Sept. 3, 1929. J. W. BURNETT 1,726,885

SELF CLOSING FAUCET

Filed April 7, 1928

Fig. 1.

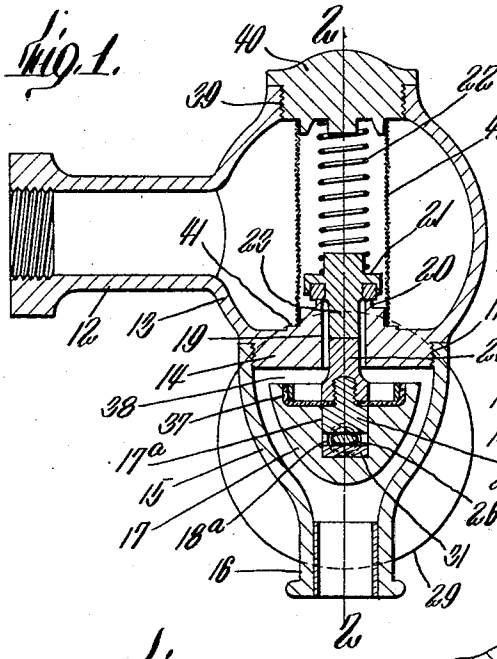


Fig. 2.

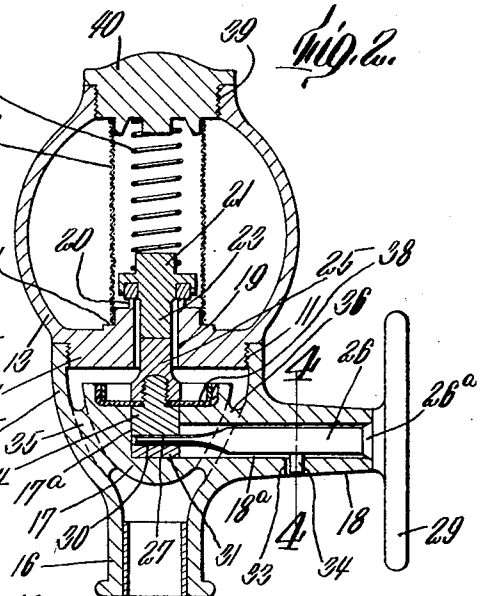


Fig. 3.

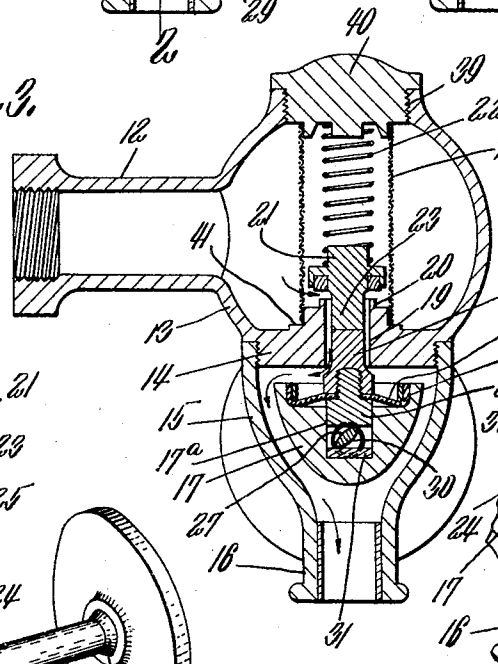


Fig. 4.

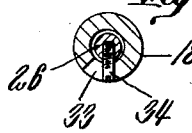


Fig. 5.

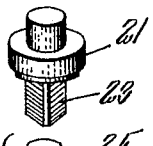


Fig. 6.

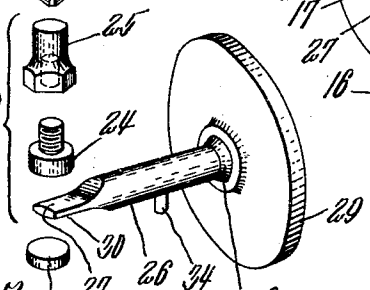


Fig. 7.

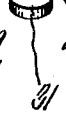
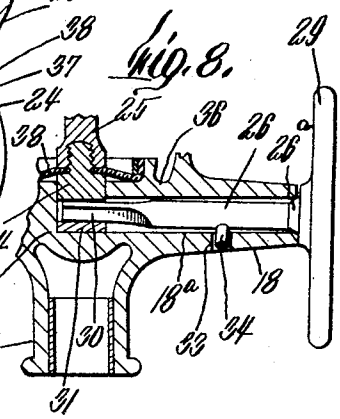


Fig. 8.



Inventor
John W. Burnett
by Wright Brown Quinby & May
Attys

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UNITED STATES PATENT OFFICE.

JOHN W. BURNETT, OF CAMBRIDGE, MASSACHUSETTS; EMMA E. BLACK, ADMINISTRATRIX OF SAID JOHN W. BURNETT, DECEASED.

SELF-CLOSING FAUCET.

Application filed April 7, 1928. Serial No. 268,196.

The chief object of this invention is to provide a self-closing faucet of simple and durable construction, composed of parts adapted to be quickly and conveniently assembled and taken apart, and sensitive in operation, so that it is adapted to be closed by light spring pressure, and opened by light manual pressure, and free from liability to leakage.

Other objects will hereinafter appear.

Of the accompanying drawings forming a part of this specification,—

Figure 1 is a sectional view of a faucet embodying the invention, the valve being closed.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 1, showing the valve opened.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is a perspective view of the valve and the valve stem section attached thereto.

Figure 6 shows separately and in perspective, the lower and intermediate valve stem sections, and the cam-faced rock-shaft shown by Figures 1, 2 and 3.

Figure 7 is a perspective view of the hardened insert which forms the bottom of the valve-stem guide.

Figure 8 is a view similar to a portion of Figure 2, showing the rock-shaft in the valve-opening position shown by Figure 3.

The same reference characters indicate the same parts in all of the figures.

The casing of my improved faucet includes an inlet section and an outlet section, these sections being connected separably by screw threads formed thereon at 11, Figures 1, 2 and 3. The inlet section includes a tubular shank or neck portion 12, adapted to be connected with a source of liquid supply, a chamber portion 13, and a bottom portion 14, constituting a partition between the two sections. The outlet section includes a body portion 15, a nozzle portion 16, a guide block 17, having a guideway 17^a for the valve stem hereinafter described, and a sleeve 18, projecting laterally from the section 15.

The bottom or partition 14 is provided with a central port or passage 19, connecting the liquid spaces of the two sections, and surrounded at its upper end by an annular valve seat 20, on which a valve 21 is normally closed by a spring 22. The stem of said valve extends through the passage 19, into the guideway 17^a, and has an upper member 23 (having flat sides, as shown by Figure 5), fixed to the valve and projecting into the passage 19, a lower member 24, movable in the guideway 17^a and an intermediate member 25, having a screw-thread connection at one end with the lower member 24, and contacting loosely and separably at its opposite end with the upper member 23.

Journaled in the bore 18^a of the sleeve 18, is a rock-shaft 26, which extends into the guideway 17^a, and is provided at its inner end with a cam face 27, on which the lower end of the valve stem bears, said end being the lower end face of the stem member 24. The cam face 27 is formed by cutting away one side of the rock-shaft, the form and arrangement of the face being such that when it is in the position shown by Figures 1 and 2, the valve 21 is closed, and when the rock-shaft is turned, as shown by Figures 3 and 8, the cam face is inclined and caused to open the valve. The pressure of the spring 22 acts through the valve and stem to normally hold the shaft turned to the position shown by Figures 1 and 2, so that after the rock-shaft has been manually turned by the hand wheel 29, or any other manipulating device, to open the valve, and then released, the valve is closed by the spring, the shaft 26 being turned back to its starting position. The diameter of the major portion of the rock-shaft is considerably less than that of the bore 18^a as shown by Figures 2 and 8, for a purpose later described, and the rock-shaft is provided with a lower cam face 30, facing oppositely from the face 27, and bearing on the bottom 31 of the guide 17, said bottom being preferably an insert of hardened steel, shown separately by Figure 7. The upper side of the insert is higher than the under side of the bore 18^a, as shown by Figures 2 and 8. The form and arrangement of the cam face 30, and the elevation of the guide bottom, are such that when the rock-shaft is turned to the position shown by Figures 3 and 8, the cam face 30 bearing on said bottom, causes the inner end of the rock-shaft to swing upwardly, so that the shaft is inclined as shown by Figure 8, this inclination being permitted by the reduced diameter of the major portion of the rock-shaft, and by a narrow peripheral enlargement 26^a of the rock-shaft closely fitting the outer end of the bore 18^a,

and movable therein to permit the inclination of the rock-shaft. The opening movement of the valve is increased by the upward swinging of the inner end of the rock-shaft, so that the valve is opened farther than would be the case if the rock-shaft were turned without being swung upward.

Another advantage of the reduced diameter of the major portion of the rock-shaft is the limited contact of its periphery with the sleeve bore, such contact being only at the enlargement 26a, the major portion of the periphery of the rock-shaft being spaced from the major portion of the sleeve bore, so that frictional resistance to the turning of the rock-shaft is considerably less than would be the case if the major portion of the shaft were formed to closely fit the sleeve bore.

To limit the turning movements of the rock-shaft in the sleeve 18, and releasably confine the shaft in the sleeve, I provide the sleeve with a transverse slot 33 (Figure 4), and the rock-shaft with a stud 34, projecting into the slot. The stud is preferably a screw engaged in a tapped orifice in the rock-shaft, so that the stud may be removed to permit withdrawal of the rock-shaft from the sleeve.

The guide-block 17 is preferably of approximately semi-elliptical form, as shown by Figures 1, 2 and 3, said block being cast integral with the lower section 15. The upper end of the block 17 is spaced from the partition 14, and its semi-elliptical surface is spaced from the outer wall of the section 15, so that a liquid passage is formed, connecting the passage 19 in the partition 14 with the outlet nozzle 16. Necks 35 and 36 (Figure 2) connect the block 17 with the outer wall.

The upper end of the block 17 is provided with a circular recess 37, to the margin of which is secured, liquid tight, the outer margin of a flexible waterproof annular diaphragm 38, the inner margin of which is clamped liquid tight between the members 24 and 25 of the valve stem. The diaphragm rises and falls with the stem, and prevents leakage of liquid into the guideway 17a and sleeve 18.

The chamber portion 13 is provided with a screw-threaded top opening 39, closed by a screw-threaded cap 40. The opening is adapted to permit the insertion and removal of the valve 21 and the spring 22, and the cap 40 constitutes an abutment for the spring.

Between the cap and a shoulder 41, on the partition 14, is interposed a tubular strainer 42, which may be of wire gauze and surrounds the valve seat, the valve, and the spring, and prevents fragments of foreign matter from passing through the valve seat and the passage 19. The strainer is confined by the cap, and may be inserted and removed when the cap is removed.

When the casing sections are separated, the upper member 23 of the valve stem is separated from the intermediate member 25, and the stem members in the lower section of the casing are exposed and readily accessible.

I claim:

1. A self-closing faucet comprising a casing including an inlet portion, an outlet portion, and a partition having a passage connecting said portions and surrounded by a valve seat, a valve normally closed on said seat by a spring, a valve stem extending from the valve through said passage into the outlet portion, a fixed stem guide in the outlet portion, a sleeve projecting laterally from the outlet portion, the bore of the sleeve communicating with said guide, and a rock-shaft journaled in the sleeve, and having at its inner end a cam face projecting into the guide, the arrangement being such that the rock-shaft is normally held in a predetermined position by pressure exerted on its inner end by the valve-closing spring through the valve and stem, and may be turned from said position to open the valve.

2. A self-closing faucet as specified by claim 1, the rock-shaft being provided with a laterally projecting stud, and the sleeve with a transverse slot, into which the stud projects, said stud and slot limiting the turning movements of the rock-shaft, and confining the shaft in the sleeve, the stud being detachable from the rock-shaft to permit withdrawal of the shaft from the sleeve.

3. A self-closing faucet as specified by claim 1, the rock-shaft including an enlarged outer peripheral portion having a limited bearing on the outer end of the sleeve bore, and a reduced major peripheral portion spaced from the major portion of said bore, so that the rock-shaft may be turned with a minimum of frictional resistance, and is free to be inclined in the sleeve bore, the inner end of the shaft having an upper cam face contacting with the valve stem, and a lower cam face contacting with the bottom of the guide, said cam faces being at opposite sides of the axial center of the rock shaft.

4. A self-closing faucet as specified by claim 1, the valve stem being composed of separable members including an upper member fixed to the valve and projecting into said passage, a lower member bearing on a cam face of the rock-shaft, and an intermediate member having a separable connection with the lower member, and contacting separably with the upper member, the faucet comprising also a flexible annular diaphragm having a liquid-tight connection at its outer margin with the guide block and clamped liquid-tight at its inner margin between the lower and intermediate stem members, said diaphragm preventing leakage of liquid into the guide and the sleeve bore.

5. A self-closing faucet comprising a sec-

tional casing including an inlet section, composed of a tubular inlet shank, a chamber, and a bottom containing a liquid passage surrounded by a valve seat within the chamber, and an outlet section composed of a body, an outlet nozzle, a valve-stem guide within and spaced from the wall of the body, and a sleeve projecting laterally from said body, said sections being separably connected the chamber of the inlet section being provided with a top opening and a removable closing cap therefor, a valve normally closed on the valve seat by a spring interposed between the cap and the valve, the valve and spring being insertible and removable through the opening, a sectional valve stem composed of an upper member, fixed to the valve, and projecting into the bottom passage, a lower member movable in the guide, and an intermediate member having a separable connection at one end with the lower member, and bearing separably at its opposite end on the upper member, to permit the removal of the valve through the top opening, and a rock-shaft journaled in the sleeve of the outlet section, and having a cam face contacting with the lower stem member, means being provided for limiting the rotary movements of the rock-shaft and removably confining it in the sleeve, the separability of the casing sections permitting access to the lower and intermediate members of the valve stem.

6. A self-closing faucet as specified by claim 5, comprising also a tubular strainer in the chamber portion, surrounding the valve and spring and seated at one end on the bottom of the chamber, and at the opposite end on the closing cap, the strainer being insertible and removable through the top opening.

In testimony whereof I have affixed my signature.

JOHN W. BURNETT.