

(No Model.)

2 Sheets—Sheet 1.

O. GASSETT.
STEAM TRAP.

No. 528,665.

Patented Nov. 6, 1894.

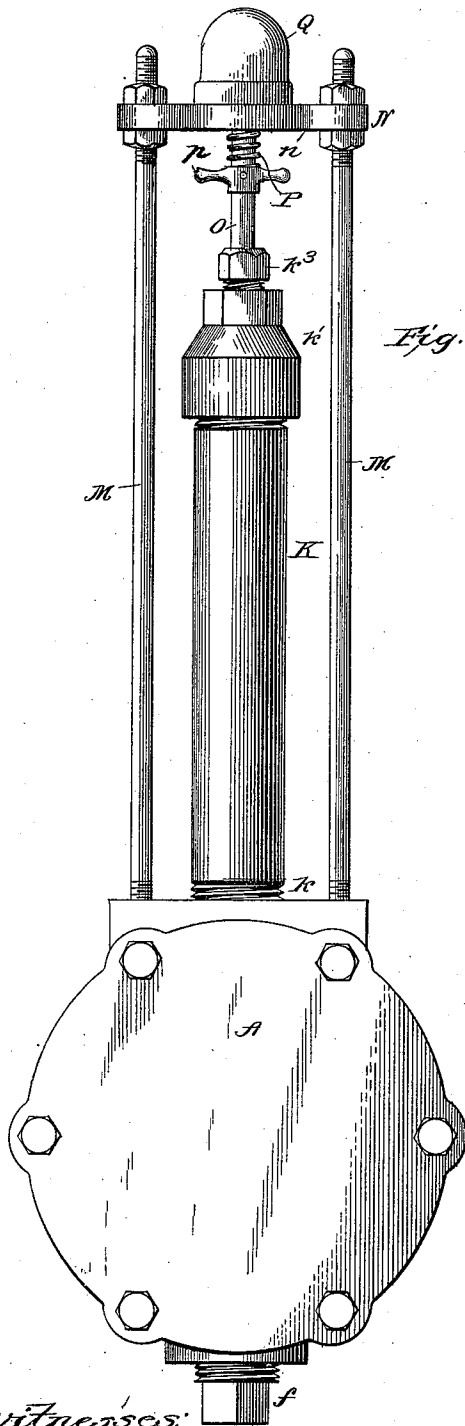


Fig. 1.

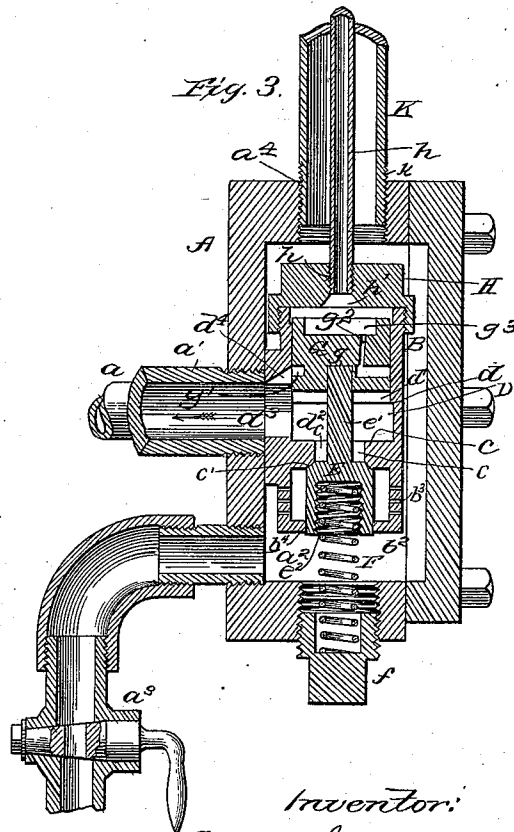


Fig. 3.

Witnesses:

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Chas. F. Miller

Inventor:

Oscar Gasset

By

W. H. Singleton,
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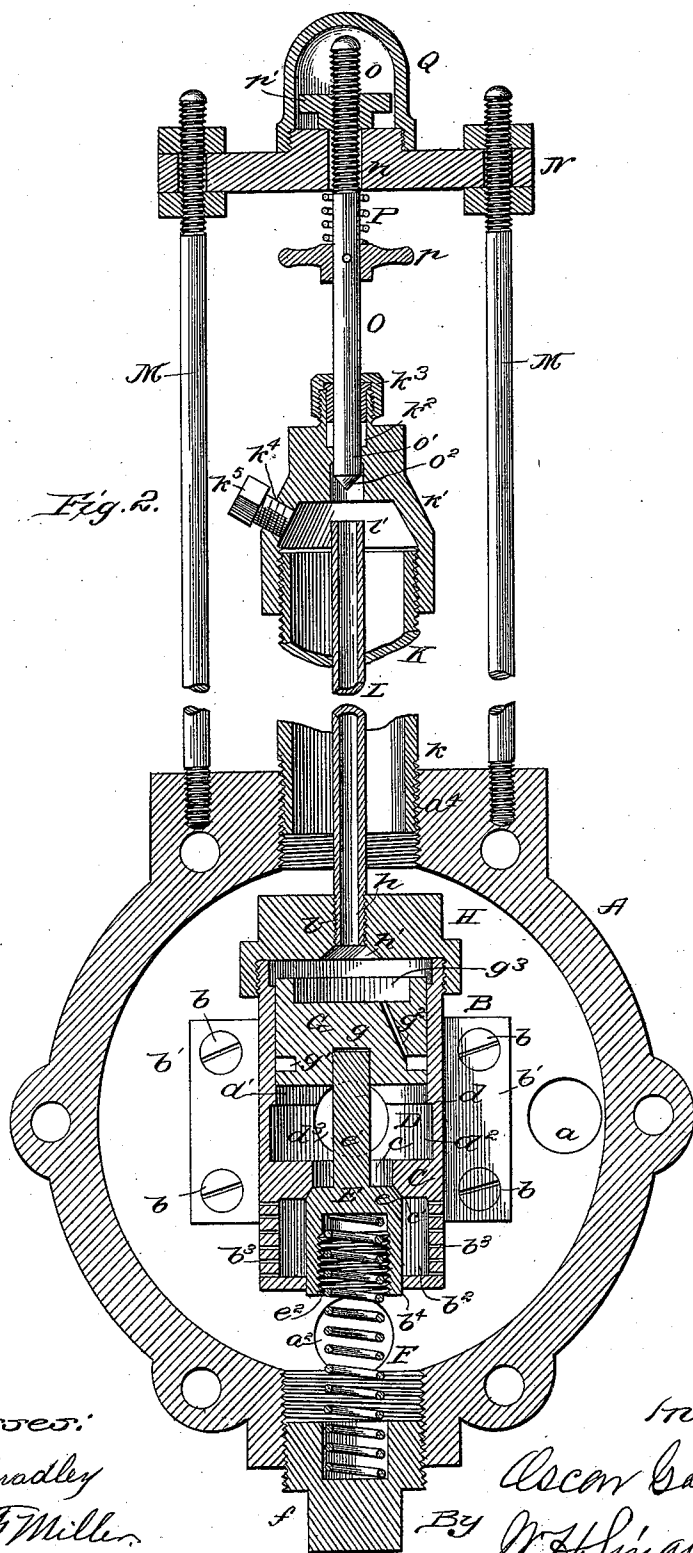
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2 Sheets—Sheet 2.

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STEAM TRAP.

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UNITED STATES PATENT OFFICE.

OSCAR GASSETT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE CROSBY STEAM GAGE AND VALVE COMPANY, OF SAME PLACE.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 528,665, dated November 6, 1894.

Application filed February 15, 1894. Serial No. 500,265. (No model.)

To all whom it may concern:

Be it known that I, OSCAR GASSETT, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Steam-Traps; and I do hereby 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 appertains to make and use the same.

This invention relates to an improvement in steam traps.

The object of the invention is to secure a quick, positive and a large opening for the discharge of water from the steam pipes leading to the steam trap, and, in order to accomplish such result, it is found that it requires a secondary, large or main valve to work in unison with the small or primary valve, as hereinafter described.

In constructing such a device it is found that the governing parts must be placed within the steam space, free from the external influence of temperature, of the atmosphere, and other influences.

The present invention consists in the construction hereinafter pointed out.

In the accompanying drawings, Figure 1 represents a face view of the steam trap; Fig. 2, a transverse vertical section taken through Fig. 1, the parts being enlarged. Fig. 3 represents a detail sectional view taken through a portion of the trap at a right angle to Fig. 2.

In the annexed drawings, the letter A represents the trap body being circular in form as shown, and leading into this body is the inlet pipe a , and leading from it the outlet pipe a' and the drain pipe a^2 , the latter being provided with a suitable cock a^3 . Secured within the trap body A is the case B being held therein by bolts b passing through the flanges b' . This case B has within it at the bottom the chamber b^2 leading into which are the small openings b^3 at the sides and at the bottom the circular bore b^4 . Above this chamber b^2 the case B has a diaphragm C in which there is a central passage c aligned with the bore b^4 and having on the under side the conical portion c' forming a valve seat. Above the diaphragm C within the valve case B there

is another cylindrical chamber D having the shoulder d which divides this chamber D into two portions d' and d^2 of different diameters. At one side there is an opening d^3 leading into the chamber D, this outlet d^3 communicating with the discharge pipe a' , and at the top this outlet d^3 has a divergent portion d^4 . Within the chamber b^2 is placed a valve E having the conical portion e to fit the valve seat c' , and a stem e' extending through the opening c and up into the chamber D. This valve E snugly fits the opening b^4 . This valve E has a central bore e^2 leading up into it from the under side. Within this bore e^2 is placed the upper end of a spring F the lower end of said spring resting inside the plug f which is threaded into the bottom of the steam trap body A. At its top the stem e' of the valve E rests in a socket g of a piston G which fits within the upper part d' of the chamber D. This piston G has an annular groove g' near its bottom, the location of this groove being such that it communicates with the portion d^4 of the passage d^3 when the piston G is at the upper part of its stroke. The passage g^2 leads from this annular passage g' out of the top of the piston G and into a circular recess g^3 of such piston. Upon the top of the valve or piston case B there is secured a cap H having at its center the threaded bore h terminating in a countersink h' within the cap, there being a space between this cap and the top of the piston G. This space and the recess g^3 form a chamber above the piston G.

In the top of the steam trap body A there is a threaded hole a^4 in which is secured the lower threaded end k of a pipe K. To the top of this pipe K is secured a cap k' having at its top a hole k^2 and a stuffing box k^3 , the top also being made with a hole k^4 closed by a tap screw k^5 . Secured in the hole h of the cap H is the lower end l of a pipe L smaller than the pipe K. This pipe L extends from the cap H up centrally through the pipe K, and the upper end l' of the pipe L terminates near the lower part of the hole k^2 in the cap k' of the pipe K. Rods M, M rise from the top of the trap body A, and carry at their top the cross head N. At the middle of this cross head N is a hole n through which passes

loosely the upper end o of a rod O, the lower end o' of such rod passing down through the hole k^2 of the cap k' and having a conical end o^2 which terminates just above the top l' of the smaller pipe L. Surrounding the rod O below the cross head, is a spring P, one end of which bears against the cross head and the other against a nut p secured on a rod O. Above the cross head N an adjusting nut p' is screwed upon the protruding end o of the rod O. A protective cap Q may be placed above the adjusting nut and protruding end of the rod O, and be secured to the cross head N.

In use steam passing through the pipe a into the steam trap body A passes up into the pipe K and down through the pipe L. The steam heating the pipe L causes it to expand until the upper end l' of the pipe L comes in contact with the conical end o^2 of the rod O, thus forming a valve, the spring P permitting sufficient play of the rod O to prevent any strain upon the parts. The pipe L continues in contact with the rod O closing the opening between the two until sufficient water of condensation enters the trap, when the water, being cooler than the steam, causes the pipe L to contract, thus causing the end l' to withdraw from the rod O, thus opening the valve at this point. When this happens the water of condensation pours down through the pipe L and into the chamber of the valve case B above the piston G. This water pressing upon the piston G forces it and the valve E downward, opening the valve E at its valve seat c' . This action of the water, as thus described, is owing to the fact that the area of the piston G being greater than that of the valve E the pressure of water upon the piston G is greater than the combined pressure of water and the spring F upon the valve E. The water of condensation then pours through the opening b^3 and through the valve seat c' , opening c into the chamber d^2 and out through the discharge pipe a' . This continues until the water of condensation shall have left the valve body. Steam then again enters the valve body, expands the pipe L as already described, and closes the opening between the pipe L and the rod O. Whatever there may be left of the water of condensation above the piston G, or whatever modicum of steam may enter the pipe L as the steam takes the place of the water of condensation in the trap they pass out through

the passages g^2 , g' into the discharge pipe a' so that there is no back pressure against the piston G which would tend to resist the action of the steam in forcing the valve E to its seat and closing it; and by having the passage g' communicating with the portion d^4 of the passage d^3 even after the piston G is returned to its uppermost position whatever steam there may be above it will gradually pass out into the discharge pipe a' .

By examining the drawings it will be seen that, when the piston is pushed down it will also push down the valve in order to open it, and when open it allows the discharge to run into the cylinder and against the lower end of the piston. The said piston in its descent cuts off a portion of the said discharge d^3 until the piston has backed up pressure enough below the piston to prevent its descent to the bottom of the cylinder.

Having thus described my invention, what I claim is—

1. The combination in a steam trap of a valve provided with a piston which controls the discharge from such trap and a pipe valve which communicates at one end with the piston and at the other end opens out into the trap, as set forth.

2. The combination in a steam trap of the steam trap body A; the pipe K leading therefrom; the piston and case B; the piston therein; the pipe L leading from within the valve case above the piston, up into the pipe K; the rod terminating within the pipe K near the top of the pipe L; the inlet a into the trap body and the discharge pipe a' leading from the piston or valve case B, as set forth.

3. The combination of the secondary, large or main valve with the small or primary valve, the latter being at the end of an expansion pipe which communicates at one end with the interior of the trap and at the other end with a chamber above the main valve, as set forth.

4. The combination of the secondary, large or main valve, the small or primary valve pipe, L, the rod, O, the spring, P, and a bearing on the rod and on the trap frame between which bearings the spring bears, as set forth.

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

OSCAR GASSETT.

Witnesses:

JOSHUA H. MILLETT,
ARTHUR L. BOWKER.