(No Model.) 3 Sheets—Sheet 1.

R. E. OLDS.

GOVERNOR FOR STEAM ENGINES.

No. 456,837. Patented July 28, 1891.

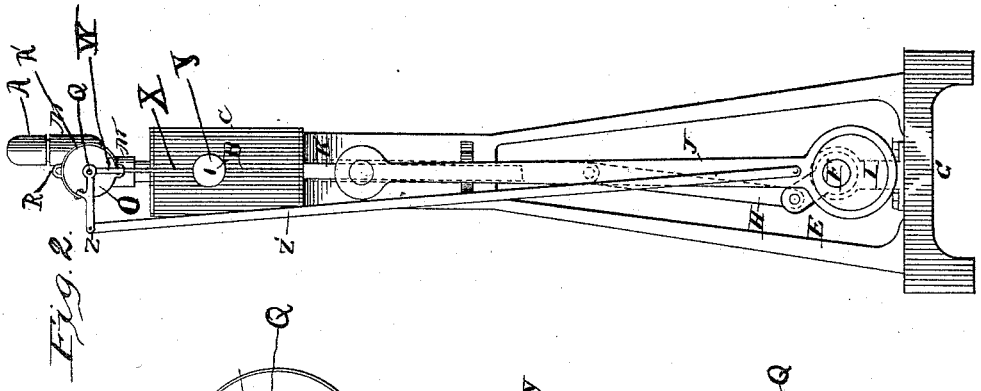
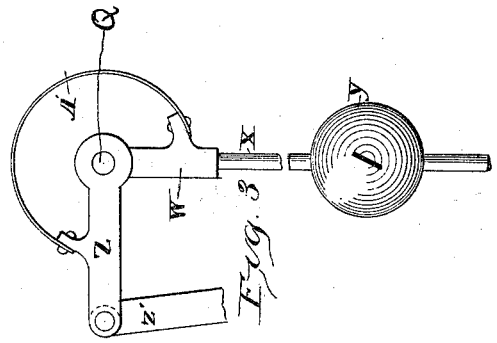


Fig. 2.



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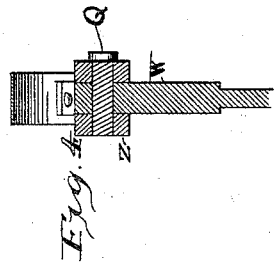

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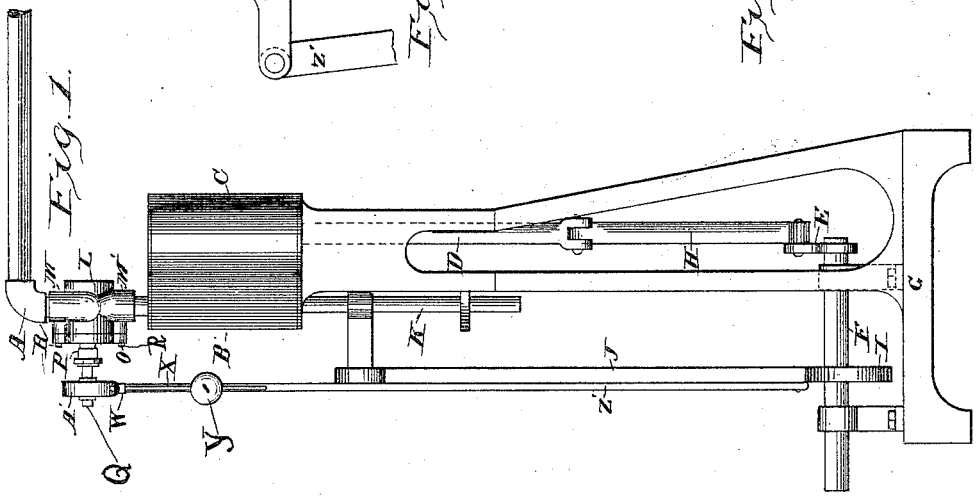

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

R. E. OLDS.

GOVERNOR FOR STEAM ENGINES.

No. 456,837. Patented July 28, 1891.

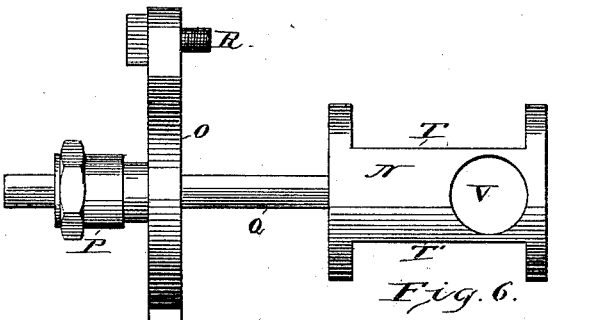

Fig. 6.

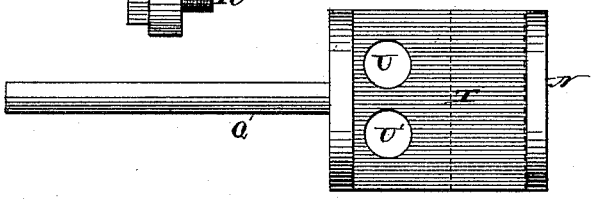

Fig. 7.

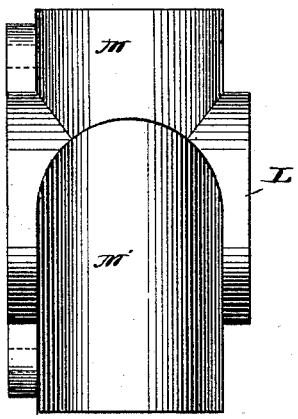

Fig. 5.

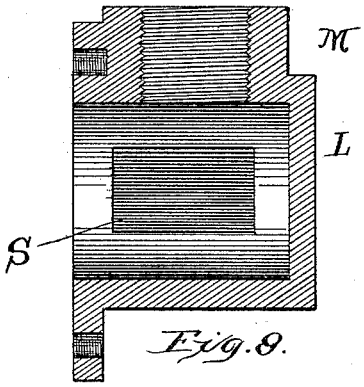

Fig. 8.

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GOVERNOR FOR STEAM ENGINES.

No. 456,837. Patented July 28, 1891.

Fig. 9.

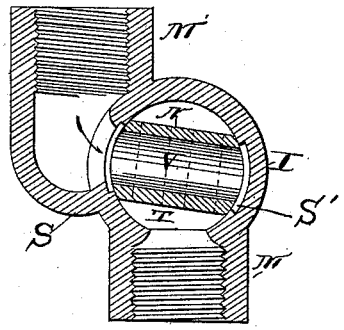


Fig. 10

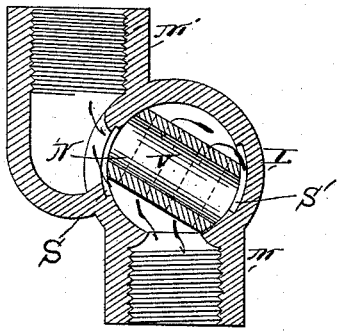
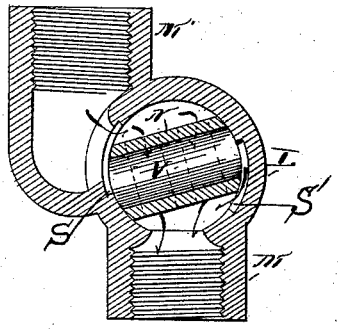


Fig. 11.



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UNITED STATES PATENT OFFICE.

RANSOM E. OLDS, OF LANSING, MICHIGAN.

GOVERNOR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 456,837, dated July 28, 1891.

Application filed March 22, 1890. Serial No. 344,966. (No model.)

To all whom it may concern:

Be it known that I, RANSOM E. OLDS, of the city of Lansing, county of Ingham, and State of Michigan, have invented certain new and useful Improvements in Governors for Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to provide a simple and efficient device for controlling the speed of a steam-engine by regulating the amount of steam supplied to the piston; and it consists in the forms and arrangements of the parts, which I will hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side elevation of a steam-engine with my governor attached; Fig. 2, a front elevation of the same. Fig. 3 is a view of the governor detached; Fig. 4, a central vertical section of Fig. 3. Fig. 5 is a side elevation of the valve-casting. Fig. 6 is a similar view of the valve and head; Fig. 7, a top view of the valve; Fig. 8, a central vertical section of the valve-casting. Figs. 9, 10, and 11 illustrate different relative positions of the valve and its seat.

Referring to the letters on the drawings, A indicates a supply-pipe adapted to communicate with a boiler, which may be of any ordinary and well-known pattern, and which is for that reason not illustrated in the drawings.

B indicates a steam-chest of any ordinary kind, and C the steam-cylinder, to and from which the piston-rod D reciprocates.

E indicates a crank secured to the shaft F, journaled upon the base of the frame G in suitable bearings and connected by means of the link H to the piston-rod. Upon the shaft F is secured the cam I, which communicates, by means of the rod J, reciprocating motion to the rod K. This rod operates the slide-valve between the steam-chest and cylinder. This valve and the cylinder and steam-chest being of ordinary construction, and because they constitute no part of my invention, are not illustrated in detail.

Coming now to what constitutes my invention, L indicates a valve-casting located between the supply-pipe and the steam-chest and establishing communication between the two.

M M′ indicate internally-screw-threaded tubular projections integral with the valve-casting, whereby it is secured to the supply-pipe and the steam-chest. The interior of the casting is made cylindrical in form and adapted to receive a closely-fitting valve N. The casting is permanently closed at one end and is provided at the other end with a collar O, which carries the gland P, through which the stem Q of the valve passes. The collar O is adapted to be secured to the casting by means of bolts R.

The casting is provided with two ports S S′, one being formed across the mouth of the projection M′ and the other being located in the opposite side of the casting. These ports are substantially oblong recesses in the interior surface of the casting. The valve N is cylindrical in form, but provided, as shown in Fig. 6, with recesses T T′ on opposite sides. Through the fore part of the valve connecting the recesses T T′ are bored two holes U U′, and through the opposite end at right angles to these holes is located a single larger hole V. When the valve is inserted in the casting and the recesses T T′ set opposite the ports, the ports will be closed and the passage of steam prevented; but steam will be admitted into the hole V, and entering the ports S S′ will serve as a balance to the valve.

W indicates a pendent arm, which is secured at its upper end to the valve-stem, and carries upon its opposite end the pendulum-rod X, to which is secured an adjustable ball Y.

Z indicates a bifurcated rod pivoted at the split end to the valve-stem around the arm W and at the other to the pitman Z′, which is pivotally united to the rod J.

A′ indicates a flat spring secured at one end to the arm W and at the other to the rod Z. The arm W is secured to the valve-stem when the valve is in the closed position, so that when the pendulum hangs stationary no steam is admitted to the engine. A movement in one direction of the valve will permit a certain amount of steam to pass through one of the recesses of the valve into the steam-chest, and a movement in the opposite direc-

tion will allow a certain amount of steam to pass through the valve by way of the holes U U′, so that if the valve be turned backward and forward alternately steam will be alternately admitted in certain determinate quantities to the steam-cylinder and alternately excluded therefrom. It will be readily understood from this statement that the rate of speed of the engine may be increased or diminished by the operation of the valve. If it is moved backward and forward rapidly the rate of speed will be increased, and if slowly the rate of speed will be diminished. I secure the oscillation of the valve by the vibration of the pendulum secured to the valve-stem and time the swing of the pendulum, as usual, by means of the adjustable ball borne thereon. In order that the valve may move in unison with the working parts of the engine, so that steam may be admitted at the proper time, I yieldingly connect the pendulum to the rod J, so that the reciprocation of that rod produces a simultaneous reciprocation of the pitman and a corresponding vibration of the pendulum. The vibration of the pendulum might be produced by securing it to some other reciprocating part than the rod J, and I do not desire to be limited to the construction shown in this particular. The spring between the pendulum and the pitman contributes ease of movement and delicacy of play to the parts, which are necessary to the practical performance of their functions.

The operation of my machine is as follows: Suppose the pendulum to be in the vertical position and the steam shut off. Then by imparting a slight motion to the shaft of the engine or to the pendulum, as preferred, steam will be admitted through the valve into the steam-chest and the engine set in motion. When the engine begins to move, the rod J causes the pendulum to vibrate and the valve connected therewith to oscillate. Thereupon the steam will all be admitted to and shut off from the steam-cylinder alternately in the manner described, and so control the speed of the engine. By lowering or raising the ball upon the pendulum-rod the rate of speed may be diminished or increased, as above suggested.

What I claim is—

1. A steam-engine governor consisting of the combination, with the supply-pipe of the engine, the stem of a rotary valve located therein, and a pendulum secured to the stem, of an arm pivotally secured upon the stem, a flat semicircular spring connecting the pendulum with said arm, and means of communicating reciprocatory motion from the engine to the arm, substantially as and for the purpose set forth.

2. A valve-casting consisting of a hollow cylindrical portion adapted to receive a closely-fitting valve within it and closed at one end, hollow projections M M′, and ports S S′, consisting of recesses sunk into the inner walls of the cylindrical portion and located substantially as described.

3. A valve consisting of a cylinder provided with recesses upon opposite sides, substantially as described, and holes U, U′, and V, at right angles to each other, passing through the cylinder, substantially as set forth.

4. The combination, with the valve-casting provided with hollow projections M M′, communicating with the interior thereof, and ports S S′, of the cylindrical valve provided with recesses T T′, holes U, U′, and V, located substantially as described, the valve-stem, and collar around the valve-stem, adapted to be secured to the valve-casting, substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

RANSOM E. OLDS.

Witnesses:
JAMES A. PARK,
DEAN PARK.