

G. W. BROWN.

AUTOMATIC AIR COCK FOR STEAM HEAT RADIATORS.

No. 265,239.

Patented Oct. 3, 1882.

Fig. 1.

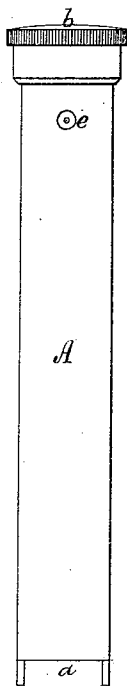


Fig. 3.

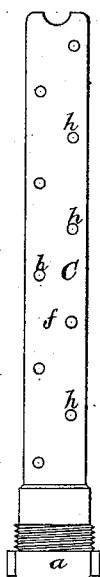
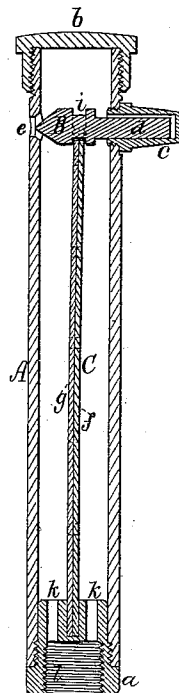


Fig. 2.



Witnesses.
S. N. Piper.
E. B. Pratt.

Inventor.
Gilman W. Brown.
by R. K. Ledy atty.

(No Model.)

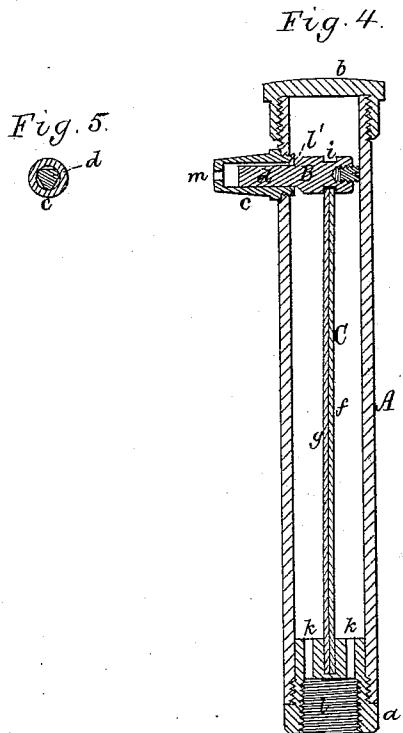
2 Sheets—Sheet 2.

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S. W. Piper.
Geo. H. Crook.

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UNITED STATES PATENT OFFICE.

GILMAN W. BROWN, OF WEST NEWBURY, MASSACHUSETTS.

AUTOMATIC AIR-COCK FOR STEAM-HEAT RADIATORS.

SPECIFICATION forming part of Letters Patent No. 265,239, dated October 3, 1882.

Application filed July 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, GILMAN W. BROWN, of West Newbury, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Automatic Air-Cocks for Steam-Heat Radiators; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, and Fig. 2 a vertical and transverse section, of an air-cock of my improved kind. Fig. 3 is a front view of its compound expansion-bar. Fig. 4 is a vertical section of the air-cock, showing the guide-thimble as open at both ends and having the valve-seat at its inner end, the shank of the valve being prismatic or otherwise properly shaped to enable it to guide the valve and allow of the flow of air through the thimble when the valve is sprung off its seat by the compound expansion-bar, to be hereinafter described. Fig. 5 is a transverse section of the thimble and the valve-spindle.

The nature of my improvement is defined in the claims hereinafter presented.

This air-cock is for letting out of a radiator while it is being charged with steam any air that may be within it, the educt of the cock being closed automatically after the radiator may have received its charge.

On steam being stopped from entering the radiator that which may be therein will, by cooling of the radiator, be condensed, and in consequence a vacuum or partial vacuum in the radiator will follow, whereby air will generally get into the radiator, the greater part, if not all, of such air entering by the educt of the radiator.

Prior to my invention it has been customary to fix the valve of the cock upon the end of a simple metallic rod, so that by expansion of the rod lengthwise of it by the heat of the steam the valve would be moved in the direction of the length of the rod to the valve-seat. This construction of the cock has been found to operate imperfectly, and not to be depended on for the attainment from day to day of desired results, for by too great expansion of the rod the valve would be forced too hard

upon its seat and the rod be sprung or bent laterally, to the injury of it and sometimes to cause leakage of the valve.

In carrying out my improvement I not only use a compound expansion-bar made of two bars unequally expansive when increased in temperature, (they being laid side by side and riveted together, and one being of copper and the other of iron or steel, for instance,) but instead of adapting the valve to the compound expansion-bar, so as to be moved by it in the direction of the length thereof, I apply the two so that on expansion of the bar the valve shall be moved in a direction transversely of the bar, which, by any increase of temperature, will be curved like a bow. In this way I have the natural elasticity of the bar to prevent the valve from being pressed too hard against its seat, and, besides, I am enabled to obtain a greater range of motion of the valve under any increase of temperature.

In the drawings, A denotes the tubular case of the cock, such case having a removable bottom, *a*, and cap *b*, the bottom being screwed into and the cap upon the case. Into the case, near its top, is screwed a thimble, *c*, which serves to receive and guide the prismatic or grooved stem *d* of the conical valve B, arranged to operate with an orifice or educt, *e*, made in the case at its opposite side.

The compound expansion-bar is shown at C, it being arranged in the case in manner as represented, and composed of one bar, *f*, of copper or brass, and another, *g*, of iron or steel, they being laid side by side and connected to each other by a series of rivets, *h*, going through them, or by brazing or soldering them together. This compound bar at its lower end is firmly fixed in or to the bottom *a*. At its upper end the bar is notched or forked, and enters a groove, *i*, made transversely in and around the valve-stem. That metallic strip of the compound bar which expands the slower is to be arranged next to the valve, in order that as the bar, while expanding, may curve laterally the valve thereby shall be moved toward its seat, a reverse movement of the valve taking place as the bar may decrease in temperature.

The bottom *a* has in it one or more holes, *k*,

for admission of steam into the case, and said bottom is also provided with a female screw, *l*, for connecting it with a radiator for warming an apartment by heat received from steam let into such radiator.

On the radiator being charged with steam it will flow into the air-cock case and will surround and heat the compound expansion-bar, and thereby cause it to expand lengthwise. In so doing the bar will be curved or bowed laterally, so as to force the valve up to its seat and close the educt, the air that may have collected in the radiator escaping in the meantime through the educt of the case. On the steam being shut off or stopped from entering the radiator the steam within it will be condensed, and the compound bar will by cooling return to its normal condition, and by so doing will draw the valve off its seat.

Sometimes I construct the thimble open at both ends, and have the valve-seat at the inner end of the thimble instead of in the case, such being as shown in Fig. 4, in which the valve-seat is represented at *l'*, at the inner end of the thimble, which has an opening, *m*, in its head.

I do not claim an automatic air-cock having a single expansion-rod, and also having its valve adapted to move to and from its seat in directions lengthwise of the rod; nor do I claim a compound expansion-bar firmly fastened at one end only within its case, and at the other end to a valve, without any guide-spindle to enter and work in a thimble screwed into the case; nor do I claim an expansion-bar fastened at one or both of its opposite ends and arranged

to operate a valve adapted to it at its middle, all such constructions being complicated or otherwise objectionable relatively to mine, in which the valve moves rectilinearly on and off its seat and is separate from the furcated expansion-bar, which, by being fastened at one end only, is not liable to lose its elasticity or become set in use. In my improvement the mode of applying or adapting the bar to the valve readily admits of removal of the valve and thimble from the bar and case for cleansing of them, as occasion may require; but

What I claim as my invention is—

1. In combination with the case *A* and with the furcated compound expansion-bar *C* fastened firmly in position at one end only therein, the thimble *e*, secured to the case near its opposite end, and the valve, grooved to receive the free end of the expansion-bar and provided with the guide-spindle extending within the thimble, all being substantially as set forth.

2. The combination of the guide-thimble, provided with the opening at its outer end and the valve-seat at its inner end, with the case, the furcated compound expansion-bar, fastened firmly at one end only in said case at or near one end thereof, and the valve, grooved to receive the free end of the expansion-bar and provided with the guide-spindle adapted to play in the thimble, all being essentially as shown and described.

GILMAN W. BROWN.

Witnesses:

R. H. EDDY,
E. B. PRATT.