

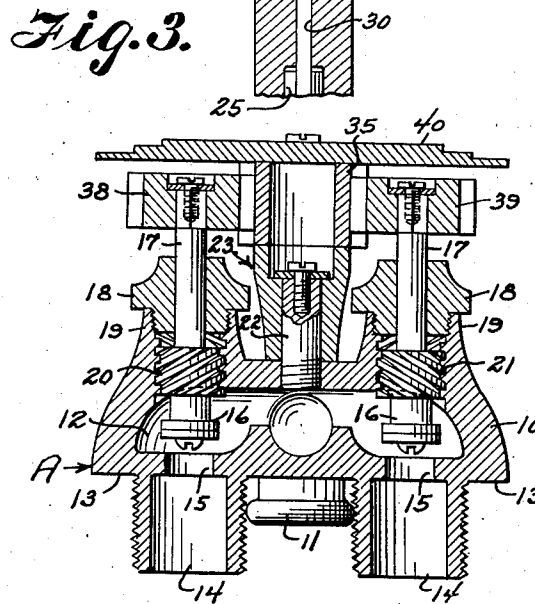
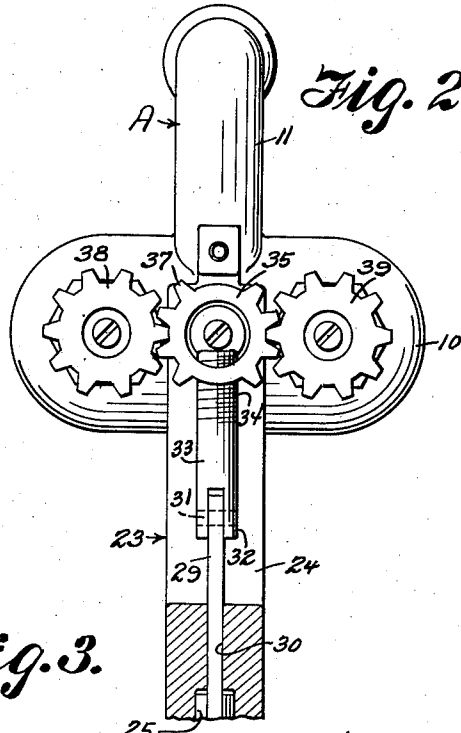
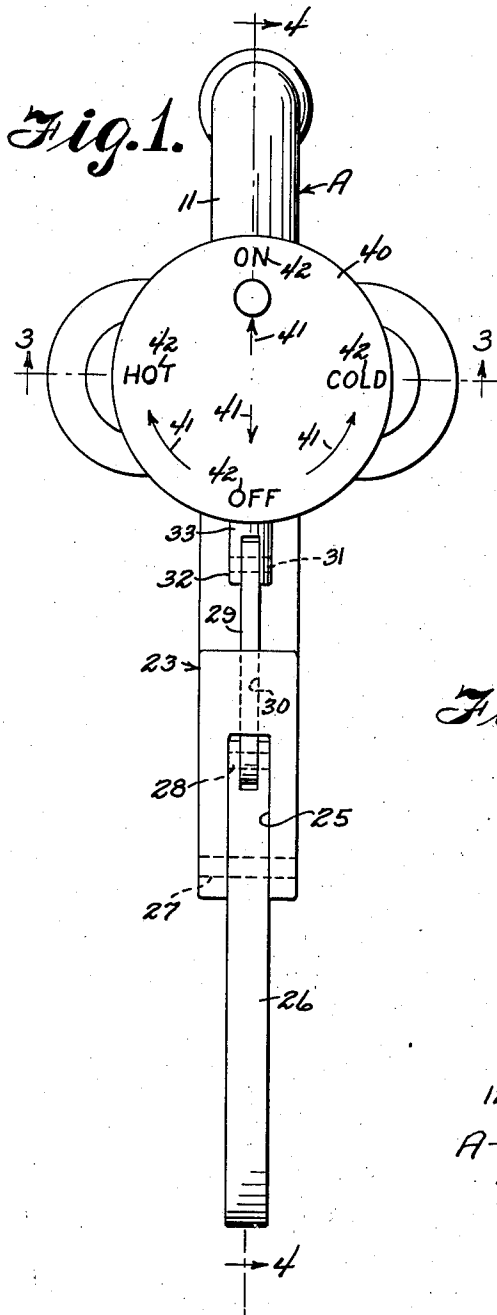
Nov. 16, 1948.

K. M. NEWCOMER
LIQUID MIXING VALVE

2,453,809

Filed May 23, 1947

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

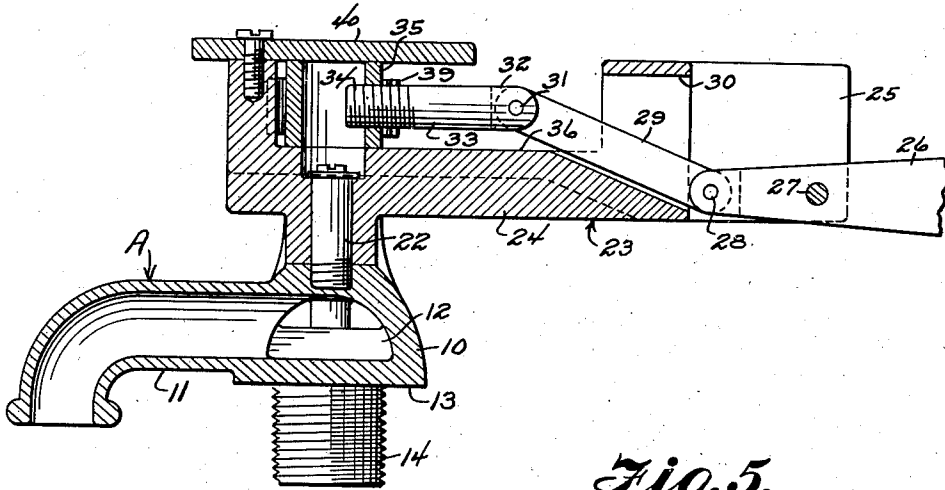
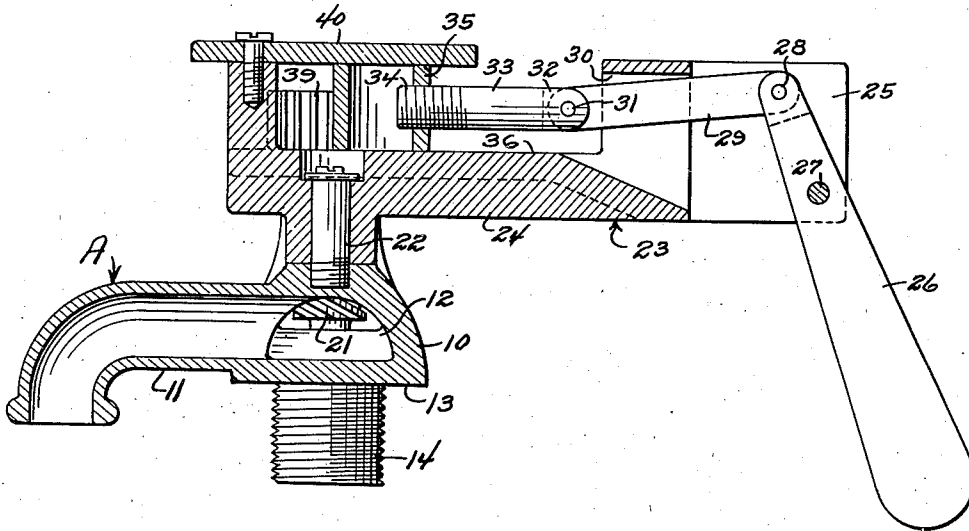


Fig. 5.



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UNITED STATES PATENT OFFICE

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LIQUID MIXING VALVE

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Application May 23, 1947, Serial No. 750,035

5 Claims. (Cl. 277-18)

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The invention relates to a valved faucet, and more particularly to a mixing valve for liquid dispensing, such as hot and cold water.

The primary object of the invention is the provision of a valve of this character, wherein a single stream of liquid can be dispensed or shut off, and such stream will involve a single or several flow volumes of liquid fed from independent sources, such for example as hot and cold water, the dispensed liquid stream being temperature controlled, without disturbing the volume thereof.

Another object of the invention is the provision of a valve of this character, wherein the control is effected from a single hand lever which is readily accessible above and forwardly of the dispensing faucet for the liquid.

A further object of the invention is the provision of a valve of this character, wherein the same is assured of a positive mechanical action and requires but one hand for its operation with immediate desired results in volume of liquid, as well as any temperature from hot to cold or vice-versa.

A still further object of the invention is the provision of a valve of this character, which is simple in construction, thoroughly reliable and efficient in operation, easily repaired, conveniently actuated, durable, neat in appearance, quick acting, readily operated, and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawing, which shows the preferred form of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawing:

Figure 1 is a top plan view of a mixing valve constructed in accordance with the invention;

Figure 2 is a similar view with the top cover plate removed;

Figure 3 is a sectional view taken on the line 3-3 of Figure 1 looking in the direction of the arrows;

Figure 4 is a sectional view taken on the line 4-4 of Figure 2 looking in the direction of the arrows with the operating lever in dual actuating position and

Figure 5 is the same in single actuating position.

Similar reference characters indicate corresponding parts throughout the several views in the drawing.

Referring to the drawing in detail, A designates

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generally a faucet comprising a hollow body 10 formed with a pouring spout 11 which leads from the mixing cavity 12 created by the hollow in said body, so that liquid delivered into the said cavity will be discharged or dispensed therefrom through the spout.

Formed at the bottom 13 of the body 10 are externally threaded nipples 14 which are adapted to be connected to hot and cold water service lines, respectively. These nipples 14 are arranged at opposite sides of the spout and have communication with the cavity 12 in the body 10 through openings formed in the bottom 13, while adapted to open and close these openings 15 are vertically movable valves 16, one for each opening.

The valves 16 have their stems 17 projected upwardly through bonnets 18 detachably threaded onto the body 10 at the upper neck portions 19 thereof, which are integral with the said body. The stems 17 of the halves 16 have the multiple square threads 20 and 21 thereon screwed into the necks 19, the threads 20 being reversed to the threads 21, so that when the said stems 17 are reversely rotated the valves 16 will seat or unseat the said valves simultaneously with respect to each other.

Fixed on the body 10 centrally between the neck portions 19 is a vertical pivot post 22 on which is mounted a horizontally swingable inverted substantially L-shaped bracket 23, its horizontal arm 24, at the outer end thereof, which is forwardly of the body 10, and bifurcated as at 25, which bifurcation has fitted therein a hand lever 26, which is pivoted on the transverse pivot pin 27 in the arm 24. Forwardly of the pivot 27 the lever 26 is pivoted at 28 to the end of a link 29 which extends outwardly of the bifurcation 25 through the guide slot 30 in the arm 24 which communicates with the bifurcation 25. The opposite end of the link 29 is pivoted at 31 in the bifurcated end 32 of the stem 33 and the stem 33 is shiftable outwardly and inwardly by movement of the lever 26 on the pivot 27 in the arm 24.

The stem 33, near its inner end, is threadably coupled by threads 34 to a shiftable divided double sector-toothed gear 35, slidable in a way 36 formed in the said arm 24 of the bracket 23. The teeth 37 of the gear 35 are adapted for meshing engagement with gears 38 and 39 fixed to the stems 17 respectively. The hand lever 26 controls the shifting of the gear 35, while the lateral turning of the bracket 23 controls the rotation of this said gear 35.

When the gear 35 is shifted rearwardly by the forward motion of the lever 26 so that the axis of

rotation of the gear 35 will coincide with the axis of rotation of the bracket 23, both valves 16 open to an equal extent, then if the bracket 23 is rotated on the post 22, the proportions of the mixture and consequent temperature of the liquid may then be controlled, the hand lever and its respective linkage and the stem 33 being a single medium for these controls.

Crowning the arm 24 is a combined cover and dial plate 40 for the gearing before mentioned, and this plate has thereon appropriate markings, such as direction arrows 41, and legends 42, respectively, for indicating the "on" and "off" liquid flow and temperature control thereof.

The multiple threads 20 and 21 are arranged so that a partial turn of the stems 17 is sufficient to open the valves 16.

When the valves are opened, the gears 35, 38 and 39 respectively, are in the position shown in Figure 2 of the drawing, that is to say, they are in transverse alignment with each other crosswise of the body 10 of the faucet, i. e., to open the said valves the hand lever 26 is pushed upwardly, then when it is desired to close the valves 16, the hand lever is pushed downwardly, according to the direction arrows and legends as before mentioned.

When valves 16 are closed, gears 38 and 39 are slightly to the rear of the alignment of these gears, as in Figure 5. This position of the gear 35 allows for changing the fulcrum of this gear when it moves rearwardly. The link 29 provides a double or universal joint for the lever 26 with the stem 33 to compensate for lateral play or movement when in operation.

When the gear 35 is moved forwardly and rearwardly of the alignment of gears 38 and 39; that is, when valves 16 are opened full or shut-off, gear 35 has moved in front of the alignment of gears 38 and 39 the same amount as when the valves are moved back of alignment of gears 38 and 39.

This full movement forward of gear 35 by pressing down hand lever 26 gives you the full volume and pressure of one valve, that is fifty per cent for each, due to each valve opening half way. Now by lateral movement either way, one valve will tend to close as much as the other will open until one is closed completely and the other is open completely.

Either valve may be opened full without opening the other one, by pressing down hand lever 26, and at the same time pushing it backward or pulling it forward.

When only one liquid is desired, such as all hot (or all cold) water, the hand lever 26 is pressed downward, and at the same time pressed or pulled forward as much as gear will allow. By doing this, only one liquid flows, such as all hot water, in the desired amount. This movement of lever 26, that is down and to you, will open only one valve, and down and away from you will open only one valve.

It is believed that from the foregoing description, the construction and operation of the device will be apparent to those skilled in the art, and it is to be understood that changes in the minor details of construction, arrangement and combination of parts may be resorted to, provided they fall within the spirit of the invention and the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A mixing valve of the kind described, com-

prising a body having a liquid mixing cavity therein, valves controlling admission of several liquids to the cavity, a single discharge spout on the body and leading from said cavity, stems operating the valves, gears fixed to the stems for turning the same, an inwardly and outwardly slidable and reversely rotatable gear, intermediate of and meshing with the said gears, a stem threadably connected to said last mentioned gear, a link connected to said stem and means connected to said link which is manually operated to actuate the slidable and reversely rotatable gear.

2. A mixing valve of the kind described, comprising a body having a liquid mixing cavity therein, valves controlling admission of several liquids to the cavity, a single discharge spout on the body and leading from said cavity, stems operating the valves, gears fixed to the stems for turning the same, an inwardly and outwardly slidable and reversely rotatable gear intermediate of and meshing with the said gears, a stem threadably connected to said last mentioned gear, a link connected to said stem, means connected to said link which is manually operated to actuate the slidable and reversely rotatable gear, and a cover plate for the gears and having indicia identifying the direction of movements for the opening and closing of the valves and the control of liquid admissions to the cavity.

3. A mixing valve of the kind described, comprising a body having a liquid mixing cavity therein, valves controlling admission of several liquids to the cavity, a single discharge spout on the body and leading from said cavity, stems operating the valves, gears fixed to the stems for turning the same, an inwardly and outwardly slidable and reversely rotatable gear intermediate of and meshing with the said gears, a stem threadably connected to said last mentioned gear, a link connected to said stem, means connected to said stem which is manually operated to actuate the slidable and reversely rotatable gear, necks formed on the body for the stems, and reversed threaded connections between the said stems and necks, respectively.

4. A mixing valve of the kind described, comprising a body having a liquid mixing cavity therein, valves controlling admission of several liquids to the cavity, a single discharge spout on the body and leading from said cavity, stems operating the valves, gears fixed to the stems for turning the same, an inwardly and outwardly slidable and reversely rotatable gear intermediate of and meshing with the said gears, a stem threadably connected to said last mentioned gear, a link connected to said stem, means connected to said link which is manually operated to actuate the slidable and reversely rotatable gear, necks formed on the body for the stems, reversed threaded connections between the said stems and necks, respectively, and a turntable mounting on the body for the said means and forming a way for the slidable and rotatable gear.

5. A mixing valve of the kind described, comprising a body having a liquid mixing cavity therein, valves controlling admission of several liquids to the cavity, a single discharge spout on the body and leading from said cavity, stems operating the valves, gears fixed to the stems for turning the same, an inwardly and outwardly slidable and reversely rotatable gear intermediate of and meshing with the said gears, a stem threadably connected to said last mentioned gear,

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a link connected to said stem, means connected to said link which is manually operated to actuate the slidable and reversely rotatable gear, necks formed on the body for the stems, reversed threaded connections between the said stems and necks, respectively, a turntable mounting on the body for the said means and forming a way for

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the slidable and rotatable gear, and pivot pins coupling the said means to said link and said link to the stem of the slidable and rotatable gear.

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No references cited.