

(No Model.)

J. H. DEWHURST.
STEAM TRAP.

No. 542,149.

Patented July 2, 1895.

Fig. 1.

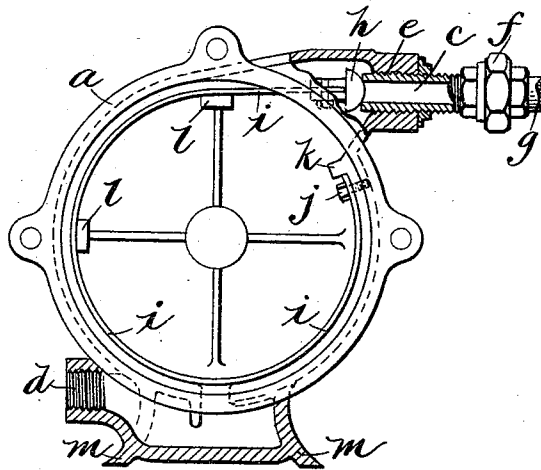


Fig. 2.

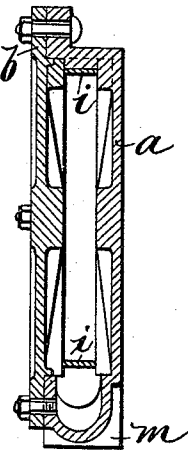


Fig. 3.

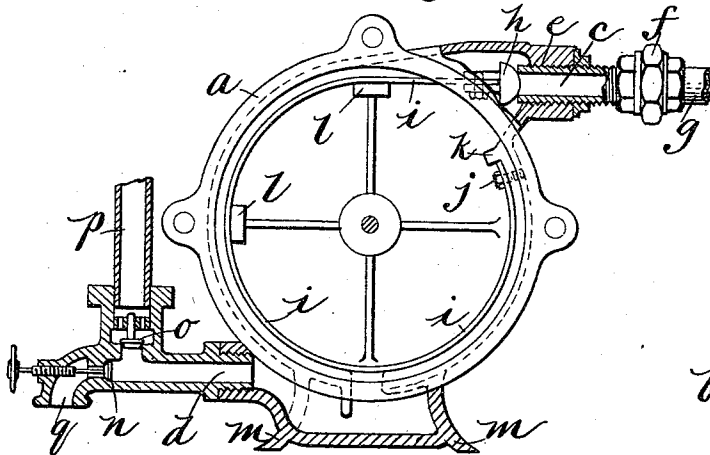
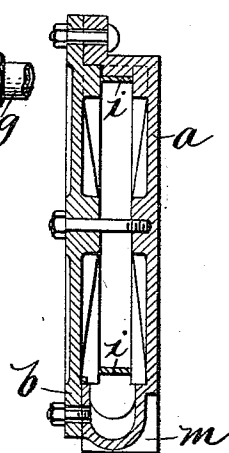


Fig. 4.



WITNESSES

Everance
Parks R. McBride.

INVENTOR

John H. Dewhurst
by
Wm H. Babcock
Attorney

UNITED STATES PATENT OFFICE.

JOHN HENRY DEWHURST, OF SHEFFIELD, ENGLAND.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 542,149, dated July 2, 1895.

Application filed February 11, 1895. Serial No. 538,013. (No model.) Patented in England August 30, 1893, No. 16,338; in Belgium February 24, 1894, No. 108,716, and in France February 26, 1894, No. 236,561.

To all whom it may concern:

Be it known that I, JOHN HENRY DEWHURST, a citizen of Great Britain, residing at Sheffield, in the county of York, England, have invented certain new and useful Improvements in Steam-Traps, (for which I have obtained a patent in Great Britain, No. 16,338, bearing date August 30, 1893; in Belgium, No. 108,716, bearing date February 24, 1894, and in France, No. 236,561, bearing date February 26, 1894,) of which the following is a specification.

My invention relates to improvements in steam-traps in which a bent or coiled rod constructed of some metal or metallic alloy or other substance highly sensitive to heat operates in conjunction with a suitable valve; and the objects of my improvements are to so construct a steam-trap that it shall be rapid in its action, simple and inexpensive in design, and one which may be used for draining by gravitation or which may be used as a water drainer and lifter. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, partly in section, of my improved steam-trap as constructed for draining by gravitation, the lid of the case being shown removed. Fig. 2 is a transverse section of the same with the lid in position. Fig. 3 is an elevation of my improved steam-trap, also partly in section and shown with the lid removed, adapted for use either as a drainer, as illustrated in Fig. 1, or as a water drainer and lifter, as circumstances may require. Fig. 4 is a transverse section of the same with the lid in position.

Similar letters refer to similar parts throughout the several views.

I construct the case or box *a*, by preference, circular in form, comparatively narrow in width, and provided with a lid *b*, an inlet *c*, and an outlet *d*, the inlet being placed tangentially at the upper circumference of the box (which stands on edge) and the outlet is placed likewise tangentially at the lower circumference of the box. The inlet-orifice I provide with an adjustable valve-seat *e*, which can be screwed or otherwise set inward or outward, as may be required. Such seat in

some cases I likewise employ as part of a union *f*, provided with suitable fittings for connecting to the inlet-pipe *g*. On this valve-seat, which faces inward into the trap, I provide a suitable ball-faced valve *h*. In some cases I employ a valve with wings fitting within the seat to guide it when being opened or closed. To the end of this valve I attach a bent or coiled rod *i*, which may be made in various sections, solid or hollow, or in the form of a tube, and constructed of some metal or metallic alloy or other substance highly sensitive to heat. This valve-rod I fit closely nearly the whole way round the inner circumference of the box its total length being equal to about the full inner circumference, though in some cases it may be made longer or shorter according to circumstances. This valve-rod, as already stated, is secured at one end to the valve and at the other end by a set-screw *j* and stop *k*, or their equivalents, to the inner case of the box. I also provide guides *l l* for this valve-rod where necessary.

When the valve and rod are in place, the seat is adjusted so that the valve closes tightly onto it when steam of a sufficiently high temperature is present in the box to cause the valve-rod to expand to the required degree.

The action of my improved trap is as follows: When the seat *e* has been adjusted and the connections made, on steam being admitted into the steam-service pipes, whatever water is present in the pipes is forced by the pressure of the steam through the valve *h* into the box of the trap, through which it continues to flow and escape by the outlet *d* until all the water in the pipe has been ejected. Steam then commences to flow and pass through the trap. As soon as the steam enters the trap, the valve-rod *i* is expanded by the heat and closes the valve *h*, which remains closed until the action of the external atmosphere on the case of the trap causes the temperature to fall, in consequence of which the valve-rod *i* cools and contracts, when the valve *h* is again opened, and whatever water may have accumulated in the pipe is allowed to escape. The presence of water in the pipe will likewise prevent the steam from coming in contact with the valve

until all the water has passed through, during which the water passing through the trap exercises a cooling influence upon the rod of the valve, which is in consequence kept open
 5 until all the water has escaped and steam re-enters the trap, when the valve is again closed by the action already described, and so on.

As a modification of the arrangement herein described, in some cases I place the trap upside down, reversing the inlet *c* and outlet *d*. In this position the inlet is always open to the steam, which condenses within the box, and as soon as the water rises a sufficient
 10 height to cool the valve-rod *i*, the valve-rod contracts, the valve *h* opens and the water present escapes. As soon as steam again enters the box, the valve-rod expands and the valve closes, and so on.

20 By the last-named arrangement the steam-trap forms a reservoir for any sudden flow of water which may be caused by priming or from other sources.

As a further modification, when the steam-trap is required for use as a drainer and water-lifter, as illustrated in Fig. 3, a stop-valve *n* and foot-valve *o* are placed in or near the outlet *d*, so that by closing the stop-valve *n* the water is forced through the foot-valve *o*
 25 into the pipe *p* to the required elevation. By opening the stop-valve *n* the water would pass through the outlet *d* to the orifice or pipe *q*, the foot-valve *o* being kept closed by the weight of water in the pipe *p* above it.

35 In any of the above modes of construction the case of the steam-trap is provided with suitable feet *m* to stand upon or brackets or

fixings by which it may be attached to a wall of a building or other suitable place.

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

1. In a steam trap used as a water drainer the combination of parts and appliances comprising the narrow circular formed case or box *a*,
 45 provided with a lid, *b*, an inlet, *c*, and outlet, *d*, the inlet orifice being provided with an adjustable valve seat, *e*, and valve, *h*, such valve being attached to a bent or coiled rod, *i*, constructed of some metal or metallic alloy highly
 50 sensitive to heat and secured within the case in the manner and for the purposes substantially as herein described and illustrated.

2. In a steam trap used as a water drainer and lifter the combination of parts and appliances comprising the narrow circular formed case or box, *a*, provided with a lid *b*, an inlet, *c*, and outlet, *d*, the inlet orifice being provided with an adjustable valve seat, *e*, and valve, *h*, such valve being attached to a
 60 bent or coiled rod, *i*, constructed of some metal or metallic alloy highly sensitive to heat and secured within the case, together with the appliances provided in or near the outlet orifice *d*, comprising the stop valve, *n*, and the
 65 foot valve, *o*, at the bottom of the upcast pipe, *p*, arranged in the manner and for the purposes substantially as herein described and illustrated.

JOHN HENRY DEWHURST.

Witnesses:

F. SQUIRE,

W. H. BAIRSTO.