M. J. KELLY.

SPRING COCK.

APPLICATION FILED SEPT. 2, 1915.

1,241,989.

Patented Oct. 2, 1917.

2 SHEETS—SHEET 1.

Fig. 1

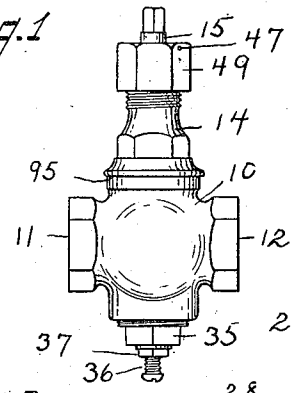


Fig. 2

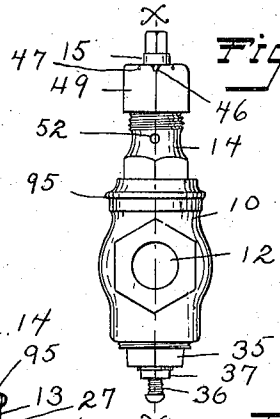


Fig. 5

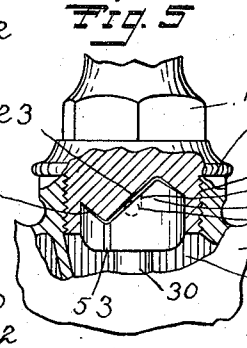


Fig. 3

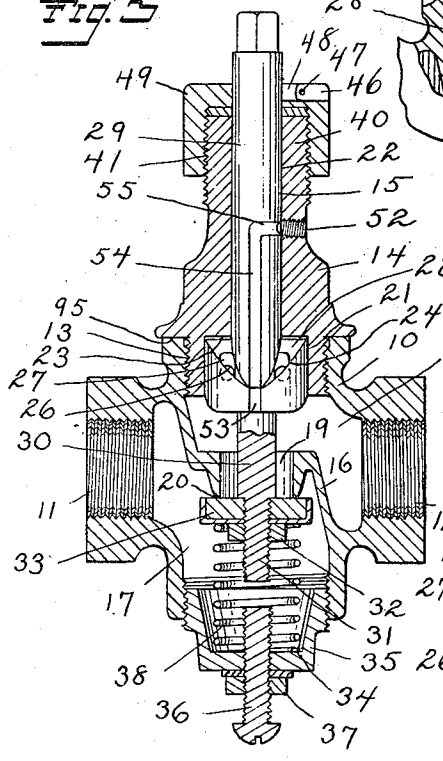


Fig. 4

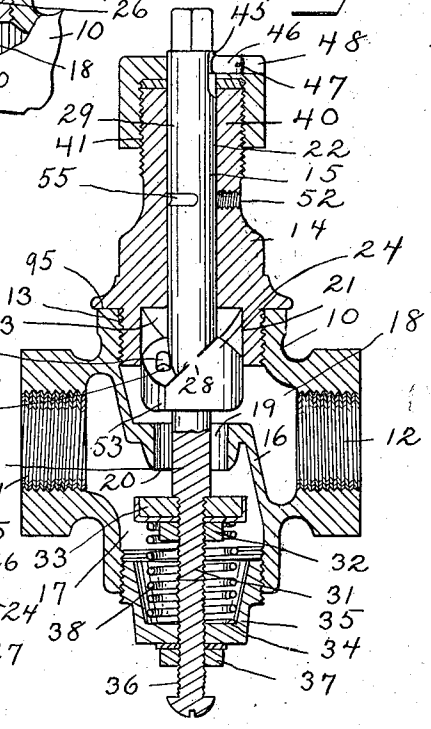


Fig. 6

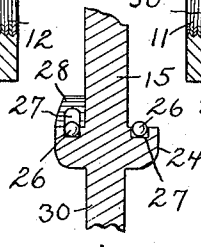
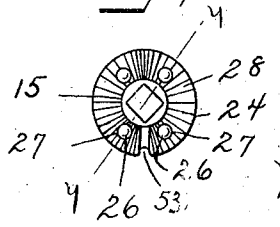


Fig. 7



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2 SHEETS—SHEET 2.

Fig. 8

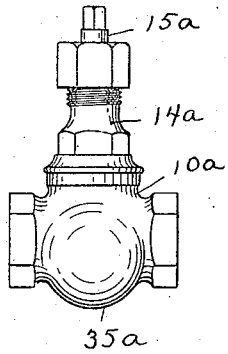


Fig. 12

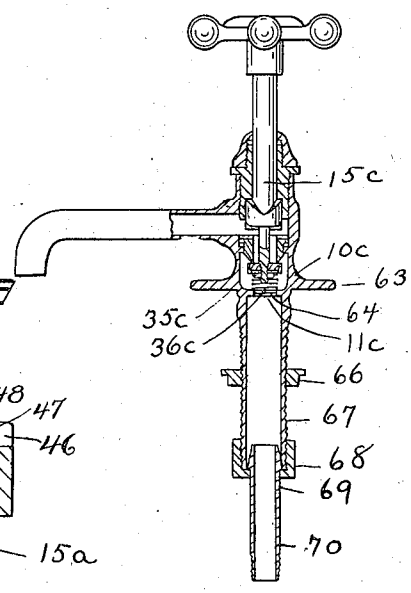


Fig. 9

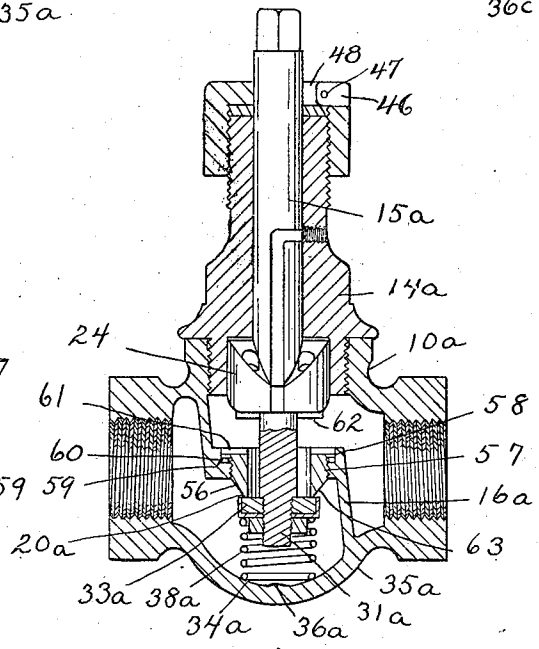


Fig. 10

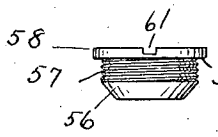


Fig. 11

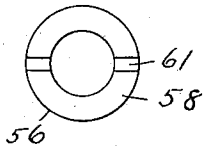
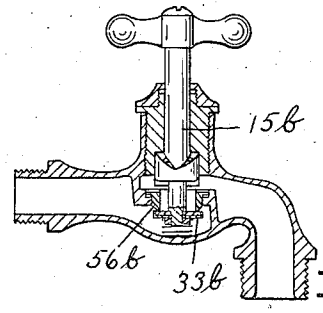


Fig. 13



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UNITED STATES PATENT OFFICE.

MARTIN J. KELLY, OF NEW BRITAIN, CONNECTICUT.

SPRING-COCK.

1,241,989. Specification of Letters Patent. Patented Oct. 2, 1917.

Application filed September 2, 1915. Serial No. 48,616.

To all whom it may concern:

Be it known that I, MARTIN J. KELLY, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Spring-Cocks, of which the following is a specification.

My invention relates to improvements in spring-cocks, and the object of my improvement is simplicity and economy in construction and convenience and efficiency in use.

In the accompanying drawing:—

Figure 1 is a side elevation of my improved spring-cock.

Fig. 2 is a front elevation of the same.

Fig. 3 is a sectional view, on an enlarged scale, on the line *x*—*x* of Fig. 2.

Fig. 4 is a similar view of the same with the parts moved to a different position.

Fig. 5 is a side elevation, and in part broken away, of part of the body and connected parts, and on a still further enlarged scale.

Fig. 6 is a sectional view on the line *y*—*y* of Fig. 7.

Fig. 7 is a plan view of the spindle member.

Fig. 8 is a side elevation, on the same scale as Fig. 1, of a modification of my spring-cock.

Fig. 9 is a sectional view, corresponding to Fig. 3 and on the same scale, of the modification shown in Fig. 8.

Fig. 10 is a front elevation of the valve seat member shown in Fig. 9.

Fig. 11 is a plan view of the same.

Fig. 12 is a sectional view of a lavatory cock having the operating parts made according to my invention, and on the same scale as Fig. 8.

Fig. 13 is a similar view of a faucet embodying my invention.

My improved spring-cock comprises a body 10 having on one side an inlet 11 and on the other side an outlet 12, and on the upper end a seat 95 inclosing an opening provided with an interior screw thread 13 which is closed by a cap 14, through which projects a spindle 15.

The body 10 is divided by a division wall 16 into two chambers, respectively a receiving chamber 17, on the lower side generally and connected with the inlet 11, and a discharge chamber 18 on the upper side, connected with the outlet 12, the said division wall 16 having an opening 19 in line with the axis of the cap 14 and spindle 15, the lower side of the wall of which opening 19 serves as a valve seat 20.

The cap 14 is an elongated structure and has a bore of two diameters the lower and larger portion 21 of which constitutes an extension of the discharge chamber 18 and the upper portion 22 of which is a fit for the spindle 15 and serves as a bearing therefor.

The lower and larger bore 21 serves as a cam chamber for housing a pair of coöperating end cams.

One of the said end cams, serving as the upper end cam 23, is integral with the cap 14, extending downwardly from the roof of the lateral or overhanging portion of the larger bore 21, relatively to the smaller or spindle bearing portion 22, the cam faces being on the lower side and arranged in V-shape, the same being made duplex, so that there is a V-shaped cam face on each side of the axis.

Opposed to the upper end cam 23 is a lower end cam 24 that is integral with the spindle 15, the form of the cam faces thereon being also V-shaped. While in some cases the end cam members may have their opposed cam faces in contact for effecting the valve movements desired and to be described, I have in the present case provided special contact balls 26 that are supported by the lower cam 24 and spindle 15 and which make contact with the cam faces of the said upper end cam 23, during the effecting of such movement.

The said balls 26 are four in number, and are located in pockets or wells 27, there being one such pocket and ball at about the middle of each of the inclined surfaces 28 of the V-shaped cam faces in the said lower cam 24.

The upper portion 29 of the spindle 15 is a fit in the spindle bearing 22 in the cap 14, the middle portion is relatively enlarged to form the lower end cam 24, and the lower portion 30 is in the form of an extension, below the lower end cam 24, and serves as a valve stem, extending through the valve opening 19 and below the valve seat 20.

The lower end portion 31 of the valve stem 30 is screw threaded and has mounted thereon, and secured in place by a nut 32, a

valve 33, positioned below the valve seat 20, suitably to coöperate therewith.

A spring 38 has the upper end engaged with the valve 33 and the lower end engaged with a seat 34 provided in the lower end of the body 10 and the said spring tends to hold the valve engaged with its seat, and also holds the opposed cam surfaces in engagement.

As the valve 33 is larger than the seat 20 I provide for inserting the said valve by means of a screw plug 35 that closes the lower side of the body 10, the lower seat 34 for the spring 38 being formed on the upper side of the said screw plug 35. A screw 36, held in place by a lock nut 37 passes upwardly through the seat 34 and serves as a stop, in engagement with the valve stem 30, to limit the downward movement of the said stem and the lower cam member 24 connected thereto.

In operation when the spindle 15 is turned from the normal position the coöperation of the cam faces serves to force the valve 33 from its seat, in opposition to the spring 38, and when the spindle is released the spring will tend to restore the parts to the normal position.

The spindle 15 is provided adjacent the upper end with a groove 45 in the side wall which engages with a key 46, as shown in Fig. 4, to hold the said spindle away from the normal position and thereby hold the valve open, in the depressed position. The key 46 is pivoted by means of a pin 47 in a slot 48, suitably to be swung in a vertical plane into and away from the engaging position, the said slot 48 being provided in a top cap 49 that covers the upper end portion 40 of the cap 14. The said top cap 49 is secured to the upper end portion 40 by means of a screw thread 41.

In some cases an outlet 52 is provided in the cap 14 and provision is made for connecting the same with the discharge chamber 18 and disconnecting the same therefrom by a set of grooves comprising a lower groove 53 across the lower cam member 24 and a longitudinal groove 54 connecting therewith on the periphery of the spindle 15 and a lateral or branch groove 55 connecting the upper end of the groove 53 with the discharge opening 52.

The small outlet 52 and the connecting grooves are provided in special cases to serve as a vent connection or outlet for the discharge chamber 18 and the portion of the piping system connected thereto through the discharge opening 12.

It will be noted as shown and described that when the valve is in the closed position the pressure of the water tends to hold the valve in such closed position and the opening is effected by moving the valve against such pressure.

In the modification shown in Figs. 8 and 9 the bottom of the body 10^a is closed or integral with the general body structure, and the seat 34^a for the spring 38^a is provided on the upper side thereof, and the stop 36^a for the end of the stem 31^a and the spindle member 15^a is in the form of an integral knob or protuberance on the said upper side of the bottom 35^a.

As the valve 33^a is larger than the seat 20^a as in the other construction described I provide the said valve seat 20^a on the lower side of a removable structure in the form of the removable valve seat member 56 which is secured in place in the body 10^a by means of a screw thread 57 provided in a suitable opening in the division wall 16^a.

The valve seat member 56 comprises an annular body portion; the exterior of which is provided with the said thread 57, and at the upper end there is an annular, laterally extending or overlapping flange 58 suitable for engaging with a seat 59 on the division wall 16^a, either directly or preferably with a packing washer 60 interposed therebetween. The upper side of the flange, or head 58 is provided with cross-slots 61 in diametral alinement and forming essentially a screw-driver slot for receiving a screw-driver device for squaring the valve seat member 56 in place.

Such screw-driver device I provide in the form of a diametral rib 62 on the spindle 15^a at lower side of the lower cam member 24.

In the assembly the valve seat member 56 is mounted loosely on the lower portion of the spindle member 15^a between the integral lower cam member 24 and the valve 33^a. The spring 38^a is placed on its seat 34^a and then the spindle member 15^a with the valve seat member 56 mounted thereon as described is inserted in the body 10^a, and the valve seat member 56 screwed into place. The lower end 63 of the valve seat member 56 is tapered suitably to facilitate engagement of the threaded portion 57.

After the spindle member 15^a and valve seat member 56 are in place the cap 14^a is placed in position.

The construction of the faucet style of cock shown in Fig. 13 corresponds to that shown in Fig. 9, differing therefrom in dimensions the same having a removable valve seat member 56^b coöperating with the valve 33^b, mounted on the spindle 15^b.

In the lavatory cock shown in Fig. 12 the inlet 11^c to the body 10^c is at the lower end thereof and except for the feature and changes that are involved with the same, the internal structure corresponds to that of the faucet style shown in Fig. 13.

The inlet 11^c is positioned at the lower side of the base 35^c of the body proper 10^c, which base is provided with a laterally extending supporting flange 63, and the said

inlet 11ᶜ is bridged by a spider 64 supporting the stop 36ᶜ that coöperates with the lower end of the spindle 15ᶜ to limit the downward movement thereof.

Below the inlet 11ᶜ and base 35ᶜ is a downward, sleeve-like extension 67, threaded at the exterior to receive a clamping nut 66, and also to receive at the lower end the screw threaded nut member 68 of a union 69. The said union 69 terminates at the lower end in the form of a sleeve member 70 which constitutes the inlet proper.

In the various styles disclosed the valve is opened against the pressure of the water, and when closed the said pressure of the water tends to hold the valve in the closed position.

Also the valve is spring closed, the handle and end cam features being brought into play merely for effecting the opening of the valve.

I claim as my invention:

1. In combination in a cock, a body having an inlet at one side, an outlet at the other side, an end opening at the upper end, and a closed bottom, and divided in the interior by a bridge into a supply chamber on the lower end, connected to the said inlet, and a delivery chamber on the upper side, connected to the said outlet, the said bridge having a valve opening and a valve seat at the lower edge thereof, a cap closing the said end opening, having in the upper portion a bore for a spindle, and in the lower portion a pair of V-shaped end cams, and a spindle member, the said spindle member comprising as one piece a spindle portion at the upper end, positioned in the said bore, an end cam portion next to the said spindle portion, having a pair of V-shaped cams, a stem portion extending downwardly from the said cam portion and passing through the said valve opening, and a reduced threaded extension below the said stem portion, a valve mounted on the said reduced threaded extension, and a spring inclosing the said reduced threaded extension, and positioned between the said valve and the said closed bottom.

2. A cock comprising a body having an opening at the upper end and having a bridge in the interior that is provided with an opening, and having a seat on the lower border of the said last named opening, a spindle member extending through the said openings, a lower end cam member and a valve on the said spindle member and on opposite sides of the said seat, and a cap engaged with the upper portion of the said spindle member, closing the said opening in the body, and provided with an upper end cam for coöperating with the said lower end cam, the said cap having an auxiliary outlet in the side wall, and the said spindle member having a passage extending along the periphery for connecting the said auxiliary outlet with the outlet side of the interior of the said body.

3. A cock comprising a spindle member having a spindle and a valve mounted thereon, a body in which the said spindle member is operatively housed and having a valve seat for coöperating with the said valve, coöperating end cams on the spindle and body for opening the valve, a spring tending to hold the said valve in the closed position, and a key for engaging with the said spindle for holding the said valve in the open position.

4. In combination in a cock, a body having an inlet at one side, an outlet at the other side, an end opening at the upper end, and a closed lower side, and divided in the interior by a bridge into a supply chamber on the lower side, connected to the said inlet, and a delivery chamber on the upper end, connected to the said outlet, the said bridge having a valve opening and a valve seat at the lower edge thereof, a cap closing the said end opening, having in the upper portion a bore for a spindle, and in the lower portion a pair of V-shaped end cams, and a spindle member, the said spindle member comprising as one piece a spindle portion at the upper end, positioned in the said bore, an end cam portion next to the said spindle portion, having a pair of V-shaped cams for coöperating with the said cams of the cap, a stem portion extending downwardly from the said cam portion and passing through the said valve opening, and a reduced threaded extension below the said stem portion, a valve mounted on the said reduced threaded extension, and a spring inclosing the said reduced threaded extension, and positioned between the said valve and the lower side of the body, and the said reduced threaded extension being of suitable length to coöperate with the said lower side to limit the movement of the said spindle member.

5. In a cock, a body portion provided with a bridge in the interior having a hole and a seat on one side of the said hole, a spindle member extending through the said hole, a valve mounted on the said spindle member, positioned on the said one side of the hole and end cam devices on the said spindle on the other side of the said hole, the said seat being provided on a removable valve seat member, and the said spindle member being provided with means for removing and replacing the said valve seat member.

6. In a cock, a body portion provided with a bridge in the interior having a hole and a seat on one side of the said hole, a spindle member extending through the said hole and a valve on the said spindle member on the said one side of the said hole and end cam devices on the other side of the said hole

and a spring housed within the said body and supported thereby, surrounding the said spindle member, and engaged with the said valve, the said seat being provided on a removable valve seat member held in place by a screw-thread connection, and the said spindle member and valve seat member being provided with coöperative means for removing and replacing the said valve seat member.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."