June 10, 1930. O. A. AMOS 1,762,148

AIR VALVE

Filed Feb. 23, 1926

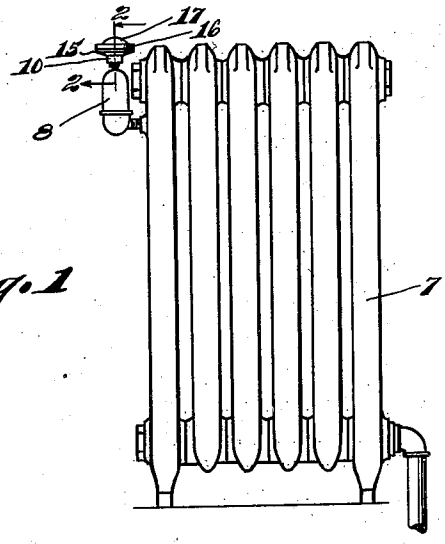


Fig. 1

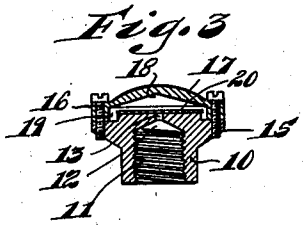


Fig. 3

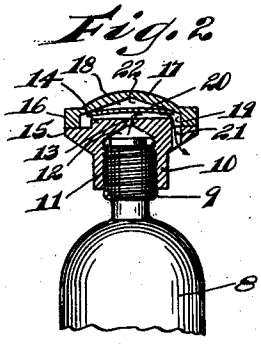


Fig. 2

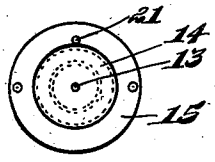


Fig. 4

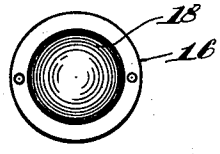


Fig. 5

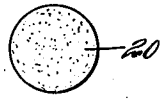


Fig. 6

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UNITED STATES PATENT OFFICE

OTTO ADAM AMOS, OF CHICAGO, ILLINOIS

AIR VALVE

Application filed February 23, 1926. Serial No. 89,943.

My invention relates to air valves, more particularly to devices of this nature for use in connection with the radiators for steam heating systems; and my invention has for its general object to provide an improved construction of means by which to prevent the entrance of air through the air valve and thereby to effect an increase in the extent of the vacuum produced by the condensation of steam when the system cools. A further object of my invention is to provide a simple construction in the form of an attachment or cap for the well known types of air valves employed in connection with steam radiators. A still further object of my invention is to provide a construction of this character which will be inexpensive to manufacture, easy to apply and highly efficient in use.

Other objects will appear hereinafter.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawing forming a part of this specification, and in which,

Fig. 1 represents an elevational view of a steam radiator equipped with an air valve carrying my improved attachment;

Fig. 2 is a partial elevational view and section, the section being taken through my attachment and substantially on the line 2—2 of Fig. 1, the section through the attachment showing the valve member in opening position;

Fig. 3 represents a central section through my attachment showing the means for securing the cap closure thereto and also showing the valve member as it appears when sealing the airway through the seat;

Fig. 4 is a top plan view of the device with the cap closure removed;

Fig. 5 is an underneath plan view of the cap closure; and,

Fig. 6 is a plan view of the valve member.

Referring to the parts illustrated in the drawing, 7 designates a radiator of the type commonly employed in steam heating dwellings and buildings; and 8 designates a well known type of air valve for the radiator.

As illustrated in the accompanying drawing, the preferred form of construction of my invention comprises an attachment which is adapted to be screw threaded upon the stem 9 in place of the usual cap therefor. The attachment includes a cylindrical stem or neck portion 10 in which is provided a central threaded opening 11 for cooperation with the threaded stem 9 as shown. A conical pocket 12 is provided at the upper or top end of the threaded opening and an airway 13 extends from the apex of this pocket through a raised circular seat 14 which is formed at the top end of the body member 10. Surrounding the body member just below the raised seat 14 is an annular flange 15 upon which is adapted to rest the flanged rim 16 of the cap closure 17 which is adapted to form a chamber 18 above the raised seat. As clearly shown in the drawing, the rim flange 16 surrounds the raised seat 14 in spaced relation so as to provide a recess 19 therearound, which recess is in communication with the chamber 18.

Arranged in the chamber 18 is a valve member in the form of a disk-shaped element 20 which is preferably made of mica or other similar substance suitable for the purpose. The element 20 is adapted to intimately overlie the flat surface of the seat 14 so as to seal the airway 13 against the entrance of air into the pocket 12 and hence into the valve 8 when, under this arrangement, a vacuum is produced in the steam heating system by reason of the condensation of the steam therein. When the steam cools, a drawing or suction action is produced through the air valve 8 and hence through the airway 13 to draw the valve member 20 tightly upon the seat 14 so as to seal the airway 13 against the entrance into the system of any outside air which may be drawn into the chamber 18 through a way 21 which extends downwardly from the annular recess 19 through the flange 15 to the outside atmosphere. When, after being cooled, the system is again heated up, the air expelled through the air valve 8 and hence through the pocket 12 and airway 13 will force the valve member 20 from its seat so as to es-

cape underneath the valve member into the recess 19 and thence through the way 21 to the outside atmosphere. In this connection it is to be noted that the cap closure 17 is provided with a conical underneath pocket 22 which is designed to serve as an air trap for cushioning the valve member 20 so that the valve member cannot possibly stick to the cap closure because of moisture or any foreign matter that may have been passed through the system and air valve into the chamber 18. Owing to the provision of the raised seat 14, the recess 19 surrounding the same and the descending way 21, any water or foreign matter issuing through the airway 13 will be promply passed to the outside of the body member, so that the top of the seat 14 is kept clean at all times under the expulsion of air for the intimate engagement of the valve member with the seat.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A valve attachment of the type described, comprising a body member having a stem and a head portion above said stem, said stem being adapted for attachment to a radiator valve and having a chamber below said head portion communicable with the air-vent of the radiator valve, said body having an axial airway, relatively smaller than said chamber, extending through the top of said head, a raised, flat-surfaced, circular seat formed on said head and surrounding said airway, a valve element comprising a disc of the character of sheet mica, normally supported loosely on said seat and covering said airway, an outlet airway through said head exteriorly of said raised seat, a cap member shaped to form a relatively low-topped chamber above and around said seat, said cap member having a flat rim adapted to rest on the upper surface of said head in spaced relation to the peripheral face of said raised seat, and its central portion being concaved above said seat, and means for detachably securing said head portion and cap member together, substantially as described.

2. In combination with a radiator relief valve havig a vent opening, of a cap member for said opening, said cap member having a lower chamber communicating with said vent opening and an upper chamber having a flat-faced bottom wall provided with a restricted central aperture affording communication between said upper and lower chambers, said upper chamber having a relatively low concaved top wall, and a loose valve element, comprising a relatively thin disc of inherently resilient material of the character of mica, resting normally flatwise on the bottom wall of said upper chamber and closing said central aperture thereof, said upper chamber having a vent opening remote from said valve element.

3. In combination with a radiator relief valve having an air-vent, of an attachment comprising a body having an attaching portion provided with a restricted airway communicable with the air-vent of the attached radiator relief valve, the body of said attachment being provided with a chamber in its upper portion, said chamber having a raised, flat-faced, circular seat at its bottom through which the restricted airway opens centrally into said chamber, said chamber being relatively low-topped and having an outlet airway outside the periphery of said raised seat, and a loose valve element normally supported on said raised seat and covering said first mentioned airway, said valve element comprising a disc of sheet material of the character of mica and being substantially the same in diameter as said raised seat.

4. An attachment of the character described, having a relatively low-topped chamber, said chamber having a flat-faced bottom portion and the top of said chamber above said bottom portion being recessed dome-like, and there being a central restricted opening in said bottom portion, said opening being communicable with the air-vent of the radiator valve when the device is applied, said chamber having an outlet opening outside of said flat-faced bottom portion, and a valve element comprising a disc of sheet material of the character of mica, normally supported loosely on said flat-faced bottom portion of said chamber and covering said restricted opening therein.

In testimony whereof I have signed my name to this specification.

OTTO ADAM AMOS.