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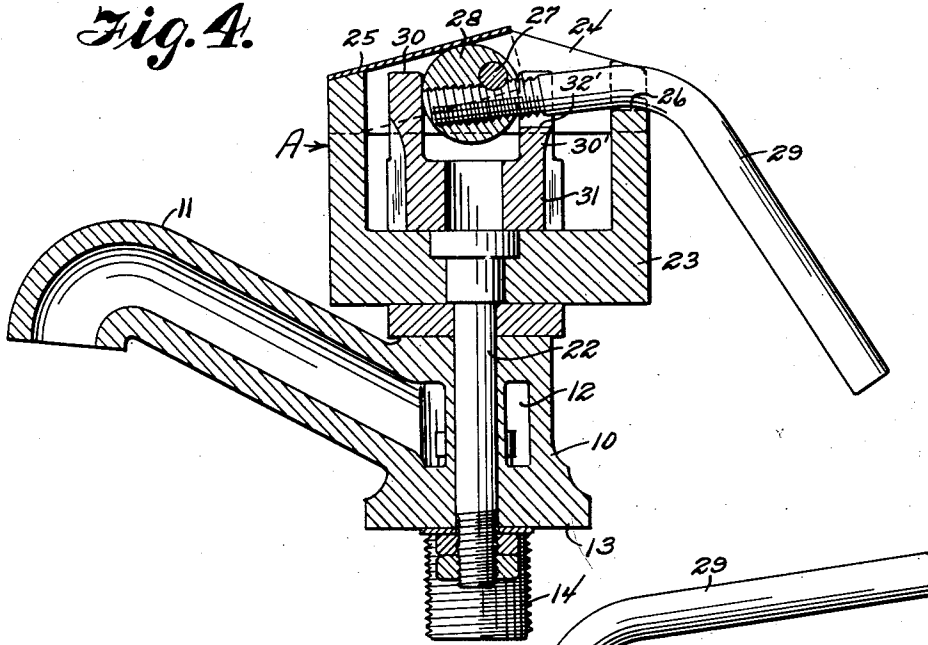
K. M. NEWCOMER  
LIQUID MIXING VALVE

2,464,458

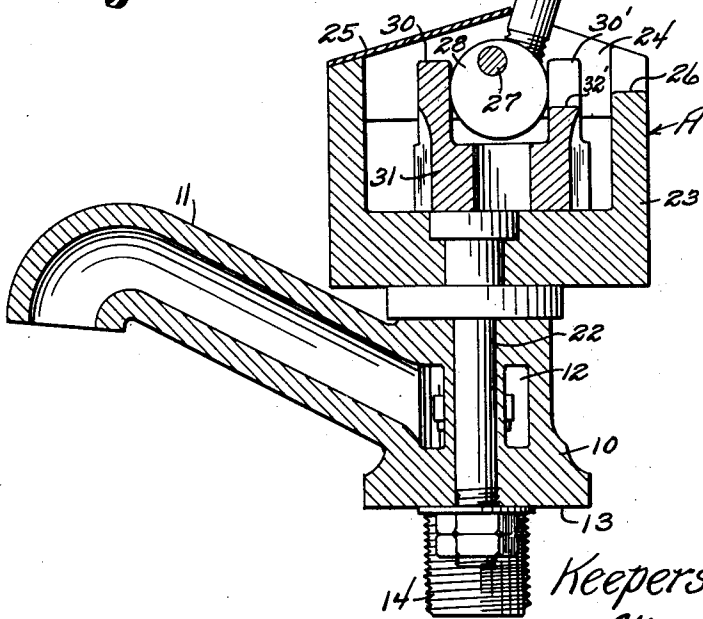
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*Fig. 4.*



*Fig. 5.*



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## LIQUID MIXING VALVE

Keepers M. Newcomer, Pittsburgh, Pa.

Application October 15, 1947, Serial No. 780,003

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, sideways or 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, and 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 sectional view taken on the line 2-2 of Figure 1 looking in the direction of the arrows;

Figure 3 is a view similar to Figure 1, with the top cover plate removed;

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 a 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.

Threadably received in 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 15 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 valves 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 be seated or unseated simultaneously with respect to each other.

Fixed in the body 10, centrally between the neck portions 19, is a vertical pivot post 22 on which is mounted a horizontally swingable inverted U-shaped bracket or movable turntable 23, which has formed on the upper end thereof the framelike structure 24 carrying the cover plate 25 over the forward portion thereof, and provided with the cutout 26 in the rear thereof. Mounted in the framelike structure 24 transversely thereof, is the pivot pin 27 on which, centrally thereof, is fixed the eccentric roller 28 which has threadably secured therein the hand lever 29. The eccentric roller 28 has a movement equal to approximately one fifth of a rotation, and the handle 29 entering the cutout 26 permits such rotation as shown in Figure 4.

The eccentric is rotatably mounted in the parallel upstanding ears 30 and 30' respectively formed on the gear 31. The gear 31 is turnable and slidable within the bracket 23, and is loosely mounted to allow lateral or horizontal play as the eccentric is rotated by means of the handle 29. Movement of the handle up and down causes backward and forward movement of the gear 31, while sideward movement of the handle 29 causes rotation of the gear 31.

When the handle 29 is in the cutout 26 in the frame 24, and the cutout 32 in the ear 30'

on the gear 31, the temperature of the water from the faucet is controlled by the lateral movement of the handle 29 which causes the gear and bracket 23 to rotate simultaneously. The angle of the handle 29 is formed to properly operate the valves 16.

The eccentric which is located between the ears on the gear 31, moves gear 31 to its various positions, through the movements of hand lever 29.

The teeth of the gear 31 are adapted for meshing engagement with the sector-shaped gears 32 and 33 fixed to the stems 17 respectively by screws 34. The hand lever 29 controls the shifting of the gear 31, while the lateral turning of the bracket 23 controls the rotation of this said gear 31.

When the gear 31 is shifted rearwardly by the forward and upward motion of the lever 29, so that the axis of rotation of the gear 31 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 by its connection to the eccentric 23 being a single medium for these controls.

The cover plate 25 may have thereon appropriate markings or indicia for indicating the "on" and "off" flow of liquid and the 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 partially opened, the gears 32, 31 and 33 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 19 of the faucet, i. e., to open the said valves, further, the hand lever 29 is pushed upwardly as in Figure 5. Then when it is desired to close the valves 16, the hand lever is pushed downwardly as in Figure 4.

When valves 16 are closed, gears 32 and 33 are slightly to the front of the alignment of all these gears, and this position of the gear 31 allows for changing the fulcrum of this gear when it moves forwardly. The eccentric 33 provides the movement for the gear 31 which movement compensates for lateral play or movement when in operation.

When the gear 31 is moved forwardly and rearwardly of the alignment of gears 32 and 33, that is, when valves 16 are opened full, gear 31 has moved in front of the alignment of gears 32 and 33 about the same amount as when the valves 16 are closed and gear 31 is moved back of alignment of gears 32 and 33.

This full movement forward of gear 31 caused by pulling up on the lever 29 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 pulling up lever 29, 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 29 is pulled upward, 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 29, that is, up and to you, will open only one valve, and up 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, 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, upstanding parallel ears formed on said last mentioned gear, an eccentric operatably mounted intermediate of said ears, and means connected to said eccentric 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, upstanding parallel ears formed on said last mentioned gear, an eccentric operatably mounted intermediate of said ears, means connected to said eccentric 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, parallel upstanding ears formed on said last mentioned gear, an eccentric operatably mounted intermediate said ears, means connected to said eccentric 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, upstanding parallel ears formed on said last mentioned gear, an eccentric operatably mounted intermediate of said ears, means connected to said eccentric

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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, upstanding

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parallel ears formed on said last mentioned gear, an eccentric operatably mounted intermediate said ears, means connected to said eccentric 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 the slidable and rotatable gear, and a pivot pin coupling the said last means to said eccentric and said eccentric to the ears of the slidable and rotatable gear.

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No references cited.