

(No Model.)

H. L. BERGER & E. NOEL.  
CENTRIFUGAL GOVERNOR.

No. 459,988.

Patented Sept. 22, 1891.

Fig. 2.

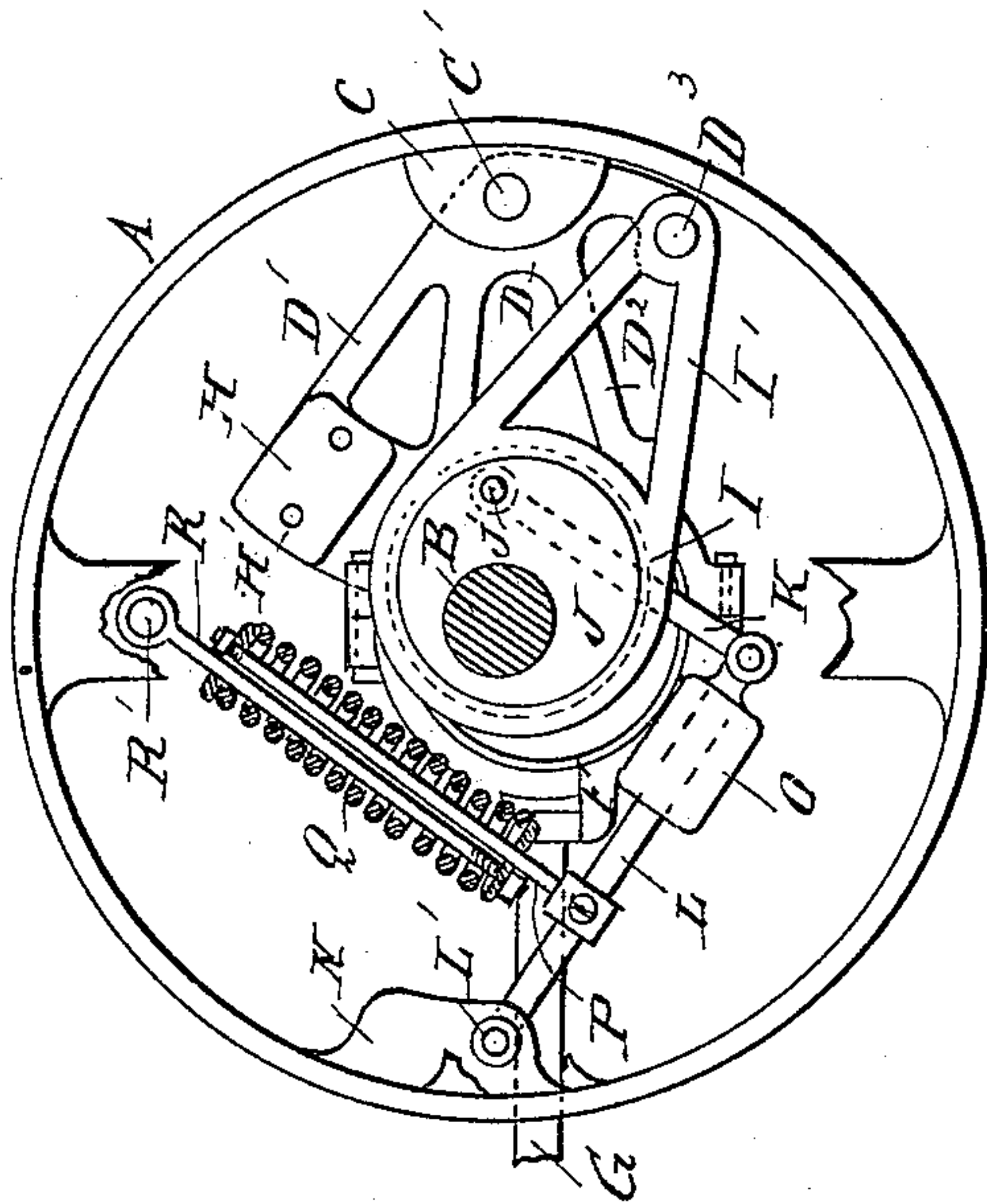


Fig. 5.

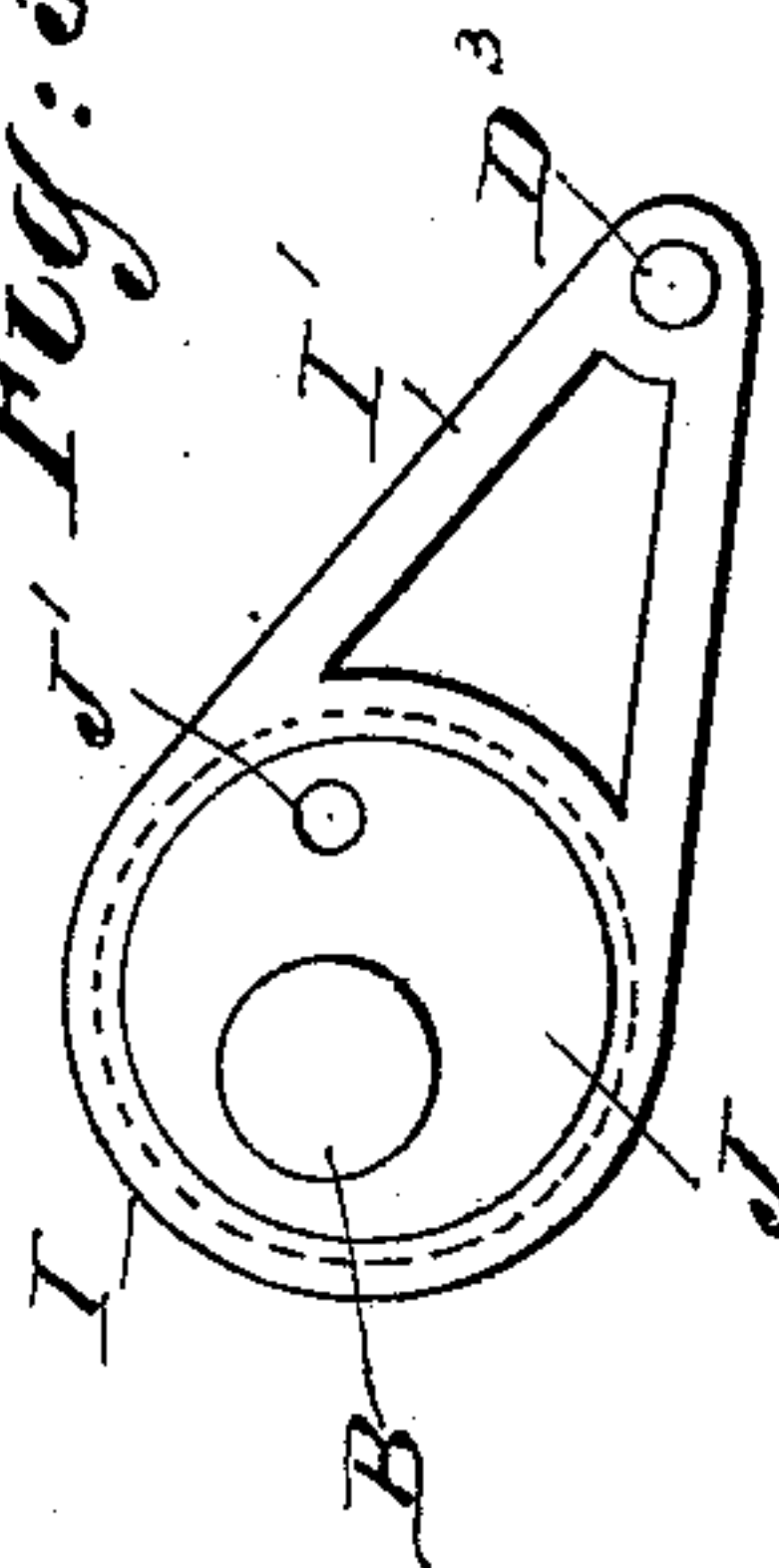


Fig. 3

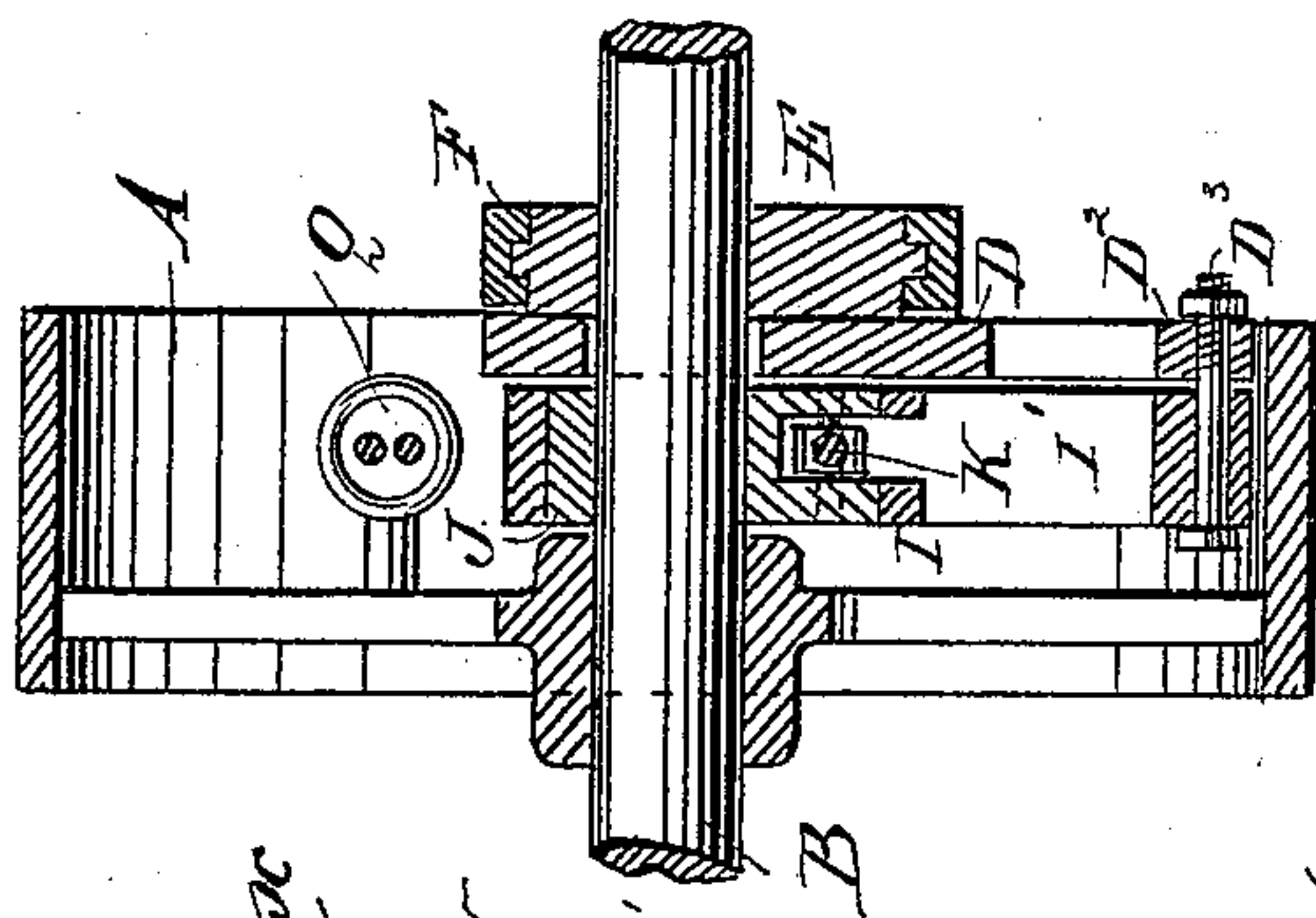
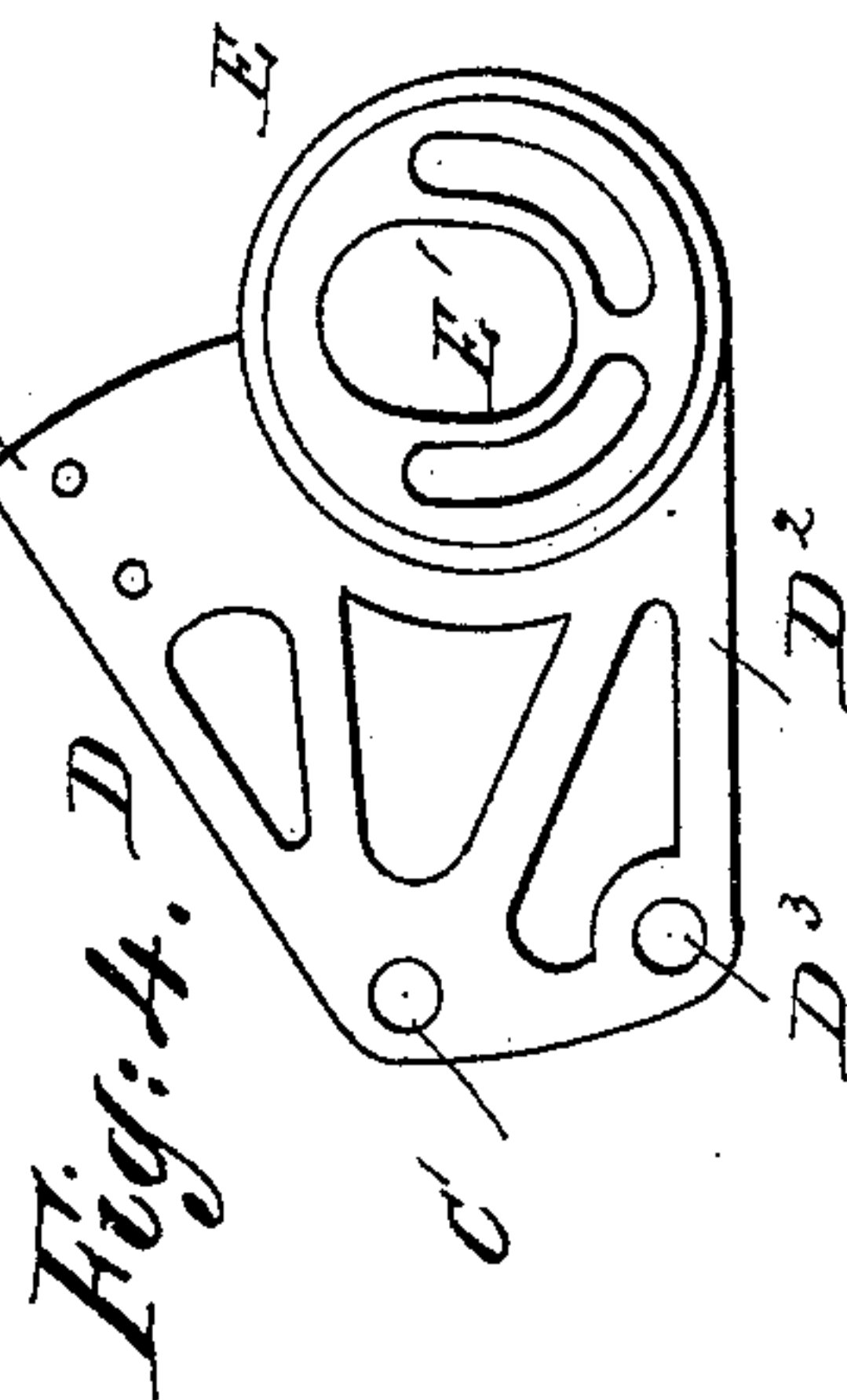
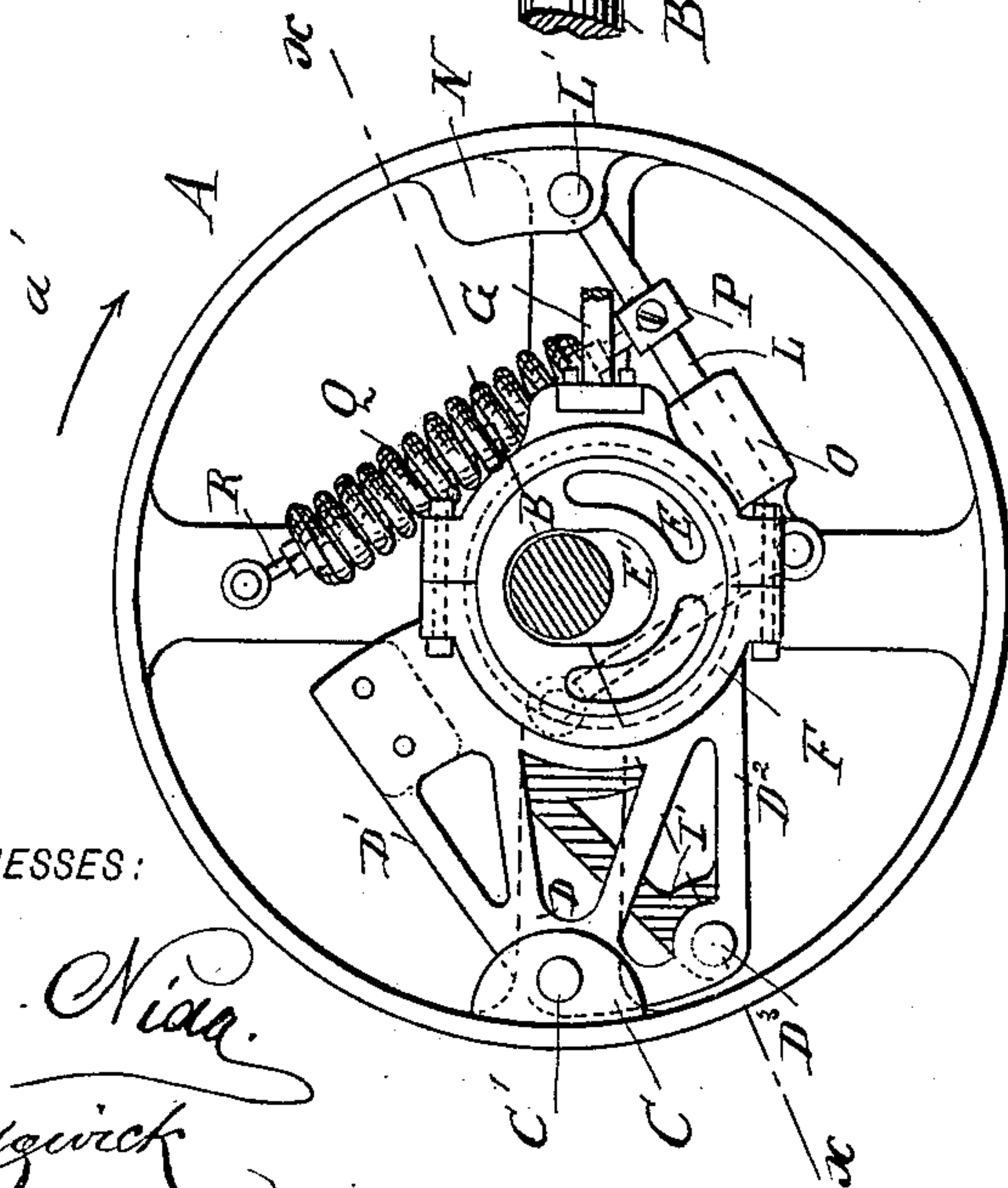


Fig. 1.



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# UNITED STATES PATENT OFFICE.

HENRY L. BERGER AND EDOUARD NOËL, OF ABBEVILLE, LOUISIANA.

## CENTRIFUGAL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 459,988, dated September 22, 1891.

Application filed January 2, 1891. Serial No. 376,441. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY L. BERGER and EDOUARD NOËL, both of Abbeville, in the parish of Vermillion and State of Louisiana, have invented a new and Improved Centrifugal Governor, of which the following is a full, clear, and exact description.

The invention relates to centrifugal governors such as shown and described in Letters Patent of the United States No. 405,760, granted to us on the date of June 25, 1889.

The object of the present invention is to provide a new and improved centrifugal governor which is simple and durable in construction and very effective and accurate in operation.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a face view of the improvement. Fig. 2 is a view of the same with parts in section. Fig. 3 is a transverse section of the same on the line *xx* of Fig. 1. Fig. 4 is a face view of the valve-eccentric, and Fig. 5 is a face view of the auxiliary eccentric.

The improved centrifugal governor is provided with a pulley A, secured to the main driving-shaft B and provided on the inside of its rim with a lug C, carrying a pivot-pin C', on which is pivoted an arm D of an eccentric E, having an elongated aperture E', through which passes the main driving-shaft B. On this eccentric E is held in the usual manner an eccentric-strap F, connected by the eccentric-rod G in the usual manner with the slide-valve in the steam-chest. On the arm D is secured a wing D', extending to one side of the main driving-shaft B and adapted to carry a suitable weight H, fastened by bolts H' or other suitable means to the said wing D'. On the arm D is secured or formed an extension D<sup>2</sup>, adapted to carry a pivot-pin D<sup>3</sup>, on which is fulcrumed an arm I', supporting an eccentric-strap I, in which is mounted to turn an eccentric J, held loosely on the main driving-shaft B. The eccentric J is pivotally connected at J' with a link K, pivotally connected

with the free end of a lever L, fulcrumed at L' on a weighted lug N, formed or secured by suitable means on the inside of the rim of the pulley A and arranged about diametrically opposite the lug C, previously mentioned. On the lever L is held a weight O, and the said lever is connected by a rod P with one end of a spring Q, connected at its other end with a second rod R, pivoted on an arm of the pulley A. The rods P and R are provided with adjustable nuts held against collars arranged at the ends of the spring Q, so that the tension of the latter can be adjusted to any desired degree.

The eccentric J has its center inside of the periphery of the driving-shaft B and on a line from the center of the shaft B to the center of the pivot D<sup>3</sup> when the valve-eccentric E is in the position of its largest throw. It will be seen that the arm D by its extension D<sup>2</sup> forms with the arm I' of the eccentric-strap I a sort of bell-crank-lever movement, in which the distances from the center of the pivot-pins C' and D<sup>3</sup> and to the center of the shaft B are so proportioned relative to each other to permit the weighted and spring-pressed lever L to swing freely on its fulcrum on the pivot-pin L' a distance equal to the throw of the valve-eccentric E, it being understood that, for instance, if the center of gravity of the weight L swings to a distance equal to one-eighth of an inch then the center of the valve-eccentric E will move one-eighth of an inch toward the center of the shaft B. As the weight H of the frame D is of the same size and set at the same distance from the shaft B as the weight O on the lever L, and also being diametrically opposite the same, it will readily be seen that the said weight H will have the same swing around with its arm D' from the pivot C' as the weight O will have, swinging with the lever L from its pivot-pin L'. It follows that the centrifugal force of both weights H and O will exactly equalize each other, and their combined centrifugal force will act powerfully to control the valve-eccentric E. Now when the shaft B is rotated in the direction of the arrow A' the pulley A will travel in the same direction and the valve-eccentric E is carried around with the pulley on account of being pivotally connected with the latter by the arm D. It



follows that the eccentric E by its rotary motion imparts by its strap F and rod G a forward and backward sliding motion to the slide-valve in the steam-chest. Now should the speed of the engine rise above the normal speed then a weight O will swing outward toward the rim of the pulley A, thus forcing the link K to act on the eccentric J, which thus shifts its center. The eccentric-strap I is thus also arranged and by being connected at D<sup>3</sup> with the arm D of the valve-eccentric E causes the latter to swing across the main driving-shaft B, thereby changing its center and causing the steam to be cut off quicker than before. The admission of steam is thus diminished, so that the speed of the engine will consequently decrease until the normal speed is again reached. When the engine slows up from the high rate of speed, then the weight O again moves backward to its former position caused by the action of the spring Q, so that the several parts are again moved to their former places and the eccentric E imparts again the usual travel to the slide-valve in the cylinder.

As the eccentric J has its center inside of the periphery of the main driving-shaft B, it locks the eccentric E securely in all positions it may assume across the main driving-shaft B. The governing-eccentric J and its strap I receive and sustain all the strain which any unbalanced valve may be subjected to, regardless of whatever position the two eccentrics may be in for a time. The valve-eccentric E will act exactly as a fixed eccentric in any position which it may occupy for the time being. It will be understood, also, that the weighted lug N, which is secured on the inside rim of the pulley A, serves to counterbalance the other mechanism hereinbefore described, so as to properly balance the entire device.

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

1. In a centrifugal governor, the combination, with a pulley secured on the main driving-shaft, of a valve-eccentric mounted on an arm pivotally connected with the said pulley and having a slot through which said main shaft passes, a second arm pivotally connected with the said first-named arm beyond the shaft and carrying a second eccentric mounted loosely on the main driving-shaft, and a weighted and spring-pressed lever pivoted on the said pulley and pivotally connected with the said second eccentric to control the movement of the same, substantially as shown and described.

2. In a centrifugal governor, the combination, with a pulley secured on the main shaft, of a valve-eccentric held on a weighted arm pivotally connected with the said pulley, the

said eccentric having a slot through which the said main shaft passes, a second eccentric pivotally connected with the said first-named eccentric and mounted loosely on the main shaft, a link pivotally connected with the said second eccentric, and a weighted lever pivoted on the said pulley and pivotally connected with the said link, substantially as shown and described.

3. In a centrifugal governor, the combination, with a pulley secured on the main shaft, of a valve-eccentric held on a weighted arm pivotally connected with the said pulley, the said eccentric having a slot through which the said main shaft passes, a second eccentric pivotally connected with the said first-named eccentric and mounted loosely on the main shaft, a link pivotally connected with the said second eccentric, a weighted lever pivoted on the said pulley and pivotally connected with the said link, and a spring connected with the said weighted lever and held on the said pulley, and a weighted lug held on the inside rim of the said pulley to counterbalance the other mechanism, substantially as shown and described.

4. In a centrifugal governor, the combination, with a pulley secured on the main shaft, of a valve-eccentric held on a weighted arm pivotally connected with the said pulley, the said eccentric having a slot through which the said main shaft passes, a second eccentric pivotally connected with the said first-named eccentric and mounted loosely on the main shaft, a link pivotally connected with the said second eccentric, a weighted lever pivoted on the said pulley and pivotally connected with the said link, and a spring connected with the said weighted lever and held on the said pulley, substantially as shown and described.

5. In a centrifugal governor, the combination, with a pulley secured on the main shaft, of a valve-eccentric held on a weighted arm pivotally connected with the said pulley, the said eccentric having a slot through which the said main shaft passes, a second eccentric pivotally connected with the said first-named eccentric and mounted loosely on the main shaft, a link pivotally connected with the said second eccentric, a weighted lever pivoted on the said pulley and pivotally connected with the said link, a spring connected with the said weighted lever and held on the said pulley, and means, substantially as described, for adjusting the tension of the said spring, as set forth.

HENRY L. BERGER.  
EDOUARD NOËL.

Witnesses:

EUGENE O. BELANGER,  
L. O. BROUSSAN.