

No. 756,794.

PATENTED APR. 5, 1904.

W. W. LOWER.
VENT FOR STEAM RADIATORS.
APPLICATION FILED JULY 27, 1903.

NO MODEL.

Fig. 1.

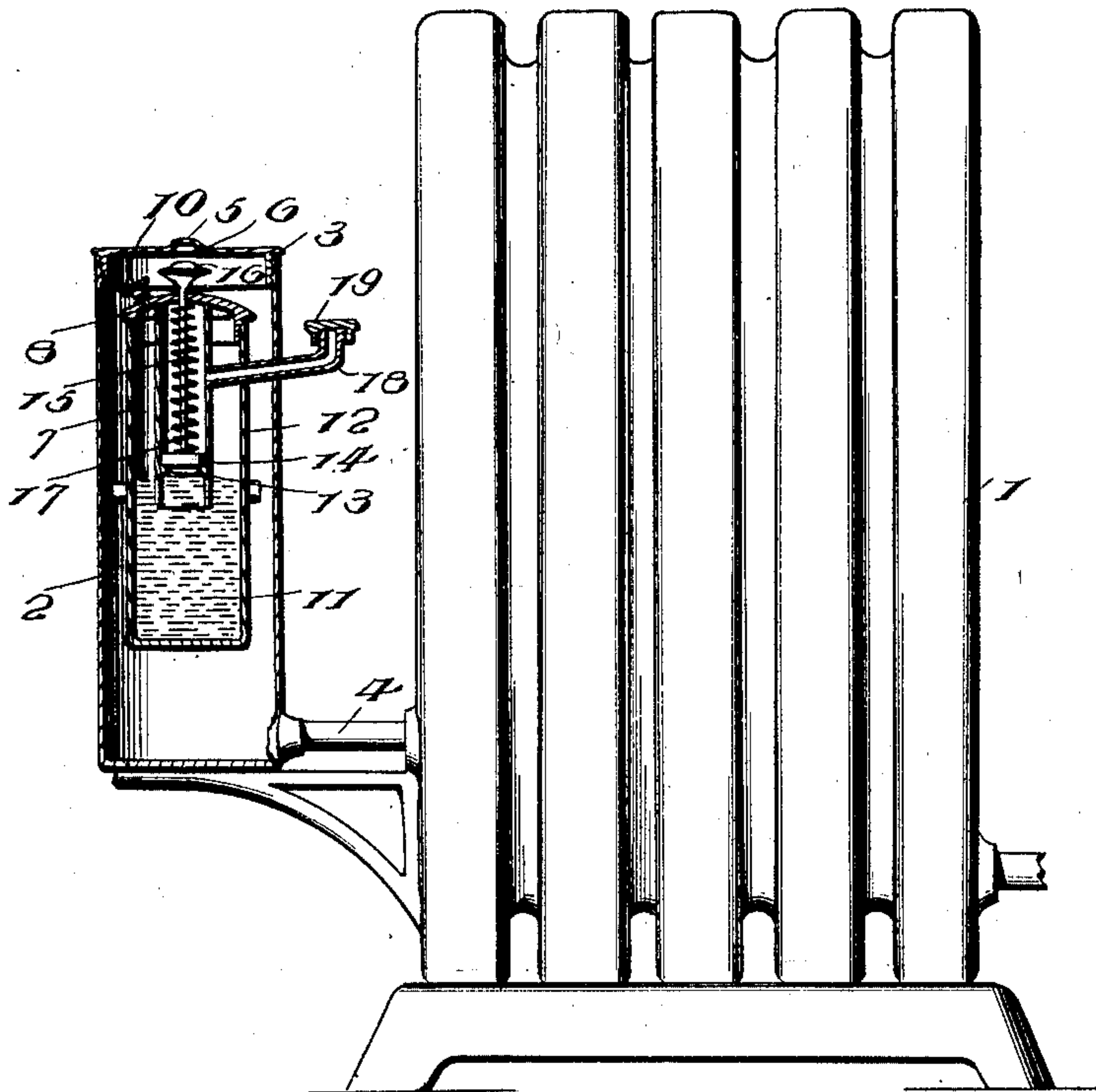
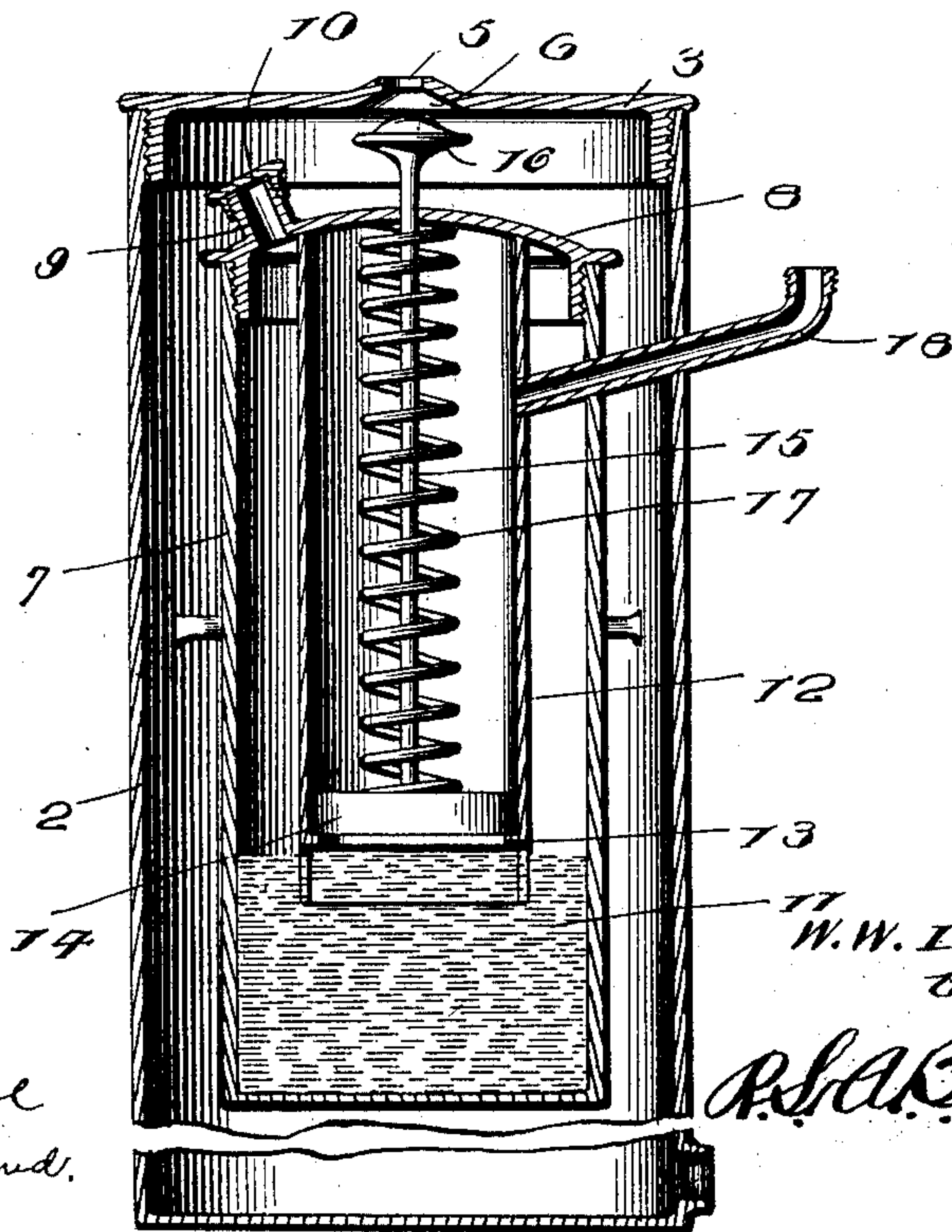


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

WARREN WILSON LOWER, OF KEYSTONE, WEST VIRGINIA.

VENT FOR STEAM-RADIATORS.

SPECIFICATION forming part of Letters Patent No. 756,794, dated April 5, 1904.

Application filed July 27, 1903. Serial No. 167,207. (No model.)

To all whom it may concern:

Be it known that I, WARREN WILSON LOWER, a citizen of the United States, residing at Keystone, in the county of McDowell and State of West Virginia, have invented certain new and useful Improvements in Vents for Steam-Radiators, of which the following is a specification.

The purpose of this invention is the provision of a novel form of vent or regulator for radiators of heating systems whereby the air confined therein may find a ready escape when the steam or heating medium is turned on, whereby the best possible results may be attained.

The invention comprises a receptacle for connection with the radiator to receive the heating medium and provided at its upper end with a vent adapted to be automatically controlled by the expansion and contraction of a liquid, such as mercury, contained in a vessel arranged within said receptacle and provided with a cylinder in which operates a piston having the valve for controlling the aforementioned vent connected therewith.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central section of the regulator, showing same applied to a radiator. Fig. 2 is a view similar to Fig. 1 of the regulator on a larger scale.

Corresponding and like parts are referred to in the following description and indicated in both views of the drawings by the same reference characters.

The radiator 1 may be of any structural type and included in the circulation of a heating medium, such as steam. The regulator is connected at its lower end with the radiator and is provided at its upper end with a valve-controlled vent and is adapted to be supported

contiguous to the radiator, so as to be heated thereby. The regulator comprises receptacle 2, preferably closed at its upper end by cap 3, threaded thereto, so as to admit of access being readily had to the interior of the receptacle for any required purpose. Pipe 4 is adapted to connect lower end of receptacle 2 with radiator 1. Cap 3 is provided with vent 5 and valve-seat 6, surrounding said vent. Vessel 7 is suspended within receptacle 1 in any manner, so as to receive the full benefit of the heating medium contained in said receptacle. Cap 8 closes upper end of vessel 7 and is provided with tubular extension 9, closed by cap 10, to admit of supplying the expansible liquid 11 to vessel 7. Cylinder 12 is located within vessel 7 and is preferably connected with cap 8 and is open at its lower end and provided with inner flange 13, forming a support for piston 14 arranged to operate in cylinder 12, and having its stem 15 working through opening in cap 8 and provided in its upper end with valve 16 for closing vent 5. Coil-spring 17 surrounds stem 15 and is confined between cap 8 and piston 14 and normally exerts a downward pressure thereon to hold valve 16 away from seat 6, whereby vent 5 is uncovered. A tube 18 connects at its inner end with the upper portion of cylinder 12 and extends through vessel 7 and receptacle 2 and is adapted to be closed at its outer end by means of cap 19. This tube 18 admits of a lubricant being supplied to cylinder 12 and provides communication therewith for any desired purpose.

A liquid, such as mercury, is supplied to vessel 7 in proper quantity to insure seating of valve 16 and closure of vent 5 when radiator 1 is relieved of the air contained therein, thereby preventing little or no escape of the heating medium. When the steam or other heating medium is turned on, the air from the radiator finds a ready escape through pipe 4 and receptacle 2, passing from the latter through vent 5. When the heating medium enters receptacle 2, the mercury or other highly-expansible liquid increases in bulk and exerts an upward pressure on piston 14, overcoming tension of spring 17 and forcing valve 16 against seat 6 and closing vent 5, thereby pre-

venting escape of the heating medium. When the steam is turned off and the radiator cools, the liquid 13 contracts and spring 17, reacting, forces piston 14 downward, thereby unseating valve 16 and permitting air to enter vent 5 and passing through receptacle 2 into the radiator to prevent formation of a vacuum therein, said valve remaining unseated until the steam is again turned on, when the operation just described is repeated.

Having thus described the invention, what is claimed as new is—

1. In an automatic regulator for heating apparatus, a receptacle, a cap closing the upper end of said receptacle and provided with a vent-opening, a vessel supported within said receptacle and adapted to receive an expansible liquid, a cap closing the upper end of said vessel, a cylinder suspended within the vessel from the cap thereof and open at its lower end, an expansible liquid supplied to the lower portion of the vessel, a piston arranged to work in said cylinder, and a valve connected with said piston and adapted to close upward against the cap of the receptacle and shut the said vent-opening, substantially as specified.

2. The herein-described regulator for the

purposes set forth comprising a receptacle, a cap fitted to the upper end thereof and having a vent-opening, a vessel suspended within said receptacle, a cap closing the upper end of said vessel and provided with a cap-closed tubular extension, an expansible liquid supplied to the lower portion of said vessel, a cylinder suspended from the cap of the vessel and having the inner flange at its lower end forming a stop, a piston arranged to operate in said cylinder and having its stem working through an opening of the cap applied to the said vessel, a valve applied to the upper end of the piston-stem and adapted to close the aforementioned vent-opening, a spring surrounding the piston-stem and confined between the piston and the cap from which said cylinder is suspended, and a tube extended from the cylinder through the sides of said vessel and receptacle, substantially as set forth.

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

WARREN WILSON LOWER. [L. s.]

Witnesses:

R. C. COOPER,

C. E. HANCOCK.