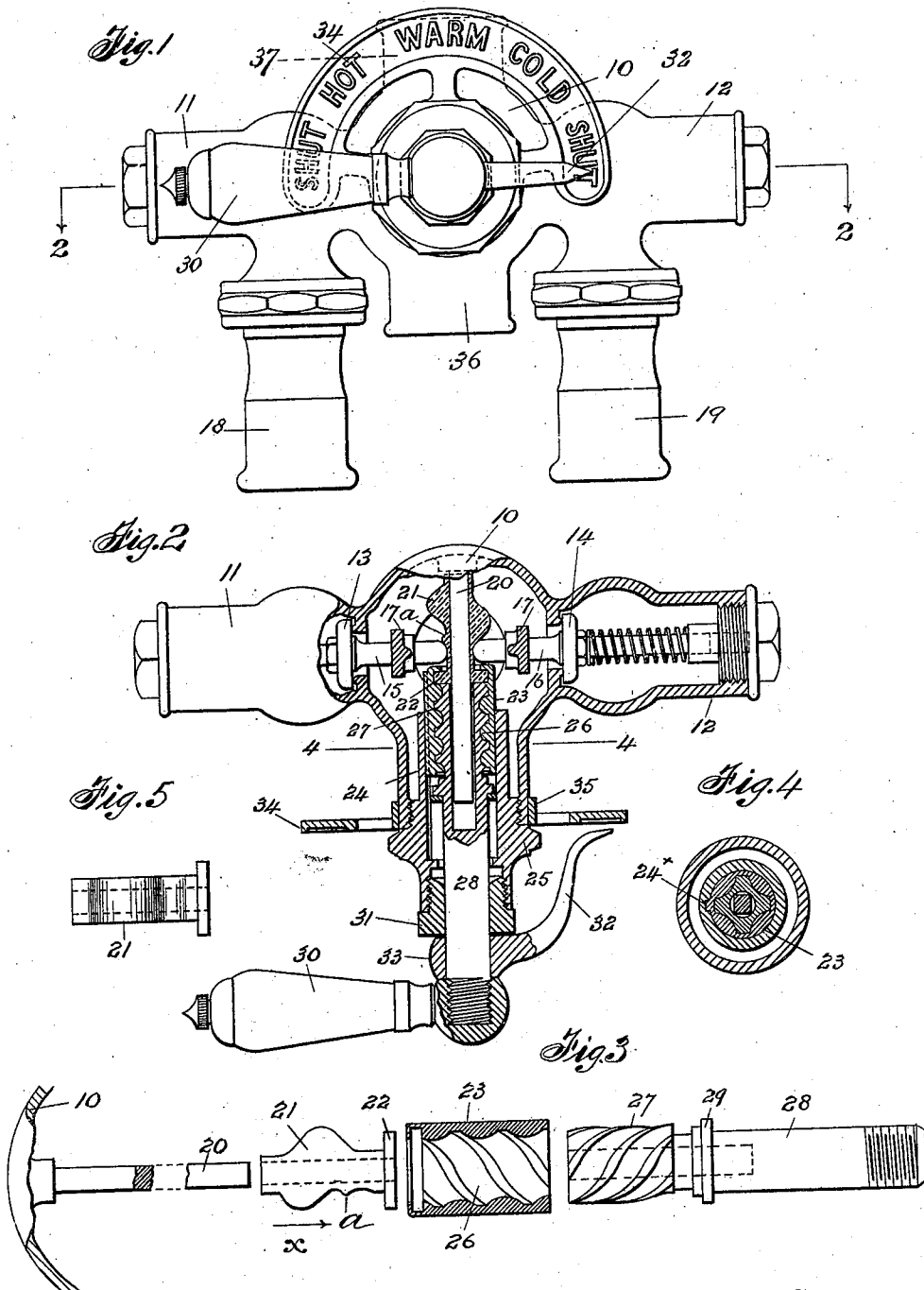


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COMBINATION FAUCET.
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983,886.

Patented Feb. 14, 1911.



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UNITED STATES PATENT OFFICE.

WILLIAM A. FLEMING, OF NEW YORK, N. Y.

COMBINATION-FAUCET.

983,886.

Specification of Letters Patent.

Patented Feb. 14, 1911.

Application filed April 25, 1910. Serial No. 557,568.

To all whom it may concern:

Be it known that I, WILLIAM A. FLEMING, a citizen of the United States, and a resident of the borough of Manhattan, in the county, city, and State of New York, have invented certain new and useful Improvements in Combination-Faucets, of which the following is a specification.

The invention relates to faucets of the type which connect with both hot and cold water supply pipes, and discharge through one outlet, or through either one of two or more outlets, water at such approximate temperature as may be desired by the user. These are known as combination faucets; and when so constructed that a single operating device, such as a lever handle or wheel, must be used to control and vary the temperature of the flow, it frequently happens that the user is scalded by a flow of very hot water at the first opening and last closing movement of such operating device.

The object of this invention is to provide an improved combination faucet which will positively prevent any such action of the hot water valve, or relative action of the two valves, as would permit a flow of exceedingly hot water except at an intermediate point of the actuation of the operating handle, which intermediate point cannot be reached without the user being able to know that the result will be a flow of hot water alone.

To these ends, the invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the drawings which accompany and form part of this specification, Figure 1, is a front elevation of my improved faucet in one of its embodiments; Fig. 2, is a plan view, partly in horizontal section through the mechanism for controlling the opening of the hot and cold water valves; Fig. 3, is a detail plan view of the principal members of the valve-actuating mechanism, detached, and parts shown in section and other parts broken away; Fig. 4, represents a section in line 4-4 of Fig. 2, and Fig. 5, is a detail edge view of the cam block.

Similar reference characters indicate the same or similar parts in all of the views.

The main casting of the attachment comprises a central portion 10 and two side portions 11 and 12 for the two valves 13 and 14 the stems 15 and 16 of which pass through

guides 17 and have their ends preferably rounded, the two stems being preferably in alinement, their rounded ends being on opposite sides of the cam actuator hereinafter described. The valves are preferably of a well known type which open against the pressure of the water supply. Suitable couplings for cold and hot water supply pipes are represented at 18 and 19 respectively.

Projecting forwardly from the rear wall of the central chamber, and rigidly connected therewith, is a guide pin 20 which is non-circular in cross-section. It is illustrated as square. The actuator for the valve stems 15 and 16 consists of a block 21 having a central aperture fitting the pin 20 so as to reciprocate without rotating thereon. The outer end of the block has a disk 22 engaging an annular interior groove in one end of a sleeve 23 in a manner to permit the block and sleeve to have a relative rotative, but not longitudinal movement. The sleeve 23 is mounted to slide in a bushing 24 projecting from a nut 25 which latter is secured to the outer end of a forwardly projecting tubular extension of the portion 10 of the main casting. The sleeve 23 is prevented from rotating in the bushing 24 by a longitudinal rib 24* of one fitting a groove in the other. The reason for the rotative connection of the block 21 and the sleeve 23 is that when assembling the parts the block cannot rotate on the pin 20, but the sleeve must rotate with the bushing and nut. When assembled, there is no relative rotation of the block and sleeve, but both must slide or reciprocate together. To effect this reciprocatory movement, the interior of the sleeve is formed with steep-pitched screw-threads 26 (see Fig. 3) which are engaged by threads 27 of the handle stem 28. Said stem has an annular flange 29 engaging an internal shoulder in the nut 25 to prevent outward movement. Inward movement is prevented by the handle 30 which is tightly secured on the stem, or by a hub of the pointer presently described. The stem passes through a gland 31 secured in the nut 25, and it is longitudinally bored to enable it to project partly over the square guide pin 20. When the handle stem is turned, its threaded portion 27 necessarily causes the sleeve 23 and cam block 21 to reciprocate longitudinally, since neither of the latter can rotate. To indicate the position to which the handle

should be turned to effect certain positions of the cam block and consequently of the two valves, I may provide a pointer 32 the hub 33 of which is rigidly secured on the handle stem. The pointer co-acts with certain words or indicia borne by a plate 34, supported by a sleeve 35 on the forward extension of the casting 10, which words or indicia are, preferably, "Shut", "Hot", "Warm", "Cold", "Shut".

I will now describe how the cam block 21 effects the desired control of the two valves.

When the parts are in the position shown in Fig. 2, both valves are closed, and the pointer would be opposite the word "Shut" at the left. The act of turning the handle so as to carry the pointer to the word "Hot", results in sliding the cam block forward, or in the direction of the arrow *x* in Fig. 3. Instantly the small rise *a* of the cam block actuates the stem 15 so that the cold water valve is opened a little before, or at the same time as, the hot water valve, each to a relatively small degree, thus positively avoiding any liability of at first getting hot water only. Further movement, and by the time the pointer reaches the word "Hot", a depression behind the rise *a* permits the valve 13 to almost or entirely close, but on the opposite side of the block, a considerably higher cam portion of the block has pushed the stem 16 out so as to open the valve 14 sufficiently to permit as complete a flow as is usually desired for hot water alone since too great a flow of hot water is liable to cause objectionable spattering. Continued movement opens the hot water valve wider, but also opens the cold water valve until "Warm" is reached. Next, the hot water valve begins to close, the cold water valve remaining open, and finally the latter closes when the pointer reaches "Shut" at the right. On the return movement, of course the cold water valve only is opened at first, and the end of the return movement causes a mixture of cold with hot water, owing to the small rise *a*. Consequently, no matter which "Shut" position is occupied, the first flow of water cannot be hot, and the latter part of the closing movement cannot result in a flow of hot water. And whatever intermediate point is desired, it can be reached quickly.

To attain the result stated it is essential that the cam block or valve actuator shall be irregular in shape, so that the movements of one valve shall be controlled differently from the movements of the other valve. As shown, the cold water side of the block has a small cam and a larger one with a depression between them, while the hot water side has but a single cam and the apex of

that one is not opposite the apex of the larger cam of the cold water side.

The water released by one or both of the valves into the chamber in the central portion 10 of the casting may flow therefrom through any preferred outlet. In Fig. 1 I illustrate a lower nipple 36 to which a nozzle tip may be connected, and an upper nipple 37 to which a shower connection may be coupled.

Having now described my invention, and specified certain of the ways in which it is or may be carried into effect, I claim and desire to secure by Letters Patent of the United States:—

1. A combination faucet having two valves opening in opposite directions, their stems being substantially in alinement, a fixed guide between the ends of said stems, a block mounted to slide on said guide, said block having cam surfaces on its side, and a screw capable of rotation in one or the other direction for reciprocating said block, substantially as described.

2. A combination faucet having two valves opening in opposite directions, their stems being substantially in alinement, a fixed guide between the ends of said stems, a block mounted to slide on said guide, said block having two cam surfaces of different sizes on one side and one cam surface on the other side, and means for reciprocating said block, substantially as described.

3. A combination faucet having a pair of oppositely opening valves provided with stems in alinement, a stationary guide pin between the opposing ends of said stems, a cam block fitted to slide back and forth on said pin, an internally threaded sleeve connected with said block, an externally threaded screw fitting said sleeve, and means for rotating said screw, substantially as described.

4. A combination faucet having a pair of oppositely opening valves provided with stems in alinement, an actuator between the opposing ends of said stems, said actuator having a large and a small cam portion on one side and a single cam portion on the other to act on said stems to prevent a flow of hot water alone at the beginning or end of its operation, means for operating said actuator, and an indicator for showing the position given to the actuator and valves, substantially as described.

In testimony whereof, I have hereunto set my hand in the presence of two witnesses this 20th day of April, 1910.

WILLIAM A. FLEMING.

Witnesses:

M. F. KILLEEN,

GRACE T. DIXON.