No. 669,274. Patented Mar. 5, 1901.

A. F. WARD.

PUMP GOVERNOR.

(Application filed May 14, 1900.)

(No Model.)

Fig. 1.

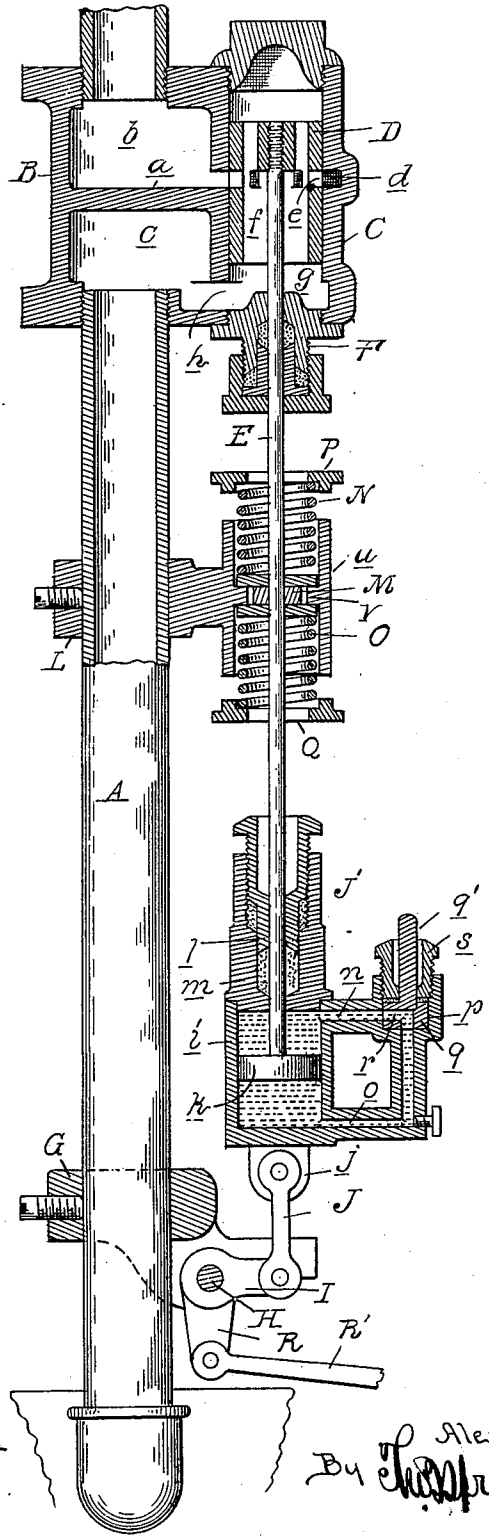
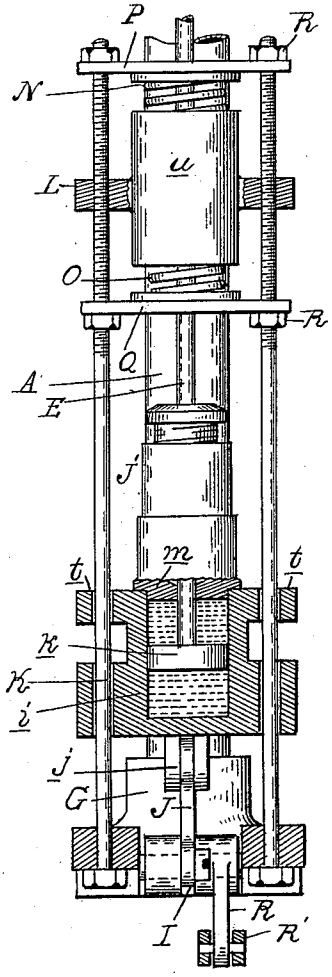


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ALEXANDER FIELD WARD, OF MEMPHIS, TENNESSEE.

PUMP-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 669,274, dated March 5, 1901.

Application filed May 14, 1900. Serial No. 16,671. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER FIELD WARD, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Pump-Governors, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to governors especially designed for use in governing the speed of steam-pumps; and the invention consists in the peculiar combination of a cut-off, an actuating connection between said cut-off and the moving part of the pump-motor, a counter-motor, and a dash-pot, as more fully hereinafter described and claimed.

The invention further consists in the peculiar construction, arrangement, and combination of parts, as specifically set forth in the claims.

In the drawings, Figure 1 is a longitudinal section through the governor, and Fig. 2 is a longitudinal section in a plane at right angles to Fig. 1 and partly in section.

In the construction shown in the drawings I have shown all the parts of my governing device as connected to and supported by the steam-pipe leading to the pump, thus dispensing with the necessity of providing a separate framework.

In this construction, A designates the steam-pipe. At a suitable point in this pipe is connected the casing B, having a central diaphragm *a*, dividing it into two chambers *b c*. At one side of the casing B is a cylinder C, preferably formed integral therewith and containing the piston-valve D. The cylinder C is connected by an annular port *d* with the chamber *b*, and the valve D is provided with a corresponding port *e*, adapted to register with the port *d* in the normal position of said valve. The port *e* connects with the central passage *f* in the valve, which communicates with a chamber *g* at the end of the cylinder C, which chamber is connected by a port *h* with the chamber *c* in the casing B.

E is a valve-rod connected to the valve D and passing out through a stuffing-box F at the end of the cylinder C.

G is a bracket clamped or otherwise secured to the pipe A, and H is a rock-shaft journaled in this bracket.

I is a rock-arm secured to the shaft H, and J is a link pivotally connected to the outer end of said rock-arm and extending in line with the valve-rod E. Between the link J and the rod E is interposed a dash-pot J', which is preferably of the following construction:

i is a cylinder pivotally connected by ears *j* to the link J. *k* is a piston in this cylinder which is connected to the opposite end of the rod E, which rod passes into the cylinder through a stuffing-box *l*, formed in the cap or head *m*. The opposite ends of the cylinder *i* are connected with ports *n* and *o*, which connect, respectively, with the end and side of a cavity *p*, in which is arranged a rotary plug *q*. This plug is provided with a port or passage *r*, which in one position of the plug will register with the ports *n* and *o*, so as to form a continuous passage or by-pass extending from one end of the cylinder to the opposite end. The plug *q* has a stem *q'* passing out through a cap *s*. Upon opposite sides of the cylinder *i* are arranged guide-rods K, which at one end are connected with a bracket G and at their opposite ends to a bracket L, also preferably clamped or otherwise secured to the steam-pipe A. The cylinder *i* is provided with apertured ears *t*, which slidingly engage with said guide-rods.

M is a collar secured to the rod E. Upon opposite sides of this collar and bearing thereagainst are springs N and O, which at their opposite ends bear against abutments P and Q. The abutments P and Q are preferably adjustably secured upon the guide-rods K by means of the nuts or threaded collars R on said rods.

The bracket L is preferably provided with a cylindrical casing *u*, which surrounds the springs N and O, and within this casing is an annular flange or collar *v*, forming a stop limiting the movement of said springs.

The parts being constructed as shown and described, in the use of the device as a governor for pumps the pipe A is connected to the steam-cylinder of the pump. From some moving part of the pump (not shown) a connection R' is made to the rock-arm R, connected to the rock-shaft H, so that in the nor-

mal operation of the pump a rocking movement will be imparted to said rock-shaft and through the link J to the cylinder *i*. The space within the cylinder *i*, as well as the by-pass, is filled with a liquid, such as oil, so that whenever there is a relative movement between the cylinder and the piston *k* therein said liquid or oil is compelled to travel through the by-pass from one end of the cylinder to the other. By means of the plug *q* the flow of oil through this pipe may be restricted to a greater or less degree, so as to govern the time required for the piston to travel from one end of the cylinder to the other. For the normal operation of the pump this plug is so set as to permit of a relative movement between the cylinder and piston equal in speed to the movement of the link J, attached to said cylinder. As the springs N and O tend to hold the rod E and the piston *k*, attached thereto, stationary, it is obvious that where the speed of the pump is normal said rod and piston may remain practically stationary, while the cylinder *i* will be reciprocated by the link J. In this position of the rod E the cut-off valve D will remain in a position where the ports *e* are in registration with the ports *d* in the cylinder C, so as to form a free passage for the steam entering the chamber *b* of the casing B through said ports and valve into the chamber *c* and thence through the pipe A to the cylinder of the pump. As soon, however, as the speed of the pump is increased the oil in the cylinder *i* of the dash-pot will not be enabled to travel through the restricted by-pass fast enough to permit of the piston *k* remaining stationary. Thus said piston will be moved against the tension of one of the springs N and O, which will cause a shifting of the valve D to partially or completely cut off the steam. This of course will slow the operation of the pump, and as soon as the latter drops to normal speed the springs will restore the valve to its normally open position.

While I have shown and described a specific construction of my governor, it is obvious that the parts might be differently arranged without departing from the spirit of my invention.

What I claim as my invention is—

1. A governor for a fluid-motor, comprising a cut-off valve in the fluid-supply conduit, a spring for yieldingly holding said cut-off valve in its open position, a reciprocating member actuated by the motor connected to said valve, and a dash-pot in said connection.

2. A governor comprising a pipe or conduit for conducting the motive agent to the motor, a casing connected into said conduit, a piston-valve at one side of said casing controlling the passage of the motive agent therethrough, a rod connected to said valve extending parallel to said conduit a dash-pot having one member thereof connected to the opposite end of said rod, a reciprocating member actuated by the motor, connected to the other member of said dash-pot, guides for said dash-pot connected to said conduit, a coil-spring surrounding said rod between said guides having an abutment secured to the latter and being adapted to yieldingly hold said rod with the valve in its open position, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER FIELD WARD.

Witnesses:

MILTON BROWN,

CHAS. SIMON.