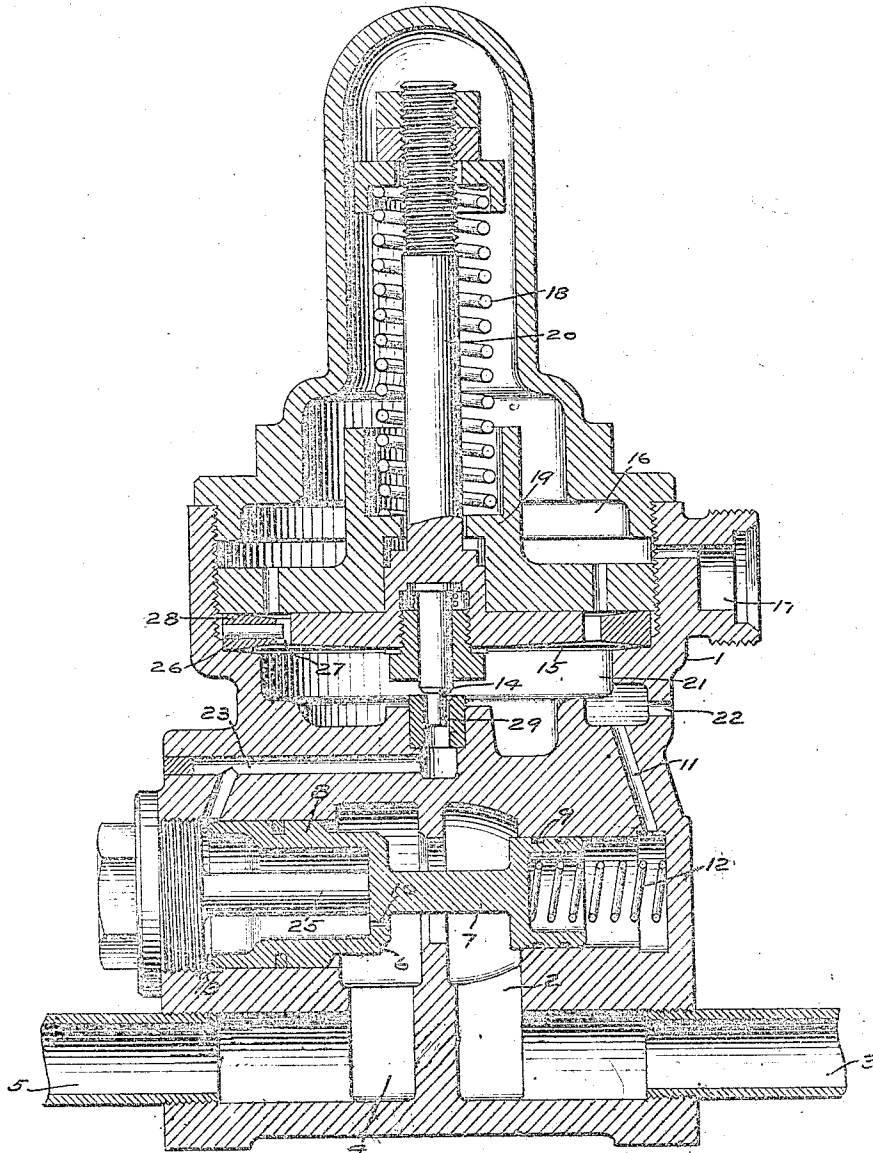


W. V. TURNER.
STEAM PUMP GOVERNOR.
APPLICATION FILED JAN. 23, 1909.

1,034,662.

Patented Aug. 6, 1912.



WITNESSES
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STEAM-PUMP GOVERNOR.

1,034,662.

Specification of Letters Patent.

Patented Aug. 6, 1912.

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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 Steam-Pump Governors, of which the following is a specification.

This invention relates to pressure regulating devices, and more particularly to a governor for controlling the admission of steam or other motive fluid to a pump for compressing fluid.

The principal object of my invention is to provide an improved construction of the above character capable of responding to slight variations in the pressure of the fluid compressed by the pump and which is quick and positive in its action and compact in construction.

The single figure shown in the drawing is a vertical section of a preferred form of my improved pressure governor, and, as shown, comprises a casing 1, containing a steam supply chamber 2, open to supply pipe 3 and a steam outlet chamber 4 connected to pipe 5, leading to the pump. Communication between chambers 2 and 4 is controlled by a valve 6, which may be formed as a part of its operating piston 7. The piston 7 comprises differential heads 8 and 9, the larger head 8 being provided with a small leakage port 10 to permit the gradual equalization of pressures upon opposite sides of said head. The outer face of the smaller head 9 is in constant open communication with the atmosphere through passage 11 and is subject to the pressure of a coil spring 12, tending to move the piston in the direction of the head 8.

A vent port 23 leads from chamber 13 at the outer face of piston head 8 and is controlled by a valve 14 the actuation of which is effected by the movement of a large diaphragm 15. The outer face of this diaphragm is constantly exposed to the pressure of the fluid compressed by the pump, the chamber 16 on that side of the diaphragm being connected to pump pressure through passage 17.

An adjustable coil spring 18 is interposed between a fixed abutment 19, suitably secured in the casing 1 and one end of the diaphragm spindle 20 and tends to move the diaphragm 15 outwardly in opposition

to the pressure of the pump acting on the diaphragm. Chamber 21 at the inner face of the diaphragm is open to the atmosphere at all times through the atmospheric port 22.

When the pressure of the fluid compressed by the pump is less than the degree of pressure at which the adjustable spring 18 is set, the valve 14 is opened, so that steam which has accumulated in chamber 13 at the outer face of piston head 8, by leakage through port 10, is vented to the atmosphere. The pressures on the piston are then substantially balanced, thus permitting the spring 12 to shift the piston and the valve 6 from its seat. As soon as this valve leaves its seat, it will be noted that as the chamber 4 is open to the steam pressure from chamber 2, a greater area of the piston head 8 is exposed to steam pressure than was before exposed, in consequence of which, the piston is shifted quickly and positively to a full open position, and full supply of steam is admitted to the pump. While the governor is in its open position, the steam which flows through the small equalizing port 10 escapes past the open valve 14 to the atmosphere. When the pump has brought the pressure of the compressed fluid up to a degree slightly exceeding the tension of the spring 18, the diaphragm 15 moves downwardly and closes the valve 14. The steam flowing through port 10 then causes the equalization of pressures on the opposite sides of piston head 8 and as the outer face of the piston head 9 is open to atmospheric pressure, there is an unbalanced steam pressure on the outer face of the head 8 which causes the piston 7 to move inwardly and close the valve 6, thus cutting off the admission of steam to and stopping the pump.

A stem 25 may be interposed in the path of movement of piston 8, so as to limit its outward movement and thereby prevent the restriction of port 23.

In order to prevent any tendency of the diaphragm spindle to turn and buckle or twist the diaphragm, a pin 26 is inserted in the diaphragm ring 28, so as to project out into a slot or notch 27 in the flange on the diaphragm end of spindle 20. Valve 14 is preferably provided with a stem 29, extending into the port beyond the valve seat. By this means the "wire drawing" effect of steam on the valve seat is avoided, such ac-

tion being transferred in this way to the outer end of the stem 29.

The above described construction of governor is particularly adapted for handling low pressures, such as are employed in gas transmission, and is capable of operating positively under small variations in the pressure of the compressed fluid.

It will be noted that with this construction there is no venting of the gas or air compressed in the operation of the governor, which feature is especially desirable where gas is pumped.

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

1. A governor for steam actuated pumps comprising a valve for controlling the admission of steam to the pump, a piston for operating said valve, said piston having two heads of different areas, the larger head being normally subject on opposite sides to steam pressure and the smaller head to atmospheric pressure on one side, and a regulating valve mechanism operating upon a reduction in the pressure of fluid compressed by the pump for venting steam from one side of the larger piston head to thereby actuate said valve and supply steam to the pump.

2. A governor for steam actuated pumps comprising a valve for controlling the admission of steam to the pump, a piston for operating said valve, said piston having two heads of different areas, the larger head being exposed on one side to steam pressure and having an equalizing port for normally

equalizing the steam pressures upon opposite sides of said head and the smaller head being constantly subject on one side to atmospheric pressure, a valve for controlling an atmospheric vent port from one side of the larger piston head, and movable means operated upon a reduction in pump pressure for opening said vent valve.

3. In a pressure governor for pumps, the combination with a valve mechanism normally subject on one side to steam pressure for controlling the admission of steam to the pump and a regulating valve mechanism subject to variations in the pump pressure for venting steam from said valve mechanism to operate the same, of means adapted upon the unseating of said valve mechanism to expose an increased area thereof to steam pressure to thereby effect a quick opening movement of said valve mechanism.

4. In a pressure governor for pumps, the combination with a valve for controlling the admission of steam to the pump, a piston normally subject on opposite sides to steam pressure for actuating said valve and a regulating device subject to pump pressure for venting steam from one side of said piston, of means operating upon the preliminary opening movement of said piston for exposing an increased area of the opposite side of said piston to steam pressure.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.

Witnesses:

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