J. AVERY, Jr.

STEAM TRAP VALVE.

No. 27,769. Patented Apr. 10, 1860.

Fig. 2.

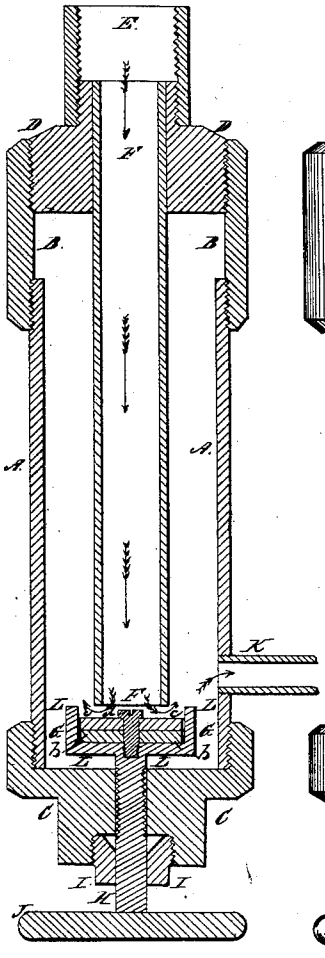


Fig. 1

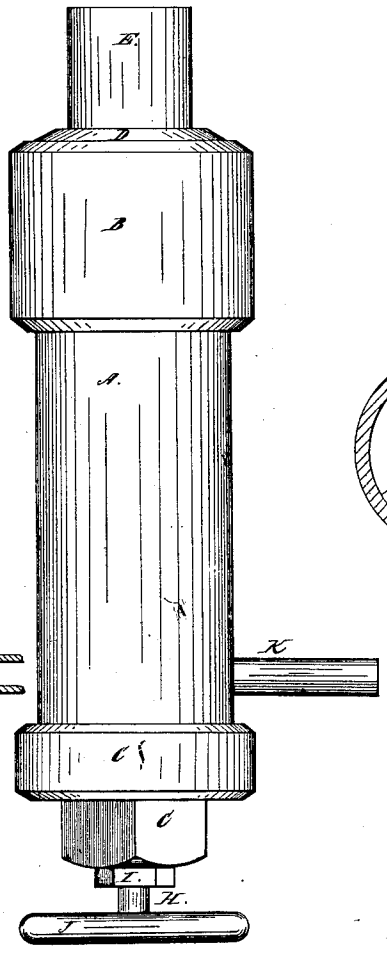
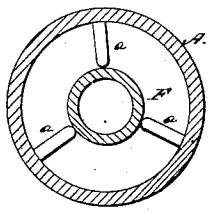


Fig. 3.



UNITED STATES PATENT OFFICE.

JOHN AVERY, JR., OF NEW YORK, N. Y.

STEAM-TRAP VALVE.

Specification forming part of Letters Patent No. 27,769, dated April 10, 1860; Reissued April 2, 1872, No. 4,847.

To all whom it may concern:

Be it known that I, JOHN AVERY, JR., of the city and county of New York and State of New York, have invented certain New and Useful Improvements in Condensing-Trap Valves for freeing steam pipes of water; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, represents a view of the entire apparatus. Fig. 2, represents a vertical central section through the same, and Fig. 3, represents a transverse section thereof.

Similar letters of reference where they occur in the several figures denote like parts of the apparatus in all of them.

I am aware that "steam traps," as they are termed, are well known; and that the expansion and contraction of tubes, and bars, under different degrees of temperature, and of metals more or less sensitive thereto, have been used for opening and closing passages. These things I do not claim independent of my particular construction and arrangement of condensing chamber and valve to effect the purpose.

My invention consists in the combination of an expansible tube, an elastic adjustable seat, and a condensing chamber, for the purposes herein set forth.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents an outer case or cylinder, upon one end of which is fitted a sleeve B; and in the other end a head C, and these parts may be of iron. Into the end of the sleeve B, is screwed or otherwise fastened a nut D, to which a steam pipe E may in turn be secured, said steam pipe communicating with, or being a part of the pipe or series of pipes to be freed of the water of condensation.

To the nut D, is secured one end of a pipe F, which extends through the interior of the case or cylinder A, the other end of said pipe being left free, as shown in the drawing Fig. 2. Guides *a*, *a*, *a* may be arranged in the case, to keep the tube or pipe F, in proper position. This pipe or tube F, should be made of some metal, or of an alloy or mixture of metals that, will expand and contract more under the same temperature than the iron will, as for instance copper, brass, zinc &c.

G, is a cup shaped piece arranged inside of the case or cylinder A, and near to the free end of the tube F. This cup is attached to the end of a screw rod H, that passes through the head C, said rod being packed as at I, and having upon its outer end a hand wheel J, or other device by which the screw rod may be turned to move the cup nearer to or farther from the free end of the pipe F. In this cup G, I place a rubber, or other elastic disk or ring *b*, and over it a plate *c*, both of which are confined to the cup by a screw *d*, or otherwise, so that the plate may yield on the elastic bearing beneath it, but not drop out of its seat. This plate *c*, as well as the end of the pipe F, that closes against it, should have well finished or ground surfaces, to make a tight joint.

The escape pipe K, is located somewhat above the free end of the pipe, so as to form between it and the head C that closes one end of the cylinder, a condensing chamber L for holding the water of condensation, and the valve composed of the cup, and the plate and yielding disk or ring, are also placed in this condensing chamber.

Though I have shown simply a rubber disk for producing the necessary yielding property to the plate or valve, a metal spring may be substituted for the rubber. The rubber, however, is cheap and effective, and serves the purpose of allowing the valve to yield when the pressure upon it is greater than that for which it has been set by the screw rod H, and it is intended to compensate for any excessive elongation of the tube F, without disarranging any of the parts.

The operation of this apparatus is obvious. When the pipes and cylinder are cold, the contraction of the one F, causes its free end to leave the valve *c*, and thus an opening is formed and the water, as shown by the arrows runs out of it, into the chamber L, and thence out of the waste pipe K. When steam is let into the pipe F, or it becomes heated, it expands until it closes its free end against the volve *c*, and thus remains tight so long as the heat remains in it, and its excessive elongation beyond an adjusted point, is taken up by the compression of the spring or cushion under said valve and prevents any breakage.

The apparatus is simple, and may be placed anywhere in connection with steam pipes, and it will free said pipes of all the water of condensation in them, whenever the fires are allowed to go down.

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

The combination of an expansible tube, an elastic or self yielding adjustable valve and a condensing chamber, substantially in the manner, and for the purpose herein set forth.

JOHN AVERY, Jr.

Witnesses:
W. E. Northen,
S. B. Althause, Jr.