(No Model.)

G. KIMBALL.

FLUID PRESSURE GOVERNOR.

No. 436,858. Patented Sept. 23, 1890.

Fig. 1.

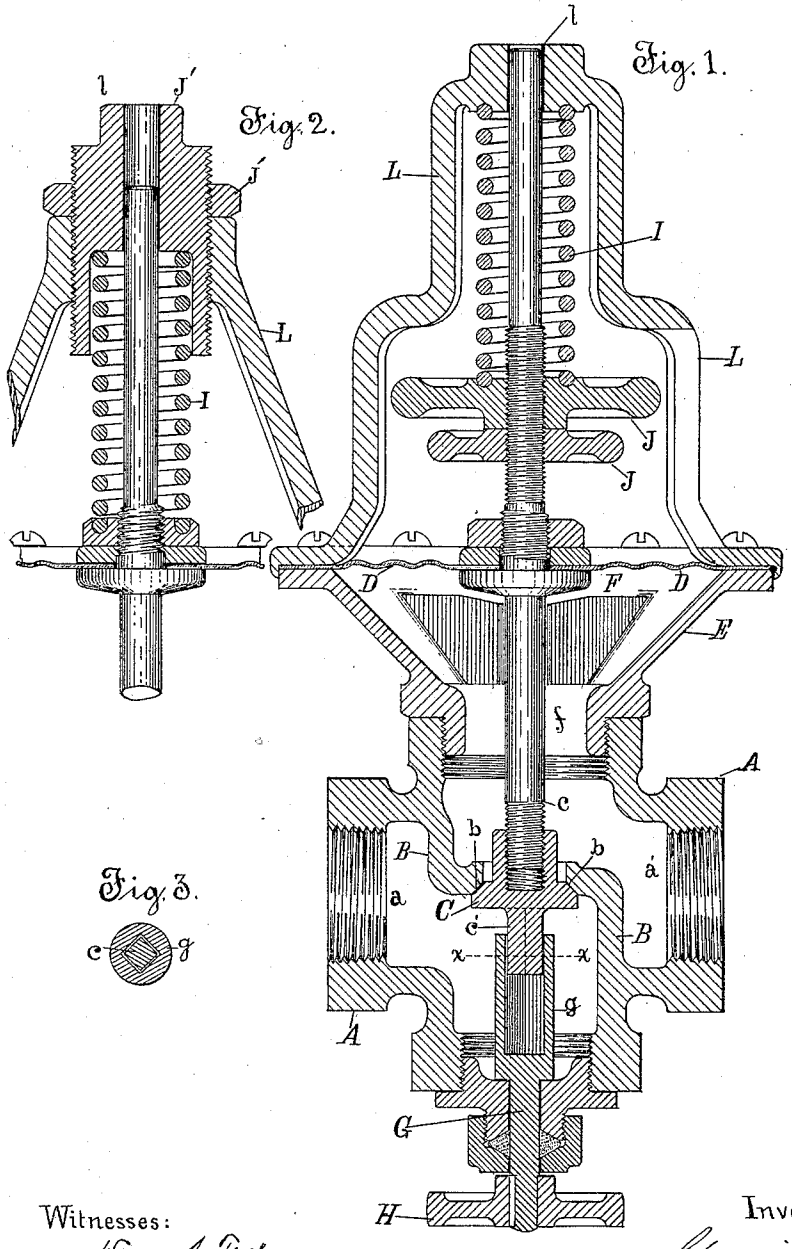


Fig. 2.

Fig. 3.

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FLUID-PRESSURE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 436,858, dated September 23, 1890.

Application filed January 10, 1890. Serial No. 336,487. (No model.)

To all whom it may concern:

Be it known that I, GRANVILLE KIMBALL, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Fluid-Pressure Governors, of which the following is a specification.

This invention relates to a fluid-pressure governor designed to receive a fluid under varying pressure and deliver it at a reduced but practically constant pressure. More particularly it belongs to that class of governors wherein the passage of the fluid is controlled by a valve of comparatively small area operated by a diaphragm or piston of comparatively great area, the pressure of the fluid upon the delivery side of the governor being applied to the diaphragm to close the valve, and a constant force, as that of a spring, being applied in opposition thereto and tending to open the valve. In the operation of these governors, the valve being, in the absence of pressure upon the diaphragm, held open by the spring, the fluid will pass through until the pressure upon the diaphragm overcomes the force of the spring and closes the valve. This cuts off the pressure from the boiler or other source until the pressure upon the delivery side of the governor subsides and allows the spring to again open the valve. The spring thus fixes the maximum pressure which can pass through the governor and opens the valve whenever the pressure upon the eduction side becomes less than such maximum. One of the especial purposes of this invention is to provide means for easily adjusting the tension of said spring and its relative position with reference to the diaphragm and valve. To such end it consists in certain mechanical features described below, and particularly defined in the annexed claims.

In the drawings, wherein like reference-letters are applied to the same or corresponding parts, Figure 1 is a central vertical section of my improved governor. Fig. 2 is a similar view of a portion of the same modified in certain parts, and Fig. 3 is a detail cross-section taken in line *x x* of Fig. 1.

Referring to the figures, A is the valve-casing; *a*, the induction, and *a'* the eduction-port. A partition B, closing the passage between these two ports, furnishes a seat *b* for an ordinary plug-valve C, guided by a stem *c*. This stem is attached at some point to the controlling-diaphragm D, supported by suitable casing E, and inclosing upon one side a chamber F, within which the fluid-pressure may act upon said diaphragm. The diaphragm-chamber F communicates with the eduction side of the governor through a suitable port or passage *f*, preferably centrally located to accommodate the valve-stem *c*, and I also prefer to apply to this valve-stem the regulating-spring I, and to make this spring easily adjustable from without I pass the valve-stem through the diaphragm and extend it outside far enough to carry said spring. To furnish an abutment for the latter, I fasten upon the valve-casing a yoke-shaped extension L, which may also be made to aid in guiding the valve-stem, as at *l*. The spring I is contained between this yoke and a shoulder on the valve-stem. The device for adjusting its tension may be applied at either end, as shown in Figs. 1 and 2, the former showing an adjusting nut or nuts J, threaded to the stem, and the latter applying similar nuts J' J' to the yoke end of the spring.

The valve C is held upon the stem by a screw-thread, and may be screwed back and forth upon the same, opening or closing the valve, when desired. To reach it a rod G, bearing a hand-wheel H, is passed through suitable stuffing into the valve-casing and there enlarged into a cup *g*, preferably square inside, as shown in Fig. 3, to fit an extension *c'* of the valve, the same fitting loosely, so that it will move freely lengthwise in the cup, but cannot turn in it. The rod and cup G *g* thus form a wrench, always accessible from without the casing, for turning the valve to screw it shut or open it, while not interfering in the least with its longitudinal movement. Incidentally the cup *g* has another important function, which is that when filled with condensation-water, as it usually is, it cushions the valve, steadying and preventing it from rattling.

The operation of this governor is as follows: The fluid enters through the port *a*, passes the valve C, held from its seat by the spring I, and fills the pipes upon the eduction side of the valve until the pressure upon the diaphragm D overcomes the spring I and closes

the valve. Now if the gage shows too light a pressure, the spring I is compressed by means of the nuts J J or J′ J′, increasing its tension and again opening the valve and admitting the fluid until the pressure rises enough to overcome the increased resistance of the spring; or, if the pressure in the first instance is found to be too great, the nut is screwed in the opposite direction, lessening the tension of the spring, and the pressure will fall below that first obtained before the valve will again open. Thus the valve can be adjusted to deliver any desired pressure without taking the governor apart or removing any portion thereof, the operation consisting simply of turning the thumb-nut J or J′ and keeping watch of the gage meanwhile. To avoid confusion, it should be remembered that the valve C is so small in comparison with the diaphragm D that the pressure upon the valve itself may be disregarded, as it will have no appreciable effect upon the working of the comparatively large diaphragm D when under pressure or upon the action of the correspondingly-powerful spring I.

I claim as new and desire to secure by Letters Patent—

1. In a fluid-pressure governor of the class described, the combination of the casing, the spring, the diaphragm, the valve-stem and valve adjustable thereon, and the cup-shaped wrench *g*, arranged to act as a water-cushion, substantially as described.

2. In a fluid-pressure governor of the class described, the combination of the valve-casing, the diaphragm adapted to operate the valve under the influence of the fluid-pressure, a spring provided with means for adjusting its tension without disturbing the relative positions of the diaphragm and valve and applied to oppose the action of the diaphragm, and means accessible from without the casing for adjusting the relative positions of the valve with regard to the diaphragm without disturbing the adjustment of the spring, substantially as described.

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