

(No Model.)

H. CREAMER,
STEAM TRAP.

No. 376,586.

Patented Jan. 17, 1888.

fig:1.

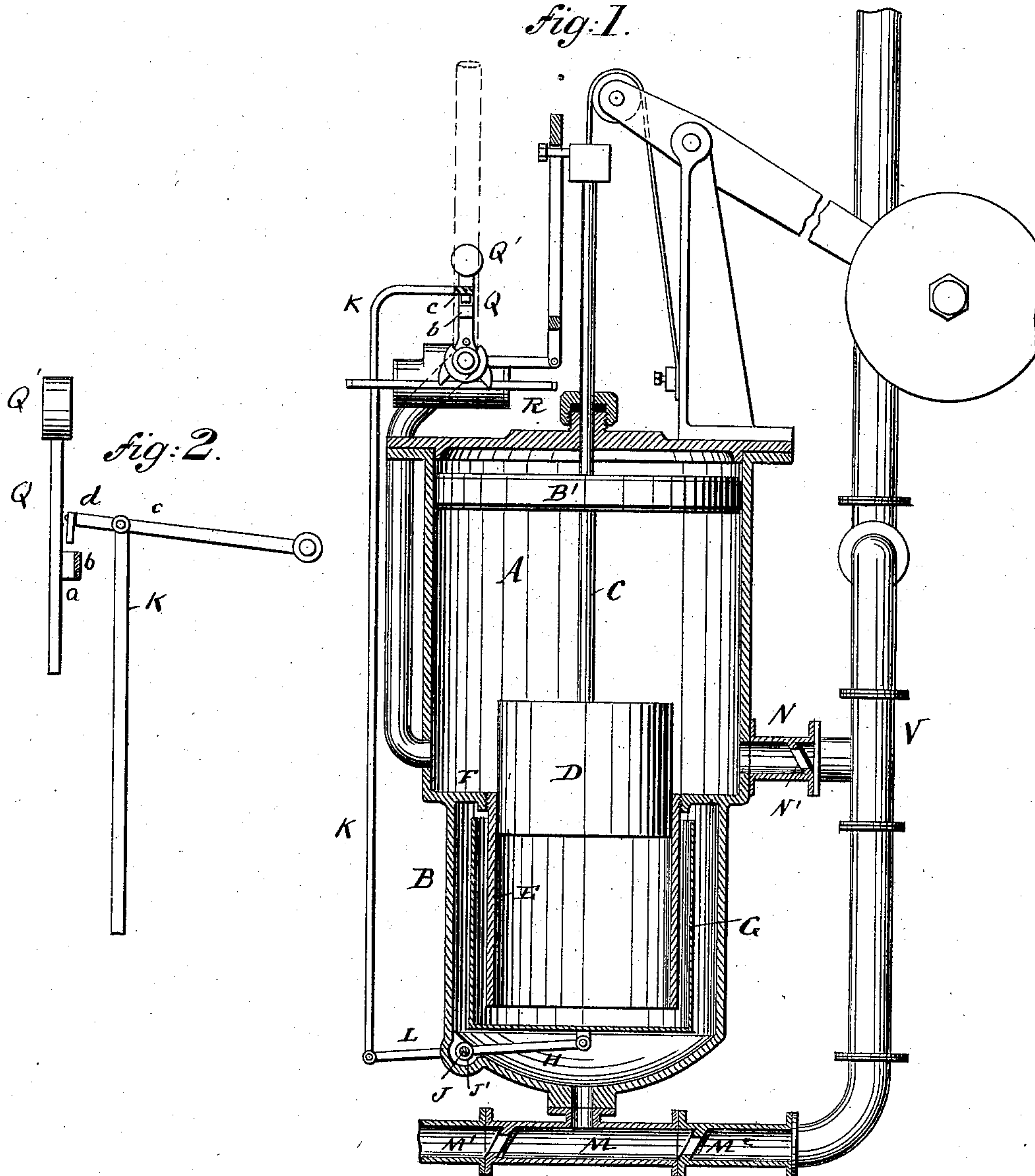


fig:2.

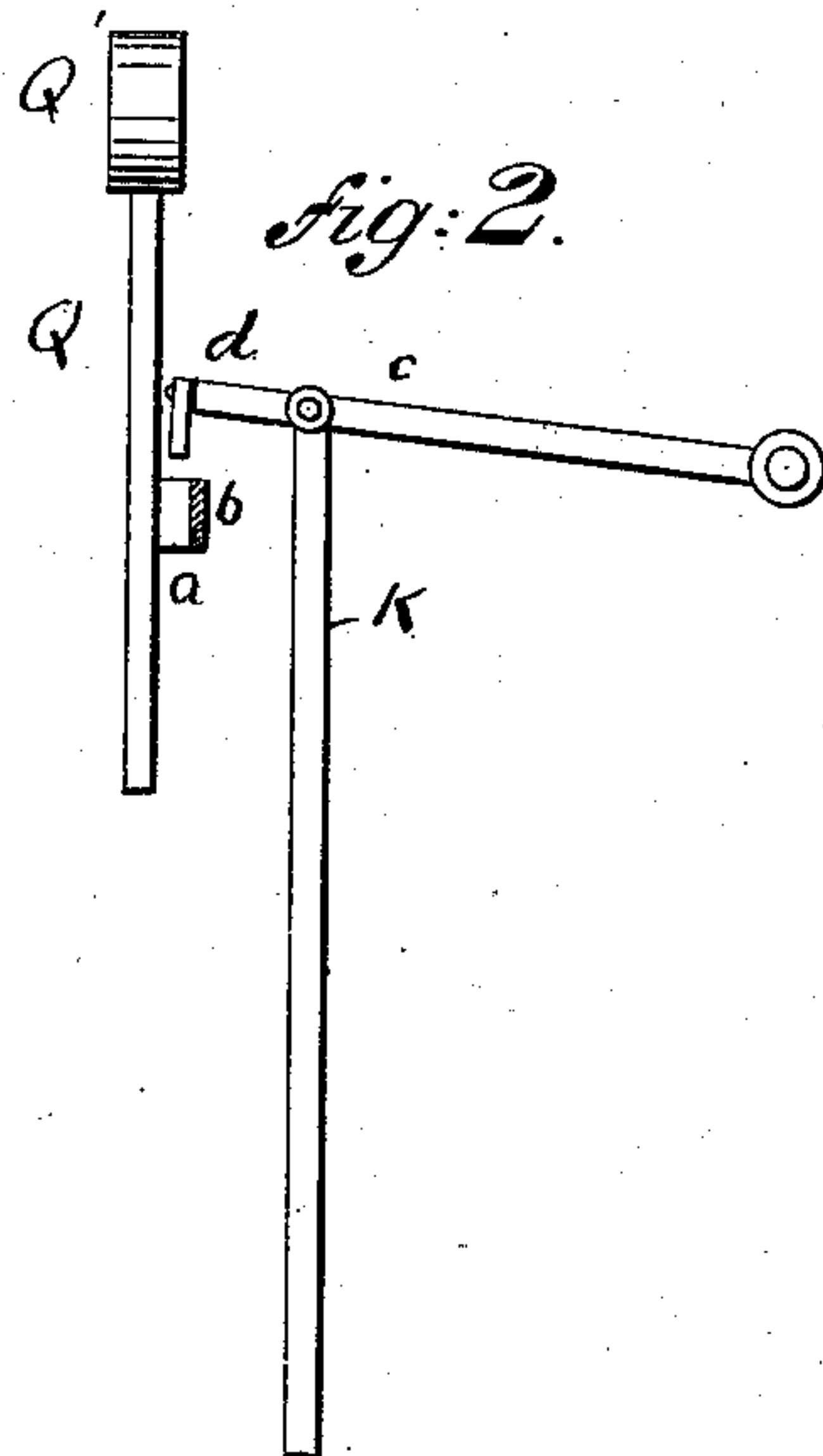
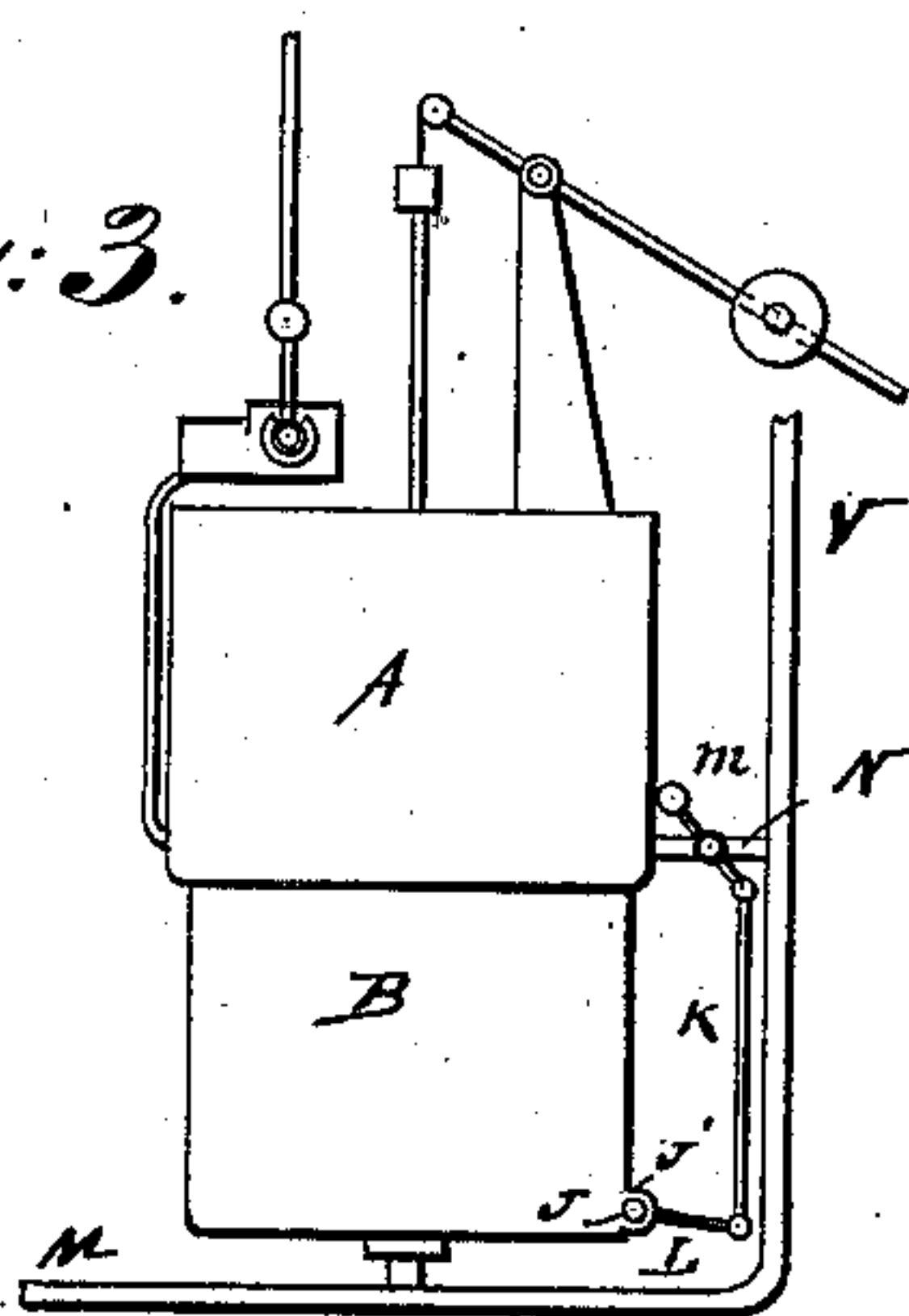


fig:3.



WITNESSES:

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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 376,586, dated January 17, 1888.

Application filed April 6, 1887. Serial No. 233,832. (No model.)

To all whom it may concern:

Be it known that I, HENRY CREAMER, of the city, county, and State of New York, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to certain new and useful improvements in those devices known as "steam-traps," and which are used for automatically forcing the water of condensation into the boiler when a certain quantity of such water of condensation has collected.

The object of my invention is to provide a steam-trap which has an automatic regulator which is simple in construction and effective in use, and which regulator is governed and operated by the quantity of water supplied to the trap.

The invention consists in the combination, with a steam and a water cylinder, of an open-top float in the water-cylinder, and a water-forcing piston for forcing the water out of the float, which water-forcing float is operated by a piston in the steam-cylinder. The said float, by means of suitable devices, governs the steam that operates the piston in the steam-cylinder.

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

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of my improved steam-trap. Fig. 2 is a detail side view of the latch operated by the float. Fig. 3 is a side view, on a smaller scale, of the trap, showing a modified arrangement of the means for starting and stopping the mechanism.

Similar letters of reference indicate corresponding parts.

The steam-cylinder A and water-cylinder B are preferably made in one piece, or united in any suitable manner. The cylinder A contains the piston B', secured to the piston-rod C, to the lower end of which the piston D is attached, which fits closely and works in a neck, E, projecting from the bottom of the steam-cylinder A down into the water-cylinder B, the annular bottom F of the steam-cylinder A being formed between the bottom of the side wall of the cylinder A and the top of the neck E. Between the neck E and the side

of the water-cylinder B, I provide an open-top or cup-shaped float, G, which can move vertically a short distance. To the lower end of the said float G a lever, H, is pivoted, which projects from a shaft, J, having its ends passed through stuffing-boxes J' in the bottom part of the water-cylinder, and on one of the outer ends of said shaft an arm, L, is provided, with which a rod, K, is connected.

M represents a pipe for conducting the water of condensation to the bottom of the water-cylinder, and is provided with the two check-valves M' and M².

N is a pipe having the check-valve N', which pipe serves for conveying the exhaust-steam from the steam-cylinder to the pipe V, which conveys the water of condensation to the pipe M.

The valve, steam-pipe, and mechanism for operating the valve automatically when the pump is in operation are the same as in my Patent No. 358,964, dated March 8, 1887, for steam feed-water traps, and need not be further described. The regulator shown in said Patent No. 358,964 consists of a float in a cylinder. In the present case the latch is of a different construction, as will now be set forth. The swinging lever Q, having the weight Q', and which serves to shift the rod R, carrying the valve, has a wing, a, provided with a laterally-projecting lug, b. The lever c is pivoted on the top of the cylinder, and is to be provided at its swinging end with a latch, d, which can engage with the said lug b. The swinging end of the lever c is connected with the upper end of the said rod K, the lower end of which is fastened on the arm L of the shaft J, as set forth.

If desired, the upper end of the rod K may be connected with the lever of the cock m in the exhaust-pipe N, as shown in Fig. 3.

The operation is as follows: When the pistons are raised, the water of condensation entering through the pipe M passes into the bottom of the water-cylinder through the space between the sides of the water-cylinder and the float G and flows over the top of the float. The open-top float G gradually fills with water, and under the weight of said water descends slightly, whereby the rod K is moved upward. The lever c is raised and the latch d disen-

gaged from the lug *b* on the wing of the lever *Q*, thus permitting the said lever to swing under the action of its weight *Q'*, whereby the valve is so shifted as to shut off the steam from the bottom of the steam-cylinder and admit it to the top. The steam, acting on the steam-piston, forces the same down, whereby the piston in the neck *E* is forced down and forces the water in the neck *E* and in the float upward through the annular space between the outside of the neck *E* and the inside of the walls of the float and down through the space between the outside of the float and the inside walls of the water-cylinder and out through the pipe *M* into the boiler. It is evident that the float is subject to a very great pressure; but the float is cushioned and supported by the water below it. By the time that the pistons complete their downward stroke the rod, projecting upward from the piston in the steam-cylinder and through the top of said steam-cylinder, reverses the valve on the top of the steam-cylinder, so that steam is admitted into the bottom part of the steam-cylinder, whereby the pistons are raised. As soon as the piston *D* is raised the upward pressure of the water below the float *G* raises said float, whereby the rod *K* is moved downward and the catch *d* on the lever *c* is engaged with the lug *b* on the wing *a* of the lever *Q*, thus locking the lever *Q* in place, whereby the entire mechanism is stopped. The lever *Q* is operated from the rod projecting upward from the steam-piston, and thus it is evident that the said lever will be in position to be locked by the lever *c* before the lever *c* is moved, as the said lever *Q* is thrown as soon as the pistons have completed their downstroke, and the lever *c* is only moved when the pressure of the water below the float begins to raise the latter, and this can only take place after part of the upstroke has been completed—that is, after the lever *Q* has been thrown to admit steam into the lower part of the steam-cylinder.

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

1. In a steam-trap, the combination, with a steam and a water cylinder, of an open-top float in the water-cylinder and a piston or

plunger for forcing the water out of said float, substantially as herein shown and described.

2. In a steam-trap, the combination, with a steam and a water cylinder, of an open-top float in the water-cylinder, a lever connected with said float, and a piston or plunger for forcing the water out of said float in the water-cylinder, substantially as herein shown and described.

3. In a steam-trap, the combination, with a united steam and water cylinder, of a neck projecting into the water-cylinder, a piston in the steam-cylinder, a piston-rod on said piston, a water-forcing piston working in the neck and fixed to the lower end of said piston-rod, and an open-top float in the space between the water-cylinder and the neck projecting into the same, substantially as shown and described.

4. In a steam-trap, the combination, with a united steam and water cylinder, of a neck projecting into the top of the water-cylinder from the bottom of the steam-cylinder, an open-top float between the sides of the water-cylinder and the said neck, a pivoted lever operated by the float, and a rod operated by the said lever, which rod acts on the valves that govern the operation of the pump, substantially as shown and described.

5. In a steam-trap, the combination, with a weighted rocking lever for operating the steam-valve, of a lugged wing on said lever, a pivoted lever, *c*, having a latch, *d*, and a rod for operating the lever *c*, which rod is operated from the float in the trap, substantially as shown and described.

6. A steam-trap constructed with a steam-cylinder and a water-cylinder, and an open-top float in the water-cylinder, into which open-top float the water-forcing piston can pass to force the water out of said float, substantially as herein shown and described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HENRY CREAMER.

Witnesses:

OSCAR F. GUNZ,
CARL KARP.