

No. 617,493.

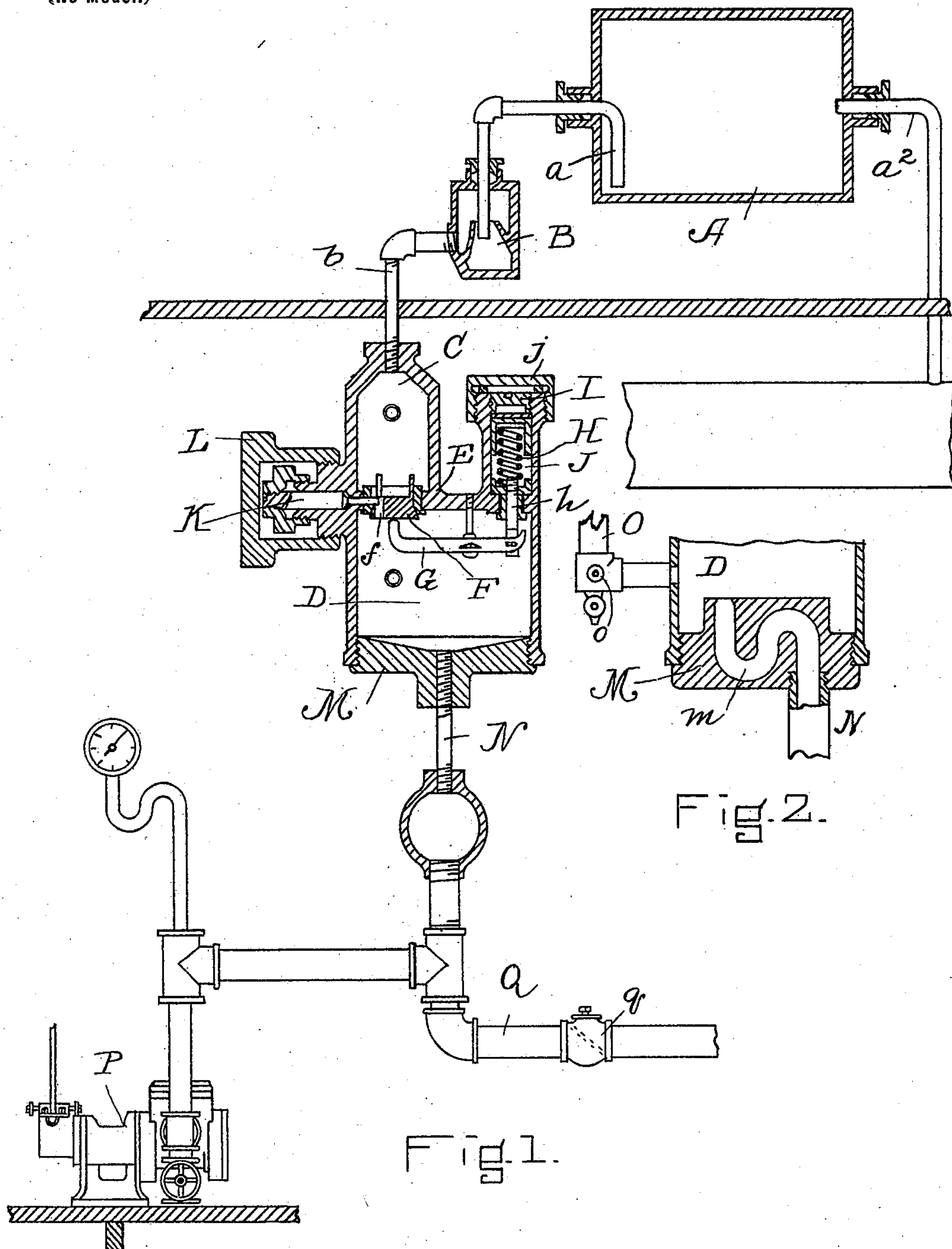
Patented Jan. 10, 1899.

J. B. MORGAN.

STEAM TRAP.

(Application filed Aug. 25, 1898.)

(No Model.)



WITNESSES.

Matthew M. Blunt.
H. W. Add

INVENTOR.

John B. Morgan,
by A. H. Pease,

ATT'Y.

UNITED STATES PATENT OFFICE.

JOHN B. MORGAN, OF QUINCY, MASSACHUSETTS, ASSIGNOR TO J. CURTIS KIMBALL, OF SUFFOLK COUNTY, MASSACHUSETTS.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 617,493, dated January 10, 1899.

Application filed August 25, 1898. Serial No. 689,481. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. MORGAN, of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

My improvements relate especially to devices for automatically removing the water of condensation from steam drums, tanks, or radiators used in steam heating and circulating apparatus, the objects being to simplify construction, to avoid back pressure, and to make the devices readily adjustable.

My invention is embodied in a recessed casting or other body formed with a chamber to receive the water of condensation and provided with a vertically-movable bottom having a reduced aperture for passage of a limited amount of water and with means for varying the size of said aperture at will. The movable bottom of the chamber acts as a valve and is supported by a pivoted lever, upon the opposite end of which an adjustable spring acts to counterbalance the weight of water accumulating in the chamber and to permit its discharge when excessive. The construction is such that the valve or movable bottom cannot yield beyond certain limits in order that it may not become displaced.

A trap or seal is provided, located as desired, but preferably formed as an S-shaped passage through the plug which closes the sediment-chamber at the bottom of the recessed casting. A vacuum-pump serves to draw the water downwardly from the chambers of said casting, and a supplementary drip-pipe leads to the drain for use in the event of accident to the pump. A glass water-column connects the two chambers of the casting, so as to indicate if any obstruction exists in them.

I do not intend by the use of the word "casting" herein to limit myself to a chambered body formed of cast metal, although I consider that material best adapted to my purpose.

The drawings illustrate my invention as applied to one of a series of steam drying-drums, such as are used in paper-making.

Figure 1 is a vertical section, partly in elevation, showing some details of construction.

Fig. 2 is a detail modification of the plug of the sediment-chamber.

A represents a steam-drum to which exhaust-steam from the main is admitted through the axial pipe a^2 , the steam being liable to speedy condensation therein. At the opposite end of the drum the pipe a extends down almost to the bottom of the drum to enter the water of condensation and draw it therefrom either into a trap B and thence through a pipe b into a water-chamber C or to said chamber direct. A vacuum-pump P, suitably located, acts to draw off the water in addition to the siphon-like arrangement of the apparatus.

The water-chamber C and sediment-chamber D are divisions of a recessed casting E peculiar to my invention. These chambers are separated by a vertically-moving valve F, forming a yielding bottom for the chamber C into which the water first enters. A lever G, pivoted about centrally and located in chamber D, bears at one end beneath the valve F, while its other end is connected by a vertical rod h to a spring H, which is adjusted to counterbalance the valve and the varying weight thereon. Variations in the tension of the spring are produced by an adjusting-nut I. The spring, as shown, is located in a chamber J, formed in the casting E, and furnished with a screw-cap j to give an air-tight joint. It is obvious that the lever and spring may be differently arranged without departing from the spirit of my invention.

In order to permit a minute quantity of water to pass at all times without movement of the valve F, I form a reduced aperture f through or at one side of the valve, and I also provide for varying the size of such aperture by an adjusting-screw K, the tip of which enters more or less into the aperture, as in Fig. 1. A suitable packing prevents the entrance of air, and an external cap L may be screwed upon a boss surrounding the screw K for further security.

The bottom of the sediment-chamber D is a removable plug M, to which the outlet-pipe N is connected. This plug may be of the form shown in Fig. 1, but is preferably made as in Fig. 2, in which the central portion of the plug is raised and has an S-shaped passage m through it, forming a trap or water seal, while any sediment in the water may

settle in the annular space around it. A tube bent in the form of the passage *m* may be set in the plug *M* to project above it in the chamber *D* with the same effect.

5 Another feature indicated in Fig. 2 is a water-gage comprising a vertical glass tube *O*, having at top a tubular connection with the water-chamber *C* and at bottom a like connection with the sediment-chamber *D*. The
10 connecting-tubes are provided with cocks *o*, and when these are opened the height of water or the current through tube *O* will show whether or not the passage from either chamber is obstructed. A supplementary drip-
15 pipe *Q*, provided with a self-closing valve at *q*, furnishes outlet for the water in case the pump *P* becomes inoperative.

I claim as my invention—

20 1. In a steam heating and circulating apparatus, the chamber *C* arranged to receive the water of condensation and provided with the valve-like movable bottom *F*, formed with a reduced aperture *f*, in combination
25 to regulate its tension, and with a supporting-lever fulcrumed between said valve or yielding bottom and said spring, substantially as set forth.

2. In a steam heating and circulating apparatus, the water-chamber *C* having the
30 vertically-movable valve or bottom *F* with an aperture for the passage of a limited quantity of water and provided with an adjusting device *K* adapted to vary the size of said
35 aperture and thereby to regulate the flow of water through it, in combination with a pivoted lever bearing on said valve or bottom and with a spring serving to hold said lever in working position and permit it to yield as
40 required, substantially as set forth.

3. In a steam heating and circulating apparatus, the recessed body *E* formed with the
45 chambers *C*, *D* and *J*, said chambers *C* and *D* being separated by the yielding valve *F* and said chamber *J* having the spring *H* therein, in combination with the pivoted lever *G* in
the chamber *D* and adapted to apply the pressure of said spring to the support of said
valve, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN B. MORGAN.

Witnesses:

A. H. SPENCER,
JAS. P. PRINCE.