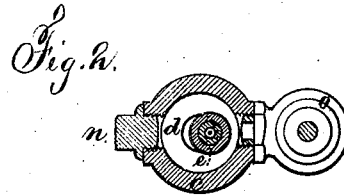
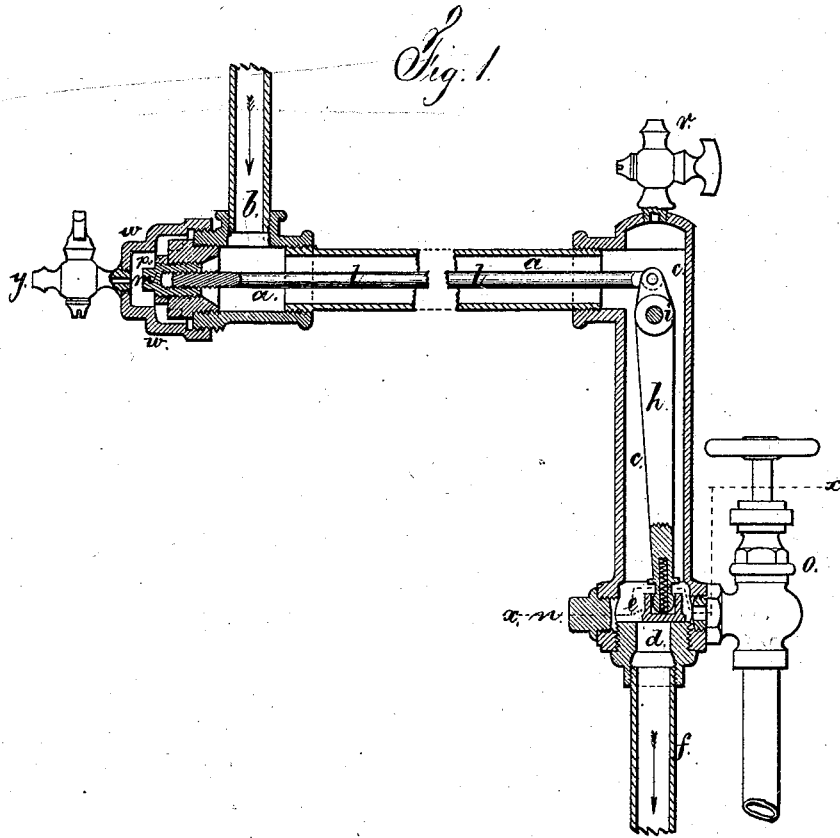


F. STEELE.  
STEAM-TRAPS.

No. 183,340.

Patented Oct. 17, 1876.



Witnesses  
Harold Serrell.  
Geo. S. Quickeney

Inventor.  
Ferdinand Steele,  
per Lemuel W. Serrell  
att'y.

# UNITED STATES PATENT OFFICE.

FERDINAND STEELE, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN STEAM-TRAPS.

Specification forming part of Letters Patent No. **183,340**, dated October 17, 1876; application filed August 28, 1876.

*To all whom it may concern:*

Be it known that I, FERDINAND STEELE, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Steam-Traps, of which the following is a specification:

Steam-traps have been made with an expansion rod to operate a valve, and alarms and air-valve have been similarly actuated. In these cases the valve closes against a seat, and is opened by being withdrawn therefrom. In these instances the parts are liable to become injured by unusual heat acting upon the expansion-rod, and pressing the valve unduly to the seat, and thereby deranging the position or adjustment of the parts.

My invention relates to a slide-valve combined with a lever and expansion-rod, and arranged in such a manner that the valve is free to move even after the maximum or minimum temperatures of the expansion-rod are arrived at, thereby preventing injury to any of the parts.

In the drawing, Figure 1 is a vertical section of the apparatus, and Fig. 2 is a sectional plan at the line *x x*.

The water of condensation from a radiator-coil or condenser is allowed to run into the tube *a* by the inlet *b*. Connected with this pipe *a* is a pipe, *c*, preferably at right angles to *a*, and a valve-seat, *d*, and valve *e* are provided at the outlet water-way or pipe *f*. In the tube *c* is a lever, *h*, connected by a ball-joint and spring with the valve *e*. This lever *h* is upon a fulcrum, *i*, and the short end is connected to the copper rod or tube *l*, that is within the pipe *a*, the opposite end of which rod is adjustably secured in the socket-plug *m*.

When water fills the tubes *a* and *c* the temperature of the rod *l* lessens, and its length contracts, so that the valve *e* is moved aside upon its seat sufficiently to open the water-way and allow the water to escape, and as steam reaches the copper rod *l* it is expanded by the heat, and the lever *h* moves the valve *e* to close it again.

By this construction the apparatus is made automatic.

A plug should be introduced at *n*, contiguous to the valve, to give access for cleaning the valve-chamber; and also a branch pipe

and cock, *o*, are provided for blowing off sediment when necessary. An air-cock is to be provided at *r*.

It is preferable to make the socket-plug *m* with an external and internal screw-thread, and one thread with a larger pitch than the other, so that the adjustment will be slow and easily effected by revolving the said screw socket-plug, and thereby positioning the valve so as to open and close at the proper temperatures.

The lock-nut *p* prevents the socket-plug turning accidentally. The cap *w* serves to make a tight cover, and prevent the socket-plug *m* being moved. A cock, *y*, is introduced in the cap *w*, for emptying the cap when necessary.

The valve-seat is introduced from outside, so that it and the valve can be removed for grinding.

I am aware that in a steam-trap there has been an expansion-tube, with a valve at one end and an adjustable screw-socket at the other end; but the tube and socket revolved together. In my trap the expansion-rod does not revolve, but the socket is revolved around the rod and within the coupling, and the adjustment is effected by the difference in the screw-threads.

I claim as my invention—

1. The combination, with an expansion-rod, of a lever and slide-valve and the inclosing-tubes, forming a steam-trap, substantially as set forth.

2. The combination, with the valve and expansion-rod in a steam-trap, of the screw socket-plug, for holding and adjusting the stationary end of the rod, such socket-plug having threads of different pitch upon the outside and inside, respectively, for the purposes and as set forth.

3. In a steam-trap, the combination of a slide-valve, lever, and expansion rod or tube, and a removable seat for the valve, substantially as set forth.

Signed by me this 22d day of August, A. D. 1876.

F. STEELE.

Witnesses:

GEO. T. PINCKNEY,  
HAROLD SERRELL.