

(No Model.)

A. J. BAYLEY.
STEAM TRAP.

No. 571,330.

Patented Nov. 17, 1896.

Fig. 1.

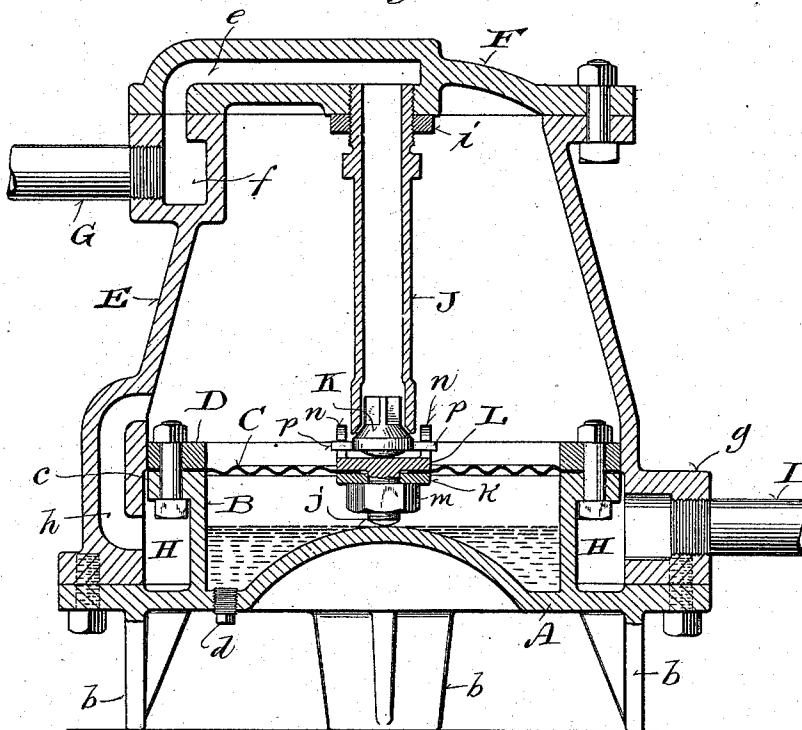
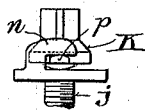


Fig. 2.



Witnesses:
Geo. W. Loring.
H. E. Oliphant

Inventor:
Arthur J. Bayley
By H. L. Underwood
Attorney

UNITED STATES PATENT OFFICE.

ARTHUR J. BAYLEY, OF MILWAUKEE, WISCONSIN.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 571,330, dated November 17, 1896.

Application filed February 24, 1896. Serial No. 580,592. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. BAYLEY, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Steam-Traps; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, quick-acting steam-trap that is not liable to get out of order and which requires but little attention to insure its automatic action under the various conditions to which such devices are ordinarily subjected.

Said invention therefore consists in certain peculiarities of construction and combination of parts hereinafter set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a sectional view of a steam-trap constructed according to my invention, and Fig. 2 an elevation of a valve and holder for the same that constitute parts of said trap.

Referring by letter to the drawings, A represents the base of my improved steam-trap, provided with legs *b*, and the central portion of this base is preferably indented, the under side being concave and the upper side convex, thus forming a dome, as herein shown. The base is also provided with an annular wall B, that surrounds its indented central portion, and supported on a horizontal flange *c* of the wall is a preferably-corrugated metal diaphragm C, surmounted by a stay-ring D, bolted to said flange.

From the foregoing it will be seen that a reservoir is provided for a suitable fluid, and the latter may be supplied from time to time through an opening in the base A, this opening being normally closed by a screw-plug *d*, as herein shown. The fluid is preferably one that has a greater expansion than water at a known temperature, although water, or a mixture of the same with other expansible fluid, may be used according to the pressure it is desirable to exert upon the diaphragm from within the reservoir at a predetermined temperature. The volume of fluid in the reservoir is preferably such as not to have its level above the indentation of the trap-base.

Bolted or otherwise suitably secured to the

base A is a flanged shell E, and likewise connected to the shell is a flanged cover F, the latter having a port *e*, communicating with a recessed portion *f* of the shell-wall to form an outlet for water of condensation from the trap, this water being led off through a pipe G, fitted in the recessed portion of said shell-wall.

The space intermediate of the fluid-reservoir and shell E constitutes a chamber H, and a hollow boss portion *g* of said shell serves as the entrance to the chamber, a pipe I being employed to connect the boss with heating-coils or other steam-using apparatus.

The chamber H is shown as having its outlet through a port *h*, leading into that portion of the trap above diaphragm C, and the discharge of water accumulating in said trap takes place through the valve-controlled pipe J, that depends from the shell-cover F, this pipe being in register with the outlet-port *e*, above specified.

The pipe J is preferably screw-threaded in the shell-cover F and held in place by a lock-nut *i*, the valve K, controlling the lower end of said pipe, being supported in a holder attached to the expansible metal diaphragm that constitutes the top of the reservoir.

The valve-holder herein shown consists of a disk L, having a screw-threaded shank *j*, extended through the diaphragm C to receive a washer *k* and locking-nut *m*, the upper face of said disk being provided with hook-arms *n*, with which lateral lugs *p* of the valve K are engaged.

The hook-opposing faces of the lugs *p* are preferably convex in order to facilitate perfect seating of the valve, the latter being preferably conical and capable of some play in pipe J to also facilitate its perfect seating.

The pipe J being adjustably fitted in the shell-cover F, the vertical play of the valve K may be varied, and the shank *j* of the valve-holder is preferably long enough to come against the dome portion of the trap-base when diaphragm C is in normal position, whereby provision is made for limiting contraction of said diaphragm.

The preferred peculiar construction of the base A, as herein shown, renders the liquid in the reservoir as sensitive as possible, and also renders it possible to use but a small quantity of said fluid to obtain satisfactory results,

while at the same time provision is made for rapid condensation of the aforesaid fluid, owing to the amount of surface exposed to external influences.

- 5 In practice the water of condensation from heating-coils or other steam-using apparatus enters the chamber H of the trap and filling the same rises through port *h* into the shell portion E of said trap. At the same time the
- 10 previously-lifted diaphragm C and valve K are returned to normal position, thus permitting the water of condensation to find its way out of the shell E through the pipe J, cover-port *e*, and recess *f* in the shell-wall.
- 15 The steam that follows the water into the trap-chamber H will cause the fluid in the reservoir to boil and thereby generate a greater pressure below diaphragm C than is above the same, this increased pressure forcing up said
- 20 diaphragm and attached valve-holder to seat the valve and thereby cut off the pipe J, thus preventing loss of steam through the trap. Now if water accumulate in the trap-chamber until the latter is partially filled the temperature of this water and exposed surface of
- 25 the trap-base will cause a condensation of the reservoir contents, thus reducing the pressure below diaphragm C to a degree less than that above the same, consequently there is a contraction of said diaphragm to bring the valve
- 30 K away from its seat and again permit the escape of water of condensation from the shell portion of the trap. The operations above described continue at such intervals that the
- 35 flow of water from the trap is practically continuous without loss of steam.

Owing to the structural detail of the steam-trap herein set forth, ready access may be had thereto at any time inspection or repair of the

40 same is found necessary or desirable. Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A steam-trap comprising a base provided
- 45 with a fluid-reservoir having an expansible diaphragm for its cover, a closed shell on the base provided at its lower end with a pipe-connecting hollow boss and having such dimensions that an annular chamber is formed ad-
- 50 jacent to the reservoir open to said boss, this

chamber and that portion of the shell above the diaphragm being in communication, a drain-pipe hung within said shell, and a valve for this pipe mounted on the diaphragm.

2. A steam-trap comprising a base having
- 55 a dome-like indentation surrounded by a wall surmounted by an expansible diaphragm, a closed shell on the base of such dimensions that a chamber is formed between it and the reservoir surrounding the latter, there being
- 60 an inlet to the chamber, communication of the latter with that portion of the shell above the diaphragm and an outlet from said shell; a pipe communicating with the outlet from within the aforesaid shell, and a pipe-valve
- 65 mounted on said diaphragm.

3. A steam-trap comprising a base provided with a fluid-reservoir surmounted by an expansible diaphragm, a shell on the base provided with an inlet and an outlet, the dimensions of the shell being such that an annular
- 70 chamber is formed between it and the reservoir open to said inlet, this chamber being in communication with that portion of said shell above the diaphragm, a shell-cover provided
- 75 with a port leading to said outlet, a pipe depending from the cover in communication with the latter port, and a pipe-valve mounted on said diaphragm.

4. A steam-trap having a water-escape controlled by a valve provided with lateral lugs, a valve-holder comprising a disk having hook-
- 80 arms engaged by the valve-lugs, and suitable means for seating and unseating the valve.

5. A steam-trap having a water-escape controlled by a valve provided with lateral lugs, a valve-holder comprising a disk having hook-
- 85 arms engaged by the valve-lugs and a depending shank held in an expansible diaphragm, and a stop opposing said shank to limit con-
- 90 traction of the diaphragm.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ARTHUR J. BAYLEY.

Witnesses:

N. E. OLIPHANT,
B. C. ROLOFF.