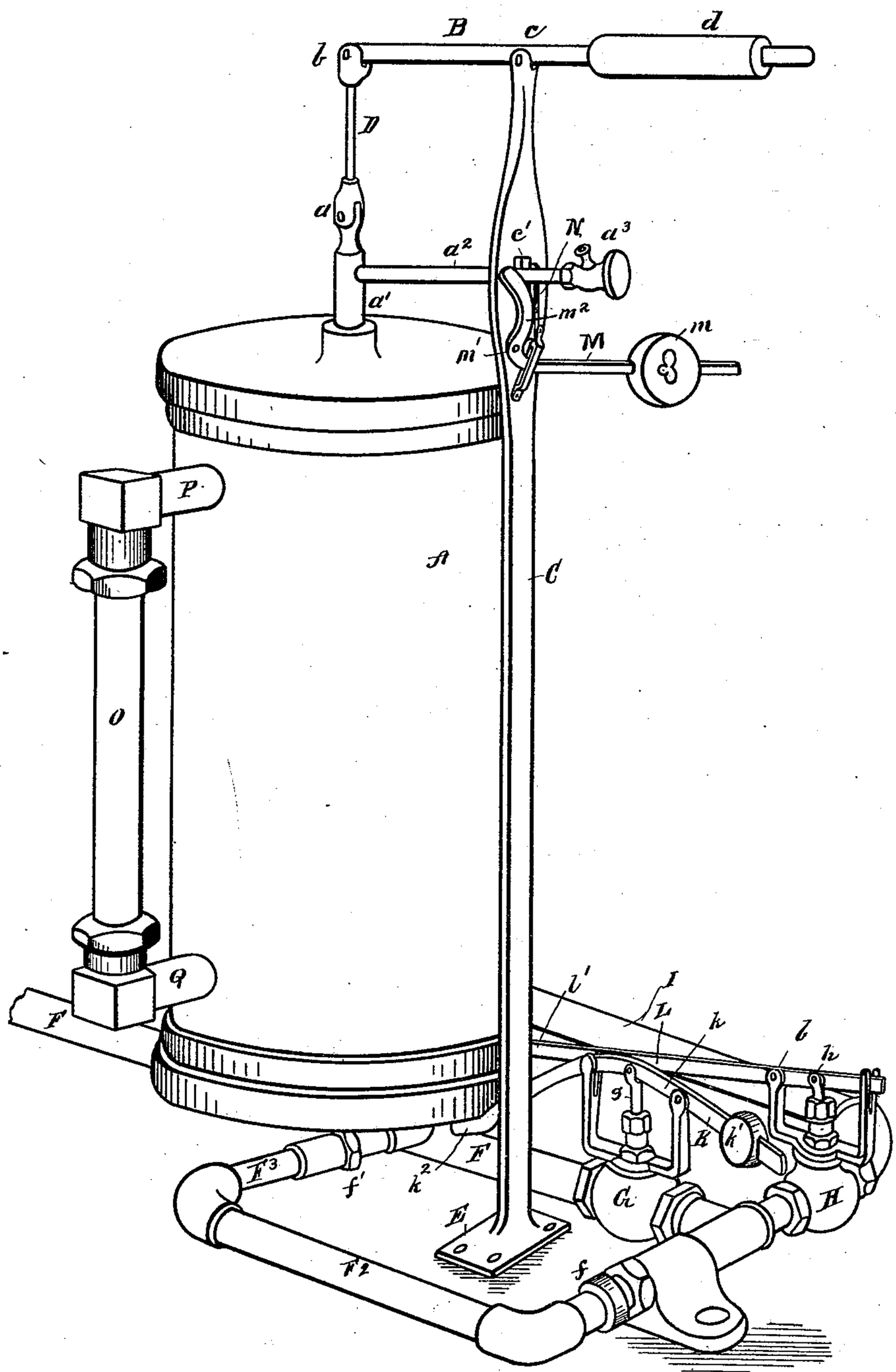
(No Model.)

B. C. ALTEBRANDT.

STEAM TRAP.

No. 512,263. Patented Jan. 9, 1894.



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BENJIMAN C. ALTEBRANDT, OF DETROIT, MICHIGAN.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 512,263, dated January 9, 1894.

Application filed March 21, 1893. Serial No. 467,023. (No model.)

To all whom it may concern:

Be it known that I, BENJIMAN C. ALTEBRANDT, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented certain new and useful Improvements in Steam-Traps; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to steam traps, and has for its object improvements in that class of steam traps in which the discharge of collected water is automatic and is induced by the weight of the water collected.

The drawings show my invention in perspective, and in it, A indicates the reservoir of a steam trap, which is suspended from one arm of the lever, B, by a link, D, jointed at *a* and *b*. The lever B is fulcrumed at *c* in the top of the post C, secured to the base E. On the other arm of the lever B is an adjustable weight *d* set to overbalance the weight of the reservoir A.

F represents the inlet pipe for the exhaust steam, which, after passing the lever controlled valve G, is bent round in F^2, F^3, and enters the bottom of the reservoir A. This pipe is thus lengthened to permit the introduction of the joints *f*, *f'*, which, working easily, keep the pipes steam tight and yet allow the reservoir A to rise and fall. Connected to a branch of this pipe F, is another lever controlled valve H, and from it leads the outlet pipe I, which is connected with the hot water tank. (Not shown.) When the valve G is open and the valve H is closed, the exhaust steam passes through the inlet pipe F F, the valve G and jointed pipe F^2, F^3, into the bottom of the reservoir A. When, on the other hand, the valve G is closed and the valve H is open, a free exit from the reservoir A is provided through the pipes F^2 F^3, valve H and outlet pipe I. The stem *g* of the valve G is pivoted to the weighted lever K, which is fulcrumed at *k*, and has at one end a weight *k'*, and the other end k^2 is caught under the edge of the reservoir A, and, being a lever of the second order, when the reservoir A descends, the valve G is closed, and, when it rises, the valve G is opened by the action of the weight *k'*. The valve H is similarly attached at *h* to the lever L, which is pivoted at *l* and has the end *l'* pivoted to the reservoir A under its lower edge; the lever is of the first order, and the valve is opened on the depression of the end *l'*; and the end *l'*, being pivoted to the bottom of the reservoir A, will rise with it and close the valve when the latter rises. At the upper end of the reservoir A is the pipe *a'*, continued in the horizontal pipe a^2, which passes through a slot *c'* in the post C, and has on its outer end the sniffle valve a^3. Below the slot *c*, the bent lever M is fulcrumed to the post C at *m'*. The other end of this lever carries a weight *m*, which holds the bend m^2 up against the stop N, fastened to the post C. This bend m^2 is so placed that the pipe a^2, when the reservoir A is lifted, as shown in the drawings, will lie in the angle above it, between it and the stop N, the bend m^2 being held in contact with the stop N by the weight *m* on the other arm of the lever M.

O is a sight water gage connected to the reservoir by the pipes P and Q.

The operation of this device is as follows: The reservoir A being empty, the weight *d* on the lever *b* keeps it in the raised position shown in the drawings, the exhaust steam and condensed water in the pipe F, flows through the open valve G (the valve H being closed as shown), and the pipes F^2 F^3, up into the reservoir A, its rise being shown by the water gage O. A small rise of water in the reservoir A would overbalance the weight *d* on the lever B, and cause the reservoir A to drop, were it not for the supplementary lever M and weight *m*. The weight of the reservoir A being balanced by the weight *d* on the lever B, the weight of the inflowing water is borne by the pipe a^2 which rests in the angle formed between the bend m^2 of the lever M and the vertical side of the stop N, the tendency being to slide down the angle and press the bent end m^2 of the lever away from the stop. This is resisted by the weight *m* on the other end of the lever M, until this resistance is overcome by the weight of water in the reservoir A, when the bend m^2 moves away like a latch, and the reservoir A descends. The weight *m* is so adjusted that this does not occur until the reservoir is full

or nearly full of water. The reservoir A, in dropping, actuates the levers K and L whose ends are beneath it, forcing them down and thus opening the valve H and closing valve G. The steam and water pressure of the pipe F is thus shut off, and the water contained in the reservoir A can flow out through pipe F^2 F^3, valve H, and pipe I, into the hot water tank, and the reservoir becomes empty again, the sniffle valve a^3 allowing air to enter as the water falls. The pipe a^2 pressing upward against the bend m^2 of the lever M, does not allow the reservoir to rise until all of the water is discharged. This rise is followed by the opening of valve G and the closing of valve H, causing the current of condensed water to again flow into the reservoir A.

I do not desire to broadly claim the use of a tilting reservoir to entrap the condensed water in steam pipes, as I am aware that, previous to my invention, tilting tanks adapted to actuate the valve closing the outflow have been used, but in such constructions the valve closing the inflow valve has always been a check valve, the operation of which was not certain, inasmuch as a very slight pressure of steam would frequently prevent the check valve from closing, and, even after it had once closed, would frequently open it before the water had entirely escaped from the tank.

In ordinary use of steam, there will always be a pressure which will tend to open the check valve, and, so long as there is any such pressure, the ordinary check valve will not work well in such a trap.

What I claim is—

1. In a steam trap, the combination of the lever valves G and H, inlet and outlet pipes F and I, with the reservoir A, balance lever B and supplementary lever M, substantially as described and for the purpose set forth.

2. In a steam trap, the combination of the valve G, stem g, lever K with weight k' and end k^2, and valve H with stem h, lever L and end l', with the outlet pipe I and inlet pipe F F^2 F^3 having joints f f', and the tilting reservoir A, substantially as and for the purpose set forth.

3. In a steam trap, the combination of the valve G bearing a weighted lever having one end actuated by the reservoir A, and the valve H, with weighted lever L, with the end l', attached to the reservoir, the outlet and the jointed inlet pipes, with the tilting reservoir balanced by the weighted lever B and supplementary lever M, substantially as described and set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

BENJIMAN C. ALTEBRANDT.

Witnesses:
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