Aug. 6, 1940. R. H. MUELLER 2,210,375

FAUCET

Filed April 22, 1939

Fig. 1.

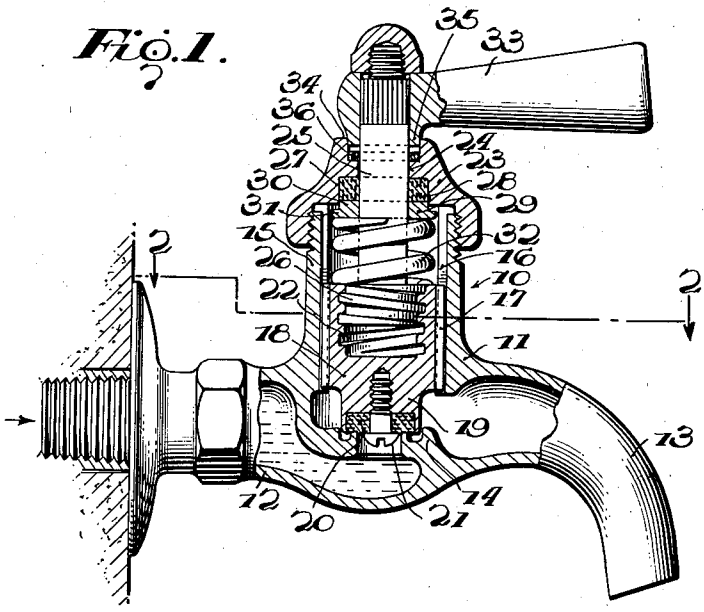
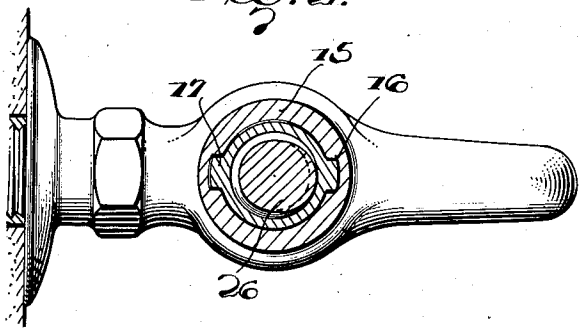


Fig. 2.



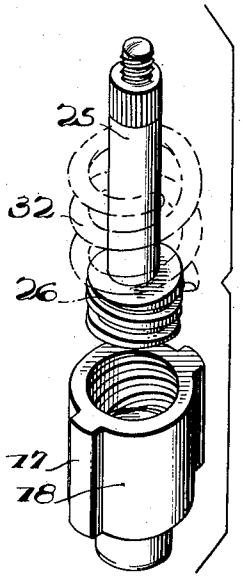


Fig. 3.

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FAUCET

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1 Claim. (Cl. 251—3)

The present invention relates to faucets and is an improvement upon the construction disclosed in Patent No. 1,872,787, Mueller et al., August 23, 1932.

An object of the invention is the provision of a faucet having all of the advantages of the patented structure but which consists of fewer parts and therefore provides a simplified and less expensive construction.

Another object is to provide an improved structure in which the spring which normally maintains the valve upon its seat, also functions to compress the packing about the valve stem. Furthermore, the spring is so arranged with respect to the rest of the structure that it will not retard or interfere with the rotation of the valve actuating stem during the opening and closing of the valve.

The present construction, while incorporating the above advantages, at the same time insures the faucet of being opened and closed without grinding or wearing down the valve. Furthermore, the spring insures that the valve will be securely closed and maintained in closed position by pressure of the spring on the valve independently of direct pressure from the valve operating means.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawing, in which:

Figure 1 is a view partly in vertical section of a faucet embodying the present invention.

Figure 2 is a section on line 2—2 of Figure 1, and

Figure 3 is a disassembled view of the valve and stem.

Referring now to the drawing, the numeral 10 designates generally the faucet embodying the present invention and consisting of a body portion 11 having an inlet 12 communicating with any suitable source of liquid supply. This inlet 12 communicates with a discharge spout 13 through an internal valve seat 14. The body 11 is provided with a tubular extension 15 located above the valve seat 14 and coaxially positioned with respect thereto.

The tubular extension 15 has a substantially smooth bore except that it has two oppositely disposed grooves 16 which cooperate with a pair of ribs 17 extending outwardly from the sides of a valve plunger or piston 18. This plunger is thus longitudinally and non-rotatably slidable in the tubular extension 15 and is provided with a reduced depending portion 19 constituting a valve carrying portion which is adapted to be moved to and from the seat 14. Preferably the extreme lower end of the reduced portion 19 is recessed to receive a valve washer 20 which is removably secured in the recess by means of a screw 21.

The upper end of the plunger 18 is substantially cup-shaped in formation and is provided with a centrally disposed internally threaded recess 22. The upper open end of the tubular extension 15 is closed by a cap 23 and this cap is provided with a centrally located opening 24 which is coaxial with the tubular extension and the valve seat 14. A valve operating stem 25 passes through the opening 24 and has a depending threaded head 26 extending within and threadedly engaging the recessed portion 22 of the plunger 18.

The cap 23 is provided with a circular recess 27 surrounding the opening 24 and within which is located packing 28 for the stem 25. A packing washer or follower 29 is provided with a reduced upper portion 30 which directly engages the packing 28 and is of a diameter to enter the recess 27. The washer is also provided with an enlarged lower portion 31 which constitutes a stop for limiting the upward movement of the portion 30 within the recess 27.

A coil spring 32 is mounted in the upper end of the tubular extension 15 and surrounds the lower end of the stem 25. The upper end of this coil spring engages the washer or follower 29 while the lower end of the spring rests upon the upper edge of the plunger 18. The spring 32 is always under compression and normally urges the valve 20 toward its seat 14. Furthermore, the spring has the additional function of keeping the packing 27 properly compressed about the stem 25. The fact that the enlarged portion 31 of the washer is spaced from the inner wall of the cap, permits limited upward axial movement of the washer whereby the spring 32 will normally exert sufficient pressure upon the packing to keep the latter compressed about the stem. When the packing becomes so worn that the spring will move the portion 31 of the washer into contact with the cap, then the packing should be replaced.

With the construction as thus far described, it will be observed that the spring 32 normally maintains the valve 20 upon its seat 14. When it is desired to open the valve it is merely necessary to rotate the handle 33, which in turn will rotate the stem 25. Rotation of the threaded head 26 will move the valve plunger 18 upwardly against the tension of the spring 32. By reason

of the rib and groove structure 16 and 17, the valve will be prevented from rotation and thus grinding of the washer 20 will be prevented on both opening and closing movements of the valve.

It is desired that the valve be held closed by the action of the spring 32, that is, that the spring hold the valve closed independently of direct pressure from the stem 25. This is accomplished by providing the cap 23 with an upwardly opening recess 34 surrounding the stem 25, and also embracing an annular flange 35 constituting a depending portion of the handle 33. Upon operation of the handle 33 the lower end of the flange 35 is moved into and out of contact with a thrust washer 36 positioned in the base of the recess 34.

Referring particularly to Figure 1, it will be observed that in the closed position of the valve the lower end of the annular flange 35 is spaced from the washer 36. Thus the valve 20 is held in seated position by the spring 32 and not by direct pressure from the stem 25. When the handle 33 is initially rotated to unseat the valve, the flange 35 will be drawn down against the washer 36. Further rotation of the handle and stem 25 will then lift the plunger 18 with the valve 21 from its seat 14. Conversely, when the valve is to be closed, rotation of the stem 25 will positively move the plunger 18 downwardly until the valve 20 engages its seat 14 and the flange 35 engages the washer 36. Further rotation of the handle 33 and stem 25 will then effect a slight lifting movement of the stem 25 and thus raise the lower end of the flange 35 away from the washer. Thus a slight lost motion between the stem and body is provided which assures that the valve will always be positively seated and maintained on its seat by the direct action of the spring 32.

In addition to the above noted advantages, the present construction is such that both the plunger 18 and stem 25 may, if necessary, be raised as a unit in the extension 15 against the tension of the spring 32. Thus, if for any reason, an excessive pressure is developed on the valve 20, this will be automatically relieved and thereby prevent the destruction of the faucet.

It will be further observed that the spring 32 is of sufficient diameter to prevent contact with the stem 25 and the head 26. Furthermore, since the lower end of the coil spring 32 directly engages the upper edge of the plunger 18 and since the latter is slidably and non-rotatably movable in the tubular extension 15, there is no frictional contact between the spring and the valve operating means to retard the closing and opening movements of the valve. Neither does the spring function to force any rotating element into contact with a non-rotating part, which would likewise tend to retard the opening and closing movements of the valve.

It will be understood that the invention is not limited to the details of construction shown in the drawing, also, that the phraseology employed in the specification is for the purposes of description and not of limitation.

I claim:

In a faucet, the combination of a body having an internal valve seat and an extension axially aligned with said seat, a valve slidably and non-rotatably mounted in said extension, a cap closing the outer end of said extension and provided with a stem receiving opening and a recess surrounding the opening and facing outwardly from said cap, a stem passing through the cap opening and threadedly engageable with said valve, a handle connected to said stem and provided with a depending flange surrounding said stem and located in said recess, and a coil spring mounted in said extension between said cap and plunger and normally urging the plunger toward the valve seat, said handle flange being spaced from the bottom of the recess in the cap when the valve is completely seated.

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