

(No Model.)

J. BEGTRUP.
ENGINE GOVERNOR.

No. 510,315.

Patented Dec. 5, 1893.

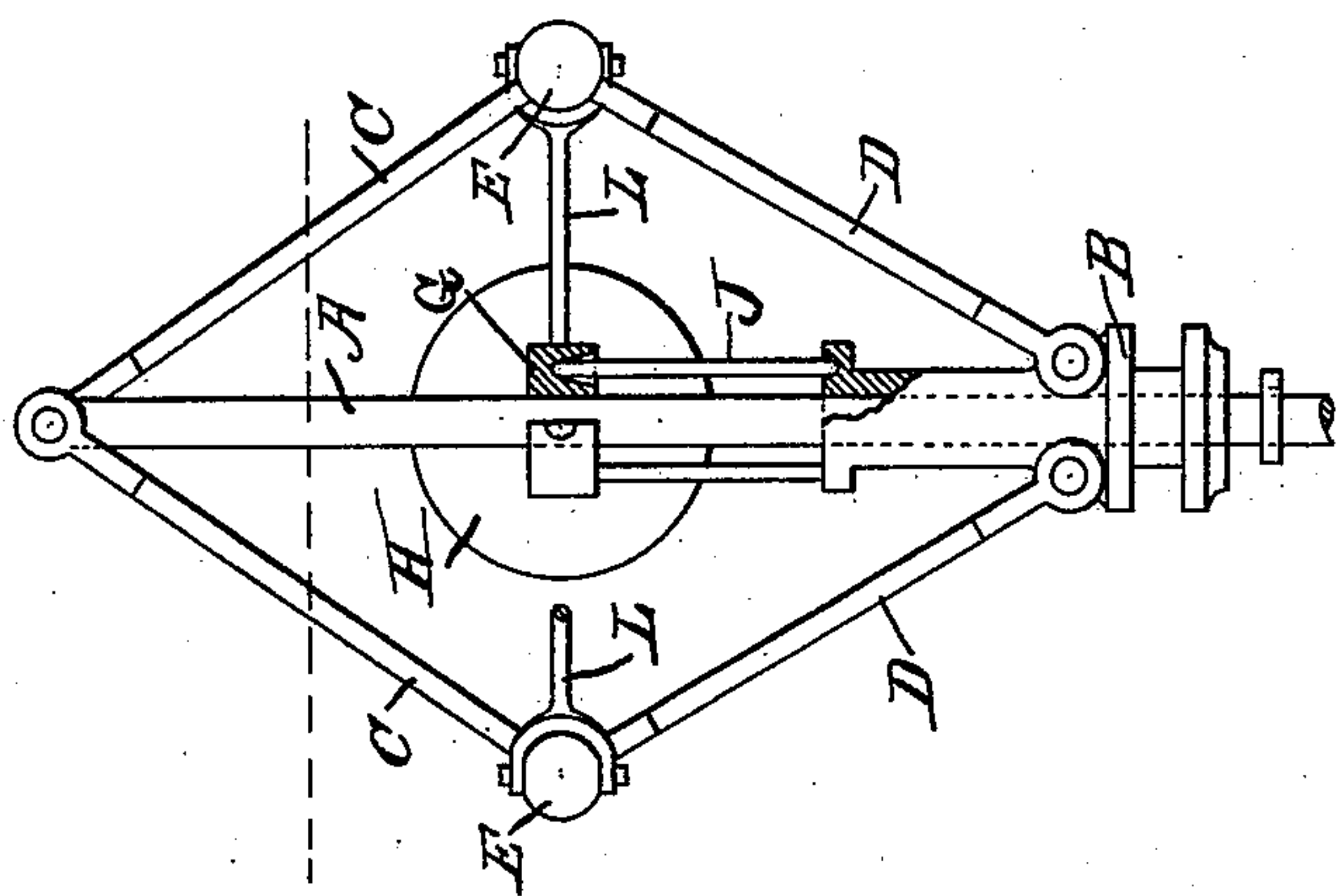


Fig. 2.

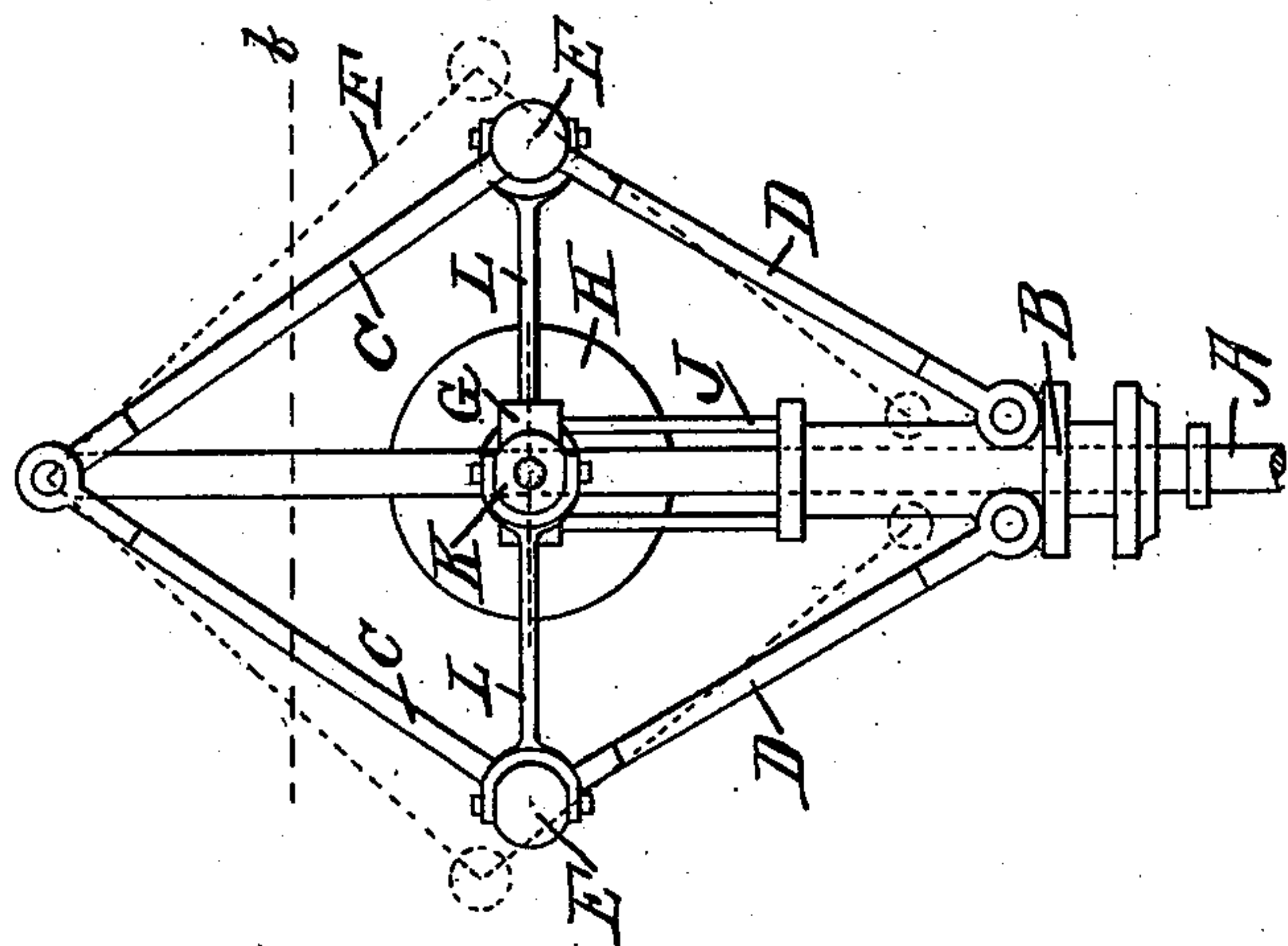


Fig. 1.

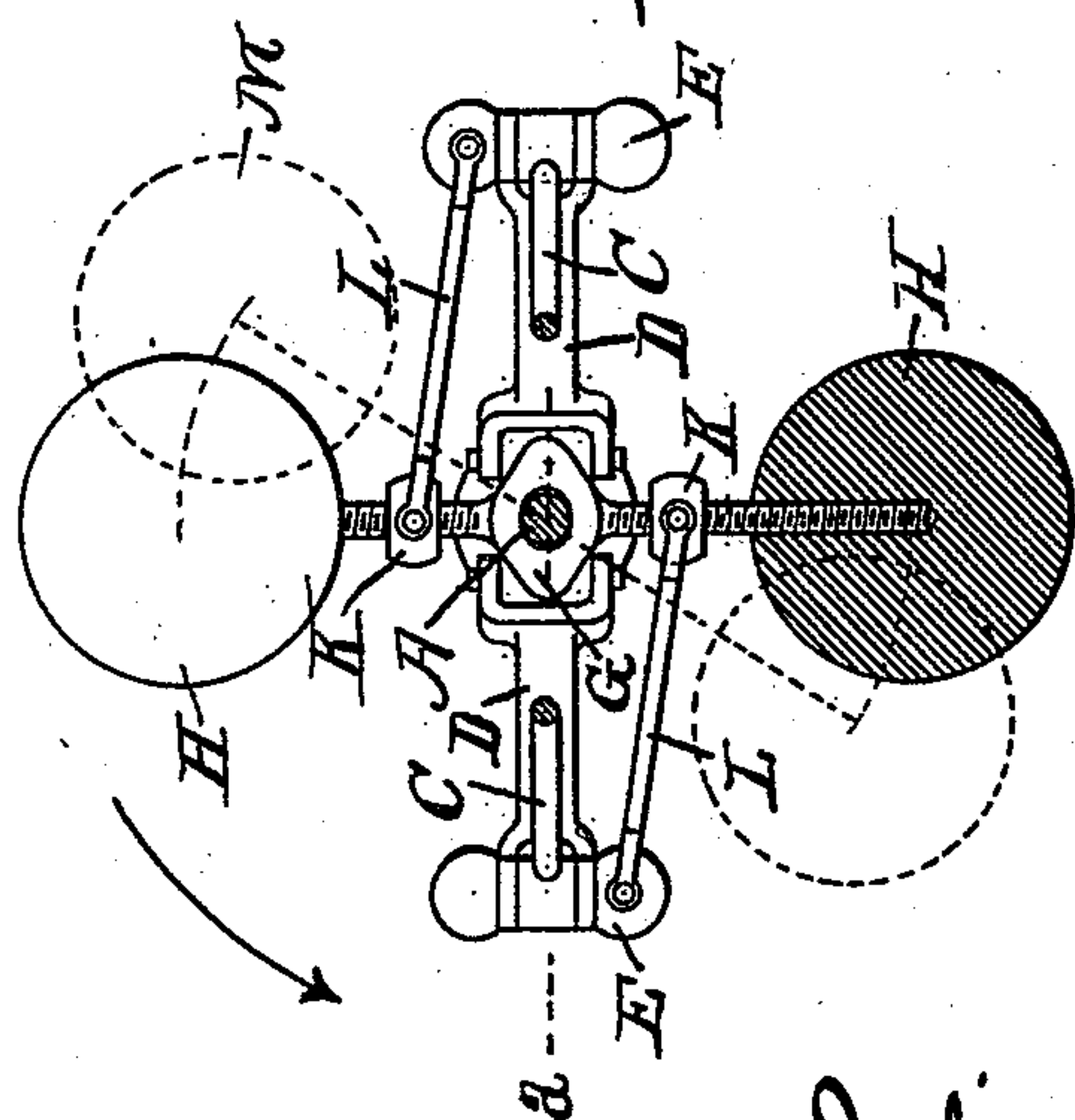


Fig. 3.

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JULIUS BEGTRUP, OF RIDGWAY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO JAMES H. McEWEN, OF SAME PLACE.

ENGINE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 510,315, dated December 5, 1893.

Application filed January 31, 1893. Renewed November 1, 1893. Serial No. 489,762. (No model.)

To all whom it may concern:

Be it known that I, JULIUS BEGTRUP, of Ridgway, Elk county, Pennsylvania, have invented certain new and useful Improvements in Engine-Governors, of which the following is a specification.

This invention pertains to governors for regulating the speed of engines and relates particularly to the type known as revolving pendulum governors.

My improvements will be readily understood from the following description taken in connection with the accompanying drawings, in which—

Figure 1, is a side elevation of a governor exemplifying my present invention, the nearer one of the inertia-weights H being omitted; Fig. 2, a similar view with portions appearing in vertical section in the plane of line "a" of Fig. 3; and Fig. 3, a plan, with parts in horizontal section in the plane of line "b" of Figs. 1 and 2, one of the inertia-weights H appearing in horizontal section in the plane of the center.

In the drawings:—A, indicates the vertical spindle of the governor which is to be rotated by power in any usual manner; B, a sleeve fitted to slide up and down upon the spindle, under the action of the governor, the vertical movement of this sleeve to be properly transmitted to the valve or valve-gear which is to be adjusted by the governor; C, a pair of pendulum arms pivoted to the spindle; D, arms pivotally uniting the lower extremities of pendulum arms C with the sleeve B; E, centrifugal weights at the junctures between arms C and D; F, dotted lines indicating change in height of the governor due to an increase in speed, all of the matter thus far referred to being of ordinary and well known construction and intended to have the usual mode of operation; G, an armed hub fitted for vertical and rotary motion upon an intermediate part of the governor spindle, the two arms of this hub projecting horizontally from the hub in opposite directions and in a vertical plane substantially at right angles to the common vertical plane of arms C and D, these arms being, preferably, provided with threads their whole length; H, inertia-weights firmly secured upon the outer ends of the arms of hub

G; J, a pair of toggle-rods having their upper ends seated in cavities in hub G and having their lower ends seated in cavities in sleeve B, there being two of these toggle-rods, one each side of the governor spindle; K, a hub secured upon each arm of hub G, between the hub and the inertia-weights H, the threads upon the arms permitting these hubs to be adjusted inwardly or outwardly upon the arms; and L, links pivoted to the hubs K and to the junctures of arms C with arms D, the axes of the uniting pivots being vertical.

The action of the ordinary parts of the governor is as usual, centrifugal weights E moving outward under the centrifugal forces and, in doing so, moving upward and raising the sleeve B, thus serving to adjust the valve or valve-gear for appropriate correction of speed of engine. Upon a reduction of speed of governor the centrifugal weights E move downward and inward, by reason of their gravity, thus moving the sleeve B downwardly. The armed inertia-structure turns with the governor and its inertia makes it adverse to changes in speed. In case the governor increases in speed the aversion of the inertia-structure to such increase will cause it to fall behind in its rotation relative to the governor, as indicated by dotted lines M. This retrogressive turning of the inertia-structure with reference to the centrifugal structure causes links L to push outwardly upon centrifugal weights E. In case the speed of the governor decreases, then the aversion of the inertia-structure to such increase causes the inertia-structure to move relatively ahead of the centrifugal structure, the links L then drawing the centrifugal weights inward and straightening the toggle-rods J. The toggle-rods furnish a good anti-friction support for the inertia-structure. The inertia-structure thus acts to immediately overcome friction of the governor when a change of load occurs and the governor will therefore be sensitive and quick acting and at the same time the inertia-structure will prevent small, irregular or periodical vibrating movements of the centrifugal weights and such movements as otherwise would result from the action of the valve-gear.

The system permits of the centrifugal

weights being made very light and thus well adapted to high speeds, under which circumstances the inertia-weight makes the governor exceedingly effective.

- 5 It is to be understood that the form of the inertia structure illustrated is simply exemplifying in character, as is also its method of connection with the centrifugal structure.

I claim as my invention—

- 10 1. In a revolving pendulum governor, the combination, substantially as set forth, of a governor spindle, a pair of pendulum arms and centrifugal weights carried thereby, and an inertia-weight carried by the spindle and
15 adapted for rotary movement relative to the centrifugal weights, and connections from said inertia-weight to said centrifugal-weights, whereby outward movement of the centrifugal weights is accompanied by a retrogressive
20 rotation of the inertia-weight with reference to the centrifugal weights.

2. In a revolving pendulum governor, the combination, substantially as set forth, of a governor spindle, a pair of pendulum arms
25 and centrifugal weights carried thereby, an inertia-weight carried by said spindle and adapted for rotary movement thereon relative to the pendulum arms, and links pivoted to said inertia-weight and said centrifugal
30 weights and acting, as the inertia-weight turns relative to the centrifugal weights to move the centrifugal weights inwardly or outwardly.

3. In a revolving pendulum governor, the
35 combination, substantially as set forth, of a governor spindle, a pair of pendulum arms and centrifugal weights carried thereby, an

inertia-weight carried by and adapted for rotatory and vertical movement on said spindle, and links connecting the inertia-weight
40 with the centrifugal-weights.

4. In a revolving pendulum governor, the combination, substantially as set forth, of a governor spindle, a pair of pendulum arms and centrifugal weights carried thereby, an
45 inertia-weight adapted for rotatory and vertical movement on said spindle, and connections between said centrifugal weights and said inertia-weight whereby the centrifugal weights support the inertia-weight. 50

5. In a revolving pendulum governor, the combination, substantially as set forth, of a governor spindle, a pair of pendulum arms and centrifugal weights carried thereby, a
55 sleeve upon the spindle, links connecting the sleeve with the centrifugal weights, and an inertia-weight upon said spindle and supported vertically by said sleeve and connected to said centrifugal weights.

6. In a revolving pendulum governor, the
60 combination, substantially as set forth, of a governor spindle, a pair of pendulum arms and centrifugal weights carried thereby, a sleeve upon the spindle, links connecting the sleeve with the centrifugal weights, an inertia-weight free upon the spindle, connections
65 between the inertia-weight and centrifugal weights, and toggle-rods between the inertia-weight and the sleeve.

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Witnesses:

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