

(No Model.)

2 Sheets—Sheet 1.

H. A. TOBEY.  
THERMOSTAT REGULATOR.

No. 549,035.

Patented Oct. 29, 1895.

Fig. 1.

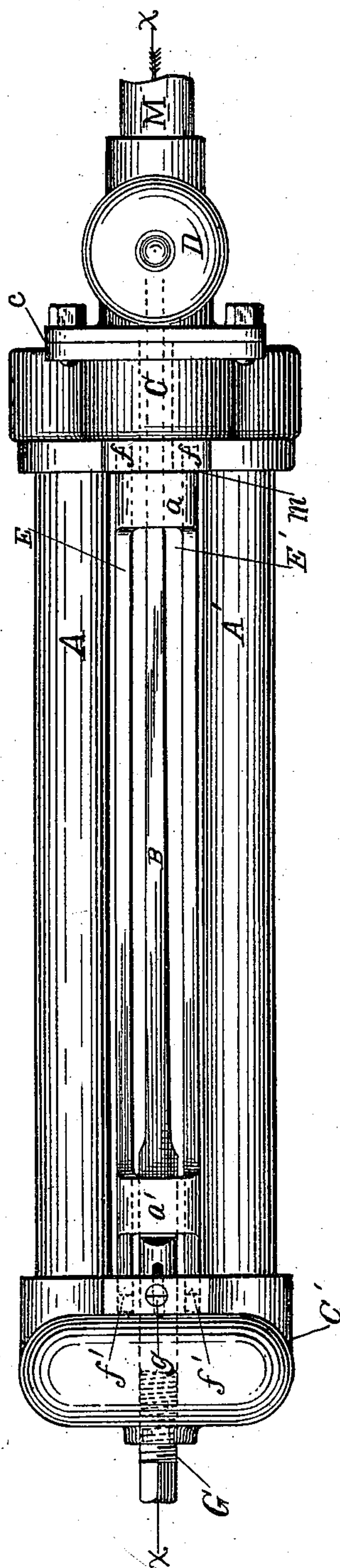
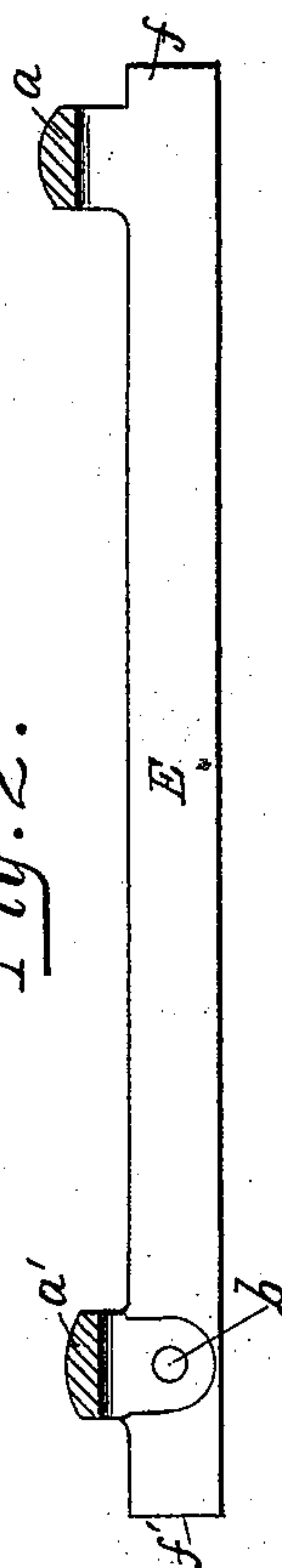


Fig. 2.



Witnesses.

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(No Model.)

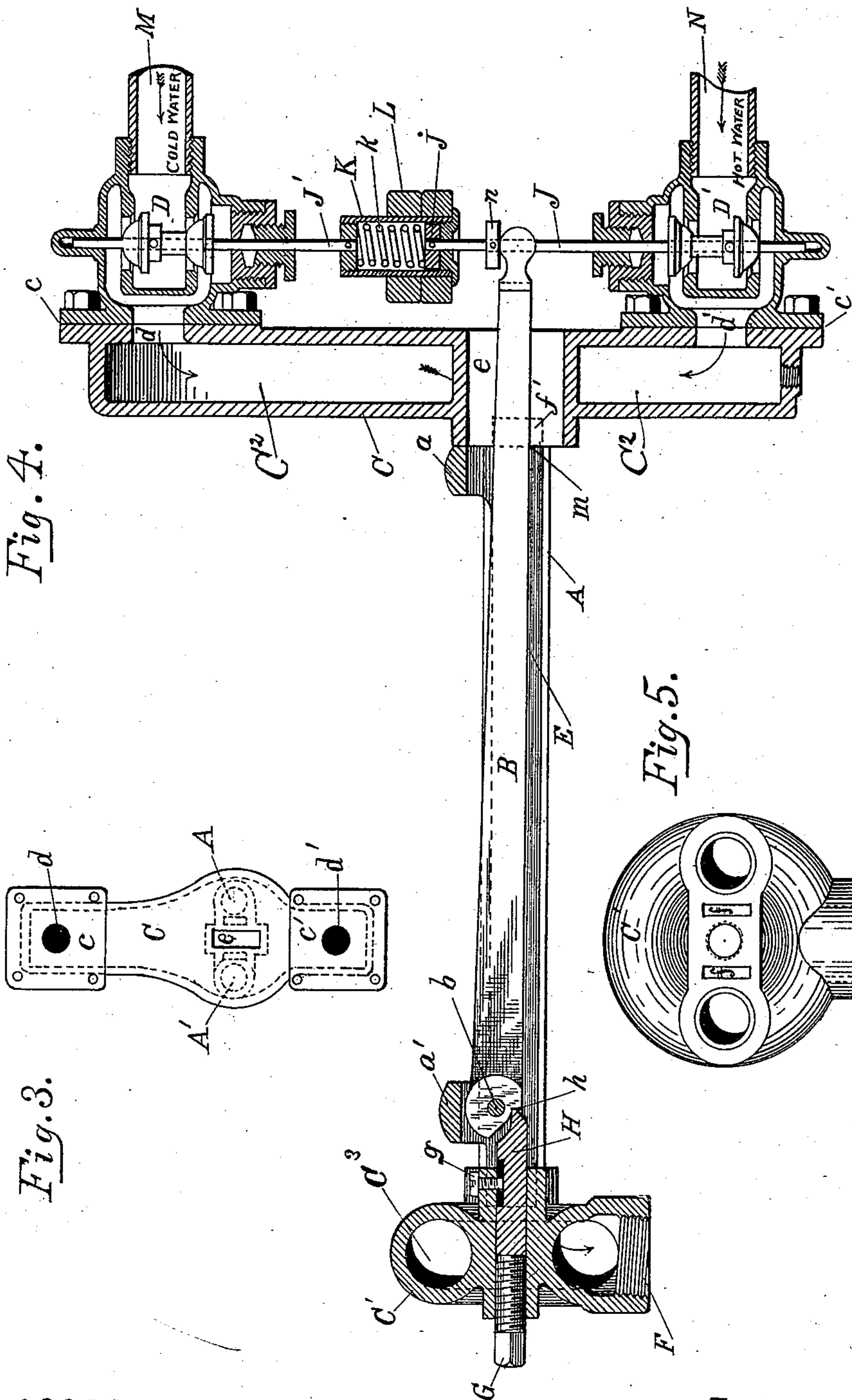
2 Sheets—Sheet 2.

H. A. TOBEY.

THERMOSTAT REGULATOR.

No. 549,035.

Patented Oct. 29, 1895.



Witnesses.  
David C. Walter  
Robert E. Hamblin

Inventor.  
Henry A. Tobey  
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# UNITED STATES PATENT OFFICE.

HENRY ARCHIBALD TOBEY, OF TOLEDO, OHIO.

## THERMOSTAT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 549,035, dated October 29, 1895.

Application filed September 4, 1894. Serial No. 522,124. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY ARCHIBALD TOBEY, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Thermostat-Regulators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in thermostatic devices.

The object of my device is to mix hot and cold water or other liquids so that the mixture may be discharged at a uniform temperature regardless of the variations in temperature of either the hot or cold liquid entering the device.

Figure 1 is a top plan of the device. Fig. 2 is a side view of one of the bars supporting a lever. Fig. 3 is a front view with valves and lever removed. Fig. 4 is a vertical section on line  $x x$  of Fig. 1. Fig. 5 shows an external end view of one of the castings  $C'$  for supporting an expansive member.

Referring to the drawings,  $A$  and  $A'$  are two tubes or pipes, made of brass or copper or a material having a large ratio of expansion by heat, and which are fastened rigidly at opposite ends into castings or boxes  $C$  and  $C'$ . Box  $C$  has a chamber  $C^2$ , with which the tubes  $A$  and  $A'$  communicate. Box  $C'$  has a chamber  $C^3$ , with which the tubes  $A$  and  $A'$  also communicate, and is provided with a discharge-pipe.

$E$  and  $E'$  are bars, made of cast-iron or some material having a low ratio of expansion by heat, and are united one with the other by end straps  $a$  and  $a'$ . They are supported in the respective boxes  $C$   $C'$  by being provided at their opposite ends with lugs  $f$  and  $f'$ , which fit loosely into sockets at  $m$  in the boxes. The bars  $E$   $E'$  constitute a stationary frame, on which is mounted a lever  $B$ , pivoted at one end on a pin  $b$  between the bars  $E$   $E'$ . The lever  $B$  extends at its opposite end through a central opening  $e$  in box  $C$  and is bifurcated at that end to embrace a valve-rod  $J$  outside of box  $C$ . Box  $C$  has fitted onto it at  $c$  and  $c'$  valve-chambers, in which are seated valves

$D$  and  $D'$ . The valve-chambers communicate with the chamber  $C^2$  of water-box  $C$  through ports  $d$  and  $d'$ , respectively. Into the center of box  $C'$  extends a screw  $G$ , which is in contact with the inner end of a rod  $H$ . The outer end of rod  $H$  is provided with a knife-edge  $h$ , which is adapted to engage with a shoulder on the head of lever  $B$ . The rod  $H$  is held from turning by means of a screw  $g$ , which enters a slot made in the side of the rod, while at the same time the rod is free to reciprocate.

The bifurcated end of lever  $B$  presses against a disk  $n$ , which is rigidly fastened to rod  $J$ . The valve  $D$  is on rod  $J'$  and the valve  $D'$  on rod  $J$ .

$K$  is a cylinder or barrel closed at both ends and inclosing spiral spring  $k$ . Within the cylinder  $K$  is a disk rigidly fastened to the top of valve-stem  $J$ . The stem  $J'$  is rigidly fastened to the upper end of barrel or cylinder  $K$ .

$L$  is a weight supported on barrel  $K$ , which tends to hold valve  $D'$  closed and valve  $D$  open.

$M$  is an inlet for cold water, and  $N$  is an inlet for hot water.

Having thus described the various parts of my device, the operation is as follows: When cold water enters valve  $D$  and hot water enters valve  $D'$ , they mix in chamber  $C^2$  of box  $C$  and pass through pipes  $A$  and  $A'$  to the discharge or outlet from the box  $C'$  at  $F$ . Should the water passing through said pipes  $A$  and  $A'$  cool, said pipes will contract or shorten, and the motion thus obtained will be imparted through rod  $H$  to the shoulder of lever  $B$  at  $h$ , the fulcrum of said lever being fixed in stationary bars  $E$  and  $E'$ . The outer or right-hand end of lever  $B$  will be lifted upward, overcoming the pressure of weight  $L$  and carrying with it valve-stems  $J$  and  $J'$ , which movement opens wider valve  $D'$ , admitting more hot water and tending to close valve  $D$ , lessening the amount of cold water. When the temperature of the mixed hot and cold water again becomes warmer, said pipes  $A$  and  $A'$  will expand or lengthen and allow the outer or right-hand end of lever  $B$  to descend, thus tending to close valve  $D'$ , lessening the amount of hot water admitted, and open wider valve  $D$ , increasing the amount of cold water admitted, thereby maintaining a



uniform temperature of the water discharged from the apparatus. Spiral spring *k* in barrel *K* is for the purpose of guarding against breaking or straining the apparatus when  
5 the temperature gets below the point where valve *D* would be closed. Should the temperature get below this point, the spring would be compressed as lever *B* is lifted upward and prevent straining or breaking. It  
10 is obvious that the farther screw *G* is screwed inward the more pipes *A* and *A'* must expand before lever *B* will allow valve *D'* to close; therefore the warmer the water must be that is being discharged.

15 Although not shown, I anticipate that screw *G* could be connected with a dial or hand for indicating the temperature of the water discharged by a similar mechanism to that shown in connection with another device of mine, de-  
20 scribed in my application, Serial No. 512,898.

Having thus described my invention, what I claim is—

1. A regulating apparatus consisting of a receiving and a discharging chamber, in combination with two valve chambers and valves  
25 therein for supplying said receiving chamber with liquids of different temperatures, expansion tubes connecting said receiving and discharging chambers and through which tubes  
30 the liquid is conducted, a stationary frame between the said chambers and the said tubes, a lever pivoted to said frame and connected to the valve rod, said lever operated by the expansion and contraction of said

tubes, and said valves operated by said lever, 35 substantially as described.

2. The combination with the receiving and discharging chambers and the connecting expansion tubes, of the connected stationary  
40 rods between said tubes, said rods being of less expansive quality than the tubes, and on which rods the opposite chambers are free to move, a fulcrumed lever provided with a shoulder and connected to said stationary  
45 rods, a rod connected to said discharging chamber and adapted to engage the shoulder of said fulcrumed lever, a valve rod to which said fulcrumed lever is connected, and valves  
50 operated by said valve rod, substantially as described.

3. A regulating apparatus consisting of expansible members forming a loop, a support  
55 for said loop, in combination with an adjustable rod connected with said members, a stationary frame between the said members, a lever fulcrumed to the said frame and in contact with said rod, said lever operated through  
60 said rod by the expansion and contraction of said members, and a valve operated by said lever controlling the medium which affects the expansible members, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY ARCHIBALD TOBEY.

Witnesses:

H. C. HAYS,  
F. D. ELMER.