Dec. 22, 1959 A. A. SCHOENROCK, JR 2,918,248

CONTROL MEANS FOR FLUSH VALVES

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Fig. 1

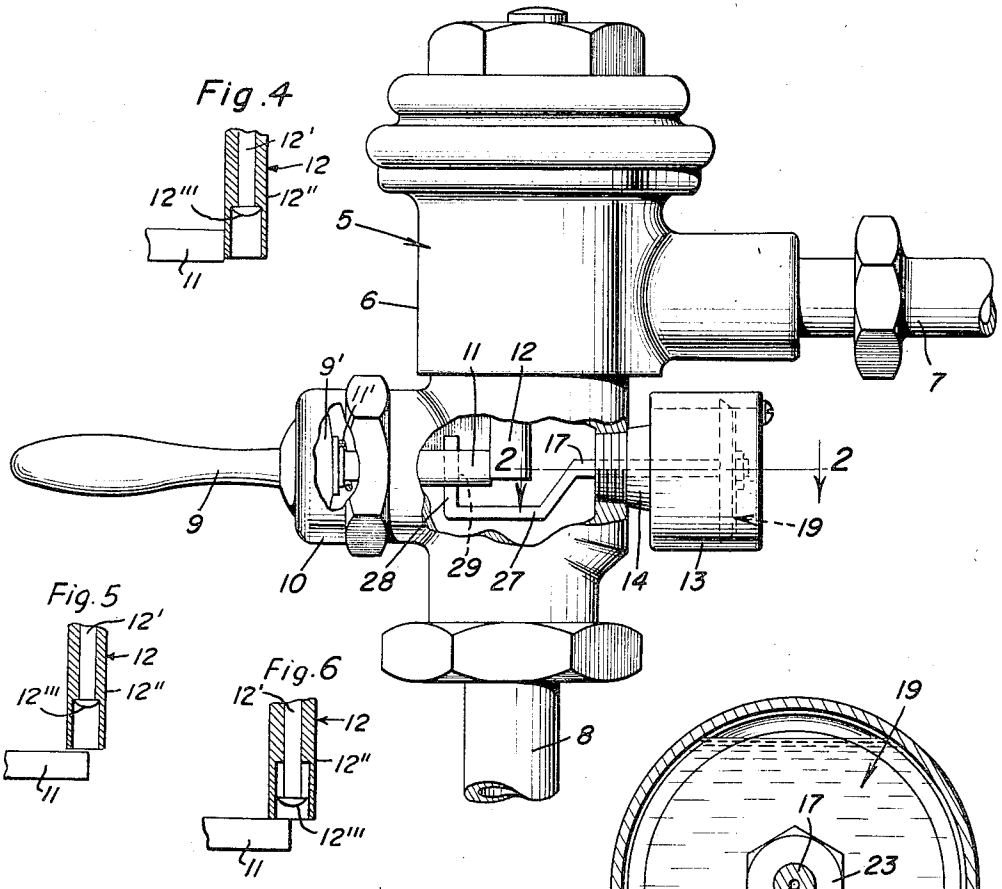


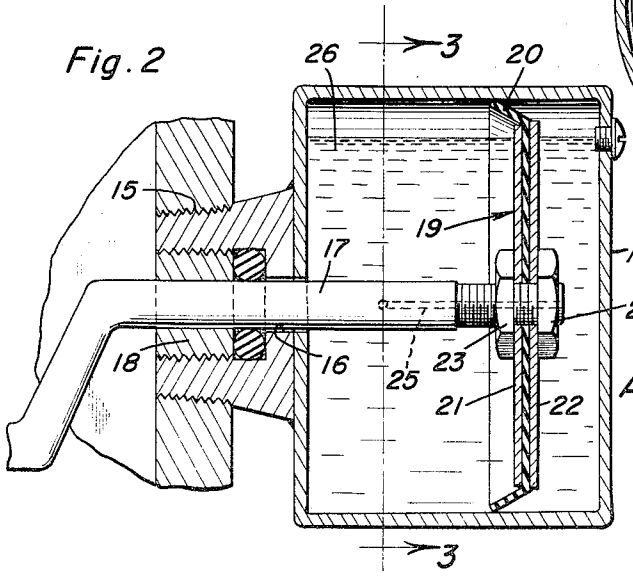
Fig. 4

Fig. 5

Fig. 6

Fig. 3

Fig. 2



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CONTROL MEANS FOR FLUSH VALVES

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1 Claim. (Cl. 251—21)

The present invention relates to new and useful improvements in flush valves to delay the successive time period of each flushing cycle.

An important object of the invention is to provide dash-pot control means for the valve plunger to delay the return action of said control means before the valve can again be operated and thus prevent overflow of the drain of urinals, toilets or installations where flush valves are used.

Another object is to provide a control attachment for flush valves adapted for connecting to the operating lever or handle of the valve in a protected position inside the valve housing.

A further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purpose for which the same is intended.

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 drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view with parts broken away and shown in section;

Figure 2 is an enlarged sectional view taken on a line 2—2 of Figure 1;

Figure 3 is a transverse sectional view taken on a line 3—3 of Figure 2, and

Figures 4, 5 and 6 are fragmentary views in side elevation partly in vertical section illustrating, respectively, different positions of the valve stem sections relative to the valve plunger.

Referring now to the drawing in detail, wherein for the purpose of illustration I have disclosed a preferred embodiment of my invention, the numeral 5 designates a flush valve of a conventional type commonly used for urinals and toilets and which includes a valve housing 6 having an inlet 7 at its upper portion and an outlet 8 at its lower portion. A swivelly movable operating handle or lever 9 is mounted in a gland nut 10 at the front of the housing and the inner end of the handle or lever, has an enlarged rocker 9' thereon which is operatively engaged with a reciprocable plunger rod 11 positioned in operating engagement with the valve stem 12 for advance to open the valve by a tilting movement of the valve stem 12 in a manner common to flush valves of this type, the plunger rod 11 being spring retracted by a spring 11' and returning the handle or lever 9 to normal starting position all as disclosed in U.S. Patent No. 1,114,398, issued to W. E. Sloan and dated October 20, 1914, to which attention is directed.

A dash-pot housing 13 is provided with an externally threaded boss 14 for threading in an opening 15 at the rear of the valve housing 6 and the boss is formed with a bore 16 in which a plunger rod 17 is slidable. A packing assembly 18 seals the plunger rod in the bore.

One end of the plunger rod 17 extends into the dash-pot housing 13 and to which a plunger 19 is attached and which comprises a Neoprene or other suitable plunger cup 20 secured between a pair of metal washers 21 and 22 by inner and outer nuts 23 and 24 threaded on rod 17. The end of the rod is formed with a passage 25 to bleed liquid 26 in the housing 13 from one side of the plunger to an opposite side thereof in a dash-pot action upon a reciprocating movement of the plunger.

The other end 27 of plunger rod 17 extends into the valve housing 6 and is formed with a lateral hook-like extension 28 engaged in a transverse opening 29 in the reciprocable plunger rod 11.

The valve stem 12 is, as shown in the aforesaid patent, of a two-part telescopic type with upper and lower telescopic stem sections 12', 12'' respectively. When the valve 5 is closed and the plunger rod 11 retracted, the lower stem section 12'' hangs suspended in advance of the plunger rod 11 from an enlargement 12''' on the upper stem section 12'', as shown in Figure 4, so that when the plunger rod 11 is advanced, the valve stem 12 is tilted, toward the right in the drawing, out of normal perpendicular position with respect to the plunger rod 11, as shown in the aforesaid patent, to open the valve 5, which, when completely opened lifts said valve stem 12 above the plunger rod 11 as shown in Figure 5. This arrangement permits the valve 5 to close and the valve stem 12 to return to normal perpendicular position if the plunger rod 11 is held advanced by the handle of lever 9, and also prevents the valve 5 from being again opened until the plunger rod 11 is retracted. This is because with the plunger rod 11 held advanced, the lower stem section 12'' may slidably seat on the plunger rod 11 while the upper stem section 12' telescopes downwardly in the lower stem section 12'', as shown in Figure 6, while the valve 5 closes, and the stem sections 12', 12'' remain in this position until the plunger rod 11 is fully retracted, whereupon, the lower stem section 12'' slides downwardly on the upper stem section 12' off of and in front of the plunger rod 11 to thereby position the valve stem 12 for again being tilted by advance of the plunger rod 11.

According to my invention, when the handle or lever 9 is operated, the plunger 19 is advanced and the cup 20 flexes at its outer edge rearwardly away from the housing 13 to permit the liquid 26, in advance of the plunger 19, to by-pass said plunger 19 around the cup 20 so that the plunger 19 may be quickly advanced and the bleed passage 25 is ineffective to retard such advance. However, when the plunger rod 11 retracts, and the plunger 19 is thereby retracted, the outer edge of the cup 20 flexes against the housing 13 into sealing engagement therewith to force liquid behind the plunger 19 to by-pass said plunger 19 forwardly through the passage 25 whereby retraction of the plunger 19 and the plunger rod 11 is retarded by slow relief through the small passage 25 of back pressure behing the plunger 19. Thus, return of the plunger rod 11 to normal position is retarded and delayed so that successive repeat operations of the handle or lever 9 to open the valve 5 must be delayed accordingly.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, 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 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:

In a flush valve having a casing provided with a valve member having a two-part telescopic stem therein operative for opening and closing thereof, a swivelly movable handle on the casing, a reciprocable member in the casing operative from a normal position by said handle to laterally engage said stem and open said valve member and means including said two-part telescopic stem preventing said valve member from being held open or immediately opened again until said reciprocable member has returned to normal position, and spring means for returning said reciprocable member to its normal position, dash-pot means for retarding return of said reciprocable member comprising a liquid containing housing on said casing, a plunger in said housing movable forwardly and rearwardly of said stem in opposition to pressure of the liquid in the housing, a cup on said plunger having a free edge flexible into frictional sealing engagement with said housing in response to rearward movement of the plunger and pressure of the liquid against said edge whereby to retard rearward movement of the plunger, a plunger rod for retarding return of said reciprocable member in correspondence with the retarded rearward movement of the plunger and moving said plunger forwardly in response to movement of said reciprocable member from normal position and extending out of said housing into said casing with one end connected to said reciprocable member and its other end fixed to and extending through said plunger, and a bleed port in the fixed end of the plunger rod opening forwardly and rearwardly of said plunger to relieve back pressure of liquid in front of said plunger opposing forward movement of the plunger.

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