E. G. HEDGES.

SELF CLOSING FLUSH VALVE.

APPLICATION FILED AUG. 23 1913.

1,281,566. Patented Oct. 15, 1918.

Fig. 1

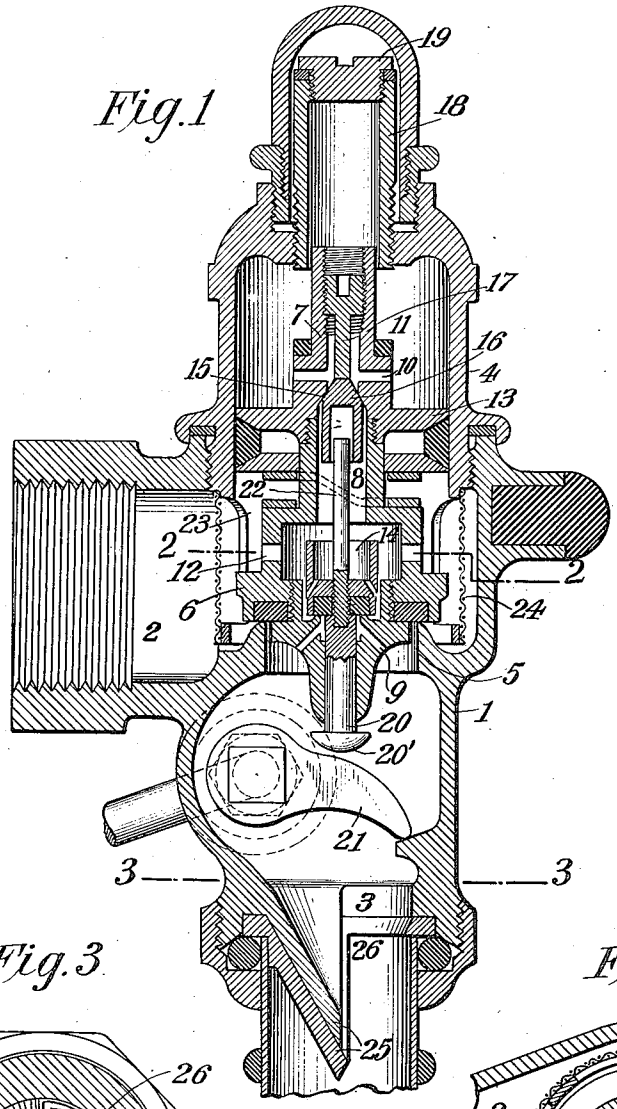


Fig. 3

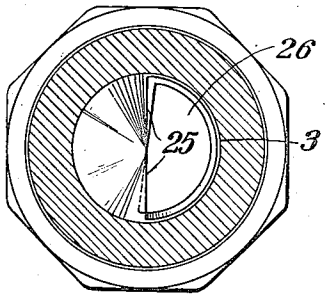
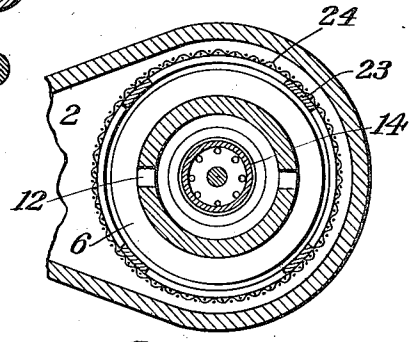


Fig. 2



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UNITED STATES PATENT OFFICE.

EDWARD G. HEDGES, OF NEWARK, NEW JERSEY.

SELF-CLOSING FLUSH-VALVE.

1,281,566. Specification of Letters Patent. Patented Oct. 15, 1918.

Application filed August 23, 1913. Serial No. 786,298.

To all whom it may concern:

Be it known that I, EDWARD G. HEDGES, a citizen of the United States, and a resident of the city of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Self-Closing Flush-Valves, of which the following is a specification.

My invention relates to a self closing flush valve device and more particularly to that type in which the valve is returned to its closing position by liquid pressure in a compression chamber. Such devices are usually provided with a plunger affixed to the valve, which plunger displaces the water from the chamber as the valve is moved to open position. The chamber is connected with the water supply, usually through a bleeding hole, to refill the same and thereby return the valve to its closing position. To control the time during which the valve is closing, that is, to control the time during which water can pass the open valve it has been usual to place in the bleeder hole, means for varying the extent of the opening therethrough.

Where this bleeder hole is used to provide an escape for the water displaced by the piston, any small opening at this place retards the flow from the chamber and offers a resistance to the unseating of the valve.

An object of my invention is to provide in the piston a liquid passageway to the compression chamber provided with means for controlling the time for closing the valve, which means will automatically permit a quick flow of liquid from the compression chamber thereby to provide an easy opening of the valve.

Various other objects of the invention will be in part obvious and in part more fully set forth in the following description of a device embodying my invention, which also discloses novel features of construction and combination of parts hereinafter set forth and claimed.

In the drawings:—

Figure 1 is a sectional view taken axially through a preferred embodiment of my invention;

Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a similar view taken on the lines 3—3 of Fig. 1.

In the drawings there is shown a tube 1 having an opening 2 in the side thereof constituting an inlet, and having an open end 3 constituting an outlet, the end opposite the outlet being closed by means of a hollow casing 4 threaded into the same. Intermediate its length the bore of the tube is contracted to form a valve seat 5 upon which normally rests a main valve 6 closing communication between the inlet 2 and outlet 3. A valve stem 7 extends from the main valve 6 into the casing 4 and has a passageway 8 extending longitudinally therethrough said passageway having extensions 9 placing the same in communication with the outlet 3, ports 10 placing the same in communication with the compression chamber 11 formed in the casing 4 and with ports 12 placing the same in communication with the inlet 2.

A piston 13 carried by the stem 7 between the ports 10 and 12 slidably fits the casing 4 and constitutes the movable head of the compression chamber 11. This piston may be of any suitable construction and for this purpose the disclosure is shown to be a device of a character forming the subject matter of my co-pending application, Ser. No. 667,701, filed December 26, 1911.

Communication through the extensions 9 is controlled by means of the normally closed release valve 14. The flow of liquid through the passageway 8 to and from the chamber 11 is controlled by a floating valve 15 therein which has a valve head 16 adapted to engage a valve seat in the stem and to incompletely close communication through the passageway 8. The valve head 16 may be maintained in unseated position by means of an adjustable stop 17 threaded into the top of the stem 7. The outer end of the casing 4 preferably includes a sleeve 18 adjustably mounted therein and affording a means for limiting the extent of the unseating movement of the main valve 6. The outer end of the sleeve 18 is closed by a cap 19, by the removal of which access may be obtained to the stop 17 to vary the position of the valve head 16 relative to its seat. An extension 20 from the release valve 14 slides through the valve 6 and has a head 20′ adapted to be engaged by an actuating lever 21 thereby to unseat the valves 14 and 6 in succession. A stop rod 22 extends from the valve 14 through the passageway 8 to maintain the valve 15 in adjustable proximity to its seat.

If desired the lower end of the casing 4 may be formed into an open frame 23 carry-

ing a removable screen 24 and having a part disposed across the inlet 2 to protect the valve mechanism.

To control the flow of the liquid from the device through the outlet 3 there is positioned therein a plurality of nested funnel shaped members 25 rotatable relative to each other and pointing in the direction of flow, each member having an opening 26 extending therethrough and adapted to co-act to form a variably restricted outlet. As shown, one of these members may be formed integral with the portion of the casing 1 forming the outlet.

In operation with the parts in the position shown in Fig. 1 the lever 21 is actuated to raise the release valve 14 and open communication between the chamber 11 through the passageway 8 and extension 9 to the outlet 3, thus releasing pressures on the upper side of the piston 13. The continued movement of the lever 21 will bodily unseat the valve 6 to permit a direct fluid passage from the inlet 2 to the outlet 3. The disengagement of the lever 21 from the head 20′ permits the liquid to act freely on the valves. The liquid flowing through the port 12, passageway 8 and port 10 into the compression chamber 11, acts on the piston 13, thereby to force the valve 6 back onto its seat and to force the release valve 14 into its closing position and ready to be again opened by the actuation of the lever 21.

Should it be desired to vary the time necessary for the valve to close itself, the cap 19 is removed and the member 17 adjusted by means of a suitable tool until the valve head 16 has a position relative to its seat to permit the desired rate of flow of the liquid to fill the compression chamber 11.

The casing 4 together with the valve mechanism and its protecting screen 24 can be unscrewed from the tube 1 as a unit thereby providing a ready access to the parts of the valve in order to repair or clean the same or to substitute another screen in place. The casing 4 may be relatively small and the capacity of the compression chamber therein increased by utilizing the bore of the stop sleeve 18 as part of the chamber. The stop sleeve 18 can be adjusted from the outside of the device and the opening through the outlet 3 may be adjusted without interrupting the device in its operation.

Having thus described my invention, I claim:—

1. In a device of the class described, having an inlet, an outlet and a valve for controlling the passage of fluid through said inlet and outlet, of a compression chamber, a piston working in said chamber and fixed to said valve, said piston having a passageway with ports leading respectively to the inlet, to the outlet and to the compression chamber, a mechanically actuated valve for controlling the port to the outlet, and a fluid pressure actuated valve for controlling the port to the compression chamber, said last named valve incompletely closing said port and free to move relative to its seat for a short distance.

2. In a device of the class described, having an inlet and an outlet and a valve for controlling the passage of fluid through said inlet and outlet, of a compression chamber, a piston working in said chamber and fixed to said valve, said piston having a passageway with ports leading respectively to the inlet, to the outlet and to the compression chamber, a mechanically actuated valve for controlling the port to the outlet, a fluid pressure actuated valve for controlling the port to the compression chamber, said last named valve incompletely closing said port and free to move relative to its seat for a short distance, and means accessible from the outside of the device without demounting the valves for maintaining said last named valve in position off its seat.

This specification signed and witnessed this 11th day of August, 1913.

EDWARD G. HEDGES.

Witnesses:
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