

E. L. OTIS.  
Governor for Pumping-Engines.

No. 216,693.

Patented June 17, 1879.

Fig. 1.

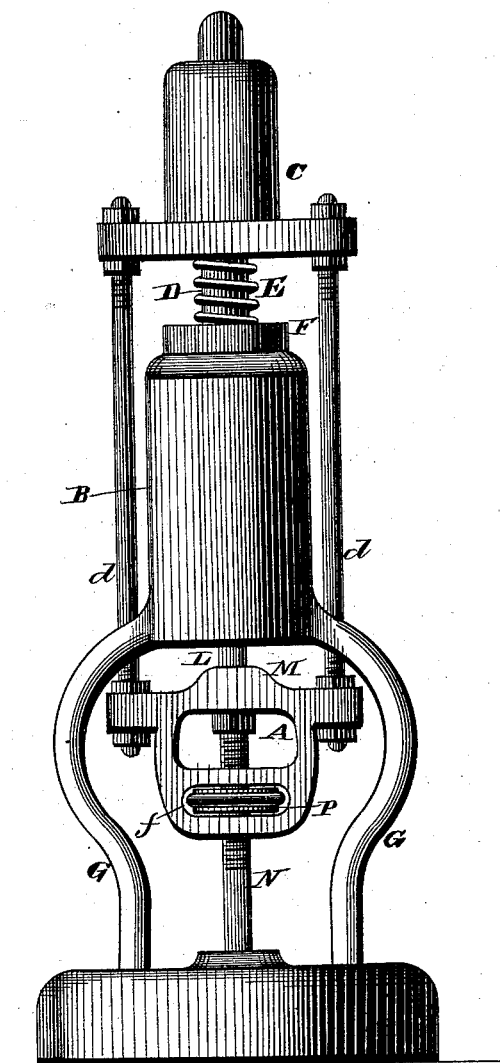
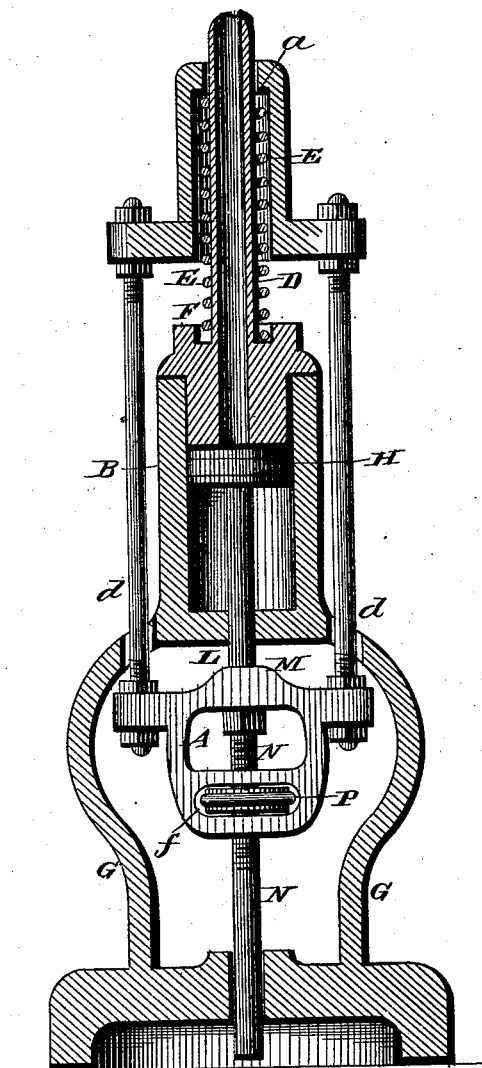


Fig. 2.



WITNESSES  
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# UNITED STATES PATENT OFFICE

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## IMPROVEMENT IN GOVERNORS FOR PUMPING-ENGINES.

Specification forming part of Letters Patent No. **216,693**, dated June 17, 1879; application filed April 29, 1879.

*To all whom it may concern:*

Be it known that I, ELBRIDGE L. OTIS, of Rochelle, in the county of Ogle and State of Illinois, have invented certain new and useful Improvements in Governors for Pumping-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of governors which regulate the action of engines in the operation of force-pumps, and is designed to provide improved mechanism for controlling the pressure of water within the service-main or the eduction end of the engine.

The improvement consists in providing a vertical frame which embraces the upright piston-cylinder of the governor, and connects at its lower cross portion with the rod of the piston which works within said cylinder, and also with the rod of the valve which supplies the engine with steam, said valve-rod having screw-thread engagement with a hand-wheel, which latter works within a horizontal opening formed in said cross portion, whereby the steam-valve stem is raised or lowered and the valve correspondingly opened or closed to admit a greater or less quantity of steam into the driving parts of the pumping-engine. This increase or decrease of driving force in the engine produces a greater or less pressure of water in the service-main or eduction end of the engine. Said pressure is communicated to the water-piston cylinder, where it exerts itself upon the piston, and by the intermediate mechanism maintains the steam-supply valve in a constant open position. In this manner the head of water in the main may be easily and effectively regulated. When a greater head of water is desired the hand-wheel is turned so as to raise the valve-rod and open the steam-supply valve to a greater extent. When it is desired to reduce the head of water the hand-wheel is turned so as to lower the valve-rod, and thereby close the steam-supply valve in a corresponding degree.

In the drawings, Figure 1 is a view in side elevation of the governor, one of the standards being broken away for a better view. Fig. 2 is a vertical central section of the same.

Said views simply represent those parts which constitute the improvement, and their adaptation to suitable connecting mechanism is readily apparent without illustrating any specific construction of the latter.

The vertical frame A, which embraces the upright piston-cylinder B, is provided with the sleeve C on its cross-head, through which the water-pipe D passes, said sleeve being of size sufficient to permit the free operation of the spiral spring E, which fits therein and encircles the pipe. The upper extremity of the spring has end bearing against the inner flange, *a*, formed on the top of said sleeve, and its lower extremity bears against the upper head of the piston-cylinder F.

The standards G are curved or bowed out, so as to permit the uprights *d* of the vertical frame to have free sliding movement in slots formed respectively in said standards, the result being to keep the frame in the same vertical plane and prevent it from moving in a horizontal line. This water-pipe D passes from the service-main or eduction end of the pumping-engine into the top of the cylinder, and thus causes the water-pressure to drive the piston H down within said cylinder. The lower extremity of the piston-rod L is secured within a suitable hole formed in the lower cross portion, M, of the vertical frame. The steam-supply valve-rod N extends up through a suitable hole made in said cross portion M, and is screw-threaded, to have engagement with the hand-wheel P, which latter works within a horizontal opening, *f*, made in said cross portion.

As the hand-wheel is turned on the valve-rod it raises or lowers the latter, so as to open or close the steam-supply valve in a corresponding degree.

The piston-cylinder of the governor may, if desired, be provided with other attachments. Thus, at any point intermediate of the water-main or eduction end of the engine and the piston-cylinder, there may be located mechanism for wire-drawing the water into said cyl-

inder. An air-pressure chamber may be interposed between the same parts; or both the air-chamber and the wire-drawing mechanism may be employed. Such mechanism (one or both thereof) could be substantially such as constitutes in part the subject-matter of Letters Patent numbered 208,489, granted to me on the 1st of October, 1878.

Certain modifications in the specific construction of the parts herein described may be made. Thus rubber or other suitable elastic material may be used instead of the spiral spring. A nut which is operated by a wrench may be used instead of the hand-wheel. The vertical frame may have any number of uprights other than the two shown for connecting its upper and lower cross portions.

It is evident that it is not necessary for the water to enter at the top end of the piston-cylinder; but it may enter at the side in the upper portion of the cylinder.

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

1. The combination of the vertical frame which embraces the upright piston-cylinder and the spring which is located between the upper portions of the two, said frame having its lower cross portion connected with the piston-rod, and also adapted by adjusting mechanism to raise or lower the valve-rod, substantially as set forth.

2. The combination of the vertical frame which embraces the upright cylinder, and whose cross-head is formed with a sleeve, with the water-pipe which passes through the latter and the spiral spring which encircles the

pipe, said spring having end bearing respectively against the upper extremities of said sleeve and piston-cylinder, substantially as set forth.

3. The combination of the vertical frame which embraces the upright cylinder, the spring compressed between the upper extremities of the two, the screw-threaded valve-rod, and the hand-wheel engaging with the latter, said hand-wheel working in a horizontal opening made in the lower cross portion of said vertical frame, substantially as set forth.

4. The combination of the piston-rod connected with the lower cross portion of the vertical frame which embraces the upright cylinder, the valve-rod connected with said cross portion below the piston-rod, and the hand-wheel which has screw-threaded engagement with the valve-rod, substantially as set forth.

5. The combination of the vertical frame which embraces the upright cylinder, the spring compressed between the upper extremities of the two, and the piston-rod whose lower extremity is fastened to the lower cross portion of said frame, said cross portion being formed with the horizontal opening in which the hand-wheel fits, the latter having screw-threaded engagement with the upper extremity of the valve-rod, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of April, 1879.

ELBRIDGE L. OTIS.

Witnesses:

CHARLES H. DAWSON,  
ELIJAH TAYLOR.