

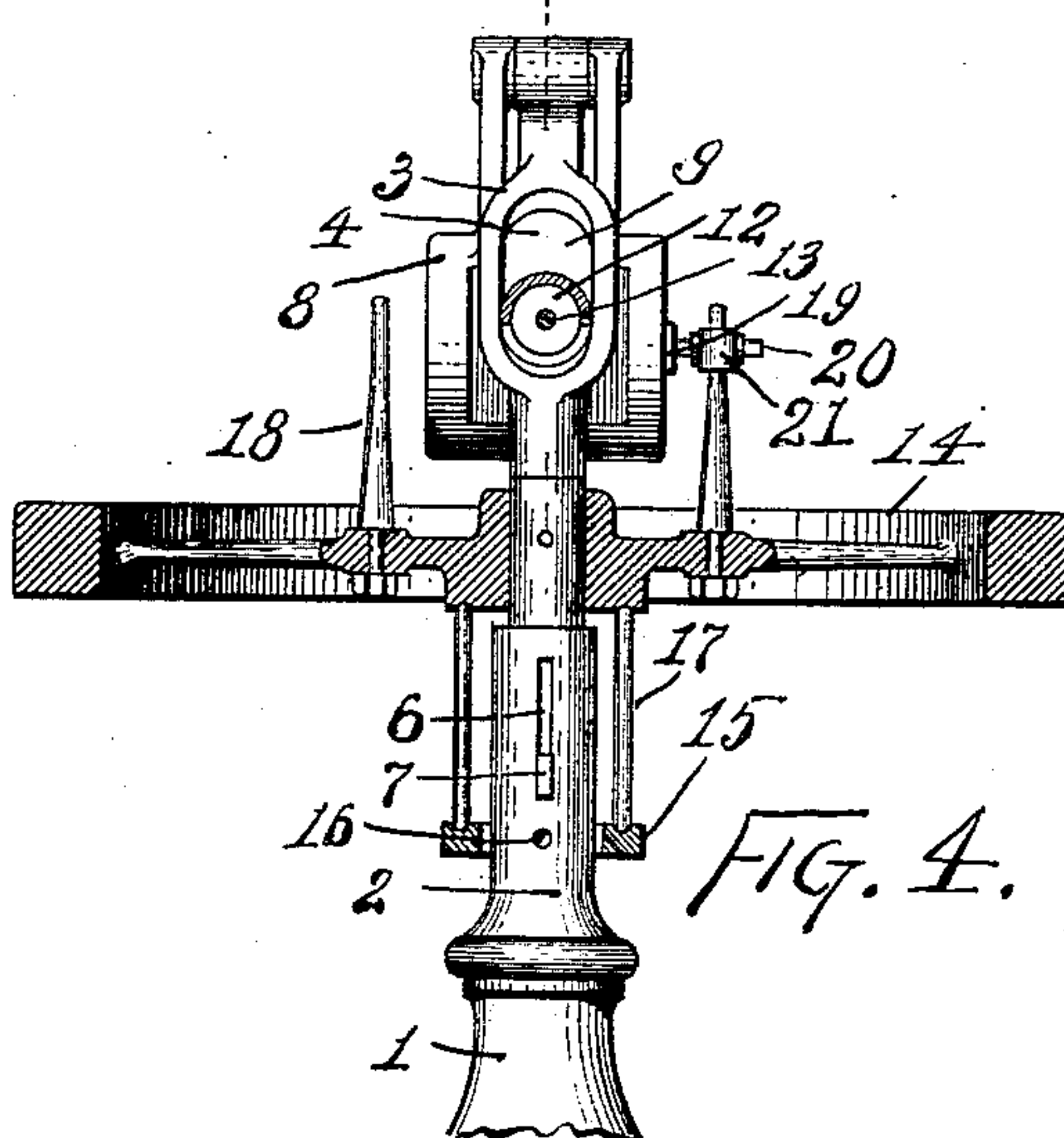
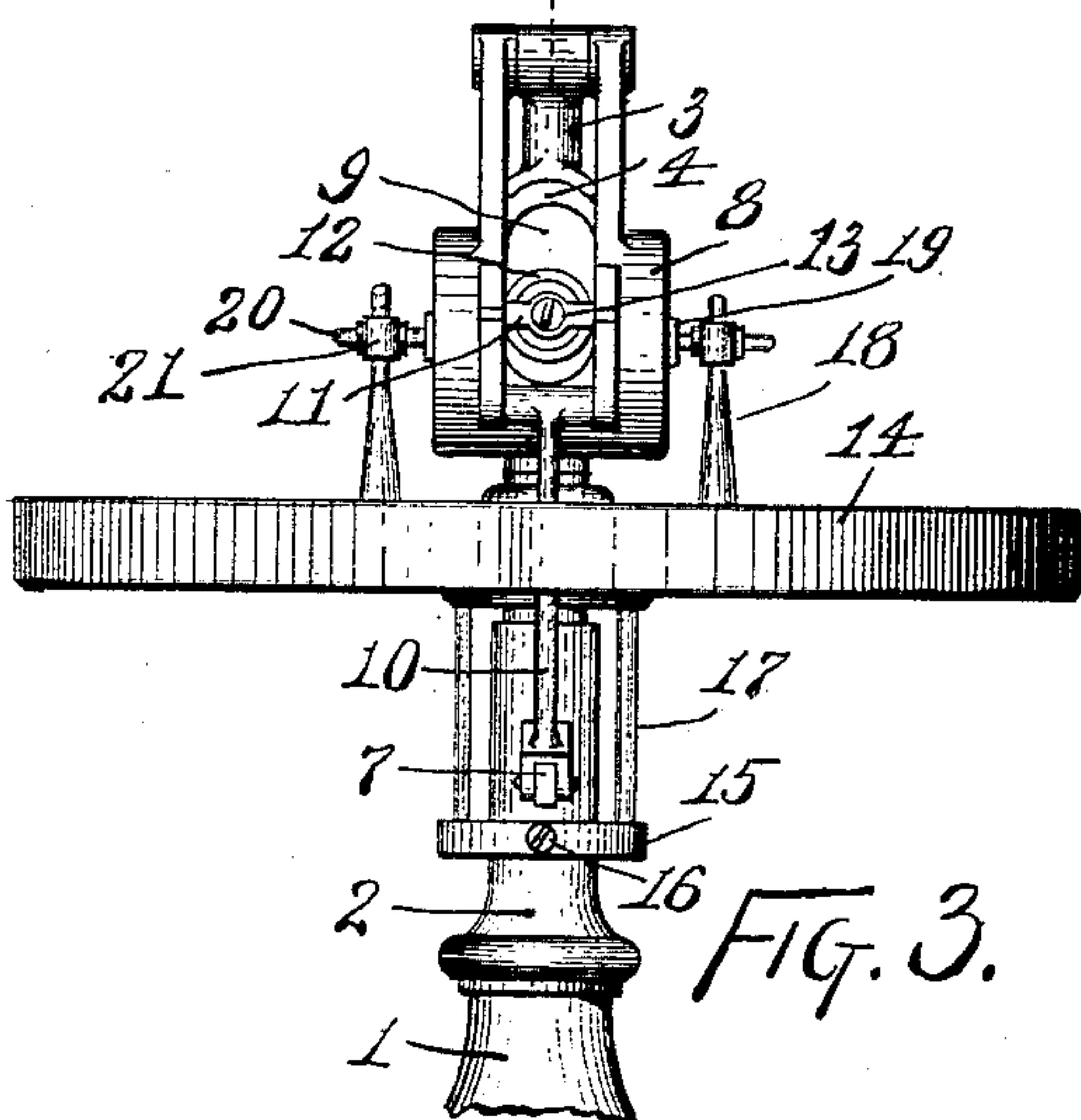
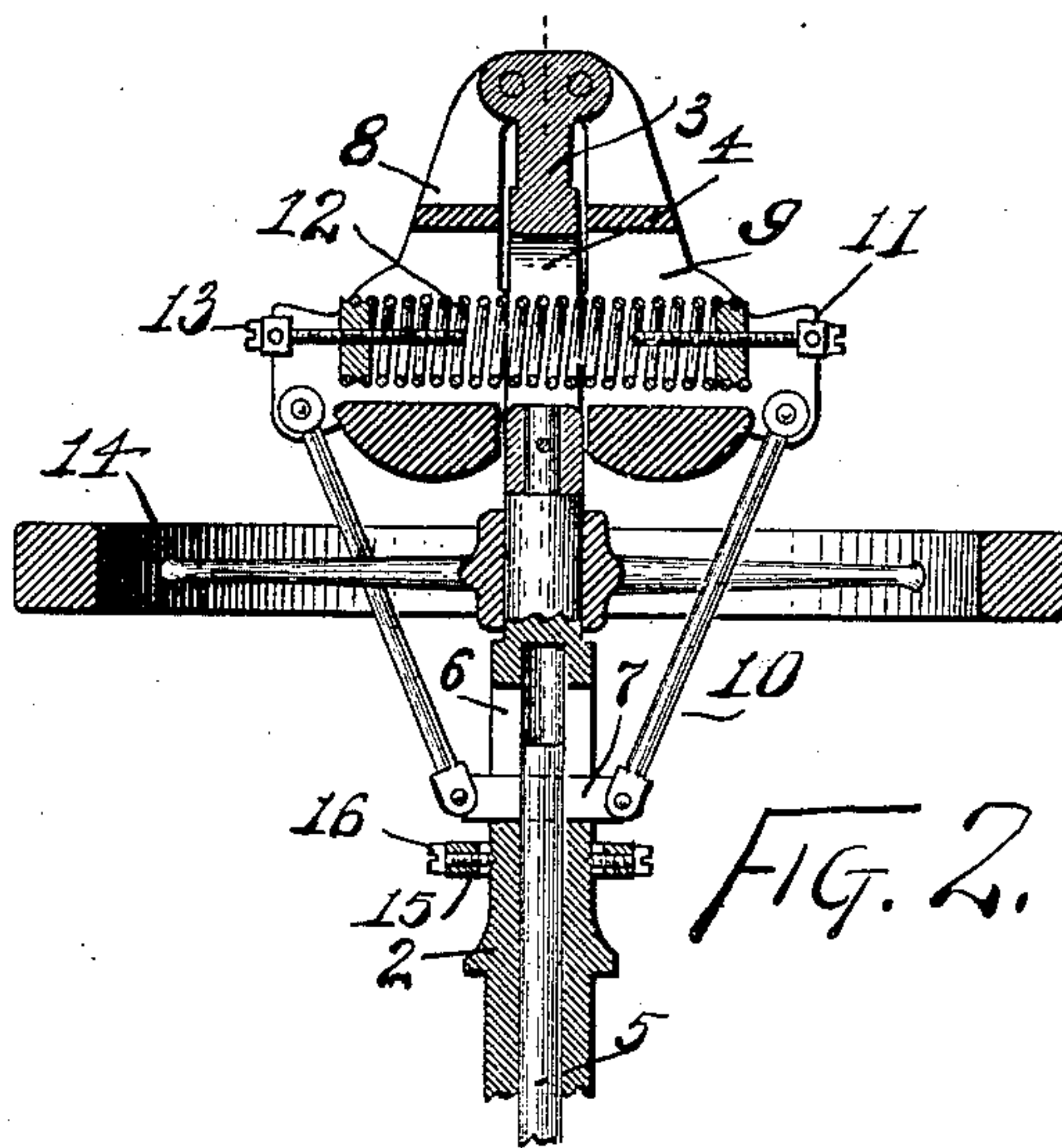
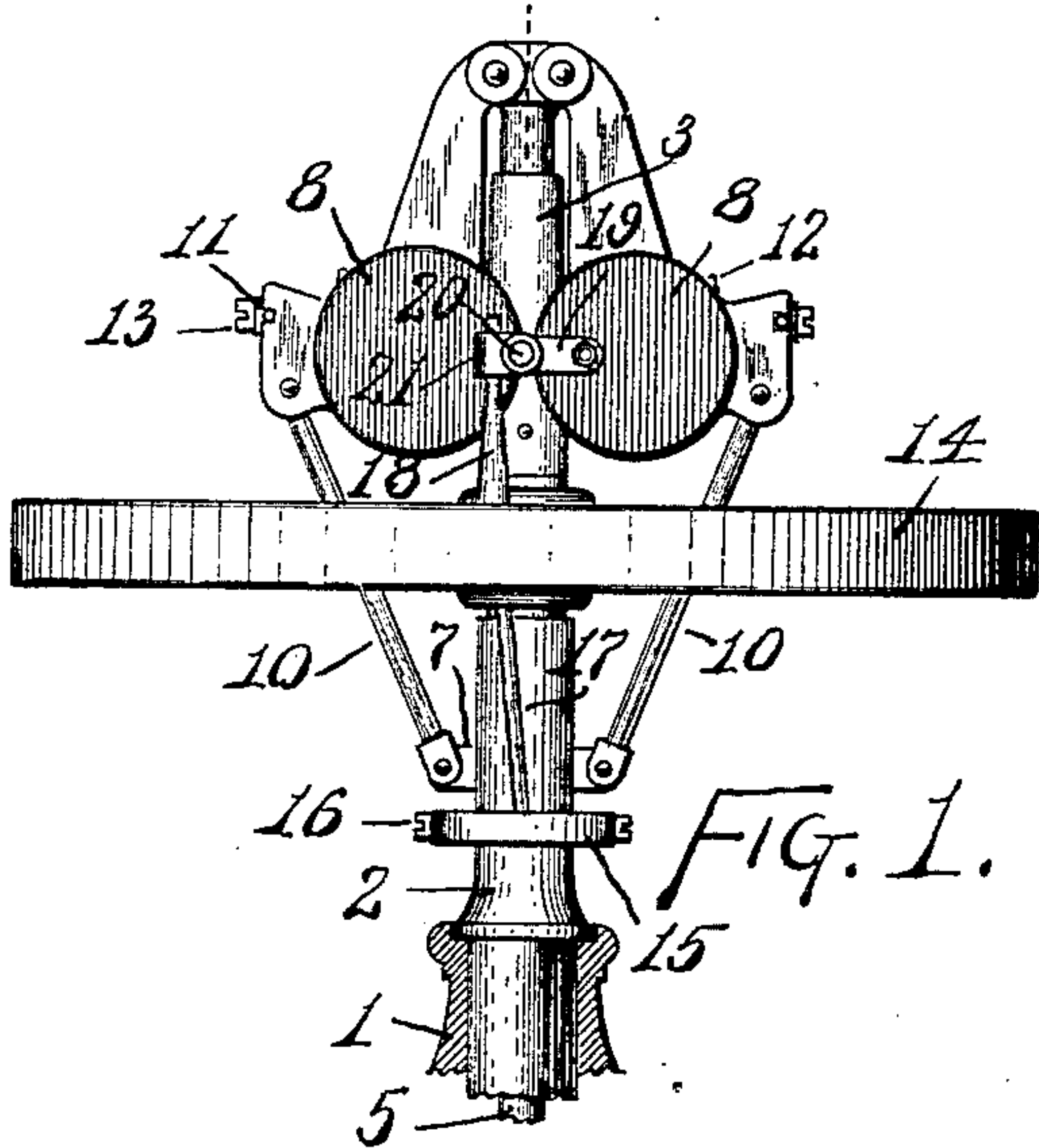
No. 677,053.

Patented June 25, 1901.

J. BEGTRUP.  
GOVERNOR.

(Application filed Feb. 16, 1901.)

(No Model.)



Witnesses:  
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# UNITED STATES - PATENT OFFICE.

JULIUS BEGTRUP, OF JERSEY CITY, NEW JERSEY.

## GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 677,053, dated June 25, 1901.

Application filed February 16, 1901. Serial No. 47,540. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS BEGTRUP, a citizen of the United States, residing in Jersey City, Hudson county, New Jersey, (post-office address No. 853 Newark avenue, Jersey City, New Jersey,) have invented certain new and useful Improvements in Governors, of which the following is a specification.

This invention pertains to improvements in revolving pendulum governors, and the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a governor exemplifying my present improvements; Fig. 2, a vertical central section of the governor, viewed in the same direction as Fig. 1; Fig. 3, a side elevation, and Fig. 4 a vertical central section in a plane at right angles to the plane of section of Fig. 2.

In the drawings, 1 indicates a bearing for the support of the revolving parts of the governor; 2, a spindle journaled therein and adapted to be rotated as usual with governor-spindles; 3, the head of the governor, the same forming the general upper end of the spindle; 4, a transverse opening through the head of the governor; 5, the governor-rod, arranged to slide axially in vertical spindle 2 and forming exemplifying means by which the governor transmits controlling motion to valve parts; 6, a vertical slot transversely through spindle 2; 7, a short bar secured in rod 5 and extending through slot 6 outwardly to each side of the spindle; 8, the governor-balls or centrifugal weights, the same being provided with arms pivoted to the top of the governor-head in an ordinary manner; 9, a large opening horizontally through each governor-ball; 10, links having their upper ends pivoted to the governor-balls and their lower ends pivoted to bar 7, so that the movement of the governor-balls under the action of changes of governor speed results in the vertical adjustment of rod 5 in the ordinary manner; 11, bars horizontally disposed across the outer ends of the openings 9 of the governor-balls, the ends of these bars being journaled, so that they are capable of turning upon their axes; 12, a helical tensional spring disposed through the openings 9 in the gov-

ernor-balls and the opening 4 in the governor-head, this spring being arranged to be free from the walls of the openings throughout the movements of the governor-balls; 13, screws journaled in bars 11 and having threaded attachment with the ends of spring 12, whereby the tension of the spring may be adjusted; 14, an inertia-weight loosely journaled on the governor-spindle below the governor-balls, the same having by preference the form of a wheel, with its hub fitting freely upon the governor-spindle, so as to be capable of turning thereon and also moving vertically thereon; 15, a ring very loosely surrounding the governor-spindle below the inertia-weight; 16, a pair of pivot-screws through ring 15, with their inner ends engaging the governor-spindle at diametrically opposite points, so that the ring is supported upon the governor-spindle and adapted to rock thereon; 17, a pair of toggle-rods, with their lower ends stepped in recesses in the upper surface of ring 15, the upper ends of the rods being seated in recesses in the lower surface of the hub of the inertia-weight, these rods being disposed upon opposite sides of the governor-spindle and in a common general plane at right angles to the vertical plane of ring-pivots 16; 18, a pair of studs projecting rigidly upward from the inertia-weight upon opposite sides of the governor-balls; 19, a bracket secured to a face of each governor-ball, one bracket at one face of one governor-ball and the other bracket at the opposite face of the other governor-ball; 20, studs projecting horizontally outward from brackets 19 and across in rear of the appropriate ones of studs 18; and 21, couplings, each having a bearing on one of studs 20 and one of studs 18, these couplings forming the universal connections between studs 18 and the governor-balls.

The governor, considered as a centrifugal regulator, operates as usual, the outward- and-inward movement of the governor-balls effecting the vertical adjustment of governor-rod 5. Spring 12 furnishes the adjustable centripetal force, the spring being completely housed within the openings in the governor-balls and governor-head.

The governor is rotated in the usual manner by power appropriately applied to its spindle 2, and through the medium of the



couplings 21 and their connected parts the inertia-weight 14 is caused to rotate with the other rotary parts of the governor. The inertia-weight 14 is supported by the governor-spindle through the medium of the balancing-ring 15 and the toggle-rods 17, this support permitting the inertia-weight to rotate with ease upon the governor-spindle and independent of the rotation of the spindle and centrifugal system. It is obvious that the governor-balls in moving out or in will cause more or less change of angular relationship of the inertia-weight to the revolving centrifugal system, and also that any change in the angular relationship between the inertia-weight and the revolving centrifugal system will cause the governor-balls to move out or in. Hence the inertia of the inertia-weight will check or prevent erratic or sudden movements of the governor-balls, thus steadying the action of the governor, and at the same time the inertia-weight, lagging angularly when the governor quickens its speed and advancing angularly relative to the governor when the latter slackens its speed, will impart the proper helpful movement in the proper direction to the governor-balls.

I claim as my invention—

1. In a governor, the combination, substantially as set forth, of a governor-spindle, centrifugal governing parts carried thereby, an inertia-weight journaled on the spindle, a supporting-ring attached to the spindle, toggle-rods resting on said ring and supporting said inertia-weight, and connections between said inertia-weight and said centrifugal governing parts.

2. In a governor, the combination, substantially as set forth, of a governor-spindle, centrifugal governing parts carried thereby, an inertia-weight journaled on the spindle, a supporting-ring attached to the spindle, toggle-rods resting on said ring and supporting said inertia-weight, connections between said inertia-weight and said centrifugal governing parts, and a pivot disposed at right angles to the axis of said spindle and serving to unite said ring and spindle.

3. In a governor, the combination, substantially as set forth, of a governor-spindle, a

head thereto provided with an opening extending through it at right angles to the axis of said spindle, a governor-ball pivoted to said head, and a helical tensional spring extending through said opening and across the axis of said spindle and connected with said governor-ball.

4. In a governor, the combination, substantially as set forth, of a governor-spindle, a head thereto provided with a transverse opening, governor-balls pivoted to said head and disposed at each face of said opening and themselves provided with transverse openings, and a helical spring disposed in the opening in said governor head and balls and connected with said balls.

5. In a governor, the combination, substantially as set forth, of a governor-spindle, a pair of governor-balls pivoted thereto, a stud projecting laterally from each of said balls, an inertia-weight loose on the governor-spindle, studs projecting from said inertia-weight parallel with the spindle, universal couplings connecting said studs in pairs, a ring attached to the governor-spindle by a pivot at right angles to the axis of the spindle, and toggle-rods resting in said ring and supporting said inertia-weight.

6. In a governor, the combination, substantially as set forth, of a governor-spindle, a head thereto provided with a transverse opening, a pair of governor-balls pivoted to said head, a helical tensional spring extending through said opening and connected with said governor-balls, an inertia-weight loose on the governor-spindle, and couplings connecting the inertia-weight and governor-balls.

7. In a governor, the combination, substantially as set forth, of a governor-spindle, a pair of governor-balls pivoted thereto, an inertia-weight loosely journaled on the governor-spindle below the governor-balls, and connections extending upwardly from said inertia-weight and coupled to said governor-balls.

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Witnesses:

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