(No Model.)

G. H. NOYES.

AIR VALVE FOR STEAM RADIATORS.

No. 437,616. Patented Sept. 30, 1890.

Fig. 1.

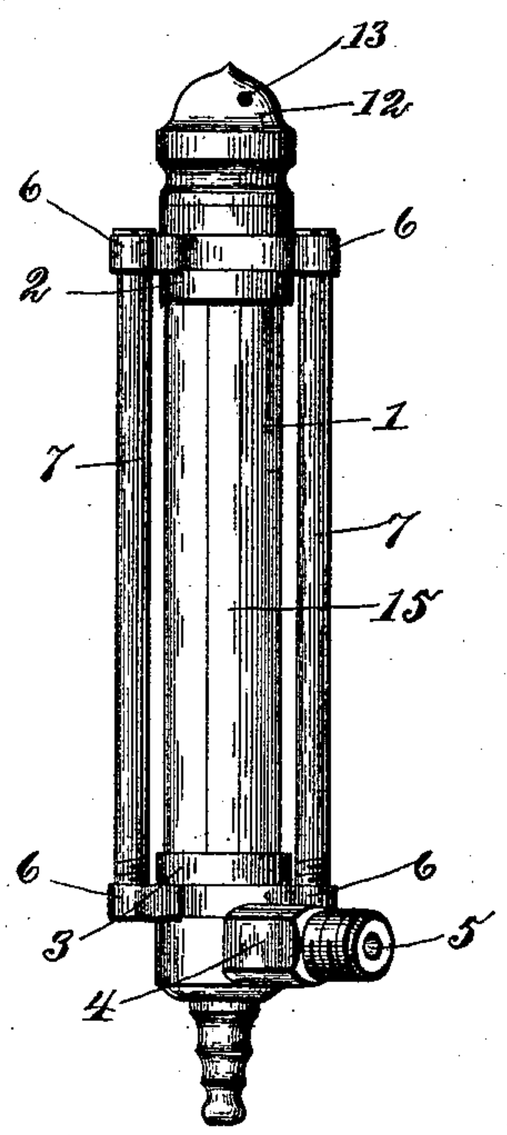
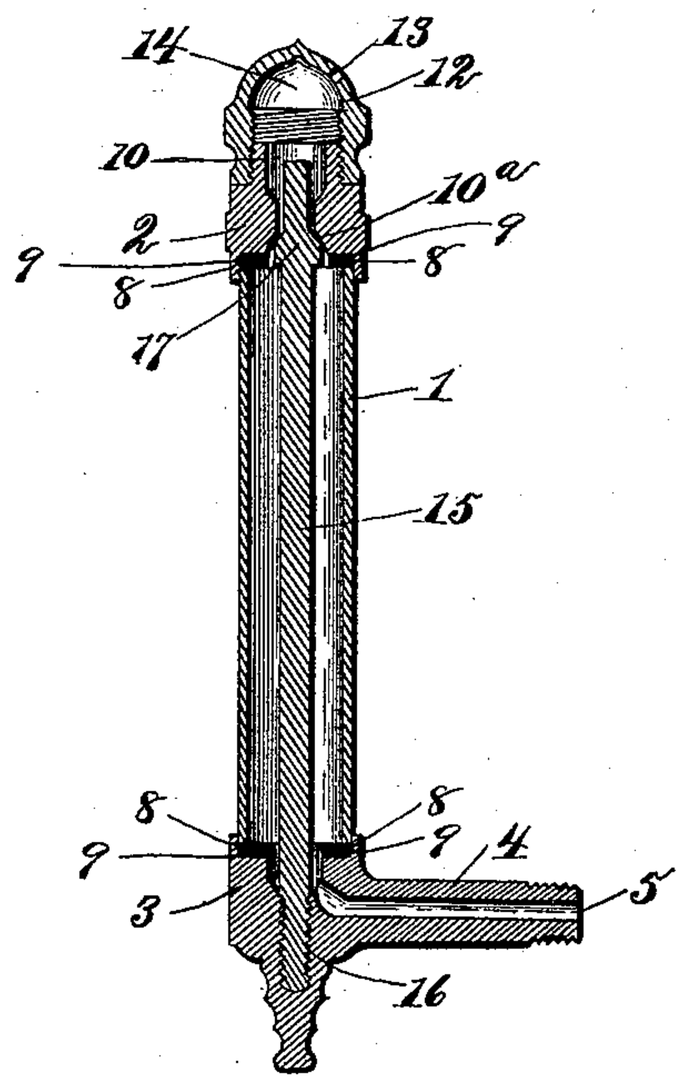


Fig. 2.



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GEORGE H. NOYES, OF EASTON, PENNSYLVANIA.

AIR-VALVE FOR STEAM-RADIATORS.

SPECIFICATION forming part of Letters Patent No. 437,616, dated September 30, 1890.

Application filed March 4, 1890. Serial No. 342,567. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. NOYES, a citizen of the United States, and a resident of Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Air-Valves for Steam-Radiators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in air-valves for steam-radiators, which valves are opened and closed by the contraction and expansion of the material of which they are composed, due to the changes in the temperature thereof.

Heretofore an air-valve for steam-radiators, operated automatically by the admission of steam into the radiator, has been constructed, the same consisting in arranging within one of the steam-pipes a perforated diaphragm, in which is mounted a rod carrying a valve which is moved to and from its seat by the expansion or contraction of the said rod. This construction is objectionable, in that the steam-pipe inclosing the valve-rod being of a heat-conducting material, a portion of the heat from the radiator which should be utilized in heating the valve-rod is lost by radiation and the action of the valve-rod rendered less sensitive. It is therefore essential that the valve-rod should be very quick and sensitive in its action, so as to operate as soon as the air has been expelled from the radiator and the chamber surrounding the valve-rod filled with steam, thus avoiding the "spitting" at the vent-opening, which is not only an annoyance, but is liable to damage furniture, carpets, and other materials or objects in the room.

The above and other defects are obviated by my invention, which consists in the novel features of construction and new combinations of parts, hereinafter fully described, and specifically defined in the claims.

In the accompanying drawings, Figure 1 is a side elevation of an air-valve for steam-radiators, constructed according to my invention. Fig. 2 is a vertical sectional view of the same.

In the said drawings, the reference-numeral 1 designates a tube made of a less expansive and a better non-conducting material than metal, preferably glass, and is connected at its ends with the top and bottom caps 2 and 3. The bottom cap 3 has an extension or arm 4, provided with an aperture 5, leading into tube 1. At its outer end this arm 4 is screw-threaded, so as to be connected with a steam-radiator. Each of these caps is provided with a series of lugs 6, having screw-threaded apertures in which fit the screw-threaded ends of the tie-rods 7, which connect the caps together. These caps are also provided with annular grooves or recesses 8, which receive the ends of the tube 1, and interposed between said ends and the caps are asbestus washers 9, which are non-conductors of heat. The cap 2 is provided with a central recess 10, forming a passage for the valve-rod, and its lower end is made flaring to form a valve-seat 10^a. The upper part of cap 2 is screw-threaded to receive the cover 12, having a vent-opening 13 communicating with the chamber 14.

15 designates the valve-rod, the lower end of which is screw-threaded and fits in a corresponding recess 16 in the cap 3. Near the upper end this rod is formed with a valve 17, corresponding in shape and size with the valve-seat in cap 2. The upper end of rod 15 is made square or angular and projects up through the aperture in cap 2, being somewhat smaller than said aperture, so as to allow the air escaping from the valve to pass to chamber 14, and from thence through vent-opening 13 to atmosphere. The valve-rod may be adjusted vertically by means of a key applied to the angular end thereof.

The operation is as follows: Steam being turned on in the radiator, the air which has collected in the pipes will be forced into the tube 1 through arm 4, and from thence through valve and cover into the room. It will be understood that the valve-rod, being cold, is contracted and the valve open. As soon as all the air has been expelled, the heat being conducted by the iron of the radiator faster than the steam travels, the valve-rod and valve are heated and expand to seat the valve before the steam gets in contact with the glass, which remains cold on account of the asbestus packing, thereby retarding one

part and hurrying another, which is the reason of its quick action. The valve-rod is very sensitive in its action, and the valve automatically closed by expansion, thus preventing any steam from issuing or escaping into the room. The asbestus packing between the caps and tube prevents any heat from the former being communicated to the latter.

From the above description the advantages of my invention will be readily understood. Owing to the great sensitiveness of the valve-rod, the valve will automatically close before the upper cap has had time to become heated. All dripping is entirely avoided and a much superior device is produced.

The valve-rod should be made of a metal which is a good conductor of heat. I prefer to make the tube 1 of a transparent material—such as glass—so that the device can be readily inspected.

Having thus described my invention, what I claim is—

1. In an air-valve for steam-radiators, the combination, with a metallic valve-rod and valve automatically operated by changes in temperature, of a surrounding tube of non-conducting material, caps closing said tube, and asbestus washers interposed between the tube and caps, substantially as described.

2. The combination, with tube 1, of a material less expansive but a better non-conductor than metal, metal caps 2 and 3, provided with lugs 6 and tie-rods 7, the metallic valve-rod 15, having valve 17, screw-threaded at its lower end, fitting in recess 16 in cap 3, and having an angular upper end, the valve-seat 10^a and aperture 10 in cap 2, the grooves 8 in the caps to receive the asbestus washers 9, and the cover 12, having vent-opening 13, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

GEORGE H. NOYES.

Witnesses:

WILL NEWTON,

J. BRUNNER.