

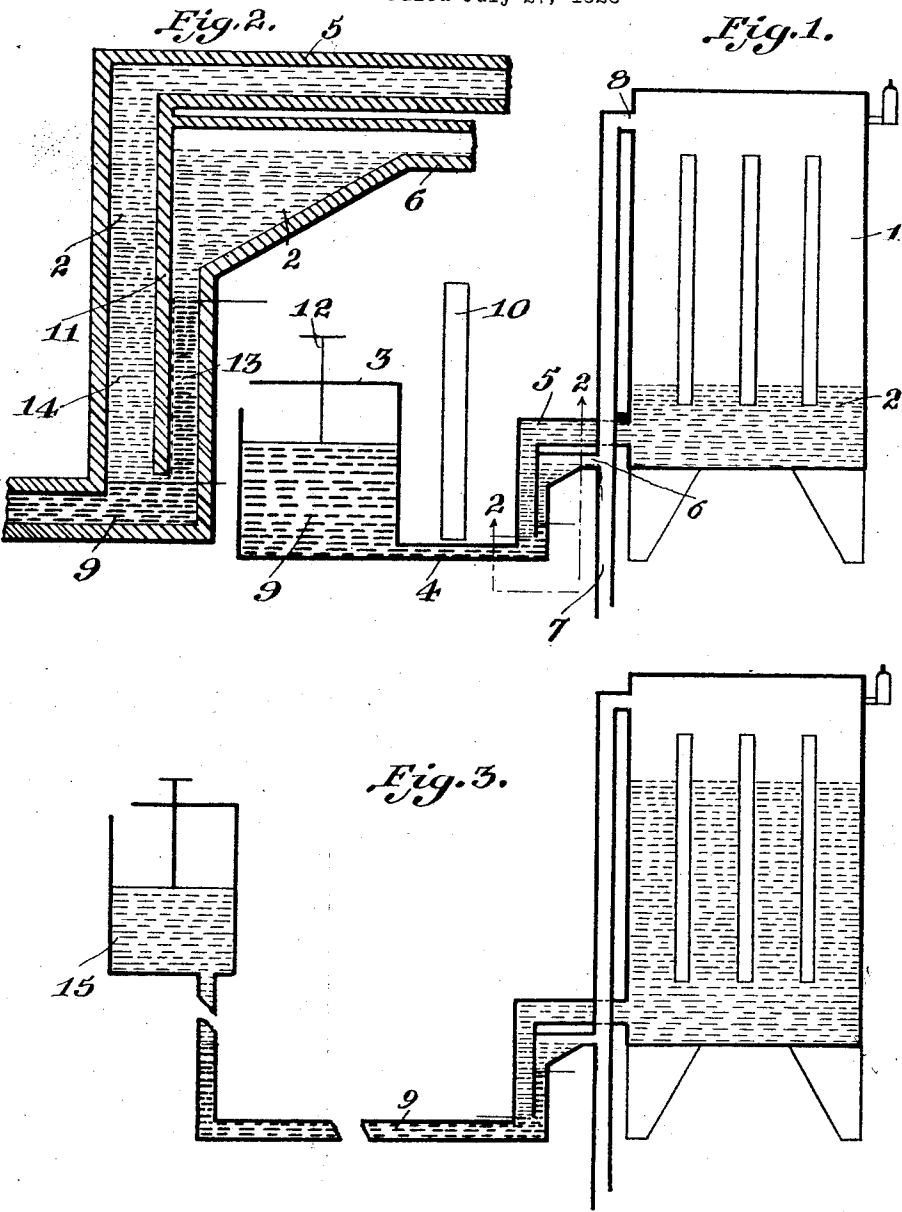
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THERMOSTATIC CONTROL FOR RADIATORS

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THERMOSTATIC CONTROL FOR RADIATORS.

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This invention relates to improvements in controls, particularly for steam heating radiators.

5 An object of this invention is to provide means for regulating the heating area of a radiator by means of a thermostatic control.

A further object of this invention is to provide a control which is simple to manufacture, having few mechanical elements in
10 combination therewith.

Another object of this invention is to provide a means to control the heating area of the radiator particularly through the entrapping of the condensate in the radiator.

15 An object of this invention is to provide thermostatic means for entrapping the condensate in the radiator consisting primarily of arranging within a suitable receptacle, a metallic metal in liquid form such as mercury, the mercury and condensation cooperating in such a manner as to regulate the heating area of the radiator depending on the temperature of the room that is being heated.

20 Further objects of this invention will be to provide a suitable sealing means in the form of a metallic liquid such as mercury, and expansible liquid such as alcohol for the purpose of actuating the mercury sealing means thereby varying the height of the condensate in the radiator and varying the effective radiating surface of the radiator.

Further objects of this invention will appear from the following detailed description
25 and from the disclosure in the single sheet of drawings which is herewith made a part of this application.

In the drawings,

30 Fig. 1 illustrates a diagrammatic view of a radiator having in operative combination therewith, a thermostatic control.

Fig. 2 represents a diagrammatic view in an enlarged form of the liquid valve as shown in the section taken at 2-2.

35 Fig. 3 illustrates a diagrammatic view of a modified form of the radiator and thermostatic control as disclosed in Fig. 1.

Numeral 1 designates a radiator of the common type used in steam heating, while
40 numeral 2 designates the condensate which accumulates usually at, or near the bottom of the radiator.

45 This invention provides a thermostatic means for regulating the amount of heating surface in the radiator. The rise and fall of the level of the condensate in the radiator

will affect the radiation of the heat, it being understood that the rise and fall of the level of the condensate in the radiator will affect the volume of steam admitted to the radiator
60 and therefore the radiating capacity.

The rise and fall of the condensate is accomplished in this invention by means of suitably locating within the room to be heated or otherwise, a receptacle for holding a
65 liquid of high specific gravity such as mercury, the receptacle to be in open communication with the radiator and the steam line to the boiler. The receptacle for the mercury is designated by the numeral 3, and the
70 open communication therefrom by the numeral 4, numerals 5 and 6 designating the open members or connections leading to the radiators and to the steam line connections respectively; the connection 5, it being
75 understood extends to the lower portion of the radiator where the condensate accumulates. The line 6 extends to the supply steam line 7 which ordinarily enters the radiator at or near the top thereof as at 8.
80 The receptacle 3 is adapted, according to this invention, to contain an expansible liquid such as mercury 9, the receptacle 3 being suitably insulated from the direct heat of the radiator or otherwise, by means of an insulating partition 10.
85

A suitable dividing element 11 is formed in the open communication between the receptacle 3 and the radiator 1, as clearly disclosed in Figure 2. This dividing element
90 11 is adapted to extend downward a suitable distance. The receptacle 3 is adapted to have in cooperation therewith, an adjustable element 12. This element 12 will function to vary the height of the mercury in the
95 open communicating chambers 13 and 14, which chambers are separated by means of the partitions 11. It is apparent that the adjusting element 12 will function to set the thermostatic control at any desired temperature, initially regulating the height of the mercury in the two chambers 14 and 13.
100 The mercury in the communicating chamber 13 leading to the steam line 7 will rise to a height depending upon the condensate head in the radiator acting on the mercury column in chamber 14, it being understood that the condensate head in chamber 13 should be subtracted from the condensate head in the chamber 14. The maximum head in communicating chamber 14 as controlled by the
110 height of the condensate in the radiator, is

equal to the head of mercury in chamber 13 plus the condensate head in chamber 13.

Any excess of head in chamber 14 over the head in chamber 13 will allow the water to escape underneath partition 11 into chamber 13, and from thence overflowing into steam supply 7.

Fig. 3 represents a slightly modified form of control employing the sealing means or mercury within the open communicating elements located between the condensate in the radiator and an expansible liquid located within the receptacle 3; the expansible liquid may be designated by the numeral 15 and will be of the nature of alcohol or other suitable expansive liquid, alcohol having approximately 7 times the coefficient of expansion of mercury in addition to its low cost.

In operation this invention provides a thermostatic control which will function to automatically vary the heat surface of the radiator according to the variations of temperature in the room to be heated. As the room temperature decreases, the temperature will tend to contract the liquid in the receptacle 3, thereby withdrawing the heavier liquid in chamber 13, and lowering the head in chamber 13, thereby functioning to lower the condensate head in chamber 14, which must always balance the total head in chamber 13, and which, when overbalancing the total head in chamber 13 escapes under partition 11, and overflows to steam pipe 7 as above described.

As the room temperature increases, the temperature will tend to expand the liquid in receptacle 3, thereby forcing some of the heavier liquid in the chambers 13 and 14, effectively shutting off flow of condensate under partition 11. The condensate in the radiator will build up until a state of equilibrium has been established between the static head in chambers 13 and 14, any excess of which will escape under partition 11 as above described.

Broadly, this invention therefore, provides a thermostatic means for controlling the radiating surface of a radiator, by the variations of room temperatures: expanding the liquid in receptacle 3, which will function to force the heavier liquid into various operative relationship within the liquid valve thereby effectively regulating the height of the condensate in the radiator and controlling the heat radiating surface.

It is to be understood that modifications and substitutions may be made in the application as above described within the scope of this invention without affecting the merits of the invention.

What I claim is:

1. A method for heating rooms and controlling the temperature thereof, consisting of supplying steam to the top of a radiator, collecting the water of condensation in the lower portion of the radiator, and controlling the relative volumes of steam and water in the radiator, thereby regulating the heating capacity of the radiator.

2. A method for heating rooms and controlling the temperature thereof, consisting of supplying steam to the top of a radiator, collecting the water of condensation in the lower portion of the radiator and controlling the relative volume of steam and water in the radiator, by utilizing the variations in temperature of the room for withdrawing the condensate from the bottom of the radiator, thereby regulating the heating capacity of the radiator.

3. A method for heating rooms and controlling the temperature thereof, consisting of supplying steam to the top of a radiator, collecting the condensation in the lower portion of the radiator and controlling the relative volumes of steam and water in the radiator through the medium of the variations in temperature of the room.

In testimony whereof I affix my signature.
EDWARD S. PORTER.