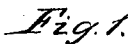


Patented Feb. 14, 1865



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

L. W. WOODWARD, OF NORTH ADAMS, MASSACHUSETTS.

IMPROVEMENT IN STEAM-TRAPS.

Specification forming part of Letters Patent No. 46,416, dated February 14, 1865.

To all whom it may concern:

Be it known that I, L. W. WOODWARD, of North Adams, in the county of Berkshire and State of Massachusetts, have invented a new and useful Improvement in Steam-Traps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of an axial longitudinal section of my steam-trap. Fig. 2 is a cross-section taken through the water escape holes *g h* of the trap at the moment when they coincide in position.

Similar letters of reference indicate like parts.

This invention consists in a novel construction of steam-trap, in which the opening and closing thereof is caused by the alternate expansion and contraction of the pipe which forms the connection between the steam apparatus to be cleared of the water of condensation and the trap.

A represents any support to which the receiver B may be secured. The receiver and the other parts of the trap are here shown to be placed in vertical positions; but they can be placed in horizontal or inclined positions without impairing their efficiency.

The receiver B is an open cylinder with a screw-thread, C, tapped in its upper end to receive a tube, F, which is firmly screwed down therein until its flange K rests upon the upper end of the receiver, or as near thereto as its proper adjustment requires. The tube F extends beyond the flange K, as seen at *a*, to receive a stuffing-box, D, of ordinary construction. The tube F is open at both ends, its lower end, *b*, extending within and nearly to the lower or opposite end of the receiver, and having at that end *b* a longitudinal slot, *j*, as shown in Fig. 1.

E is a steam-pipe connected with the steam-pipe S of an engine or any other steam apparatus to which a steam-trap is to be applied. The pipe E is passed into or through the tube F a distance equal to the length of said tube, and has on one side, near its end, a pin, *i*, which fits in the slot *j* of the tube. The end of said pipe E is closed, but its sides are perforated, on a line about midway of the length of the receiver, with numerous holes, *g*, which coincide, in certain positions

of the pipe, with like holes, *h*, cut through the sides of the tube F. The joint formed by the pipe E where it enters the neck *a* of the tube F is made tight by means of the stuffing-box D. The receiver is to be connected at G, where a screw-thread is cut in its end, to a pipe, which shall carry off the water of condensation.

The operation of the apparatus is as follows: The receiver being properly secured in place, the tube F is adjusted therein so that the holes in the steam-pipe E shall coincide with the holes in the tube, the adjustment being made when the several parts are cold. When steam is got up in the steam-pipes or apparatus to which the pipe E is connected, the steam will fill the pipe E and cause it to expand by raising the temperature of the metal, and its sides will move far enough within the tube F to take the holes *g* past the holes *h*, so as to prevent the escape of steam.

The trap is to be located in such a position as that any water of condensation produced in the pipe S and its connections will flow into and fill the lower end of the pipe F. Since the temperature of the said pipe E will be lowered by means of the presence of the water of condensation, it will contract in length, and the said holes will again coincide, when the water will escape into the receiver, and pass from thence into the conducting-pipe screwed into its end G. The longitudinal movements of the pipe E are guided, and the pipe and tube prevented from displacement by the rotation of either, by means of the pin *i* and the slot *j*.

This steam-trap is found in practice to be very efficient, and, as will be perceived by those skilled in the art to which it belongs, it is not easily liable to derangement or displacement, either from accident or from the operation of natural causes—such as frequent changes in temperature—nor is it liable to become easily deranged from the presence therein or the passage through it of oil or other foreign substances.

I claim as new and desire to secure by Letters Patent—

The steam-trap constructed and operating substantially as above described.

L. W. WOODWARD.

Witnesses:

A. W. RICHARDSON,
CHARLES MUNN.