

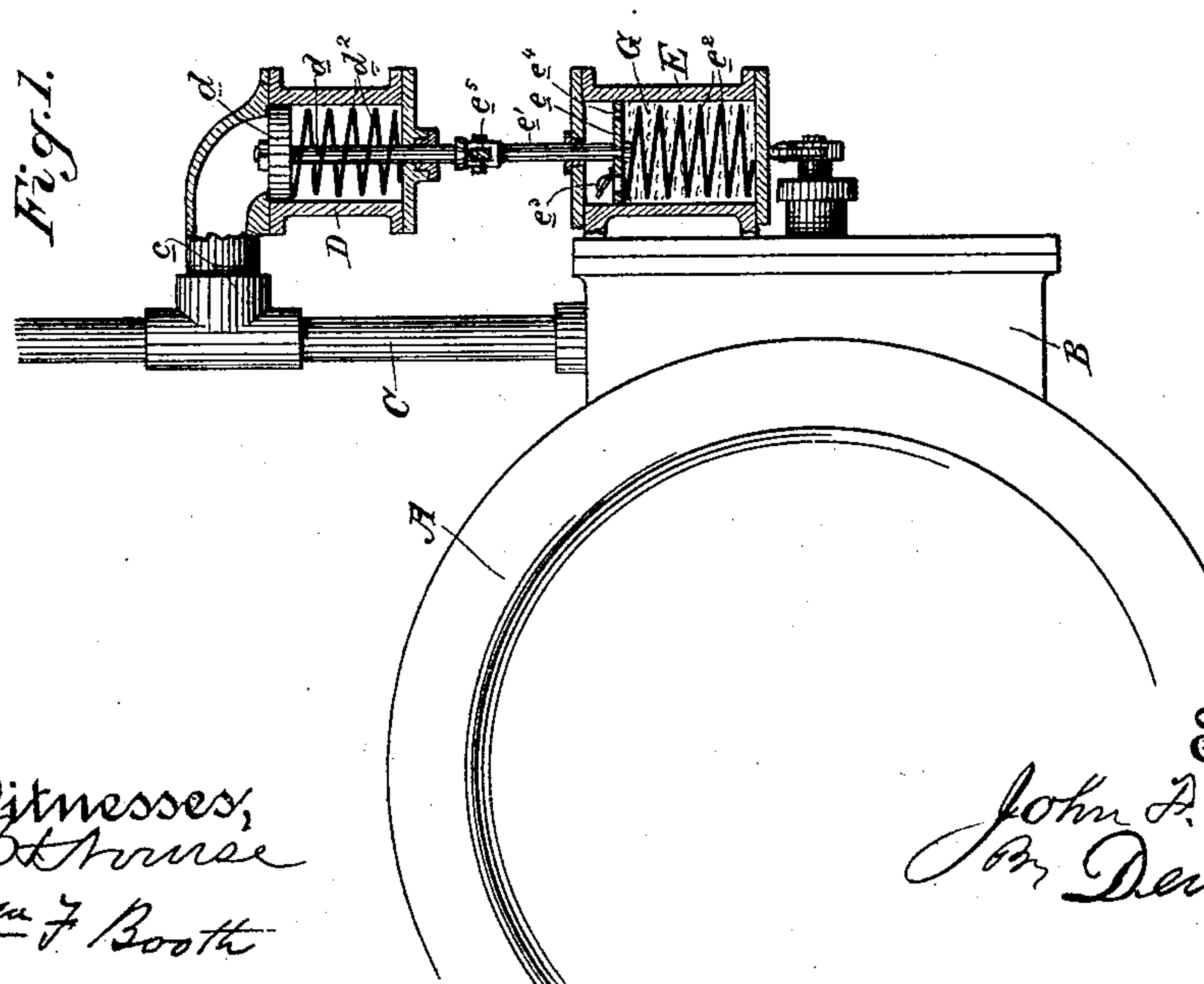
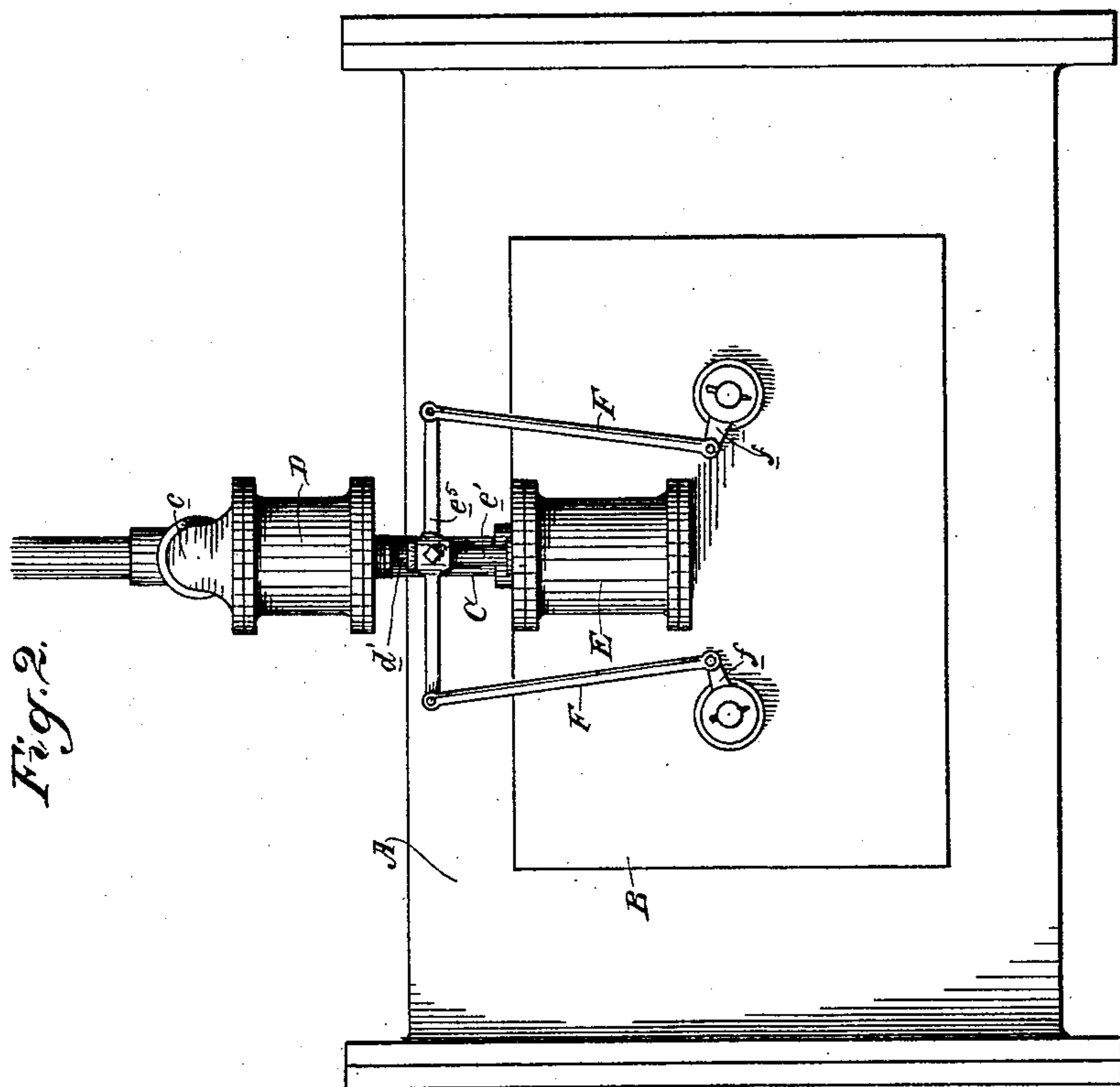
(No Model.)

2 Sheets—Sheet 1.

J. F. KIRBY.
GOVERNOR.

No. 454,218.

Patented June 16, 1891.



Witnesses,
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UNITED STATES PATENT OFFICE.

JOHN F. KIRBY, OF SAN FRANCISCO, CALIFORNIA.

GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 454,218, dated June 16, 1891.

Application filed December 10, 1890. Serial No. 374,216. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. KIRBY, a citizen of Canada, residing in the city and county of San Francisco, State of California, have invented an Improvement in Governors; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of governors adapted to regulate the valves of the engine according to and by means of steam-pressure.

It consists in the novel construction and arrangement of parts hereinafter fully described, and specifically pointed out in the claims.

The object of my invention is to provide a simple and effective means of governing the engine according to the steam-pressure.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical section of my governor. Fig. 2 is an elevation of same. Fig. 3 is an elevation showing the connection of the generator with the valves.

A represents the cylinder of an engine, and B the steam-chest, in which the valves are located.

C represents a steam-pipe which supplies the steam-chest.

D is a cylinder in which a piston d is mounted, the rod d' of which extends through and projects beyond the cylinder. Under this piston within the cylinder is a spring d^2 , which serves to normally hold the piston up. The upper end of the cylinder D communicates with the steam-pipe C in any suitable manner, as by the connection c .

E is a second cylinder, having within it a piston e , the rod e' of which projects from the cylinder and has its end adapted to come in contact though not connected with the end of the piston-rod d' , and the ends of both piston-rods may be enlarged to insure perfect contact. Within the cylinder E, under the piston e , is a spring e^2 , which serves to hold the piston up. In the piston e is made an upwardly-swinging valve e^3 , and through said piston is also made a very small aperture e^4 . The piston-rod e' is connected in any suitable manner with the valves in the steam-chest.

I do not confine myself to any particular

connection between the rod e and the valves, but the following will answer for such connection. The valve G is the common rotary form, by the oscillation of which the inlet-passage is controlled. This valve carries a rocker-arm g , to the lower arm of which is connected the clutch-bracket H, in a groove or way in the top of which is seated a slide-bar I, connected with the rocker-wheel J, which is connected, as usual, with the eccentric of the engine. The slide-bar I is normally connected with and operates the bracket to actuate the rocker-arm and rock the valve by means of a clutch-bar K, carried by the bracket. The upper end of this bar bears frictionally against the slide-bar, while its lower end is seated in a slot or groove in the lower end of the bracket. A spring k bears on and returns the clutch-bar. The lower end of the clutch-bar is locked in one end of the slot and held to operative position by a block L, pivoted in one end of the slot or groove and bearing with its other end against the lower end of the clutch-bar. The side of the block projects to one side, and against this projection the lower end of a rod F, pivoted at its upper end to a cross head or piece e^5 on the piston-rod e' , is adapted to bear. This rod F is bent at f' , and to its bend is pivoted an arm f , mounted loosely on the valve.

M is fixed pin to throw the block L back to place.

N is the dash-pot connection with the rocker-arm g of the valve, and O is the dash-pot.

The operation of these parts is essentially similar to the cut-off of many engines. The rocking of the valve takes place normally through the connection of the slide-bar I with the bracket H; but when the piston-rod e' is moved down the rod F is moved down, and by reason of its connection with the arm f its lower end is moved over sidewise into contact with the block L, and thereby throws said block out from behind the clutch-bar K, thus tripping the bar, which being relieved no longer binds on the slide-bar I, which is thus disconnected from the bracket. Thereupon the dash-pot connection acts to throw the rocker-arm and close the valve, and the

bracket being swung over its block L comes in contact with the fixed pin M, and is thereby returned so once more lock the clutch-bar.

I do not confine myself to the location of
 5 the two cylinders D and E here shown, nor to their connection with the steam-pipe and valve-chest, as these parts may be located in any suitable position and suitably with relation to each other, the only requirements being
 10 that the upper cylinder D shall communicate with the steam-pipe and the piston-rod of the lower cylinder shall be connected with the valves, the piston-rods of the two cylinders being adapted to come in contact
 15 with each other. The lower cylinder E is to be filled with some liquid—as, for example, oil, (represented by G,) though water or other liquid might be used.

The operation of the governor is as follows:
 20 The spring d^2 in the cylinder D holds the piston d and its rod d' up normally to their highest position, and the spring e^2 in the cylinder E likewise holds the piston e and rod e' to their highest position, and in this position
 25 the adjacent ends of the two rods are close together. Now when the steam-pressure in the boiler increases it forces down the piston d , and the rod d' of said piston, coming in contact with the rod e' of the piston e , forces
 30 said piston down, the valve e^3 opening and allowing the liquid to pass up through the piston to the space above it. This movement of the piston-rod e' effects the movement of the valves, as heretofore described.
 35 As the pressure in the boiler decreases, the upper rod d' will rise again by the power of the spring d^2 . Now if the lower piston and rod were allowed to rise correspondingly by the power of spring e^2 , so that the ends of the
 40 two rods would lie and follow in contact, it is obvious that the lower piston-rod, and consequently the valves with which it is connected, would be subject to the jerks and unequal movements of the upper piston and rod on
 45 each stroke of the engine, due to the sudden and temporary relief of pressure in the steam-pipe when the valves admitted steam to the

cylinder; but by reason of the liquid in the lower cylinder, which cannot return from above the piston e , except through the small
 50 aperture e^1 , said piston moves upwardly very slowly, and is thus controlled by the liquid, which has the effect of keeping the valves steady and regulating them slowly and free from any sudden movement of the upper
 55 piston.

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

1. A governor for engines, consisting of a
 60 cylinder communicating with the steam-pipe and having within it a spring-controlled piston and a piston-rod projecting from it, a second cylinder with piston and rod, said rod being adapted to come in contact with the
 65 piston-rod of the first cylinder, whereby the piston-rod of said second cylinder is moved, a connection between said last-named piston-rod and the engine-valves, and a means for effecting and controlling the return of the
 70 piston-rod of the second cylinder independent of the movement of the first piston-rod, substantially as herein described.

2. A governor for engines, consisting of the cylinder having a communication with the
 75 steam-pipe, a spring-controlled piston and a piston-rod, the second cylinder having a piston and piston-rod adapted to come in contact with the piston-rod of the first cylinder, whereby it is moved, a connection between
 80 the piston-rod of the second cylinder and the engine-valves, a spring for returning the piston of the second cylinder, and the valve and aperture in said piston, and liquid in said
 85 second cylinder for controlling the return of the piston therein, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN F. KIRBY.

Witnesses:

S. H. NOURSE,
 WM. F. BOOTH.