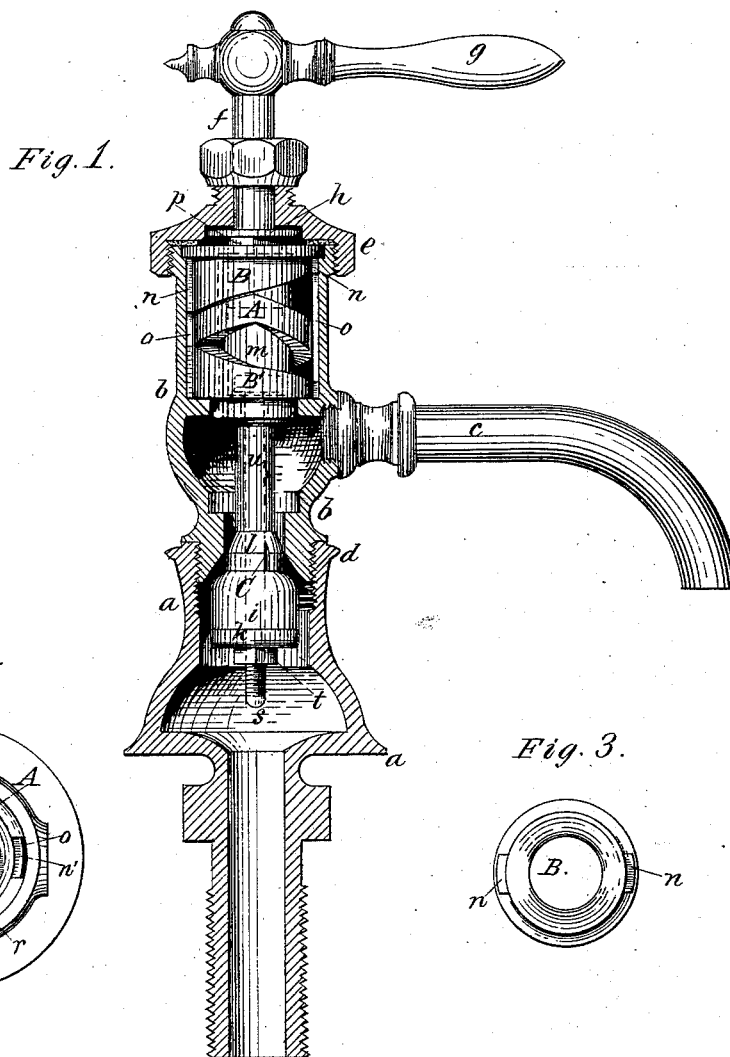


H. H. CRAIGIE.
Water-Faucet.

No. 216,661.

Patented June 17, 1879.



Attest:

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HUGH H. CRAIGIE, OF STAMFORD, CONNECTICUT, ASSIGNOR TO JULIA CRAIGIE, OF SAME PLACE.

IMPROVEMENT IN WATER-FAUCETS.

Specification forming part of Letters Patent No. **216,661**, dated June 17, 1879; application filed November 8, 1878.

To all whom it may concern:

Be it known that I, HUGH H. CRAIGIE, of Stamford, Fairfield county, Connecticut, have invented certain new and useful Improvements in Water-Faucets, of which the following is a specification.

My present invention relates to that class of water-faucets, some of which are known as "compression-cocks," where the valve-disk, usually formed of rubber or other compressible material, is raised or lowered to or from its seat by a reciprocating movement. In this class of faucets the movement of the valve-disk is effected generally either by a crank, as in the Fuller cock, or by a uniform screw, as in the Hero compression-cock. In both cases a rotatable, or partly rotatable, operating-handle is employed, the shaft of which is in the former case cranked and disposed at right angles to the valve-stem, while in the latter case the shaft is arranged in line with the valve-stem, and is threaded, as a nut, to engage with similar threads on the valve-stem, which latter is prevented from turning by being squared and moving in a square bearing in the valve-casing, in which it is free to rise or fall in obedience to the action of the screw, to open or close the valve.

In another instance a cam has been employed of such form which effects the opening of the valve by a partial turn in either direction, or by pressing down the cam-handle; but its action is positive only in opening the valve, a spring serving to close it, the cams having but a single bearing, and consequently an action vertically in but one direction.

This construction forms the main feature of my invention, which also embodies minor features, as hereinafter fully set forth.

Figure 1 in the annexed drawings presents a vertical section of a basin-cock constructed according to my invention, the valve-disk being shown raised to a medium position or approaching the point of closure. Figs. 2 and 3 are minor figures, which will be hereinafter explained.

The body or casing of the valve is, for convenience of construction, preferably made in two parts—that is, a base-piece, *a*, which rests upon the base, to which the cock is fixed,

and terminates in a threaded shank, as shown, which connects with the water-pipes, and an upper part or body, *b*, which carries the operating parts of the valves, and also the discharge-spout *c*, which projects therefrom.

The lower extremity of the body *b* terminates in a threaded neck, which screws into the base-piece *a*, as represented, and the aperture of this neck is ground to form a conical valve-seat, *d*, as shown, while the top of the body *b* is closed by a screw-cap, *e*, provided with the usual gland, through which the rotating shaft *f* of the operating-handle *g* passes. This shaft connects with or is or formed with a double or return screw-cam, *A*, of opposite inclinations, which may be said to be formed, as shown, by a segment of a right and left screw-thread, which are arranged parallel and on the same plane, encircling the axis or cylinder *m*, from which they project, and blending together where they meet, thus forming a continuous or uninterrupted return-cam, as seen in Fig. 1. This cam works between inclined bearings *B B'* fixed to the side of the casing above and below the cam *A*, as shown, each of which is also formed with a corresponding double or right-and-left incline.

It will now be observed that when the cam is turned to the right or left by the operating-handle the valve is raised or lowered, the movement being positive in opening or closing the valve, and being effected in whichever direction the handle is turned, and by means of but a partial rotation thereof.

The operation of the valve is thus rendered very effective and simple, and much more rapid and convenient than is the case with the usual screw movement, which requires a number of turns in the same uniform direction.

The cam *A* is preferably formed on a short cylindrical section, *m*, which forms the connection between the valve-stem and the shaft *f* of the handle; and the bearings *B B'* of the cam are preferably formed by bevel-rings, which are socketed in the valve-casing, as shown, above and below the cam *A*. The axis *m* of the cam turns in the central aperture of the rings, which form the bearing thereof at top and bottom, and the cam *A* works between the corresponding cam-surfaces of the rings,

which face each other, as seen in Fig. 1. The lower ring, *B'*, rests on a shoulder at the center of the valve-casing *b*, and the upper ring, which has a narrow projecting rim, rests on a shoulder at the mouth of the casing, under the screw-cap *e*, while both rings are provided with short lugs *n n'*, which engage with grooves *o* on the valve-casing, and this holds the rings fixed therein, while the cam *A* is free to turn between them, and is thus raised or depressed by its rotation thereon. These lugs and grooves are better shown in Figs. 2 and 3, the former of which shows a plan view of the mouth of the casing *b* with the upper ring, *B*, removed, while the latter is an inverted plan view of the removed ring.

The shaft *f* of the handle is formed with a projecting disk or shoulder, *h*, which lies in a cavity between the screw-cap and the upper ring, *B*, and this holds it in proper vertical position, while the shaft terminates below the disk in a square key, *p*, which engages with a square bore, *r*, Fig. 2, in the axis *m* of the cam, thus forming a turning connection between the handle and cam.

The valve-disk *i* is preferably formed of compressible rubber, as usual, being held on the valve-stem between two metal disks or shoulders, *k l*, the latter of which forms a plug or cut-off, which enters the aperture of the valve-seat previous to the seating of the valve, and checks the flow of water. This plug is formed with a notch or groove, *C*, running nearly the full length of the plug, as shown. This groove affords, as will be seen, a slight vent or escape to the moving column of water during the closing movement of the valve and before the full seating of the valve-disk occurs, and thus obviates the complete and sudden check of the flowing column, which is the cause of the severe hammering common to this class of valve as usually formed, but which I thus effectually prevent by means of this relief-groove *C*.

The valve-stem is formed by a long pin or slender bolt, *s*, which is hung from the axis *m* of the operating-cam, its head resting on the bottom of the square cavity *r* therein, Fig. 2, while the round shank of the stem extends through a circular hole in the bottom of the cavity, in which it is free to turn, as seen in Figs. 2 and 1.

The valve-disk *i* and plug *l* are slipped on the lower end of the stem, which is threaded, and are held in place by the adjusting-nut *t*, while a sleeve, *u*, slipped on the upper part of the stem, between the cam *A m* and the valve-disk and plug, *i l*, holds the parts in proper relative position, and prevents them rising out of place.

The turning of the nut at the end of the valve-stem tightens the parts together and compresses the rubber disk *i* more or less, thus increasing or decreasing the practical length of the valve-stem, and thereby serving to adjust the force or degree of tightness with which

the disk is drawn to its seat by the action of the cam.

It will now be seen that the valve-stem, with its attachments, is prevented from moving up or down independent of the cam, which is held to the stem between the shoulder presented by the sleeve and the head of the stem; but that at the same time the cam is free to turn on the valve-stem, so that when the action of the cam draws the valve to its seat, the cam at its final or tightening movement can freely turn on the stem without turning the valve-disk on its seat, which would be injurious; and this freely-turning and double-shouldered connection between the parts forms another feature of my invention, which is of importance in this class of valves.

It will be readily understood that the detailed construction of the operating double cam and its necessary connections may be varied without departing from the principle of the invention—that is, the cam *A m* may be formed solidly on the shaft *f* of the handle, instead of being a separate part; and the cam-surface may be formed in this shaft by a depressed groove instead of a raised rib, as shown, with which groove a fixed pin projecting from the casing *b* may engage with similar effect; or this modification may be reversed, the pin being on the rotary shaft *f* and the continuous or double cam-groove on the interior of the casing. I however prefer the construction described, as it is better adapted to existing modes of manufacture, and is strong and durable.

I have shown my invention applied to a basin-cock; but it is, of course, as applicable to bib and other cocks, by simple changes of form, proportion, and arrangement, without departing in any manner from the essential features of the invention.

In cocks used for hot water, where an incompressible valve-disk is used, the valve-stem is preferably fitted with a strong upwardly-acting spring, to constantly tend to force the disk to its seat.

What I claim as my invention is—

1. The combination, in a water-cock, of a reciprocating valve and a rotating operating-handle, with a double or return screw-cam, formed with uninterrupted right and left inclines, and provided with a positive bearing above and below the inclines, by which a partial rotation of the handle in either direction effects, through the medium of the said cam and its upper and lower cam-bearings, the closing or opening of the valve with a positive movement in both directions, substantially as herein set forth.

2. In a water-cock constructed with a reciprocating valve-disk and a rotating actuating-cam or cam-handle, the valve-stem connected with the actuating-cam by means of a freely-turning shank provided with a shoulder above and below its connection with the cam, whereby a positive up or down move-

ment may be imparted to the valve without turning the valve on its seat at the opening or the closing movement of the cam, substantially as herein shown and described.

3. The combination, in a water-faucet, of a reciprocating valve and rotating operating-handle of the rotating cam-cylinder A *m* and

stationary cam-rings B B', arranged and operating substantially as and for the purpose set forth.

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Witnesses:

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