

W. HILTON & F. R. CLARKE.

STEAM-TRAP.

No. 172,738.

Patented Jan. 25, 1876.

FIG. 1.

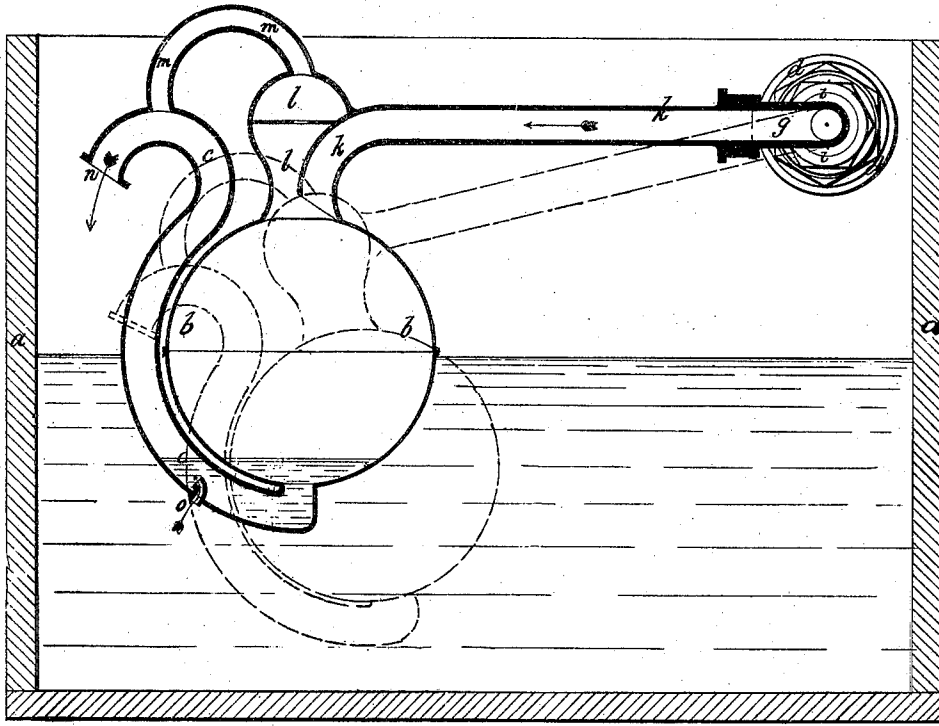
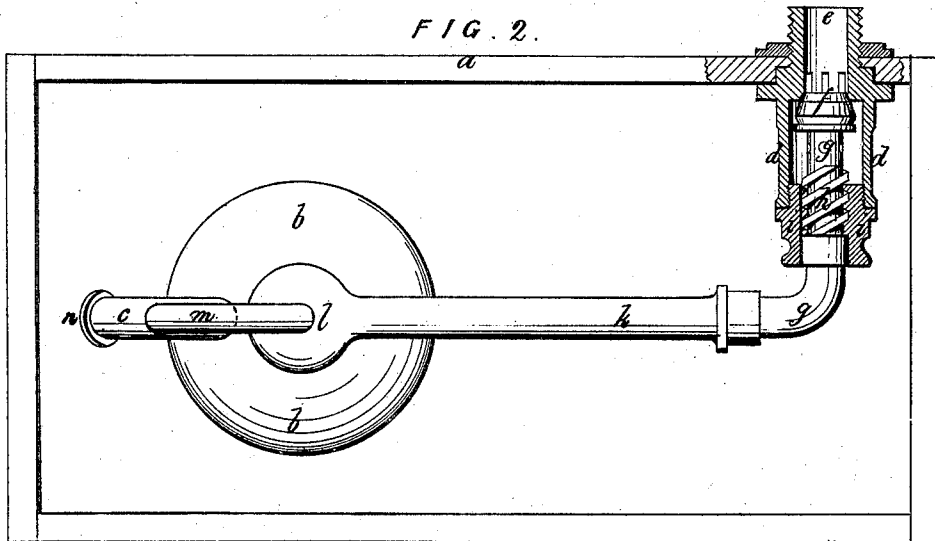


FIG. 2.



Witnesses.

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WILLIAM HILTON AND FRANCIS R. CLARKE, OF HEATON NORRIS, GREAT BRITAIN.

IMPROVEMENT IN STEAM-TRAPS.

Specification forming part of Letters Patent No. **172,738**, dated January 25, 1876; application filed October 4, 1875.

To all whom it may concern:

Be it known that we, WILLIAM HILTON and FRANCIS ROWLAND CLARKE, both of Heaton Norris, in the county of Lancaster, Kingdom of Great Britain and Ireland, have invented an Improved Steam-Trap, of which the following is a specification:

This invention relates to the construction of what are known as "steam-traps," which are employed for allowing of the escape of air and condensed water from steam-pipes, steam-chests, or drying-cylinders, and at the same time preventing the escape of steam therefrom.

The invention is applicable to that class of steam-traps wherein the rising and falling of a hollow copper ball or float in a vessel of water closes or opens the aperture of the steam-pipe, so as to allow the air and water to escape at intervals without losing the steam, and is intended to prevent the sticking too fast of the plug of the tap, which is a frequent occurrence in such steam-traps, and also the choking of the siphon-pipe with dirt that may be contained in the water, either of which events would at once stop the action of the steam-trap.

Figure 1 in the annexed drawing is a vertical section taken longitudinally through our improved steam-trap; and Fig. 2 is a plan view of the same, with the valve-box shown in section.

a a is the vessel; *b b*, the ball or float, and *c c* the siphon-pipe.

We dispense with the plug-tap entirely, and in its place we screw or fix a cylindrical valve-box, *d d*, at the end of the steam-pipe *e e*, in which is a conical valve-seating, fitted with a conical disk-valve, *f f*, attached to a short hollow stem, *g g*, in the sides of which are openings.

This stem is provided with a quick-threaded screw, *h h*, working in a similar nut, *i i*, formed or fixed in the interior of the valve-box *d d*, and thus, by turning the hollow stem *g g* of the valve, the latter is either opened or closed, so as to open or close communication between the interior of the steam-pipe *e e* and the inside of the hollow stem *g g* of the valve *f f*.

Outside the valve-box the hollow valve-stem *g g* is curved or bent round horizontally at a right angle, and to it is attached a tube, *k k*, which thus serves as a lever to open or close the valve, and, at the same time, serves as an inlet-pipe to the ball or float *b b*.

The other end of this tube is bent downward and attached to the upper part of the hollow ball or float *b b*, passing through an air-vessel, *l l*, fixed to the top of the ball. There is a small opening leading from the ball into this air-vessel, and an escape-pipe, *m m*, for the air leading from the top of the same.

Leading from the bottom of the ball *b b* is an S-shaped siphon-pipe, *c c*, which is of about the same diameter as the inlet-pipe *k k*, and is curved upward round the outside of the ball, and terminates in a discharge-opening at *n*.

The air-escape pipe *m m*, above named, leads into the upper curve of this S-shaped siphon-pipe *c c*, and in the lower part of the latter above the bottom of the ball, but below the line of flotation, is a small orifice at *o*, through which water can be admitted into the ball.

The action is as follows: The ball *b b*, being filled with water, which enters through the orifice *o*, last referred to, sinks into the position shown by the dotted lines in Fig. 1, and opens the valve in the end of the steam-pipe. As soon as the steam is turned on the air in the pipes, steam-chest, or drying-cylinder escapes through the valve, and, passing by the inlet-pipe *k k* to the air-chamber *l l*, above the ball *b b*, escapes by the air-escape pipe *m m*, before named.

The air is then followed by the water of condensation, which forces the water out of the ball *b b* up the S-shaped siphon-pipe *c c*, and discharges it, the steam continuing to drive the water of condensation through the ball and the S-shaped discharge-pipe; but, as soon as all the water has been forced out and the steam attempts to follow, the ball, being lightened, rises up and closes the valve. The ball then commences to fill again slowly with water, and the operation is repeated as before.

We claim—

1. The combination of the hollow float *b* and its hollow stem *k g*, having perforations within the valve-chamber *d*, with the screw-valve *f*, as set forth.

2. The air-vessel *l l*, communicating with the upper portion of the ball *b*, and, at its opposite end, with the air, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM HILTON.

FRANCIS ROWLAND CLARKE.

Witnesses:

T. E. DAVIES,

JOHN HUGHES.