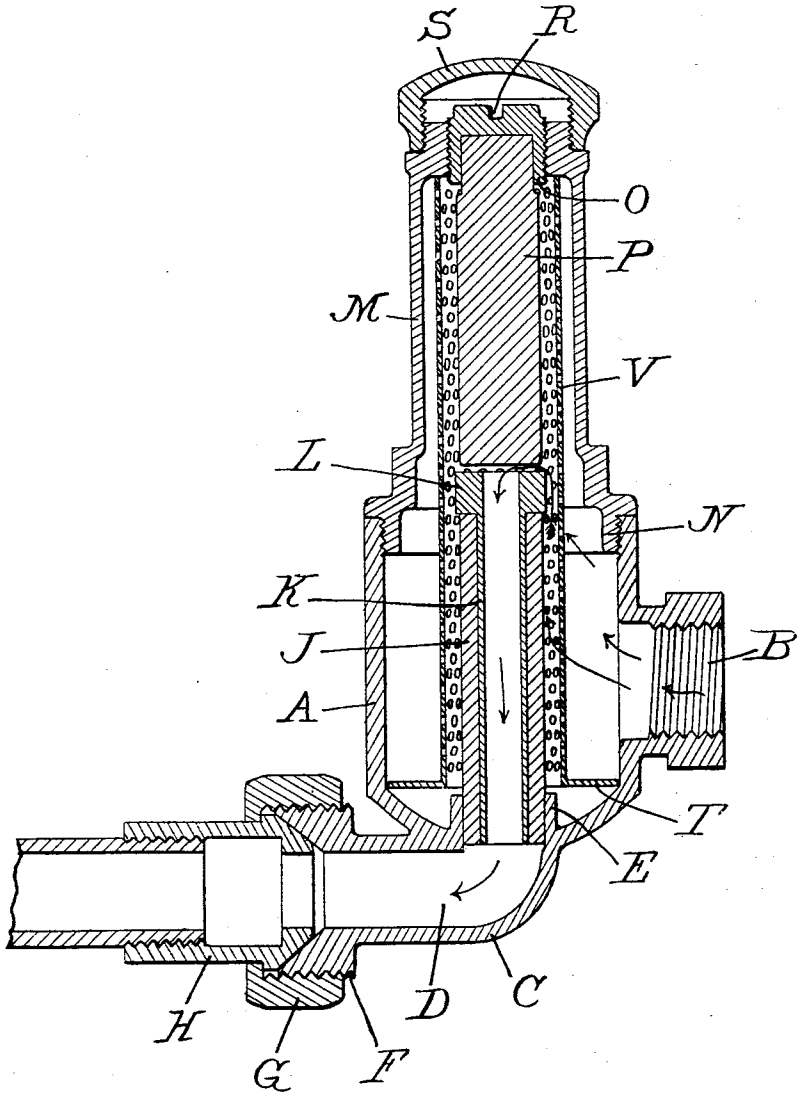
(No Model.)

J. P. MARSH.

AIR VALVE.

No. 593,595. Patented Nov. 16, 1897.



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UNITED STATES PATENT OFFICE.

JAMES P. MARSH, OF CHICAGO, ILLINOIS.

AIR-VALVE.

SPECIFICATION forming part of Letters Patent No. 593,595, dated November 16, 1897.

Application filed November 30, 1896. Serial No. 613,940. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. MARSH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Air-Valves, of which the following is a specification.

My invention relates particularly to air-valves for steam-radiators, the object being to provide a device whereby when the steam-radiator has become cold an opening will be made, so that the water, if any, in the radiator can be discharged and fresh steam can be drawn in, and whereby when the radiator has become heated and cleared of its air and water and the like the valve will be closed, so as to prevent further escape and waste. The device which I have shown is applicable for this purpose and also for other similar and analogous uses which will readily occur to any one familiar with devices of this character and with this art.

In the drawing I have illustrated one form of my invention, though when I have explained it it will be obvious that there are many modifications which can be made without departing from the spirit of my invention, and I do not wish to be understood as limiting myself by the description of a single form to that form alone.

The figure illustrates a cross-section through a valve constructed according to the principles of my invention.

A represents the body of the valve, having the inlet-opening B, adapted to be connected with the radiator and making a passage through the side of the body into the lower part thereof.

C is a downwardly and outwardly projecting part, preferably formed continuous with the body and having the passage-way D therein. Within the body is the raised annulus E about the passage-way. The end of the part D is screw-threaded at F to receive the coupling-nut G of the connecting-piece H, whereby connection may be made with a return-pipe or a waste-pipe, if desired. Rising from and thus sustained in the annulus E is the cylinder of expansion material J, which may have, if desired, the interior projecting metallic lining K, and preferably about its upper end the metal valve-seat L.

M is an upper portion screw-threaded at N into the body A and carrying at its upper end the screw-threaded plug O, which is hollowed out, as indicated, so as to receive and secure the expansion part P, the lower end of which serves as one part of the valve to rest upon the metal part L. The plug O preferably has the slot R at its upper end, whereby it can be adjusted, and S is a screw-threaded cap which covers this exposed end.

V is a gauze-like cylinder which surrounds the parts J and P and protects the entrance to the passage D, which is made between the parts P and J at the valve-seat L. On the lower end of the gauze cylinder is the collar T, which snugly fits the interior of the body A.

I have spoken of "valve" and "seat," but of course these terms are used more as suggestive than as descriptive terms. In other words, it is immaterial which should be considered the valve and which the seat.

The essence of the invention is found in the fact that the expansion material, which is of course similar to that in common use in such devices, is here divided into two parts and the valve and seat are placed between the two parts and preferably about midway between the total length of both. It is found that in the use of these expansion tubes, rods, or cylinders there is a certain length of the tube or cylinder which can be used with safety and satisfaction, such length depending upon the general size and arrangement of the parts, but it is also found that to get the most satisfactory results a considerably greater length is desired. Now if in a given valve-case we attempt to use the greater length it will be found that the expansion substance or material will warp, twist, alter its shape and position and vary in length and in arrangement of its valve or valve-seat end responsive to changes in its heat conditions, so as to render the action of the valve unequal, irregular, and unsatisfactory. Of course these variations are not great, but when we reflect that the total area of escape-passage opening is very slight it becomes evident that slight changes in the shape of the expansion material will produce disastrous results. These difficulties are peculiarly liable to occur where the expansion substance is arranged in a cylindrical form, which is

the preferred form in many forms of air-valves. I have therefore invented the devices illustrated, wherein I place the valve and seat preferably about midway of the total length of the expansion substance. In other words, I use the greatest length which is practicable without such warping effect as I have suggested. Then to increase the expansion effect I use another section or length of expansion material. I prefer, of course, to place the valve or opening midway between these two pieces, though it might be possible to arrange it otherwise, and when this is done one of them obviously must be cylindrical. This therefore accommodates itself very easily to that class of air-valves in which the expansion portion is cylindrical, for when this cylindrical expansion portion has received the greatest possible length consistent with effective working we may then put probably an equal length of expansion material under it, one carrying the seat, the other the valve, and thus practically double the expansion effect. This is all illustrated in the device as I have shown it. It is best to surround the opening with the perforated cylinder, and when this is used the chamber beneath the entrance-valve can be easily cleaned by providing at the lower end of the cylinder the cleaning-collar, which somewhat snugly fits the body and therefore receives on its upper face and about the perforated cylinder the sedimentary deposit. When the top is taken off the body, the cylinder may be lifted out, carrying with it substantially all of the sedimentary deposit.

Of course the arrangement of the upper part need not be just as shown, and any convenient means for holding the upper expansion portion and arranging it for adjustment may be employed. In the instance shown by removing the cap and applying a screw-driver to the upper plug the upper expansion-piece may be adjusted, and by removing the top from the body of the valve the whole interior may be exposed for cleaning and the like.

The interior metallic lining of the lower cylindrical expansion material is merely the preferred form and not imperatively necessary. Neither is it imperatively necessary to use metal for the valve-seat or valve, as the case may be.

I use the term "air-valve" in the specification and will employ the same in the claims, but I do not wish thereby to be understood as limiting my device to such use, but of course understood any such use as the invention is capable of being put to.

I have described my invention as relating to valves wherein the expansion portions are made of non-metallic material, but it is of course evident that such portions might be made of metallic material, if desired.

I claim—

1. In an air-valve the combination of a valve-casing with supply and discharge passage-ways, and an expansion valve-controlling device, the expansion device consisting of two parts adapted to expand toward each other so that the effects are concentrated upon a single valve-opening.

2. In an air-valve the combination of a valve-body with supply and discharge passage-ways and two expansion parts contained within said valve-body, one acting as valve the other as seat, to control the flow of fluid through the valve.

3. In an air-valve the combination of a valve-body with inlet and outlet passage-ways, a cylindrical expansion part contained within said valve-body with a valve-seat at one end thereof, and a second expansion part within said valve-body carrying a valve end exposed to such seat.

4. In an air-valve the combination of a valve-body with inlet and outlet passage-ways, a cylindrical expansion part with a valve-seat at one end thereof, and a second expansion part carrying a valve end exposed to such seat, said cylindrical part composed of non-metallic material and provided with a metallic lining.

5. In an air-valve the combination of a valve-body with upwardly-projecting parts therein through which the passage through the valve partly passes, a surrounding perforated shield for such upper parts and a lower sediment-receiving collar on the lower end of such shield and adapted normally to rest at the bottom of the valve-body.

JAMES P. MARSH.

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