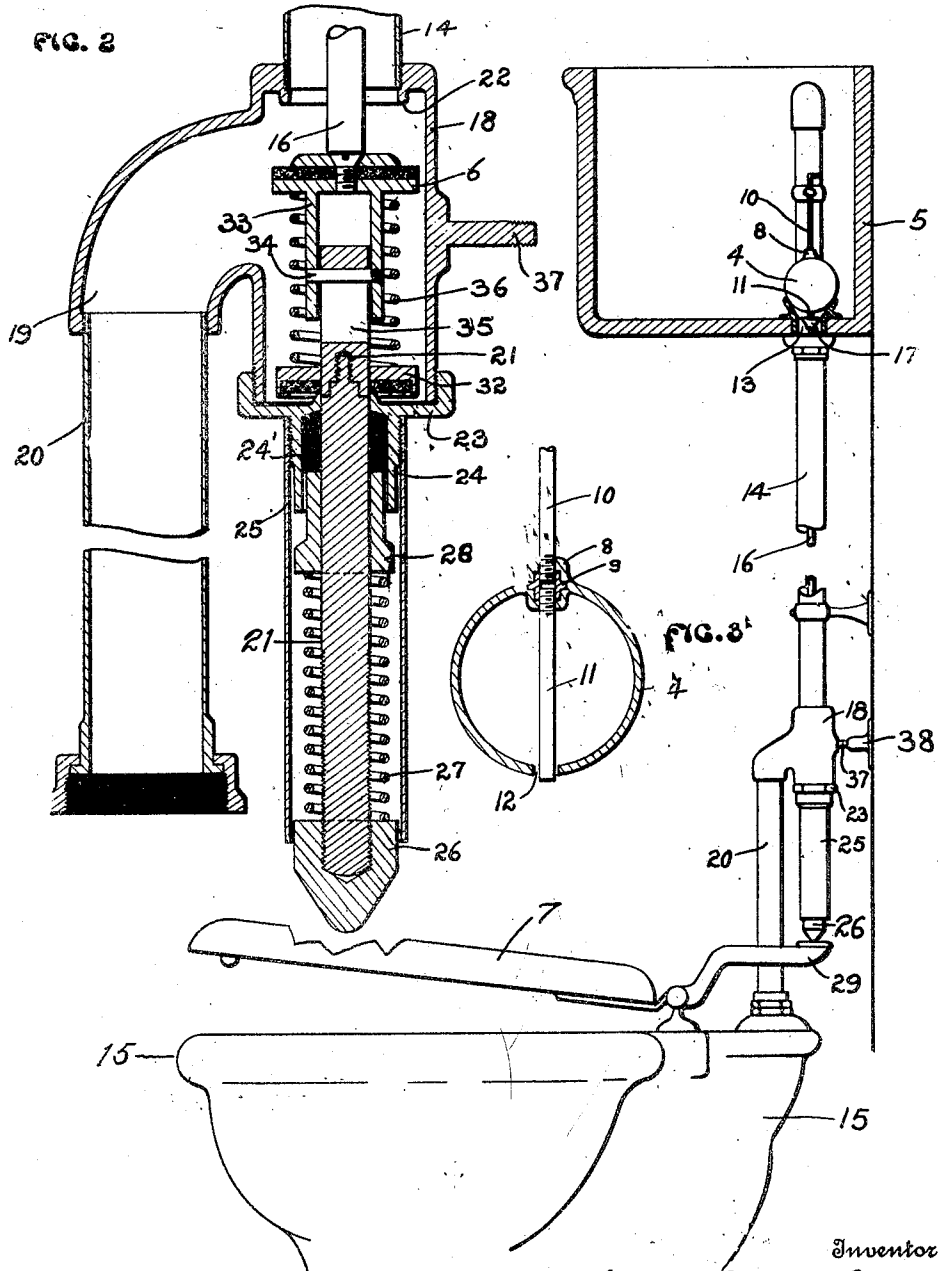


D. W. McNEIL.
 FLUSH MECHANISM FOR CLOSETS.
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Witnesses

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To all whom it may concern:

Be it known that I, DANIEL W. McNEIL, a citizen of the United States of America, and resident of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Flush Mechanism for Closets, of which the following is a specification.

This invention relates to flush mechanism for closets, and has for an object to produce a simple and reliable seat actuated flush valve and valve operating mechanisms of improved construction. This and other objects I attain by means of apparatus embodying the features herein described and illustrated.

In the drawings accompanying this application and forming a part thereof, Fig. 1 is an elevation of a closet embodying my invention, portions being shown in section and portions being broken away for convenience of illustration. Fig. 2 is a sectional view of a portion of the valve operating mechanism, which forms a part of my invention. Fig. 3 is a sectional view of an improved form of flush valve which forms a detail of my invention.

Referring to the drawings:—The apparatus illustrated, comprises a ball-float or flush valve 4, which is located in a flush tank 5, a seat operated mechanism for unseating the valve 4, and a stop valve 6 which is actuated by the seat operated mechanism, and is adapted to shut off the flow of water from the tank 5 while the operating pressure is maintained on the seat 7 and while the valve is open or unseated. The flush valve 4 illustrated consists of a hollow ball-shaped disk, which is preferably made of rubber and is provided on one side with a lug 8, in which a metal ferrule 9 is located. The ferrule is provided with a threaded and longitudinally extending opening, which registers with apertures provided in the lug 8. A stem or guide rod 10 for the ball 4 is threaded at its lower end and is adapted to be screwed into the ferrule 9. A contact rod 11 is threaded at its upper end and is screwed into the lower end of the ferrule 9. This rod extends from the ferrule downwardly through the interior of the ball 4 and projects a short distance beyond the surface of the ball through an aperture 12. The stem or guide rod 10 is secured in place in the tank 5 in any suitable manner, so that it

will permit the ball to move up and down freely, but will to some extent guide its movements. The ball 4 is adapted to seat on a flange of a discharge port 13, provided in the bottom of the tank 5, and in this manner cut off communication between the tank 5 and a flush pipe 14, which extends downwardly from the port 13 and communicates with the flush passages of the porcelain bowl 15 of the closet.

A release rod 16 extends upwardly through the piping 14 and is provided at its upper end with a cup-shaped seat 17, which is adapted to contact with the contact rod 11 of the ball 4 and to raise the ball from its seat, for the purpose of opening the port 13. The ball 4 is held to its seat by the unbalanced water pressure, but as soon as it is unseated, it is exposed on all sides to water pressure, and consequently floats upwardly and fully opens the port 13. The ball will not close the port until almost all of the water is discharged from the tank and the ball has moved adjacent to the port 13. It is then carried by the flow of water, through the port, to its seat and the unbalanced condition is reestablished. The release rod 16 extends downwardly through the piping 14 and its lower end seats on the valve 6, which is located in a housing 18, secured to the lower end of the piping 14. The housing 18 is provided with a discharge port 19, which communicates through suitable piping 20 with the flush passages of the bowl 15. The valve 6 is mounted on a rod 21 and is adapted to seat on an annular flange or seat 22, provided on the housing 18, for the purpose of closing communication between the piping 14 and the housing 18, and consequently between the flush tank 5 and the flush passages of the bowl 15. The lower end of the housing 18 is closed by a screw-cap 23, through which the rod 21 projects, and which is provided with an integrally formed annular flange 24, in which a suitable packing 24' for the rod 21 is located.

A depending sleeve 25 is screwed, or otherwise secured, to the flange 24 and forms a guide for a cap-nut 26, which is screwed on to the lower end of the rod 21. A coiled spring 27 is located around the rod 21 and between the cap-nut 26 and a bushing 28, which is loosely mounted on the rod 21 and projects into the flange 24, for the purpose of holding the packing 24' in place. With

this arrangement, the packing 24' is maintained tight by the tension of the spring 27, and the bushing 28 forms a guide for the rod 21. The cap-nut 26 is adapted to contact with the lever 29. A disk 32 is secured on the rod 21 and is so located within the housing 18, that it will seat on a flange provided on the cap 23 around the rod 21, when the rod is moved to its lowest position by the tension of the spring 27.

The valve 6 illustrated, consists of a valve disk provided with means for securing a washer in place, and provided with an annular flange 33, which is adapted to fit over or cap the upper end of the rod 21, and is secured in place on the rod by means of what may be termed "a lost-motion connection." The lost-motion connection consists of a pin 34, which extends diametrically across the flange 33 and is located within a longitudinally extending slot 35, provided in the rod 21 near its upper end. The valve 6 is yieldingly held in position on the rod 21 by a coil spring 36, which surrounds the upper end of the rod and the flange 33 and yieldingly forces the valve upwardly, so that the pin 34 is normally held in contact with the upper end of the slot 35. With this arrangement, the lost-motion connection is self-adjusting.

The operation of the apparatus is as follows: When the seat 7 is depressed against the bowl 15, the rod 21 is raised through the agency of the lever 29, so that it moves the valve 6 against its seat 22 and causes the release rod 16 to move upwardly and unseat the valve 4. This opens communication between the tank 5 and the flush pipe, 14, but does not permit of a flow of water to the bowl 15, since the valve 6 closes communication between the piping 14 and the housing 18. As soon as the depressing force is removed from the seat 7, the rod 21 is forced downwardly by the pressure of the spring 27, so that the valve 6 is unseated, the disk 32 seated, and so that the seat 7 is raised to the normal or inoperative position. The unseating of the valve 6 opens communication between the tank 5 and the bowl 15 and causes a flow of water from the tank through the flush passages of the bowl.

By employing the self-adjusting lost-motion connection between the valve 6 and the rod 21, the rod 21 may be raised a considerable amount, for example, an inch, after the valve 6 is seated. This arrangement is particularly important, since it eliminates the necessity of a nice adjustment of the apparatus and insures the seating of the valve 6.

By separately forming the sleeve 25, I am able to remove it from the cap 23 and to adjust the packing 24', in case of leakage around the rod, without the necessity of removing the cap. The valve disk 32 forms in effect an emergency packing for prevent-

ing leakage around the rod and is effective when the rod 21 is forced to its lowest position. The washers on the valve 6 and on the valve disk 32 may be renewed by simply removing the cap 23 and withdrawing the valve from the housing 18. The tension of the spring 27 may be adjusted by varying the position of the nut 26 on the rod 21.

In the drawings, I have shown the housing provided with an integrally formed stud 37, which is threaded at its outer end and is adapted to be secured in place by means of a fixture 38. With this arrangement, the flush pipe 4 and the housing 18 are rendered more rigid and the housing is prevented from turning out of alinement after the closet is installed.

What I claim is:—

1. A flush mechanism for closets comprising a flush valve, a stop valve, a release rod for said flush valve, a seat actuated mechanism for controlling said stop valve and said release rod, and a self-adjusting lost-motion connection between said stop valve and said seat actuated mechanism.

2. A flush mechanism for closets comprising a flush valve, a stop valve, a release rod for said flush valve, a seat actuated rod for controlling said stop valve and said release rod, and a self-adjusting lost-motion connection between said seat actuated rod and said stop valve.

3. A flush mechanism for closets comprising a flush valve, a stop valve, a release rod for said flush valve, a seat actuated rod for controlling said stop valve and said release rod, a spring for moving said seat actuated rod to the normal position, and a spring controlled lost-motion connection between said seat actuated rod and said stop valve.

4. A flush mechanism for closets comprising a flush tank, a flush valve located in the tank, a flush pipe communicating with the tank, a release rod located in the pipe for operating said valve, a bowl provided with a flush passage, a movable seat on said bowl, a stop valve between said pipe and said passage, a spring restrained rod for closing said stop valve and for actuating said valve operating rod to open said flush valve, a self-adjusting lost-motion connection between said spring restrained rod and said stop valve, and a lever mounted on said seat for actuating said spring restrained rod.

5. A flush mechanism for closets comprising a flush tank, a flush valve located in said tank, a bowl provided with a flush passage, a seat on said bowl, piping between said tank and said passage, a stop valve between said tank and said passage located in said piping, concealed means for actuating said flush valve, a spring restrained rod for actuating said stop valve and said concealed means, a self-adjusting lost-motion connection between said rod and said stop valve,

and a lever mounted on said seat for actuating said rod.

5 6. A flush mechanism for closets comprising a flush tank provided with a discharge port, a flush valve located in said tank and adapted to close said port, a flush pipe communicating with said port, a release rod located in said pipe for opening said valve, a housing communicating with said pipe, a
10 bowl provided with a passage communicating with said housing, a stop valve located in said housing for closing communication between said pipe and said passage, a movable seat mounted on said bowl, a seat actu-

ated rod for moving said stop valve to close 15 communication between said pipe and said passage, a spring controlled lost-motion connection between said seat actuated rod and said stop valve, a lever mounted on said seat for contacting with said seat actuated rod, 20 and a spring for forcing said rod against said lever and for raising said seat to an inoperative position.

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