N. E. NASH.

STEAM-ENGINE GOVERNOR.

No. 192,273. Patented June 19, 1877.

FIG. I

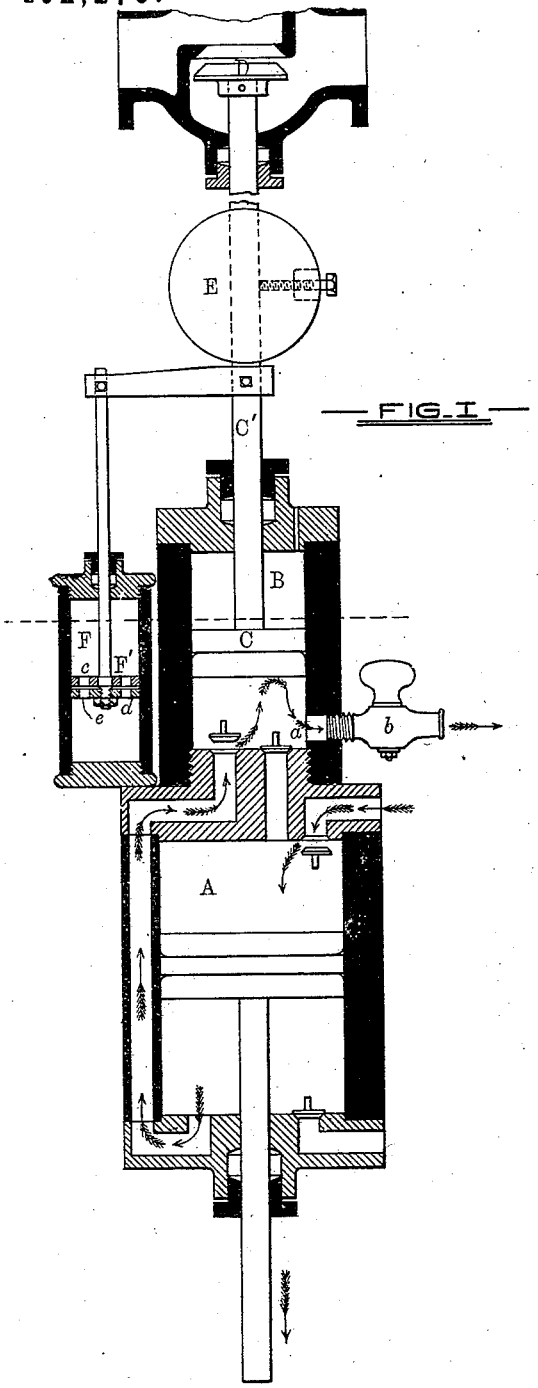
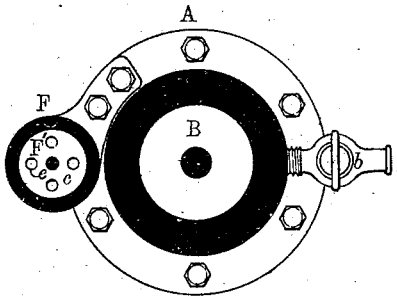


FIG. II



WITNESSES:

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UNITED STATES PATENT OFFICE.

NATHAN E. NASH, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN STEAM-ENGINE GOVERNORS.

Specification forming part of Letters Patent No. **192,273**, dated June 19, 1877; application filed November 20, 1876.

To all whom it may concern:

Be it known that I, NATHAN E. NASH, of Westerly, in the county of Washington and State of Rhode Island, have invented certain new and useful Improvements in Steam-Engine Governors, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

This invention relates to certain improvements in that class of governors in which atmospheric air, compressed within a cylinder by means of an air-pump driven from the engine, is used to elevate a weighted piston and close the governor-valve, to which it is indirectly connected, the opening of the said governor-valve being caused by the depression of the weighted piston as the tension of the compressed air, acting underneath thereof, is reduced by the diminished speed of the engine through the medium of the air-pump aforesaid.

In the further description of my invention which follows, due reference must be had to the accompanying drawing, forming a part of this specification, and in which—

Figure 1 is a vertical section of my improved governor with an air-pump attached, and Fig. 2 a sectional plan of the same.

Similar letters of reference indicate similar parts of the invention in both figures.

A is an air-pump of ordinary construction, secured to the frame or other stationary portion of the engine, and operated from the steam-valve stem or other moving part of the same. B is a cylinder, connected to the air-pump A in such manner as to receive the air discharged from the same at a point below the piston C. The piston-rod C′ extends from the piston C through a suitable packing-box in the upper end of the cylinder A, and is attached, directly or indirectly, to the governor-valve D, the operation of which regulates the flow of steam to the steam-cylinder of the engine. The opening of the governor-valve by its movement in a downward direction is obtained by means of a weight, E, attached to the piston-rod C′, or to some connection thereof, having a corresponding movement derived therefrom. The upward movement of the governor-valve, by which movement it is closed, is caused by the pressure of the compressed air from the air-pump, the air acting upon the under side of the piston C and finding its escape through the aperture *a*, the size of which is regulated by a valve or stop cock, *b*. F is a supplemental or regulating cylinder, having a piston, F′, and a rod extending therefrom to an arm projecting from the piston-rod C′, to which it is fastened. The piston in the cylinder F is in two parts, *c* and *d*, one of which is susceptible of being turned circumferentially independently of the other. This circumferential movement of one part of the piston is for the purpose of opening or closing perforations *e* in the said piston, and thereby establishing or closing the connection between the portions of the cylinder above and below the piston.

Upon the engine being placed in motion, air is forced by means of the air-pump A to the cylinder B, and acts directly upon the under side of the piston C, elevating the weight E and closing the governor-valve. The pressure of air in the cylinder B regulates the vertical position of the piston C and the quantity of steam admitted to the steam-cylinder by means of the governor-valve. Consequently it is only necessary to control this pressure to obtain any desired speed of the engine. To acquire this control over the air pressure, I provide the discharge-aperture *a* with the valve *b*, before alluded to, which is accessible to the engineer, and is graduated to indicate the areas of opening necessary to give different numbers of revolution of the engine. The supplemental cylinder F, before alluded to, is filled with oil, water, or other liquid, and is for the purpose of preventing an objectionable sensitiveness of the piston C and its connections, the said liquid offering a resistance to displacement or change of position through the medium of the piston F′, in proportion to the area of communicating openings in the same.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

1. As a pneumatic engine-governor, an air-pump and communicating air-cylinder, com-

bined with a supplemental cylinder, the piston of which has a movement common with that of the air-cylinder piston, and operates in a fluid for preventing the too sensitive action of the governor-valve, substantially as herein set forth.

2. In a steam-engine governor, the cylinder B, piston C, and piston-rod C′, in combination with the supplemental or regulating cylinder F, the said cylinder F being provided with a piston having perforations therein, the effective sizes of which are variable, the said piston being operated through the medium of suitable mechanism from the piston-rod C′, substantially as and for the purpose specified.

In testimony whereof I have hereunto subscribed my name this 7th day of October, in the year of our Lord 1876.

NATHAN E. NASH.

Witnesses:

EUGENE B. PENDLETON,

A. B. COLLINS.