April 6, 1926. 1,579,785

W. J. ROULEAU

FLUSH VALVE

Original Filed August 6, 1921

Fig. 1.

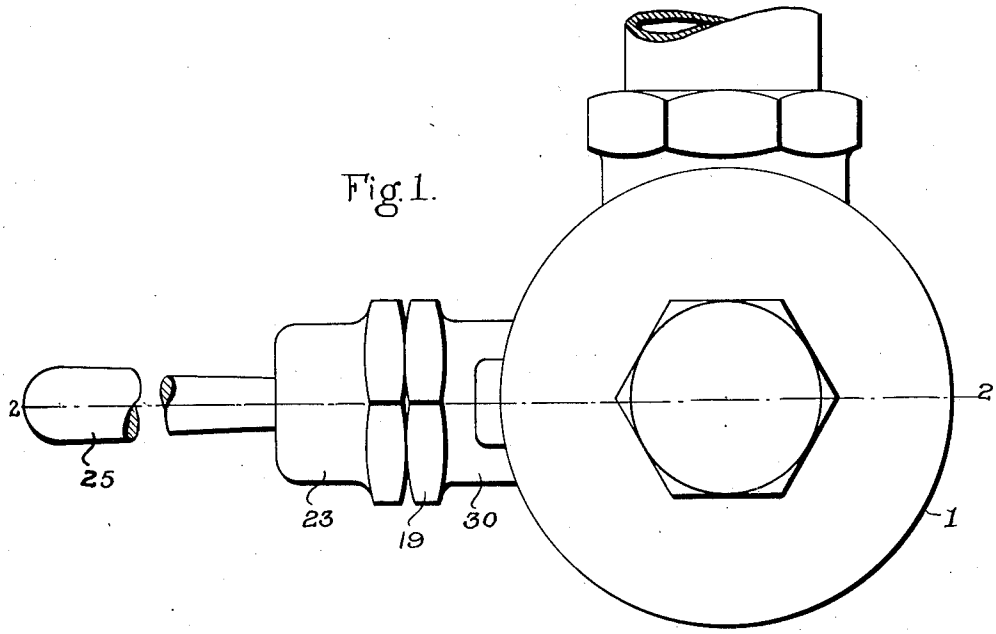
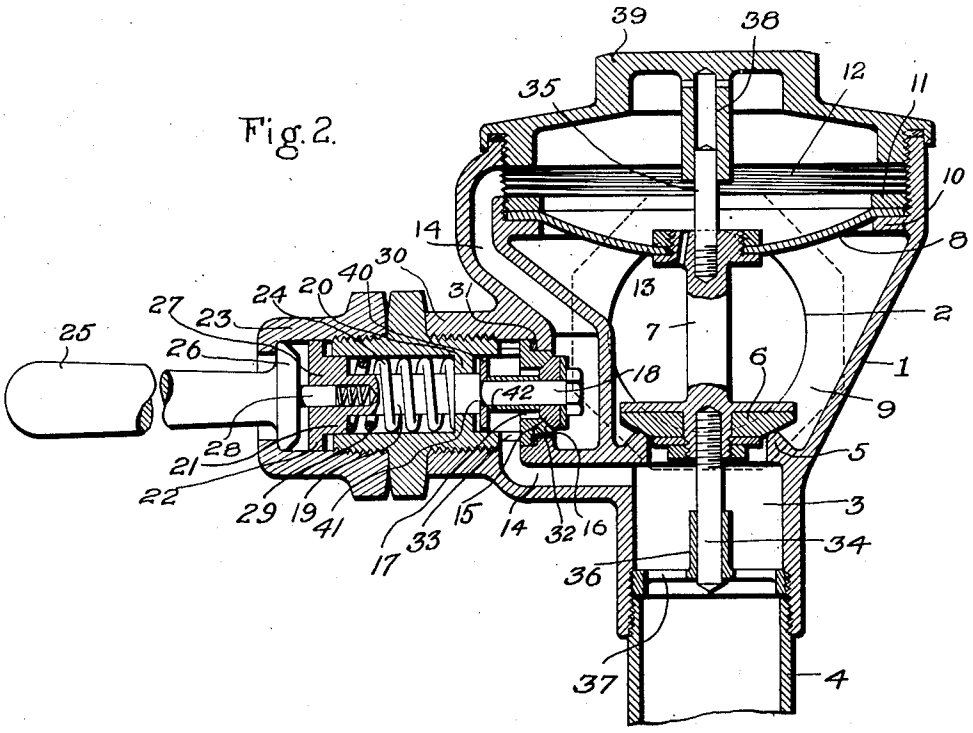


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILFRED J. ROULEAU, OF QUINCY, MASSACHUSETTS.

FLUSH VALVE.

Application filed August 6, 1921, Serial No. 490,200. Renewed December 2, 1924.

To all whom it may concern:

Be it known that I, WILFRED J. ROULEAU, a citizen of the United States, and resident of Quincy, county of Norfolk, State of Massachusetts, have invented an Improvement in Flush Valves, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to flush valves, and it has for its object to provide a novel flushing valve which is constructed to perform the desired flushing operation without the use of the ordinary flush tank. My improved valve is so arranged that when it is actuated, it will permit the water to flow freely through the discharge pipe for a predetermined length of time and will then automatically close.

In order to give an understanding of my invention, I have illustrated in the drawings a selected embodiment thereof, which will now be described, after which the novel features will be pointed out in the appended claim.

In the drawings, Fig. 1 is a top plan view of a flush valve embodying my invention.

Fig. 2 is a vertical sectional view on the line 2—2, Fig. 1.

My improved flush valve comprises a valve casing 1, provided with an inlet port 2, which is connected to the water supply system and also provided with a discharge port 3, which communicates with the discharge pipe 4, that leads to the bowl or other container to be flushed. The valve casing is also provided with a ported valve seat 5 situated between the inlet and the outlet, and which is normally closed by a valve 6 which seats thereon. This valve 6 is formed with a valve stem 7, to which is connected a flexible diaphragm 8, the latter forming one side of a valve chamber 9, in which the valve 6 is received. The periphery of the diaphragm 8 is clamped against an annular flange 10 formed on the valve casing by means of a clamping ring 11, which is screw-threaded into the valve casing.

The valve casing is also provided with a pressure chamber 12 situated above the diaphragm, and the latter has a bleed hole 13 therethrough, so that under normal conditions water will accumulate in the pressure chamber 12, so that there will be the same pressure in said chamber 12 as in the valve chamber 9. Under these conditions, the valve 6 will be normally held to its seat by the pressure of the water thereagainst. The valve 6 is opened by relieving the pressure in the pressure chamber 12, and when this is done, the water pressure against the under side of the diaphragm 8 will over-balance the pressure against the valve 6 because the diaphragm is of a considerably larger area than the valve, and as a result the valve will be lifted from its seat, thereby allowing water to flow from the inlet 2 through the outlet 3. The valve 6 is seated by building up a pressure in the pressure chamber 12, so that there will be the same pressure on both sides of the diaphragm 8, and when this condition exists, the water pressure against the valve 6 will automatically seat the latter.

For thus relieving the pressure in the pressure chamber 12, I have provided the valve casing with a duct 14, communicating with the pressure chamber at one end and with the discharge pipe 3 at the other end, and I have provided a manually-controlled valve 15 by which said duct is closed or opened. When the valve 15 is closed, the water will leak through the bleed hole 13 until the pressure on both sides of the diaphragm is equalized, at which time the valve 6 will close. When the valve 15 is opened, the pressure in the pressure chamber 12 is relieved, and the valve 6 will open automatically.

This valve 15 seats against a valve seat 16, surrounding a port 17, and it is carried by a valve stem 18, which is slidably mounted in a fitting 19. This fitting has an interior rib 20, which fits the valve stem 18, and the latter is provided at its outer end with the head having a portion 21 of smaller diameter that slidingly fits the fitting 19, and a portion 22 of larger diameter which slidingly fits the interior of a cap member 23, which is screwed to the fitting 19. A spring 24 surrounding the valve stem and bearing at one end against the rib 20 and at the other against the portion 21, serves to yieldingly hold the valve 15 against its seat 16. The valve is opened by means of an operating handle 25, which extends into the member 23, and is formed with the head 26. The valve stem 18 has the axial bore 27, in which is slidably mounted a pin 28, the latter being backed by a spring 29. The handle 25 can be swung or tilted in any direction, and when it is so tilted it will act on the pin 28

to move the valve stem 18 to the right, thereby opening the valve 15. As soon as the valve is opened, the pressure in the chamber 12 is relieved, and the excess pressure on the under side of the diaphragm 8 will operate to open the valve 6. As soon as the valve 15 is closed again, the pressure will gradually be built up in the chamber 12, and when said pressure sufficiently over-balances that against the under side of the diaphragm 8, the valve 6 will be closed automatically. The length of time which the valve 6 remains open will depend upon the size of the bleed hole 13.

In the construction shown, the valve seat 16 is formed with the shoulder 31 and a gasket 32 cooperates with said shoulder to make a tight joint. Said valve seat is held in place by the fitting 19 which is screwed into the boss 30 formed on the valve casing. Said fitting is also provided with lateral openings 33 for the passage of water.

The valve 6 is held in its right line position by means of two guiding pins 34 and 35, which are secured thereto, and one of which operates in a guide 36, carried by the bridge 37, and the other of which operates in a guide 38, carried by the cap 39, which is screwed into the top of the valve casing.

The valve stem 18 carries a baffle disk 40 which rests against a shoulder 41 formed on said stem and is retained in place by a sleeve 42. The purpose of this baffle disk is to deflect downwardly the water passing through the valve seat and thereby prevent the water from leaking past the valve stem.

The function of the spring-pressed pin 28 is to maintain the handle 25 in horizontal position when the valve 15 is closed and regardless of any wear which may occur in the valve or valve seat. It will be noted that there is a space between the head 26 and the end 22 of the valve stem, and this is provided so that even if the valve 15 or valve seat 16 wears the valve stem will not engage the head 26, and the pin 28 will function to hold the handle 25 normally in horizontal position.

I claim:—

In a valve, the combination with a valve casing having a duct, of a fitting removably secured to the casing and provided at its end with a valve seat located in said duct, a spring-pressed valve carried by the fitting and normally engaging said valve seat, said valve having a stem extending axially through the fitting and provided at its outer end with an enlarged portion, and also having an axial bore at its outer end, a spring-pressed pin slidable in said bore, a cap member secured to the fitting and provided with an opening in its outer end, a tiltable handle extending through said opening and having a head enclosed within the cap and constructed so that tilting movement of the handle will cause one side of the head thereof to engage the enlarged end of the valve stem and thus open the valve, the spring-pressed pin normally holding the handle yieldingly in axial alignment with the valve.

In testimony whereof, I have signed my name to this specification.

WILFRED J. ROULEAU.