

(No Model.)

4 Sheets—Sheet 1.

F. A. JONES.
PRESSURE REGULATOR.

No. 330,240.

Patented Nov. 10, 1885.

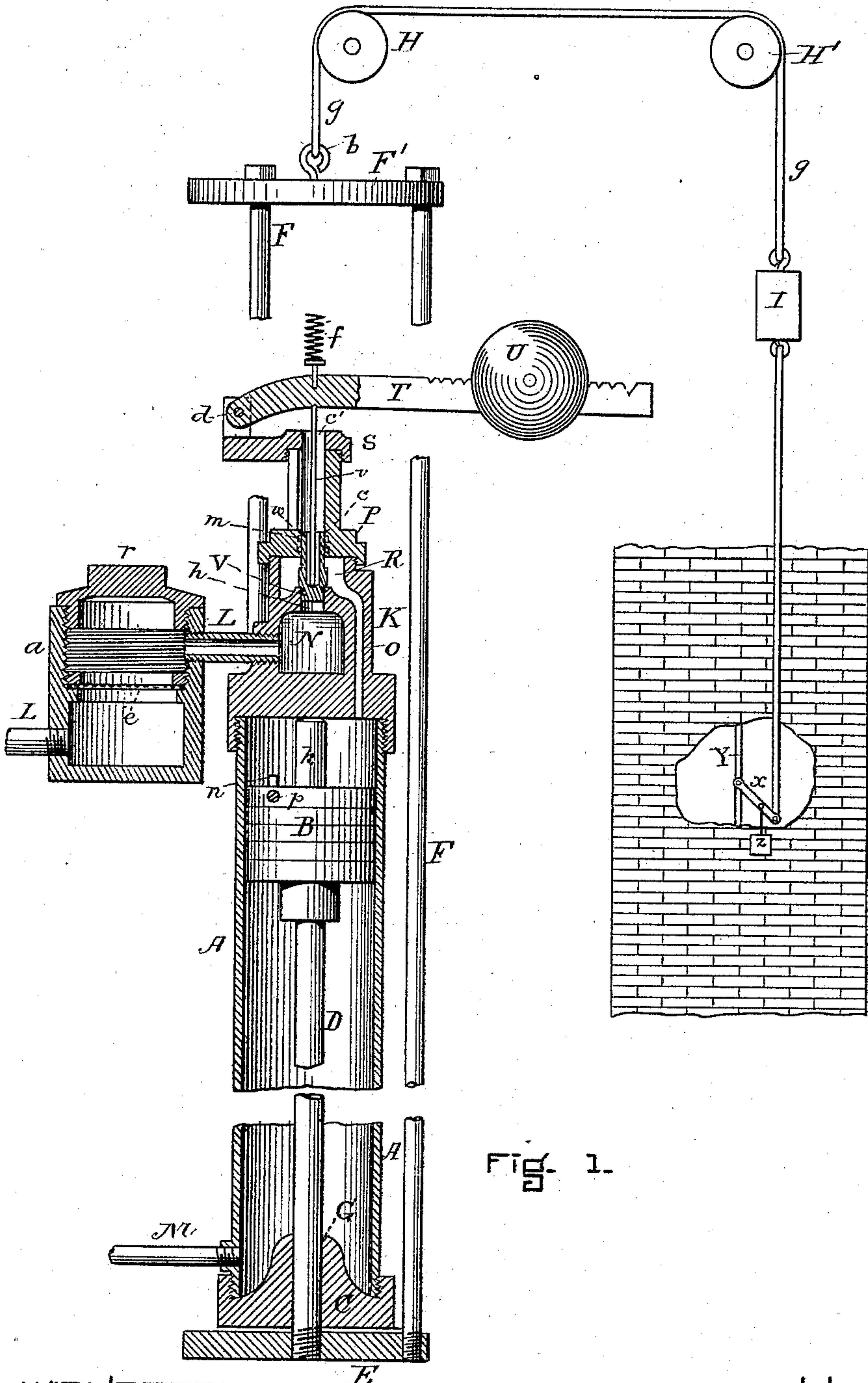


FIG. 1.

WITNESSES.

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John F. Wakefield

INVENTOR.

F. A. Jones

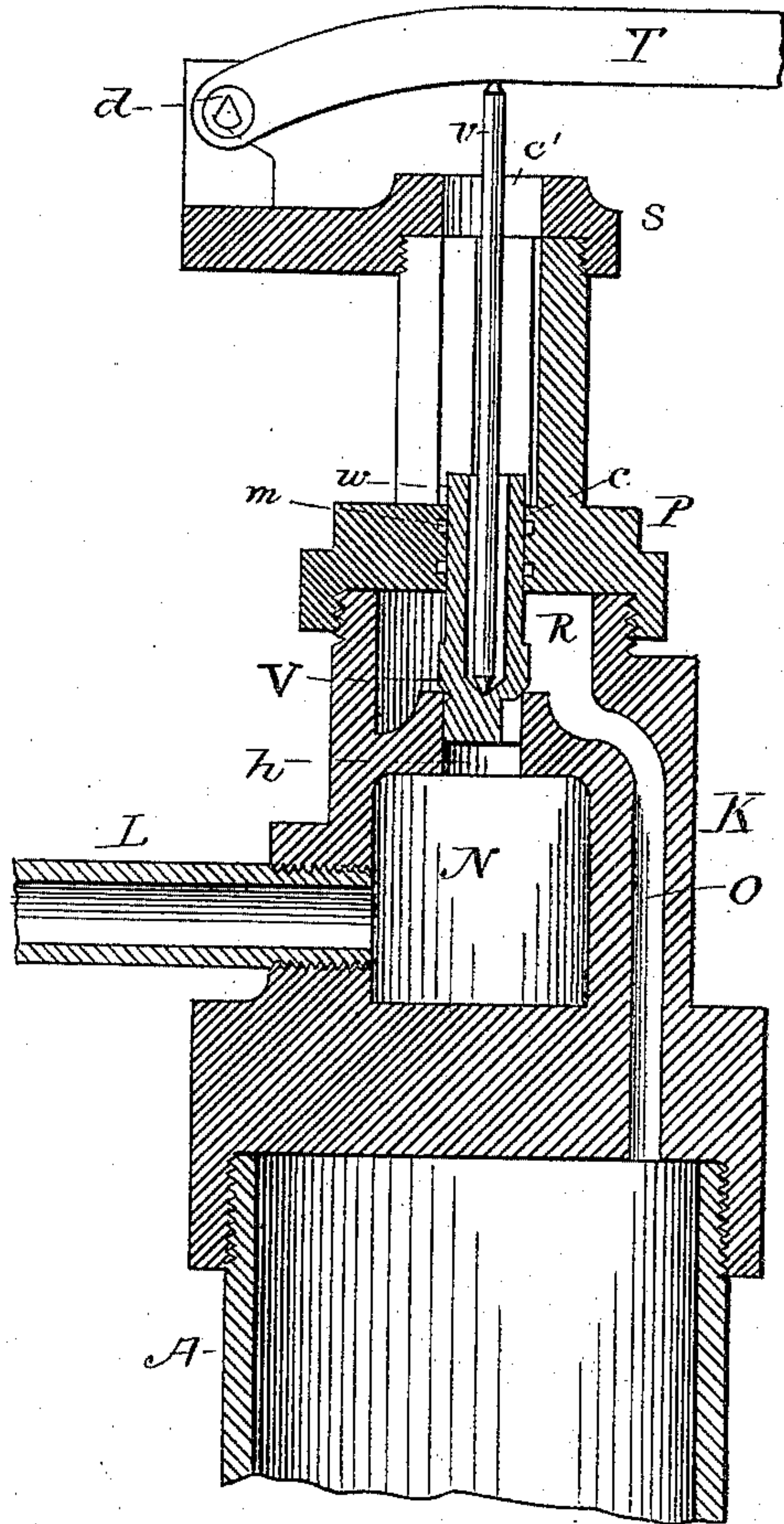
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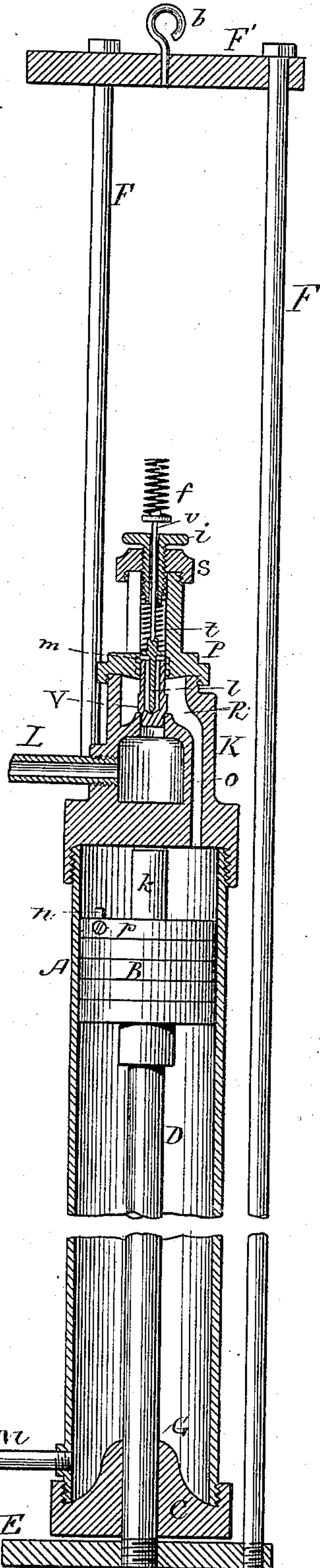


FIG. 3.

WITNESSES.

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4 Sheets—Sheet 4.

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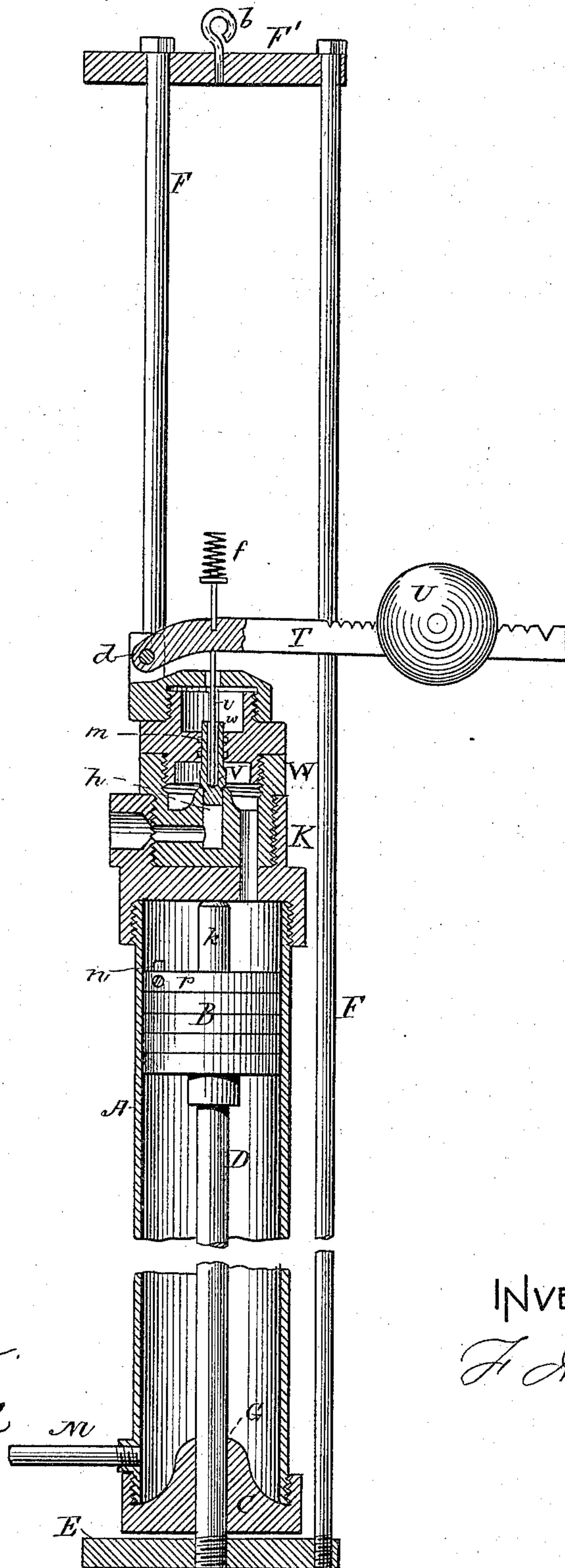


FIG. 4.

WITNESSES.

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UNITED STATES PATENT OFFICE.

FLORENTINE A. JONES, OF MALDEN, MASSACHUSETTS.

PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 330,240, dated November 10, 1885.

Application filed June 17, 1885. Serial No. 169,007. (No model.)

To all whom it may concern:

Be it known that I, FLORENTINE A. JONES, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Pressure-Regulators, of which the following is a specification.

My invention relates to certain new and useful improvements in devices for regulating the draft of steam-boiler furnaces by automatically operating the damper by means of the steam-pressure in the boilers, and also for automatically operating a valve or similar device for the purpose of regulating or controlling the pressure in pipes or vessels. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire machine with a lever-adjustment. Fig. 2 is a vertical section of the chamber and valve enlarged. Fig. 2^a shows the bottom or guide of the valve. Fig. 3 is a vertical section of the machine with a spring-adjustment. Fig. 4 is a modification in construction of Fig. 1.

The object of my invention is to obtain greater durability and sensitiveness with more positive action and simplicity of construction than have been attained heretofore in this class of machines.

Similar letters refer to similar parts throughout the several views.

A represents a hollow cylindrical pipe, provided with a thread at either end, within which the piston B is fitted, so as to easily slide in the cylinder A.

C is the bottom cap, which is provided with a thread to screw onto the cylinder A, and this cap C has a hole, G, through its center to allow the easy passage of the piston-rod D, which is attached at its upper end to the piston B and at its lower end to the plate E. To the plate E are attached the rods F, which, at their upper ends, are attached to a similar plate, F', provided with the hook b, the whole making a frame which is movable by and attached to the piston B. To the hook b is attached the cord g, passing over pulleys H and H', and carrying a weight, I, and its end attached to the crank x of the damper Y. The crank x is provided with the weight z.

K is a casting forming the top end of the

cylinder A, and is provided with a thread to screw onto the cylinder A, and is also provided with a hole in its side for the inlet-pipe L, and its center being hollow makes the chamber N. The top of the cap K is hollow, and provided on its outside with a thread, by means of which the cap P, also provided with a thread, is attached to the cap K, forming the chamber R. The cap K is also provided with the passage O, leading out of chamber R, down into the cylinder A, over the piston B. The cap P is provided with the hole c, and also has a thread upon its upper end, to which the holder S, also provided with a thread, is attached; and it will be seen that the hole c in the cap P is provided with annular recesses m. The holder S is provided with a hole, c', being a continuation of the hole c in cap P, and also has two perforated projections, to which the lever T is attached by the knife-edged pin d, and the lever T is provided with the movable weight U and the spiral spring f. The spiral spring f is attached to the lever by means of a pivot entering a hole in the top of the lever, or may be in any convenient form; and, in fact, a spring is not necessary, as a projection of any kind would do instead, and any connection between the piston or frame and the rod u or lever T would suffice. There is a passage, h, connecting the chamber N with the chamber R, the top inside edges of this passage h forming the seat for the valve V, and are not beveled, while the valve V is beveled, and this feature is fully shown in Fig. 2.

The valve V is enlarged sufficiently above its seat to form a bevel-seat, while its lower end is three-cornered to serve as a guide with little friction, and the upper end of the valve V is cylindrical, and is of a size to fit easily in the hole c in cap P, which hole c is of the same size as the hole formed by the passage h between the chambers N and R. It will also be observed that the upper end of the valve-stem is hollow down to a point on a line with the seat, for the purpose of allowing the rod v to obtain a bearing at that point. It is by means of this rod v that the weight of the lever is exerted upon the valve V to hold the valve upon its seat against the pressure in the chamber N.

The piston B is provided with a projection,

5 k , for the purpose of preventing the piston from rising up to the cap K or top of the cylinder A , and thereby I obtain a chamber over the piston at all times. The piston B is also
 10 provided with a hole, n , the surface being slightly raised around it, as shown, and there is a screw, p , entering this hole n through the side of the piston B , for the purpose of diminishing the size of the hole n as desired. The
 15 pipe L is the inlet by which this mechanism is connected with the boiler or other vessel. The pipe M is an outlet, and enters through the cylinder A at a point below the center of cap C , which is raised above the pipe M .

15 It will be seen that the valve-seat formed on the upper end of the passage h is raised above the bottom of chamber R and passage O .

20 a is a cylinder, r the cap, and e the strainer, the whole connected with the chamber N by the pipe L for the purpose of preventing any particles entering and obstructing the working.

25 When this device is used to operate a valve, it may be connected with the valve in a similar manner as it is shown connected to the damper in Fig. 1.

30 Fig. 3 shows the device provided with the spring t and screw i for the purpose of weighting the valve V , instead of the lever T and weight U shown in Fig. 1.

Fig. 4 shows the cap K separable for convenience by the casting W .

35 It will be observed that I obviate the necessity of any packing by entering the pressure on the opposite end of the piston from the communicating rod D , and by placing the valve V above the piston and entrance-pipe L all danger from impurities preventing the valve closing is obviated.

40 The operation of this device is as follows: The inlet L is connected to the boiler, steam-pipe, or vessel whose pressure it is desired to control, and the pressure in the chamber N raises the valve V and allows the pressure to
 45 escape into the chamber R , and by means of the passage O into the cylinder A over the piston B , and force the piston down, carrying the rod D and frame E , F , and F' down, and by means of the cord g , attached to the frame
 50 by the hook b , and passing over the pulleys

H and H' , and attached to the damper-crank x , the damper or valve will be closed and its weight z , as well as the weight I , will be raised. Then as the pressure in the vessel decreases the weight U on lever T , by means
 55 of the rod v , will force the valve onto its seat, thus shutting the pressure out of the cylinder above the piston, and the pressure passes by the piston or through the hole n in the piston and passes off by the outlet-pipe M . Thus as
 60 the pressure is taken off from the upper side of the piston the weight I will pull the piston back and allow the weight z to open the damper or valve.

65 The object of the spring f is to close the valve V without awaiting a reduction of pressure in the chamber N , and thereby prevent waste of steam, and also obtain greater sensitiveness of operation. It is operated by means of the
 70 plate F' being brought down onto the spring f whenever the pressure in the cylinder forces the piston B down.

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

75 1. In a pressure-regulator, the combination of the following parts, viz: the pressure-cylinder A , piston B , piston-rod D , plates E F' , rods F , valve V , and means whereby pressure is applied to the piston, for the purpose described.

2. The combination of the cap K , provided with the chamber R , passages O and h , and cap P , the inlet-pipe L , and valve V , said valve being placed at a point higher than said
 85 inlet-pipe and above the piston, substantially as set forth.

3. In a pressure-regulator, the valve V , chambered out vertically, as shown, the lower end of said chamber being substantially on a
 90 line with the valve-seat, for the purpose set forth.

4. The combination, with the cap F' , lever T , rod v , and valve V , of the spring or buffer f , extending upward from said lever, and operating substantially as set forth.

FLORENTINE A. JONES.

Witnesses:

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 JOHN F. WAKEFIELD.