

Aug. 12, 1924.

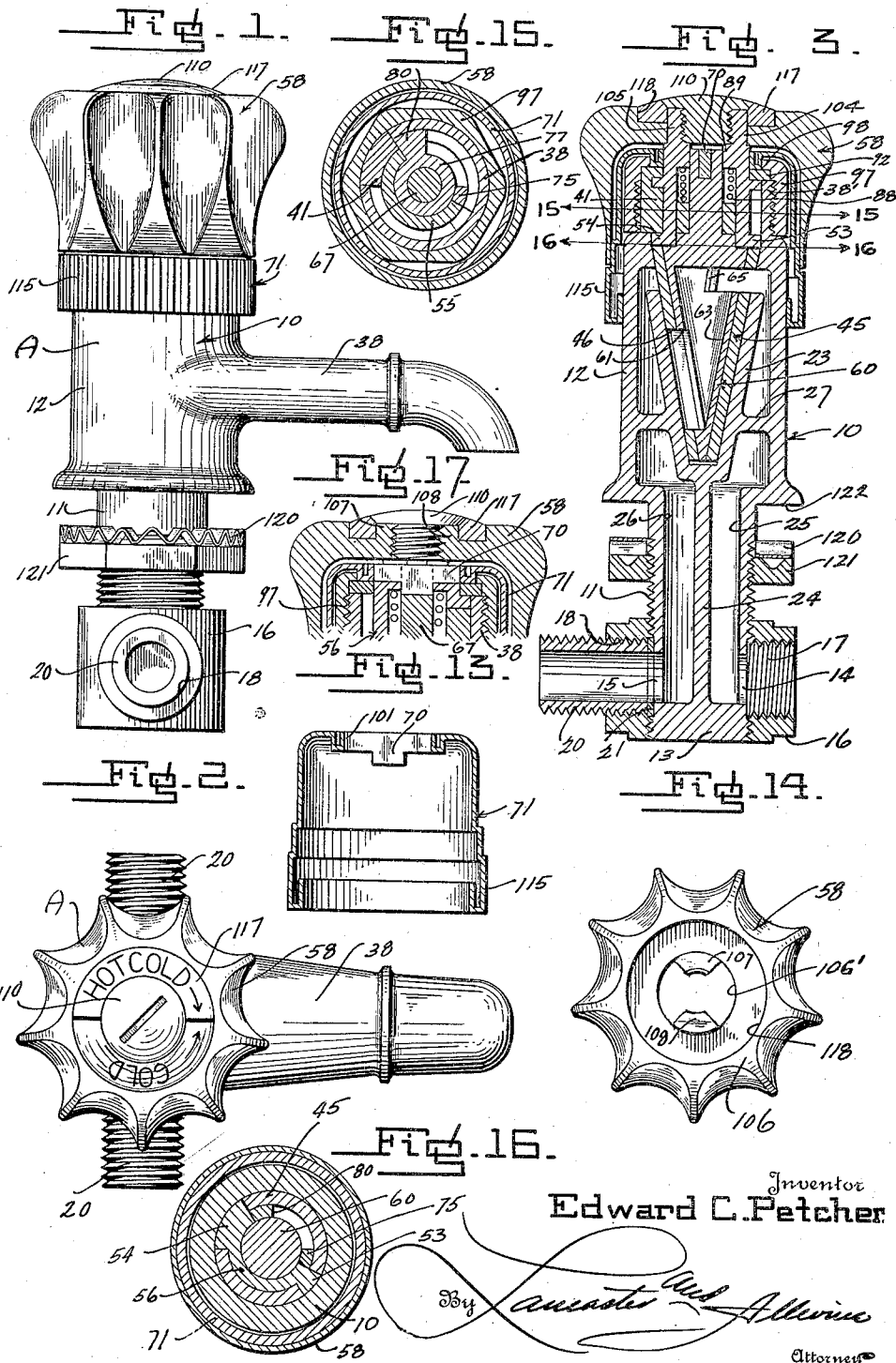
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1,504,498

FAUCET

Filed March 6, 1923

4 Sheets-Sheet 1



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FAUCET

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4 Sheets-Sheet 2

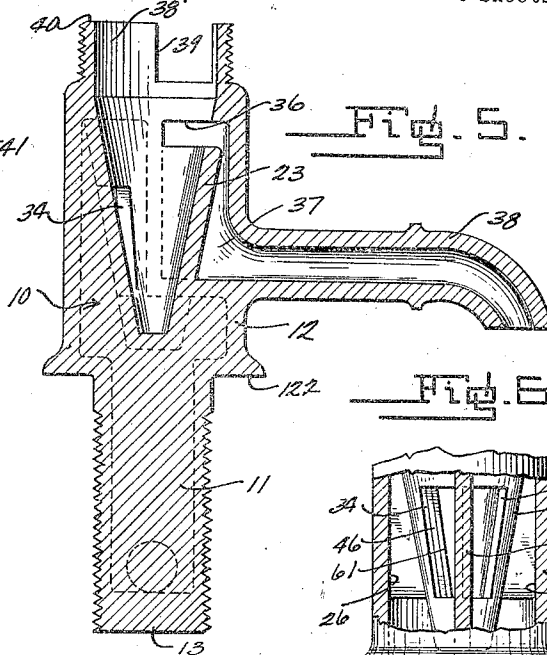
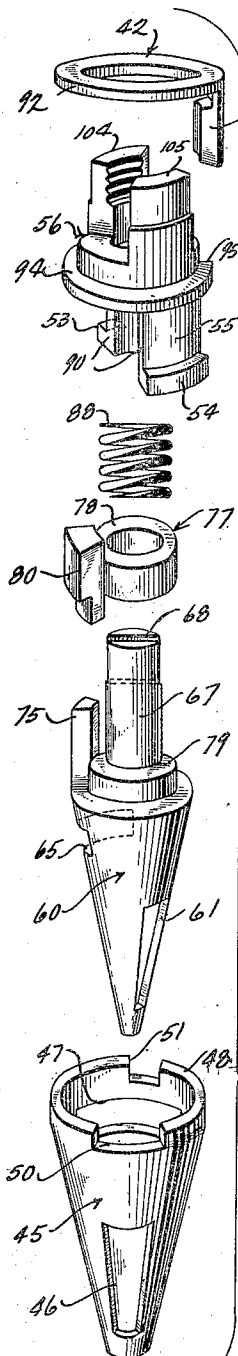


Fig. 5.

Fig. 6.

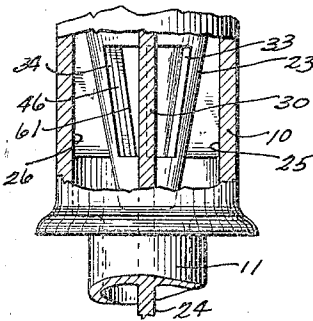


Fig. 4.

Fig. 7.

Fig. 8.

Fig. 9.

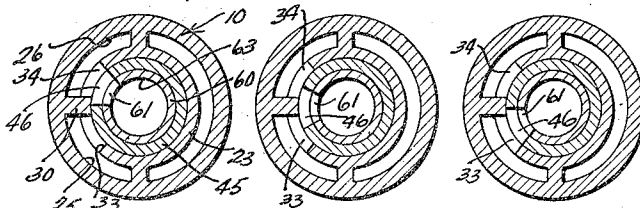
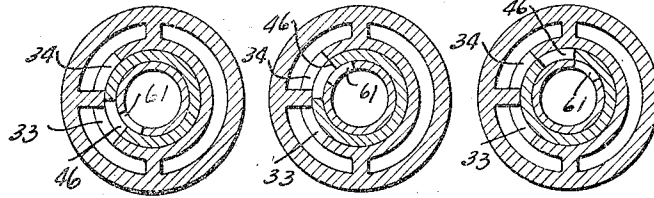


Fig. 10.

Fig. 11.

Fig. 12.



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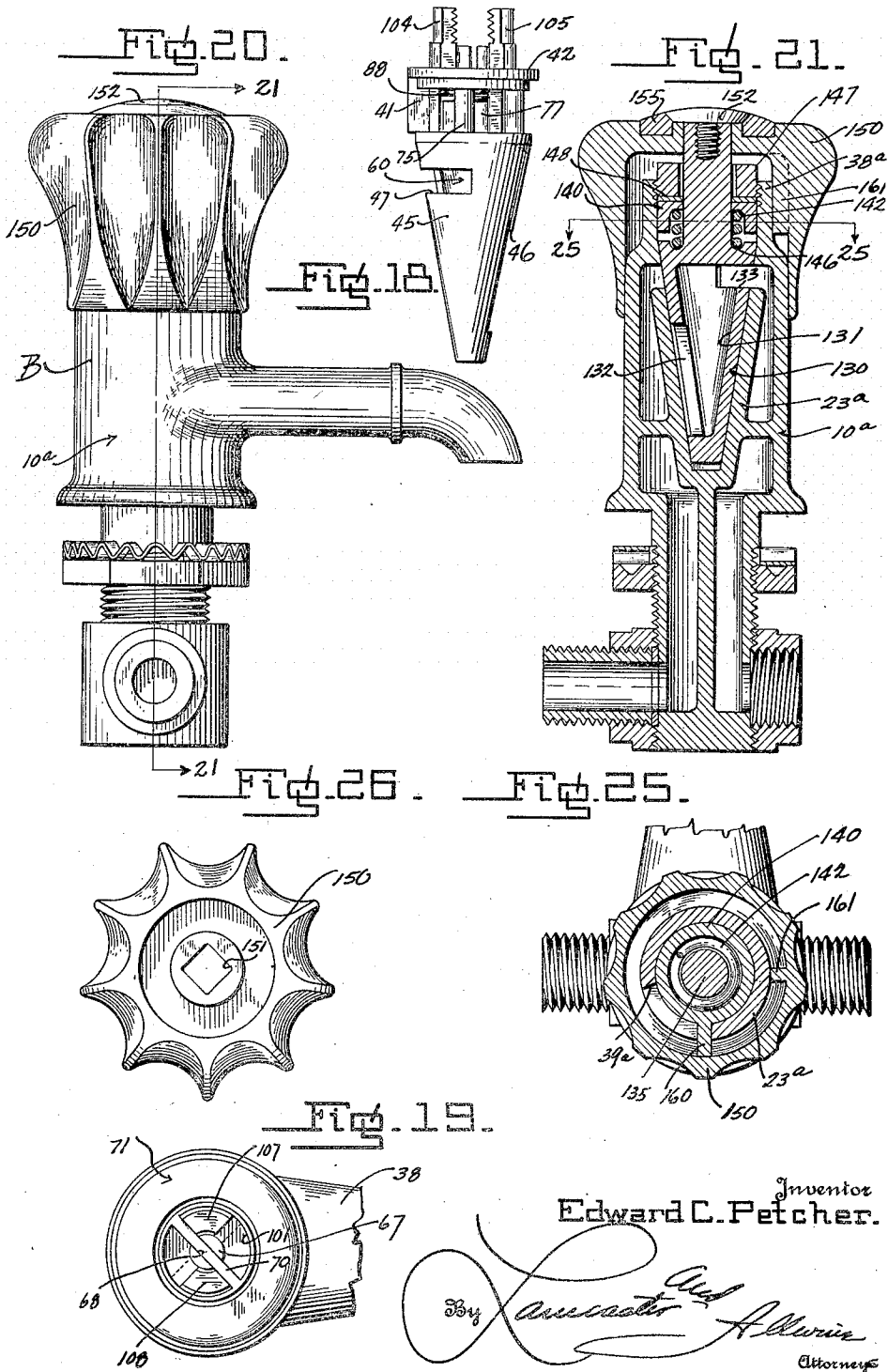
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FAUCET

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4 Sheets-Sheet 3



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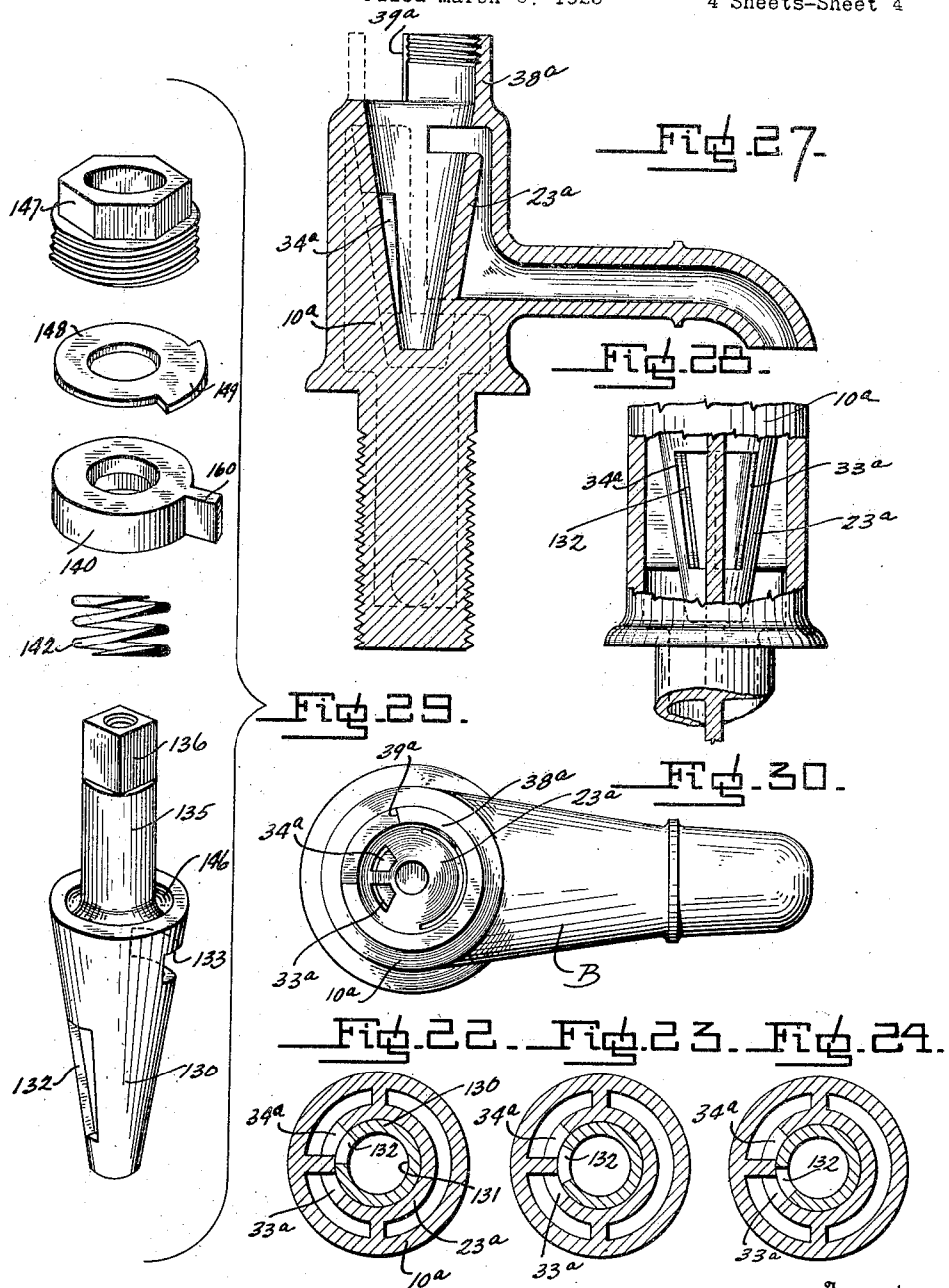
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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FAUCET.

Application filed March 6, 1923. Serial No. 623,162.

To all whom it may concern:

Be it known that I, EDWARD C. PETCHER, a citizen of the United States, residing at St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Faucets, of which the following is a specification.

This invention relates to improvements in valves.

The primary object of this invention is the provision of a faucet embodying means for selectively regulating flow of hot or cold water.

A further object of this invention is the provision of an improved faucet, which may be provided for household use, or in other places where it is preferred to quickly and conveniently secure a predetermined amount of water at a predetermined temperature.

A further object of this invention is the provision of a relatively simple and economical type of faucet, which embodies improved means to conveniently and effectively permit the selective flow of hot or cold water in predetermined quantities and temperatures.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views.

Figure 1 is a side elevation of the preferred and improved type of faucet.

Figure 2 is a plan view of the preferred type of faucet.

Figure 3 is a cross sectional view, taken longitudinally through the improved faucet illustrated in Figure 2 of the drawings.

Figure 4 is a perspective view illustrating the various operating details of the improved preferred type of faucet.

Figure 5 is a cross sectional view taken through the housing of the improved faucet.

Figure 6 is a fragmentary side elevation, partly in cross section, showing the improved valve details of this invention.

Figures 7, 8, 9, 10, 11 and 12 are transverse cross sectional views showing various cooperating positions of valve and housing details of the improved faucet, so that water may be selectively drawn therefrom in predetermined quantities of predetermined temperatures.

Figure 13 is a cross sectional view, taken through a manually operable cap member embodied as a part of the improved faucet.

Figure 14 is a plan view of a hand engaging operating cap embodied as the main operating part of the improved faucet.

Figures 15 and 16 are transverse cross sectional views, taken on their respective lines in Figure 3 of the drawings.

Figure 17 is a fragmentary cross sectional view, taken through the upper part of the improved faucet at right angles to the plane on which the cross sectional view of Figure 3 is taken.

Figure 18 is a side elevation of cooperating valve members and details embodied as a part of the improved and preferred type of valve.

Figure 19 is a plan view of the operating cap illustrated in Figure 13, showing the manner in which the same is used for regulating a valve of the improved and preferred type of faucet.

Figure 20 is a side elevation of a modified type of faucet.

Figure 21 is a longitudinal cross sectional view, taken through the modified form of faucet.

Figures 22, 23, and 24 are cross sectional views, taken transversely of the faucet, showing valve regulating details in various adjusted positions.

Figure 25 is a transverse cross sectional view, taken substantially on the line 25—25 of Figure 21 of the drawings.

Figure 26 is a plan view of an operating cap embodied as a part of the modified form of faucet.

Figure 27 is a longitudinal cross sectional view, taken through the housing of the modified form of faucet.

Figure 28 is a side elevation, partly in cross section, showing valve operating details of the housing of the modified form of faucet.

Figure 29 is a view, designating in perspective cooperative details of the modified form of faucet.

Figure 30 is a plan view of a housing embodied as a part of the modified faucet.

In the drawings, wherein for the purpose of illustration are shown preferred and modified forms of this invention, the letter A generally designates the preferred type of faucet, which preferably includes a housing of any approved type of material, such as

brass, nickel, iron, or analogous metal, depending upon the character of the place in which the improved faucet is used. This housing or casing 10 preferably includes the attaching shank 11 which is exteriorly screw threaded and axially provided upon the main body portion 12 thereof. The free end 13 of the attaching shank 11 is plugged, and is provided with diametrically opposed ports 14 and 15. A coupling 16 is preferably detachably provided upon the shank 11, having the internally screw threaded ways 17 and 18 in aligning relation on opposite sides thereof, adapted for respective communication with the ports 14 and 15 when the coupling 16 is positioned upon shank 11. Externally screw threaded attaching pipes 20 or the like may be provided for the screw threaded passageways 17, and are preferably adapted for threading therein, so that they may be clamped into engagement with packing rings or washers 21 in secure engagement against the attaching shank 11, so that the pipes 20 are in communication with the inlet openings 14 and 15, substantially as is illustrated in the drawings. A conical valve seat 23 is preferably provided within the body 12 of the housing 10, being supported therein so that the lower reduced end faces the attaching shank 11. A partition web 24 preferably extends upwardly from the plug end 13 of the attaching shank 11, subdividing the latter and the lower portion of the body 12 into compartments 25 and 26, which are adapted for respectively receiving supplies of hot and cold water, the same being fed thereinto through the pipes communicating with the inlet openings or ports 14 and 15. Other partitioning 27 may be provided within the body 12 of the housing 10, so that the hot and cold water may only have exit from the compartments 25 and 26 through the valve arrangement disposed upon the seat 23. The web 24 is continued upwardly within the body portion 12, along the seat 23 therein, as at 30, and at opposite sides of the partition web or wall 30, the seat 23 is preferably provided with elongated ports 33 and 34 which respectively communicate with the compartments 25 and 26 above described.

The hot and cold water is of course regulated by the valve means disposed in or upon the seat 23, and is led therethrough into an exit port 36, which is provided transversely in the housing 10 at the upper end of the seat 23 thereof; said exit opening 36 preferably leading into a passageway 37 provided in a faucet spout 38, which may be of any convenient formation, and in the ordinary instances disposed at right angles to the axis of the housing or casing 10. The upper end 38' of the housing 10 is preferably reduced, externally screw threaded, and is segmental, due to the fact that a recess 39 is

disposed inwardly from the upper marginal edge 40 thereof for the accommodation of the depending stop lug 41 of a member 42; the latter being provided to stop the valves of the preferred type of invention so that the valve arrangement may be positioned for full discharge, as will be subsequently set forth.

Referring to the improved valve arrangement as used with the preferred type of faucet A, the same preferably includes a main or outer valve member 45, which is preferably of conical construction, having the lower end thereof entirely closed, and the upper end fully open, and being provided adjacent its lower end and thru the side wall thereof with an elongated opening 46, preferably of the same dimension as either of the openings 33 and 34 provided in the housing valve seat 23, and with which said opening 46 is adapted for selective alignment so that hot or cold water or both may have ingress to the pocket of the valve 45. This valve member 45 is preferably provided, adjacent the upper end thereof, with a transverse slot 47, adapted for alignment with the exit port 36 of the housing 10. Inwardly of the upper marginal edge 48 of the valve member 45, relatively large and relatively smaller slots 50 and 51 are provided which are adapted for detachably or flexibly receiving the depending outwardly extending ends 54 and 53 respectively of a segmental sleeve 55; said sleeve 55 being provided as a part of the coupling member 56, which is adapted for rigid connection to the main operating cap 58 to permit operation of the valve member 45, as will be subsequently described.

A second conical shaped valve 60 is preferably provided, of such dimension as to permit the same to readily seat in snug relation within the pocket of the valve member 45; said valve 60 having the lower end thereof closed and adjacent the same being provided with an elongated opening 61 extending longitudinally of the valve of such dimension as to align in all respects with the inlet port or opening 46 of the valve member 45. The compartment or pocket 63 provided within the smaller conical valve member 60 is preferably provided with an exit port 65, adjacent the upper end of said valve member, being in the form of a transverse slot adapted for alignment with the slot 47 of the larger conical valve member 45, so that water may readily pass from the housing compartments 25 and 26 through the pocket or compartments 63 and exit through the slots 47 and 65 into the discharge passageway 37 of the housing 10. The upper end of the first mentioned valve member 45 is entirely open, to facilitate the insertion of the valve member 60. However, the latter valve member preferably has the

upper end thereof provided with a reduced stem 67, inwardly slotted, as at 68, from the top thereof, and within which the diametral bar 70 of the operating cap 71 may be detachably positioned, to facilitate independent operation of the valve member 60, as will be subsequently described. An upstanding lug or finger 75 is preferably provided on the second mentioned valve member 60, extending upwardly in spaced parallel relation with the reduced stem 67.

In assemblage, the larger conical valve 45 is of course disposed within its seat 23 and assumes the position illustrated in the drawings. The inner valve member 60 is then disposed within the pocket of the valve member 45 and snugly conforms thereto. A ring 77 is detachably positioned upon the stem 67, being provided with an opening 78 therein to effect such positioning, so that the same may rest upon the annular shoulder 79 provided upwardly upon the valve member 60. In this position, the ring portion of the member 77 is adjustably disposed within the space intermediate the outstanding lug 75 of valve member 60 and its stem 67. A lateral stop lug 80 is preferably provided, rigid or integral with the ring member 77, which outstands therefrom so that the same may contact in abutting relation with the sides of the upstanding lug 75 as the ring member 77 is moved annularly relatively to the valve member 60, or vice versa. A spiral spring 88 is preferably provided for retaining the cone valves 45 and 65 seated with respect to each other, and with respect to their seat 23 in the housing 10; the same preferably being slipped over the stem 67 to rest upon the upper marginal edge of the ring 77. The member 56 is next slipped over the stem 67, so that the radial projections 53 and 54 formed upon the segmental sleeve 55 thereof enter the marginal slots or recesses 51 and 50 respectively of the valve member 45, and which of course couples the member 56 to the valve member 45, against any liability of relative circumferential movement. This relation of parts will compress the spiral spring 88, due to the fact that the member 56 adjacent the upper end thereof is provided with an inner annular flange 89, which receives the top of the spring 88 thereagainst. The lugs 75 and 80 are so positioned in the upper end of the housing 10, that the same extend laterally into the path of the segmental sleeve 55, and are adapted for contact by the vertical or side marginal edges 90 of said depending sleeve 55.

As above mentioned, the member 42 is provided with the stop lug 41 for regulating certain positions of the valve members 45 and 60. This member includes a supporting ring 92 which is adapted for slipping over

the upper portion of the coupling member 56 to rest upon an annular shoulder 94 provided upon the latter; said annular shoulder 94 preferably having a portion 95 cut away to permit the relatively thick lug 41 to pass the same, so that the same lies in arcuate abutting relation against the depending sleeve 55 of the member 56, and preferably upwardly of the outstanding lugs 53 and 54. The stop lug 41, is of such thickness that the same extends radially inwardly of the internal diameter of the upper end 38 of the housing 10, so that the same may have the outstanding lug 80 of the member 77 contact at the side portions thereof, substantially as is illustrated in the cross sectional view of Figure 15 of the drawings. In order to maintain the parts heretofore described in the relation set forth, a nut 97 is provided for adjustment upon the reduced end 38 of the casing 10, the same preferably being provided with a top annular flange 98 adapted to overlie the ring portion 92 of the member 42. It is at once apparent that when the nut member 97 is adjusted onto the screw threaded end 38, the same will compress the spiral spring 88 and hold the two valve members 45 and 60 in their assembled relation within the seat 23.

The adjusting member 71, is preferably in the form of a cylindrical cap, having an opening 101 provided in the top thereof, across which the key bar 70 diametrically extends. In position upon the faucet, the cap member 71 is slipped over the upper end of the casing 10, so that the cross or key bar 70 engages in the slot 68 of the valve member 60; it being illustrated in the drawings, that the top of the stem 67 extends upwardly of the clamping nut 97 to permit such placement of the member 71. It is to be further noted that upstanding segmental portions 104 and 105 are provided upon the coupling member 56 above described, and which likewise extending upwardly through the nut 97, and through the opening 101 in the cap 71. The cross bar or key bar 70 extends intermediate the upstanding segmental posts or portions 104 and 105, and the amplitude of movement is limited thereby. Thus, it is obvious that when the cap 71 is moved relative to the segmental upstanding portions 104 and 105, such movement will impart rotary movement to the valve 60 to rotate the same relative within the outer valve member 45. By such relative movement of the valve members 45 and 60, the effective area of the ports 46 and 61 of said valves members may be regulated and increased or decreased at will.

The main cap or hand operating portion 58 of the improved faucet A is preferably provided with an opening 106' in the top 106 thereof, and into which opening diametrically opposed segmental lugs 107 and 108

extend, which, together with the segmental upstanding portions 104 and 105 of the coupling member 56 are internally screw threaded and adapted to receive a clamping screw or bolt 110, so that the cap member 58 may be fixedly secured in detachable manner to the coupling member 56, and thus indirectly secured in rigid manner to the main conical valve member 45. It is to be noted that the cap member 58 is cylindrical in formation, and overlies the upper portion of the cap member 71 heretofore mentioned as provided for regulating the inner conical valve member 60. However, the lower annular portion 115 of the cap 71 extends below the lower marginal edge of the main operating cap 58 and preferably has the outer circumference thereof flush with the outer circumference of the adjacent portion of the cap member 58, so that the fingers of an operator can not only be utilized for operating the main cap 58, but may likewise extend for operating the cap 71 relative to the cap 58 to have control, in simple and convenient manner, of both of the valve members 45 and 60.

It is preferred that a ring shaped member 117, preferably of opal or some contrasting colored material be provided for reception within an annular groove 118 in the top 106 of the operating cap 58, upon which may be inscribed indicia, such as is designated in Figure 2 of the drawings. The outer marginal edge of the screw 110 may be beveled to maintain this ring 117 in proper position upon the faucet A.

In operation, if it is the desire of a person to run cold water entirely from the faucet A, the person, by rotating the cap 58 to the right as indicated by the indicia upon the ring 117 will position the inlet ports 46 and 61 of the valve members 45 and 60 respectively, into aligning relation with respect to each other, and with respect to the cold water port 34, provided in the housing 10, substantially as is illustrated in Figure 7 of the drawings. In this relation of the valve parts of the faucet to the casing, the pocket 63 of the inner valve 60 will have full communication through the aligning ports with the cold water supply compartment 26 of the housing 10, so that the cold water may, under pressure, flow into the pocket 63 of the valve 60 and flow therefrom through the aligning exit openings 47 and 65 of the valve member, into the discharge passageway 37 through the port 36, so that the cold water may flow from the faucet spout 38 under full flow. Such movement of the cap 58 to the right will always automatically adjust the inlet ports of the valve members into aligning relation, since the marginal edge 90 of the depending sleeve 55 of coupling member 56, engages the upstanding lug or post 75 of the valve member

60 to move the same until it engages the outstanding lug 80 of the member 77. Similarly, the outstanding lug 80 of the ring member 77 will engage the inwardly projecting stop lug 41 of the member 42, and which will limit any further movement of the handle 58, so that the operator knows that cold water is under full flow.

From the position of full flow of cold water, if the operator desires to obtain part cold and part hot water in the greatest quantity which the same will flow from the improved faucet, it is necessary to rotate the cap 58 in the direction indicated by the indicia designated hot and cold, to the position indicated in Figure 8 of the drawings. The valve members 45 and 60 will always move together if the operator merely adjusts the cap 58, so that it is possible to secure full discharge of either hot or cold water, or hot and cold water in combination.

If the operator desires a less quantity of water than the faucet will give at full discharge, it is merely necessary for the operator to move the cap 71 relative to the cap 58, with the tip of his or her fingers, and which will lessen the effective communicating area of the ports 46 and 61 of the valve members. It is obvious that this adjustment of the inner valve 60 with respect to the outer valve is permitted, incident to the fact that the cross bar 70 of the cap 71 may operate intermediate the side marginal edges of the segmental upstanding parts 104 and 105 of the coupling member 56 within the amplitude of angular movement illustrated in Figure 19 of the drawings. The various positionings of the valves with respect to each other and with respect to the ports in the housing 10 are illustrated in Figures 7 to 12 inclusive of the drawings, so that it is apparent that it is possible for a person to draw in selective manner any quantity of hot or cold water, or combination of hot or cold water at any predetermined degree of temperature.

For convenience in attaching the improved faucet A to a stand, wall, or like support, it is preferred to provide a washer 120 positioned upon the shank 11 of the housing or casing 10, and for cooperation with a clamping nut 121 adjustable upon said shank 11, whereby the supporting stand or wall may be clamped intermediate the nut 121 and the annular surface 122 facing the nut 121.

Referring to the modified form of faucet B, as illustrated in Figures 20 to 30 inclusive of the drawings, the same preferably includes a casing 10^a of substantially identical construction with the casing 10 of the preferred form of faucet A, with the exception that the upstanding segmental end 38^a of the same is interiorly screw threaded, and is provided with a recess 39^a extending

downwardly from the top marginal edge thereof, substantially as is illustrated in Figures 27 and 30 of the drawings.

In the modified form of the improved faucet B, a single valve member 130 is provided, which is preferably conical in formation, having a pocket 131 therein, and an elongated port 132 in the side wall thereof of substantially the same dimensions as the ports 33^a and 34^a of the seat 23^a. The valve member 130 is provided with an exit port or slot 133 adjacent the top thereof, communicating with the pocket 131 and provided with a reduced upstanding stem 135 having a polygonal top 136 thereon. A follower 140 is preferably provided for longitudinal adjustment within the upper portion 38^a of the faucet housing 10^a, and adapted to receive a spiral spring 142 therein; said spiral spring 142 resting intermediate the follower 140, and the annular grooved shoulder 146 of the valve member 130. A nut 147 is adjustably disposed within the screw threaded part of the housing top 38^a, preferably having a washer 148 clamped intermediate the same and the follower 140; said washer 148 preferably having a segmental projection 149 for reception within the cut-away or recess portion 39^a of the top 38^a. This follower 140, as is obvious, is provided in connection with the adjusting nut 147 to maintain the valve 131 normally in snug relation within its seat 23^a to compensate for any wear upon the frictional surfaces of the valve with respect to its seat.

A cap member 150, somewhat analogous to the cap 58 for the preferred form of invention, is provided, preferably having a polygonal opening 151 in the top thereof, for receiving the polygonal portion 136 of the valve stem 135. A screw 152 is preferably provided for maintaining the cap 150 upon the valve stem 135, and which likewise retains an indicia bearing ring 155 within a top annular groove of said cap 150, altogether similar to the construction of the cap of the preferred form of faucet. The depending annular walls of the cap 150 engage the outer surface of the cylindrical portion of the faucet casing 10^a. It is preferred to provide a lug 160 radially extending outwardly from the follower 140, through the recess 39^a of the faucet housing or casing 10^a, which is adapted for cooperation with an inwardly extending rib 161 provided inwardly of the cap or operating part 150 of the modified faucet B. It is obvious that as the cap 150 is rotated, the rib 161 will engage the outwardly extending lug 160 of the follower, until said lug 160 will engage the side marginal edge of the upstanding portion of the faucet top 10^a, and thus limit any further movement of the operating cap 150. In this position, the port of

the valve member will be in alignment with the cold water port 34^a of the faucet housing 10^a to supply cold water at full capacity for discharge from the faucet B.

With the modified form of improved faucet B, it is possible to secure either hot or cold water, or a combination of the same, although no inner valve is provided for limiting the capacity or quantity of water discharged. It is not as convenient a type of valve where it is desired to regulate quantity and temperature of the water, as is very necessary in connection with faucets used in supplying water for medical or surgical use.

From the foregoing description of this invention, it is apparent that a valve has been provided which is of novel construction, and by means of which a person may readily and conveniently draw hot or cold water separately, or in combination, in predetermined quantity, and so that the degree of temperature of the water may be regulated to suit particular requirements. This type of valve will find favor where it is desired that a compact faucet be provided for supplying water as indicated, and in addition is desirable where an ornamental and easily operable faucet is desired.

Various changes in the shape, size and arrangement of parts may be made to the form of the invention herein shown and described, without departing from the spirit of the same or the scope of the claims.

I claim:

1. A faucet comprising a housing having a seat therein and hot and cold water supply compartments, said seat having ports therein communicating with the compartments therethrough, a valve rotatably disposed on said seat having a passageway therein for communication through the inlet ports of said seat, a second valve within the first mentioned valve having a port therein adapted for alignment with the port of said first mentioned valve, said second mentioned valve being hollow and having an exit port therein, means for joint or independent operation of said first and second mentioned valves flexibly connected thereto, and spring means normally urging said valves into seating relation with respect to each other and to their seats in the housing.

2. A faucet comprising a casing having a seat therein provided with inlet and exit ports, a cone valve for said seat having inlet and exit ports therein adapted for cooperation with the inlet and exit ports of said housing, a second cone valve for seating within the first mentioned cone valve having a compartment therein communicating exteriorly through inlet and exit ports which are adapted for adjustable communication with the inlet and exit ports of said first mentioned valve and housing, independent or jointly operable means for adjusting said

valves with respect to each other and with respect to the seat in said housing, flexibly connected to said valves, spring means normally urging said valves into their seats, 5 and means for limiting the amplitude of movement of said valves so that they may be positioned for full capacity water discharge, said ports of the valves being so related to the ports of the housing that they 10 may be selectively placed in communication with one of the inlet ports of said housing to the exclusion of the other inlet port of the housing, or in overlapping relation with both of said ports to receive hot and 15 cold water in combination therefrom.

3. A faucet comprising a hollow body having a discharge spout and separate inlet passages for hot and cold water, an annular valve seat in said body having its walls in 20 spaced relation to the walls of the body, partitions dividing the space about the valve seat into a discharge compartment communicating with said spout and hot and cold water compartments and the annular 25 wall of the valve seat having passages communicating with said compartments, a hollow valve rotatably fitting in said body in close fitting engagement with the annular wall of the valve seat and having a port 30 for registering with the passage communicating with the discharge chamber and a port for selectively registering with one or both of the passages communicating with the hot and cold water compartments when 35 the valve is rotated, and means for rotating said valve.

4. The structure of claim 3 a second hollow valve rotatably fitting within the first hollow valve and having an annular wall 40 in close fitting engagement with the annular wall of the first valve, the second valve having ports movable into and out of

registry with the ports of the first valve when the second valve is rotated, and means 45 for rotating the second valve independent of the first valve.

5. The structure of claim 3 a second hollow valve rotatably fitting within the first hollow valve and having an annular wall in 50 close fitting engagement with the annular wall of the first valve, the second valve having ports movable into and out of registry with the ports of the first valve when the second valve is rotated, means for rotating 55 the second valve independent of the first valve, and means for transmitting rotary movement from one valve to the other.

6. A faucet comprising a hollow body having a discharge spout, a hollow valve seat in said body and tapered downwardly 60 in spaced relation to the walls of the body, vertical partitions dividing space about the valve seat into a discharge compartment having communication with said spout and hot and cold water compartments, the lower 65 portion of the faucet being provided with hot and cold water passages communicating with the hot and cold water compartments respectively, said valve seat having it annular wall provided with an outlet 70 port communicating with the discharge chamber and inlet ports communicating with the hot and cold water compartments adjacent the partition forming the same, a hollow downwardly tapered valve mem- 75 ber rotatably fitting in said valve seat and having an outlet port for registering with the outlet of the valve seat and an inlet port for registering with one, both or neither of the inlet ports of the valve seat when the 80 valve is rotated, and means for rotating said valve.

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