Aug. 17, 1937. G. E. RIPLEY 2,090,309

DUAL ACTUATING UNLEAKABLE FAUCET

Filed Oct. 15, 1936

Fig. 1.

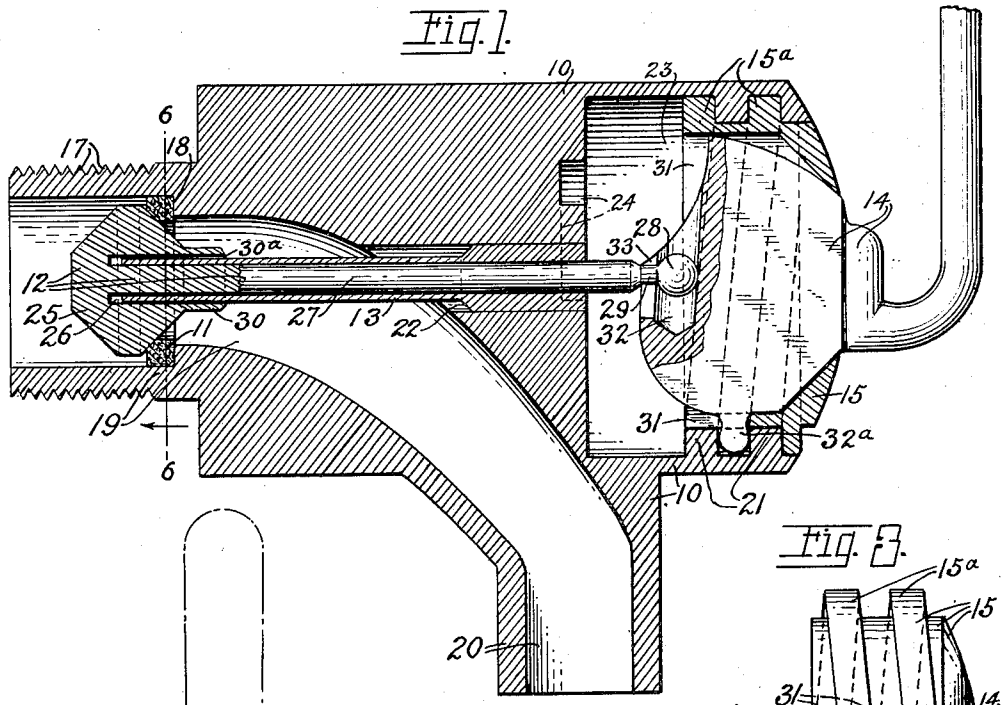
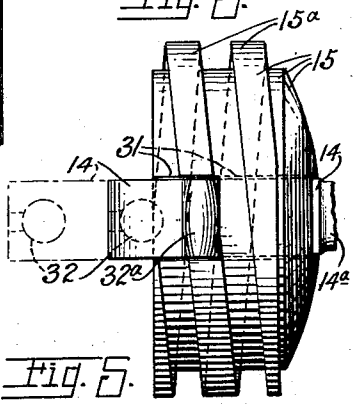


Fig. 3.



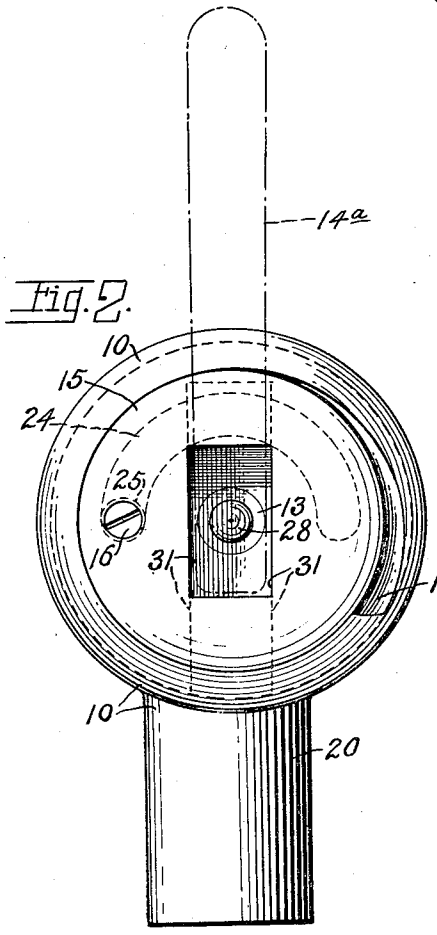


Fig. 2.

Fig. 4.

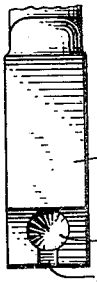


Fig. 5.

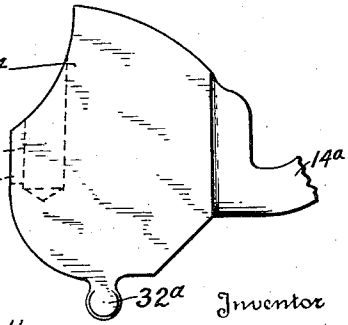
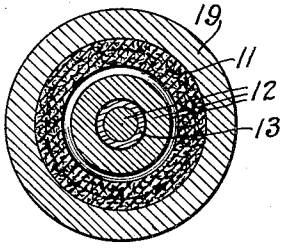


Fig. 6.



Inventor
G. E. Ripley.
By—
Sterling P. Buck,
Attorney.

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DUAL-ACTUATING UNLEAKABLE FAUCET

Giles E. Ripley, Fayetteville, Ark.

Application October 15, 1936, Serial No. 105,724

4 Claims. (Cl. 251—20)

This invention relates to faucets, to valves, and to valve-actuators, and especially to an improved faucet, that is, a dual actuating, unleakable faucet.

One object of this invention is to provide, in a faucet, an improved, positive and practical two-way valve-actuator which enables the valve to close when operated by merely pushing or depressing and releasing, and which prevents the valve from closing when the valve actuator is rotated or turned and not returned to its normal position.

Another object is to provide an improved faucet that has no need of packing around its valve-stem to prevent leakage around the valve stem or around the actuator, inasmuch as the flow of liquid through the restricted-throat (hereinafter described) creates an inward suction of air which repels any tendency which the liquid might possibly have to press through the joint around the valve-stem.

Another object is to provide in a valve, an actuating means or manipulator which is adjustable to an infinite number of positions for holding the valve in an infinite number of positions between the closed and wide-open positions, so as to regulate the flow to any desired rate between the minimum and maximum rate of flow.

Another object is to provide a valve-actuator that is operable to quickly stop any leakage around the valve-closure, in case such leakage is caused by an obstruction such as a gravel or grain of sand in the valve, by depressing the actuator and quickly releasing it, so the impact either displaces the obstruction, crushes it, or imbeds it in the conformable valve-seat.

Another object is to provide an improved faucet that is not only thoroughly practical from a standpoint of the users, but also thoroughly practical from the standpoints of the manufacturer and dealer, inasmuch as it consists of very few essentially separate or originally separate parts, so it can be manufactured at a low production-cost and can be sold at good profits for manufacturer, distributers and retailers, while retailing at a reasonable price to the user.

Other objects and important features are pointed out or implied in the following details of description, in connection with the accompanying drawing in which:

Fig. 1 is a view mainly in central vertical section, only parts of the valve-stem and actuator being in side elevation.

Fig. 2 is a front elevation, as seen from the right of Fig. 1 when the inner element of the dual-actuator is omitted or removed, the normal position of the actuating lever or handle being indicated in a dot-dash line bowed at its upper extremity.

Fig. 3 is a bottom plan view of the externally threaded outer actuating element, considering Figs. 1 and 2 to show the normal position of the faucet, parts of the inner actuating element herein also being shown in full and dotted lines, and the assembling position (hereinafter described) being indicated in dot-dash lines.

Fig. 4 shows a fragment of the actuating lever, a plan view thereof considering Figs. 1 and 5 as showing it in its normal position.

Fig. 5 is a side elevation of the inner actuating element having its handle broken off, that is, a fragmental view of the actuating lever removed from the outer actuating element.

Fig. 6 is a vertical cross-sectional view, the section being along the line 6—6 of Fig. 1.

Referring to the drawing in detail, in which, similar parts are referred to by similar reference numerals in the drawing and following specification, the invention is described in detail as follows:

The seven primarily or initially separate parts of the faucet are the main body 10, the valve-seat 11, the valve-member 12, the valve-guide 13, the valve-lever or inner actuator 14, the outer actuating element 15, and the single securing and limiting element or screw 16.

The main body 10 is formed with any appropriate means for securing it to a liquid container, for instance, screw-threads 17, and with a shoulder 18 on which the annular valve-seat is disposed, this valve seat 11 being of leather or any other appropriate conformable material. The body 10 also includes a tubular part 19 in which the valve-seat is disposed near the inlet end, said tubular part including the spout or liquid outlet 20. Considering the axis of rotation of the body 10 when being threaded at 17 or at 21, or the axis of rotation of a boring tool in making the bore 22 in the body 10, it is seen that this bore 22 is axially alined with the cylindrical cavity 23 that is surrounded by the screw-threads 21 and that is directly in open communication with an arcuate channel or groove 24 into which the screw or limiting element 16 extends from the member 15 (see Fig. 2).

The member 15 is apertured and screw-threaded at 25 (Fig. 2) to receive the screw 16 when in normal position of the latter, but the latter may be retracted so as to permit the member 15 to be screwed into the internally

threaded cavity **23** to its normal position, then advanced to enter the groove **24** so as to abut against an end of the latter for limiting the unscrewing movement of the member **15**, also to abut against the other end of the groove **24** for limiting the advancing movement of the member **15**; and although this groove is shown semi-circular, it may be substantially circular or annular so as to permit the member **15** to be turned through a greater arc than permitted by this relatively short groove which, however, has been found to be sufficiently long for usual domestic purposes. While the material at the ends of the groove **24** constitute the means to combine with the screw **16** for limiting the combined rotary and axial movement of the member **15**, various other devices can be substituted for the limiting means here specifically described and which also serves as a securing means to prevent accidental separation of the parts **10**, **12**, **14**, and **15**, which securing means is quickly operable to release said parts and permit them to be removed or separated for any desirable purpose.

The valve-member **12** includes the closure **25** having an annular cavity **26** around the inner end of the valve-stem **27** where the latter is united with the closure. The outer end of the valve-stem is formed with a ball or connecting element **28** that is united with the main part of the valve-stem by an integral neck **29**. Moreover, the valve-member includes a hollow cylindrical deflector and passage-restricting sleeve **30** which, when the valve is open and liquid is flowing therethrough, deflects the liquid from centripetal stream-lines to parallel stream-lines over and past the annular joint **30***a* for preventing back-pressure at said joint and for inducing a suction of air or other fluid or gas through said joint for positively repelling any tendency of the liquid to back-press through said joint, thereby not only eliminating the necessity for packing or leak-proofing, but also permitting the valve stem to be quite loosely slidable in the guide or bearing-tube **13** so no lubrication is needed. The outer end of the tube **13** is tightly fitted in the bore or aperture **22** so as to be fixed with respect to the body **10** and substantially integral with the latter, while the inner end of this tube **13** is within the annular cavity **26** and surrounded by the closure and the combined deflecting and passage-restricting element **30**.

The inner actuating element or valve-actuating lever **14** has flat parallel faces loosely fitted between parallel walls **31** of the member **15**, so as to be slidable in the latter. The inner relatively narrow face of the member **15** is bored or apertured at **32** and slotted at **33** to receive the head **28** and neck **29** of the valve-stem **27**, so the latter is held in place when the faucet is being handled before being put to use, and so the valve can be opened against pressure of the liquid, when in use, by inward movement of the middle part of the member **14** when the handle **14***a* is pushed inward, or by a combined rotary and axial motion of the dual-actuator **14**—**15** that is, a turning of the dual actuator on its helical track **21**, by swinging the handle **14***a* around the axial line of the valve-stem; in this latter motion, utilizing the screw-threads **21** and the corresponding or interengaging screw-threads **15***a* in cooperation with the members **13** and **14** for depressing the valve-closure and opening valve. When the handle **14***a* is depressed and released, the pressure of liquid returns the valve to closing or closed position, provided the member **15** is in its normal position here shown in Fig. 1; but if the member **15** is turned clockwise from the position shown, thereby advancing the members **14**, **15**, and **16** helically that is, around the screw-threads, this motion depresses the valve closure and opens the valve, and if not returned to normal, holds the valve-closure in its open position or partly open position, according to whether the dual actuator is at the limit of its advanced movement or at any one of its infinite number of effective positions between it limits of movement.

Even when the valve is open to its widest extent and maximum capacity, the orifice around the valve-closure and passage-restricting sleeve **30** is less capacious than the spout **20** which latter is also lower than the valve and exerts a syphoning effect, while the rush of liquid through the restricted throat, around the combined deflector and passage-restricting sleeve **30**, cooperates with the syphonic spout to eliminate or prevent any back-pressure of the liquid at the joint **30***a*; but on the other hand, the rush of liquid through the restricted throat and past the joint **30***a* induces a draught of air from the cavity **23** through the joint around the valve-stem and around the inner end of the tube **13** to further resist any tendency of back-pressure at the joint **30***a*.

In effect, the member **14** is pivotally connected to the body **10**, and yet, no actual pivot or pintle is used or needed, the fulcrum-element **32***a* being substituted for the pivot at first intended to be used, this fulcrum-element being an integral part of the member **14** and extending through an opening at one end of each wall **31** (as best shown in Fig. 3), thence between screw-threads **21**, one of the screw threads or helices **15***a* having a segment cut out to provide room for the element **32***a* as a fulcrum having its seat interengaged with the adjacent helices of the internal screw-threads of the member **10**; so as may be clearly seen, this fulcrum **32***a* is always between adjacent ends of the severed screw thread or helix **15***a*, regardless of the position of the latter with respect to the member **10**; and now, assuming that the handle **14***a* is pushed toward the body **10**, the whole lever **14**, moving about the center of its fulcrum **32***a* will push the valve-member **12** to its open position, and on releasing the handle **14***a*, the liquid pressure on the valve closure, will return all the depressed elements to normal; but, assuming that the handle be not depressed, but rotated about the axis of the valve-stem in clockwise direction, the valve-closure will be pushed open only to the extent of rotary and axial movement of the members **14** and **15**, and will be held at that open or partly open position even after the handle is released, and until the handle is manually returned to its normal position, thus permitting the liquid pressure to close the valve.

Assuming all the seven parts to be separate, in the course of manufacture, and are to be assembled: The valve-guide or tube **13** is first pressed into tight-fitting engagement with the wall of the bore **22**, or secured by a shrinking or a sweating method, or may be taper-fitted so the liquid pressure tends to make it tighter; next, the valve-seat **11** is seated; third, the valve-stem is passed through the tube **13** and protrudes into the cavity **23**; fourth, the member **14** is properly engaged with the threads **21** by means of the fulcrum **32***a* and engaged with the head **28** of the valve-stem by means of the walls of the slot **29** and bore **22**; fifth, the handle **14***a* is passed through central rectangular opening in the

member 15, and the latter is started into the cavity 23 and screwed inward while the member 14 turns therewith, the fulcrum 32a sliding along the helices 21 until the normal position is attained for the members 15 and 10 with respect to one another; and sixth, the screw or limiting element 16 is placed so it is in proper relation with the cooperating or correlated abutments (ends of the slot or groove 24) thus completing the assembling of the originally or primarily separate parts.

The inventor has no intention to limit his patent protection to the precise and exact details of construction and arrangement specified in the foregoing, or as shown in the drawing, for the invention is susceptible of numerous and various changes within the scope of the broad inventive ideas as here implied and claimed.

What I claim as my invention is:

1. In a faucet or the like, a main body having a substantially evenly curved fluid passage therethrough inclusive of an inlet and an outlet, a valve-seat in the inlet of said passage, a valve-closure normally seated against said valve-seat and provided with a valve-stem which is depressible for moving the valve-closure from the valve-seat, said main body having a tube united therewith and disposed substantially tangentially to the curvature of said fluid passage and providing a guide through which said valve-stem extends into operable position, and said valve-closure having thereon deflecting means to deflect a stream of fluid away from the interior of said tube, the flow-capacity of the said passage being restricted around said deflector and valve-closure and expanded and unobstructed at the outlet side thereof and to the outlet end of the said passage, thereby preventing back pressure of the liquid or fluid and thus preventing leakage around the valve-stem.

2. In a faucet or the like, the combination of a main body having a passage therethrough, having an internally screw-threaded recess or cavity therein, and having an opening or aperture extending from said passage to said cavity; a valve-seat in said passage; a valve-member including a valve-closure and a valve-stem in cooperative relation to said valve-seat for constituting a valve; said valve-stem extending through said aperture into said cavity; an externally screw-threaded member having its threads interengaged with the threads of said internally screw-threaded cavity and movable toward and from said valve-seat and provided with means to limit its movement and having a substantially rectangular opening therethrough; and a valve-actuating element having a part slidable in said rectangular opening and a part engaged with said valve-stem for actuation of said valve by pressure exerted through the outer part of said rectangular opening; said valve-actuating element being rotatable with said externally screw-threaded member for cooperating with the latter so as to open the valve to any predetermined extent within minimum and maximum limits and to maintain said valve at said predetermined extent of opening until the said externally screw-threaded member is manually returned to its normal position.

3. The combination defined by claim 2, said valve-actuating element being a lever having a fulcrum interengaged with the screw-thread of said internally screw-threaded cavity and having a handle protruding outward from said rectangular opening and adapted to be swung towards said valve for opening the latter and also adapted to be swung about the axial line of said screw-threaded cavity for causing the externally screw-threaded member to have a rotary and axial motion.

4. In a faucet or the like, the combination of a main body having a passage therethrough including a longitudinally curved main part which has an inlet end and an outlet end, the inlet end having therein a valve-seat, a valve-closure normally seated against the inlet side of the valve-seat and projecting through the valve-seat to a point beyond the inlet side of the latter in the proper relation for restricting the said passage around the valve-closure while the remainder of said passage is sufficiently unrestricted and unobstructed to permit fluid to flow freely therethrough without any back-pressure at or near said valve-closure, and a tube united with said main body and extending substantially tangentially to the curvature of said passage and substantially to said valve-seat, said valve-closure being provided with a stem that is united therewith and extends through said tube, said valve-closure having therein an annular recess around the part of said stem that adjoins said valve-closure, said tube having one end within said annular recess, for the purposes specified.

GILES E. RIPLEY.