(No Model.)

J. P. MARSH.

AIR VALVE OR STEAM TRAP.

No. 319,593. Patented June 9, 1885.

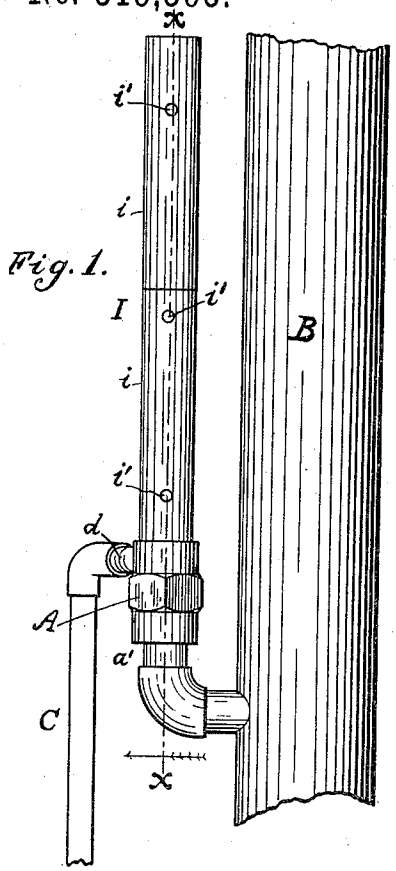


Fig. 1.

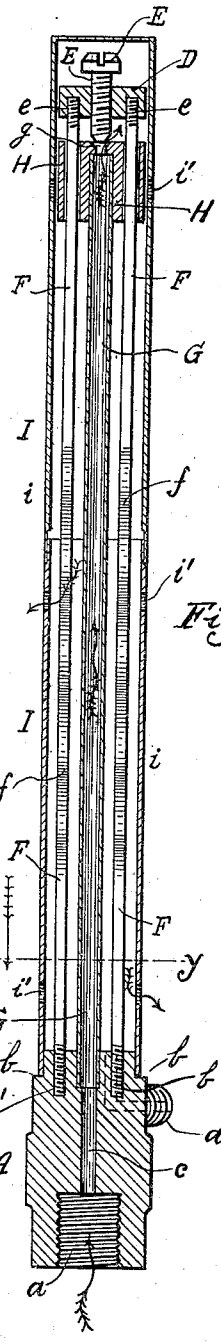


Fig. 2.

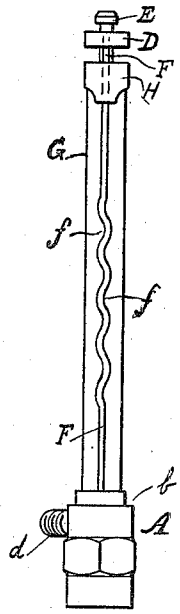


Fig. 3.

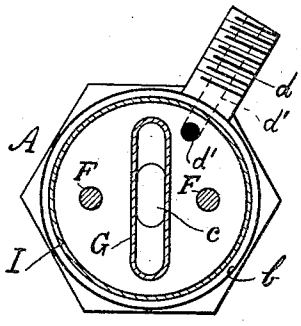


Fig. 5.

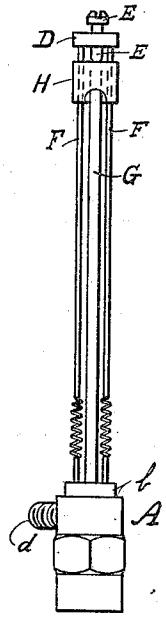


Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES P. MARSH, OF CHICAGO, ILLINOIS.

AIR-VALVE OR STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 319,593, dated June 9, 1885.

Application filed April 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. MARSH, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Valves or Steam-Traps, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1 is a side elevation of a valve or trap embodying my invention. Fig. 2 is a section in the plane of the line *x x* of Fig. 1, enlarged. Fig. 3 is a side view of the valve or trap with the case or shell removed. Fig. 4 is a like representation viewed from another side, and showing a slight modification in the construction; and Fig. 5 is a section in the plane of the line *y y*, viewed downward.

Like letters of reference indicate like parts.

My purpose is to make a small or compact, durable, and neat air-valve or steam-trap for use in connection with steam coils or pipes, and for like purposes.

A represents the bottom piece or base of the valve or trap. The lower end of the base-piece is tapped, as shown at *a*, to admit of its being suitably connected to the steam coil or heater by means of a suitable joint or extension, as shown at *a'*, Fig. 1, wherein B represents one of the pipes or coils of a steam-radiator. The upper end of the base-piece is shouldered, as shown at *b*, and also tapped, as shown at *b' b'*; and *c* is an opening or channel passing vertically through the central part of the base-piece.

d is a drip-nozzle projecting laterally from the base-piece, and *d'* is a passage or channel passing from the top of the base-piece downward and out through the said nozzle.

C is a drip-pipe joined to the nozzle *d*.

D is a head-plate or top piece, which is tapped on its under side, as shown at *e e*, and E is a screw valve or stopper passing downward through the central part of the top D.

F F are metallic rods, made by preference of steel or of iron, having some flexibility or spring-like quality. Each rod F has a right screw-thread upon one end and a left screw-thread upon the other, and the female screws *b' b'* and *e e* are correspondingly cut to receive the screw-threaded ends of the said rods, which connect the top with the base-piece, as is clearly indicated in Fig. 2. These rods F F, I wave or corrugate between their ends, as shown at *f f*, in order that the head or top piece D may be somewhat yieldingly connected to the bottom piece or base, A; but I would regard spiral springs, as shown in Fig. 4, as the equivalent of the waves or corrugations *f f* shown in Fig. 3.

G is a flattened tube, made by preference of spring metal—such as hammered sheet-brass. The tube G is seated in a socket in the base A, and is rigidly attached thereto by means of solder or otherwise, and the upper end of the channel *c* meets the lower end of the said tube, which is open at that end.

H is a block or head-piece rigidly attached to the upper end of the tube G, and *g* is a port or valve-opening in the said block, the said opening communicating with the upper end of the said tube. The rods F F pass freely through the block H, and the screw E has its point or lower end arranged to act as a valve or stopper for opening and closing the port or opening *g* automatically, it being understood that the rods F F and tube G expand and contract differently under the influence of heat, a comparatively high degree of heat carrying the valve-opening or block H up to the screw or valve E, and a comparatively low degree causing the block H to move away from the said valve or screw, thus permitting the port *g* to be open before the steam coils or pipes become heated, and allowing the air to pass out as the steam passes in, when the higher degree of heat thus produced will cause the closing of the valve. The screw or valve E is made adjustable, so that it may be set with facility, so as to close the valve-opening by the time or about the time the air has been all expelled.

I is the case or shell, which is seated on the base A and attached thereto. This case I make in sections *i i*, by preference, the upper section being removable. *i' i'* are perforations in the case I. The drip channel or opening *d'* has its upper end between the casing and the tube G, as is clearly indicated in Fig. 5.

The screw-connections of the rods F F with the top and base are not essential to some features of my invention. For example, the spring action of the rods is not thereby affected; but I deem such a connection preferable, as a more firm connection is made thereby than by riveting; also, to hold the rods F F firmly, I deem it best to make the block H comparatively thick, as shown, so that the said rods

will have a broad bearing near their upper ends.

By connecting the top piece, D, to the base yieldingly I take off the dead strain heretofore caused by contraction and expansion. The tube G, by being flat, renders the device compact, as the rods F F may be arranged very near its flat sides. In case of escape of any steam through the valve-opening it will be drained off inside of the casing, being first condensed therein. The openings in the casing permit a free circulation of air within the casing, thereby keeping the rods cool. The upper section of the casing protects the screw E, and the casing gives a neat and finished appearance, and the whole device is comparatively small and compact, as well as durable and effective for the purpose for which it is intended.

I do not here intend to claim, broadly, an air-valve or steam-trap when automatically operative by reason of the influence of different degrees of heat upon metals having different degrees of expansibility and contractibility; nor do I intend to claim, broadly, a removable cap, nor a perforated case; nor do I intend to claim, broadly, those features of construction which permit the condensed steam to drip down inside of the casing.

An expansible steam-tube having a valve-opening at its upper end, and a loose ball-valve seated at the said opening, and above that ball an adjustable abutment for holding the said ball or valve to its seat, the said abutment being connected to a base-piece by means of expansible rods, are features of construction not new with me; but,

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

1. The combination, substantially as specified, in an air-valve or steam-trap, of a fixed expansible steam-tube ported or open to receive the steam and discharge the air, a base-piece having a channel or conduit communicating with the said tube, a head-plate or top piece, an adjustable valve carried by the said head-plate or top piece, and yielding rods connecting the head-plate or top piece to the base-piece, for the purposes set forth.

2. The combination, in an air-valve or steam-trap, of a flat steam-tube ported or open to receive the steam and discharge the air, a base-piece, a head-plate or top piece carrying a valve or stopper for opening and closing the air-port, and yielding rods passing along the flat sides of the said tube and connecting the head-plate and base-piece, substantially as and for the purposes specified.

3. The combination, substantially as specified, in an air-valve or steam-trap, of a fixed expansible steam-tube ported or open to receive the steam and discharge the air, a base-piece having a channel or conduit therein communicating with the said tube, a head-plate or top piece, an adjustable valve carried by the said head-plate or top piece, and the waving expansible rods F F, connecting the head-plate to the base-piece, for the purposes specified.

In testimony that I claim the foregoing as my own I hereto affix my signature in presence of two witnesses.

JAMES P. MARSH.

Witnesses:
F. F. WARNER,
J. B. HALPENNY.