

No. 842,606

PATENTED JAN. 29, 1907.

E. P. ALLEN.
AIR VENT VALVE.
APPLICATION FILED MAY 19, 1902.

Fig. 2.

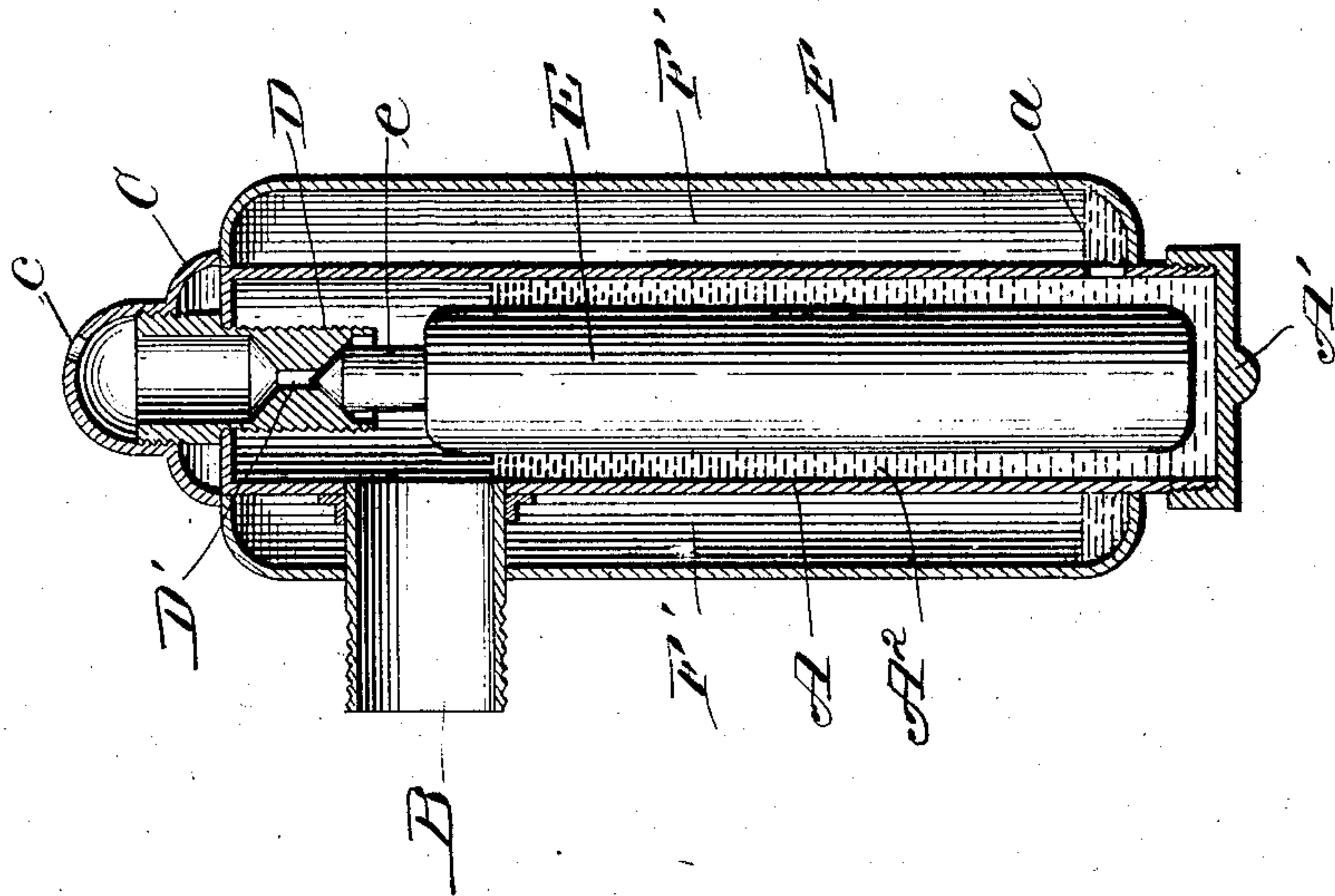
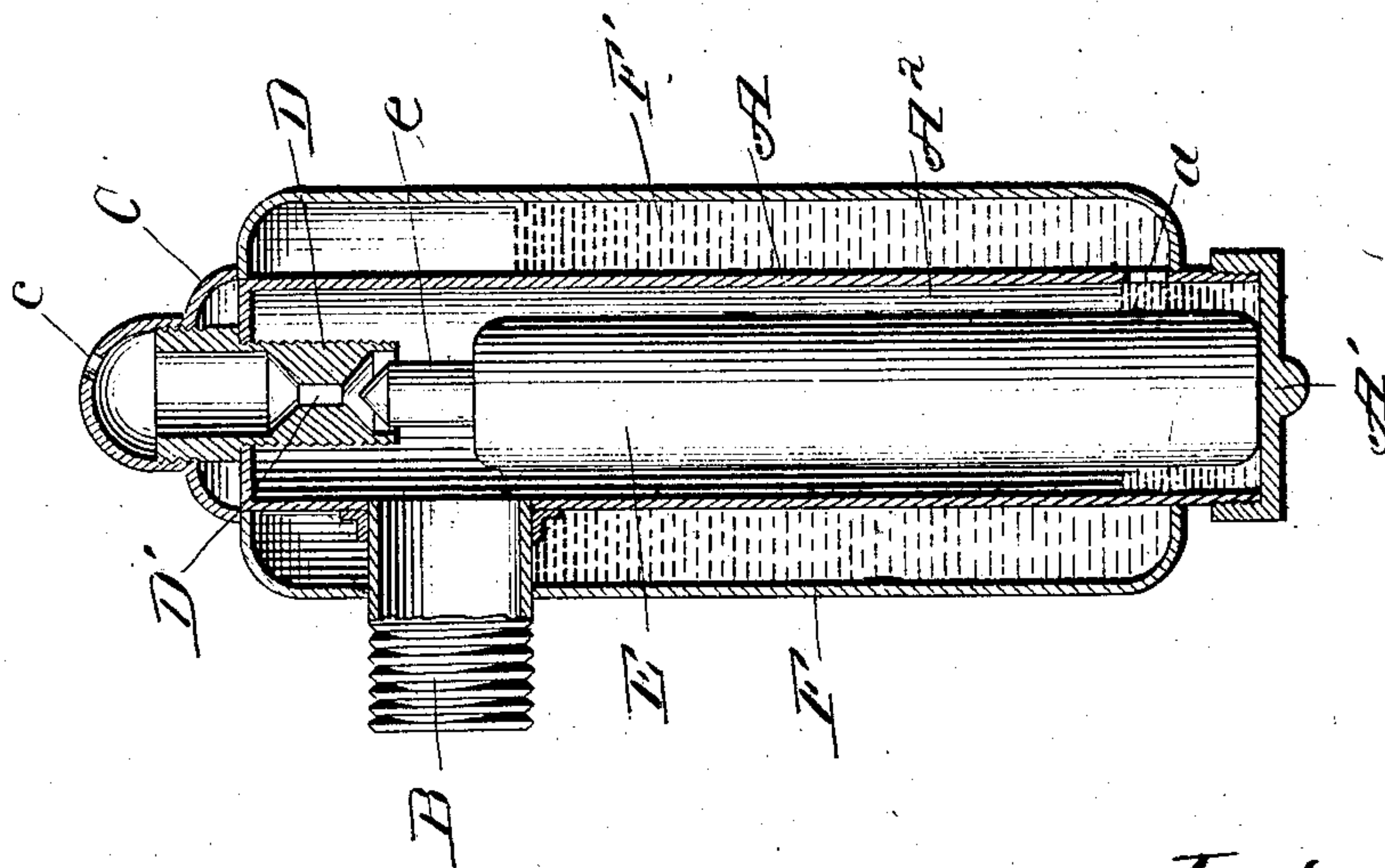


Fig. 1.



Witnesses:

H. S. Gaither

Clara C. Cunningham

Inventor:

Everett P. Allen

By *Lambert & Wilkinson*
Attorneys.

UNITED STATES PATENT OFFICE.

EVERETT P. ALLEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO ROMEO M. WILBUR, TRUSTEE, OF CHICAGO, ILLINOIS.

AIR-VENT VALVE.

No. 842,606.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed May 19, 1902. Serial No. 108,017.

To all whom it may concern:

Be it known that I, EVERETT P. ALLEN, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have
5 invented a certain new and useful Improvement in Air-Vent Valves; and I declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the production of an air-vent valve for use more particularly on radiators and steam and hot-water systems generally; and it consists in the combination of devices and appliances hereinafter described and claimed.

20 In the drawings, Figure 1 is a vertical section of the valve with the float in its lower position, and Fig. 2 is a corresponding view with the float in its upper position.

In carrying out the invention A represents a suitable casing to which is engaged the inlet-nipple B, provided with screw-threads,
25 whereby it may be suitably secured to the radiator or other part of the system which it is desired to vent. In the upper end of the casing is a fitting D, having the outlet-port
30 D'. Engaging the upper end of the fitting is a cap C, having a vent-orifice c.

E is the float, provided on its upper end with the valve e, adapted to close the outlet-port D'. This float is preferably what is
35 known in the art as a "closed" float—that is, it is not raised by the expansion of air in or adjacent to the float, but is raised by what is known in the art as "flotation," and while I prefer to make it a sealed shell, as shown, it
40 might be made in other forms.

A' is a cap engaged, preferably, by screw-threads to close the lower end of the casing A. Surrounding the casing A is a casing F, forming, together with the wall of the casing A,
45 what I will hereinafter term the "air-chamber" F'.

a is a port connecting the lower end of the air-chamber with the float-chamber A²,
50 formed by the casing A, in which the float is located.

The operation of the valve will now be understood. The valve is secured to the radiator in the usual manner by screwing the part B into the ordinary interiorly-screw-threaded

hole in the wall of one of the radiator-coils. 55
No water need be placed in the valve prior to securing it to the radiator, and consequently when the valve is rotated to secure the same to the radiator there is no danger of water
60 flowing therefrom either to injure any objects or to interfere with the operation of the valve. After applying the valve to the radiator the float rests by gravity upon the cap A', leaving the outlet D' open for air to be ejected
65 from the system by the heating medium, such as steam. After the air has been ejected the accumulation of water of condensation within the float-chamber A² lifts the float E and causes the valve e to close the
70 outlet D', so that the escape of the heating medium ceases. The air within the chamber F' is expanded by the heating medium and a part thereof passes through the port a. When the heating medium is cut off from
75 the radiator, the air within the chamber F' becomes cool and by contraction is reduced in volume, so that the water within the float-chamber A² is drawn from such chamber into the lower portion of the air-chamber, as
80 shown in Fig. 1. The withdrawal of the water from the float-chamber permits the float to fall from the position shown in Fig. 2 to that shown in Fig. 1, thereby opening the
85 outlet D'. Upon the heating medium being again admitted to the radiator it drives the air out of the outlet D'; but such outlet is closed after the expulsion of the air by the
90 expansion of the air within the chamber F', due to the heat imparted thereto from the heating medium. The expansion of air within the chamber F' forces the water from
95 the lower part of such chamber through the port a into the float-chamber A² and raises the float, so that the valve e will close the outlet D'. If the water within the lower part of
100 the air-chamber F' is more than sufficient to reach the level shown in Fig. 2, the excess water returns to the system, and if the expansion of the air within the chamber F' causes its volume to exceed the space within
105 such chamber the surplus air passes through the port a. The float-chamber A² and air-chamber F' are so related in size that the contraction and expansion of the air within the air-chamber will so vary the level of the water within the float-chamber as to raise and lower the float, and thereby open and close the valve.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents, as circumstances may suggest or render expedient without departing from the spirit of my invention.

What I claim is—

10 1. In an automatic vent-valve, the combination with a hollow casing, having an inlet leading directly thereto from the radiator, above the line of flotation thereof, and an outlet leading therefrom, the portion of said casing below the inlet forming a float-chamber, of a float located within said float-chamber and adapted to control said outlet, and an air-chamber in communication with said float-chamber near the bottom thereof, said chamber arranged to be heated by the heating medium from the radiator.

2. In a valve, the combination with a casing having an inlet leading thereinto near the top thereof, and an outlet leading therefrom, of a closed float located within the casing below the inlet and adapted to open and close said outlet, and an air-chamber closed at its top and communicating with the casing at a point below said inlet.

30 3. In a valve, the combination with a casing having an inlet leading thereinto near the top thereof and an outlet leading therefrom, of a closed float located within the casing below the inlet and adapted to open and close said outlet, and an air-chamber closed at its top extending from a point adjacent to the inlet and communicating near the bottom thereof with said casing.

4. In a valve, the combination with a casing having an inlet leading thereinto above the bottom thereof and an outlet leading therefrom, of a closed float located within the float-chamber formed by the casing below the inlet and adapted to open and close the outlet, and an air-chamber closed at its top located concentrically with respect to said

casing and extending from a point adjacent to the inlet and communicating near its bottom with the interior of the casing.

5. In a valve, the combination with a casing having an inlet leading thereto and an outlet leading therefrom, of a float within said casing adapted to open and close the outlet, and an air-chamber surrounding said casing, said chamber being closed at its top and communicating with the casing at a point adjacent the lower end of said float.

6. In a valve, the combination with a casing having an inlet leading thereto and an outlet leading therefrom, of a float within said casing adapted to open and close the outlet, and an air-chamber concentrically surrounding said casing, said chamber being closed at its top and communicating with the casing at a point adjacent the lower end of said float.

7. In an automatic vent-valve having an inlet and an outlet, the combination with a closed float for controlling the outlet, of a casing forming a float-chamber within which said float is located, a second casing surrounding and spaced apart from the first casing to form an air-chamber between said casings, means for uniting the upper ends of said casings thereby closing the air-chamber at its top, said first casing having a port adjacent its lower end through which said float and air-chambers communicate.

8. In an automatic vent-valve having an inlet and an outlet, the combination with a float for controlling the outlet, of a float-chamber within which said float is located, an air-chamber closed at its top and surrounding said float-chamber, said chambers being in communication adjacent their lower ends.

In testimony whereof I sign this specification in the presence of two witnesses.

EVERETT P. ALLEN.

Witnesses:

H. S. GAITHER,

CLARA C. CUNNINGHAM.