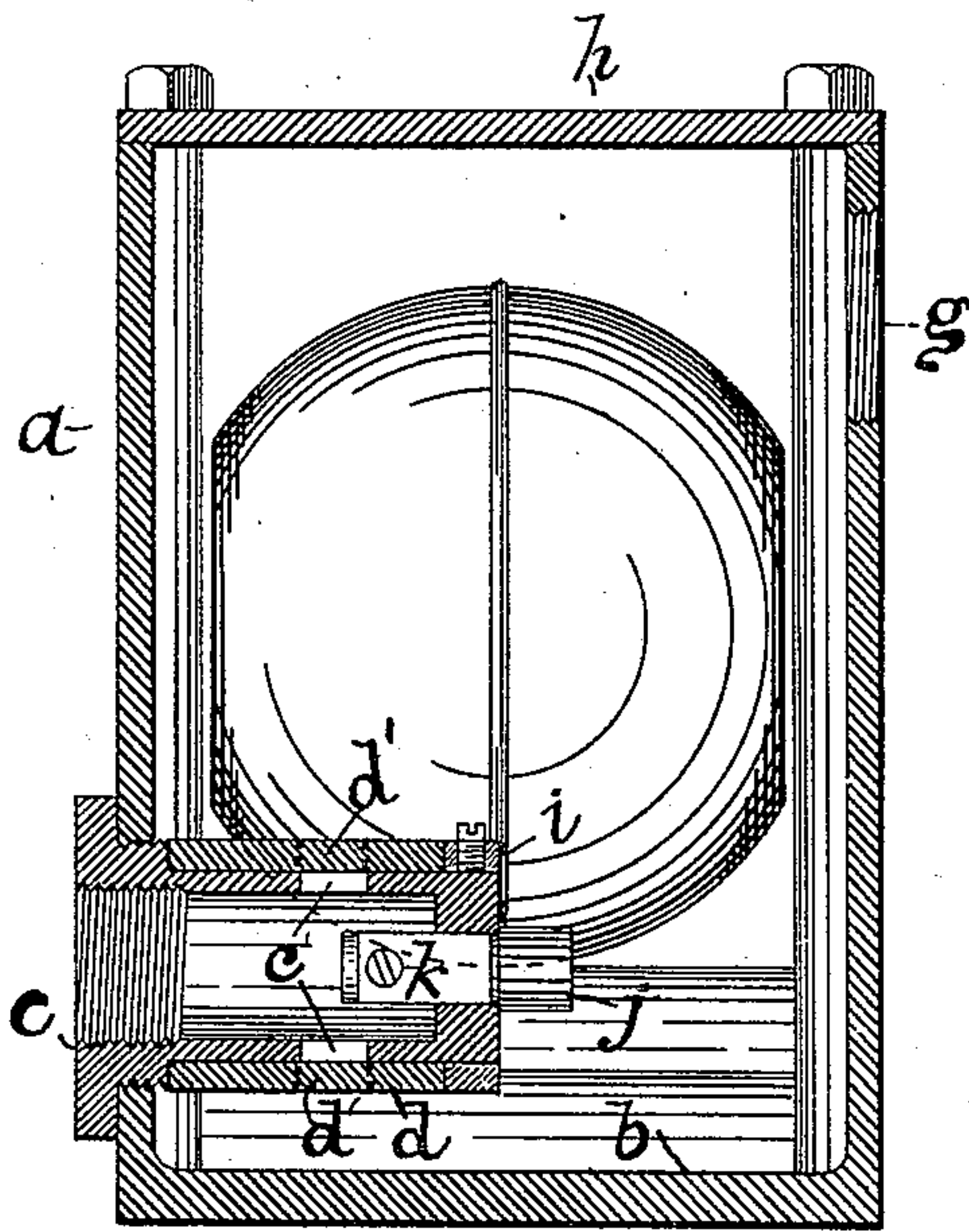
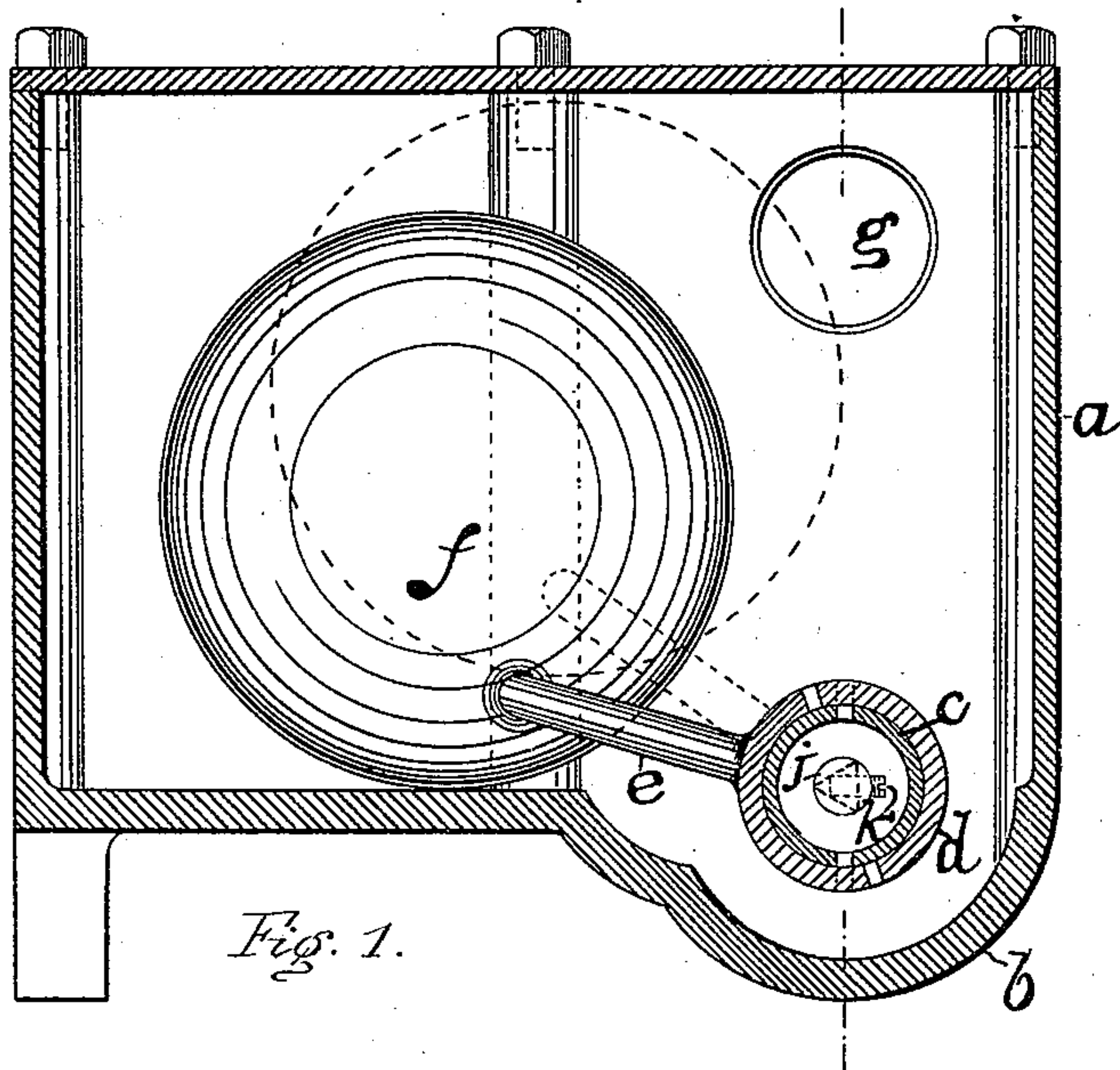


(No Model.)

A. B. LEITH & B. HAMPTON.
STEAM TRAP.

No. 450,415.

Patented Apr. 14, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER B. LEITH AND BENJAMIN HAMPTON, OF CHICAGO, ILLINOIS.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 450,415, dated April 14, 1891.

Application filed January 12, 1891. Serial No. 377,508. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER B. LEITH and BENJAMIN HAMPTON, citizens of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Traps, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 shows a vertical longitudinal section of our steam-trap cut through the steam-ports, while through the box the cutting plane passes between the float and side of the box. Fig. 2 shows the box as cut by a transverse vertical plane which passes through the axis of the valve-chamber.

Like letters refer to like parts.

The object of our invention is to produce a steam-trap which shall be entirely automatic in its operation and wherein the main valve shall be balanced and the auxiliary valve shall work in combination with it and alternately by means of steam and atmospheric pressure, and which shall not be liable to be injured by frost when unused in cold weather; and in order to attain said desirable ends we construct our said new and improved steam-trap in substantially the following manner, namely:

We provide a suitable chamber or box *a* with a cavity *b*. Said cavity is not indispensable, but its object is to make the space which shall hold the last portion of water as small as possible, and consequently of harmless proportion in case it should freeze. Into said cavity *b* is inserted a hollow plug *c*, adapted to be screwed to a pipe and provided with diametrically-opposite ports *c'*, and over said plug is passed a sleeve having ports *d'* fitting over the ports *c'* when open, and to said sleeve or valve is attached an arm *e*, to the outer end of which is secured a float *f*. Steam is let into the box through the opening *g*. There is a lid *h* to the box, held in place by suitable bolts. A ring *i* holds said valve *d* in its place on the plug *c*. The opposite end of the said valve rests against a shoulder of the plug *c*. By making the ports

c' and *d'* of equal area and diametrically opposite each other the valve becomes balanced, and hence quite free to act by very light force.

The interior end of the plug has an opening upon which is placed a valve *j*, having mechanism which allows it to work properly, as three wings radiating from the axis of the valve at equal angles or a triangular stem having similar working-surfaces, as here shown, of which the edges, like the said wings, will form the bearings on which the valve is carried as it plays. A pin or screw *k* at the end of said wings or stem holds the valve and its stem within the opening.

The operation of the above-described mechanism is substantially as follows, namely: When condensation occurs, when the valves are all closed, as shown in the figures, the water first fills the depression *b* and then continues to rise above the cavity *b* and over the floor of the chamber or box, and thus raises the float *f* into the position shown in the dotted lines. This causes the valve *d* to open its ports into the ports *c'*, after which the water in the trap will pass out through said ports, which at the same time will begin to close as the float descends, and when all the water is out and the float again rests on the floor of the trap the valve *d* will have closed the ports, and thus continue its operation. After the steam-pressure is ended and condensation occurs a vacuum would be formed in the trap *a* were it not for the valve *j*, which is forced from its seat, and thereby allows air to enter the box through the plug *c*, and at the same time this valve *j* lets out the water which may have come into the trap while there was yet steam-pressure. When steam is again turned into the trap, the air will pass through said open valve *j* until there is sufficient steam-pressure to close it, after which the float and its valve will again operate, as already shown.

Through this mechanism only a small quantity of water can ever be in the trap, and that only in parts of the cavity *b*, which is of such a shape that if the water should freeze no harm could result from it.

What we claim is—

In a steam-trap, the combination, with the chamber *a*, provided with hollow plug *c*, diametrically-opposite ports *c'*, and a valve-opening at its interior end, of the valve *d*, actuated by a float provided with ports *d'*, registering over the ports *c'*, and valve *j*, provided

with stem and stop *k*, substantially as specified.

ALEXANDER B. LEITH.
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