

No. 745,748.

PATENTED DEC. 1, 1903.

W. O. WEBBER.
STEAM ENGINE GOVERNOR.

APPLICATION FILED DEC. 26, 1902.

NO MODEL.

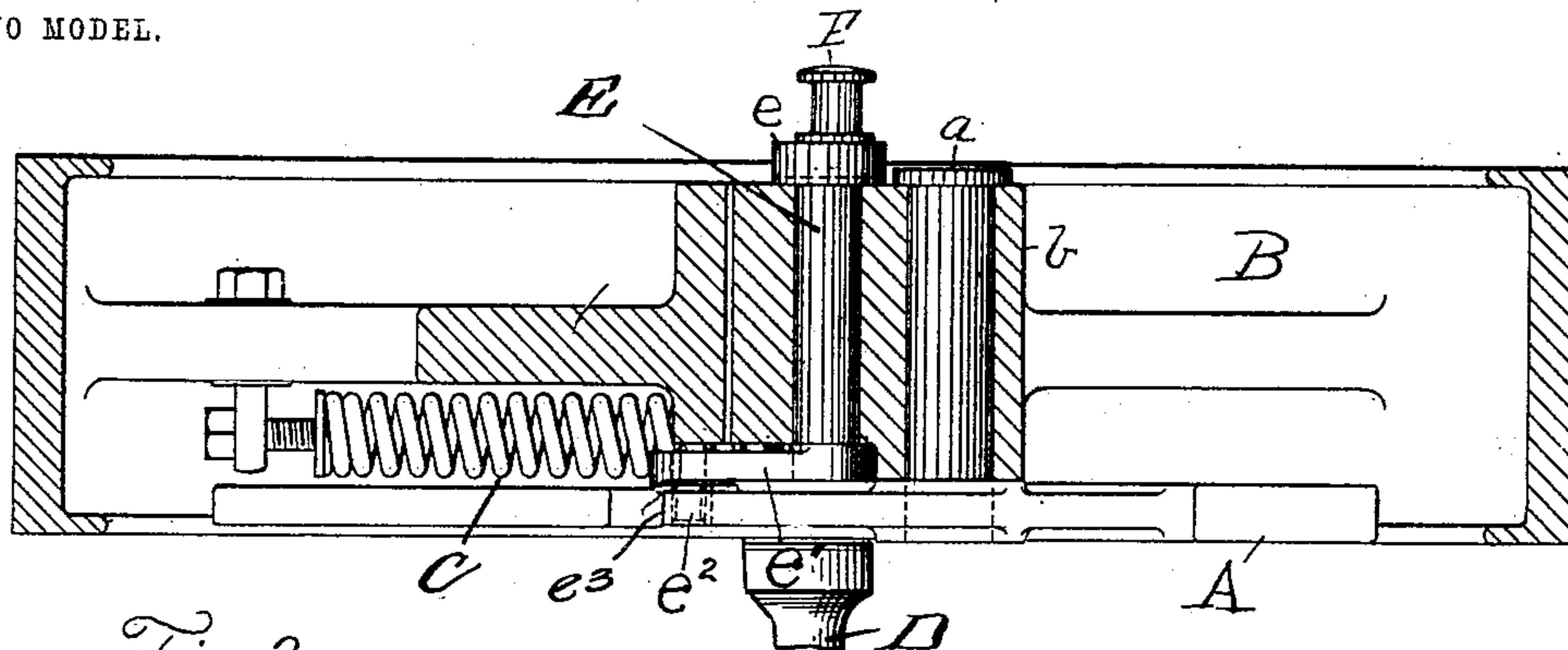


Fig 2

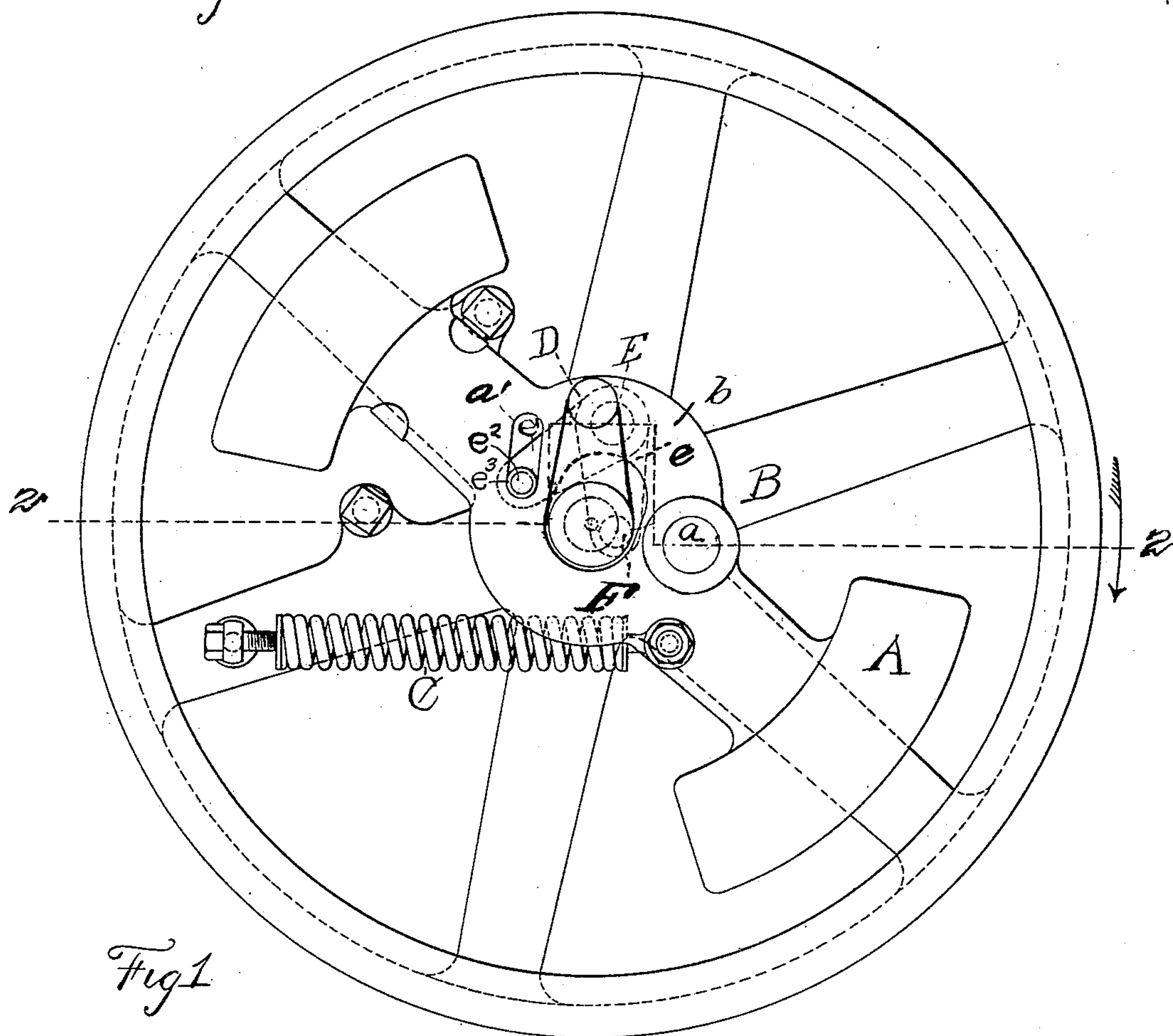


Fig 1

WITNESSES:

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WILLIAM O. WEBBER, OF BOSTON, MASSACHUSETTS.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 745,748, dated December 1, 1903.

Application filed December 26, 1902. Serial No. 136,656. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM OLIVER WEBBER, of the city of Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Steam-Engine Governors; and I hereby declare that the following is a clear, full, and exact description of the same.

This invention relates to steam-engine governors, and particularly to that type of steam-engine governors wherein the governing apparatus is placed in the fly-wheel of the engine, generally known as the "shifting-eccentric cut-off" type of governor; and it consists of certain improvements in the construction thereof, as will be fully hereinafter set forth, and pointed out in the claims.

My invention is illustrated by the accompanying drawings, as follows:

Figure 1 is a side elevation of my device in place in the fly-wheel of an engine. Fig. 2 is a transverse section on the dotted lines 2 2 of Fig. 1.

This invention has for an object to provide a construction for producing the method of steam distribution employed in Patent No. 466,475, granted to me January 5, 1892, by the inertia and centrifugal movement of a single-piece weight adapted to directly actuate a valve-moving rock-shaft without having to employ an intervening link, as shown in the prior art, thus effecting economy of construction, stability of action, and a locking action at all points of movement.

By placing the center of the rock-shaft on the same side of the wheel as the crank-pin carried by the wheel-shaft, but a little to one side of a center line passing through the center of the wheel-shaft and the crank, I obtain the result of having the lead increase rapidly from the point of minimum cut-off to about half of the stroke and then remain practically constant, which gives the best steam distribution in the engine-cylinder. The object of my present invention pertains to accomplishing this result by the use of a single-piece inertia and centrifugal weight without the use of an intervening link or other part and pertains to cheapness of construction, stability of action, and a locking action at all points of movement.

The construction is as follows, reference

being had to drawings by letters of reference marked thereon: A weight A is eccentrically pivoted by pin *a* to hub *b* of the supporting-wheel B at a suitable distance from its center, so as to be subject to the rotative effect of centrifugal and inertia force about this pin. The weight A is connected to a spring C, the tension of which acts in the ordinary manner in opposition to the action of centrifugal force upon the weight A, the mechanism so far as described consisting of the essential elements of a shaft-governor. Pivoted nearly at right angles with this pin *a* is a journal-bearing through the hub in the same manner, and on the same side of the center of the wheel as the position of the crank-pin D, carrying the ordinary pitman connection, is the valve-moving rocker-arm E, having one arm *e* carrying the valve-moving eccentric or pin F on the opposite side of the wheel from the main governor-weight A and a second arm *e'* at an angle to arm *e*, which is actuated by the weight A through the medium of a pin *e''*, carrying a roller *e'''* on the outer end of this arm *e'* and entering into and being actuated by a slot *a'* in the weight A. The relative positions of the centers around which the different parts move are such that the weight A in moving around its center of rotation *a* has a powerful leverage against the outer end of the arm *e'*, attached to the rock-shaft E, and through it to the moving pin at the outer end of the opposite arm *e*; but the center about which the rock-shaft revolves being so much more nearly in line with the axis of the slot *a'* the thrust from this rocker-arm would have very little leverage to move or overcome the inertia of the weight A.

The reason for pivoting the arm E on the same side of the center of the wheel as the location of the pitman crank-pin D is that it will cause the valve-moving pin F to describe an arc of a circle in moving from its inner position to its outer position, which will rapidly move away from a line representing constant lead during the first half of this travel and then be practically parallel or coincident with this lead-line for the remainder of its travel. The advantages of locating the center about which this valve-moving pin revolves, as described in my invention, are that it causes the lead

of the main valve of the engine to increase quite rapidly from the point of minimum cut-off to a point representing a mid-load or medium cut-off, after which there will be a practically constant lead or a very slight increasing lead to a point representing maximum cut-off. The advantage of this is that there will be better admission of steam to the piston of the engine when the valve is at its minimum travel and is opening more slowly, which is not necessary when the valve is at its maximum travel and moving more rapidly. There will also be a rapid increase of compression up to about mid-load of the engine to help throw the engine over its center and only a slight increase thereafter when such additional increase is not so necessary for smooth running.

What I claim is—

1. In the valve-gear of an automatic cut-off engine, the combination with the shaft and governor-wheel, of a single-piece centrifugal and inertia weight pivoted thereon adjacent to said shaft, a valve-moving rock-shaft journaled in said wheel adjacent to the shaft thereof and provided with a crank-arm adapted to directly engage said weight, substantially as described.

2. In the valve-gear of an automatic cut-off engine, the combination with a shaft provided with a crank-pin and governor-wheel, of a single-piece centrifugal and inertia weight pivoted upon said wheel adjacent to said shaft, a valve-moving rock-shaft journaled in said wheel on the same side of the center of the wheel as the crank-pin carried by the wheel-shaft, and means, carried by

one end of said rock-shaft for directly connecting said shaft to said weight and at the opposite end thereof for a valve connection, substantially as described.

3. In the valve-gear of an automatic cut-off engine, the combination with a shaft provided with a crank-pin and governor-wheel, of a single-piece slotted centrifugal and inertia weight pivoted upon said wheel adjacent to said shaft, a valve-moving rock-shaft journaled in said wheel adjacent to and on the same side of the center thereof as the crank-pin, an arm on said rock-shaft parallel to the weight, and a pin on said arm extended into the slot in said weight, substantially as described.

4. In the valve-gear of an automatic cut-off engine, the combination with a shaft and governor-wheel, of a single-piece centrifugal and inertia weight pivoted thereon adjacent to said shaft and provided with a slot at one side of said shaft, a valve-moving rock-shaft journaled in said wheel at one side of the slot, a rock-arm provided with means to enter the slot in said weight, and adapted to cause said arm to rotate in an opposite direction to the direction of rotation of the weight, and a valve-rod connection upon the end of the rock-shaft opposite said arm, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

WILLIAM O. WEBBER.

Witnesses:

EDWIN D. SIBLEY,
HELEN A. MOYLAN.