(No Model.)

W. MORAVA.

STEAM ENGINE GOVERNOR.

No. 341,933. Patented May 18, 1886.

Fig. 1.

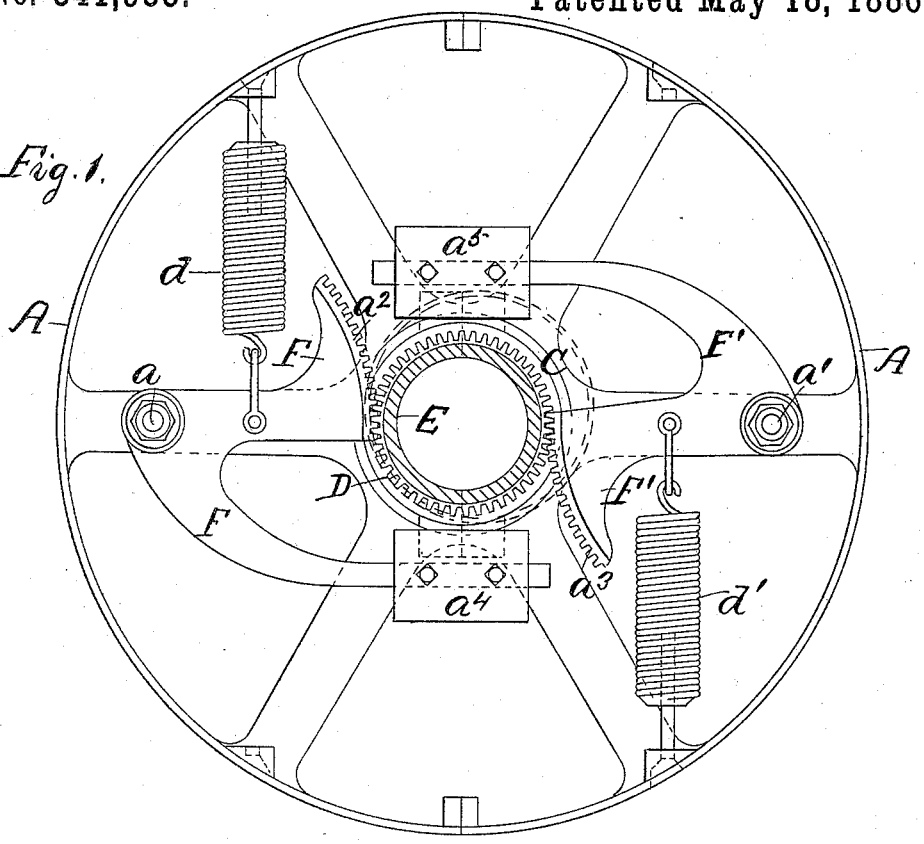
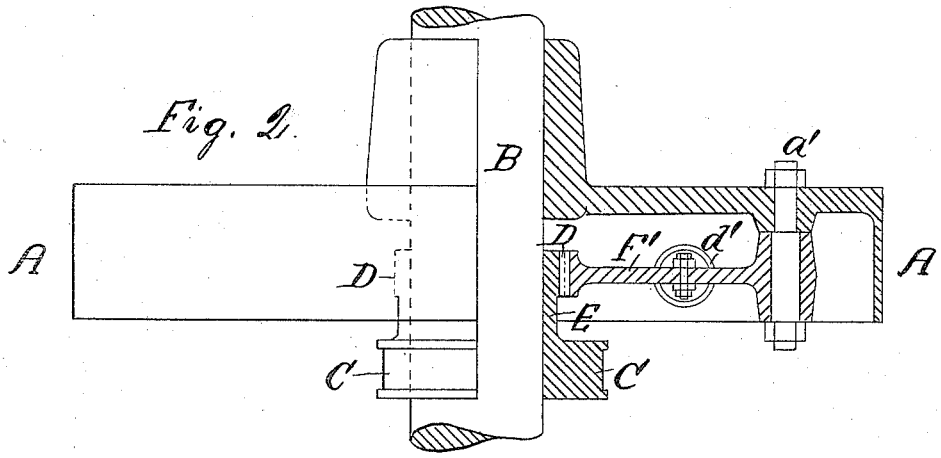


Fig. 2.



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WENSEL MORAVA, OF CHICAGO, ILLINOIS.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 341,933, dated May 18, 1886.

Application filed May 28, 1885. Serial No. 166,908. (No model.)

To all whom it may concern:

Be it known that I, WENSEL MORAVA, of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in a Steam-Engine Governor, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of this invention is to provide an improved governing device that will automatically regulate and control the motion of a steam-engine and maintain a uniform velocity under all the various changes to which the same may be subjected.

The nature of this invention consists in attaching it to a fly-wheel or other revolving body, a pair of angular-curved lever-arms having a pivotal movement in relation to the same, the inner ends of said arms being adapted to have some suitable intermediate connection with the cut-off valve. The outer ends of these lever-arms are weighted, and are capable of being drawn away from the center of axis by the centrifugal force developed in the revolving body and drawn in the opposite direction by centripetal straining springs.

Figure 1 is a side-elevation of a fly-wheel embodying my improved features, and Fig. 2 a plan and partial section.

Referring to the drawings, A represents a fly-wheel; B, the main or crank shaft on which said wheel is mounted; C, an eccentric, and D a gear-wheel, both cast on the sleeve E, the latter being loosely mounted on the crank-shaft.

The two angular curved lever-arms F F′ are attached to the fly-wheel, and are provided at opposite points with the pivotal bearings *a a′*. The inner ends of these lever-arms are provided with the segment-rack gears a^2 a^3, which are adapted to engage with the gear-wheel D on opposite sides, as shown in Fig. 1. The inner teeth of the segmental rack-bar are normally in contact with those teeth on the gear-wheel that are on the same plane as the fulcrums of the levers. By this construction I am enabled to make the long arm parallel with the short arm and have its projecting end just above the gear-wheel. The lever will therefore have greater play and increased velocity the further the long arm moves away from the gear-wheel. This is considered very advantageous for the reason that, while a slight variation in the speed will be taken up at once, a greater variation will be taken up in almost the same time by reason of the constantly increasing velocity of the lever's movement. The outer parts of the lever-arms are curved inwardly from their pivotal points, bringing the same parallel with the inner parts, and are provided on the extreme ends with the adjustable weights a^4 a^5, located opposite to each other and at right angles to the position of the inner ends of said lever-arms.

d d′ are two spiral springs, the inner ends of which are connected to the lever-arms at a point about central between the inner ends and the pivotal points *a a′*, while the outer ends are suitably secured to the rim of the fly-wheel or governor-case. These springs may be attached by an adjustable connection for the purpose of regulating the tension of the same, and serve the purpose of increasing the centripetal attraction acting in opposition to the centrifugal force; these opposing forces changing the angular position of the lever-arms as the load on the engine is diminished or increased.

No means are shown for connecting the eccentric on the crank-shaft with the cut-off valve for the purpose of transmitting the required motion, for the reason that any of the various mechanical devices may be thus employed; neither is it necessary that the lever-arms should be attached to a fly-wheel; but they may be inclosed in a cased-wheel, and mounted either on the crank-shaft or on some counter or auxiliary shaft.

The lever-arms are pivoted near their longitudinal center, the outer ends being curved to correspond nearly to the circle of the revolving body to which they are attached. This form and arrangement makes the governing device very sensitive, and causes the same to instantly respond to the slightest change or variation in the speed or working of the engine.

The operation is as follows: After the engine is put in motion and has attained the degree of speed that will develop sufficient centrifugal force to overcome the tractive power of the

centripetally-acting springs, the lever-arms are caused to move on their pivots, the weighted ends being gradually drawn outward and away from the center of axis, and the inner ends shifting the eccentric or translating it across the crank-shaft; this outward movement of the weighted ends of the lever-arms continuing until an equilibrium is established between the engine and its load. When the speed of the engine slackens, the weighted ends will be drawn in the opposite or inward direction and the movement of the eccentric reversed, thereby varying the cut-off on the engine and admitting a greater or less volume of steam, as may be required.

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

In a steam-governor, the combination of a revolving body, a crank-shaft, an eccentric having a gear-wheel, springs, and the levers, each having two arms parallel with each other and cast in one piece, and one arm having a segmental rack-gear projecting outwardly, and its inner teeth normally in contact with the gear-wheel, and the long arm having a weight at its free end and curved to correspond nearly to the circle of the revolving body, substantially as described.

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Witnesses:
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