

(No Model.)

J. L. JUDG.

AIR VALVE FOR RADIATORS.

No. 394,860.

Patented Dec. 18, 1888.

Fig. 1.

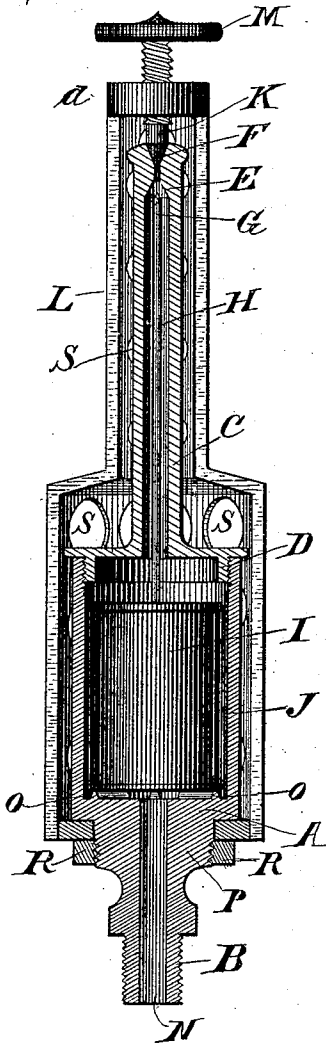
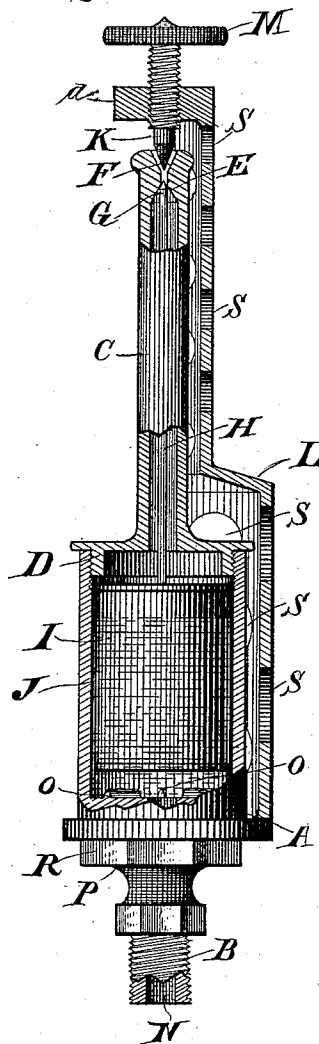


Fig. 2.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## AIR-VALVE FOR RADIATORS.

SPECIFICATION forming part of Letters Patent No. 394,860, dated December 18, 1888.

Application filed October 15, 1887. Serial No. 252,412. (No model.)

### *To all whom it may concern:*

Be it known that I, JAMES L. JUDG, of Kenosha, in the county of Kenosha and State of Wisconsin, have invented new and useful Improvements in Air-Valves for Radiators; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in air-escape valves for steam-heating radiators.

The object of my invention is to provide an automatic valve which will permit the escape of air from a radiator when the steam is turned on, but will automatically close as either steam or water enters it, thus preventing the escape of both steam and water.

The construction of my invention is explained by reference to the drawings, in which—

Figure 1 represents a longitudinal vertical section through the valve-case and a front view of the valve-supporting bracket. Fig. 2 represents a side view, part in section.

Like parts are represented by the same reference-letters in both views.

A is the valve-case, which is attached by the screw-threaded sleeve B to the upper part of a radiator. The case A is provided with an elongated neck, C. The neck C is secured to the case A by a screw-threaded flange, D. The upper end of the neck C is provided with two valve-seats, E and F. The valve-seat E is closed by the valve G, which is formed on the upper end of the valve-rod H. The lower end of the valve-rod H is affixed to a float, I, which is adapted to move a slight distance upward and downward in the chamber J of the case A. Thus as water accumulates in the radiator from the condensation of steam therein it buoys up the float I, thereby closing the valve G and preventing the escape of water from the chamber J, as it would otherwise do. The valve-seat F is adapted to be closed soon after the admission of steam into the radiator by the expansion of the case A and neck C, by which expansion the valve-seat F is brought in contact with the adjustable valve K. The valve K is adjustably supported above and partially within the valve-seat F from and by

the valve-supporting bracket L. The bracket L is made semi-cylindrical in shape, and is larger at its lower end to conform to the shape of a float-chamber, J, and is contracted at its upper end to conform to the shape of the contracted neck C of the valve-chamber, and is provided with numerous apertures, S, which permit of the circulation of air through it, and the same is preferably made of iron or other metal of less expansibility than the valve-case A, while the valve-case A is preferably made of brass or other metal of greater expansibility than the bracket, whereby by the excess of expansion and contraction of the valve-case over that of the supporting-bracket said valve-seat F is opened and closed. The valve K is adjusted higher or lower in the forward-projecting flange *a* of the bracket L, according to the length of contraction and expansion of the valve-case, by turning the hand-screw M.

Thus it is obvious that when the steam is turned off the valve-case A will, as it becomes cool, contract, thus causing the valve-seat F to be drawn away from the valve K, whereby the valve is opened and air is permitted to enter the radiator through the valve-case A and steam-passage N, when by the cooling and condensation of the steam water accumulates in the radiator. When steam is again turned on, the water in the radiator, which might thereby be forced through the valve-case and from thence into the room; is arrested in its upward movement through the case by the float I, which float is raised by the buoyancy of the water as it enters the chamber J, thereby raising the valve G and closing the valve-seat E, thus preventing the possibility of the water escaping before the case A has been heated by the influx of steam, and consequently before the valve F has been closed by the expansion of the case A. When, however, the steam has entered sufficiently to displace the water in the chamber J and to expand the case A, the valve F will close, thus preventing the escape of steam after the float I has dropped back to the bottom of the chamber J. Thus it will be seen that by the use of the float and expansible valve-chamber I am enabled to permit the free escape of air without permitting the escape of either steam or water.

The lower end of the case A is provided with

upward-projecting flanges O, which support the float slightly above the upper extremity of the steam-passage N, thus preventing the float from closing said steam-passage. The valve-supporting bracket L is affixed at its lower end to the lower end of the valve-case A upon the shoulder P, and is held in place by the nut R.

The valve-supporting bracket L is preferably provided with apertures S, which permit the free circulation of air through it, thus preventing it from becoming heated to so high a degree of temperature as it otherwise would, whereby the difference in expansibility of the valve-case A and its supporting-bracket is increased, and the valves are thereby rendered more sensitive to the action of heat and cold and are more positive in their action than they would otherwise be when controlled by supports of the ordinary construction.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In an air-valve for radiators, the combina-

tion of an enlarged float-receiving chamber, J, elongated neck C, of less diameter than said chamber J, provided at its extreme upper end with two opposing valve-seats, E and F, at the respective ends of the air-escaping aperture of said neck C, valve-controlling float I, located in the chamber J, valve-stem H, affixed to said float I and extending upward within said neck C, and provided at its upper end with a valve, G, adapted by the buoyancy of the float to close said lower valve-seat, E, adjustable steam-valve K, and valve-supporting bracket L, affixed at its lower end to the lower end of the float-receiving chamber J and extending upward to and supporting said valve K above the upper valve-seat, F, formed in said neck C, all substantially as and for the purpose specified.

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

JAMES L. JUDG.

Witnesses:

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