No. 764,822. PATENTED JULY 12, 1904.

A. ROESCH.

AIR VENT.

APPLICATION FILED DEC. 8, 1902.

NO MODEL.

Fig. 1,

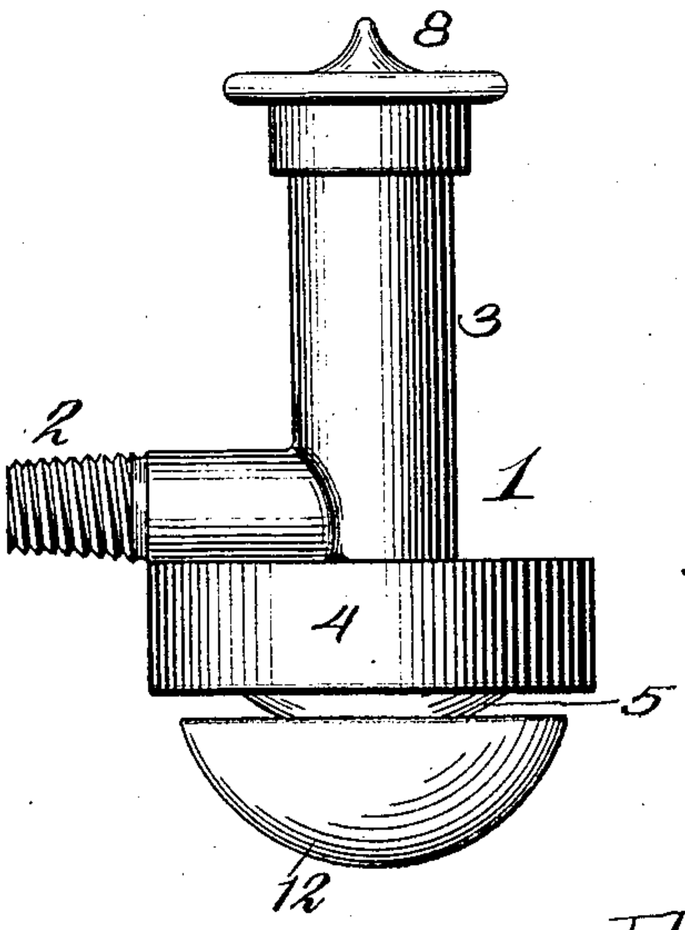


Fig. 2,

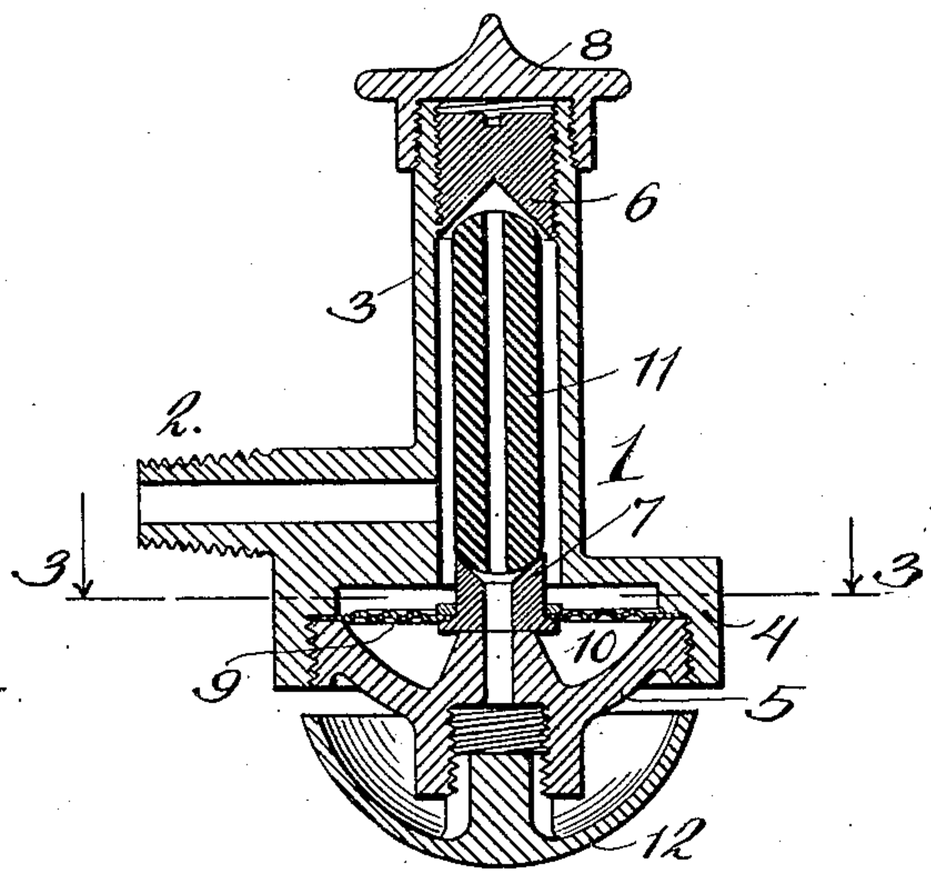
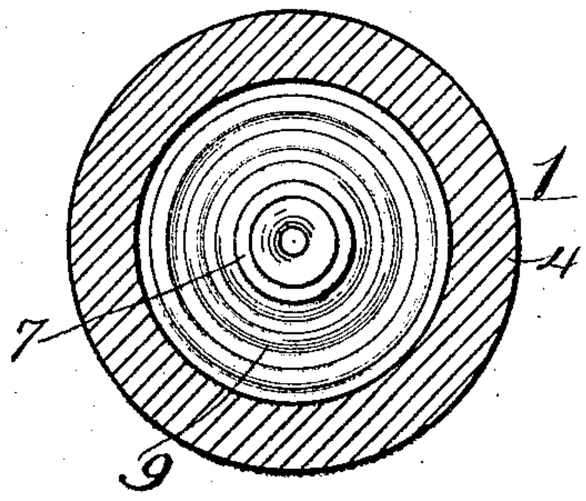


Fig. 3,



WITNESSES:

~~Harry Goss.~~

C. F. Carrington

INVENTOR

Alfred Roesch

BY

Chapin Maynard & Haible

his ATTORNEYS

No. 764,822. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

ALFRED ROESCH, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO DAVIS & ROESCH TEMPERATURE CONTROLLING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

AIR-VENT.

SPECIFICATION forming part of Letters Patent No. 764,822, dated July 12, 1904.

Application filed December 8, 1902. Serial No. 134,248. (No model.)

To all whom it may concern:

Be it known that I, ALFRED ROESCH, a citizen of the United States of America, and a resident of Bridgeport, county of Fairfield, State of Connecticut, have invented certain new and useful Improvements in Air-Vents, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to air-vents for heating systems, and particularly to air-vents adapted to be attached to radiators in steam-heating systems.

The class of air-vents to which my invention appertains are designed to permit the escape of air from the system, while preventing the escape of steam therefrom, and also to prevent the return of air into the system should a partial vacuum be formed therein upon the condensation of steam or otherwise.

My invention consists in an improved air-vent comprising a casing having two abutments, one of which contains a discharge-passage, a thermostatic member loosely disposed between the two abutments and adapted upon expansion to bear against both of the abutments, so as to close the discharge-passage, and a pressure-operated device engaging one of the abutments to move same to close the discharge-passage regardless of the relative expansion of the thermostatic member when atmospheric pressure overbalances the pressure within the system.

The objects of my invention are to simplify devices of this character and to render them more efficient, to so construct the device that warping or other abnormal distortion of the thermostatic member will not affect the successful operation of the device, and to so arrange and construct the parts as to reduce the possibility of a leakage of steam to a minimum.

My invention further consists in certain details of construction and combination of parts, as will be hereinafter more fully pointed out, and other advantages will appear hereinafter.

I will now proceed to describe an air-vent embodying my invention and will then point out the novel features in claims.

In the drawings, Figure 1 is a view in side elevation of an air-vent embodying my invention. Fig. 2 is a view of same in central vertical section. Fig. 3 is a view in horizontal section, the plane of section being taken upon the line 3 3 of Fig. 2.

In carrying out my invention I provide a casing 1, having an extension 2 at one side thereof by which the device may be secured to a radiator or other portion of the heating system, as may be desired, a tubular body portion 3, and a cylindrical base 4 of larger diameter than the body 3, and an inclosing cap or cover 5, secured by screw-threaded connection to the portion 4. The casing is provided with two abutments 6 and 7. The upper abutment 6 is preferably stationary with respect to the casing under normal conditions, but may be adjusted in position when the device is being initially set or is being adjusted by hand, so that it may operate at the desired temperature, and for this purpose is shown in the form of a separate plug screw-threaded into the tubular body portion 3. A cap 8 is provided completely inclosing the upper end of the casing, so as to protect the abutment 6 from accidental movement except at such times as it may be desired to manually adjust same.

The abutment 7 is here shown as fitted to a diaphragm 9, securely held between a shoulder in the cylindrical base 4 of the casing and the lower cover 5 thereof. This abutment 7 normally rests upon a hub 10, forming a part of the said cover 5. The abutment 7 contains a discharge-passage which is in register with a discharge-passage through the hub 10 in the cover 5.

A thermostatic expansion member 11 is loosely disposed between the two abutments 6 and 7—that is to say, it is not attached to either abutment, but is free to move longitudinally between them. This thermostatic expansion member is composed of a material, such as hard rubber, which has a high coeffi-

cient of expansion relatively to the casing. It is also here shown as being hollow—that is to say, it has a longitudinal perforation through it from one end to the other.

In the operation of the device the thermostatic member 11 performs the function of a valve-plug and one or both of the abutments valve-seats. So long as air is discharging from the system such air will be free to pass along the extension 2 into the tubular body 3 through the hollow thermostatic expansion member or valve-plug 11 and through the discharge-passages in the abutment 7 and the cover 5. A drip-cup 12 is secured beneath the discharge-passage in the cover 5, so as to catch any condensation from water-vapors or steam which may pass over with the air. After all the air has been discharged and steam enters the casing the rise of temperature occasioned thereby will cause the member 11 to expand sufficiently to bear against both the abutments and thereby to close connection between the interior of the casing and the external atmosphere.

Heretofore it has been common in this class of device to rigidly secure the thermostatic member to some part of the casing. The thermostatic member when made of hard rubber or similar material is very likely to warp or become distorted under the influences of variations of temperature. The thermostatic member so secured when warped would fail upon expansion to properly close the valve-seat with which it is arranged to engage, and air-vents have often failed to successfully operate after a while because of this defect. The thermostatic member of my present device, being loosely disposed between two abutments, will tend to seat itself regardless of any warping or similar distortion.

I have secured the abutment 7 to the diaphragm 9 in order that should the pressure within the system fall below atmospheric pressure the thermostatic member will still be caused to engage both the abutments, regardless of temperature, by the raising up of the abutment 7, due to the suction upon the diaphragm 9. By this I prevent a return of air into the system after admission of steam thereto has ceased and the steam remaining in the portion of the system open to the air-vent has condensed.

In addition to the advantages before recited it will be further noted that by my construction I am enabled to discharge to the bottom of the air-vent without providing any tubes or the like which are commonly employed to convey the discharging fluid from the top of the air-vent to the base, that my device is an extremely simple one comprising but very few parts, and that the liability of those parts to get out of order is reduced to a minimum.

I do not desire, of course, to be limited only to the precise details of construction and combination of parts herein shown and described, as the same are obviously capable of many modifications within the spirit and scope of my invention, and it will further be apparent that certain portions of my invention may be used with parts of other construction than herein shown and described.

What I claim is—

1. In an automatic air-vent for heating systems, the combination with a casing having two valve-seats, and an inlet-passage located between them, of a thermostatic expansion member comprising two oppositely-arranged valves, loosely disposed between said valve-seats, and adapted upon expansion to bear against, and close passage past, both of them.

2. In an automatic air-vent for heating systems, the combination with a casing having two abutments, one of which contains a discharge-passage, and an inlet-passage located between the two said abutments, of a valve-plug having a passage therethrough arranged to discharge through the said discharge-passage, said valve-plug composed of material having a higher coefficient of expansion than the casing, and loosely disposed between the two abutments and adapted upon expansion to bear against both of them.

3. In an automatic air-vent for heating systems, the combination with a casing having two valve-seats, and an inlet-passage located between them, of a member comprising two oppositely-arranged and connected valves, loosely disposed between said valve-seats, said casing and valve member composed of materials having different coefficients of expansion, whereby the relative expansion thereof, at certain temperatures, will cause the valves to engage their respective valve-seats and to close passage past same.

4. In an automatic air-vent for heating systems, the combination with a closed casing having a valve-seat opening to a discharge-passage, and an abutment against which a thermostatic expansion member may bear, said casing having an inlet-passage located between the valve-seat and the said abutment, of a thermostatic member comprising a valve-plug, composed of a material having a higher coefficient of expansion than the casing, loosely arranged between the abutment and the valve-seat, and adapted upon expansion to bear against the abutment and press the said valve against its seat, said valve-plug having a passage therethrough adapted to discharge through the discharge-passage in the valve-seat and to close the said discharge-passage and the passage through itself when in engagement with the said abutment and said valve-seat.

5. In an automatic air-vent for heating systems, the combination with a casing having two oppositely-disposed valve-seats, one of which communicates with a discharge-opening, and an inlet-passage located between

them, of a valve-plug having a passage therethrough arranged to discharge through said opening, composed of a material having higher coefficient of expansion than the casing, loosely disposed between the two valve-seats, and adapted upon expansion to coact with both valve-seats.

6. In an automatic air-vent for heating systems, the combination with a casing having a movable diaphragm and two abutments, one of which is movable with said diaphragm and has a discharge-passage therethrough, and having a stationary hub upon which the movable abutment is adapted to seat itself in its rearward position, of a thermostatic expansion member comprising a valve loosely disposed between said abutment, substantially as and for the purpose set forth.

7. In an automatic air-vent for heating systems, the combination with a closed casing 1 having a diaphragm 9, a closed abutment 6, an abutment 7 secured to the diaphragm and having a discharge-passage therethrough, and an inlet between said abutments, and having a hub 10 at the rear of said diaphragm and movable abutment, said hub having a discharge-passage therethrough arranged to register with the discharge-passage through the abutment 7, of a thermostatic expansion member 11 comprising a hollow valve-plug having a passage therethrough arranged to discharge into the discharge-passage in the abutment 7, loosely disposed between said abutments, and a drip-cup 12 secured beneath the said hub, substantially as set forth.

ALFRED ROESCH.

Witnesses:
WILLARD WADSWORTH,
JOSEPH T. WADSWORTH.