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THERMOSTATIC MEMBER AND SUPPORTING POST THEREFOR.

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1,112,448. Patented Oct. 6, 1914.

Fig. 1.

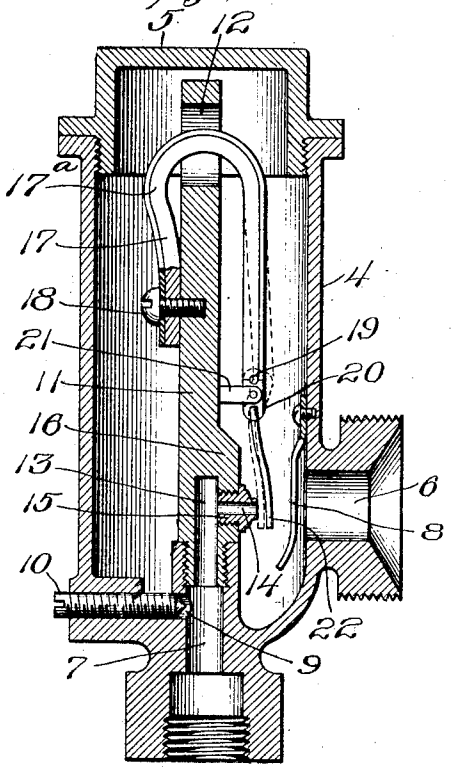


Fig. 2.

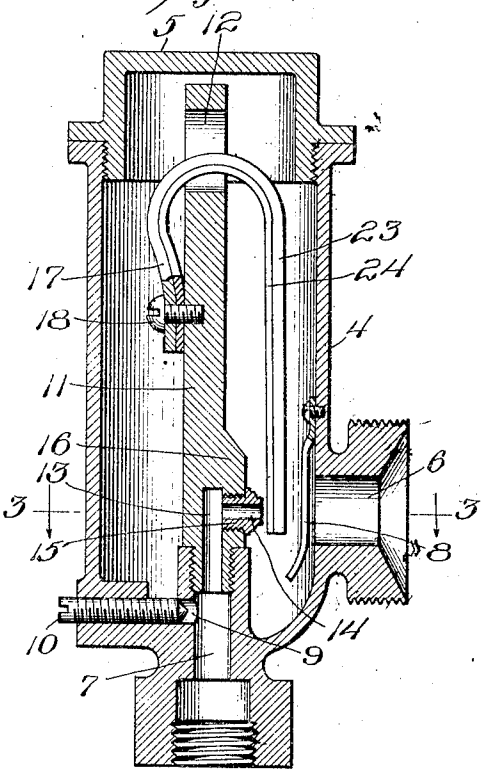
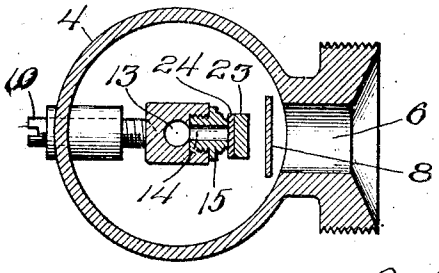


Fig. 3.



Witnesses.

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THERMOSTATIC MEMBER AND SUPPORTING-POST THEREFOR.

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To all whom it may concern:

Be it known that I, ORVILLE CROMWELL HATCH, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Thermostatic Members and Supporting-Posts Therefor, of which the following is a specification.

The present invention relates to a thermostatic member and supporting post therefor, which are arranged within the interior of a valve casing used with steam heating systems for the purpose of controlling the flow of air and water of condensation from the radiator into the return pipe of the system.

The main objects of the present invention are, to arrange the thermostatic member so that a substantial amount of the surface thereof will be exposed to the action of heating and cooling elements discharged into the valve casing, whereby a sufficient movement of the thermostatic member is produced by the variations in the temperature within the casing to control the flow of air and water of condensation from the interior of the casing to the discharge pipe of the system in an efficient and desirable manner.

Further objects of the invention are, to arrange the thermostatic member and supporting post therefor so that the same may be easily removed from the interior of the valve casing; and to arrange a passage through the post leading to the discharge passage of the heating system whereby the open end of said passage, which communicates with the interior of the valve casing, is located in a position so that it will not become choked or clogged with dirt or sediment which collects in the lower end of the valve casing.

The invention further consists in the features of construction and in the combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a vertical section of a valve casing having the thermostatic member and supporting post therefor of the present invention arranged therein in operative position; Fig. 2, a view similar to Fig. 1, showing a modified construction of thermostatic member; and Fig. 3, a section on line 3—3 of Fig. 2, looking in the direction of the arrow.

In certain types of valves used in connection with steam heating systems, especially systems of the so-called vacuum type, a thermostatic member is arranged within a suitable valve casing, which controls a passage leading from said casing to the discharge pipe of the system for controlling the flow of air and water of condensation out of the interior of the casing into said return pipe; and this thermostatic member is influenced by the heat conditions within the valve casing, whereby it opens and closes said passage in accordance therewith. The present invention deals particularly with the arrangement of a thermostatic member for accomplishing this end, and also with the arrangement and construction of the post which supports this thermostatic member.

Referring now to the drawings, a valve casing 4 is illustrated, which may be of any suitable style and configuration; and in the form shown in the drawings this valve casing is closed by a cap 5, and contains an inlet passage 6 and an outlet or discharge passage 7, each communicating with the interior of the casing. It is understood that the form of casing may be of any desired type and that the form illustrated in the drawings is not considered to be a limitation upon the present invention. The casing illustrated is provided with a baffle plate 8, which forms a weir whereby a liquid seal is made when water of condensation enters the casing. The utilization of this weir is not necessary for a practical working of the thermostatic member of the present invention, but by using a weir a column of water is quickly formed in the valve casing, which is a desirable feature, as will be more fully hereinafter set forth. A by-pass 9, controlled by a needle valve 10, is provided, which permits of the suction of all dirt and sediment out from the lower end of the valve casing into the return pipe of the system. This feature, however, is common in the art.

The present invention deals particularly with the thermostatic member and the post for supporting the same. The post consists of an elongated member 11 of suitable size and configuration, which is formed with a passage 34 in its lower end communicating with the discharge passage 7, and preferably provided with an aperture 12 adjacent its upper end. The passage 13 is in turn in communication with a cross-passage 14, com-

municating with the interior of the casing. The cross-passage, in the form of device shown in the drawings, is formed in a nipple 15 screw-threaded or otherwise secured adjacent the lower end of the post, and said post is thickened, as indicated at 16, so as to give the necessary amount of metal at this point to lend rigidity to the lower end of the post when the bore or passage 13 is formed therein.

The thermostatic member illustrated in Fig. 1 is formed of two sections or strips one consisting of a strip of thermostatic metal 17 and a strip of thermostatic metal 17ª, said strip 17 being of higher thermostatic properties than the strip 17ª, which is bent to pass through the aperture 12, and has one end secured to the body of the post, on one side thereof, by suitable securing means 18, and its other free end 19 attached to the lever member 20, which, as shown, is pivoted to an arm 21 attached to the opposite side of the post 11 from that to which the end of the thermostatic member is attached. The free end 22 of the arm is arranged to control the end of the passage 14.

The operation of this form of device is as follows: Before steam is admitted to the radiator, the interior of the valve is in a relatively cooled condition, and the thermostatic member is shrunk so that the free end is moved inwardly toward the post, such movement of the free end forcing the lever 20 into the position shown in full lines in Fig. 1, leaving the passage 14 in communication with the interior of the valve casing. When steam is admitted to the radiator, it first forces the air from the radiator into the valve casing; and this air will flow through the passage 14 into the passage 13 and out through the discharge passage 7. After the air has been exhausted from the interior of the radiator by the incoming steam, steam and water of condensation will pass into the interior of the casing from the radiator. The heated steam, however, will expand the thermostatic member so as to swing the free end into the position shown in dotted lines in Fig. 1, thus moving the lever to the dotted line position shown in Fig. 1 and cutting off communication between the interior of the valve casing and the discharge pipe of the system, which prevents the escapement of steam through the valve. As the water of condensation collects and rises in the valve casing, it will have a cooling action upon the thermostatic member, returning the member to the position shown in full lines in Fig. 1 and swinging the lever to the full line position shown in Fig. 1, thus uncovering the port or passage 15 and permitting the water of condensation to be sucked or drawn out from the interior of the casing into the discharge passage of the system. As the water of condensation decreases in the valve casing, the thermostatic member will again become heated and expand to actuate the lever and close communication between the discharge passage and the interior of the valve casing. The action above described will be repeated as long as the system is being used.

In the form of thermostatic member illustrated in Fig. 2, the lever 20 is eliminated, this thermostatic member being composed of two sections 23 and 24, fastened together in any suitable manner, as illustrated in Fig. 2. The metal of which the strip or section 23 is composed is of a higher thermostatic efficiency than the metal of which the section 24 is composed; that is, the section 23 is more susceptible to the variations in heat and cold. As a result of this, when steam enters the valve casing following the discharge of air therefrom, it will cause the outer section 23 to expand or lengthen, but will have practically no effect upon the inner section 24. Under these conditions, it is obvious that the free end of the thermostatic member will be swung inward, so as to close the port or passage 14. As the thermostatic member cools, the outer section 23 will shrink; and the inner section 24 remaining practically unaffected, it is obvious that the free end of the thermostatic member will be swung free of the port or passage 14 in Fig. 2, whereby water of condensation will pass out from the interior of the valve casing in the manner described in explaining the construction illustrated in Fig. 1.

By arranging the thermostatic member so that it lies upon both sides of the post, a great length of said member is exposed to the action of the heating and cooling agencies, and, furthermore, the free end is removed a substantial distance from the point of attachment, so that the movements of the thermostatic member at the free end are of considerable degree and sufficient to effectively close and open communication through the port or passage 14. In the construction shown in Fig. 1, the movement of the free end of the thermostatic member is further amplified by being in operative connection with the lever 20.

I claim:

1. In a valve of the class described, the combination of a casing having an inlet passage and a discharge passage therein, a post within said casing, a passage in said post communicating with the outlet passage, a non-thermostatic pivoted member for controlling the passage through said post, and a thermostatic member attached directly to said post and having an operative connection with said pivoted member, substantially as described.

2. In a valve of the class described, the combination of a casing having an inlet pas-

sage and a discharge passage therein, a post within said casing, a passage in said post communicating with the outlet passage, a non-thermostatic pivoted member for controlling the passage through said post, and a thermostatic member bent to lie upon opposite sides of the post, having the end lying upon one side of the post secured thereto, and the free end on the opposite side of the post in operative connection with said pivoted member, substantially as described.

3. In a valve of the class described, the combination of a casing having an inlet passage and a discharge passage therein, a post within said casing, a passage in said post communicating with the outlet passage, a non-thermostatic pivoted member for controlling the passage through said post, said post having an aperture therein, and a thermostatic member extending through said aperture and bent to lie upon opposite sides of the post, the end upon one side of the post being secured thereto, and the free end on the opposite side of the post having an operative connection to said pivoted member, substantially as described.

4. In a valve of the class described, the combination of a casing having an inlet passage and a discharge passage, a member composed of thermostatic material within said casing, a supporting post for said member removably secured within said casing, a passage through said post communicating with and forming a portion of the discharge passage, and also in communication with the interior of the casing, a lever of non-thermostatic material pivotally secured to said post, means for securing one end of said thermostatic member to said post, the free end of said member being secured to one arm of said lever, the other arm of said lever being arranged to have its end controlling the passage through said post, substantially as described.

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