J. W. Hayes,

Governor.

No. 80,173. Patented July 21, 1868.

Fig 1.

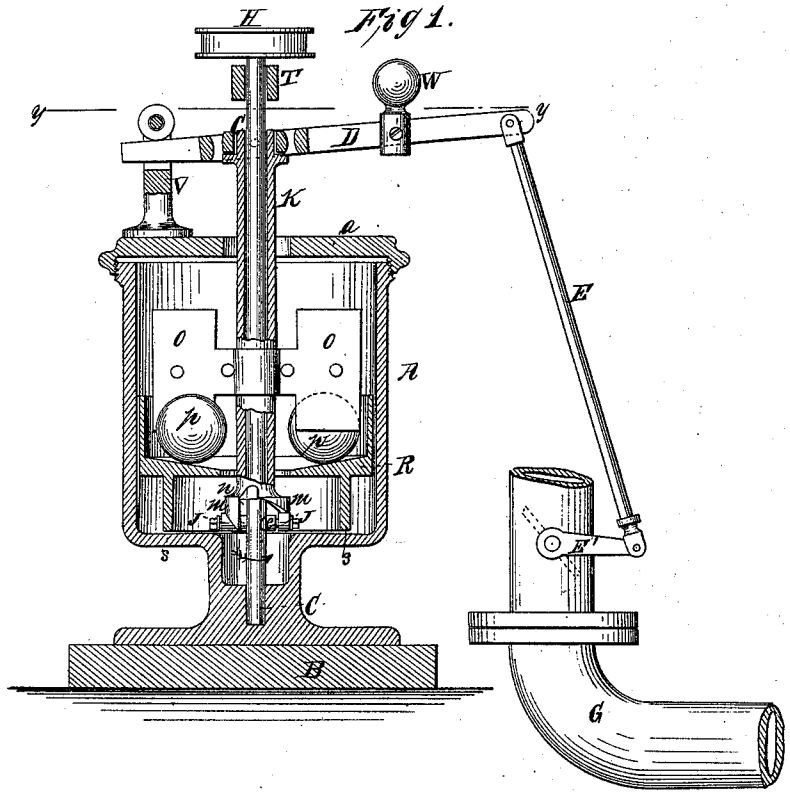
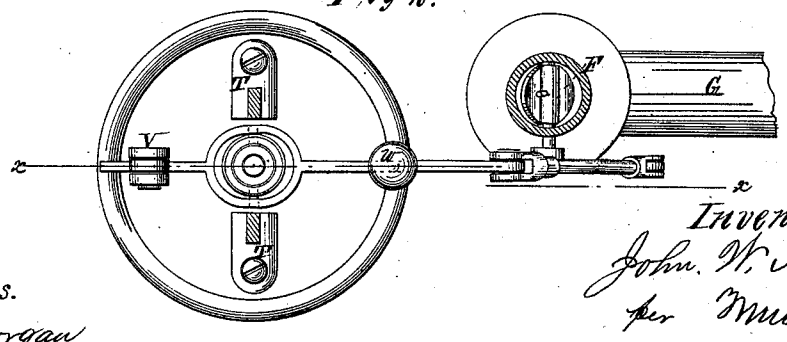


Fig 2.



Witnesses.
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JOHN W. HAYES, OF KITTERY, MAINE, ASSIGNOR TO HIMSELF AND JACOB G. CROCKETT, OF PORTSMOUTH, NEW HAMPSHIRE.

Letters Patent No. 80,173, *dated July* 21, 1868.

IMPROVEMENT IN GOVERNORS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN W. HAYES, of Kittery, in the county of York, and State of Maine, have invented a new and useful Improvement in Governors; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to improvements in governors for regulating the motion of steam-engines, and for other purposes.

And it consists in operating the throttle-valve by means of a sleeve on the governor-spindle, the sleeve having inclined planes and wings, and being free to revolve with the spindle within a cylindrical cup, as hereinafter described.

Figure 1 represents a sectional elevation of the governor and its attachment to the throttle-valve, the section being through the line *x x* of fig. 2.

Figure 2 is a sectional horizontal view from the line *y y* of fig. 1.

Similar letters of reference indicate corresponding parts.

A is the cylindrical cup, which is firmly attached to the plate or bed B, and which supports the operative parts of the governor.

C is the governor-spindle,

D is the governor-lever, and

E is the rod by which motion is imparted to the throttle-valve F, as seen in the drawing.

G is the steam-pipe.

The spindle C is revolved by a belt on the pulley H, or it may be revolved by gearing, if more convenient or desirable.

Near the lower end of the spindle there is a transverse bar, *i*, with friction-rolls J upon its ends. This bar is attached to and revolves with the spindle C.

K is a sleeve on the spindle, the vertical motion of which operates the lever D, and imparts motion to the throttle-valve through the rod E and short lever E′.

This vertical motion is produced by two circular inclined planes, *m m*, on the bottom of the sleeve.

As the spindle is revolved in the direction of the arrow, the tendency of the friction-rolls J is to raise the sleeve vertically a distance equal to the line *n*, which is the measure of its variation.

The tendency of the revolving arm *i*, and the contact of the rolls J, is to not only raise the sleeve or allow it to descend according to the velocity of the motion, but to revolve it; and for the purpose of counteracting, to some extent, and regulating this rotating motion, I provide the sleeve with wings *o o* and balls *p p*, which balls rest upon the inclined bottom of the interior cylinder R.

This cylinder slips loosely into the main cylinder A, upon the bottom of which it rests, as seen at *s*.

When in a state of rest, the balls *p* will naturally roll down on the inclined bottom of R until they come in contact with the sleeve.

When motion is imparted to them by the revolution of the wings, the centrifugal force will throw them up from the sleeve, thereby operating with greater power to retard the rotating motion of the sleeve.

When the engine is running at the required speed, the balls would occupy the position seen in the drawing, and the friction-rolls would be in contact with the middle of the inclined planes.

When in this position, any variation in the speed of the engine must either raise or lower the sleeve which imparts motion to the throttle-valve, either opening or closing it, as before stated.

The cylinder A may contain more or less oil for the reduction of friction.

The upper end of the spindle is supported by a yoke, T, which rests on and is attached to the head of the cylinder A, marked *u*.

V is a stand which forms a fulcrum for the lever D.

W is an adjustable weight on the lever D.

I claim as new, and desire to secure by Letters Patent—

1. In combination with a governor-spindle, the sleeve K, when constructed with the inclined planes *m m* and wings *o o*, substantially as described.

2. The interior cylinder R, with its inclined bottom and the balls *p p*, arranged substantially as described, in combination with the sleeve K.

3. The transverse bar *i* on the spindle C, in combination with the inclined planes *m m*, substantially as and for the purposes set forth.

JOHN W. HAYES.

Witnesses:

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