No. 836,784. PATENTED NOV. 27, 1906.

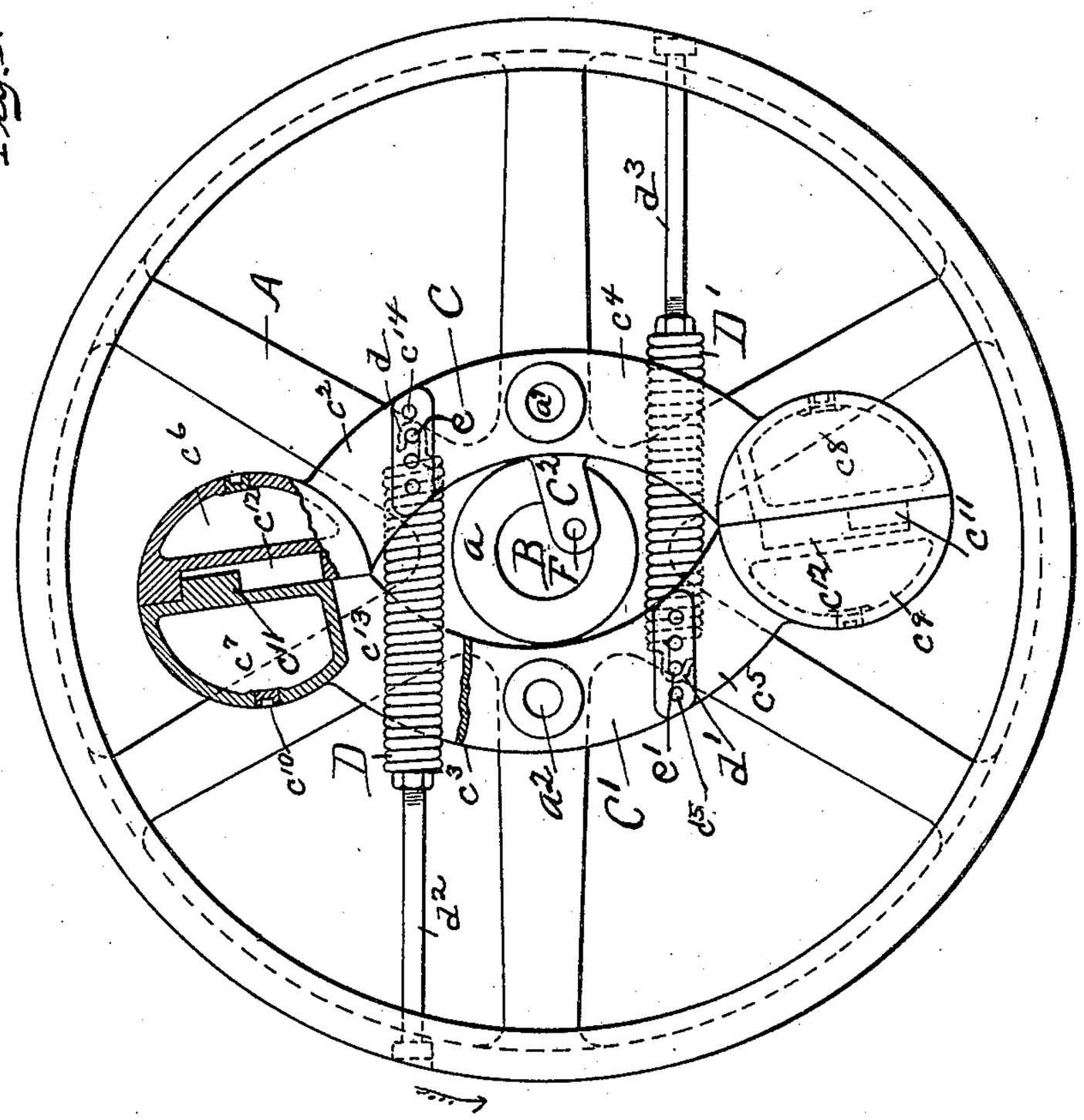
G. E. RIBLET.

ENGINE GOVERNOR.

APPLICATION FILED JULY 26, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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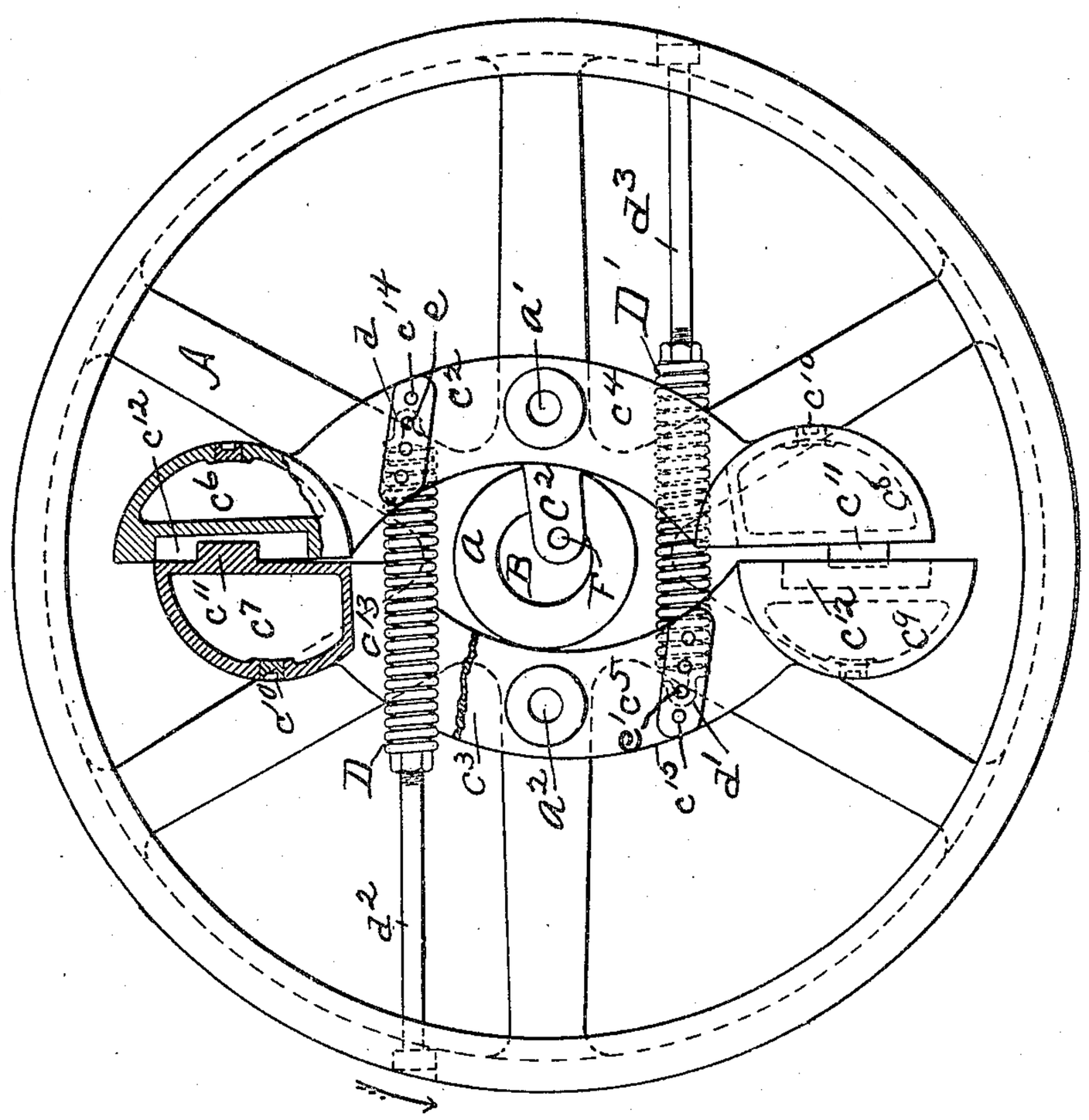
3 SHEETS—SHEET 2.

Fig. 2.



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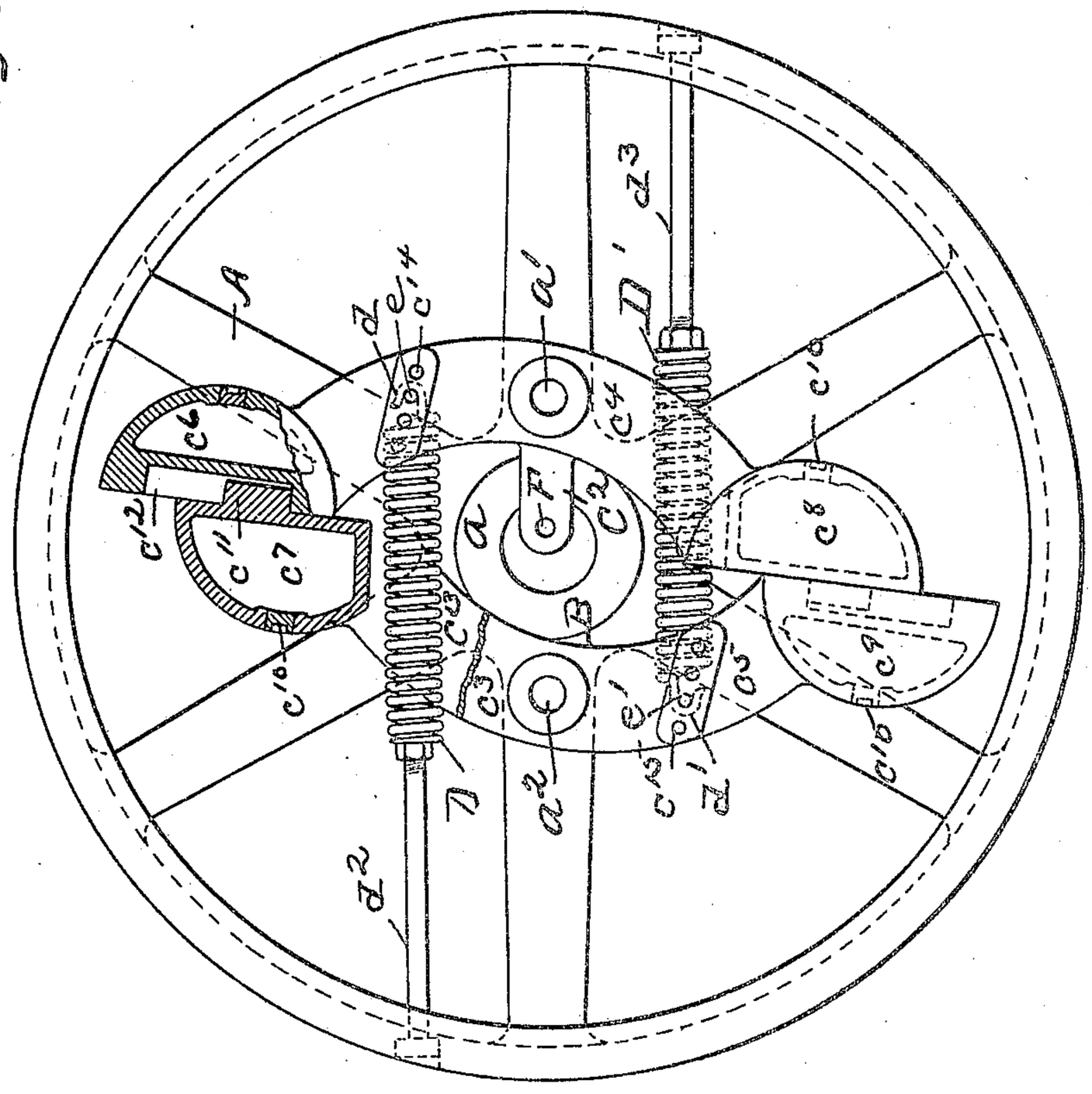
3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE E. RIBLET, OF ERIE, PENNSYLVANIA.

ENGINE-GOVERNOR.

No. 836,784. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed July 26, 1905. Serial No. 271,339.

To all whom it may concern:

Be it known that I, GEORGE E. RIBLET, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Engine-Governors, of which the following is a specification.

This invention relates to engine-governors; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and specified in the claims.

More particularly, the invention relates to that class of governors which are arranged on the drive-shaft of the engine and control the engine through the engine-valve.

The invention is illustrated in the accompanying drawings as follows: Figure 1 is a side elevation of the governor, the parts being in their initial position. Fig. 2 shows a similar view of the governor, the weights having moved to an intermediate position. Fig. 3 is a similar view, the weights being moved to their extreme outward position.

A marks the fly-wheel of the engine, which, as shown, forms the rotative carrier on which the governor is mounted; B, the drive-shaft of the engine, on which the fly-wheel is mounted. The governor-weights C and C′ are pivotally mounted on the pins a' and a^2, respectively, extending from the carrier A. These weights extend each side of the pins a' and a^2 in the form of curved arms c^2, c^4, c^3, and c^5, the arms being so curved as to bring the weighted ends c^6 and c^7 into immediate engagement and the weighted ends c^8 and c^9 into immediate engagement. This curve is sufficient to accomplish this purpose with the pivotal pins a' and a^2 arranged outside of the hub a. Extending from the weight C is an arm C^2, on which an eccentric F is mounted. The valve-gear (not shown) is secured to this eccentric F and operated in the usual manner. The weighted ends of the governor are hollow and are provided with the openings c^{10}, through which material may be inserted for increasing the weights of the ends, as desired.

The weighted ends are adjacent to each other throughout the movement of the governor-weights and in this respect operate substantially similar to the governor-weights shown in my former patent, dated August 25, 1899, No. 623,740. I find it desirable, however, to provide stops for limiting the movement of the governor-weights directly on the weights. To this end the faces of the weighted ends c^6 and c^9 are provided with elongated sockets c^{12}, and the opposing weighted ends c^7 and c^8 are provided with the projections c^{11}, which extend into these sockets. As the weights move in and out these projections c^{11} contact the ends of the sockets, as clearly shown in Figs. 1 and 3, thus limiting the movement of the governor-weights.

The springs D and D′ form the centripetal element of the governor. The arms c^3 and c^4 are bifurcated, as shown, by the sectional construction of the arms c^3. The spring D extends through the arm c^3 and is provided with the hooked end d. This hooked end extends over a pin e, which is passed through perforations c^{14} in the arm c^2, the arm being reinforced at this point to compensate for the perforations. The spring is connected with the rotative carrier by means of the bolt d^2. The spring D is similarly arranged and extends through the arm c^4 and is provided with a hooked end d'. This hooked end engages the pin e', extending through the perforations c^{15}. A bolt d^3 connects this spring with the rotative carrier.

It will be noted that the force of the spring is in a line approximating a tangent to an arc generated by the point of attachment of the springs to the weight around the pivot of the weight. There are several perforations arranged approximately along this line. If it is desired to increase or decrease the arm of the lever on which the spring acts in exerting force to the weight, the pin e may be shifted from one perforation to another to accomplish this purpose, so that with the movement of the governor-weight the arm may be made to increase or decrease, and in this way the spring may exert more or less than theoretical tension at the various points in the movement of the weight, and in this manner the engine may be made to speed up under load or to decrease the speed under load, as desired. Where the arm increases with the outward movement of the weight, the point at which the spring is secured to the weight moves toward the point of tangency between the line of force of the spring and the arc generated by the point of tangency and where the arm decreases it moves away from this point of tangency. A similar action takes place with the arm D′ and a similar adjustment is provided.

In order that there may be a constant contact maintained between two of the weighted

ends, it is desirable that one of the springs be made slightly stronger than the other. In the construction shown the spring D is slightly stronger than the spring D′ for this purpose and by reason of this the weighted ends c^6 and c^7 remain in contact. I have found that a closer regulation may be maintained where there is a variation in the surface exposed by the weights in their different positions. In the construction shown there is a greater exposure as the weights move outwardly. Viewing Fig. 1 it will be noted that the weighted ends c^6 and c^9 present practically no exposed surface. As the weights move outwardly, as indicated in Fig. 2, the ends of the weighted ends c^6 and c^9 are exposed and this exposure increases as the weights move outwardly, as will appear from an inspection of Fig. 3. At the same time there is no diminution in the exposure of the weighted ends c^7 and c^8. The air therefore presents greater resistance to the weights in the position shown in Fig. 3 than in Fig. 1, and this variation permits of a closer adjustment of the springs and weights without objectionable racing. It will be noted that the engagement of the weights one on the other creates friction, which, in the operation of the governor, acts as a dash-pot. This frictional engagement may be made greater or less by varying the relative strengths of the springs.

What I claim as new is—

1. In an engine-governor, the combination of a rotative carrier; two governor-weights mounted thereon at opposite sides of the center of said carrier, said weights having parts thereon adjacent to each other; and a stop device carried by one of said weights coacting with the other of said weights for limiting the outward movement of the weights.

2. In an engine-governor, the combination of a rotative carrier; two governor-weights pivotally mounted intermediate their ends at opposite sides of the center of said carrier, said weights having parts thereon adjacent to each other; and a stop device carried by one of said weights coacting with the other of said weights for limiting the inward movement of the weights.

3. In an engine-governor, the combination of a rotative carrier; two governor-weights mounted thereon at opposite sides of the center of said carrier, said weights having parts thereon adjacent to each other; and a stop device carried by one of said weights coacting with the other of said weights for limiting the outward and inward movement of said weights.

4. In an engine-governor, the combination of a rotative carrier; a governor-weight arranged to present an increasing surface to the air as the weight moves outwardly the air resistance tending to move the weight outwardly.

5. In an engine-governor, the combination with a rotative carrier; two governor-weights pivotally mounted intermediate their ends on said carrier and swinging with their ends in close relation with each other and arranged to vary the surface exposed to the action of the air as the weights swing on their pivots.

6. In an engine-governor, the combination with a rotative carrier; two governor-weights pivotally mounted on said carrier and extending into close relation with each other and arranged to increase the surface exposed to the action of the air as the weights swing on their pivots the air resistance tending to move the weights outwardly.

7. In an engine-governor, the combination of a rotative carrier; two governor-weights mounted on said carrier each having a bifurcated arm; and a spring secured to each of said weights and extending through said bifurcated arm of the other weight.

8. In an engine-governor, the combination of a rotative carrier; two weights pivoted at opposite sides of the center of said carrier and arranged to act in immediate proximity to each other; a spring exerting force on each of said weights, one of said springs being stronger than the other.

9. In an engine-governor, the combination of a rotative carrier having a hub thereon; two governor-weights pivotally mounted on said carrier at opposite sides of said hub, said weights comprising curved arms encircling the hub; and weighted ends arranged in immediate contact.

10. In an engine-governor, the combination of a rotative carrier; two governor-weights mounted on said carrier and moving in frictional contact with each other; and means for varying the force of the contact to vary the frictional engagement.

11. In an engine-governor, the combination of a rotative carrier; two governor-weights mounted on said carrier and moving in frictional contact with each other; springs forming the centripetal element of the governor, one secured to each weight, said springs being of different strength for creating friction between the weights.

12. In an engine-governor, the combination of a rotative carrier; two governor-weights mounted on said carrier and moving in frictional contact with each other; springs forming the centripetal element of the governor, one secured to each weight, said springs being of different strengths for creating friction between the weights; and means for adjusting one of the springs to vary the difference between the strengths of the springs.

13. In an engine-governor, the combination of a rotative carrier, two governor-weights pivotally mounted on said carrier at opposite sides of the carrier and arranged to be operated by inertia and centripetal forces,

said weights being so shaped as to bring their ends into immediate and frictional contact with each other and arranged to vary the surfaces exposed to the action of the air as the weights swing on their pivots, a stop device carried by one of said weights and coacting with the other of said weights for limiting both the inward and outward movement of said weights, a spring forming the centripetal element of the governor secured to one of said weights and exerting force in a direction approximating a tangent to the path of the point of the weight at which the spring is secured about the pivot of the weight, said spring being mounted in close proximity to the axis of the governor, means for varying the point of securing the spring to the weight to make a path of movement of the point at which the spring is secured to the weight either toward or from the point of tangency formed by the line of force of the spring and the arc generated about the pivot of the weight, and an eccentric actuated by said weights.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE E. RIBLET

Witnesses:
H. C. LORD,
M. C. SULLIVAN.