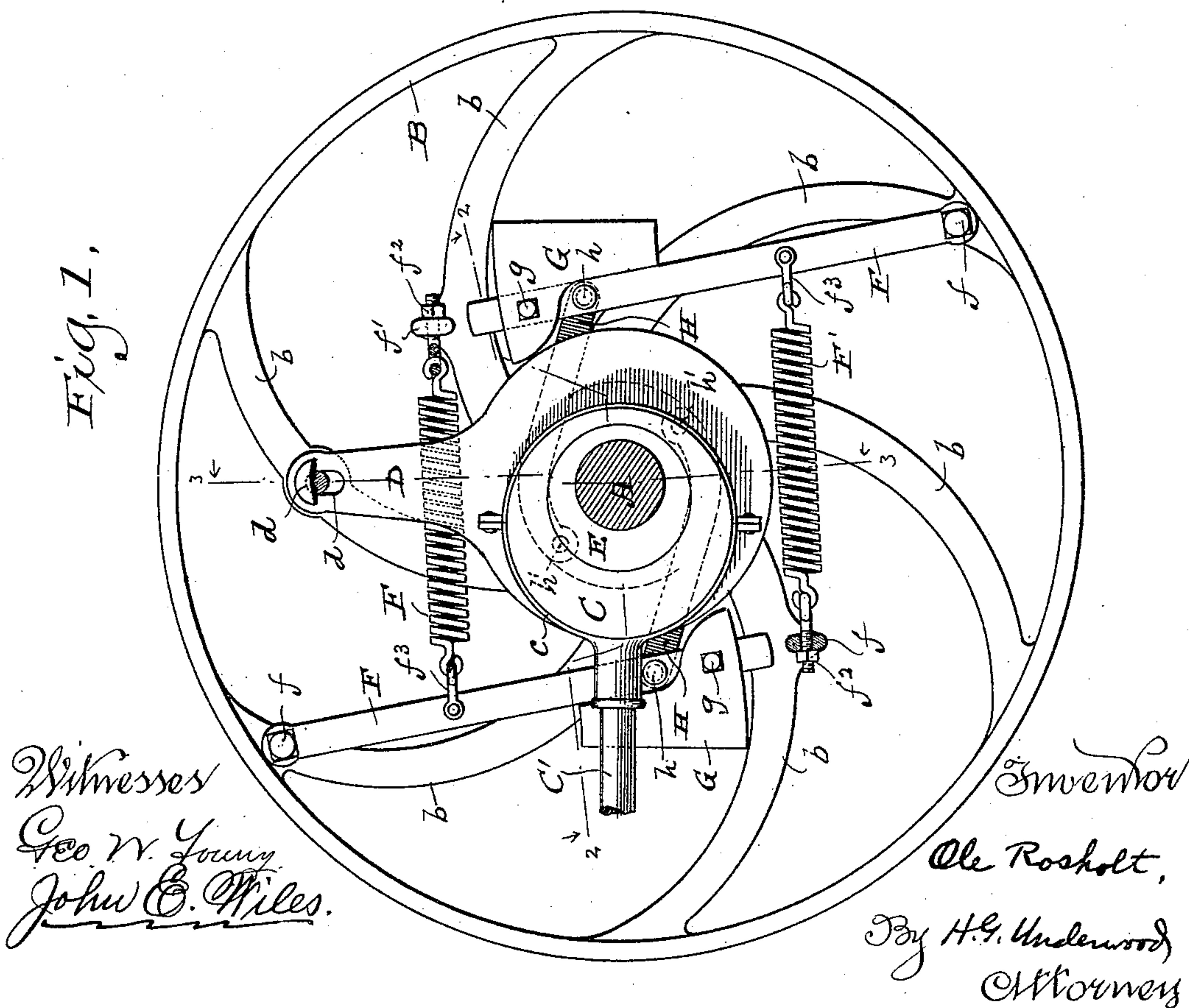
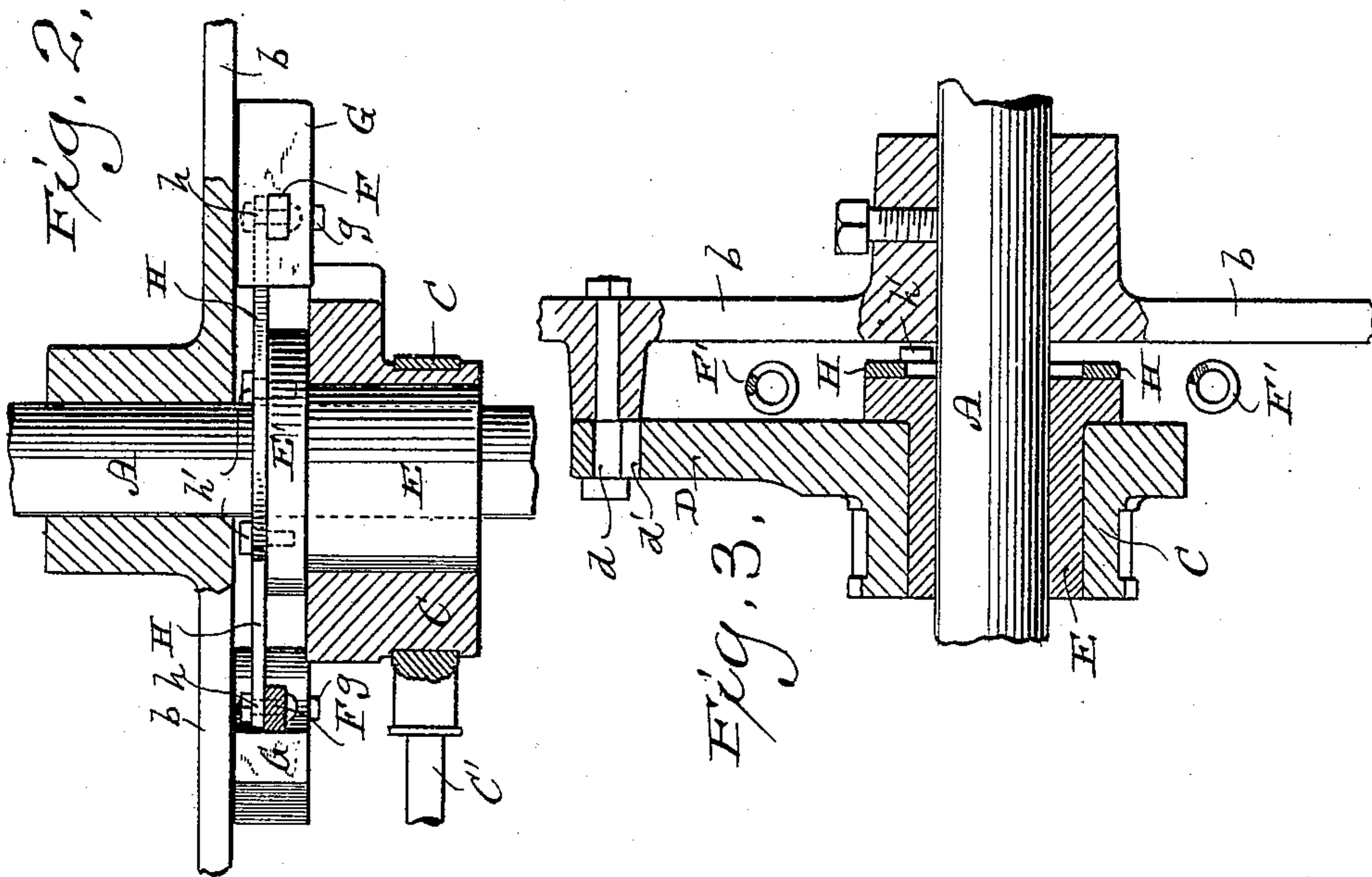


(No Model.)

O. ROSHOLT.
STEAM ENGINE GOVERNOR.

No. 466,106.

Patented Dec. 29, 1891.



UNITED STATES PATENT OFFICE.

OLE ROSHOLT, OF OCONOMOWOC, WISCONSIN.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 466,106, dated December 29, 1891.

Application filed May 4, 1891. Serial No. 391,536. (No model.)

To all whom it may concern:

Be it known that I, OLE ROSHOLT, a citizen of the United States, and a resident of Oconomowoc, in the county of Waukesha, and in the State of Wisconsin, have invented certain new and useful Improvements in Steam-Engine Governors; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to certain new and useful improvements in steam-engine governors, and relates more particularly to that class of governors which are applied to the fly-wheel of the engine, or to the eccentric which governs the operation of the slide-valve.

The various features of my invention will be fully described in the following specifications, and more fully pointed out in the appended claim.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of an engine fly-wheel with my improved form of governor applied thereto. Fig. 2 is a sectional view of the same, taken on line 2 2 of Fig. 1. Fig. 3 is a sectional view on line 3 3 of Fig. 1.

In said drawings, A indicates the crank-shaft of an engine; B, the fly-wheel carried thereby, and C the eccentric by means of which the slide-valve of the engine is operated. The valve-rod C' is connected with said eccentric by means of the usual eccentric-strap c, which engages a peripheral groove in the eccentric C. The eccentric C is pivotally connected with the fly-wheel in any convenient manner—for instance, as shown in the drawings, in which an arm D is provided upon one side of said eccentric and pivoted at its end to one of the spokes of the fly-wheel, as at d, the end of said arm being preferably slotted, as shown at d', so as to permit of a slight longitudinal movement of said arm with the movement of the eccentric. A circular aperture is provided in the eccentric C, within which aperture a second eccentric E is fitted, said latter eccentric being loosely mounted upon the shaft A.

Governor-arms F F are provided, as shown in Fig. 1 of the drawings, said arms being pivoted to the wheel in any convenient manner, as at f f. Weights G G are provided upon the free ends of the arms F F, and are ad-

justably secured upon said arms by means of set-screws or nuts g g.

Springs F' F' are connected at one end with ears f' f' in any suitable manner—as, for instance, by means of eyebolts f² f², which are passed through said ears and secured in position by nuts. The other ends of said springs are secured to the arms F between the weights and the pivotal connections between said arms and the wheel by means of clips f³ f³. Any desired tension may be given to the springs F' F' by adjusting the nuts upon the ends of the eyebolts f² f², so as to relieve or expand said springs so as to afford any desired resistance to the centrifugal action of the weights G G.

The arms F F are connected with a disk E', located at the rear of the eccentric E and preferably made integral therewith, said connections between said arms and said disk being made in any suitable manner—as, for instance, by means of links H H, which are pivoted to the arms F F at h h, and at their other ends pivoted to the disk E', as at h' h'. These connections are so arranged that any outward motion of the arms F F will operate to rotate the disk E' and the eccentric E in an obvious manner.

The connections between the several operating parts and the wheel may be made in any desired manner; but I prefer to connect said parts with the spokes b b of the wheel, as shown in the drawings, as all that is necessary in order to make such connections is that suitable ears be provided upon the spokes and suitable holes bored at proper points in said spokes to receive the pivots for the governor-arms and the eccentric-arm.

The operation of my improved governor is as follows: The engine being started, the wheel B is rotated by the motion of the crank-shaft, and the arm D is carried around the shaft A by its connection with the spoke of said wheel B. This rotation of the eccentric-arm will obviously turn the eccentric about the shaft, and the rotation of said eccentric will operate to give a longitudinal movement to the slide-valve in the ordinary manner. The centrifugal force occasioned by the rotation of the governor mechanism about the shaft will tend to throw the weights G G and arms F F outwardly, while the springs will

resist to a certain extent such outward movement. If, however, the speed of the engine becomes excessive, the weights G G will move outwardly and will, by the consequent movement of the arms F F, cause the links H H to also move outwardly so as to rotate the inner eccentric E about the shaft A, as before described. This rotation of the inner eccentric will obviously operate to move the eccentric C toward the shaft, so that its eccentricity will become less and the consequent motion of the valve-rod and the slide-valve will be proportionately less, thereby serving to lessen the supply of steam to the cylinder. When the motion of the engine becomes less rapid, the springs will operate to draw the arms F F inwardly, so as to return the parts to their initial positions.

It will be observed that by my improved construction the eccentric which governs the operation of the slide-valve is held firmly in position by the engagement of the inner eccentric therewith, while the operation of the governor mechanism serves to automatically increase or decrease the steam-supply in proportion to the work being done by the engine, so as to maintain a very uniform speed of the engine.

A great disadvantage common to all forms of governors which are connected with the fly-wheel or the crank-shaft of the engine and which operate directly upon the slide-valve is that in order to provide for the movement of the eccentric which governs said valve said eccentric is slotted, so as to pass over the crank-shaft, and the slot in said eccentric is made sufficiently large to permit of the necessary movement of the same about the shaft.

With a construction of this kind, in case the slide-valve is not perfectly balanced the operation of the governor mechanism is very unsatisfactory from the fact that any resistance offered by said slide-valve to the movement of the eccentric will operate to shift said eccentric upon the shaft, and thus render the operation of the governor uncertain. The eccentric, being free to move about the shaft, will be very sensitive to any such resistance of the slide-valve, and the operation of the governor will be consequently very unsteady. With my improved construction, however, the inner eccentric, being at all times engaged

with the outer eccentric, serves to prevent any unsteadiness of motion of said latter eccentric, so that the operation of the slide-valve is entirely controlled by the movement of the governor-arms, and the motion of the engine thereby rendered steady.

By my improvement I am enabled to use the governor in connection with any form of slide-valve, either balanced or unbalanced, with equal success, and am enabled to obtain a much closer regulation of the engine than is possible with a governor of any of the ordinary forms of construction.

By the arrangement of the two eccentrics as shown, when the governor-arms move outwardly, so as to rotate the inner eccentric about the shaft, the consequent change in the position of the outer eccentric, which governs the operation of the slide-valve, will give the said valve a slight lead and cause the valve to admit and cut off steam earlier in the stroke, thus causing the engine to work expansively.

It is obvious that various modifications may be made in the details of construction, and I therefore do not limit myself to the exact form of construction shown in the drawings and herein described.

Having described my invention, what I claim is—

The combination, in a steam-engine governor, of an eccentric located upon the fly-wheel shaft for governing the movements of the slide-valve, an arm extending from said eccentric and having a slotted engagement with a stud upon the fly-wheel, an eccentric, a circular aperture in said eccentric of larger diameter than said shaft, an auxiliary eccentric fitted within said aperture and revolubly engaged with the shaft, and governor-arms provided with weights and engaged with said auxiliary eccentric and adapted to rotate the same within said circular aperture, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand, at Oconomowoc, in the county of Waukesha and State of Wisconsin, in the presence of two witnesses.

OLE ROSHOLT.

Witnesses:

C. R. REID,
HENRY MOORE.