

Albert L. Ide.

Improvement in Draft Regulators.

116962

PATENTED JUL 11 1871

Fig. 1.

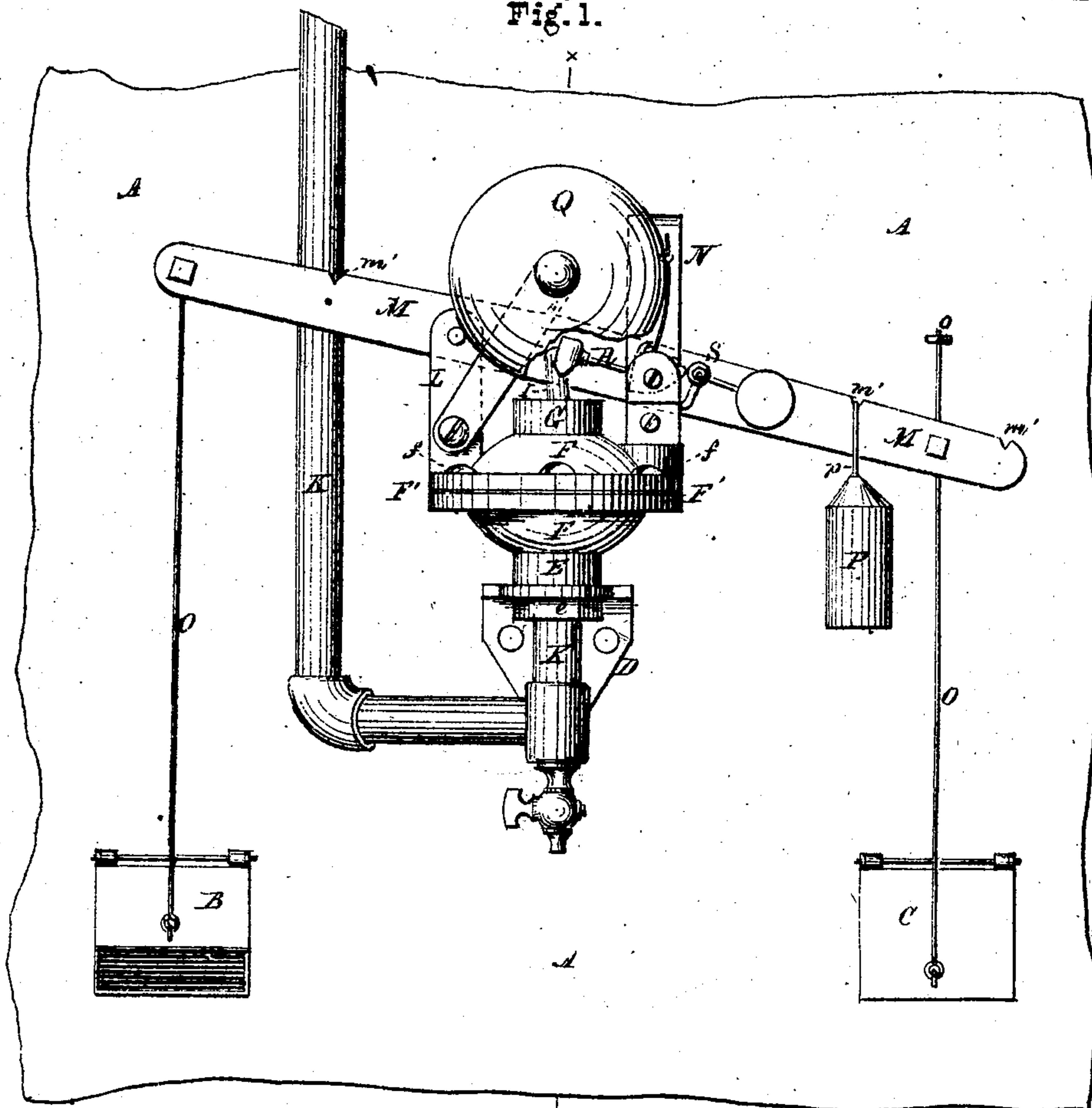
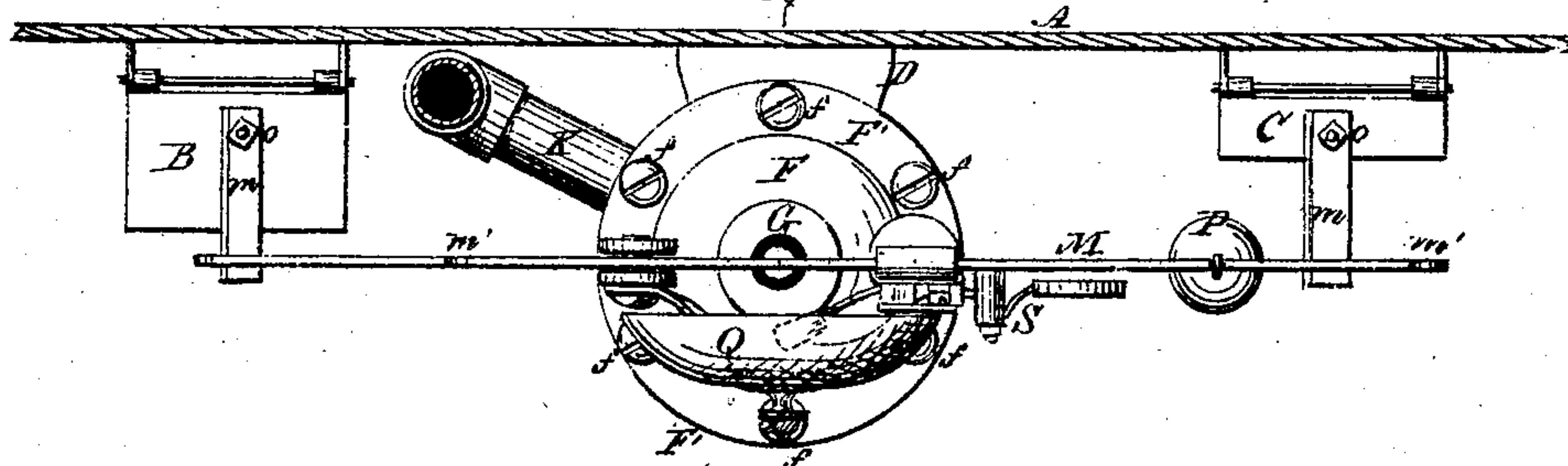


Fig. 2.



Witnesses.

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Fig. 3.

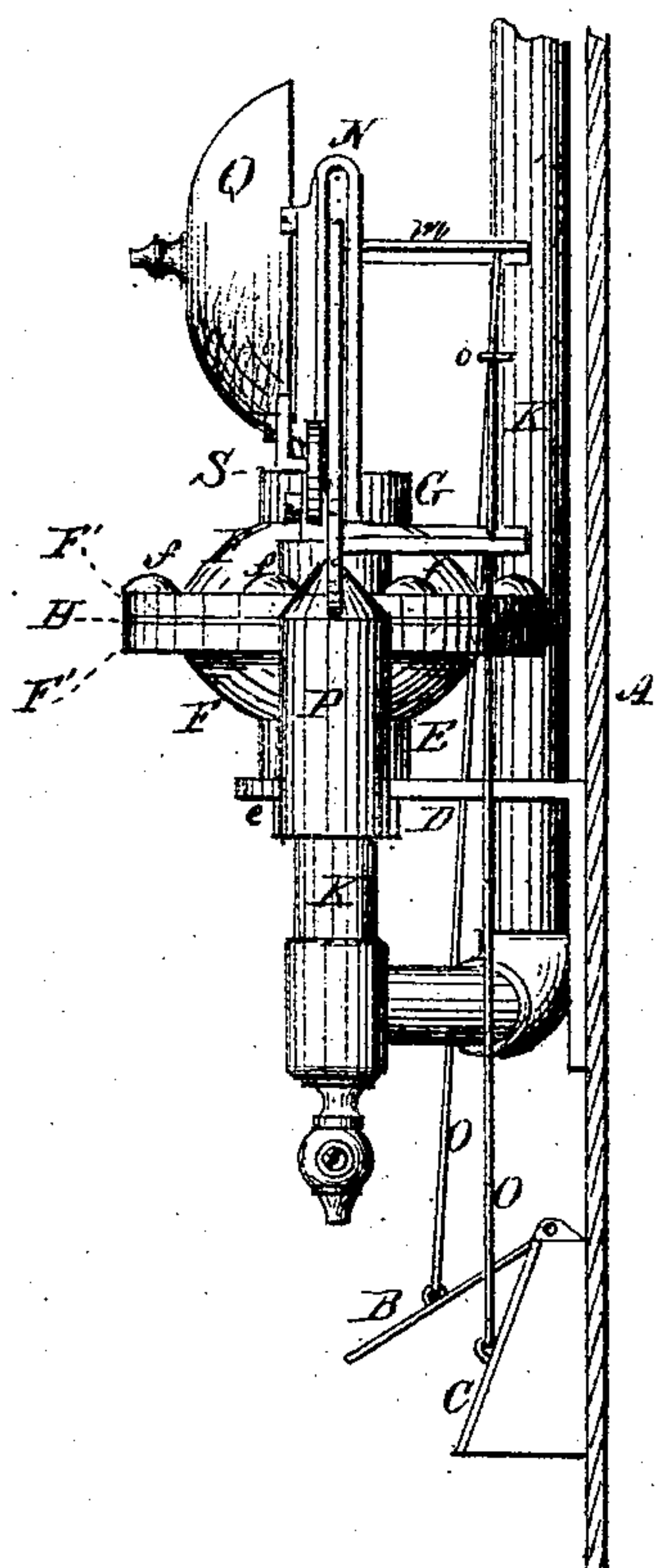
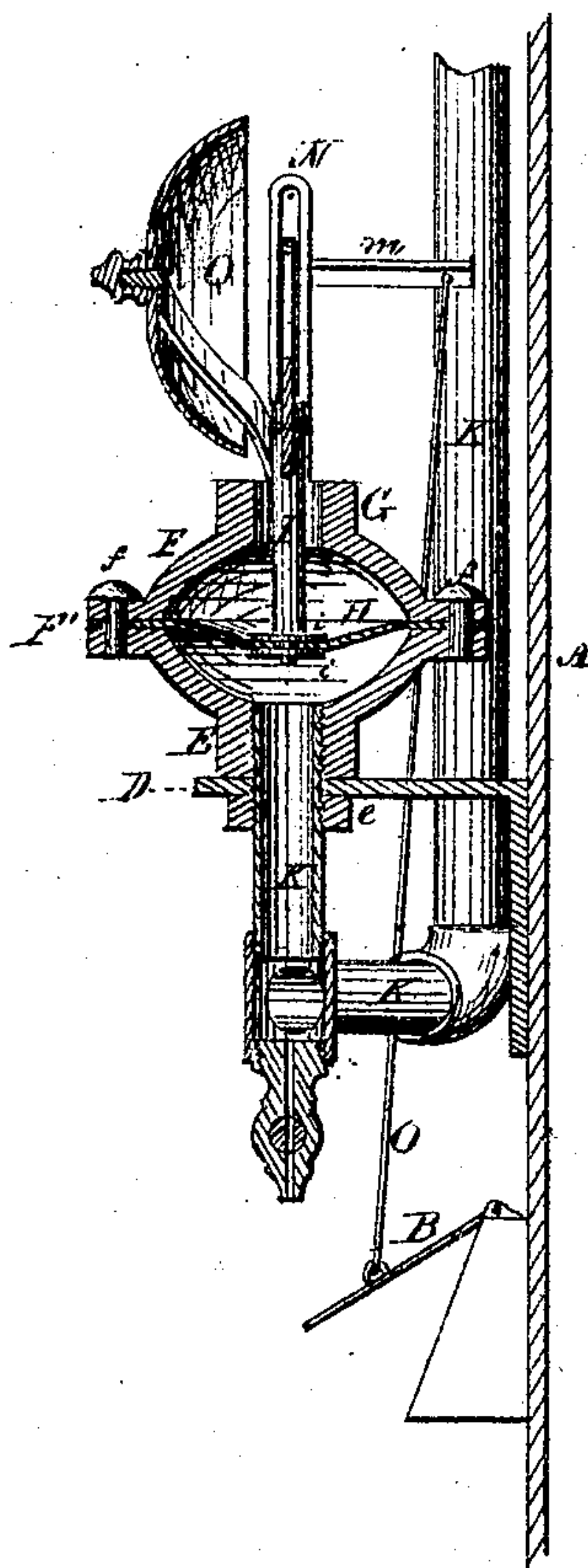


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALBERT L. IDE, OF SPRINGFIELD, ILLINOIS.

IMPROVEMENT IN DRAUGHT-REGULATORS.

Specification forming part of Letters Patent No. 116,962, dated July 11, 1871.

To all whom it may concern:

Be it known that I, ALBERT L. IDE, of Springfield, in the county of Sangamon and in the State of Illinois, have invented certain Improved Draught-Regulators for Steam-Heating Apparatus; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a front elevation of my improved device as attached to a furnace. Fig. 2 is a plan view of the upper side of the same. Fig. 3 is a side elevation of said device, and Fig. 4 is a vertical central section of the same on the line $x x$ of Figs. 1 and 2.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is the production of a regulator that, by the action of steam-pressure, shall automatically open or close the draught-opening of the fuel-chamber so as to control the combustion of the fuel contained therein, and, consequently, the production of said steam, and also warn the attendants whenever the fuel becomes exhausted; and it consists in combining, with a reciprocating piston actuated by the pressure of steam within a boiler, an alarm-bell so arranged as to sound an alarm when the steam-pressure falls below a certain limit, substantially as and for the purpose hereinafter specified.

In the annexed drawing, A represents the front plate of a boiler-furnace provided with a draught-door, B, and a check-draught or soot-door, C, both of which are hinged at their upper edges so as to remain closed when unmolested by the action of gravity. Secured to or upon the face of the plate A is an angle-plate, D, the horizontal portion of which is provided with an opening for the reception of a neck, e , formed upon the lower end of the casing F of the piston-valve, which casing is nearly spherical in exterior form, is provided upon its upper and lower sides with suitable cylindrical bosses E and G, respectively, and, being divided centrally and horizontally, is furnished at the contiguous edges of the sections with two corresponding flanges F', which project horizontally outward and receive a number of binding-screws, f , that, passing downward through the upper and into the lower flange, firmly unite said part. The interior of the casing F is divided horizontally by means of a rubber diaphragm, H,

which, corresponding in size and shape with the exterior of the flanges F', is secured between the same. Attached to the center of said diaphragm, by means of two nuts, i , placed upon opposite sides of the same, is a rod, I, which from thence projects upward through a corresponding opening provided within the boss G. A steam-pipe, K, attached at one end of the lower boss E, and communicating, through a suitable opening in the same, with the interior of the casing, is connected at its opposite end with the boiler, and permits steam to pass from the latter to said casing so as to raise the diaphragm and rod, the object of which will be hereinafter explained. Secured to and projecting vertically upward from one side of the casing F is a bar, L, provided at its upper end with a transverse slot in which is pivoted a lever, M, that from thence extends outward in either direction, its longer portion passing through and being contained within a slotted guide or standard, N, attached to and extending upward from the opposite side of said casing. The short and long ends of the lever M are connected, respectively, to the draught and soot-doors by means of suitable rods O, while at its center said lever is pivoted to or upon the upper end of the rod I, so that a vertical movement of said rod will be communicated to said lever and through it and said connecting-rods to said doors, the length of the connecting-rods being such as to permit both of the doors to remain closed when the lever occupies a middle or horizontal position. To permit such adjustment the upper end of each rod is threaded, and, passing through a lug, m , secured upon and projecting rearward from the side of the lever M, is provided with a nut, o , as shown in Fig. 1. A weight, P, provided at its upper end with a hook, p , and a series of notches, m' , cut within the upper edge of the lever, complete this portion of the device, the operation of which is as follows:

The weight P being placed upon the end of the lever M, opposite to the draught-door, the latter is raised so as to admit air to the fuel-chamber and cause a rapid combustion of its contents, and, consequently, the generation of steam. When the steam attains a sufficient pressure the diaphragm and piston-rod are forced upward so as to cause the lever to assume a horizontal position and close the draught-door, by which means the combustion of the fuel is checked; but if the heat within the

fuel-chamber is still sufficient to produce more steam than is used the upward motion of the piston and lever continues until the soot-door is opened more or less and air admitted to the lower flues in rear of the bridge-wall, whereby said flues are cooled and the fire still further deadened. Should the steam decrease in pressure the piston-rod and lever will fall until the soot-door is closed and the draught-door again opened, the rapidity and extent of these changes depending entirely upon amount of fuel supplied to the fuel-chamber and the capacity of the boiler with relation to the requirements of the heating apparatus. Should the fuel become so much exhausted as that opening the draught-door will not cause the required production of steam, the following-described mechanism will give warning to the attendant: A gong-bell, Q, provided with a pivoted spring-hammer, R, is attached to the casing F or other contiguous portion of the mechanism, so as to bring it within convenient reach of the lever M, upon or to the latter of which is pivoted a pawl, S, so adjusted as to engage with and operate said hammer when the end of said lever opposite the draught-door moves downward below a certain point. As thus arranged, the lever and draught-door are so adjusted as that before the bell is sounded the latter will be sufficiently opened by the falling pressure of steam to cause the fire to burn up and increase the production while a sufficient supply of fuel remains within the fuel-chamber; but when said fuel becomes exhausted so that the admission thereto of air will not sufficiently raise the heat the pressure of steam will continue to decrease and the lever

to fall until the bell is sounded and the attendant warned. Upon supplying a fresh quantity of fuel to the fire the lever will rise to its usual position, and the pawl, slipping over the hammer-cam, will be ready for engagement with the latter when a similar occasion causes the lever to drop. The intensity of the fire, and consequently the pressure of steam, may, within certain limits, be controlled by adjusting the weight longitudinally upon the lever, as thereby a greater or lesser pressure of steam will be required to move said lever and operate the draught and soot-door.

The advantages possessed by this device are obvious, as by its use the steam within the heating apparatus can be maintained at a uniform pressure without other attention from the attendant except to supply fuel to the fire, the need of which is indicated with certainty by the operation of the mechanism.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

In combination with a reciprocating piston actuated by the pressure of steam within a boiler, and with suitable intervening mechanism, an alarm-bell so arranged as to sound when said steam-pressure falls below a fixed limit, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of March, 1871.

A. L. IDE.

Witnesses:

A. B. JUDKINS,
C. S. ZANE.