A. BEYER.

COMBINATION FAUCET.

APPLICATION FILED OCT. 18, 1909.

961,426. Patented June 14, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

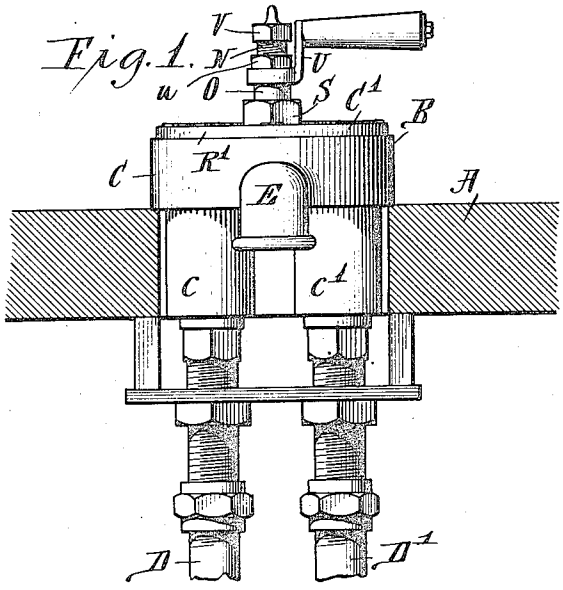
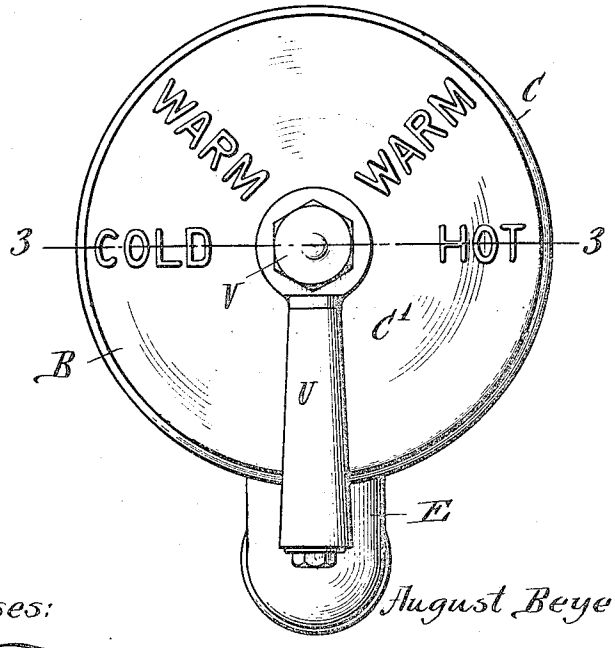



Fig. 2.




Witnesses:

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3 SHEETS—SHEET 2.

Fig. 3.

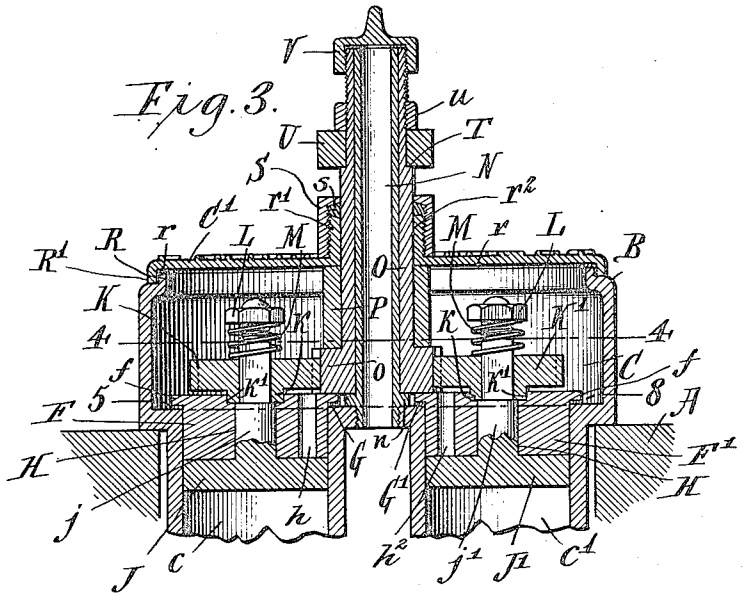
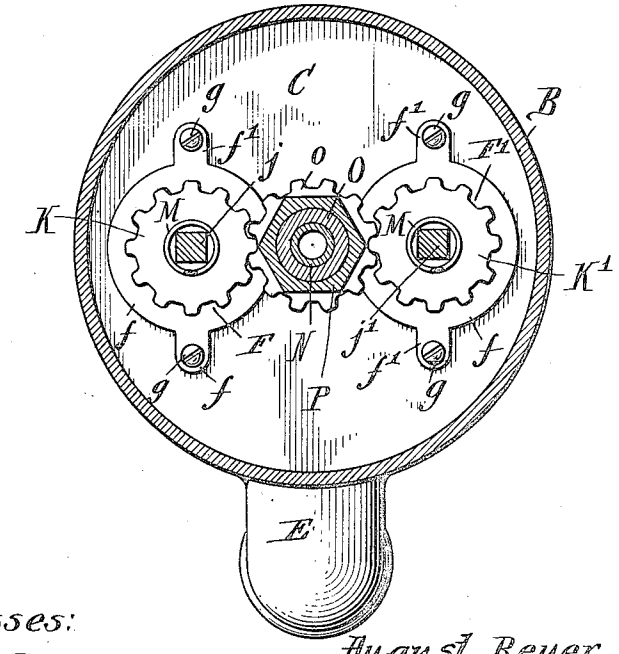



Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5.

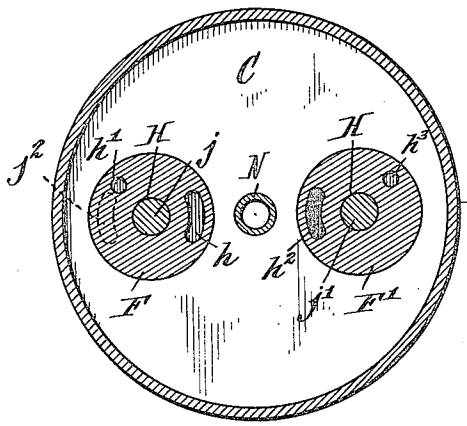



Fig. 6.

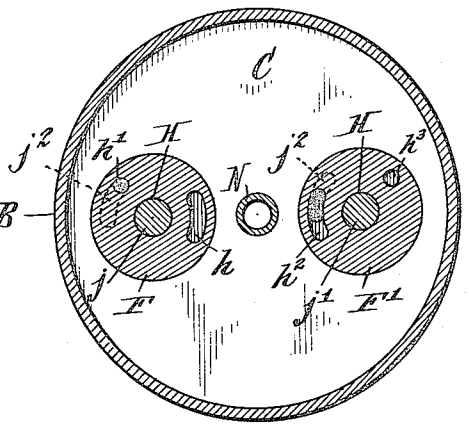



Fig. 7.

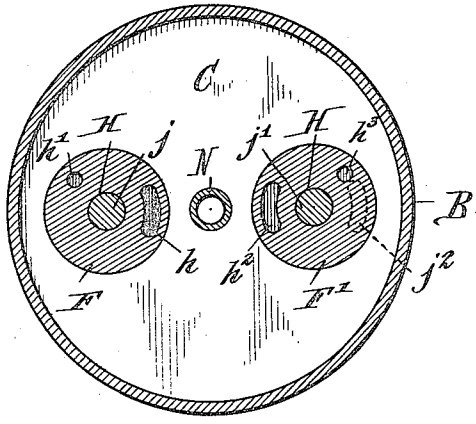



Fig. 8.

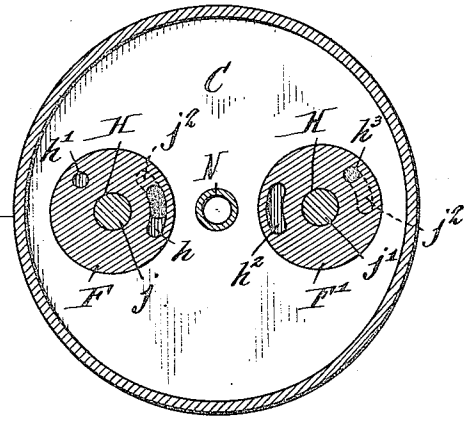



Fig. 9.

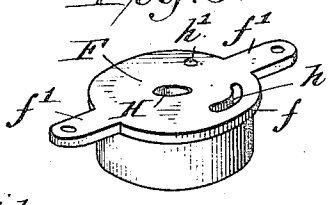
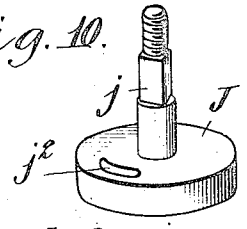



Fig. 10.

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# UNITED STATES PATENT OFFICE.

AUGUST BEYER, OF BUFFALO, NEW YORK.

## COMBINATION-FAUCET.

961,426. Specification of Letters Patent. Patented June 14, 1910.

Application filed October 18, 1909. Serial No. 523,270.

*To all whom it may concern:*

Be it known that I, AUGUST BEYER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Combination-Faucets, of which the following is a specification.

My invention relates more particularly to a combination faucet having a mixing chamber provided with a hot-water inlet, a cold-water inlet, valves controlling the admission of water through said inlets, and a water-outlet.

One of the primary objects of my invention is the production of a simple and durable faucet of this type in which rubber, leather, or other yielding valves are entirely dispensed with.

Other objects of my invention are to so construct the faucet that the admission of hot and cold water thereto is governed by a single handle, and so that by moving said handle to certain points, cold, warm, or hot water may be drawn from the faucet; to improve the construction of the valves controlling the flow of the hot and cold water; to provide plane-faced spring-retained disk-valves; and to otherwise improve on faucets of the type mentioned to render the same more efficient and reliable.

To these ends the invention consists in the construction, arrangement, and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the accompanying drawings,—Figure 1 is a front elevation of a faucet constructed according to my invention, the same being shown applied to a lavatory. Fig. 2 is a plan view of the faucet. Fig. 3 is a vertical section taken on line 3—3, Fig. 2. Fig. 4 is a horizontal section taken on a plane indicated by line 4—4, Fig. 3. Figs. 5 to 8 inclusive are horizontal sections taken on a plane indicated by line 5—8, Fig. 3; the disk-valves being shown in different positions. Fig. 9 is a detached perspective view of one of the bushings with which the disk-valves coöperate. Fig. 10 is a detached perspective view of one of the disk-valves.

In the drawings, which form a part of this specification, like letters of reference refer to like parts in the several figures.

The reference letter A indicates the top of a lavatory, a portion of a bath-tub, or any object in connection with which a faucet of this type may be of use.

B designates the faucet considered as a whole. It has a hollow body-portion C provided with two parallel depending tubes $c$, $c^1$, and a cover $C^1$ which closes the upper open end of said body. By preference, I make the body cylindrical, but it may be otherwise shaped to suit the desires of the maker or the requirements of the user. One of said tubes, for instance the tube $c$, is connected to a cold-water pipe D, while the other tube $c^1$ is connected to a hot-water pipe $D^1$. The hollow body-portion C serves as a water-receiving or mixing chamber and it has a forwardly and downwardly-directed discharge nozzle E extending from its cylindrical wall.

Fitting into the upper ends of the tubes $c$, $c^1$, are bushings F, $F^1$, each having an annular overhanging flange $f$ and a pair of securing-ears $f^1$ extending laterally from said flange at diametrically opposite points. Between the bottom of the chamber and said flanges, gaskets G, $G^1$, are interposed and passing through said ears and taking into said bottom are screws $g$ whereby the bushings are secured in proper position and the gaskets G, $G^1$, compressed to prevent leakage of water along the sides of said bushings. Each of said bushings has a central circular aperture H. The bushing F has a curved slot $h$ and a circular aperture $h^1$ while the bushing $F^1$ is provided with a curved slot $h^2$ and a circular aperture $h^3$.

The slot $h$ and aperture $h^1$ in the bushing F serve as cold-water inlets, while the slot $h^2$ and aperture $h^3$ in the bushing $F^1$ serve as hot-water inlets. Said curved slots $h$ and $h^2$ are arranged on opposite sides of the axes of said bushings, preferably between said axes and the axis of the water receiving-chamber, while the apertures $h^1$ and $h^3$ are arranged between the axes of said bushings and the cylindrical wall of said chamber. Such arrangement, however, is not absolutely necessary to an efficient working of the faucet, as will be apparent from further description. The undersides of said bushings are preferably made flat and true so as to act as valve-seats for disk-valves J, $J^1$, having stems $j$, $j^1$, which are passed through the circular apertures in said bushings and project into said receiving-chamber. The

upper faces of said valves are flat and true and bear against the bushings, and each valve has a curved slot or passage $j^2$ corresponding to the slots or inlets $h$, $h^2$ of said bushings.

The portions of the valve-stems passed through the bushings F, F¹, are cylindrical so that they may rotate therein, the intermediate portions thereof are preferably made square, and the extremities cylindrical and reduced in diameter and threaded. Fitting onto the square intermediate portions of said valve-stems are gear wheels K, K¹, provided with bosses $k$ on their undersides which enter depressions $k^1$ formed in the upper faces of said bushings. Surrounding said stems between said gear-wheels and nuts L applied to the threaded extremities of said stems are coil springs M acting to retain the disk-valves and said gear-wheels against opposite sides of said bushings.

Threaded centrally into the bottom of the hollow body or water-receiving chamber C is a cylindrical tube N having a collar $n$ near its lower end which bears against said bottom. Fitting onto said tube so as to rotate thereon is a sleeve O having a gear-wheel $o$ in piece therewith which meshes with the gear-wheels K, K¹, on the valve-stems. A spacer P surrounds sleeve O between the cover C¹ and the gear-wheel $o$ so that said sleeve cannot move lengthwise on the tube N, thereby avoiding all possibility of the intermeshing gears becoming disengaged. It might here be stated that the cover C¹ may be secured to the hollow body or chamber C in any approved manner, but I preferably provide said body or chamber C with an upstanding externally-threaded flange R, and the cover with an internally-threaded rim R¹ adapted to be threaded onto said flange, and to avoid leakage of water between said body or chamber and said cover, a gasket $r$ is interposed between the two. Said cover has a central externally threaded boss $r^1$ and an axial opening $r^2$ which extends through said boss and through which the tube N and the sleeve O pass. A gland S is threaded onto said boss and between the upper end of the latter and said gland, packing $s$ is interposed to prevent leakage of water at this point.

The upper end of the sleeve O is reduced in diameter to provide a shoulder T and fitting onto said reduced portion so as to bear against said shoulder is a handle U. Said sleeve is threaded from its upper end to said handle and a nut $u$ applied thereto which securely clamps the handle to said sleeve and compels the latter to rotate when moving said handle through an arc of a circle. To the upper extremity of said sleeve, a cap V is applied to give the device a finished appearance.

When the water is shut-off, the handle U lies in a plane directly over the discharge nozzle, and from this position—which may be termed normal position—it is moved in opposite directions, depending upon whether cold or hot water is to be drawn, or whether warm water is to be drawn after first drawing hot or cold water. In order that the user may quickly determine in which direction the handle is to be moved to draw water as he desires it, the cover C¹ is provided with the word "Hot" at one point; with the word "Cold" at another point, preferably at a point diametrically opposite the word "Hot"; and with the word "Warm" at two different points. The passages $j^2$, are so arranged relative to each other and to the inlets $h$, $h^1$, $h^2$, $h^3$, that when the handle is moved over the designating words on the cover, the water will enter the receiving-chamber C and be discharged through the nozzle E, either cold, warm, or hot, depending on the designating term over which the handle is positioned. This is accomplished by reason of the fact that the movement of the handle compels rotation of the sleeve O which has the gear-wheel $o$ thereon, and as the latter is in mesh with the gear-wheels K, K¹, secured to the valve stems, the valves J, J¹, are rotated to bring one or both of the water passages therein into registration with the proper inlet or inlets in the bushings.

I wish to state that the bushings may be considered broadly as forming a part of the body C, even though they are shown as separate and fastened to said body, as the illustration is merely a representative one.

In Figs. 5 to 8 inclusive, the water-passages of the valves are shown in four different positions. When the handle U is in normal position, the passages $j^2$ in the valves are out of registration with all the inlets in the bushings; consequently, preventing the flow of either hot or cold water into the receiving-chamber C. By moving the handle to the right until it is directly over the word "Hot" the passage $j^2$ in the valve J remains uncovered, as shown by dotted lines at the left in Fig. 5, while the passage $j^2$ in the valve J¹, is brought into registration with the curved slot or large inlet $h^2$ in the bushing F¹, thus allowing water from the hot-water pipe D¹ to enter the receiving chamber C and escape through the discharge nozzle E. By continuing the movement of the handle in the same direction until it is directly over the word "Warm" on the same side of its axis, the passage $j^2$ in the valve J¹ is partly closed, as shown in Fig. 6, thus reducing the flow of hot water through the large inlet $h^2$ in the bushing F¹. At the same time, the passage $j^2$ in the valve J is brought into registration with the small inlet $h^1$ in the bushing F to

allow a quantity of cold water to enter the receiving-chamber C, where it mixes with the hot-water and passes out the discharge nozzle E as warm water. By returning the handle to normal position to close all the inlets and then moving the same to the left until it is directly over the word "Cold," the passage $j^2$ in the valve J is brought into registration with the large inlet $h$ in the bushing F, while the remaining inlets remain uncovered, as shown in Fig. 7; thus allowing water from the cold-water pipe D to enter the receiving-chamber C and escape through the discharge nozzle E. By continuing the movement of the handle in the direction last described until it is directly over the word "Warm" on the same side of the axis as the word "Cold," the passage $j^2$ in the valve J is partly closed, as shown in Fig. 8, thus reducing the flow of cold-water through the large inlet $h$ in the bushing F. At the same time, the passage $j^2$ in the valve $J^1$ is brought into registration with the small inlet $h^3$ in the bushing $F^1$ to allow a quantity of hot water to enter the receiving-chamber C, where it mixes with the hot-water and passes out the discharge nozzle E as warm water.

It is to be noted that warm water may be drawn from the faucet when the handle U is in two different positions. This is very desirable, as it permits of mixing the water in the receiving-chamber without moving the handle from cold to hot positions, which would necessitate swinging the handle through an arc of 190 degrees; whereas, in the present construction, the hot water may be changed to warm, or the cold water may be changed to warm by swinging the handle through an arc of only 45 degrees. Moreover, it has the advantage, that when drawing cold-water, which may be found too cold for the purpose intended, the temperature of the water drawn can be quickly raised without swinging the handle to the opposite side of the faucet, as that would necessitate its being passed over normal position, in which position the flow of water would be entirely shut-off. Or when drawing hot-water which may be found too hot for the purpose intended, it may be quickly caused to flow from the discharge-nozzle at the desired temperature without first shutting-off the supply and then swinging the handle to the opposite side of the faucet to open the cold water inlet.

The construction herein described, embodies rotating disk-valves which are held with a yielding pressure against their valve seats, and consequently binding and grinding of the valve-surfaces is entirely eliminated, thus lengthening the life of the same. Moreover, owing to the particular construction employed, the valve-seats and the valves can be made of metal so that the tendency to wear and the consequent leakage, is reduced to the minimum.

Having thus described my invention, what I claim is,—

1. A combination-faucet comprising a chamber having a discharge-outlet, a cold-water inlet and a hot-water inlet, rotary disk-valves adapted to close said inlets and having water-passages therethrough to be brought into registration with said inlets to open the same, and means to rotate said valves simultaneously; the passages in said valves being so related to each other and to said inlets that cold, hot, or warm water may be drawn from said discharge outlet.

2. A combination-faucet comprising a chamber having a discharge outlet, a cold-water inlet and a hot-water inlet, disk-valves mounted for rotation and adapted to close said inlets and having water-passages therethrough to be brought into registration with said inlets to open the same, and a handle operatively connected with said disk-valves; the passages in said valves at certain points in the range of movement of said handle being brought into various positions relative to said inlets so that hot, cold, or warm water may be drawn from said discharge outlet.

3. A combination-faucet comprising a chamber having a discharge-nozzle, a cold-water inlet and a hot-water inlet, disk-valves coöperating with said inlets to open and close the same and having axial stems, a gear-wheel secured to each of said stems, a master gear-wheel between said first-mentioned gear-wheels and in mesh therewith, a rotary element carrying said master gear-wheel and extending out through a wall of said chamber, and a handle on said rotary-element; the passages in said valves being so related to each other and to said inlets that hot, cold, or warm water may be drawn through said discharge nozzle.

4. A combination-faucet comprising two coöperating parts, one a chamber having a discharge-outlet and the other a closure-device comprising two rotary members, one of said parts having two openings, and the other part having four openings, the openings of each part being so related to each other and to the openings of the other part that upon rotation of the valves of one of said parts to different degrees, hot, cold or warm water may be drawn from said discharge opening.

5. A faucet comprising a chamber having a discharge-outlet, a hot-water pipe and a cold-water pipe, a bushing entered in each of said pipes and having two inlets, a valve bearing against each of said bushings and having a passage therethrough, and means for rotating said valves, said inlets being so related to each other and to the passages of said valves that either hot, cold, or warm

water may be drawn from said discharge-outlet by rotation of said valves to certain degrees.

6. A faucet comprising a chamber having a discharge-outlet, a hot-water pipe and a cold-water pipe, said chamber having a part closing the inner end of each pipe which serves as a valve-seat and each of said valve-seats having a small inlet and a large inlet, a rotary-valve seated against each valve-seat and provided with a water-passage therethrough, and means for rotating said valves including a handle, the passages in said valves being so related to each other and to the inlets in said valve-seats that when said handle is in one position, all the inlets are closed, when in a second position cold-water is drawn, when moved to a third position hot-water is drawn, and when moved to either of two other positions, warm-water is drawn.

7. A combination-faucet comprising a chamber having a removable cover, a discharge-outlet, a hot-water inlet and a cold-water inlet, rotatable-valves having valve stems and adapted to open and close said inlets, a gear-wheel secured to each of said valve-stems, a tube supported on the bottom of said chamber and extending through said cover, a sleeve surrounding said tube and rotatable thereon, a gear-wheel on said sleeve and in mesh with the gear-wheels on said valve-stems, and a handle secured to said sleeve.

8. A combination-faucet comprising a chamber having a discharge-outlet, a cold-water pipe and a hot-water pipe, bushings closing the inner ends of said pipes and having water-inlets formed therein, disk-valves having valve-stems rotatable in said bushings and being provided with water-passages, gear-wheels secured to said valve-stems so as to rotate therewith and permit of movement lengthwise thereon, nuts applied to the free ends of said stems, springs surrounding said stems between said gear-wheels and said nuts, a master gear-wheel in mesh with said first-mentioned gear-wheels, and a rotatable element carrying said master gear-wheel.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

AUGUST BEYER.

Witnesses:
EMIL NEUHART,
ELLA C. PLUECKHAHN.