(No Model.)

J. R. PIDCOCK.

AUTOMATIC AIR VALVE.

No. 512,660. Patented Jan. 9, 1894.

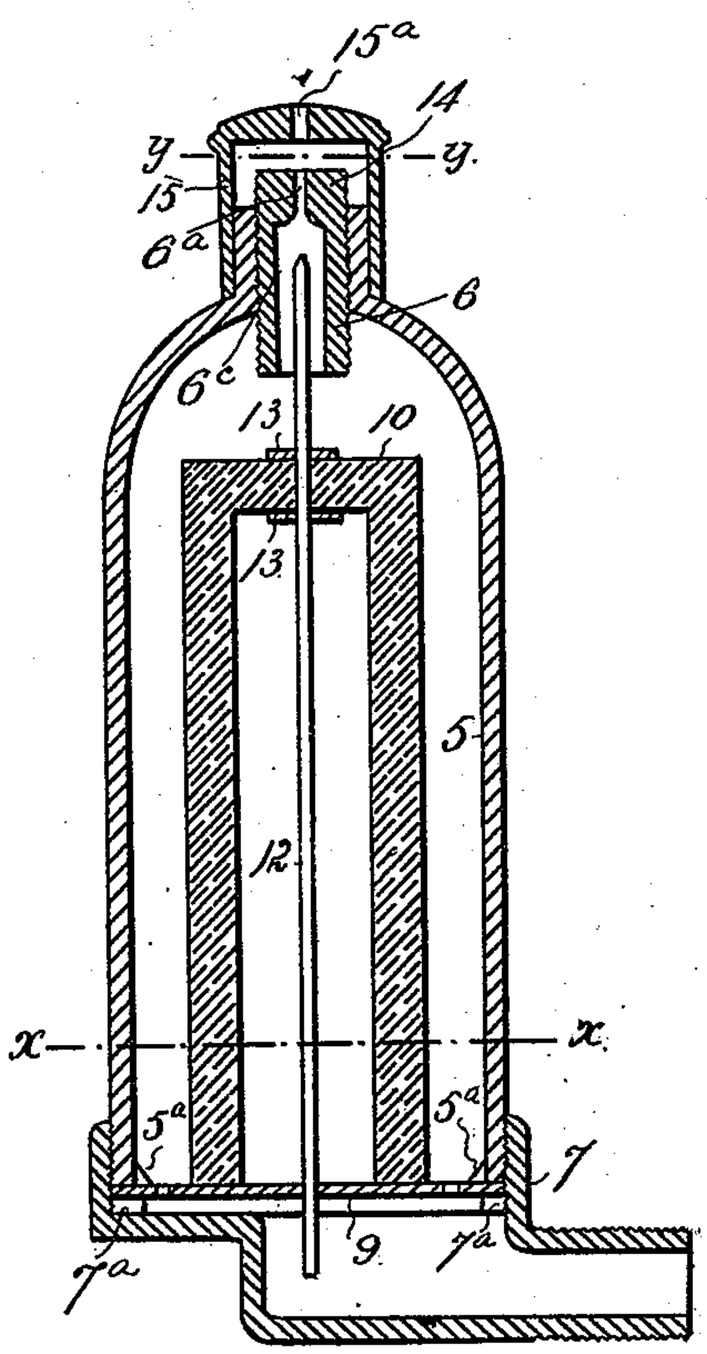

Fig. 1.

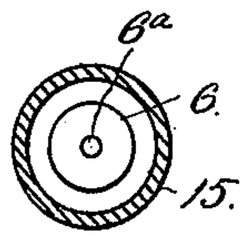

Fig. 3.

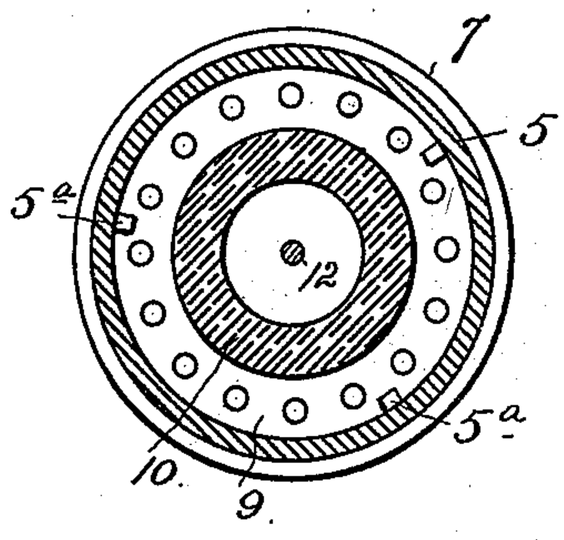

Fig. 2.

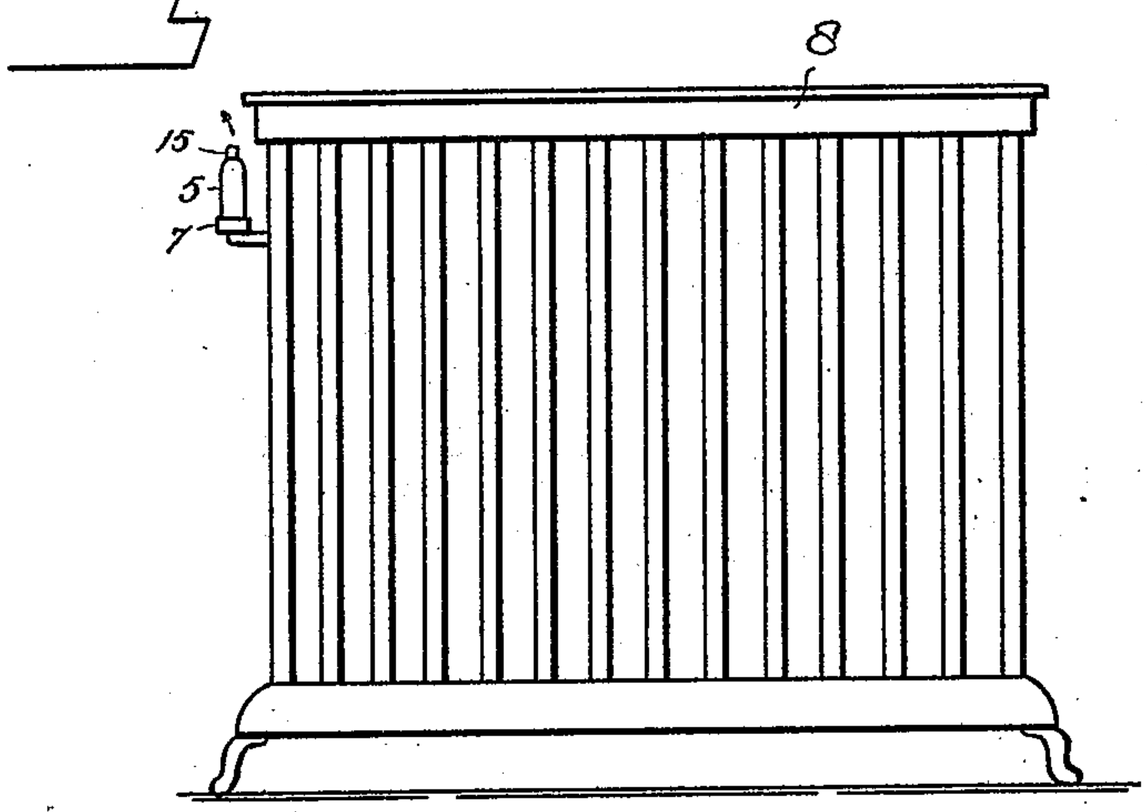

Fig. 4.

WITNESSES:

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JOHN R. PIDCOCK, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO FRANK H. LARIMER, OF SAME PLACE.

AUTOMATIC AIR-VALVE.

SPECIFICATION forming part of Letters Patent No. 512,660, dated January 9, 1894.

Application filed May 12, 1893. Serial No. 474,047. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. PIDCOCK, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Automatic Air-Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in automatic air-valves for the radiators of steam and hot water heating systems.

My improved device consists of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a longitudinal section taken through the device. Fig. 2 is a horizontal section taken on the line *x*—*x*, Fig. 1. Fig. 3 is a similar section taken on the line *y*—*y*, same figure. Fig. 4 shows the device attached to the radiator.

Similar reference characters indicate corresponding parts or elements in the several views.

The numeral 5 designates the shell of the device which is open at both ends. Its lower extremity is screwed into the hollow socket 7 which is threaded to enter a suitable aperture formed in one of the pipes of the radiator 8. The upper extremity of the shell is reduced in size and interiorly threaded to receive the screw plug 6 which is apertured as shown at 6^a to permit the escape of air from the interior of the shell. In the bottom of the socket 7 is located the perforated air distributing disk 9 supported upon short lugs 7^a. The shell 5 is screwed to engagement with this disk and is provided with interior projections 5^a which maintain the disk securely in place. These projections are employed in case the disk should be so small that the thin edge of the body of the shell would not form a sufficient bearing surface to hold it in place properly. Upon this air distributing disk 9 is located the hollow expansible float 10 open at the bottom and carrying a stem 12 which passes through its longitudinal center and is attached to its top by small metal plates 13 secured to its outer and inner surfaces, whereby the metal pin or stem is held securely in place. The float is preferably formed of hard rubber and the object of these plates is to prevent the possibility of the stem's becoming loose or movable upon the float by reason of the expansion and contraction of the latter. These plates have sufficient surface to permit of their being soldered fast to the float, and the metal stem may then be secured to the plates in the same manner. The stem 12 projects above the top of the float into the enlarged recess 6^c, and its upper extremity is cone-shaped or pointed, forming a valve adapted to engage the seat 14 located between the aperture 6^a and the recess 6^c, and thus cut off the escape of water or steam from the air exit 6^a. The lower extremity of the stem projects below the bottom of the float and passes through a central aperture formed in the air distributing disk. This lower part of the stem extends through the disk far enough to form a guide for the float, preventing lateral displacement as it fluctuates or moves up and down in the performance of its function. The top of the shell is provided with a cap 15 which fits tightly thereon and is provided with an aperture 15^a in its top to permit the escape of air.

The air distributing disk is provided with a row of perforations located between the float 10 and the shell 5; hence as the air driven by the steam or hot water passes upward from the pipes, it escapes through these perforations in the disk and passes upward around the float and out by the way of aperture 6^a of the screw and 15^a of the cap. This construction and arrangement of the air distributing disk with reference to the float are designed to prevent the air from acting on the float and raising the same sufficiently to close the valve before the cold air has all escaped from the pipes, as is the case with some valves of this class.

After the air has been expelled from the pipes, the hot steam expands the float sufficiently to close the valve formed by the upper extremity of the stem 12 if it is a steam heating system, while if it is a hot water sys-

tem, the float rises with the water and accomplishes the same purpose, thus preventing the escape of the steam or the water as the case may be, through the air exit aperture.

Having thus described my invention, what I claim is—

1. In an automatic air-valve for the radiators of steam and hot water heating systems, the combination of the shell, the socket into which the bottom of the shell is screwed, the apertured screw plug inserted in the reduced upper extremity of the shell, the perforated air distributing disk 9 resting upon lugs formed in the socket and held in place by the shell which is screwed to engagement with the disk, the hollow float open at the bottom, closed at the top and resting upon the disk 9, whose perforations are located between the shell and the float, the latter being provided with a stem extending through its longitudinal center, the top of the float being apertured to receive the stem to which are attached two small metal plates engaging both surfaces of said top, the stem projecting above the float into a recess in the screw plug and below the float, into a central aperture formed in the disk 9 substantially as described.

2. In an automatic air-valve, the combination of the shell, the socket into which the shell is screwed, the air distributing disk resting on the socket and held in place by the shell which is screwed to engagement therewith, and the hollow float carrying a stem which forms a valve above, and a guide below, its lower extremity entering a central opening formed in the disk, the perforations in the disk being located below the shell and the float, which, when engaging the disk is thereby closed at the bottom against the entrance of air, substantially as described.

3. In an automatic air-valve, the combination of the shell, the socket and the hollow float open at the bottom, closed at the top and provided with a stem passing through its longitudinal center and projecting from both extremities thereof, the upper projection forming a valve, and the lower projection, a guide, the stem being provided with two metal plates engaging both the inner and outer surfaces of the top of the float, whereby the stem is held securely in place, and a disk located in the bottom of the casing and provided with a central aperture, which the projecting extremity of the stem engages, substantially as described.

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

JOHN R. PIDCOCK.

Witnesses:
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