(No Model.)

J. ST. MARY.

PRESSURE GOVERNOR.

No. 558,999. Patented Apr. 28, 1896.

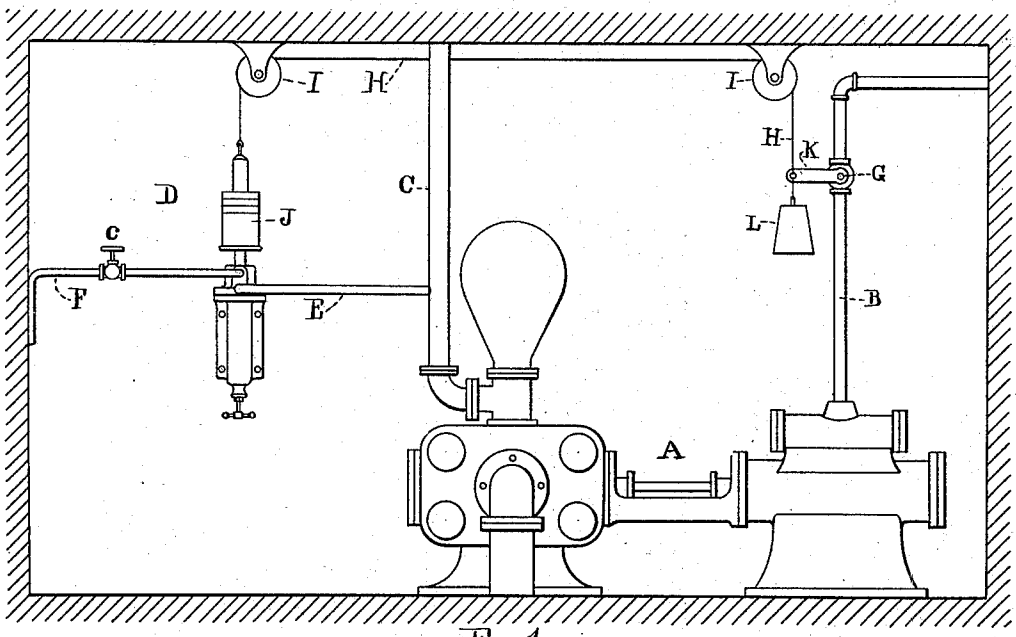

Fig. 1.

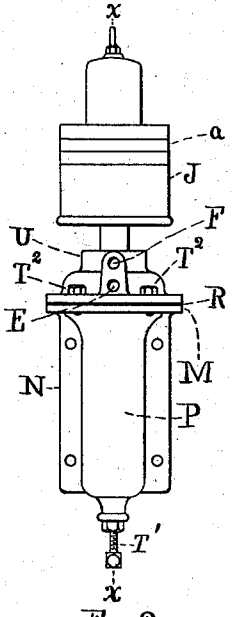

Fig. 2.

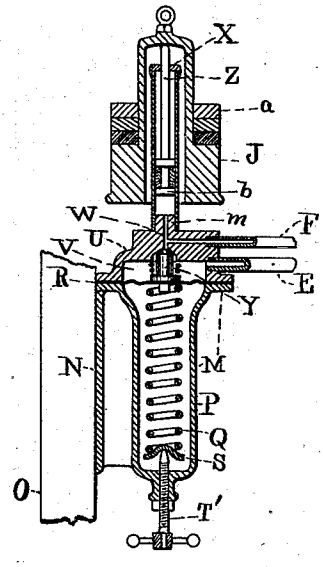

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOSEPH ST. MARY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO JOHN C. WINANS, OF SAME PLACE, AND PETER ST. MARY, OF PORTLAND, OREGON.

PRESSURE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 558,999, dated April 28, 1896.

Application filed March 25, 1895. Serial No. 543,148. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ST. MARY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Pressure-Governors; and I hereby declare the following specification and the drawings therewith to constitute a complete description of my invention.

My invention relates to apparatus for the regulation of air-currents to or from steam-furnaces, also jets of steam and air to promote combustion, or the power applied to pumping apparatus.

My improvements consist in an actuating piston and cylinder, a flexible plate or diaphragm, controlling and escape valves, and an adjustable compensating spring, self-contained, set in alinement, and constructed in a simple form, attachable to a wall or post, as will be hereinafter pointed out in connection with the drawings, and set forth in the claims at the end of this specification.

The principal object of my invention is to provide in a very simple and inexpensive form the various elements of a pressure-regulating apparatus, with provision for endurance and safety from derangement in use.

Referring to the drawings, Figure 1 shows the manner of connecting my improved regulating apparatus to a pump so as to control its speed and work from the resulting pressure. Fig. 2 is a front elevation of one of my improved regulating devices complete. Fig. 3 is a central section on the line *x x* of Fig. 2.

Similar letters of reference are employed to indicate corresponding parts in the different figures of the drawings.

Referring first to Fig. 1, showing the manner of connecting my regulating device to a steam-supply valve, A is a common steam-pump, B the steam-supply pipe, and C the pump discharge-pipe.

D is one of my improved regulating devices attached to the wall, E a small pipe connecting the regulator D with the pump discharge-pipe C, and F a waste-pipe for the escape of water from the regulator.

G is a steam valve or cock in the pipe B, operated by the lever K and a chain or cord H, passing over pulleys I I to the movable or sliding weight J of the regulator D.

As the weight J is moved upward by pressure in the pipes C and E acting on the piston *b*, which by means of the chain or cord H and the weight L moves the lever K, opening or closing the cock G accordingly, shutting off the supply of steam to the pumping-engine A. When the weight J sinks by reason of diminished pressure in the pipe C, the weight J being heavier than the one L, this latter weight and lever K are raised and additional steam supplied to the pumping-engine A, as the pressure in the pipe C may determine.

The application to a flue or chimney damper, ash-pit door, blowing-nozzles for furnaces, and like purposes is the same as here represented, except as to the method of connecting the weight J with the element to be moved, as will be obvious from the case just described.

Referring now to the construction of the regulating apparatus D, (shown in the enlarged views, Figs. 2 and 3,) the main member M is provided with a flange N, to be attached to a wall or post O. Formed integrally with this member M is a chamber or sleeve P, containing a coiled spring Q, pressing at the top against a thin flexible plate R, and at the bottom resting on a follower S, adjustable up or down by the screw T', so as to regulate the force of the spring Q and the amount of pressure beneath the plate R.

Attached to the member M by the bolts T^2, and securing the flexible plate R, is an upper member U, containing a circular chamber V, an inlet passage and pipe E and outlet pipe and passage F, also a small passage W, leading upward into the tube or cylinder X, closed by a small pointed valve Y, attached to the flexible plate R, as shown in Fig. 3.

The cylinder or tube X is attached to a nipple *m* on the member U and has a close-fitting piston *b* therein, provided with a strong stem or piston-rod Z, that extends upward, projecting to receive the annular sliding weight J. This weight J is provided with re-

movable auxiliary weights *a*, to increase or diminish the load on the piston *b*, as the working force may require.

The chamber V is constantly filled and sustains a static pressure from the fluid entering through the pipe and passage E, tending to depress the flexible plate R against the pressure of the spring Q, and thus open the valve Y, permitting the fluid to pass upward around the valve Y, through the small passage W, into the cylinder or tube X beneath the piston *b*, raising the weight J by means of the stem Z, and acting on a damper, valve, or other element that generates or controls the pressure passing through the pipe and passage E, as shown in Fig. 1.

If the pressure in the chamber V falls below that imparted by the spring Q, pressing beneath the flexible plate R, then this plate rises and the valve Y is closed. The fluid contained in the cylinder X beneath the piston *b* slowly leaks out through the passage and pipe F, permitting the weight J to descend and open a damper, valve, or other element supplying or controlling the pressure in the pipe and passage E and the chamber V. This leak of fluid from the cylinder X through the pipe and passage F is controlled by a cock *c*, (seen in Fig. 1,) so adjusted as to not pass a quantity sufficient to interfere with the supply through the valve Y when that is open, but to permit a slow escape of the fluid and descent of the piston *b* and weight J when the valve Y is closed. In this manner it will be seen that the weight J will rise and fall as the pressure in the cylinder V is more or less, and that the degree of pressure required to operate the apparatus is dependent upon the force exerted by the spring Q, and is adjustable to any degree by means of the screw T'.

It will also be seen that the apparatus is applicable for regulation in any place where variable fluid-pressure is available as an actuating force, and when the supply of the generating element—whether air, steam, gas, or oil—can be controlled by movement of a piston subjected to variations of pressure, and that my invention is applicable to dampers, ash-pit doors, water-pumps, and air-compressors.

Having thus explained the nature and objects of my invention and the manner of constructing and applying the same, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fluid-pressure-regulating apparatus, the combination with the bracket or wall plate adapted to be attached to the wall or a post, of the flexible plate, the spring-actuated inlet-valve operated thereby, an inlet-pipe, a horizontal fluid-escape passage between said inlet-valve and the weighted piston to control the fluid-pressure above said inlet-valve, and the piston carrying adjustable weights and operating a valve, substantially as described.

2. In a fluid-pressure regulator, the combination with a bracket or wall plate provided with an integrally-formed sleeve or chamber adapted to receive a spring, of a removable covering-head containing an annular chamber and inlet and outlet passages, an interposed flexible plate carrying a spring-pressed inlet-valve, and a weight-carrying piston controlling the steam-pressure, substantially as and for the purpose herein set forth and described.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

JOSEPH ST. MARY.

Witnesses:
ALFRED A. ENQUIST,
WILSON D. BENT, Jr.