W. V. TURNER.

ELECTRIC PUMP GOVERNOR.

APPLICATION FILED MAY 28, 1907.

1,067,562. Patented July 15, 1913.

Fig. 2.

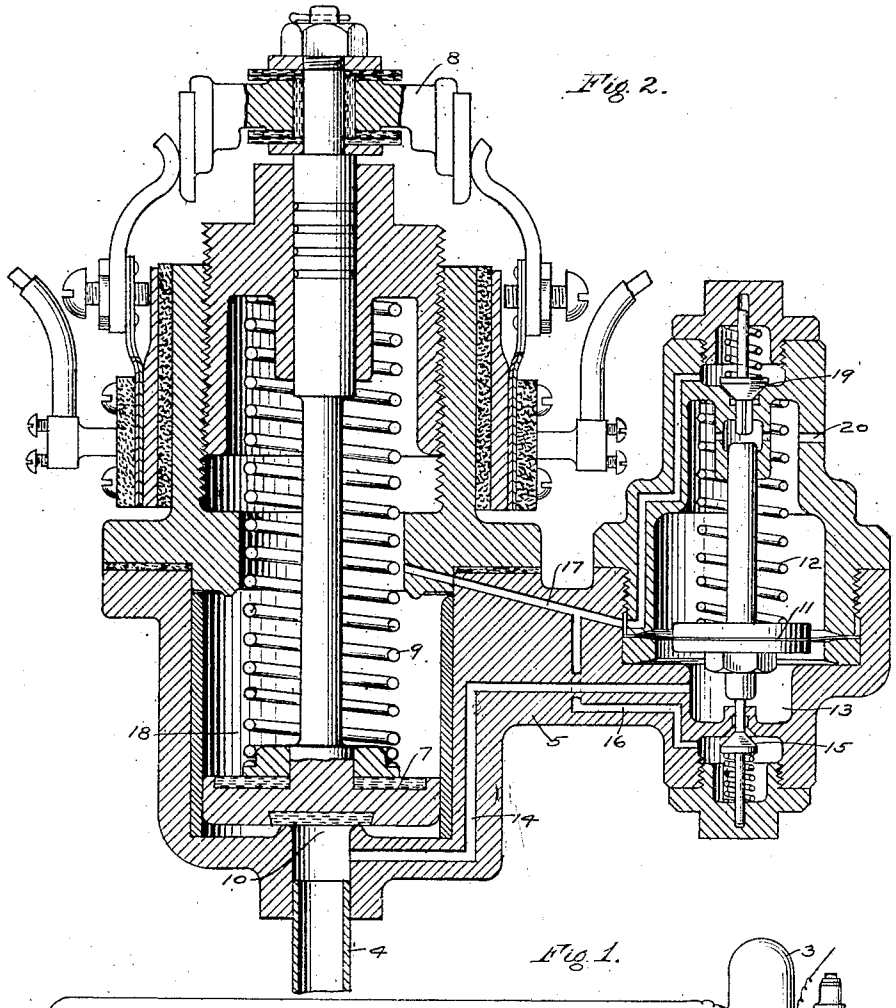
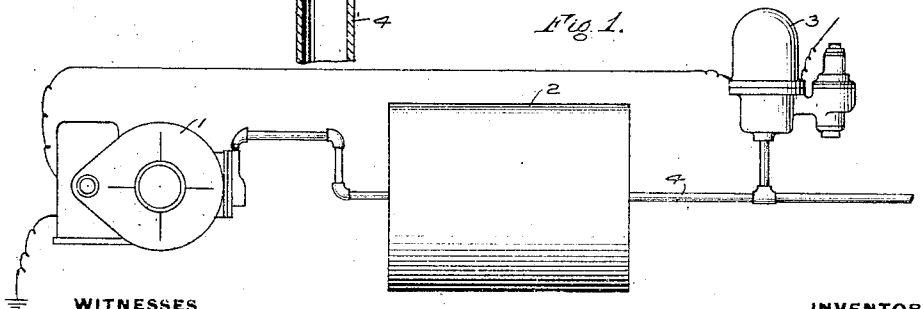


Fig. 1.



WITNESSES

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UNITED STATES PATENT OFFICE.

WALTER V. TURNER, OF EDGEWOOD, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE AIR BRAKE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ELECTRIC PUMP-GOVERNOR.

1,067,562. Specification of Letters Patent. Patented July 15, 1913.

Application filed May 28, 1907. Serial No. 376,165.

To all whom it may concern:

Be it known that I, WALTER V. TURNER, a citizen of the United States, residing at Edgewood, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Electric Pump-Governors, of which the following is a specification.

This invention relates to pump governors, and more particularly to governors for motor driven pumps, wherein a controlling device, or switch, for opening and closing the circuit to the pump motor, is operated by variations in pump pressure.

The principal object of my invention is to provide an improved electric pump governor, wherein the movement of the actuating piston to either the cut in or cut out position, is rapid, so that a quick, snap-like movement of the controlling device, or switch, is produced.

Another object is to provide a simple, compact and cheaply constructed pump governor of this character.

In order to attain the above objects, my invention consists, generally stated, of an actuating piston for the controlling device or switch, constantly subject on one face to fluid pressure, and a valve mechanism governed by pump pressure for admitting and releasing fluid to and from the opposite face of said actuating piston, and further, to secure a quick movement of said piston, the area thereof, constantly exposed to fluid pressure, may be restricted, the piston being adapted, on preliminary movement, to expose a larger area to fluid pressure, and thereby rapidly shift said piston.

In the accompanying drawing, Figure 1 is a diagrammatic view of an electric pump governor, with my invention applied, connected to its pump and reservoir, and Fig. 2 a central sectional view of one form of electric pump governor, embodying my improvements.

In Fig. 1 is illustrated, diagrammatically, the usual arrangement of electric motor driven pump 1, connected to a reservoir 2, and electric pump governor 3, containing my improvements, and connected to the reservoir 2 by pipe 4.

One form of electric pump governor embodying my improvements, is shown in Fig. 2, and comprises a casing 5, containing an actuating piston 7, for a controlling device or electric switch 8. In its inner position, at which the actuating piston 7 is normally held by a spring 9, a large port 10, leading to reservoir pipe 4, is closed by said piston. The valve mechanism for varying the pressure on one side of said actuating piston 7, comprises a diaphragm 11, subject on one face to the pressure of an adjustable spring 12, and on the other face to pump pressure, the chamber 13, at that face of the diaphragm, being open, through a passage 14 to reservoir pipe 4. The spring 12 tends to maintain the diaphragm 11 in a position in which a supply valve 15 is held open, and establishes a communication between the reservoir pipe 4 and pump pressure through passage 14 and chamber 13, passage 16 and 17 to the chamber 18 at the outer or spring face of the actuating piston 7. Movement of the diaphragm 11 in the direction to compress the spring 12, opens a release valve 19, which controls communication from the spring chamber 18, through passage 17, to an exhaust or release port 20. The electric pump circuit being closed by the switch 8, as shown in Fig. 2, the pump 1 supplies compressed air to the reservoir 2, thereby raising the fluid pressure therein, and in chamber 13 and on the face of the diaphragm 11. When the fluid pressure rises to the point at which the spring 12 may be adjusted, the diaphragm 11 is moved and permits valve 15 to close, and opens the release valve 19. Fluid under pressure is thereupon vented from the spring chamber 18, through the passage 17, to the exhaust port 20. The fluid pressure, acting on the restricted area of the actuating piston face, open to the port 10, is then sufficient to lift the piston from its seat against the opposing pressure of the spring 9. The preliminary movement of the piston 7 opens the large port 10 to the chamber below said piston, thereby causing a sudden and large increase in fluid pressure on the piston, which rapidly moves the same to its outer seat, thus producing the desired quick and snap-like movement of the electric switch contacts, thereby opening the electric motor circuit to the pump. The actuating piston 7 is maintained in this outer position by the reservoir or pump pressure on its inner face, and when the reservoir pressure has diminished to a point below the pressure of the regulating spring 12, the diaphragm 11 responds to the excess pres-

sure of the spring and moves the valve 15 to its open position, at the same time permitting the release valve 19 to be closed by its spring. Thereupon fluid under pressure is admitted from the reservoir 2, through passage 14, chamber 13 and passage 16 and 17, to the spring chamber 18. The sudden increase in fluid pressure thus produced on the spring face, balances the fluid pressure on the inner face of the graduating piston 7, permitting the spring 9 to rapidly move said piston to its inner position, closing the electric pump circuit through the switch 8, and thereby starting the pump motor.

It will thus be apparent that I have provided a simple and easily constructed electric pump governor, wherein, at the time of cutting in or cutting out, the movement of the actuating piston is rapid, so that the switch moves with a quick, snap-like action, thus preventing what is known as "arcing" and consequent burning of the switch contacts.

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

1. A pump governor, comprising a controlling device, an actuating piston therefor, constantly subject to the opposing pressures of a spring and fluid under pressure, and a valve mechanism governed by pump pressure for admitting fluid pressure to one side of said piston to thereby actuate said piston.

2. A pump governor, comprising a controlling device, an actuating piston therefor, subject to fluid pressure on one face, a valve mechanism for establishing a communication from a source of fluid pressure to the opposite face of said actuating piston, and operated by a predetermined increase in pump pressure to open a vent port to said opposite face and cause the movement of said piston in one direction, and operated by a predetermined decrease in pump pressure to admit fluid under pressure to said opposite face, and a spring for then moving said piston in the opposite direction.

3. A pump governor comprising a pump controlling device, a piston constantly subject on one side to fluid pressure and on the opposite side to the pressure of a spring for operating said controlling device, a valve for releasing air and a valve for supplying air to the spring side of said piston, and a movable abutment subject to the opposing pressures of the pump and an adjustable spring for operating said valves, said abutment having a movement relative to said valves to permit one valve to close before the other valve opens.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.

Witnesses:
R. F. EMERY,
WM. M. CADY.