Aug. 6, 1940. Y. REGNELL 2,210,860

REGULATING DEVICE APPLIED TO FLUSH VALVES

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Fig. 1

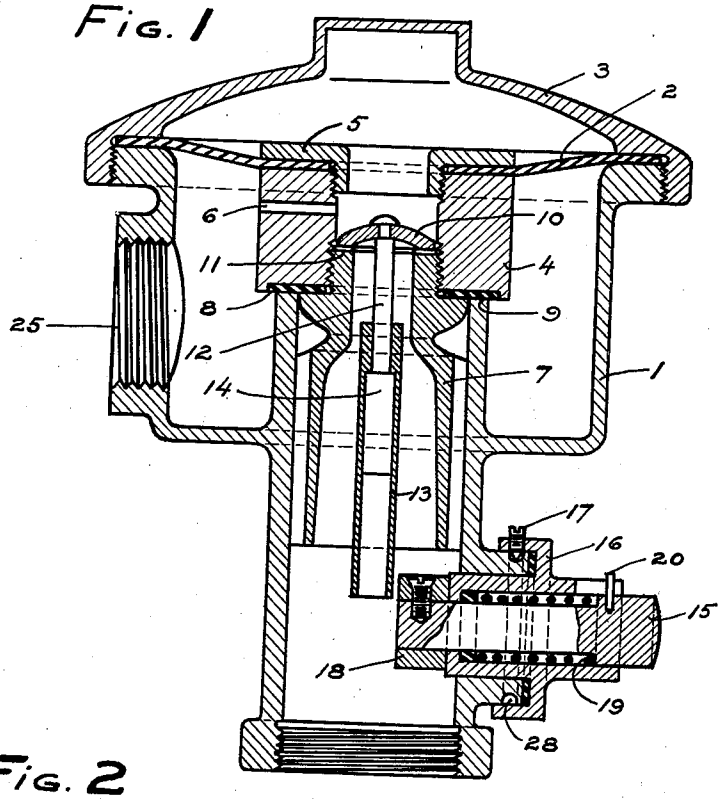


Fig. 2

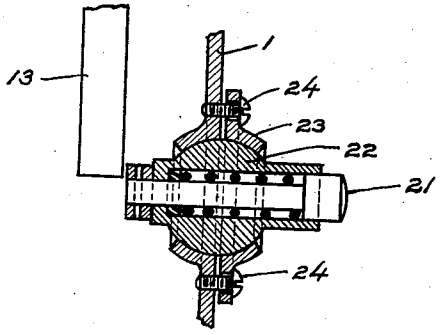
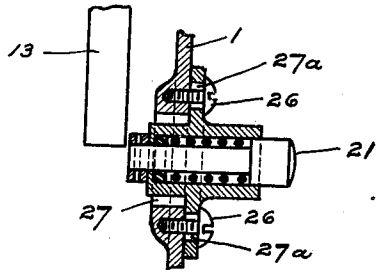


Fig. 3



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REGULATING DEVICE APPLIED TO FLUSH VALVES

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2 Claims. (Cl. 137—93)

This invention relates to a device for regulating the water or fluid flow in flush valves or in apparatus of similar nature. In order to regulate or change the water flow, which is wanted to pass through the flush valve is generally has been necessary to remove the cap or other parts of the flush valve to be able to make the necessary changes on the regulating part or parts of the apparatus.

The object of the invention is to provide a device whereby the water or fluid flow through flush valves or similar apparatus can be regulated from the outside of the apparatus. The object is obtained by a device, which makes it possible to change from the outside the reciprocable position of the regulating parts in the apparatus, so that the water or fluid flow, leaving the apparatus, can be regulated to desired measure without dismounting or removing any parts of the apparatus whatever.

In the accompanying drawing Fig. 1 shows a section of a flush valve with the regulating device connected to the push lever, Fig. 2 and Fig. 3 are sections showing various constructions of the regulating device connected to the push lever.

In Fig. 1 is shown the valve casing 1 and a diaphragm 2, which is tightly pressed to the valve casing by the cover 3. The valve body 4 is by a lock device 5 securely fastened to the diaphragm 2. In the valve body 4 is a channel 6, through which the chambers above and below the diaphragm 2 communicate. Below the valve body 4 and connected thereto is a guided part 7 of the main valve, which keeps in place a gasket 8 of rubber or the like, which tightens against a seat 9. In the valve body 4 is placed an auxiliary valve 10, which tightens against a seat 11. On the stem 12, is placed a socketed member 13, which can slide on the stem. The member 13 is prevented from falling down by a shoulder 14 on the stem 12. The member 13 can be operated by a push lever 15, which is slidably fitted in a casing 16, inset in the valve casing 1 in such a way, that the push lever 15 itself or together with the casing 16 can be moved in different positions and be locked in desired position by means of a screw 17 and a groove 21. By unlocking the screw 17 and turning the casing 16, connected with the push lever 15 an eccentric disk 18 will give different connection spaces to the socket 13 and thus regulate the water flow by operating on the inside regulating parts of the apparatus. On the inner end of the push lever 15 is attached the eccentric disk 18. Even so the casing 16 or other parts, that guide the push lever, can be eccentrically formed.

The push lever 15 is kept to its outside position through a spring 19 and is prevented from turning around in the casing 16 by a pin 20.

In Fig. 2 is shown another design, where the push lever 21 is arranged in a casing 22 with a ball-formed shoulder, which by an overlap 23 is tightened against the valve casing 1. By loosening the bolts 24 the push lever can be turned in different axial positions and afterwards locked in the desired position by tightening the bolts.

In the design shown in Fig. 3 the adjustment of the push lever is obtained by loosening the bolts 26 and pushing the casing 16, movable in the spare spaces 27 and 27a upwards or downwards, whereby different connection spaces and the desired water flow regulation are obtained.

When the water passes into the valve through the inlet 25, the chamber below the diaphragm 2 is filled with water and through the channel 6 is the chamber above the diaphragm filled with water. As the pressure area on the top side of the diaphragm is larger than the area on the underside, the valve is kept closed by means of the water pressure. By pushing in the push lever 15, the eccentric disk 18 operates on the socket 13 appplied on the auxiliary valve stem 12, so that the auxiliary valve 10 is tilted to open position, whereupon a part of the water from the chamber above the diaphragm 2 runs away. The valve body 4 is now lifted by the higher pressure on the under side of the diaphragm, and the water is allowed to flow through the valve. When the valve body 4 is lifted, will at the same time the auxiliary valve 10 and stem 12 together with the member 13 be lifted. When the main valve 7 is lifted to such a position, that the lowest edge of the member 13 has passed the eccentric disk 18, the auxiliary valve 10 returns to its original position. The chamber above the diaphragm refills gradually through the channel 6 and the main valve will be closed by the regained pressure on the top of the diaphragm. If the push lever 15 is held in its inward position the member 13 will abut the eccentric disk 18 and the stem 12 will slide down, by which arrangement the auxiliary valve 10 will be kept closed.

The longer time the auxiliary valve will be kept open by the push lever's operating on the auxiliary valve, the more water will be allowed to pass out of the chamber above the diaphragm, and the longer time it will take before this chamber will be refilled and the main valve again will be closed. Naturally the auxiliary valve must be

opened to such a degree, that a larger amount of water will be allowed to flow out therethrough than into the chamber above the diaphragm through the channel 6.

By turning the casing 16 and operating the push lever, different parts of the eccentric disk 18 will be brought in contact with the socket 13, by which the valve body 4 must be kept open a longer or shorter time, before the auxiliary valve closes. This time can be varied between the limits, which are controlled by the eccentricity of the disk 18 in such a manner, that if the extreme part of the eccentric disk 18 touches the socket 13, the time for the water flow will be a maximum, and if the lowest part of the same disk touches the socket, the water flow will be a minimum. By turning the casing 16 in different intermediate positions the water flow can be adjusted at will. The same result will be obtained, if the push lever is eccentrically located in the casing 16. The same result is obtained by various modifications as shown in Fig. 2 and Fig. 3, the means of regulating being as described above. By using a regulating device according to this invention, the water flow in flush valves can be regulated from the outside in shortest possible time by using a screw-driver.

Another advantage is that, if the wanted water flow is not obtained by the first regulation a smaller adjustment can immediately be done.

The invention claimed is:

1. A valve device comprising two valves, one a main valve, which controls the water flow, the other an auxiliary valve for controlling the main valve, a depending laterally movable stem for controlling said auxiliary valve, a casing enclosing said valves and stem, a push rod mounted in a tubular guiding member extending into said casing for engaging said stem so as to move it laterally to open the auxiliary valve, and means for attaching said tubular member to the casing so that it can be angularly adjusted, whereby the push rod contacts the auxiliary valve stem at different distances from the end thereof.

2. A valve device comprising two valves, one a main valve which controls the water flow, the other an auxiliary valve for controlling the main valve, a depending laterally movable stem for controlling said auxiliary valve, a casing enclosing said valves and stem, a push rod mounted in a tubular guiding member extending into said casing so that the inner end of said push rod is adjacent the end of said stem and may be moved into contact therewith for actuating said auxiliary valve, said tubular member, where it passes through the casing, having a spherical surface formed thereon, said casing having a corresponding surface, whereby the tubular member and push rod may be angularly adjusted with relation to the auxiliary valve stem, thereby varying the time of closing of the auxiliary valve as the push rod contacts the stem at different distances from the end thereof, and means for retaining said tubular member in adjusted position.

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