

(No Model.)

S. BONSER.

STEAM TRAP.

No. 370,600.

Patented Sept. 27, 1887.

Fig. 1.

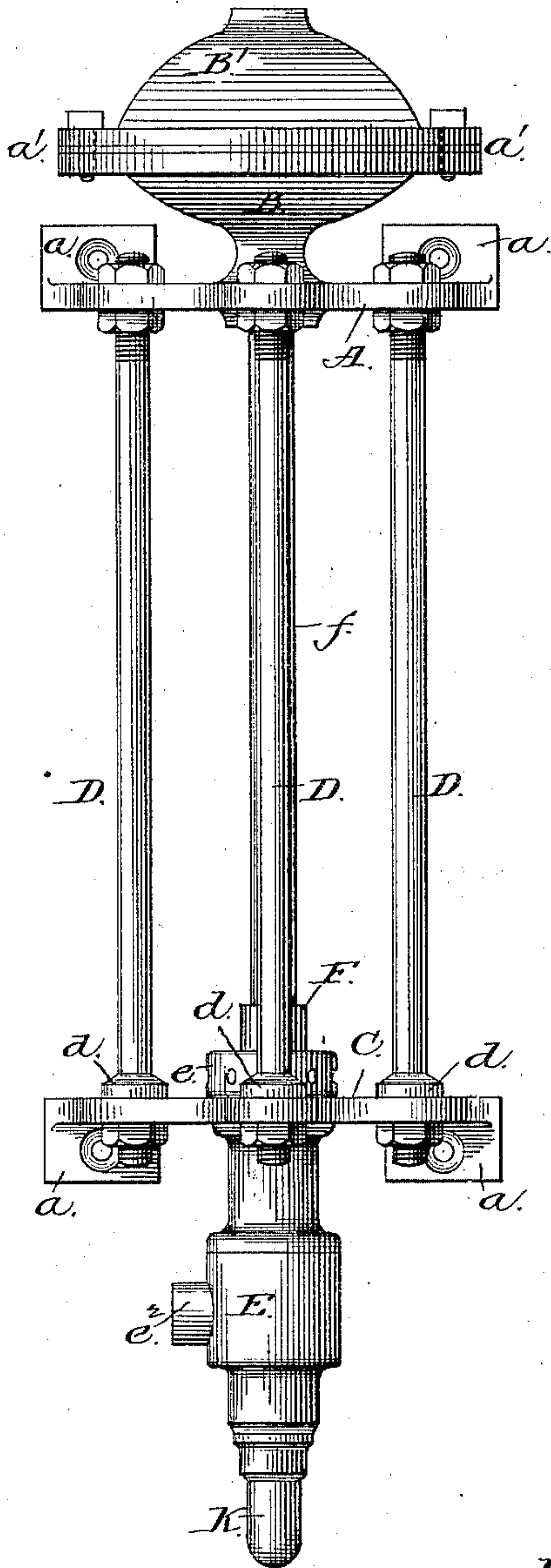


Fig. 2.

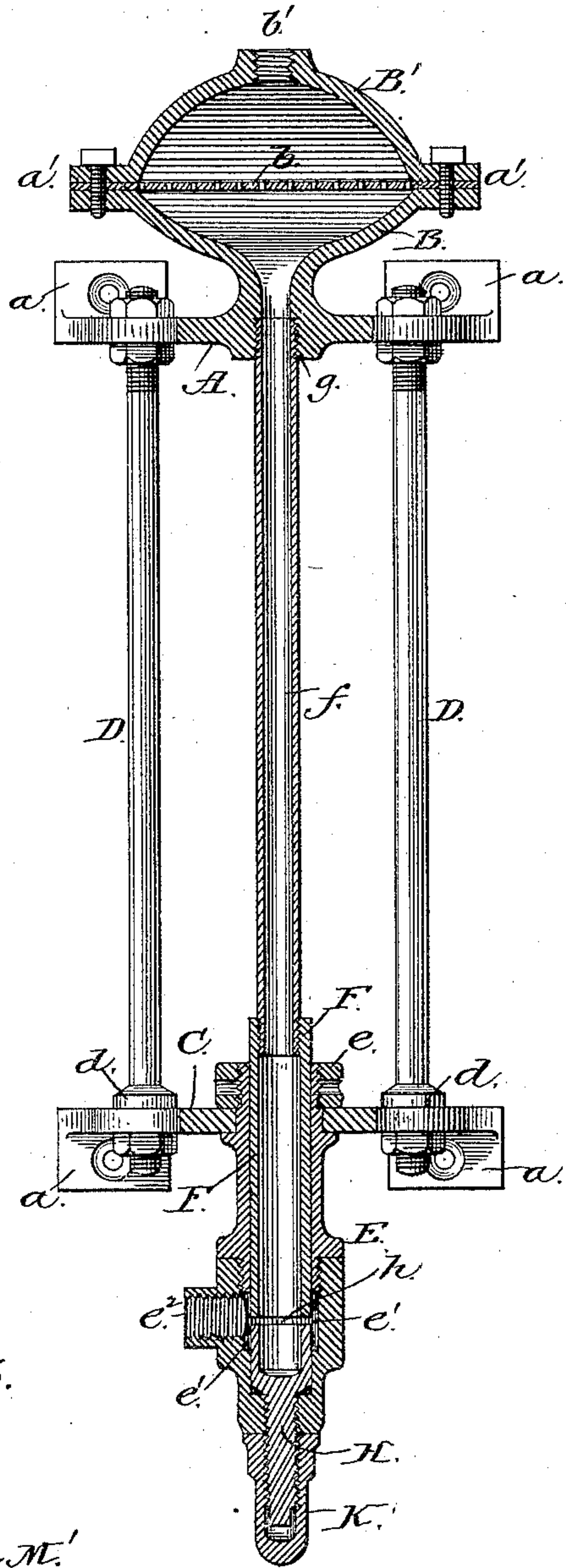
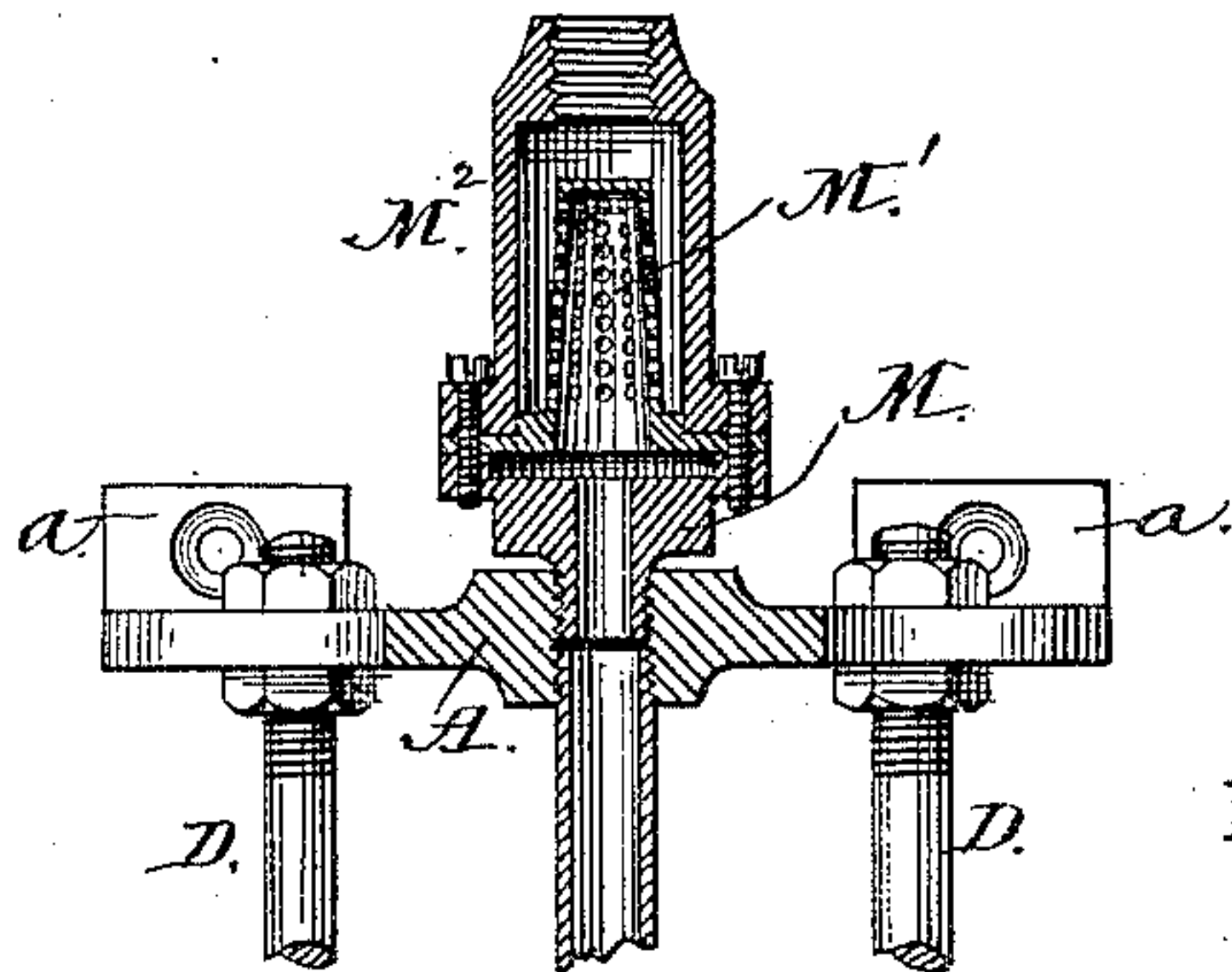


Fig. 3.



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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 370,600, dated September 27, 1887.

Application filed November 20, 1886. Serial No. 219,480. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BONSER, of Dover, in the county of Strafford and State of New Hampshire, have invented a new and Improved Steam-Trap, of which the following is a full, clear, and exact description.

My invention relates to a device for discharging the water of condensation from a steam-heating or other steam apparatus, and has for its object to effect the same in a simple yet positive manner and to afford a means whereby the water is filtered before entering the body of the trap, thereby preventing any sediment or scale interfering with the action of the valves.

The invention consists in the construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of my trap, and Fig. 2 a central vertical section thereof. Fig. 3 is a central vertical section through a modified form of filter.

In the construction of my steam-trap I provide a triangular head-plate, A, having its two opposite ends formed with projections *a* at right angles thereto, purposed to serve as feet, and a central apertured semicircular projection, B, adapted to sustain a perforated metal plate, *b*, and receive a semicircular cap, B', having an opening, *b'*, centrally therein, the cap B', semicircular projection B, and perforated plate *b* being held in close connection by screw-bolts passing through annular flanges *a'*, made integral with the said cap and semicircular projection, between which flanges the said perforated plate is clamped. Thus I produce a filter-dome at the head of the trap, through which all scale or sediment which accumulates in heating-pipes and all heating apparatus, and which usually finds its way to a steam-trap, is prevented from reaching the valves, therefore avoiding leakage by the indentation of their faces or continued separation by particles intervening them. I further provide a second triangular plate, C, also having integral right-angular projections or feet

a at its two opposite ends, and hold the said plates A and C securely together by means of three rods, D, fitted near their lower ends with collars *d*, which rods are held in position through screw-nuts at each end, as shown in the drawings.

Centrally within the lower triangular plate, C, a divided cylinder, E, is secured by a lock-nut, *e*, which cylinder is provided with an annular chamber, *e'*, having an outlet, *e''*.

Within the cylinder E a tube, F, is entered to about the center of the annular chamber *e'*, having secured thereto a second tube, *f*, whose other end is secured into the aperture *g* of the triangular head-plate A. The tube *f* is preferably made of copper, while the tube F is usually made of brass.

Through the lower end of the cylinder E a tubular threaded spindle, H, is inserted to a contact with the tube F, the lower end of which tube and the upper end of the said tubular spindle are square flat surfaces, forming a joint, *h*, surrounded by the aforesaid annular chamber *e'*. The extreme lower end of the spindle H is made square, to facilitate turning, and a threaded cap, K, is provided therefor, to avoid possible leakage, and also to prevent tampering with the said spindle and consequent disturbance of the valve-joint. The water of condensation entering through the filter-dome is filtered and discharged between the ends of the tube F and spindle H into the chamber *e'*, and from thence passes out through the outlet *e''*. When the water has been discharged and steam enters and takes its place, the tubes F and *f* will expand downward from the head-plate A in length sufficiently to close the aperture or joint *h*. When water again accumulates and becomes cold, or the temperature falls, the said tubes, or one of them, contracts, and the water is again discharged, and so on indefinitely.

The tubular spindle H may be adjusted with the greatest nicety, protected by the cap K, so that the joint *h* will close when the tubes contain steam and open when they contain water, or when the temperature falls. It will thus be seen that the temperature governs the operation of the instrument with perfect precision when it is properly adjusted. The operation will be the same if the steam only en-

ters the tube F; but the longer the tube is exposed to the variations of temperature the more will be the expansion and contraction.

In Fig. 3 I illustrate another form of strainer
5 or filter, which consists of a lower apertured and threaded flanged plate, M, adapted to receive a tubular filter, M', surrounded by a tubular flanged casing, M², the said lower plate, filter, and casing being held securely united
10 by screw-nuts entered through the same. This form of filter is detachable from the head-plate A, as connection is made therewith by a thread only. When the steam is shut off at any time, the tubes F f will contract and open the valve-
15 joint h, allowing the water to discharge, thereby leaving the heating apparatus hot and dry. Thus it will be seen that the trap cannot freeze when placed in a cold place.

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

1. The combination, with the head-plate

provided with a central aperture and a filter held above the same, of the divided cylinder having an annular chamber and an outlet, the
25 tubular spindle, the spindle-cap, the cylindric tube, and the connecting-tube, substantially as and for the purpose set forth.

2. The combination, with the head-plate A, provided with feet a, having a central aper-
30 ture and a filter, b, held above the same, the lower plate, C, having feet c, and the rods D, provided with collars d, connecting said plates, of the divided cylinder E, having an annular chamber, e', and outlet e², the tubular spindle
35 H, spindle-cap K, cylinder-tube F, and connecting-tube f, all arranged to operate substantially as shown and described, and for the purposes herein set forth.

SAMUEL BONSER.

Witnesses:

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