(No Model.)

A. S. HODGE.

AUTOMATIC RELIEF VALVE FOR RADIATORS.

No. 479,806. Patented Aug. 2, 1892.

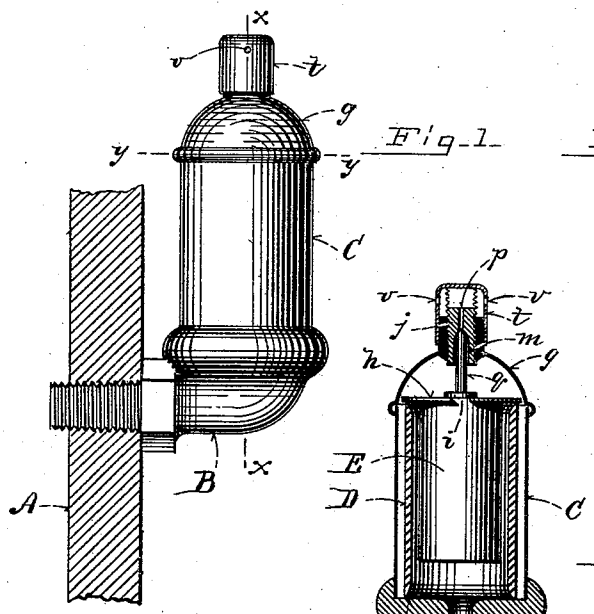

Fig-1.

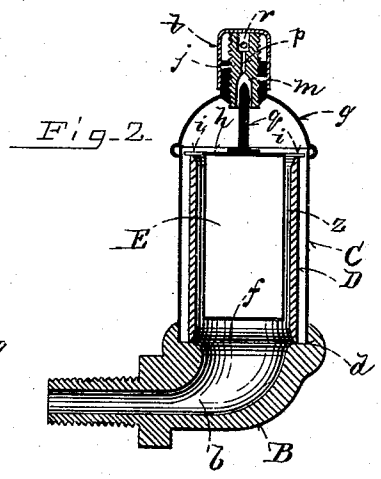

Fig-2.

Fig-3.

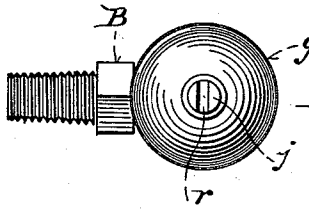

Fig-5.

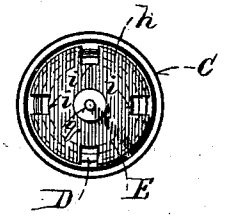

Fig-4.

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AUTOMATIC RELIEF-VALVE FOR RADIATORS.

SPECIFICATION forming part of Letters Patent No. 479,806, dated August 2, 1892.

Application filed February 29, 1892. Serial No. 423,191. (No model.)

To all whom it may concern:

Be it known that I, ALBERT S. HODGE, of Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Automatic Relief-Valves for Radiators, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved relief-valve, represented in position; Fig. 2, a central vertical section of the same; Fig. 3, a like view taken on line *x x* in Fig. 1; Fig. 4, a horizontal section taken on line *y y*, and Fig. 5 a top plan view of the cap removed.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates especially to a valve automatically actuated by the steam or water in a radiator for permitting the air to escape without the accompanying escape of the water or steam; and it consists in certain novel features hereinafter fully set forth and claimed, the object being to produce a simpler, cheaper, and more effective device of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the wall of the radiator, in which the screw-threaded nipple or base B of the valve-casing or shell is inserted. This brace comprises a casting provided with a duct *b* and having an interior annular rabbet or shoulder *d*, upon which the cylindrical shell C of the valve rests. The mouth of the duct *b*, opening into said body, is contracted or of the same diameter as the outer end of the duct *b*, the length of said mouth *f* being less than the diameter of the shoulder *d*, as shown best in Fig. 2. The cylinder C is disposed in vertical position on said shoulder, as shown, its upper end being closed by a dome-shaped top *g*, secured to the body by reaming and soldering.

Within the body and resting on the shoulder *d* there is a cylinder D of hard rubber or similar material, which will readily expand from the heat of the steam. Disposed within said rubber cylinder there is a metallic cylindrical float E. Said float is closed at both ends and is provided at its upper end with an annular laterally-projecting flange *h*, which rests on the top of the expansible cylinder D and supports the float therein. Said float fits loosely into the rubber cylinder, and the flange is provided with a series of notches *i*, (shown in Fig. 4,) which form air-passages from the interior of the rubber cylinder to the dome *g*. The dome *g* has disposed centrally in its top a screw-plug *j*, which may be adjusted vertically therein. Said plug is tapped centrally in its lower end, forming a cone-shaped valve-seat *m*. A port *p* opens through the apex of said seat and discharges through the top of the plug. A valve comprises a rod *q*, fixed centrally to the top of the float E and having its upper end cone-shaped to seat on said valve. The outer end of the plug is provided with a tool-slot *r*, whereby it may be adjusted vertically. A tight-fitting cap *t* covers the plug and is provided with vent-openings *v* for the escape of air, which passes through the valve.

In the use of my improvements the casting B is tapped into the radiator-tube A near its top. Steam being admitted to the radiator, the air therein is forced through the port *b* and passes between the float E and the expansible cylinder D, thence through the notches *i* in the float-flange *h*, and out through the valve at the top of the dome *g*. The pressure of the steam in the radiator increasing as soon as the air has escaped, as described, the heat thereof causes the rubber cylinder D to expand longitudinally, forcing the valve-stem *q* against its seat *m*, closing the port *p* and preventing the escape of steam. As the water of condensation in the pipe is frequently forced upward by the steam-pressure, should it pass into the body C it will cause the float to rise independently of the expanding cylinder D and close the valve *m*. By thus permitting the air to escape the throbbing or cracking noise incident to the admission of steam to the radiators is avoided. Moreover, the escape of water common

to the use of the ordinary petcock is prevented. By forming the mouth *f* of the port *b* so that it opens entirely within the cylinder D the steam is prevented from passing between said cylinder and the casing C, and has the additional effect of tending to elevate the float while the cylinder is expanded.

Having thus explained my invention, what I claim is—

1. A relief-valve mechanism for radiators, comprising a casing, a connection opening into the bottom thereof from the radiator, a tube of expansible material disposed around the mouth of said connection, a flanged float supported by said tube, having air-openings in said flange, a valve-seat in the top of said casing, and a valve on said float, adapted to engage said seat, all being arranged to operate substantially as described.

2. In a relief-valve for radiators, a cylinder of heat-expansible material disposed within the valve-casing around the inlet, a valve-seating in said casing, and a float secured to said valve and pendent within said cylinder, said float being so disposed that air expelled from the radiator may pass between it and said cylinder, substantially as described.

3. The connection B, provided with the duct *b*, a casing supported on said connection and provided with the relief-valve seat, a cylinder of expansible material disposed within the casing around the mouth of said duct, and a float pendent within said cylinder and bearing a valve adapted to engage said seat, substantially as described.

4. In a device of the character described, the connection, a casing provided with the adjustable plug *j*, and the valve-seat *m* and port *p*, in combination with the expansible cylinder and the pendent float therein bearing a valve adapted to engage said seat, all being arranged to operate substantially as described.

5. The connection and casing provided with the adjustable valve-seat, in combination with the hard-rubber cylinder D, and the float E, pendent therein and bearing a valve adapted to engage said seat, substantially as described.

6. The connection and casing provided with the adjustable valve-seat, in combination with the expansible cylind r D, and the closed float E, having the notched supporting-flange *h* and bearing a valve adapted to engage said seat, all being arranged to operate substantially as specified.

7. In a device of the character described, the connection and casing, in combination with the adjustable plug *j* in said casing, provided with the valve-seat and port, the expansible cylinder disposed around the inlet in said connection, the closed float E, disposed within said cylinder and provided with the flange *h*, having the notches *i*, and the valve *q* on said float, adapted to engage said seat, substantially as described.

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