

(No Model.)

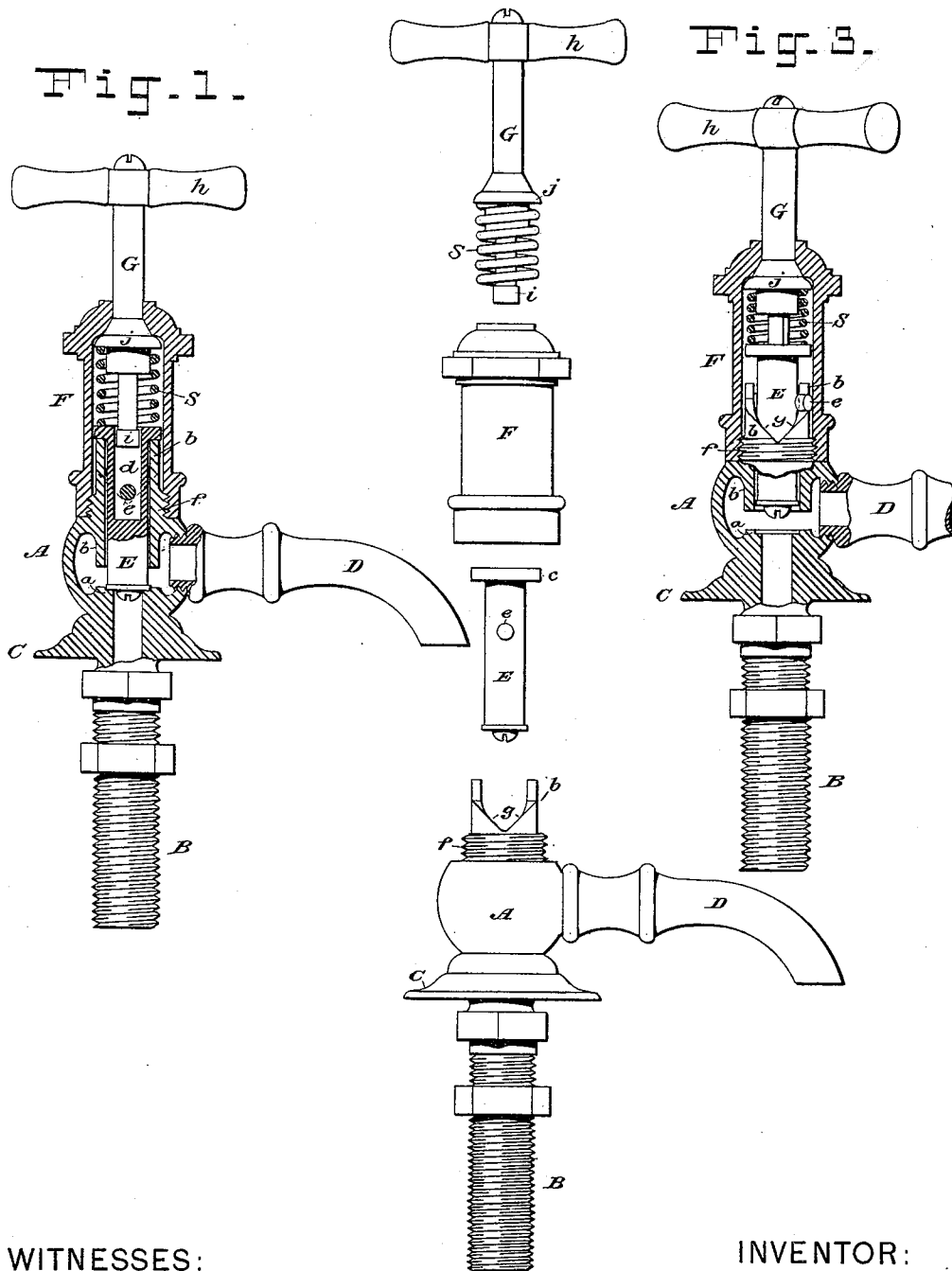
2 Sheets—Sheet 1.

J. E. BOYLE.
SELF CLOSING COCK.

No. 329,807.

Patented Nov. 3, 1885.

Fig. 2.



WITNESSES:

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INVENTOR:

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

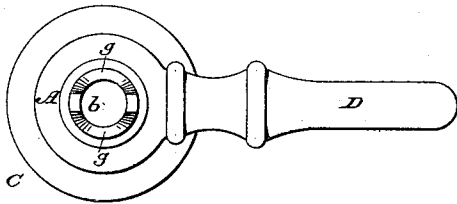


Fig. 5.

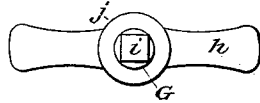


Fig. 6.

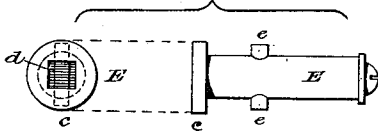


Fig. 7.

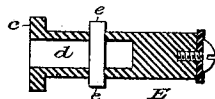


Fig. 8.

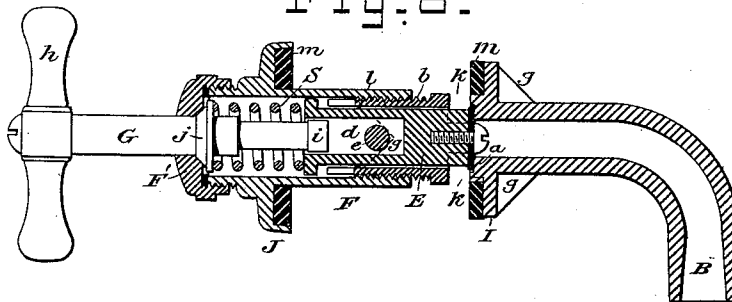
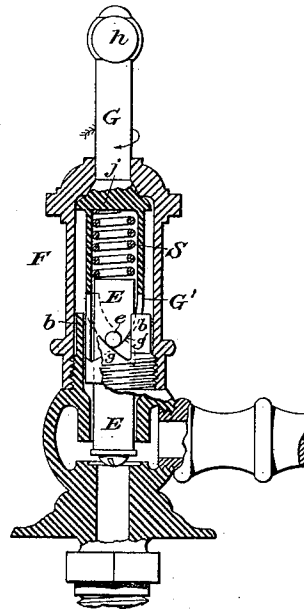


Fig. 9.



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UNITED STATES PATENT OFFICE.

JAMES E. BOYLE, OF BROOKLYN, NEW YORK.

SELF-CLOSING COCK.

SPECIFICATION forming part of Letters Patent No. 329,807, dated November 3, 1885.

Application filed January 31, 1885. Serial No. 154,561. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. BOYLE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Self-Closing Cocks, of which the following is a specification.

This invention relates to cocks or faucets which remain open only while so held, closing of themselves by means of a spring when released.

The object of the invention is to provide a cock that shall be self-adjusting, thus requiring no fine or close fitting, that shall not leak around its stem, and that shall at the same time be simple in its parts and cheap to construct.

Figures 1 to 7 of the accompanying drawings show this improved cock in its preferred form applied as a faucet for a stationary wash-basin. Fig. 1 is a vertical mid-section showing the cock closed. Fig. 2 is a side elevation of the parts separated. Fig. 3 is a sectional view corresponding to Fig. 1, and showing the cock opened. Fig. 4 is a plan of the base or shell and spout. Fig. 5 is an inverted plan of the stem and handle detached. Fig. 6 includes a side and end view of the valve-plunger, and Fig. 7 is a longitudinal mid-section thereof. Fig. 8 is a longitudinal section of a modified form of the cock adapted as the supply-cock for a urinal; and Fig. 9 is a view answering to Fig. 3, and showing a modified construction of basin-faucet.

I will first describe the particular construction shown in Figs. 1 to 7.

Let A designate the body portion or shell of the faucet, having the usual screw-threaded inlet-pipe, B, the flanged base C, and the delivery-spout D. These parts are in the main of the usual construction, as shown, or they may be of any good or suitable construction. The shell A is formed with the usual valve-seat, *a*, and with a tubular partition, *b*, which extends vertically into and above the shell, and forms a guide for the plunger or valve proper, E. This plunger (shown best in Figs. 6 and 7) is cylindrical, with the usual rubber packing on its bottom end, which comes against the seat *a*, and is formed preferably with a flange, *c*, on its top. From its top downward a square socket, *d*, extends into it about half

its depth, and it is provided with two diametrically-opposite projections, *e e*, formed preferably by a pin driven tight into a transverse hole through the plunger and projecting at both ends, as shown. The projecting tubular portion *b* of the shell A has a screw-thread, *f*, and above this it is formed with angular notches *g g* on diametrically-opposite sides, as shown best in Figs. 2 and 4. Both sides of these notches are preferably inclined, as shown, forming inclined planes or ways, and when the plunger E is in place the projections *e e* enter these notches *g g*. On turning the plunger its projections *e e* must ride up on these inclines, thus lifting the plunger spirally.

F is a tubular barrel or cap, which screws onto the threads *f*; and G is the valve-stem, which passes out through the cap F and receives the handle *h*. On its lower end it is squared to fit the socket *d*, forming thereby a key, *i*, to turn the plunger E. A spring, S, is arranged to press downward upon the plunger, and to press upward against the stem G, thereby pressing the plunger down upon its seat and making a tight joint where the stem passes through the cap F. At this point the stem is provided with a flange, *j*, the upper side of which is conical or globular, being ground to fit the cap in order to avoid leakage. The spring S is confined between the flange *j* on the stem and the flange *c* on the plunger. On turning the stem G by the handle *h* its key *i* turns the plunger E, which moves spirally upward by the sliding of its projections *e e* on the inclines *g g*, compressing the spring S and opening the valve. The valve will remain open and the water will run as long as the handle is held, and when it is released the tension of the spring S will press the plunger spirally downward upon its seat, thus turning back the stem G. As the plunger rises, the walls of its socket *d* move upward against the key *i*, which merely turns without rising. The socket *d* should therefore be deep enough to permit the plunger to rise as high as is desirable without the key *i* striking its bottom.

This faucet is simple to construct and requires no special nicety in fitting. The plunger E may be longer or shorter. The stem G below the flange *j* may be longer or shorter, or the cap F may stand a little higher or lower,

without impairing the operation of the device, the only difference in the latter case being that the spring S may be compressed a little more or less, which is unimportant. It is only necessary that the notches *g g* be deep enough to permit the plunger to descend fully to its seat. As the stem G simply turns without rising or falling, the use of a ground joint between its flange *j* and the cap is rendered possible, by which means leakage around the stem is avoided. The form of the key *i* and socket *d* may be greatly varied, provided only that the key shall be capable of entering and engaging the socket, and thereby turning the plunger.

The self-adjustability of this improved cock renders it readily adaptable to those uses where a capacity for adjustment to different dimensions is required. As one instance of such use, I have introduced the modification shown in Fig. 8. This is a supply-cock for the urinal shown in my pending application for a patent on urinals, filed September 25, 1884, to which reference is made for a detailed understanding of the construction. The upper tubular barrel of the earthenware bowl of that urinal is provided with a pipe-connection in which is the supply-cock.

In Fig. 8, B is the spud for connection with the supply water-pipe. I is a flange formed thereon. *b* is a tube formed thereon, and extending forward from the flange; and *k k* are apertures in this tube for the escape of the water into the urinal-bowl. The tube *b* is formed with the notches *g g*, is screw-threaded, and on it screws the tubular body *l* of the cap F, which is formed with a flange, J, and is open at its front end, where it receives a cap, F'. The other parts are the same as the like-lettered parts in the faucet already described. The tube *b* is entered into the rear of the tubular barrel on the earthenware bowl until the flange I abuts against the rear of the barrel. The cap F is then applied at the front, its tube *l* entering the barrel and screwing onto the tube *b* until the flange J bears tightly against the front of the barrel. Rubber washers *m m* are interposed between the flanges I J and the ends of the barrel. The plunger E is then thrust into the tubular portion of the cap F, the spring S and stem G are entered, and the cap F' is screwed tightly down. The earthenware barrel may be somewhat longer or shorter without impairing the action of the cock, since in such case the only effect will be to compress the spring S a little more or less.

It is not essential to my invention that the precise construction which I have described be closely followed, as my invention is susceptible of considerable modification without departing from its essential features. One such modification I have shown in Fig. 9. In this construction the stem G is not formed with a key on its end to turn the plunger, but has formed on it an inclined way, which co-operates with the inclined side of the notch *g* to act upon and raise the projection *e*. The stem

G is formed beneath the flange *j* with a tubular portion, G', which fits over the plunger E, and fits into the upper portion of the tubular extension *b*. This tubular portion G' of the stem is formed with inclined slots or openings cut through its opposite sides, the lower sides of which form inclined ways *g'*. The notches in the tubular portion *b* have each only one inclined side *g*, which is inclined in the opposite direction from the incline *g'* on the stem. The spring S is first placed in the tubular stem G', the plunger E is then inserted therein, the pin *e* is then inserted in the plunger through the slots in the stem, and the stem and plunger are then inserted into the tubular extension *b*, the cap F being then screwed down. The spring S presses the plunger down to its seat and the stem upward against the cap. On turning the stem in the direction shown by the arrow the inclines *g'* engage the projections *e*, and push them up the inclines *g*, thus raising the plunger by a spiral movement, as in the construction first described. This spiral movement of the plunger is not, however, essential, as it might be so guided that it could only move vertically, being lifted solely by the inclines *g'* on the tubular stem. The connections for this cock may be reversed without rendering it inoperative—that is to say, the water may enter it through the spout D and may leave it, when the valve is lifted, through the tube B, which in such case would constitute the spout. The spring S may then be made very light, as the valve will close with the pressure of water instead of against it.

I am aware that it is not new to construct a valve or faucet with a spring arranged to press the valve to its seat in one direction, and to press in the opposite direction against the stem, so as to make a tight joint between a flange on the stem and the opening in the shell through which the stem passes out. Such a construction has heretofore been applied to disk-valves which do not lift off their seats, but have ports which by turning the valve are brought into coincidence with similar ports on the seat. I am also aware that many kinds of self-closing valves have been constructed with a spring to press the valve to its seat, and inclines for lifting the valve upon the turning of its stem; but in all such valves the stem has been made to rise and fall with the valve, and the spring has been reinforced against some fixed part instead of against the stem.

I believe my improved cock or faucet to be the first self-closing cock wherein the stem has only a rotary movement with a ground joint against the cap, and wherein the one spring is utilized both to press down the valve or plunger to its seat and to press up the stem and thereby keep its ground joint tight.

It is essential to the invention that the cock be provided with inclined ways or other equivalent devices known in the art by which the turning of the stem shall cause the plunger to lift, and incidentally the descent of the plun-

ger under the pressure of the spring shall cause the stem to be turned back to its starting-point.

I claim—

5 1. The combination, to form a self-closing cock, of a shell formed with a seat, a plunger adapted to move toward and from said seat, a rotary stem engaging said plunger and formed with a shoulder ground to a seat
10 against said shell where the stem passes out through the latter, inclined ways upon one or more of the respective parts engaging projections on one of the other parts, substantially as described, whereby the turning of
15 said stem acts to move the plunger from its seat, and a spring arranged to press in opposite directions against said plunger and stem, thereby pressing the said ground shoulder on the stem tight against its seat and preventing
20 leakage, and acting to press the plunger to its seat upon the release of the stem, thereby turning the latter back to its starting-point, substantially as set forth.

2. The combination, to form a self-closing cock, of a shell, A, formed with seat *a* and inclines *g*, plunger E, having projections *e e*, adapted to engage and ride up said inclines upon the turning of the plunger, stem G, having flange *j*, and formed as a key to engage and turn said plunger, cap F, having a ground seat for said flange *j* where the stem passes through it, and the spring S, arranged to press in one direction against said plunger to force it toward the seat, and in the other direction against said stem to press its flange *j* against
25 30 35 said cap, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES E. BOYLE.

Witnesses:

ARTHUR C. FRASER,
GEORGE H. FRASER.