

(No Model.)

E. VERSTRAETE.
ENGINE GOVERNOR.

No. 359,299.

Patented Mar. 15, 1887.

Fig. 1.

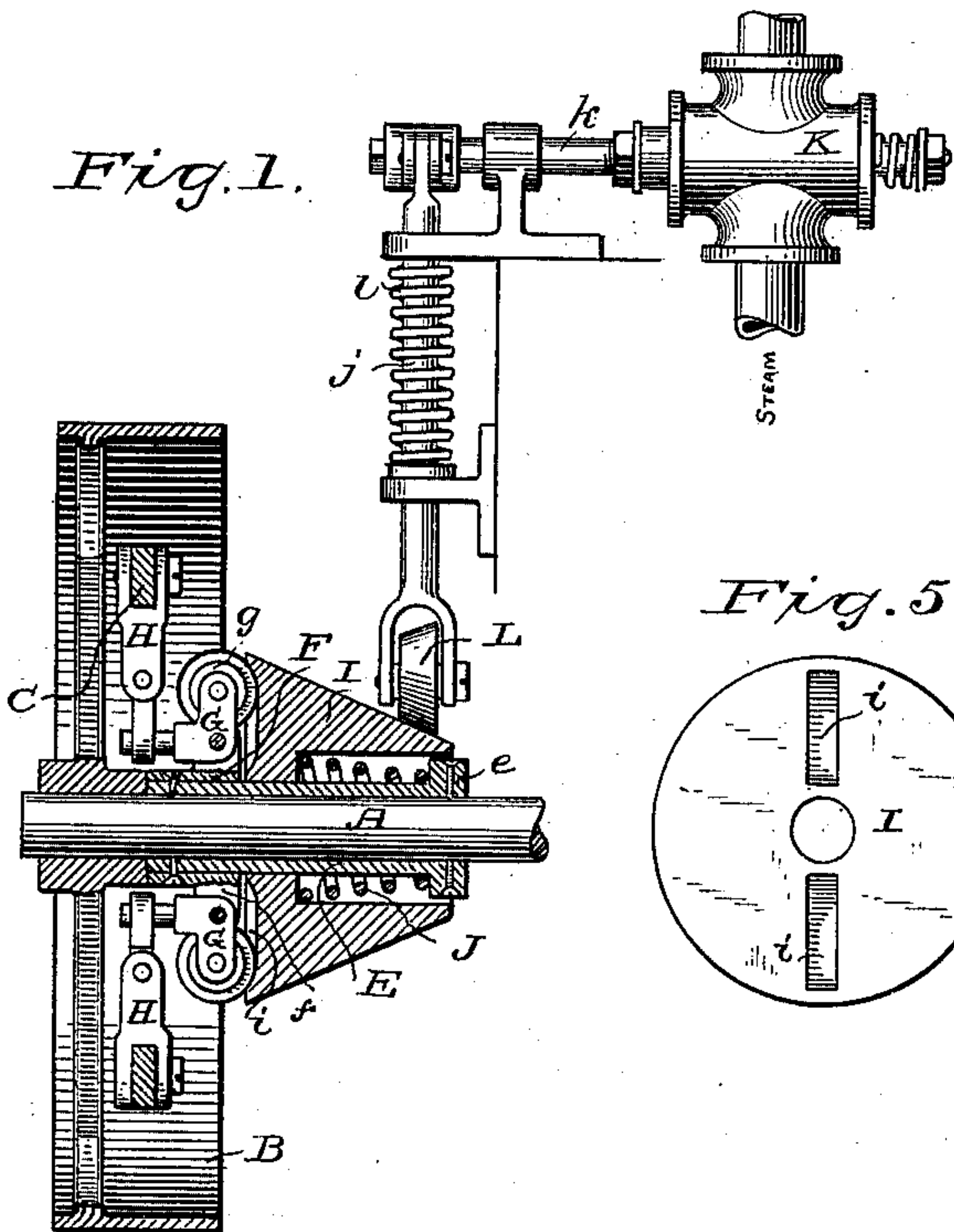


Fig. 6.

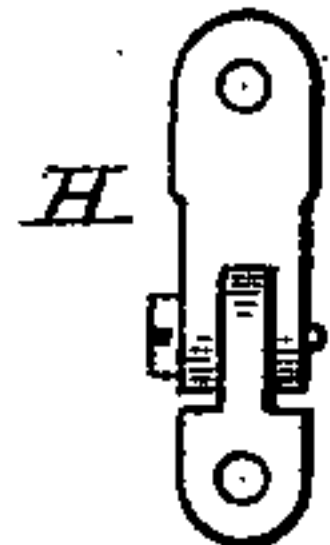


Fig. 5.

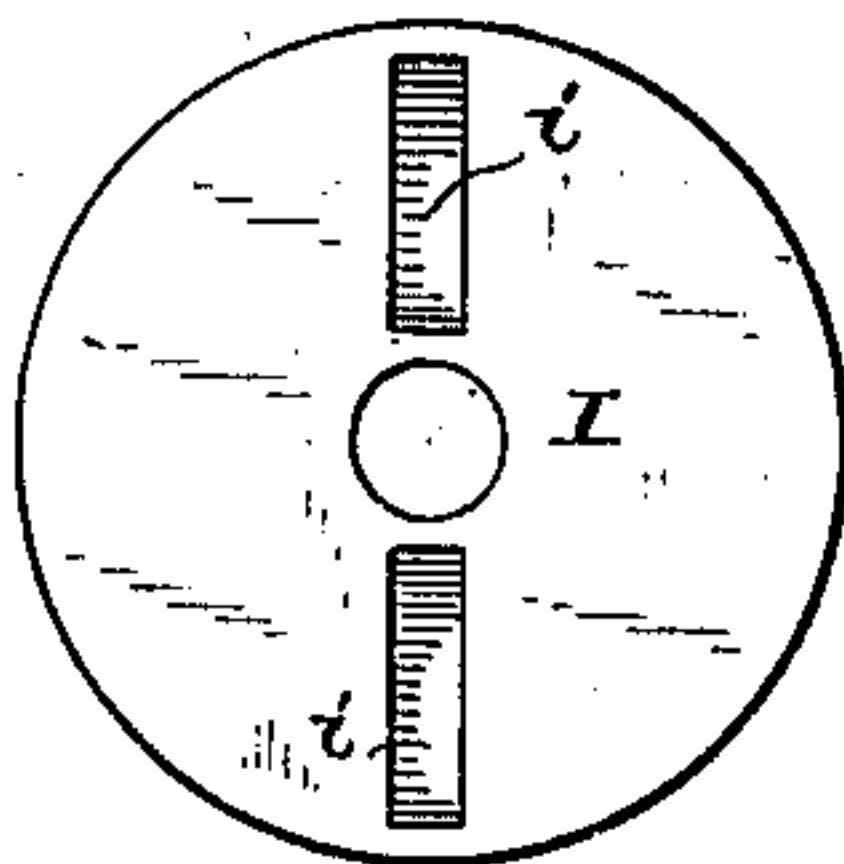


Fig. 7.

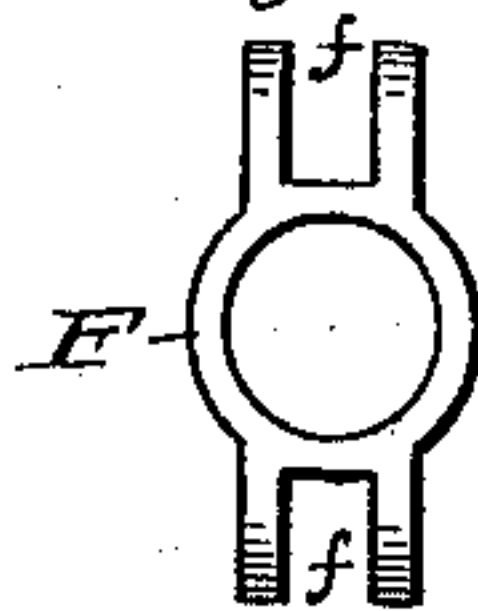


Fig. 8.

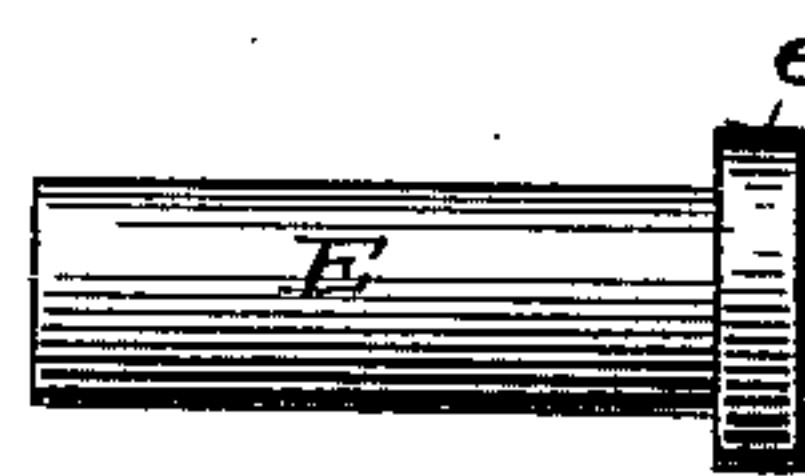


Fig. 2.

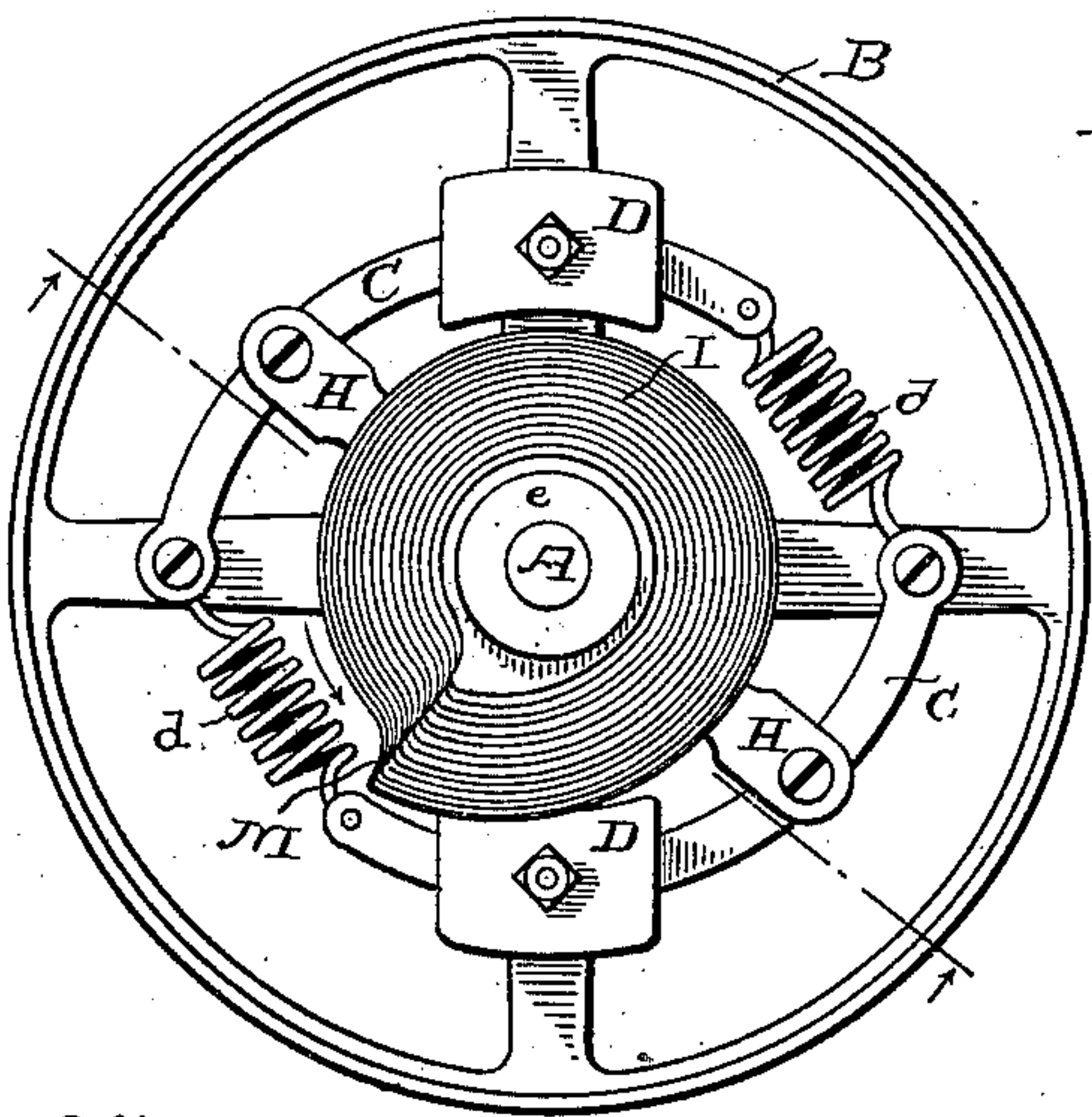


Fig. 3.

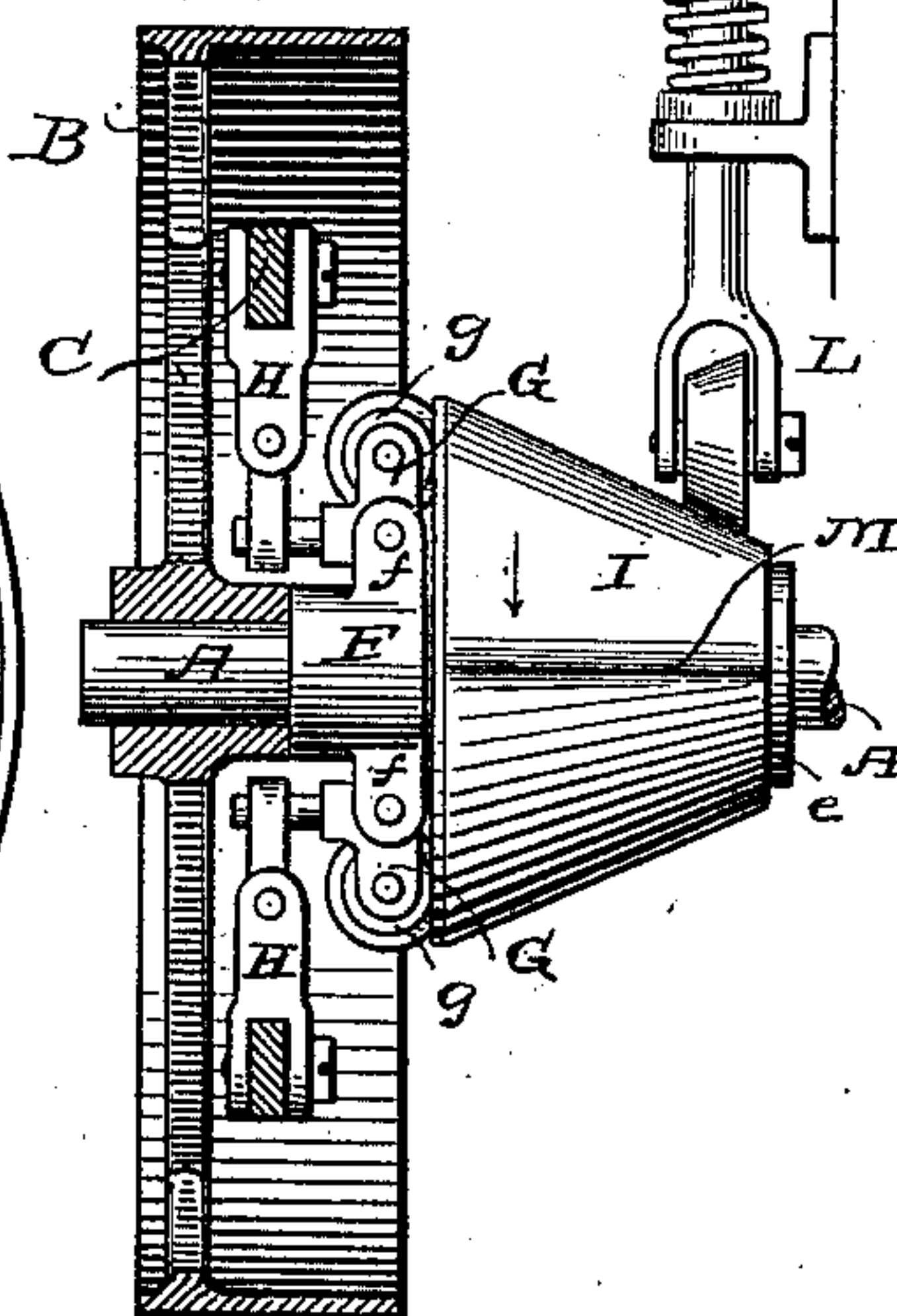
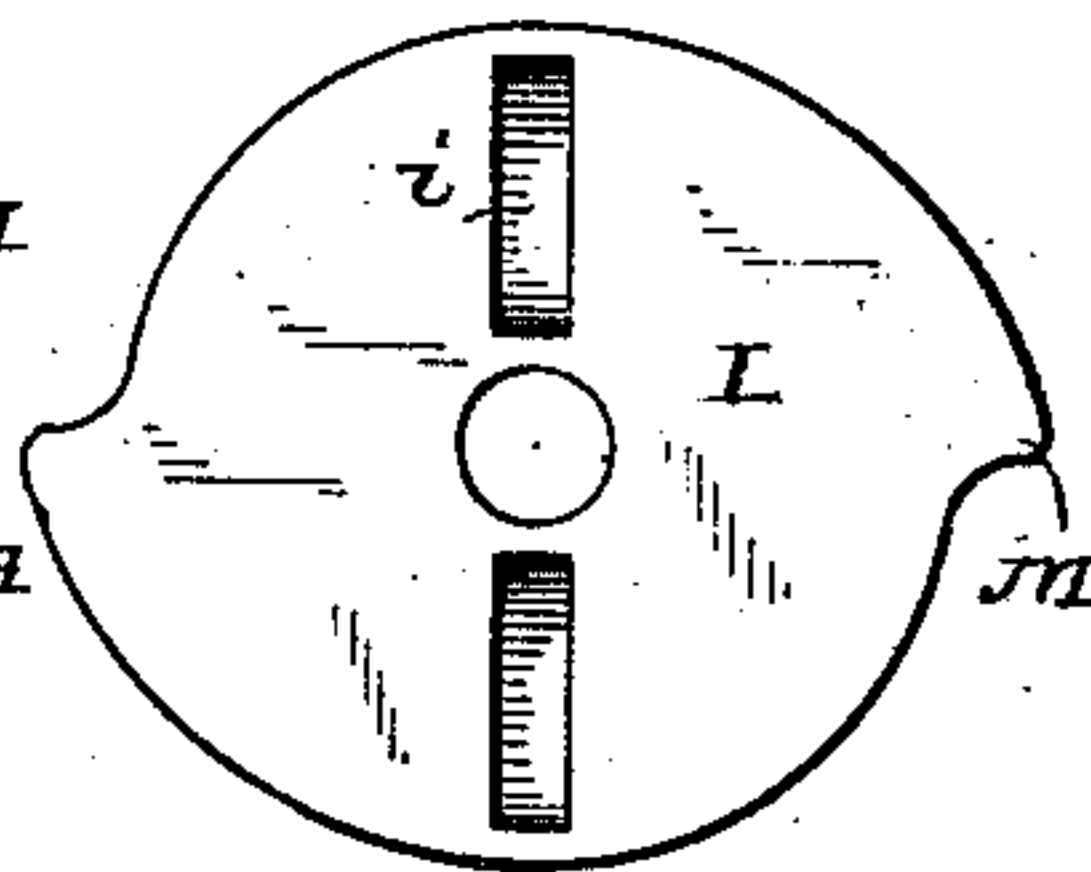


Fig. 4.



Witnesses

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ENGINE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 359,299, dated March 15, 1887.

Application filed December 14, 1886. Serial No 221,540. (No model.)

To all whom it may concern:

Be it known that I, EDMOND VERSTRAETE, at present a subject of the King of Belgium, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Engine-Governors, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in speed-governors for engines driven by steam, gas, air, or equivalent means, the details of construction and arrangement whereof will be fully pointed out in the following description.

In the accompanying drawings, Figure 1 is an elevation, partly in section, showing the main shaft and fly-wheel of an engine equipped with my improved governor. Fig. 2 is a view in elevation showing the fly-wheel of a gas-engine to which my improved governor has been applied. Fig. 3 is an elevation, partly in section, showing the same mechanism as in Fig. 1, except that the valve-actuating device is specially adapted for gas engines. Fig. 4 is a detail plan view of a portion of the governor. Figs. 5, 6, 7, and 8 are details relating to and showing the construction of separate parts of the apparatus.

Similar letters denote like parts throughout.

A represents the main shaft of an engine, which may be driven by air, gas, steam, or any of the well-known media, and be of any known construction.

B is the fly-wheel mounted upon the shaft A, and to the spokes of which are pivoted levers or arms C, provided with adjustable weights D and tension-spings *d*, by which latter the outer ends of the levers C are held in their normal positions until the speed of rotation of the fly-wheel exceeds the predetermined degree, when the levers, impelled by the weights D, will be thrown outward by centrifugal force in direct proportion to the excess of speed in the fly-wheel B.

Upon the shaft A, in close proximity to the hub of the fly-wheel, is fixed a sleeve, E, which is formed at one end with a flange, *e*, and upon the other end of this sleeve E is mounted the collar F, which is provided at opposite sides with pairs of lugs *f*, between which are pivoted

the angle-arms G, in the outer ends of which are mounted friction-rollers *g*, their inner ends being loosely connected to jointed links H, which are pivotally attached to the arms C, by which they are moved inward and outward according to the motion of said arms with the varying speed of the fly-wheel, said motion being communicated therethrough to the rollers G, causing them to move longitudinally backward and forward along the shaft A.

I represents a conical block or taper pulley, which is provided at its upper larger end with two depressions, *i*, and is apertured to fit over the sleeve E. The bore of the block I is enlarged at its lower end to a diameter somewhat greater than that of the sleeve E, upon which it is then fitted, a spiral retracting-spring, J, occupying the enlarged space within the cone I, and resting against the flange *e* of the sleeve E, in which position it can move backward and forward thereon freely when impelled by the friction-wheels G, which rest in the depressions *i* at the upper end of the cone.

It will be obvious that the sleeve E may be dispensed with entirely, the collar F being in that case secured directly to the shaft A, and the upper end of the cone being apertured to fit said shaft instead of the sleeve, and a collar similar to the flange *e* being secured directly to the shaft to form a bearing for the spring J, the principal use of the sleeve E being to enable standard sizes of governor apparatus to be readily fitted to shafts of varying, irregular, or unusual diameters.

K represents a throttle-valve from which extends a cranked shaft, *k*, to which is pivoted a second shaft, *j*, mounted in suitable bearings and provided at its lower end with a friction-roller, L, which at all times rests upon the surface of the cone I, being held thereagainst by the tension of the spring *l* upon the rod J. With this construction, as the speed of the fly-wheel increases and the arms C are thrown outward, the rollers G will be pressed against the cone, moving it longitudinally along the shaft A and away from said wheel, and thereby raising the friction-wheel L and rod *j* and rotating the throttle-valve K, thereby diminishing the amount of steam or other impelling-fluid passing therethrough to the engine. As

soon as the speed of the fly-wheel decreases, the springs J and I will return the parts to their normal positions.

In Figs. 2, 3, and 4 are shown the slight modifications of the above necessary to adapt it for use with gas-engines. In this case the cone J is provided with one or more tappets in the form of ridges or teeth M, extending along the surface of the cone J, so as to produce similar effects wherever the friction-wheel may be, the function of these teeth being to open and close what may be termed the "throttle"—that is to say, the passage-way by which the gas and air mixture reaches the cylinder, whatever form it may assume in different styles of engine. A cone with one of the teeth M is used where the engine is operated by one explosion per revolution, and a cone having two teeth where two explosions per revolution are used, and more, if found necessary.

Various modifications of the above-described apparatus will suggest themselves to those skilled in the art to which the invention relates, and I therefore do not wish to limit myself to the exact details herein set forth.

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

1. In a speed-governor, the combination, with the main shaft of an engine, the fly-wheel, and weighted arms pivotally connected thereto, of the pivoted rollers, the cone longitudinally movable on said shaft and arranged to be actuated by said rollers, and the friction-roller bearing against the exterior of said cone, and to which the power-controlling devices are connected, as set forth.

2. In a speed-governor, the combination, with the main shaft of an engine, the fly-wheel, and weighted arms pivotally secured thereto,

of the pivoted rollers connected to the weighted arms, the cone mounted upon the main shaft and spring-pressed against the pivoted rollers and arranged to be moved longitudinally against its spring by said rollers, and the friction-roller bearing against the surface of the cone, and to which the valve-controlling connections are secured, substantially as shown and described.

3. In a speed-governor, the combination, with the main shaft, fly-wheel, and weighted arms, substantially as shown and described, of the cone I, sleeve E, provided with flange e, and the retracting-spring J, contained within the cone, the collar F, provided with lugs f, the crank-arms G, carrying pulleys g, engaging the recess i in the upper end of the cone, and the hinged connecting-links H, extending from the crank-arms G to the weighted levers C.

4. In a speed-governor, the combination, with main shaft, fly-wheel, and pivoted weighted arms C, of the cone I, mounted upon said shaft and provided with a spring, J, for normally holding said cone in the direction of the fly-wheel, a pair of friction-rollers pivotally mounted upon the shaft and bearing against the upper end of the cone, and connections between the pivoted pulleys and the lever-arms C, whereby the cone is forced away from the fly-wheel by the centrifugal action of said arms, and power-regulating devices actuated by the longitudinal motion of said pulley, substantially as described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

EDMOND VERSTRAETE.

Witnesses:

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