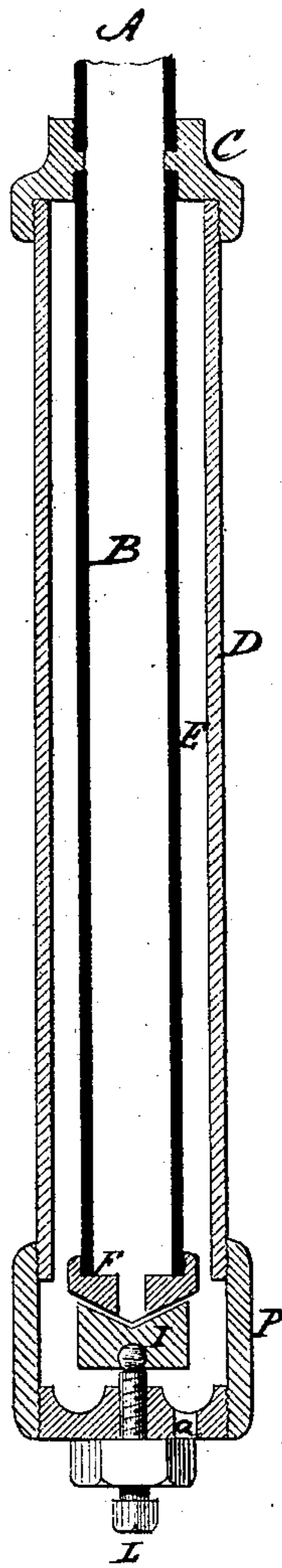


J. BISHOP.  
Steam-Traps.

No. 145,387.

Patented Dec. 9, 1873.



Witnesses.

J. H. Sumner  
A. J. Tibbitts

Joseph Bishop  
Inventor

By His Att'y.

John E. Earle.

# UNITED STATES PATENT OFFICE.

JOSEPH BISHOP, OF MERIDEN, CONNECTICUT, ASSIGNOR TO HIMSELF AND CHARLES PARKER, OF SAME PLACE.

## IMPROVEMENT IN STEAM-TRAPS.

Specification forming part of Letters Patent No. 145,387, dated December 9, 1873; application filed January 3, 1872.

*To all whom it may concern:*

Be it known that I, JOSEPH BISHOP, of Meriden, in the county of New Haven and State of Connecticut, have invented a new Improvement in Steam-Trap; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents a vertical central section.

This invention relates to an improvement in the device commonly termed a "steam-trap"—that is to say, a device to be attached to steam-pipes to catch and remove the water arising from condensation in the pipes; and the invention consists in the arrangement of a tube in direct connection with a steam-pipe, or whatever it is desired to take the condensation from, within a second tube, which forms a chamber around the first, and within the said chamber a valve formed in connection with the lower end of the tube, which permits the water which flows into the said inner tube to pass therefrom into the chamber, as more fully hereinafter described.

A is a tube in connection with the steam-pipe, or whatever apparatus or device it is desirable to remove the condensation from. In connection with this tube A is a second tube, B, connected by a head or coupling, C, and around this tube B a second tube, D, of larger diameter is arranged, so as to form a chamber, E, between the two tubes B and D. To the lower end of the said tube B, a valve, F, is secured, having a perforation therethrough, and is of conical form, the tube being suspended from the upper end and the lower end free. Below the valve F a seat, I, is arranged, corresponding in form to the valve, and made adjustable by a set-screw, L, or its equivalent, so as to be set at a greater or less distance from the end of the said valve. This valve and its seat are inclosed in the chamber by a suitable head or coupling, P. To adjust the valve to perform the functions desired, steam is admitted into the tube B and allowed to pass therethrough until it is heated to its fullest extent. The steam will pass freely out to the atmosphere through an opening, a, in

the chamber. The inner tube B is alone exposed to the heat, and consequently lengthens by expansion, the outer tube remaining stationary; therefore, so soon as the inner tube has attained its greatest length by the heat applied thereto, I set the valve-seat I close up to the valve, to close the lower end of the tube. As no more steam can escape, the water caused by condensation will flow into the tube B, taking the place of the steam, and, cooling therein, will cause the tube B to contract and open the valve sufficiently to permit the water to pass out; so soon as the water has escaped, steam will again fill the tube, causing its expansion, to act as before.

By preference, I make the tube B from a metal susceptible of more expansion than the outer tube, to guard against any heat which might cause an equal expansion of the outer tube.

I have represented the valve as formed by the fitting of an independent piece onto the end of the tube; but it will be evident that the end of the tube itself might be brought to bear directly upon the end of the seat, but I prefer the valve; and, to insure the perfect acting of the valve, I make the seat self-adjusting, to adapt itself to any irregularities in the surface or position of the valve.

In some cases, after the valve has been set, I find it advantageous to withdraw the seat slightly from the valve, in order to leave a slight constant opening; but in such cases, when there is no condensation, a very slight amount of steam would escape.

I do not broadly claim a conical seat for the expansion tube or rod in steam-traps, as such, I am aware, is not new.

I claim as my invention—

The herein-described steam-trap, consisting of the inner expanding tube B, of conical form at its lower end, and the outer non-expansive tube D, combined with the valve-seat I, corresponding to the lower end of the tube, and made adjustable relatively to the valve or open end of the tube, substantially as described.

JOSEPH BISHOP.

Witnesses:

J. W. MILES,

F. GEO. MARKHAM.