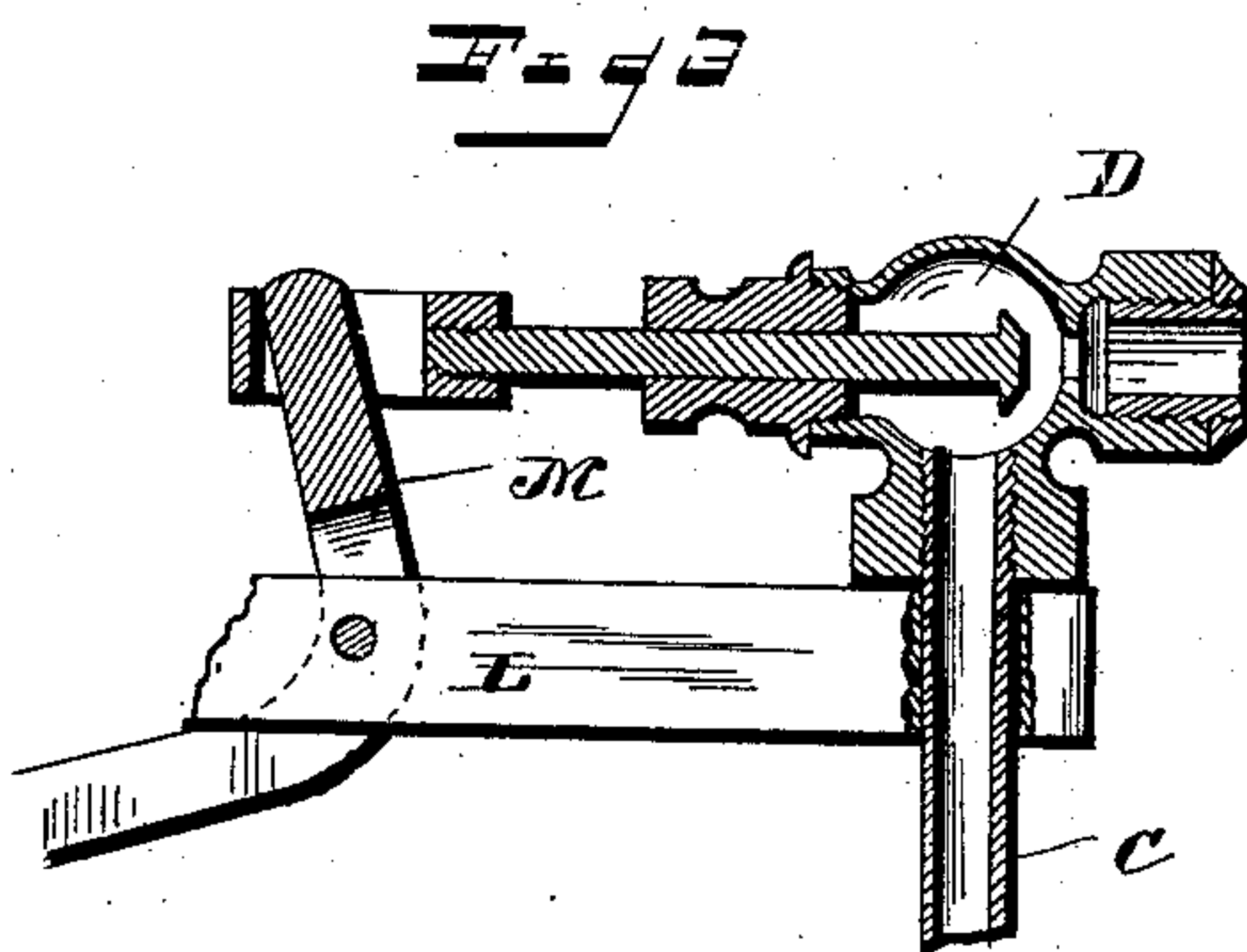
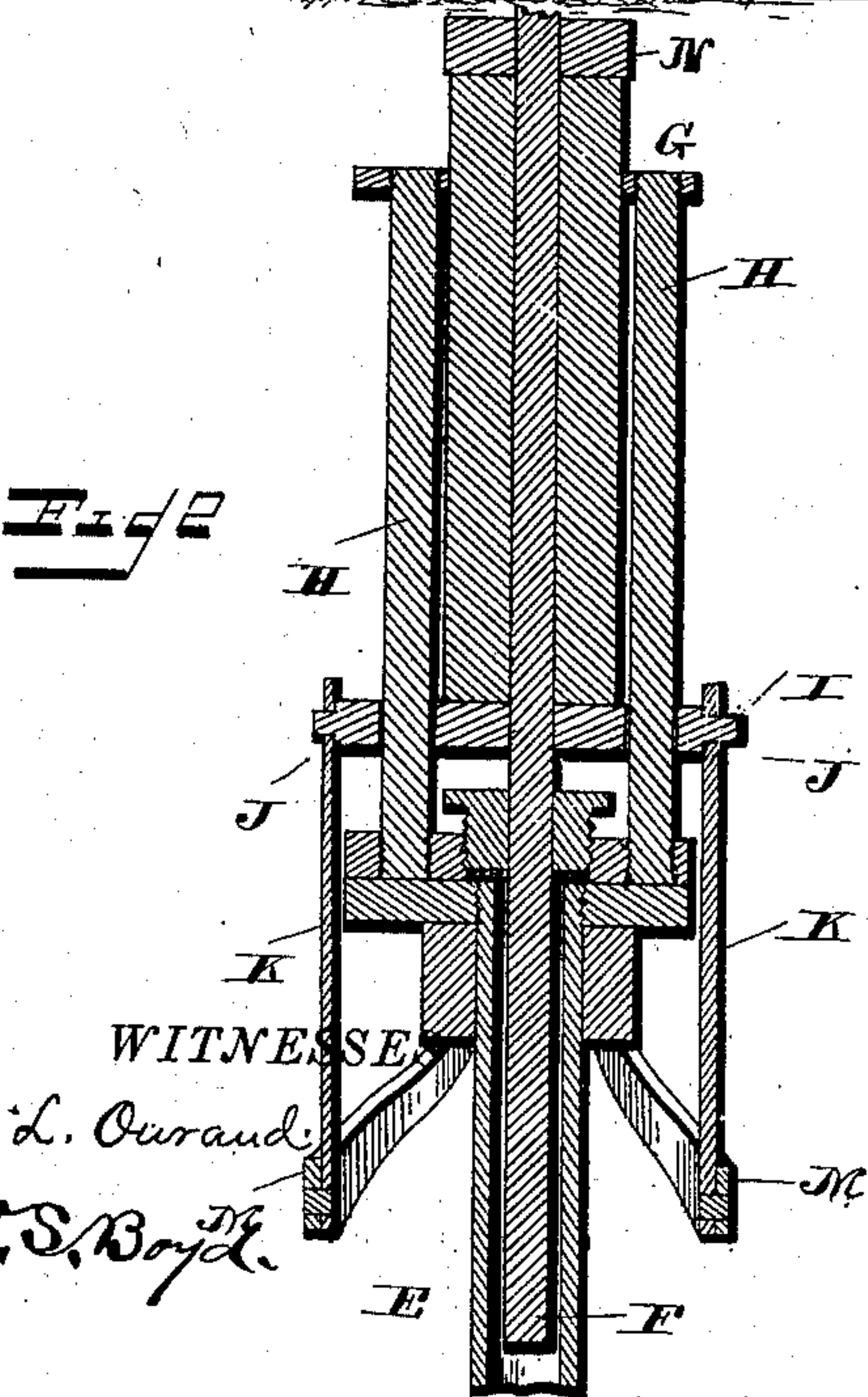
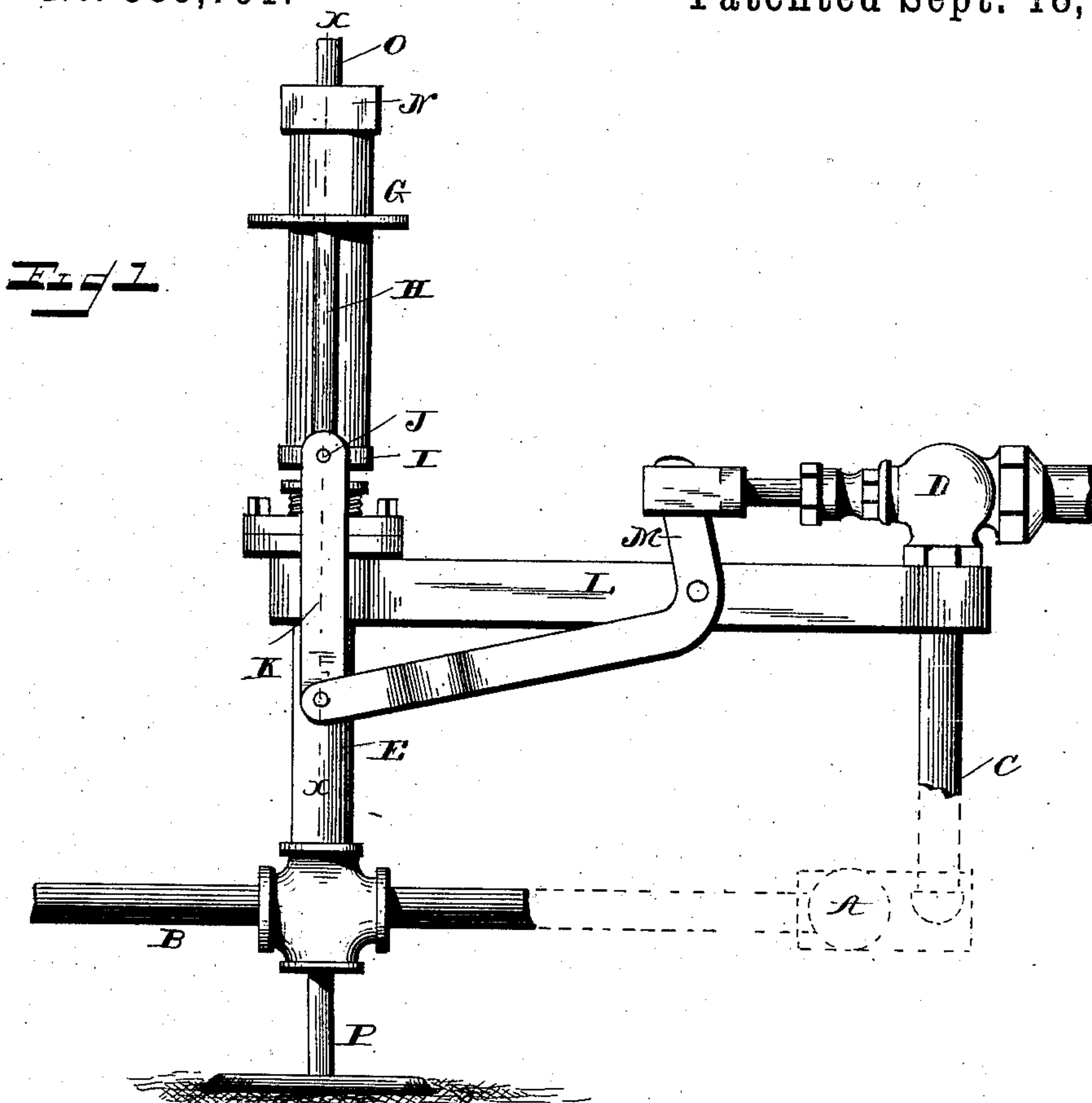


(No Model.)

C. E. BROWN.
PRESSURE REGULATOR.

No. 389,791.

Patented Sept. 18, 1888.



WITNESSES
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UNITED STATES PATENT OFFICE.

CHARLES E. BROWN, OF ROME, NEW YORK.

PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 389,791, dated September 18, 1888.

Application filed February 9, 1888. Serial No. 263,517. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BROWN, a citizen of the United States, and a resident of Rome, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Pressure-Regulators for Steam-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a plan view of my improved pressure regulator as applied. Fig. 2 is a vertical sectional view taken on the line *x x* of Fig. 1, and Fig. 3 is a horizontal sectional view through the valve mechanism.

My invention has relation to automatic pressure-regulators for steam-pumps, and has for its object to prevent the bursting of the pipes when the outlet-pipe has been closed, or when the pressure within them exceeds a certain point; and it consists in the following improved construction and combinations of parts.

Referring to the accompanying drawings, in which the same letters of reference indicate corresponding parts in all of the figures, A indicates the pump, (shown only in dotted lines,) and B the pipes to which the regulator is applied. The pipe C, which supplies the pump with steam, is provided with an ordinary plug-valve, D; or, if preferred, any other construction may be used. The pipe through which the water is forced by the pump is provided with an upright pipe, E, within the upper end of which is located the lower end of a piston, F, the top of the pipe being provided with an ordinary stuffing-box to prevent leakage around the piston. The upper end of this piston slides through an apertured plate, G, which is supported at the required distance above the top of the pipe by means of the two uprights H H, which are secured at their lower ends to the top of the stuffing-box. If desired, the upper portion of the piston can be enlarged, as shown, and a cross-head, I, is secured to the piston, near its lower end, having suitable apertures through which pass the guides or uprights H H. Upon the outer ends of this

cross-head are pins or bearings J J, upon which are pivoted the upper ends of the two pitmen or links K K.

A bar or connecting-rod, L, may be secured at its ends to the supply-pipe C, and to the upper end of the upright pipe E, (or any other support may be provided,) upon which is pivotally secured the right-angled or L-shaped lever M, the short arm of which engages with the outer end of the plug-valve, and the longer arm, which is preferably bifurcated and bent outwardly at its ends, is secured to the lower ends of the pitmen K K. The short end of the lever may be secured to the end of the plug-valve in any suitable manner which will permit of its free action; but I have shown it passed through a slot in the end of the valve, the slot being of sufficient size to permit of its free movement without the danger of its binding or sticking.

My regulator can be used to advantage upon the ordinary steam-pumps for supplying water to boilers, or it may be made of such size as to be used upon the water-mains of cities, &c. On boilers the outlet-pipe may be provided with an ordinary cock, which is opened when the boiler is being supplied with water, and which is closed when the boiler is as full as desired. In this case as soon as the cock is closed the pump will instantly increase the pressure in the pipes to such a degree that if there were no means of relief it would burst the pipes; but as soon as the pressure increases to a certain point the water in the pipe E acts upon the lower end of the piston F and forces it upward, which in turn carries with it the cross-head I. The cross-head, through the links or pitmen K K, lifts up the longer arm of the lever M and causes the shorter arm to push in the plug-valve D, and thus shut off the supply of steam and stop the pump. As soon as the cock is opened to supply the boiler with water the pressure on the pipes is removed and the piston and the cross-head are allowed to fall, and thus, through the links and lever, open the valve and admit steam and start the pump.

If it is desired, the cock may be dispensed with and the device made to work at different points or degrees of pressure, as may be desired, by providing the piston with weights N,

which may be placed upon an extension of the piston, as shown at O, so that by placing enough weights upon the piston it can be so regulated that when the pressure upon the pipes exceeds a certain point the piston will be raised and the pump stopped. As soon as the pressure upon the interior of the boiler and upon the pipes decreases to a certain point the piston will fall and open the valve and again start the pump.

Where the device is to be used for pumping water for railway stations, it is preferable to place the pipe B upon the support P and provide the pipe with a way-cock, to one of which the pipe E is attached; but when used upon the water-mains of a city no support is needed, as the pipe itself is buried in the ground.

The device is extremely simple and is capable of being attached and used upon any form of pipe and pump, and when properly arranged and adjusted it will prevent all damages to either the pipe or the pump.

Having thus described my invention, I claim—

1. In a pressure-regulator for steam pumps, the combination, with the steam-supply pipe, of a valve therein, an upright pipe secured at its lower end to the outlet-pipe, a bar secured at its ends to the steam-pipe and to the upright pipe, a piston in the upper end of the upright pipe, a cross head upon the upper

portion of said piston, a bifurcated lever pivotally secured upon said bar, one end of which operates the valve, and two links secured at one end to the cross-head upon the piston and at the other to the ends of the bifurcated lever, substantially as described. 35

2. In a pressure-regulator for steam pumps, the combination, with the steam-supply pipe, of a valve therein, an upright pipe secured at its lower end to the outlet-pipe, a piston within the upper end of said upright pipe, the upper end of the piston being provided with a stem adapted to receive weights, two uprights at the side of the piston, a perforated plate secured to the tops of said uprights, a cross-head upon the piston having holes which slide upon the uprights and having pins upon their outer ends, a bifurcated lever pivotally secured between the piston and the valve in the steam-pipe, one end of which operates the valve, and two links pivotally secured upon the pins upon the cross-head at one end and to the ends of the lever at the other end, substantially as described. 40 45 50

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses. 55

CHARLES E. BROWN.

Witnesses:

JOHN S. BAKER,

CLARK W. DRAPER.