

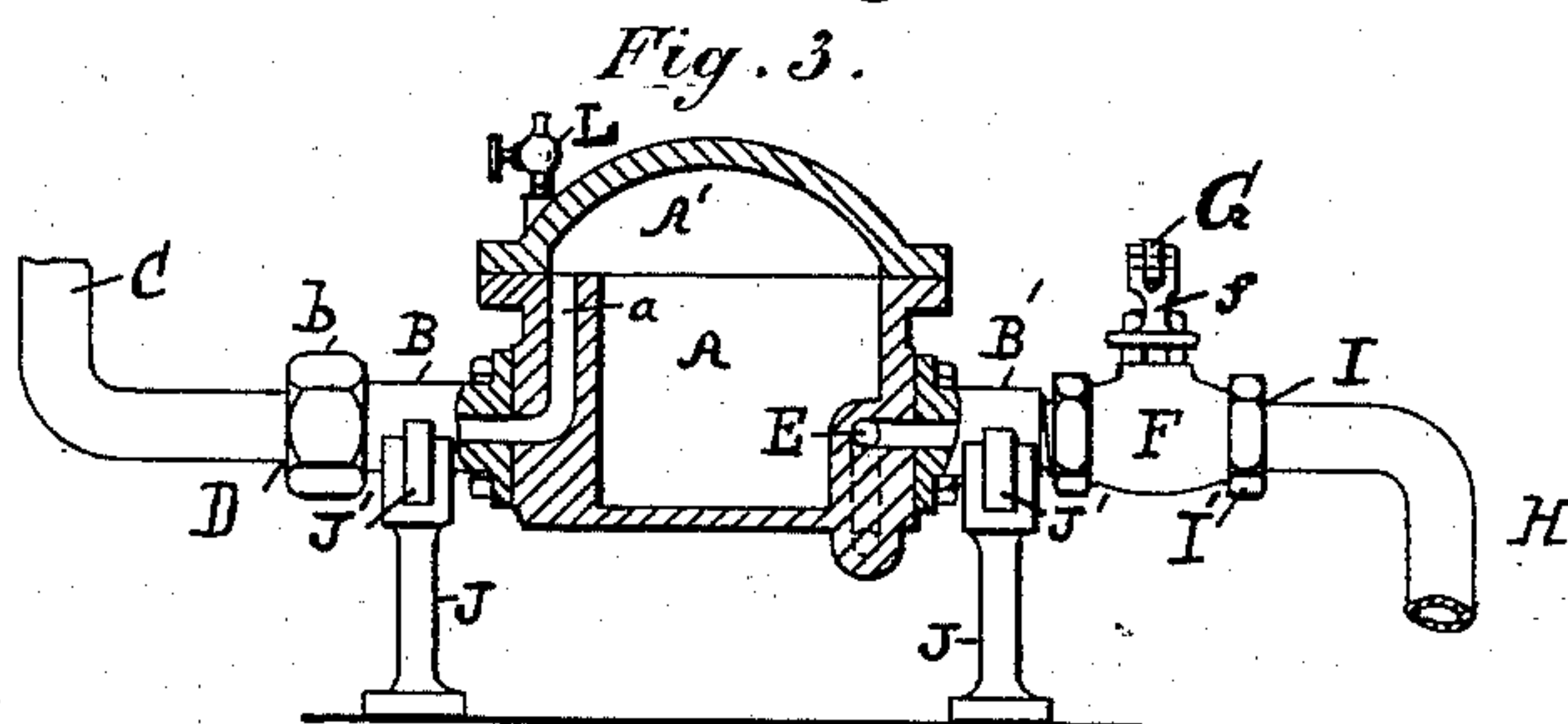
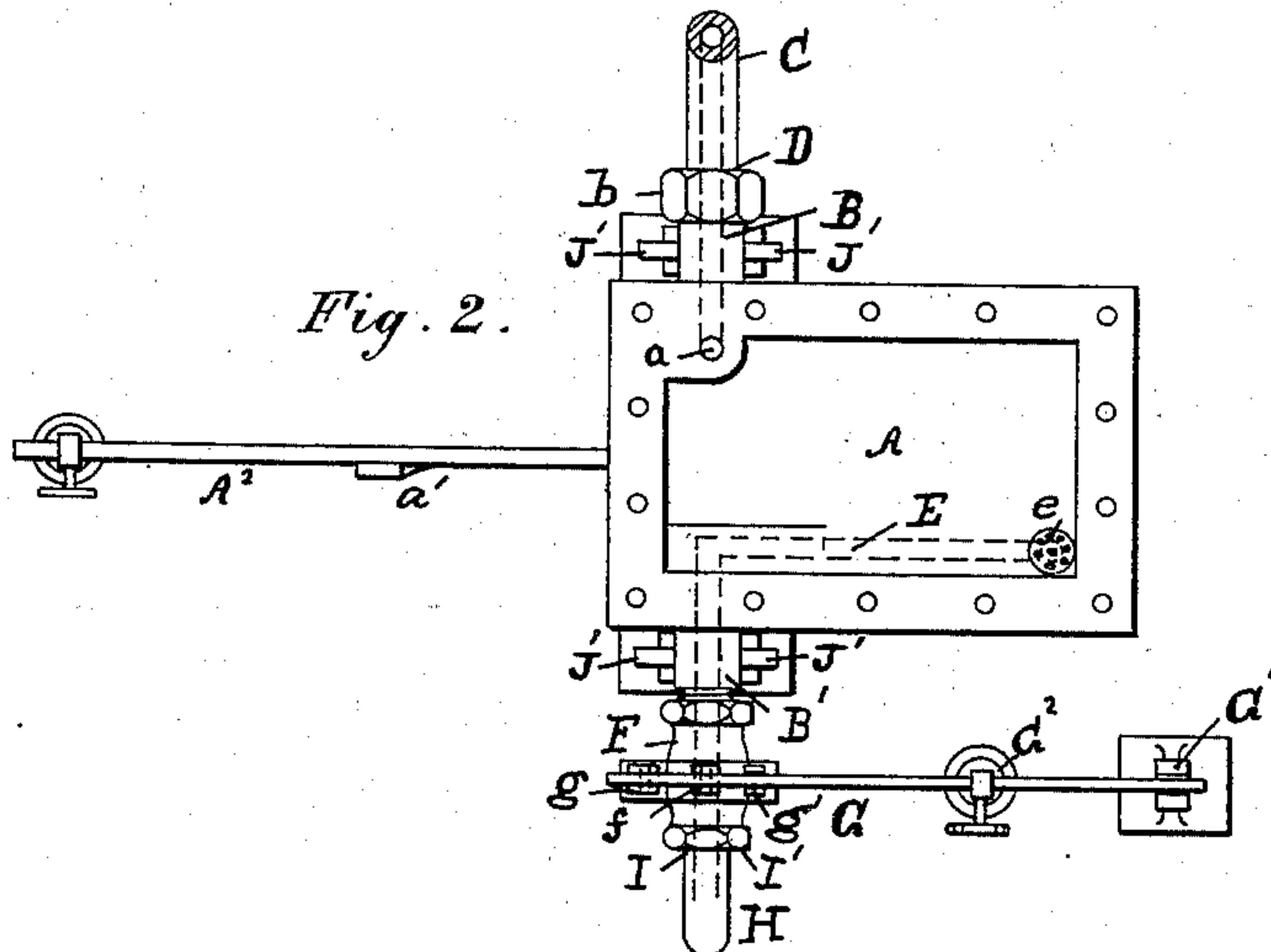
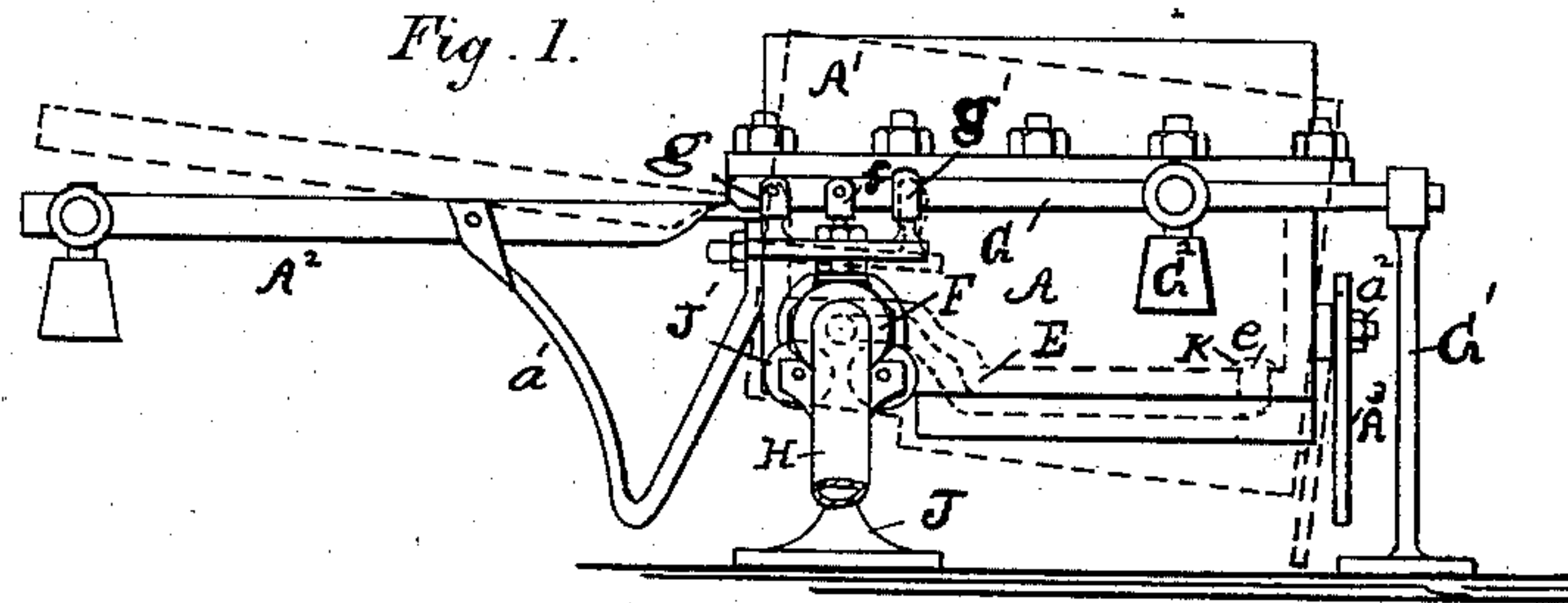
(No Model.)

J. MOREHEAD.

STEAM TRAP.

No. 282,353.

Patented July 31, 1883.



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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 282,353, dated July 31, 1883.

Application filed January 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN MOREHEAD, of Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Steam-Traps; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to that class of steam-traps for which Letters Patent were issued to me September 5, 1882, No. 263,716; and my present invention consists in a novel combination of devices, which will be fully hereinafter explained, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of an apparatus embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section, showing parts in elevation.

My invention has for its object the construction of steam-traps adapted to free steam-pipes from the condensed water which may accumulate therein.

In steam-traps heretofore constructed the mechanism has often been of such a nature as to render it difficult or impossible to tell when it is working correctly, or whether steam is escaping with the condensed water.

It is the purpose of my invention to remedy this difficulty and to construct a steam-trap in which the mechanism shall be visible, easy of access, and which shall be simple and efficient in its operation. I accomplish this result by suspending a suitable vessel or water-chamber one side of the center of gravity, said vessel being provided with a weighted arm to keep it in a suitable position until the water accumulates sufficiently in the vessel to counterbalance the weight and tilt the vessel, which tilting opens a suitable valve whereby the water is discharged, when the weight restores the vessel to a proper equilibrium, ready for the accumulation of another charge of condensed water.

In the drawings, A represents the vessel or water-chamber in which the condensed water is accumulated. A' is the cover adapted to be firmly secured thereto.

Band B' are the hollow supporting-arms, secured to said vessel at one side of its center of gravity. They form the receiving and discharge arms of the vessel, respectively. The supporting-arm B communicates with an upright inlet-pipe, a, on the interior of the ves-

sel, adapted to carry the steam above the condensed water in the vessel. The arm B is also connected with the steam-pipe C by means of a slip-joint, D, secured to said arm by means of a nut, b, with suitable intervening packing to make the joint tight and prevent the escape of water or steam.

E is a water-passage or outlet-pipe extending along the bottom of the vessel and communicating both with the interior of the vessel, as shown at e, and with the hollow supporting-arm B'. I prefer that said pipe E should be constructed with open ends and closed by plugs, by removing which said pipe may readily be cleaned.

Connected with the outer end of the supporting-arm B' is a valve-chamber, F, provided with any suitable valve, said valve constructed with a valve-stem, f.

G is a lever engaged with said valve-stem, and with a supporting-arm, g, connected with the end of the lever, and a guide-arm, g', said lever provided with a lug or stop, G', the construction being such that when the vessel tilts the valve is opened, and when the vessel is restored to its normal position the valve is closed. It is evident that the valve may be so located in said chamber as to be opened either from above or from below. In case the valve is opened from below, as shown in the drawings, it will be necessary to provide the lever G with a weight, G², which may be so adjusted as to counteract the pressure of steam upon said valve. The outer end of the valve-chamber is adapted to be connected to the waste-pipe H by means of a slip-joint, I, similar to the joint D, secured to said chamber by means of a nut, I', with proper intervening packing.

Attached to the vessel A is a weighted lever, A², provided preferably with a lug or stop, a', adapted to prevent the vessel from tipping too far in that direction. This weighted lever is secured to said vessel on the end adjacent to the supporting-arms B B'. The vessel is also provided at the opposite end with an adjustable stop, A³, adapted to prevent its tipping too far when tilted by the accumulation of condensed water. For this purpose the stop A³ may be provided at the top with a vertical slot to receive a bolt or set-screw, a².

The slip-joint D is connected firmly with the pipe C, and the joint I is also connected firmly with the pipe H, so that said joints are stationary; but at their opposite ends said joints

are so connected as to slip in the arm B and valve-chamber F, thus forming the axis for the tilting of the vessel.

The arms B B' may be supported in any suitable manner—as, for instance, by resting on standards J, provided with anti-friction rollers J'.

The operation of the device will now be understood, and is as follows: Steam entering the vessel A through the pipe C, joint D, arm B, and the interior pipe, *a*, the condensed water accumulates until it overbalances the weighted lever A², when the vessel tilts, as shown by the dotted lines in Fig. 2. The stop G' strikes the floor or base of the trap, lifts the end of the lever G, thereby opening the valve, and the water is discharged. This done, the vessel tilts back into a state of equilibrium and the valve is closed.

I prefer to cast the pipes *a* and E integral with the vessel A, and to secure the arms B B' to said vessel by suitable bolts; but I do not limit myself to such a method of construction.

It is evident that in a steam-trap so constructed the operation of the mechanism is automatic and can at all times be observed.

If desired, a strainer, K, may be located over the mouth of the pipe E within the vessel A. I design to construct said traps either with or without such strainer. Its use would tend to prevent the passage of sediment into the pipe E and to the valve; also, a cock, L, may be located in the vessel in suitable manner, as shown, or an expansion air-valve.

I am aware of Letters Patent No. 237,698; but the invention therein described and shown is essentially different from the appliances claimed by me.

What I claim is—

1. An automatic steam-trap for the discharge of condensed water from steam-pipes, consisting of the combination, with a suitable receiving-vessel provided with an interior pipe adapted to carry the steam above the water in said vessel and a discharge-pipe provided with an exterior valve, of a lever arranged and adapted to hold said valve closed when the vessel is in a horizontal position, and to open said valve when the vessel is tilted, and in connection therewith an axial support, whereby the vessel may be suitably connected with the inlet steam-pipe and the discharge-pipe, and means whereby the vessel may be caused to return to a horizontal position when relieved of its surplus water, substantially as described.

2. An automatic steam-trap for the discharge of condensed water from steam-pipes, consisting of the combination, with a suitable receiving-vessel provided with an interior pipe adapted to carry the steam above the water in said vessel and a discharge-pipe, of supporting-arms at one side the center of gravity communicating with said pipes, an exterior valve located in the discharge-arm, a lever arranged and adapted to hold said valve closed when the vessel is in a horizontal position, and to

open said valve when the vessel is tilted, axial connections whereby the vessel may be connected with the inlet and exit pipes, and a weighted lever adapted to return said vessel to a horizontal position when relieved of its surplus water, substantially as described.

3. An automatic steam-trap for the discharge of condensed water from steam-pipes, consisting of a suitable receiving-vessel provided with a weighted lever, an inlet steam-pipe, an interior pipe connected therewith, adapted to carry the steam above the water in the receiving-vessel, a discharge-pipe provided with a suitable exterior valve and valve-stem, a lever connected with said valve-stem and adapted to open said valve when the vessel is tilted out of a horizontal position, and to keep said valve closed when said vessel is relieved of surplus water, and in connection therewith axial slip-joints adapted to connect said inlet and discharge pipes with the steam and waste pipes, whereby the vessel may be tilted, substantially as described.

4. An automatic steam-trap for the discharge of condensed water from steam-pipes, consisting of a suitable vessel provided with a cock and weighted lever, an interior inlet-pipe adapted to carry the steam above the water in said vessel, an exit-pipe provided with a strainer, supporting inlet and outlet arms communicating with said inlet and exit pipes, a valve located in the outlet-arm, a lever arranged and adapted to hold said valve closed when the vessel is in a horizontal position, and to open said valve when the vessel is tilted out of said position, and in connection therewith axial joints whereby the supporting-arms may be connected with the steam and waste pipes, and anti-friction rollers supporting said arms, substantially as described.

5. An automatic steam-trap for relieving steam-pipes of condensed water, consisting of a receiving-vessel provided with an interior inlet-pipe adapted to carry the steam above the condensed water, and an exit-pipe provided with a valve exterior to said vessel, and in combination therewith a lever arranged and adapted to hold said valve closed when the vessel is in a horizontal position, and to open said valve when the vessel is tilted out of said position, axial supports located one side the center of gravity of the said vessel, whereby it may be suitably connected with the steam and waste pipes, stops whereby the vessel may be prevented from tilting too far in either direction, and means whereby it may be caused to return to a horizontal position when relieved of its surplus water, substantially as described.

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

JOHN ^{his} X MOREHEAD.
mark.

Witnesses:

N. S. WRIGHT,
A. E. INGLIS.