F. W. ROBINSON.

Steam-Engine Governor.

No. 220,660. Patented Oct. 14, 1879.

Fig. 1

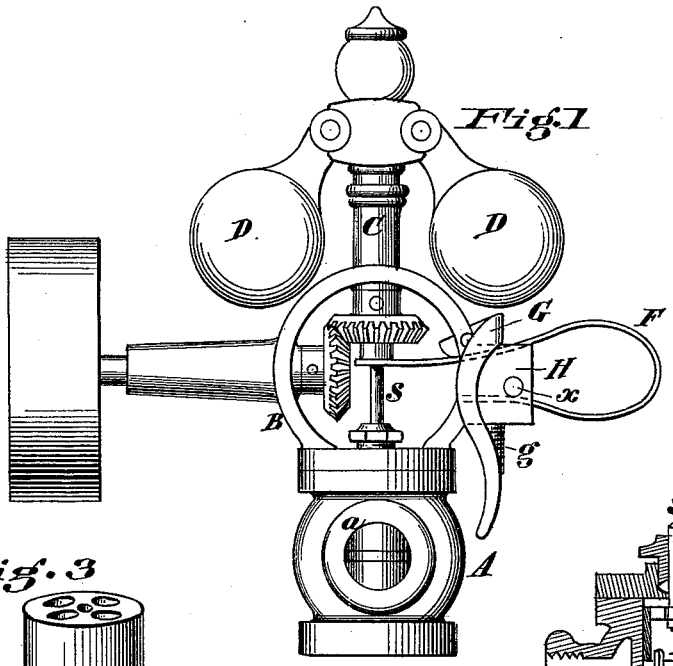


Fig. 2

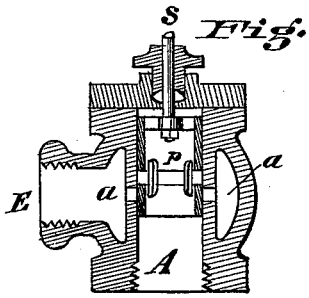


Fig. 3

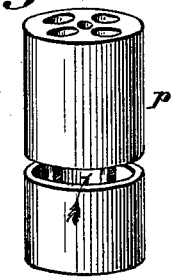
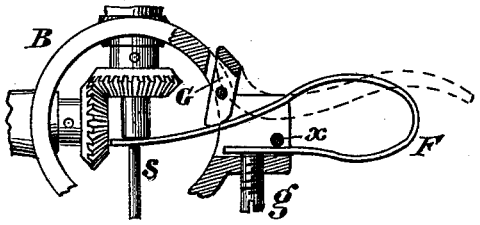


Fig. 4



Attest

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UNITED STATES PATENT OFFICE.

FRANCIS W. ROBINSON, OF RICHMOND, INDIANA.

IMPROVEMENT IN STEAM-ENGINE GOVERNORS.

Specification forming part of Letters Patent No. **220,660**, dated October 14, 1879; application filed May 7, 1879.

To all whom it may concern:

Be it known that I, FRANCIS W. ROBINSON, of Richmond, Wayne county, Indiana, have invented a new and useful Improvement in Steam-Governors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and the letters of reference marked thereon.

This invention relates to certain improvements in that class of steam-engine governors provided with a piston-valve and valve-chamber, which regulates the flow of steam by means of the usual ball device.

My improvement consists in the combination, with the valve-chamber, piston-valve, and valve-stem connected with the regulating-balls of a steam-engine governor, of a curved flat spring attached at one end to the gear-supporting frame, and connected at its other or free vibrating end with the valve-stem, and a dog pivoted within a recess in said gear-supporting frame directly above the free end of the flat spring, and provided with a projecting handle, the construction and operation of which will be fully hereinafter described.

In the drawings, Figure 1 represents a side elevation of my improved governor complete; Fig. 2, a side section of the valve-chamber and valve in position; Fig. 3, a perspective view of the piston-valve; and Fig. 4, a side elevation, showing the spring in its depressed condition as held by the dog.

A is the valve-chamber; B, the gear-supporting frame; C, the hollow standard, and D D the swinging balls of the governor. The parts, excepting the valve-chamber, are constructed in the usual manner, the balls being so mounted and arranged that when they are thrown outward by centrifugal force in their rotation the inner extremities of their arms impinge upon and depress the stem S, which is connected with the regulating-valve.

The valve-chamber A is cylindrical interiorly and bored for the vertical play of a snugly-fitting hollow piston, *p*. (Shown in Fig. 3.) The interior periphery of the valve-chamber is cut by a circumferential slot opening into the lateral chamber *a*, cast around the valve-chamber A, and leading to the side steam pipe, E. The piston *p* is similarly provided with a circumferential slot opening through its shell into the hollow interior.

When the parts are in position together these slots or openings, which are of an area equal to that of the delivery-pipe openings, register so that a current of steam entering the lower end of the valve-chamber passes through the hollow valve and through the circumferential openings into the chamber *a* and the opening E, or may pass in the reverse direction, as may be arranged. As the valve *p* is moved upward or downward the relative aperture will be decreased to any point or closed entirely, as will be readily seen.

The valve *p* is operated by a stem, S, secured thereto, and extending upward through an ordinary stuffing-box upon the valve-chamber A and through the hollow standard C, and connected with the arms of the governor-balls D in the usual manner. The gear-supporting frame B is cast with projections H upon one side, between which a spring, F, is secured by means of a pin, *x*, and a set-screw, *g*, as fully shown in Figs. 1 and 4. The spring curves over upon itself, and, passing within the frame B, embraces the stem S, which it therefore tends to sustain against the tendency of the swinging balls when rotating to depress it. The tension of the spring is regulated by the set-screw *g*, but is ordinarily only of sufficient force to take up any lost motion between the head of the stem and the swinging arms in order to insure an accurate regulating movement.

A dog, G, with a projecting handle is also pivoted in the frame B above the spring, and so arranged that when its handle is drawn out the spring is depressed, and by consequence the stem S and the valve stand fully open. The friction between the head of the dog and the spring holds the parts in this position for the time being, and the steam flows freely into the engine; but as soon as the balls acquire some velocity in rotation they depress the stem, and by consequence the spring, when the dog falls down by the weight of its handle and allows the spring to vibrate freely.

It is intended to use the dog only in starting the engine, in order that a free passage may be opened for the steam into the engine;

but that as soon as the motion of the engine is established the dog will drop automatically out of gear and allow the governor to act normally.

I am aware that in steam-engine governors a pivoted lever has been connected at one end with the valve-stem of a piston-valve, the other end being acted on by a coiled spring contained in a cylindrical case, said lever being held and automatically released by a weighted pawl; and I am also aware that a pivoted lever has been connected at one end with the valve-stem of a piston-valve and weighted at its outer end, being held and automatically released by a weighted pawl pivoted beneath the weighted end of the lever, and such I hereby disclaim; but,

Having fully described my invention, I claim—

In a steam-engine governor, the combination, with the valve-chamber, piston-valve, and valve-stem connected with the ball-governor, of the curved flat spring F, attached at one end to the supporting-frame B, and connected at its other or free end with the valve-stem, and the dog G, pivoted within a recess in the supporting-frame directly above the free end of the flat spring and provided with a projecting handle, all constructed and arranged substantially as shown and described.

In testimony whereof I have hereunto set my hand this 22d day of April, 1878.

F. W. ROBINSON.

Witnesses:
L. M. HOSEA,
EDGAR J. GROSS.