

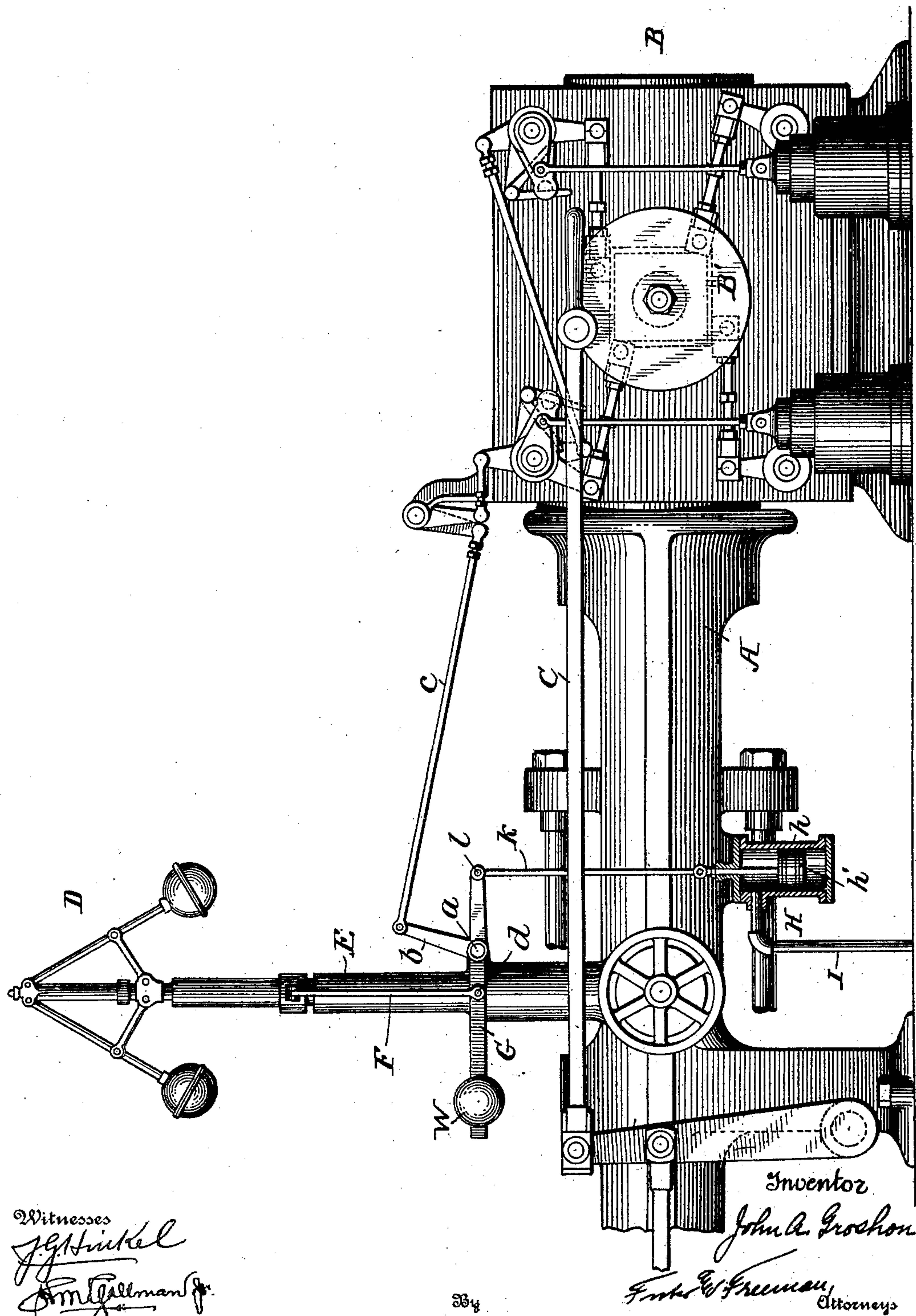
No. 704,536.

Patented July 15, 1902.

J. A. GROSHON.
GOVERNOR CONTROLLED VALVE GEAR.

(Application filed Sept. 30, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

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GOVERNOR-CONTROLLED VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 704,536, dated July 15, 1902.

Application filed September 30, 1901. Serial No. 77,065. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. GROSHON, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Governors, of which the following is a specification.

My invention relates to steam pumping-engines, and more particularly to governors for the same of the type known as "pressure-governors."

The object of my invention is to provide an improved pressure-governor for a pumping-engine which changes the speed of the engine by releasing the valve-gear sooner or later in accordance with the pressure in the pump or mains, thereby regulating the pressure on the water in the pump.

My improved governor comprises an ordinary fly-ball governor for shortening cut-off on an increase of the speed of the engine upon diminished load, as upon decrease of pressure in the pump, this ball-governor operating in conjunction with a pressure-governor connected thereto for shortening cut-off upon an increase of pressure in the pump or mains, thus cutting down the speed of the engine and reducing the pressure in the mains. The operation of the fly-ball governor in reducing speed on diminished load is not interfered with by the pressure-governor; but the two act in opposition to each other upon an excessive increase of pressure in the mains, so that in this case the ball-governor is powerless to lengthen the cut-off and increase the engine speed; but the regulation is entirely due to the pressure-governor, which shortens cut-off and reduces the speed of the engine.

My invention consists in the details and construction of a governor, as fully set forth and illustrated in the accompanying specification and drawing, in which the figure is a side view of part of the frame of a horizontal engine, showing my improved governor connected thereto with the necessary operative connections between the governors and valve-gear.

Referring to the drawing, A represents a portion of the frame of a steam pumping-en-

gine, of which B is the steam-cylinder, provided with suitable valve-gear, in this instance shown as a release valve-gear, which may be of any preferred type operated from the oscillating disk B' in the usual manner, which disk is arranged to be actuated by the eccentric-rod C.

A speed-governor D is suitably supported from the engine-frame by a standard E and, as shown in this instance, has a fly-ball governor which raises and lowers a rod F; but it is to be understood that any suitable regulator may be substituted which responds to changes in the speed of the engine, I merely having shown a fly-ball governor as a convenient means of illustrating my invention. What I shall term a "regulating-lever" G is pivoted to any convenient part of the frame, as shown, being pivoted at *a* to a lug on the standard E. This lever is operatively connected in any suitable manner, as by an arm *b* and rod *c*, pivoted thereto, with the valve-gearing, while the rod F of the governor is pivotally connected to the lever, as at *d*.

Through the operation of the construction so far described the speed-governor D is adapted to raise the rod F and rock the lever G to shorten the cut-off upon an increase of speed in the engine consequent upon a decrease of load, as upon a decrease of the pressure in the mains which are supplied by the pump, thus restoring the engine to normal speed.

A pressure-governor H is also connected to the pivoted regulating-lever G and comprises a hydraulic cylinder *h*, provided with a piston *h'* (shown in dotted lines) and piston-rod *k*, which rod is pivotally connected to the lever G at *l*. A suitable pipe connection I is made from the upper portion of the cylinder *h* to the mains (not shown) into which the engine may be pumping, so that the hydraulic cylinder *h* is subjected to the pressure in the mains and the piston *h'* will be actuated thereby.

While many different ways of connecting a speed-governor and a pressure-governor could be devised, those connections shown in the drawing are simple and convenient for carrying out the objects of my invention. It

will be seen that the rod *F* of the speed-governor and the piston-rod *k* of the pressure-governor are pivotally connected to the lever *G* at opposite sides of the pivot *a*, forming a couple acting about the pivot *a*. By this means should a decrease in pressure occur and the engine speed up the rod *F* would be raised and the piston-rod *k* and piston *h'* pressed downward. A shorter cut-off would be obtained and the engine brought back to normal speed. In this case the speed-governor acts entirely independently of the pressure-governor, or, in other words, according to the connections shown the pressure-governor in no way interferes with the operation of the speed-governor to shorten cut-off and reduce the speed, but acts in conjunction therewith.

Variable means are provided for counterbalancing different pressures in the pressure-governor, so that it will not act to reduce the speed except upon a predetermined increase of pressure. It is very desirable in steam pumping-engines which pump directly into the mains to regulate the pressure in the mains as well as the speed of the engine, and my combination-governor operates effectively to accomplish this end. Any suitable means may be provided; but in this instance a weight *W* is shown connected to that portion of the regulating-lever *G* at the other side of the pivot *a* from the point *l* at which the piston-rod *k* of the pressure-governor is connected to the lever. The weight *W* thus acts to compensate for pressure on the pressure-governor *H*, for at only a given pressure may the piston *h'* move downward in its cylinder to raise the weight. By moving the weight along the lever a greater or less pressure may be counterbalanced, since the lever-arm and moment of the weight are varied about the point *a*. Upon the pressure in the governor *H* becoming sufficient to overcome the inertia of the weight *W* the piston *h'* will be moved downward and the lever *G* rocked in the same manner that it would be if the balls of the governor *D* had risen, thereby serving to shorten cut-off and reduce the speed of the engine, thus reducing the pressure in the mains. If the speed of the engine should decrease because of increased pressure in the mains, the natural tendency of the balls on the governor *D* would be to fall and actuate lever *G* and rod *c* to lengthen the cut-off and speed up the engine; but it will be seen that if the increase of pressure which caused the lowering of the speed of the engine were of such amount as to be sufficient to lower the piston *h'* then the pressure-governor *H* would act to control the speed-governor *D*, acting in opposition thereto through means of the couple referred to, and a shortening of the cut-off would take place, with a lowering of the engine speed and reduction of pressure in the mains.

It will readily be seen that nice adjust-

ments may be made with my improved governor for regulating both speed and pressure.

Without limiting myself to the precise details of construction shown and described, I claim, and desire to obtain by Letters Patent, the following:

1. The combination with the valve-gear of a steam pumping-engine, of a governor, a pivoted lever operatively connected with the valve-gear, connection between said governor and the lever, a pressure-governor and connection between it and the lever, and means for counterbalancing different pressures on the pressure-governor, substantially as described.
2. The combination with the valve-gear of a steam pumping-engine, of a speed-governor, a pivoted lever operatively connected with the valve-gear, connection between the speed-governor and the lever, a pressure-governor and connection between it and the lever at one side of the pivot, and means on the lever at the other side of the pivot for compensating for pressure on the pressure-governor, substantially as described.
3. The combination with the valve-gear of a steam pumping-engine, of a speed-governor, a pivoted lever operatively connected with the valve-gear, connection between the speed-governor and the lever at one side of the pivot, a pressure-governor and connection between it and the lever at the other side of the pivot, and means on the lever for compensating for pressure on the pressure-governor, substantially as described.
4. The combination with the valve-gear of a steam pumping-engine, of a speed-governor, a pivoted lever operatively connected with the valve-gear, connection between the speed-governor and the lever at one side of the pivot, a pressure-governor and connection between it and the lever at the other side of the pivot, and variable means for counterbalancing different pressures on the pressure-governor, substantially as described.
5. The combination with the valve-gear of a steam pumping-engine, of a speed-governor, a pivoted lever operatively connected with the valve-gear, connection between the speed-governor and the lever, a pressure-governor and connection between it and one end of the lever, and a weight on the other end of the lever compensating for pressure on the pressure-governor, substantially as described.
6. The combination with the valve-gear of a steam pumping-engine, of a speed-governor, a pressure-governor, and operative connections between the two and the valve-gear so arranged that the operation of the speed-governor is independent of the pressure-governor on a decrease of pressure but said speed-governor is controlled by the pressure-governor upon an increase of pressure, substantially as described.
7. The combination with the valve-gear of a

5 steam pumping-engine, of a speed-governor, a pressure-governor, and operative connections between the two and the valve-gear so arranged that said governors act in conjunction to control the valve-gear on a decrease of pressure but act in opposition on an increase of pressure, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN A. GROSHON.

Witnesses:

CHARLES C. GILL,
GUNDER GUNDERSON.