(No Model.)

A. H. ENGSTRÖM.

AUTOMATIC AIR VALVE.

No. 376,799. Patented Jan. 24, 1888.

Fig 1

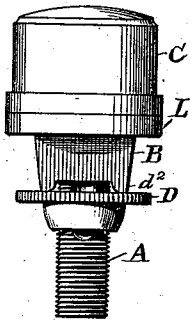


Fig 2

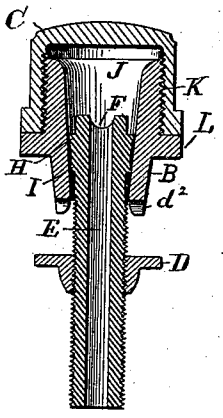


Fig 3

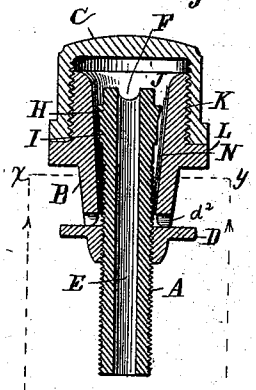


Fig 4

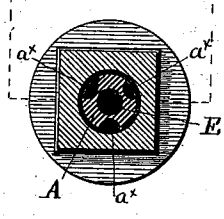


Fig 5

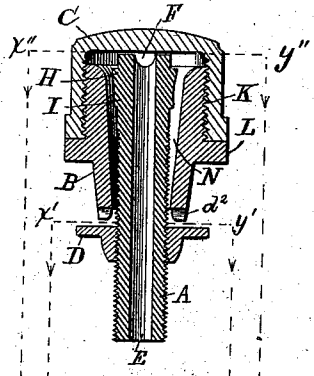


Fig 6

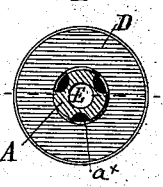


Fig 7

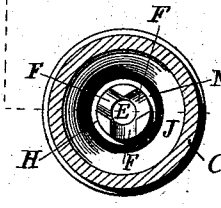
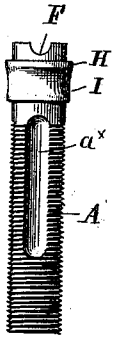


Fig 8



WITNESSES:

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INVENTOR

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by his attorneys.
Wm. C. Marcellus
J. Bonsall Taylor.

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

UNITED STATES PATENT OFFICE.

AXEL H. ENGSTRÖM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO STANLEY G. FLAGG & CO., OF SAME PLACE.

AUTOMATIC AIR-VALVE.

SPECIFICATION forming part of Letters Patent No. 376,799, dated January 24, 1888.

Application filed July 28, 1887. Serial No. 245,577. (No model.)

To all whom it may concern:

Be it known that I, AXEL H. ENGSTRÖM, a subject of the King of Sweden, residing in the city and county of Philadelphia in the State of Pennsylvania, have invented an Improvement in Automatic Air-Valves, of which the following is a description, reference being had to the accompanying drawings and the letters of reference marked thereon, which form a part of this specification.

My invention is an improvement upon an automatic air valve invented by Christopher Shields, and described by him in an application for Letters Patent filed March 19, 1887, as Serial No. 231,547, and allowed June 14, 1887.

The object of my invention is to provide a valve, of the general construction shown and described in said Shields application, with devices by which it may be vertically set or adjusted within certain limits, to be operated to close at various and predetermined pressures;—the Shields valve, as constructed, and as described in his said application for Letters Patent, being capable of closing at but one pressure.

In the drawings, Figure 1 is a side elevation of a valve embodying my invention; Fig. 2 is a central sectional elevation of a valve embodying my invention, the valve being therein represented as closed; Fig. 3 is a central sectional elevation of the valve, said valve being open; Fig. 4 is a transverse section of the valve shown in Fig. 3, section being taken on the dotted line *x*–*y* of said figure and sight being supposed in the direction of the arrows shown in connection with said figure; Fig. 5 is a central sectional elevation of a valve embodying my invention the valve being open and in that adjustment which requires the greatest pressure, within its limit of adjustment, to close it; Fig. 6 is a plan view, partly in section on the line *x'*–*y'* of the device shown in Fig. 5; and Fig. 7 is a cross-section of the device shown in Fig. 5, section being taken on the dotted line *x''*–*y''* thereof. Fig. 8 is a detail side elevation of the pipe.

Similar letters of reference indicate corresponding parts.

The valve proper consists essentially of three parts or devices, a vent or escape pipe A, a collar B, and a cap C. The vent or escape pipe A is, at its lower end, screw threaded to permit of its being attached to a steam radiator, or other device, in connection with which it is to be used, and it is provided with a central bore or orifice E. This pipe is provided at its upper end with notches F which open into and communicate with its bore E, and it is, on its outer surface, and near its upper end, provided with annular rings H I having ground faces adapted to rest, when the valve is closed, upon, and in close contact with, the interior conical bearing surface J of the collar B. The collar B is, upon its outer surface, and at its upper end, provided with screw threads K which, at their lower ends, terminate at an annular collar or shoulder L.

C is a cap, closed at its upper end, and, upon the inner surface of its wall, provided with screw-threads which permit of it being screwed upon the upper end of the collar B and in close and hermetical contact with the shoulder L. The construction of these parts is such that the collar B, surrounds the pipe A loosely and thus provides an annular interspace N. The form and dimensions of the conical portion of the bore of the collar B, the dimensions of the cap C, as well as the dimensions and form of the annular rings H I are such as to provide, when the valve is not closed, an interspace between the outside surface of the pipe A, and the interior surfaces of said collar B and cap C, said interspace being in communication with the notch F of the pipe A. From the construction described it will be understood that when the valve is applied to a steam radiator, or to other devices in which the air or steam is of a pressure less than the pressure at which the valve is set or adjusted to close, the air or steam within such radiator will be free to escape therefrom through the notches and interspace.

From the construction above described it will also be understood that when the pressure of the air contained within the radiator becomes greater than the pressure at which the valve is set to close, the cap C will be lifted and the interior conical bearing surface J of the collar B, be brought into close and hermetical contact with the ground surfaces of

the annular rings H I by which the valve will be closed and the escape of steam or air from the radiator be prevented.

My invention consists in providing the valve described with a device by which the vertical adjustment of the cap C, and annular ring B, may be varied, within certain limits, so as to increase or decrease the length of the path through which the cap C and ring B must move to close the valve, and also to increase or decrease the width of the interspace N. The device shown in the drawings to accomplish this result, is a ring D having a central screw threaded opening, which screw threads take into corresponding screw threads upon the outer surface of the pipe A, by which said ring may be vertically adjusted upon said pipe.

The lower edge of the collar B is provided with feet d^2 by means of which the cap and collar are supported upon the ring D, the spaces between said feet in conjunction with gutters $a^\times$ in the outer surface of the pipe A affording communication from the radiator, through the valve, to the outer air.

It is obvious that the feet d^2 may be dispensed with and the ring D be provided with holes forming a communication between the annular space between the parts A and B of the valve and the outer air.

In this specification I have used the word cap to denote the part lettered C in the drawings, in the claims I employ the word cap to denote the device by which the upper end of the pipe A is inclosed, whether it be made up of the specific parts lettered B and C, or be of a construction different from that in which my invention is, in the drawings, shown as embodied.

It is obvious from the description above given that the proportion and shape of the various parts of the valve may be modified or changed without departing from my invention.

Having thus described my invention, I claim and desire to secure by Letters Patent:—

In an automatic air valve, in combination, an air vent or escape pipe, provided, as to its outer surface, with a seat, and adapted, at one end, to be attached to a radiator, a cap, contracted at its lower end, and which, in its lowest position, rests on the top of said pipe, and a device on which said cap, in positions intermediate between its lowest position and the position it occupies when the valve is closed, rests and by which it is vertically adjustable, said cap when lifted having a part of its surface in close hermetical contact with the seat on the outer surface of said pipe, as specified.

In testimony whereof I have hereunto signed my name this 2d day of July, A. D. 1887.

AXEL H. ENGSTRÖM.

In presence of—
WM. C. STRAWBRIDGE,
JOHN JOLLEY, Jr.