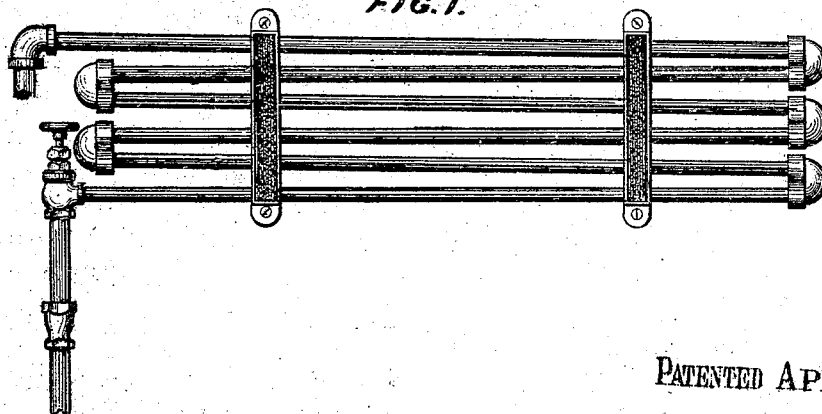


*J. J. Jordan assr etc. Impd. Steam Trap.*

FIG. 1.



PATENTED APR 4 1871

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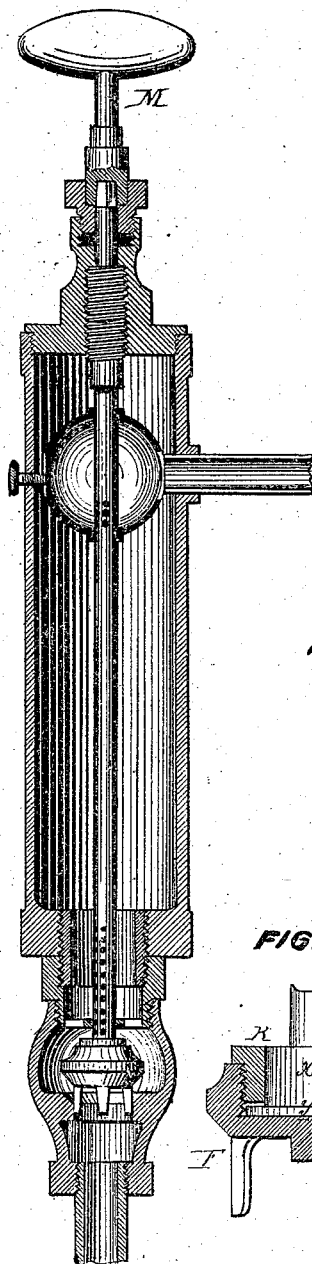


FIG. 3.

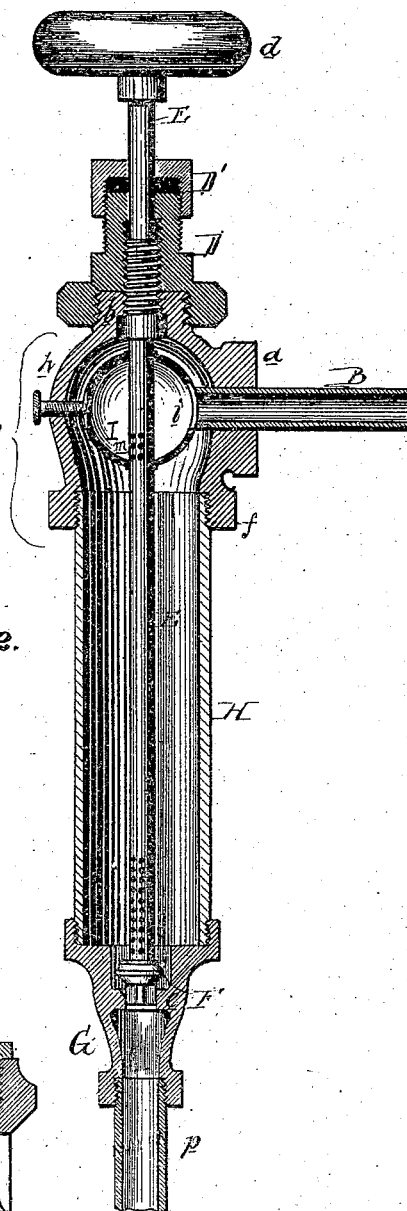


FIG. 2.

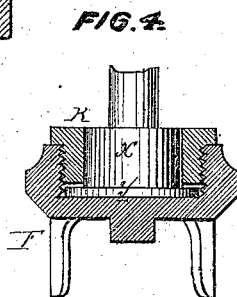


FIG. 4.

WITNESSES

*Jas. B. Harding*  
*Harry Smith*

*Inventor*  
*J. J. Jordan*  
*by his Attors*  
*Horsman & Son*

# UNITED STATES PATENT OFFICE.

JOHN JOSEPH JORDAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND GEORGE T. CARTER, OF SAME PLACE.

## IMPROVEMENT IN STEAM-TRAPS.

Specification forming part of Letters Patent No. 113,434, dated April 4, 1871.

*To all whom it may concern:*

Be it known that I, JOHN JOSEPH JORDAN, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improved Steam-Trap, of which the following is a specification.

My invention consists of an automatic instrument, too fully described hereinafter to need preliminary explanation, for effectually draining from steam-heating and other steam pipes the water of condensation and preventing the escape of steam therefrom.

In the accompanying drawings, Figure 1 is a view of steam-heating pipes with my improved steam-trap; Fig. 2, a vertical section of the steam-trap; Fig. 3, the same, with slight modifications; and Fig. 4, a sectional view, drawn to an enlarged scale, showing a mode of connecting the valve to the tubular stem.

In Fig. 2, A is a chest or casing, one branch, *a*, of which is secured to a tube, B, the lowest of the series shown in Fig. 1. To the upper branch, *b*, of the casing is secured the stud D, surmounted by a screw-cap, D', containing packing. Through this cap and stud passes a valve-spindle, E, on a portion of which is formed a screw-thread, adapted to an internal thread in the branch *b* or cap D, or both, so that the spindle E can be raised or lowered by turning the hand-wheel with which its upper end is provided. The spindle E has at its lower end a valve, F, adapted to a seat, *e*, in the valve-seat G, which is connected by a tube, H, to the branch *f* of the casing A, the chamber of the latter containing a vessel or receiver, I, which is in the present instance of a spherical shape, and which is so fitted snugly to the spindle as to permit the latter to turn freely, the vessel itself being retained by a set-screw, *h*, so that its opening *i* shall always be opposite to the end of the tube B. The valve-spindle E is tubular and its interior communicates through small orifices *m m* with the interior of the vessel I. As long as steam alone enters the instrument through the pipe B the tubular rod E will remain so expanded by heat as to maintain the valve F close to its seat *e*, the spindle having been so adjusted as to insure this condition of the valve under the circumstances. Should the water of condensation,

however, be driven by the steam through the pipe B, it will at once enter the vessel or receiver I, pass through the orifices *m m*, and down the tube E, which, being thus exposed by the comparatively cool water of condensation, will be suddenly contracted, the valve being consequently raised from its seat and the water passing through small orifices in the spindle above the valve, and thence through the seat *e* and waste-water pipe *k*, the expulsion of the water from the tube being urged by the pressure of the steam. Immediately after the water of condensation has been thus discharged and the tubular valve-spindle is exposed to steam alone it will be expanded by the heat of the same, and the valve will consequently be closed and the escape of steam will be prevented.

It will be observed that the water of condensation is isolated from the exterior tube, H, which, being exposed to steam only at all times, is subjected to little or no expansion or contraction, and consequently never varies to any appreciable extent in its length, whereas the tubular valve-spindle E is exposed to sudden changes of temperature. It is this permanency of the outer tube and the restriction of sudden changes of temperature to the tubular spindle which cause a sudden action of the valve and insure the quick disposal of the water of condensation and the instantaneous prevention of the escape of steam after the water has been disposed of.

The vessel I and tubular perforated valve-stem, besides insuring a sensitive and instantaneous action of the apparatus, serves also, when arranged as above described, as strainers for the water and as receptacles for sediment and other impurities, which in other steam-traps frequently settle on and about the valve-seat and interfere with the free operation of the valve.

The instrument illustrated in Fig. 3 differs in construction only from that shown in Fig. 2, the instruments being the same as regards their mode of operation. In Fig. 3 the tubular spindle is adjusted by means of a detachable screw-key, M, in a manner too clearly shown to need description, and for the purpose of preventing unauthorized persons from tam-

pering with the apparatus, and the tubular spindle is connected to the valve in a manner best observed in the enlarged view, Fig. 4, where the end of the spindle is provided with a cylindrical block, *x*, having a flange, *y*, which is retained by a screw-ring, *k*, in a recess in the valve, not so tightly, however, as to prevent the valve having a slight play on the end of the spindle. A valve thus loosely connected to the spindle is not liable to be affected as regards its proper adjustment to the seat by any slight distortion of the spindle.

I claim—

The adjustable tubular and perforated valve-

spindle E, its valve F, and the vessel I, arranged for receiving the water of condensation, in combination with a casing, constructed substantially as described, and having a seat for the said valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN JOS. JORDAN.

Witnesses:

WM. A. STEEL,

FRANKLIN B. RICHARDS.