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AUTOMATIC WATER TEMPERATURE CONTROL

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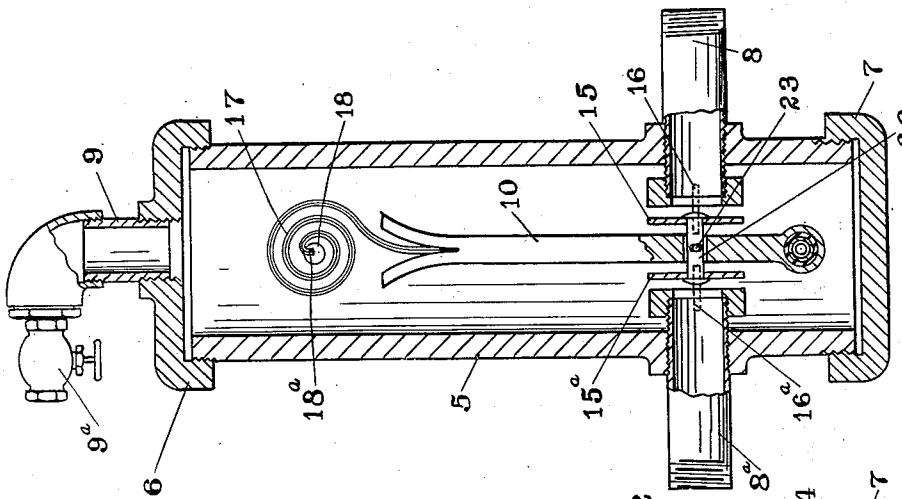


Fig. 3.

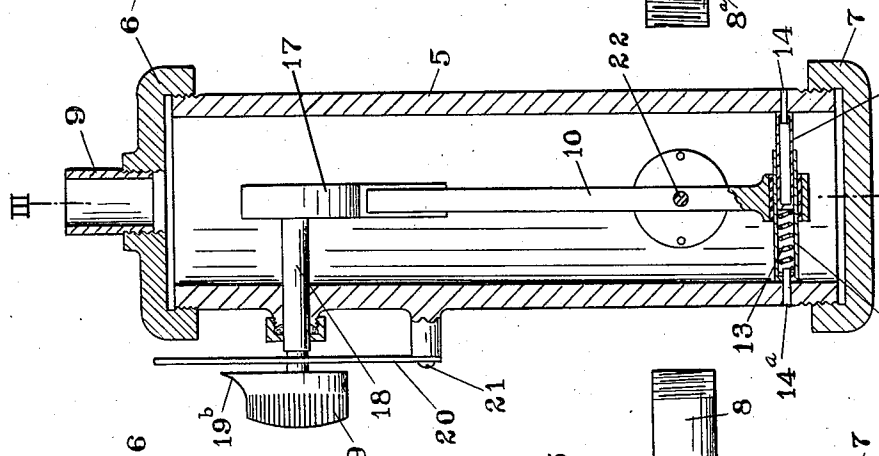


Fig. 2.

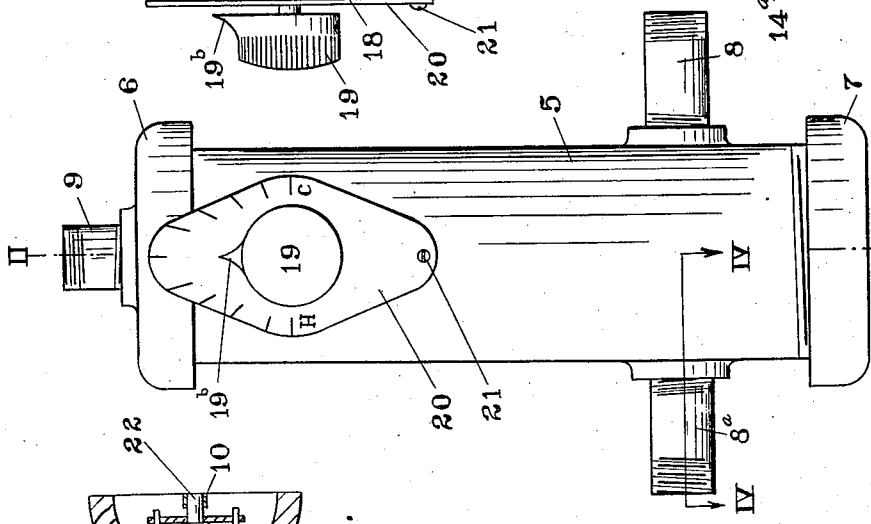


Fig. 1.

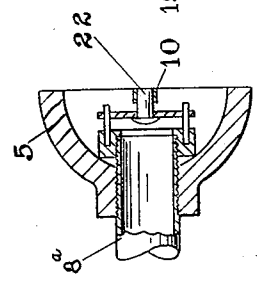


Fig. 4.

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AUTOMATIC WATER TEMPERATURE CONTROL

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3 Claims. (Cl. 236—12)

This invention relates generally to thermostatically controlled means and is designed more particularly for controlling and regulating the temperature of water used in shower or tub baths but is useful for any domestic or commercial purpose where hot and cold water or other liquids are to be mixed to be discharged or used at a desired and substantially uniform temperature.

In the plumbing of modern dwellings and buildings the pressure of the hot and cold water is substantially equal, hence by properly proportioning the quantities discharged into a vessel or chamber any desired resulting intermediate temperature can be obtained. Hence when the thermostatic element with other elements as herein described is preliminarily set within the mixed water to be used, the resultant temperature thereof is automatically regulated and maintained by the behavior of the thermostatic element because of the tendency of that element to respond to fortuitous or accidental variation in the temperature of one of the waters.

The object of the invention is to provide a simple and economical construction whereby the results indicated can be achieved.

In its preferred form the invention is embodied as shown in the accompanying drawing in which—

Figure 1 is an elevation of the front side thereof.

Fig. 2 is generally a vertical section on the line II—II Fig. 1 with some parts in full and some parts broken out.

Fig. 3 is generally a vertical section on the line III—III Fig. 2, with a control valve in the discharge added.

Fig. 4 is a horizontal half section on the line IV—IV Fig. 1.

In the view 5 designates a cylindrical casing, having a top cap 6 and a bottom cap 7. The characters 8 and 8a designate water inlet pipes, that designated 8, in the instance shown, being for the introduction of cold water to the casing while that designated 8a is for the introduction of hot water to the casing. The open ends of the pipes 8 and 8a are spaced apart but alined horizontally with each other for the purpose hereinafter appearing. The outlet 9 for the mixed water is conveniently located in the top cap and said outlet can be provided with an ordinary stop cock 9a, (see Fig. 3).

The character 10 designates a lever bifurcate at its upper end and fulcrumed at its lower end on a suitable bar extended diametrically between opposite sides of the casing. Said bar or fulcrum, in the instance shown, consists of two telescoping tubes 11 and 12 with a pressure spring 13 in the larger tube tending, when the bar is longitudinally compressed, to force opposite open ends of the bar onto supporting pins 14 and 14a fixed in the diametrically opposite sides of the wall of the casing. This construction of the means for supporting the lever 10 favors the assembling and removal of the parts when and if necessary for repair, replacement or cleansing.

Supported by means of a pin in an opening in the lever 10 are two valves 15 and 15a normally standing equidistant from the discharge opening of the inlet pipes 8 and 8a and in such proximity to said openings as to equalize or to vary the rate of flow of water from said pipes into the casing according to the position of said lever 10. The said valves 15 and 15a are connected together by means of a bar 22 and said bar is perforated at its middle with a vertically elongated slot to receive pin 20 and connecting said bar with the valves with the lever 10, but said bar can be omitted and the valves actuated by contacts of the lever 10 with said valves. Guiding pins 16 and 16a engaging the valves 15 and 15a and nuts on the inner ends of the pipes 8 and 8a (see Fig. 4) can be provided to aid in holding said valves in parallel position. Obviously such guiding pins for the valves can be fixed either in the nut or in the valve so as to be movable with respect to the other. It will be observed that the portion of the lever 10 above the connection of the valve stem 22 is much longer than the portion of the bar from said stem to the fulcrum of the bar. By reason of this construction and the consequent distance of the thermostat from the intakes the action of the water on the thermostatic element is much more uniform and sensitively effective in its action on and control of the valves. Because of the distance of the upward flow of the two waters due to the lengthy arm 10, the waters become more thoroughly mixed to a uniform temperature by the time they reach the neighborhood of the said thermostatic element.

The thermostatic element is indicated at 17, it being of the usual thermostatic bimetal in the form of a volute and having the end of its inner coil fixed at 18a to one end of a shaft 18, the other end of which latter extends through a suitable bushing to the exterior of the casing where it is provided with a finger actuated button 19 formed with a pointer at 19b. The said finger button and its pointer cooperate with a plate 20 fixed at 21 on the casing, said plate being

marked with a scale indicating or suggesting when the pointer is set the temperature of the water to be obtained or to be discharged upon the opening of the cock 9ª in the outlet pipe.

The end of the outer or larger coil of the thermostat is bent to extend into and engage the corner of the bifurcation or fork of the lever 10, and by turning the finger button 19 to the right or left, the pressure of the coil is varied and can be left fixed to secure a mixture of cold and hot water of the temperature desired.

The forms and number of the parts can be changed and parts omitted without departing from the gist of the invention as claimed.

What we claim is:

1. Means for thermostatically controlling the mixture of hot and cold liquids including in combination, a vertically extending casing having in the opposite sides of its lower portion axially alined inlets for hot and cold liquids into said casing and a controllable outlet for the mixed liquid at its upper end, a rigid lever having a forked upper end and fulcrummed at its lower end in the lower portion of said casing, a pair of axially alined valves for said inlets connected with the lower portion of said lever said valves rectilinearly operable in both directions by said lever for varying and controlling the proportions of the flow of the hot and cold liquids into said casing, the length of said lever above the connection of said valves therewith being largely in excess of that from said connection to the fulcrum of the lever, and a thermostatic element adjustably fixed in the upper portion of said casing and engaging by contact only the fork of said lever for actuating and controlling the positions of said valves.

2. Means for thermostatically controlling the mixture of hot and cold liquids including in combination, a vertically extending casing having axially alined inlets thereto in the opposite sides of the lower portion thereof for hot and cold liquids and an outlet for the mixed liquids at the upper end of said casing, a rigid lever having a forked upper end and fulcrummed at its lower end in the lower portion of said casing, a valve for each of said inlets connected with the lower portion of said lever and actuatable in both directions by said lever for varying the proportions of the flow of liquid into said casing, and a volute bi-metallic thermostatic element fixed at one end in the upper portion of said casing and connected at its other end by contact only in the forked upper end of said lever for actuating said lever and the valves in both directions.

3. Means for thermostatically controlling the mixture of hot and cold liquids including in combination, a vertically extending casing having in the opposite sides of the lower portion thereof axially alined inlets for the hot and cold liquids respectively into said casing, and a controllable outlet for the mixed liquids in the upper end of said casing, a spring actuated removable fulcrum for said lever in the lower end of said casing, a rigid lever mounted on said fulcrum and carrying at its lower portion a pair of valves for said inlets actuatable in both directions by said lever for varying the proportions of the flow of liquid into said casing, said lever having a forked upper end a thermostatic element adjustably fixed at one end in the upper portion of said casing and engaging at its other end by contact only the fork of the upper end of said lever for actuating said lever and said valves, and a removable cover for the lower end of said casing whereby the said fulcrum, the lever and valves can be removed from said casing independently of the thermostatic element.

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