(No Model.)

E. K. ROLLINS.

AIR VALVE FOR RADIATORS.

No. 350,844. Patented Oct. 12, 1886.

Fig 1.

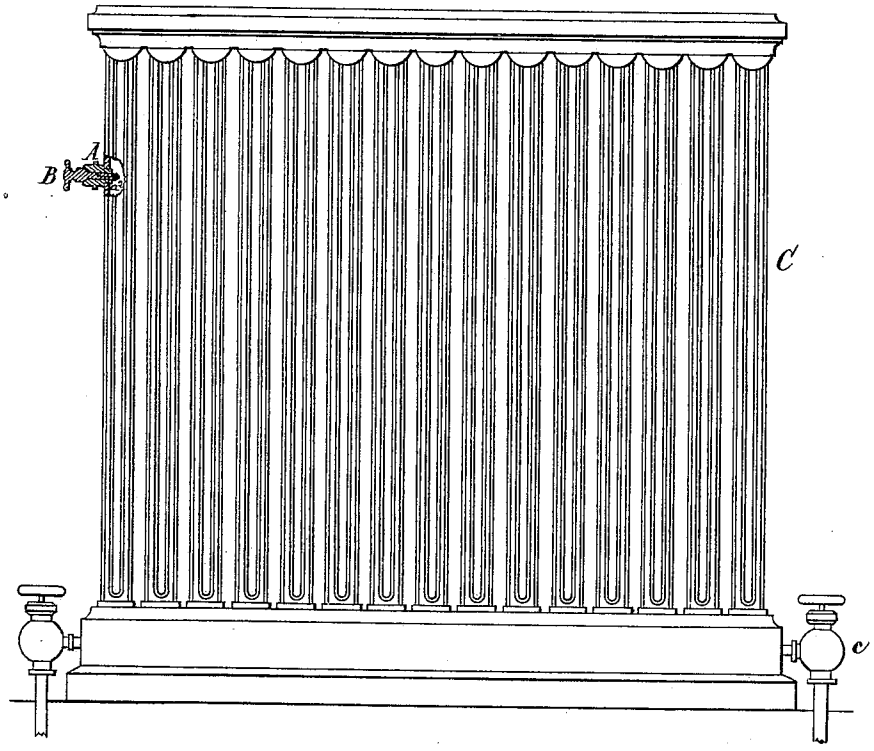


Fig 2.

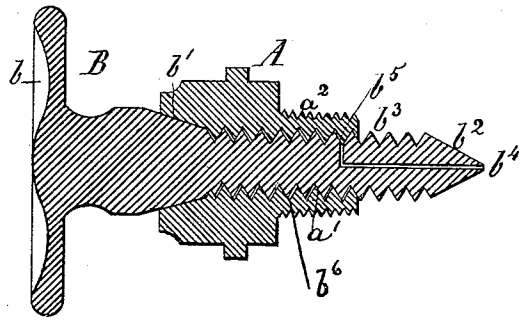
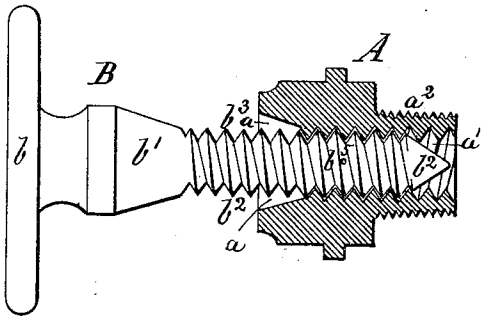


Fig 3.



Witnesses:
J. P. Theo Lang.
Robt L. Fenwick.

Inventor:
Edward K. Rollins
by his attorneys
Mason Fenwick & Lawrence

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

EDWARD K. ROLLINS, OF SCRANTON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ALEXANDER E. HUNT, OF SAME PLACE.

AIR-VALVE FOR RADIATORS.

SPECIFICATION forming part of Letters Patent No. 350,844, dated October 12, 1886.

Application filed March 30, 1886. Serial No. 197,161. (No model.)

To all whom it may concern:

Be it known that I, EDWARD K. ROLLINS, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain 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 the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to valves employed on steam-radiators for the purpose of exhausting air which accumulates therein when the steam is shut off and condensation of the steam within the radiator takes place; and it consists, first, in the combination, with a radiator, of an air-valve provided with an escape-passage which is helical for a portion of its length, and which permits the air to pass out very gradually, and thereby prevents a sudden flow of supply-steam toward the point where the air is escaping; second, in an air-valve comprising a valve-seat body having a valve-seat surface and inner screw-thread, a valve-body having a valve-surface and a shank with outer screw-thread, a helical air-passage between said threads, and a longitudinal air-duct beginning at or near the end of said screw-threaded shank, extending partly the length thereof, passing out sidewise and communicating with the helical air-passage which leads to the valve-seat, and therefrom out into the atmosphere when the valve is open.

By my invention provision is made for conducting the air along the screw-threads of the valve, and thus a very slow and gradual discharge of air from the radiator is effected, and consequently a gradual natural flow of supply-steam up and down the successive looped pipes of the radiator produced, instead of having the supply-steam shoot directly across the base of the radiator, leaving the pipes filled with air instead of steam, and also avoiding the forcing of the water of condensation out at the air-vent.

In the accompanying drawings, Figure 1 shows my invention in section and as applied to a steam-radiator, which also is shown partly in section and in elevation. Fig. 2 is a longitudinal central section of my improved air-valve closed and detached from the radiator; and Fig. 3 is a view showing the valve-seat in section and the valve in elevation, the parts being in an open position.

The letter A in the drawings represents a valve-seat body having an inner conical valve-surface, a, inner forward screw-thread, a', and an outer forward screw-thread, a^2, by means of which latter it is attached to the radiator C, as seen in Fig. 1.

B is a valve-body, consisting of a suitable handle, b, conical valve-surface b', and a shank, b^2, with a screw-thread, b^3. The conical valve-surfaces a and b', when together, form a perfect air-tight valve-joint. The screw-threads a' and b^3 are fitted to work together in a slight degree less snugly than commonly, in order to afford a very slight helical escape passage-way, b^6, between the respective threads, as shown. The helical passage-way b^6 thus provided for outward escape of air from the steam-radiator is connected with a longitudinal passage-way, b^4, in the shank b^2 by means of a lateral passage, b^5. The passage b^4 begins at the forward end of the shank and terminates at a suitable distance therefrom, as indicated at b^5, in the threaded surface b^3 of the valve B, as is seen in Figs. 2 and 3.

When the radiator provided with my air-valve has become charged with steam, the air-valve is closed, as in Fig. 2, and when the heat of the radiator is to be lowered the steam is cut off by the valve c, provided for that purpose, and the steam remaining on the inside of the radiator condenses, and the vacuum thus created is gradually filled with air, and when the steam is again let on at c the air-valve is opened, in order to allow the said air to escape. This escape of the air from the radiator has thus far not been as perfectly accomplished as desired, inasmuch as many of the valves constructed for that purpose do not enable the operator to so adjust the area of the escape-passage as that a sudden rush of steam from the valve c to the air-valve can be prevented, and owing to this as regular and uniform a circulation of the steam throughout the loops of the radiator as is desirable has not been effected.

In my invention the air, after having moved through the direct passage-way b^4 b^5, has to follow the minute space b^6 between and around

the screw-threads a' b^3 and overcome the friction, which is very considerable, owing to the close position of the inner helical surfaces of the said minute space. Thus by unscrewing the valve-body B slightly out of the valve-seat body A the air leaving the opening b^5 will have to follow this minute space around the screw-threads a' b' many times around the shank b^2, the length of which space laid out upon a straight line would exceed the length of the whole valve-body, and with every backward turn of the valve-body the length of this air-passage is shortened to the amount of length equal to the circumference of the shank. It can easily be seen to what degree of accuracy the operator can readily adjust the escape of air from the radiator, and how speedily he can operate my air-valve without the danger of causing the steam to rush through the base of the radiator toward the air-valve.

With my air-valve judiciously operated, the entering steam will preserve its consistency in the radiator by gradually filling the heating-tubes and crowding the air before it in an undivided body until it has entirely left the radiator.

What I claim is—

1. The combination, with a steam-radiator, of an air-valve provided with an escape-passage which is helical for a portion of its length, substantially as and for the purpose described.

2. An air-valve comprising a valve-seat body, A, having an inner screw-thread, a valve-body, B, having a valve-surface, b', and shank with outer screw-thread, a helical air-passage between said screw-threads, and an air-duct, as b^4 b^5, connected with the helical passage, substantially as and for the purpose described.

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

EDWARD K. ROLLINS.

Witnesses:
MILO J. WILSON,
F. PARTRIDGE.