

No. 630,436.

Patented Aug. 8, 1899.

C. S. AMBRUSTER.
BICYCLE.

(Application filed Dec. 14, 1898.)

(No Model.)

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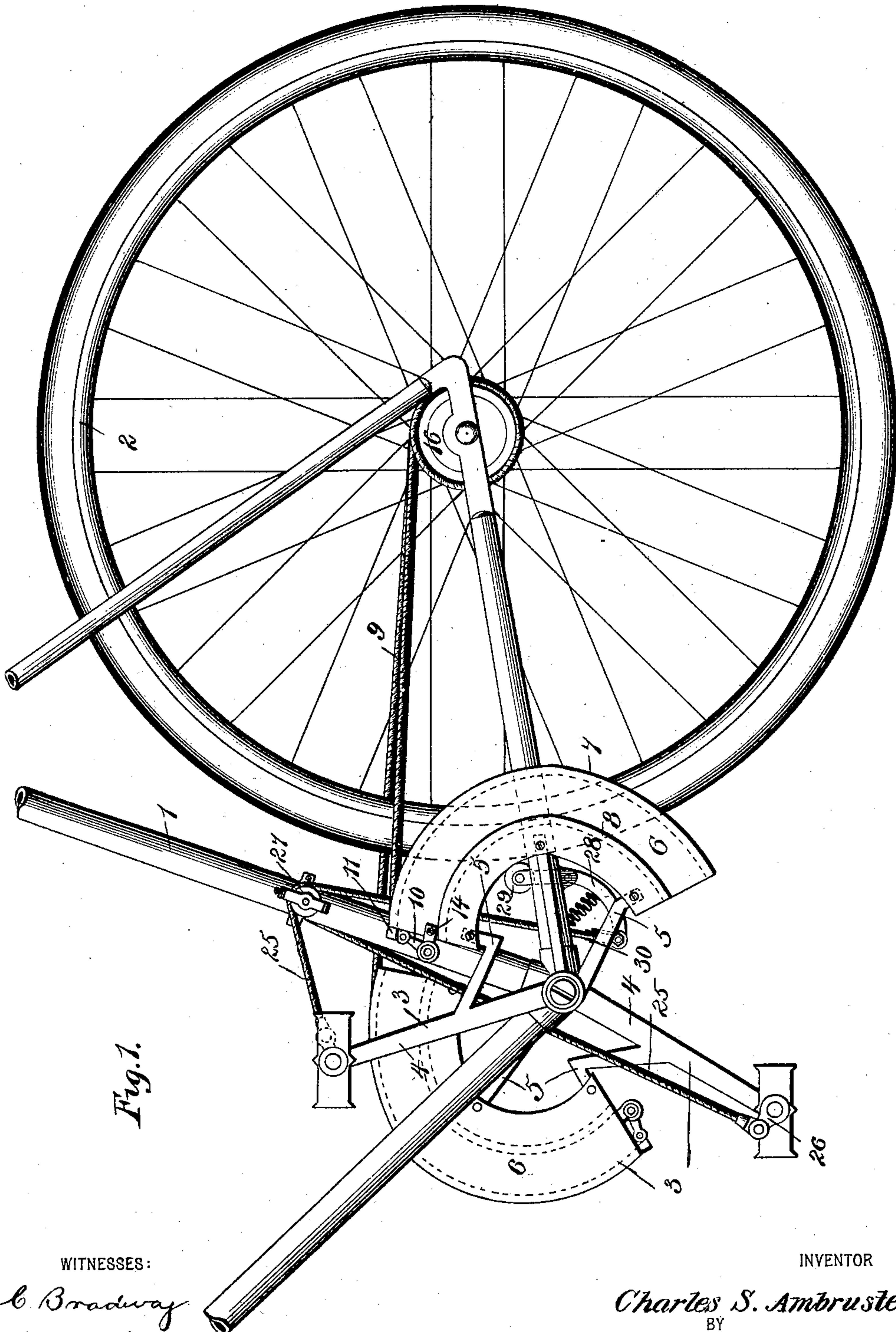


Fig. 1.

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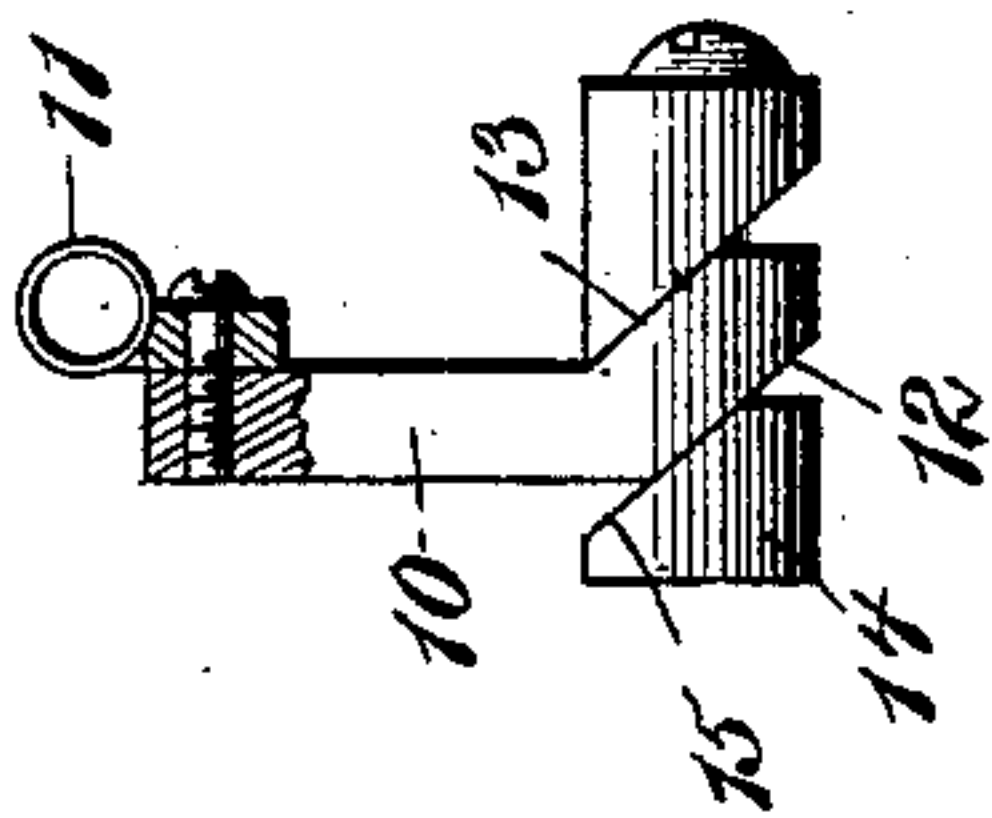


Fig. 8.

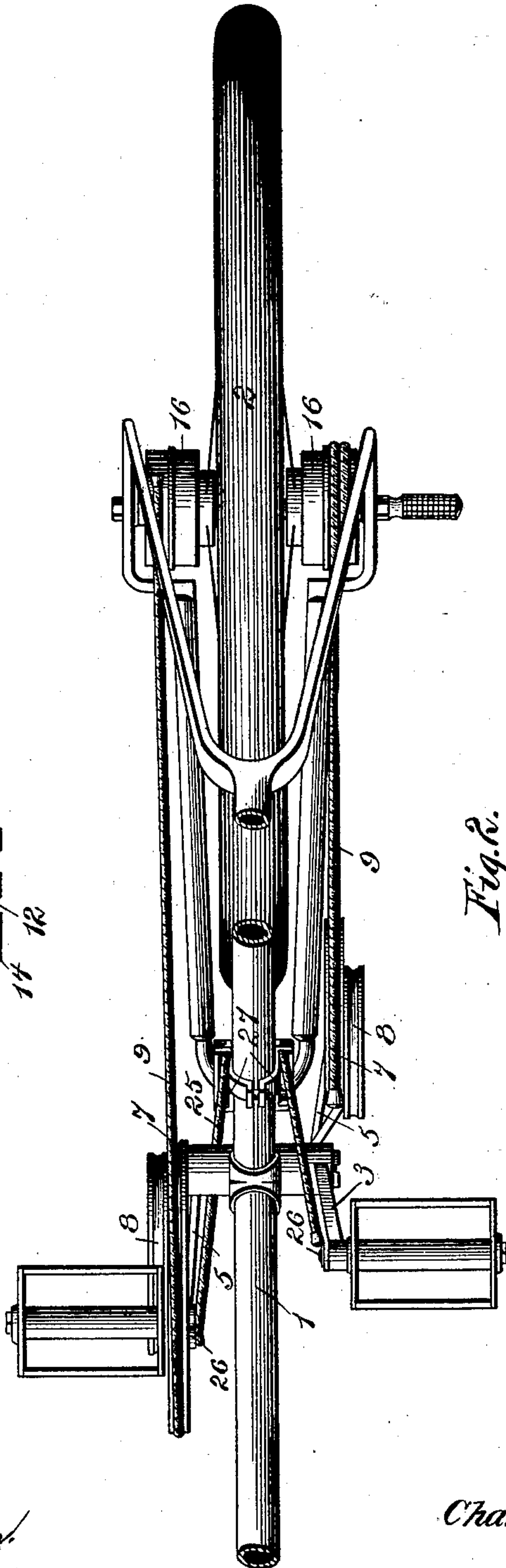


Fig. 2.

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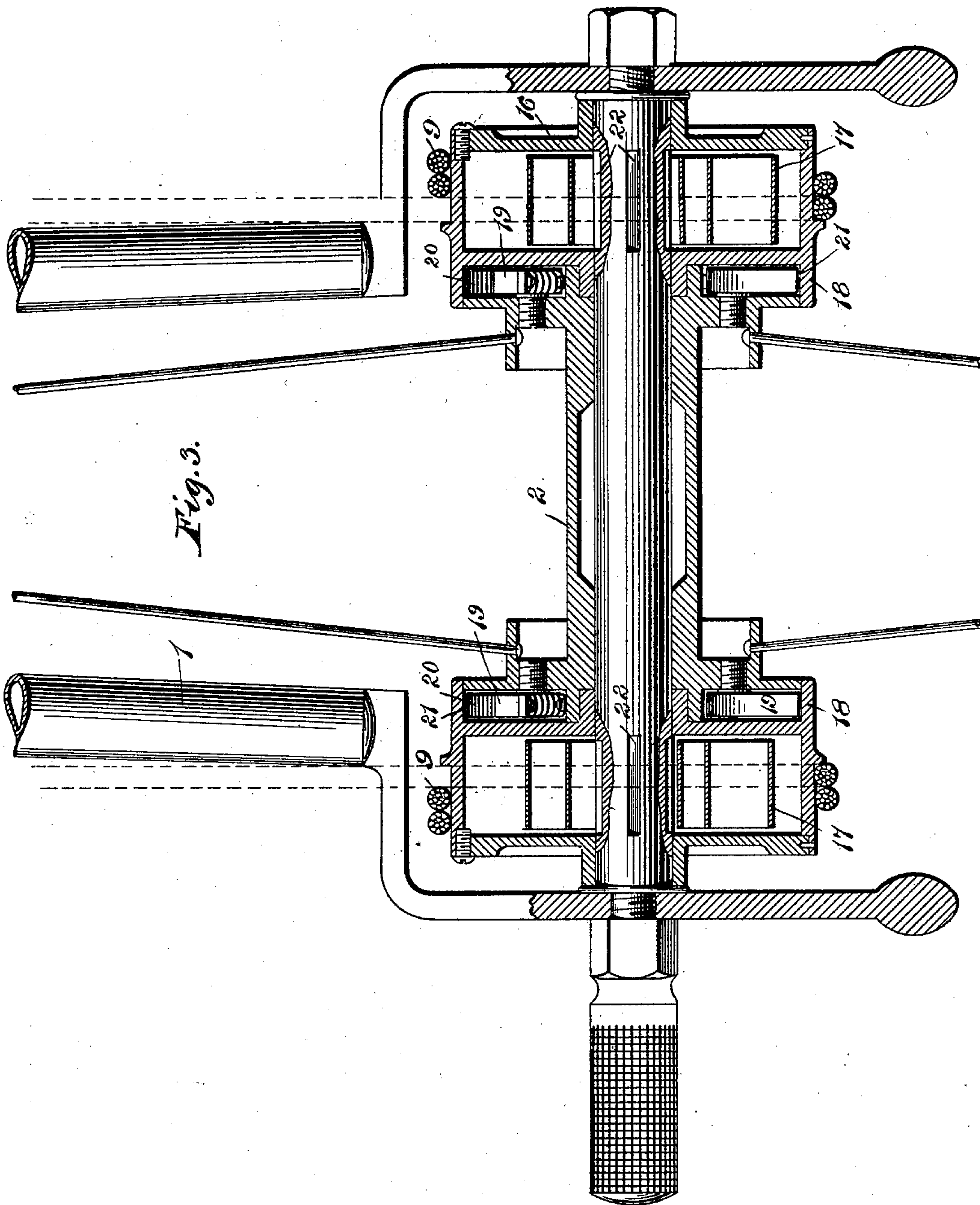
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Fig. 5.

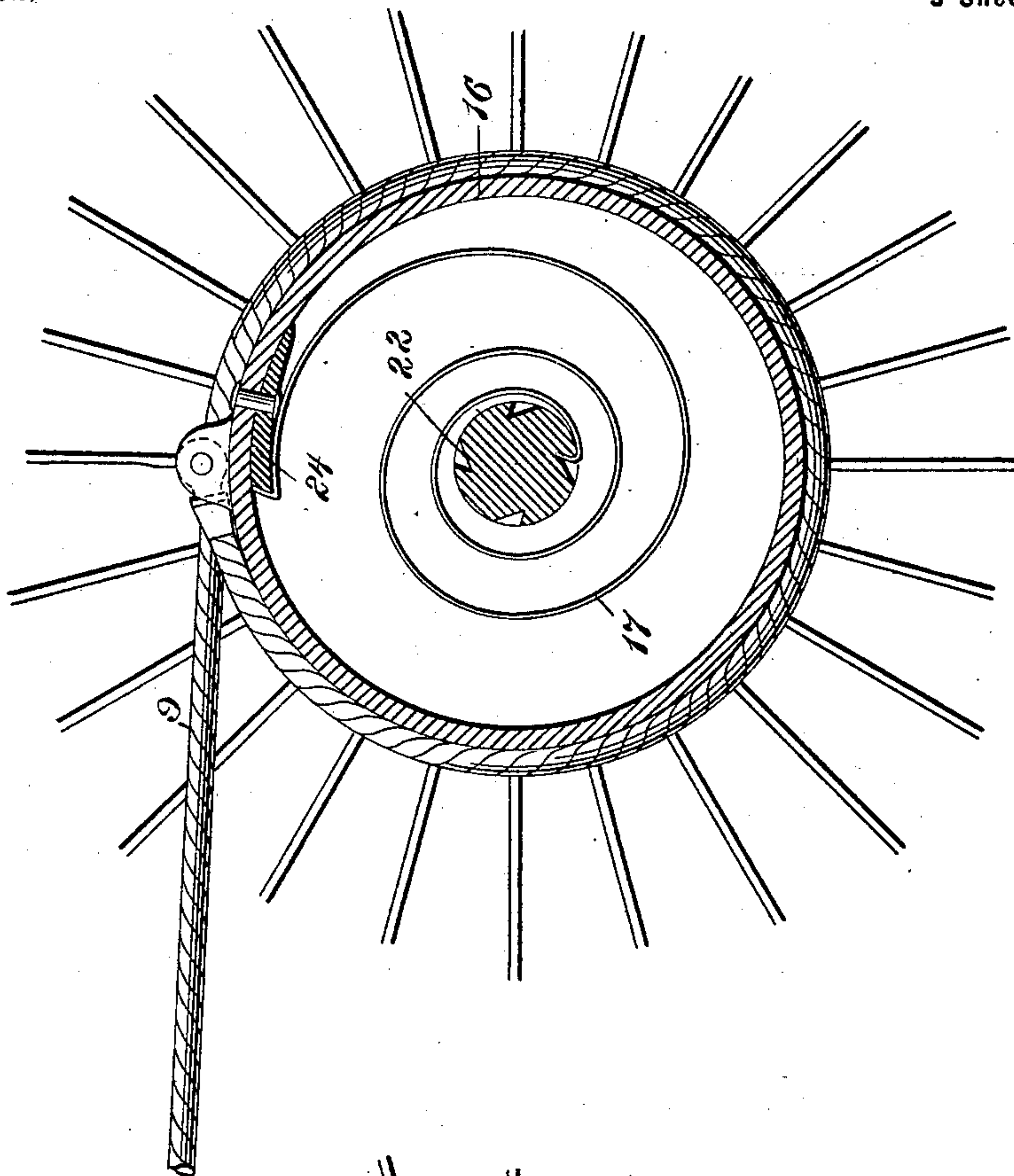
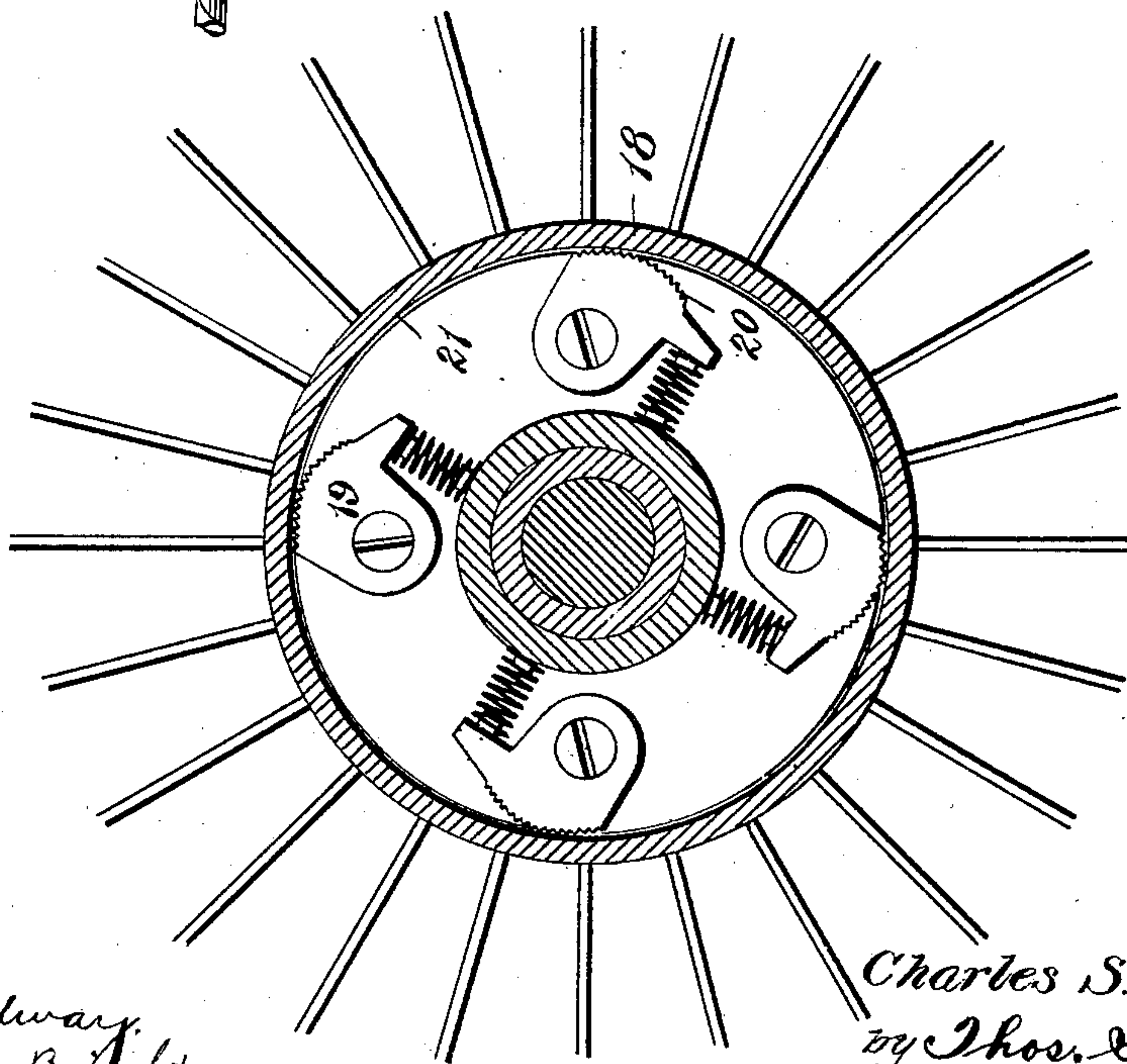


Fig. 4.



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Fig. 7.

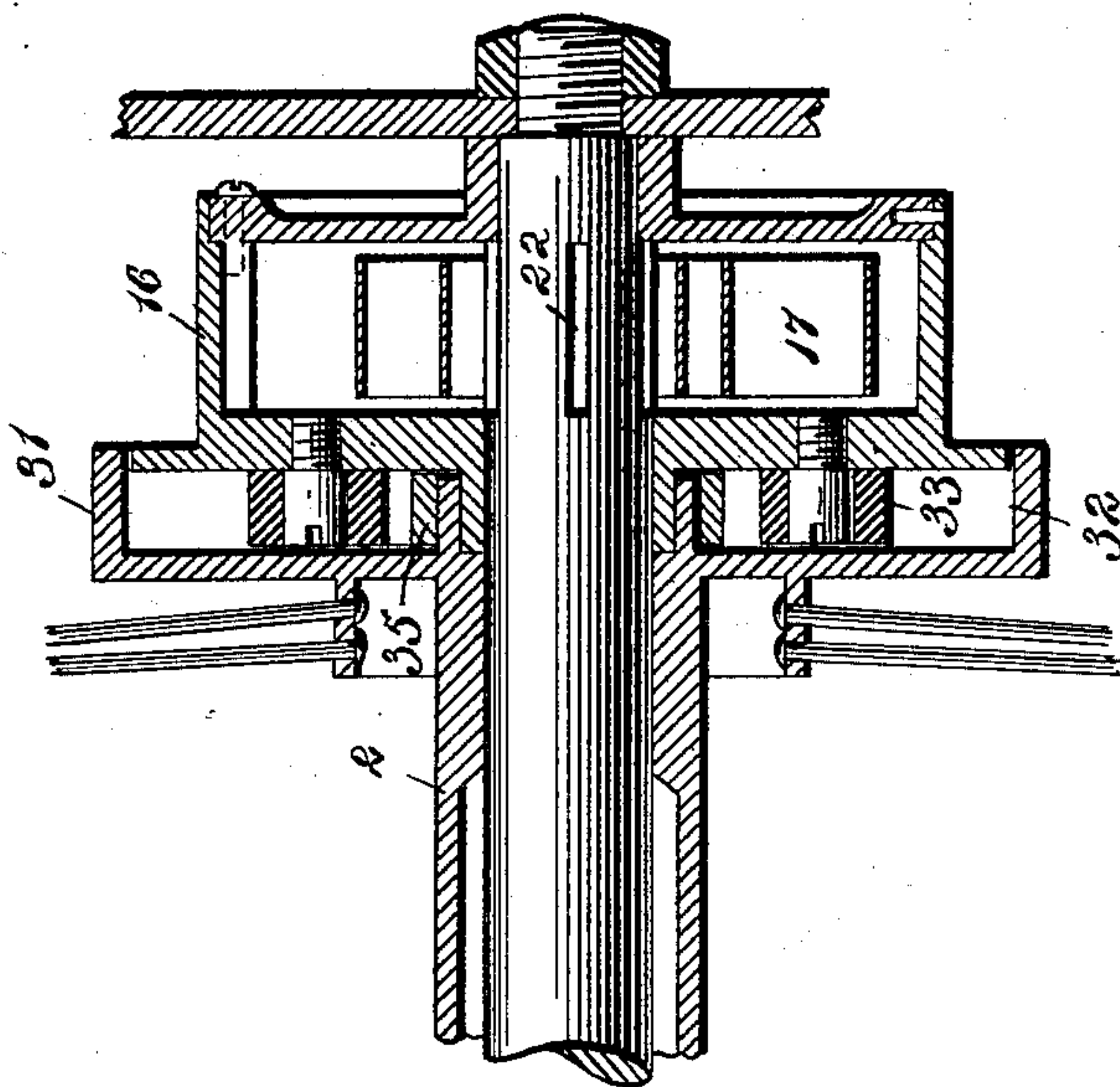
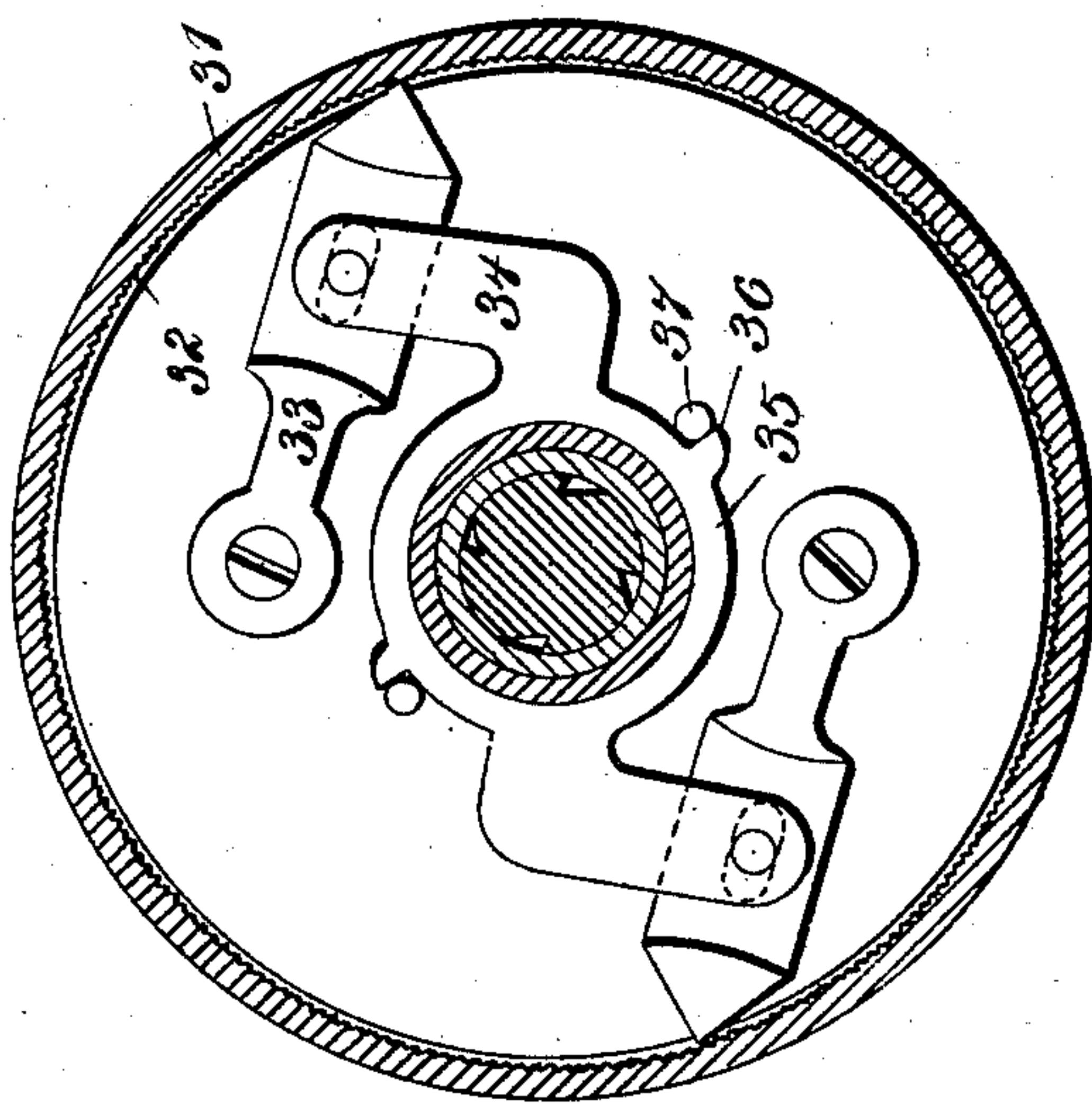


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES STRATTON AMBRUSTER, OF ELMER, NEW JERSEY.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 630,436, dated August 8, 1899.

Application filed December 14, 1898. Serial No. 699,285. (No model.)

To all whom it may concern:

Be it known that I, CHARLES STRATTON AMBRUSTER, of Elmer, county of Salem, State of New Jersey, have invented certain new and useful Improvements in Bicycles, of which the following is a full, clear, and exact description.

My invention relates more particularly to an improved means for changing the gear of bicycles employing a lever-and-ratchet mechanism as a propelling power; and it consists of the several novel features of construction, which will be more fully described, and pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of part of a bicycle embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view taken through the rear wheel, showing the drum mechanism. Figs. 4 and 5 are detail views of the drum mechanism. Fig. 6 is a modified form of the same, and Fig. 7 is a section thereof. Fig. 8 is a detail of a cable-fastening carried on the lever.

Referring to the drawings, similar numerals correspond to similar parts in the several views.

The numeral 1 represents the frame of the bicycle, and 2 the rear wheel.

3 represents the pedal-levers, having bearings at the crank-hanger and consisting of pedal-arms 4, terminating in fingers 5, to which are removably secured sector-plates 6. These plates are provided with grooves 7 and 8, one being circumferential and the other concentric thereto, the object of the grooves being to form bearing-grooves for driving-cable 9. These cable-bearing grooves may be formed in contour of one or more arcs of a circle in order that the sector move with greater speed and leverage to each depression of lever.

The purpose of the plurality of cable-bearing grooves is to present a driving device in which the gear may be readily and expeditiously changed, according to the option of the rider, from a high gear to a low gear, or vice versa. To accomplish this, there is provided a cable-fastening, which consists of an arm 10, carrying a collar 11, pivoted thereto, and a head having parallel inclined surface

12 13. The arm is secured to a stud 14 on the sector by means of a clamping-screw, the said stud having inclined surface 15. The collar is in alinement with one of the grooves, and when it is desired to change the cable to the other the collar is first turned through an arc of one hundred and eighty degrees. Then upon unclamping the head the arm is turned one hundred and eighty degrees, and thus by virtue of the inclined surfaces on the head and stud the fastening moves laterally, so that the collar 11 travels the distance from the plane of one groove to the plane of the other. By reclamping the head the fastening is secured.

The cable 9, extending rearwardly, is coiled around the drum 16, journaled on the axle and on opposite sides of the rear wheel. The drum forms a housing or chamber for the spring 17 and is also provided with a circumferential flange 18, which, butting against the hub, forms a chamber for the ratchet mechanism, which latter consists of spring-pawls 19, having teeth 20, which are adapted to engage rack 21 on the flange 18. The pawls are pivoted to the hub of the wheel, and when the teeth 20 engage the rack 21 the hub and the drum become as one. The spring 17 is fastened at its inner end by a depending portion fitting in longitudinal slot 22 in the axle and the outer end secured by stop 24 on the drum. In operation by the depression of the lever the drum is revolved and the tension of the spring 17 increased. At the same time the teeth of the pawls 19 engage the ratchet on the inner surface of the flange 18, and thereby impart a rotary motion to the wheel. Upon raising the lever the pawls become disengaged and the drum by force of the spring 17 is revolved in the opposite direction independent of the motion of the wheel, thereby re-coiling the cable.

In the pedal-recovering device, 25 represents the reciprocating cable, secured at the ends to the pedal-fastenings 26 and passing over twin pulleys 27, which are clamped on the central tube of the wheel and on opposite sides thereof. The cable extends downward to combine with a brake which consists of a lever 28, carrying a friction-roller 29 and a cable-pulley 30. The said lever is ful-

crummed on and between the bottom forks of the frame. In operation a lever when depressed raises the other by means of the cable, which has a comparatively frictionless passage over the several pulleys, and thus is obtained an efficient alternate and reciprocating action of the levers. When it is desired to apply the brake, both levers are depressed simultaneously, thereby causing the cable to act directly upon the brake-lever, and thus forming braking contact with the rear wheel as an automatic brake.

In Figs. 6 and 7 is presented a modified form of ratchet mechanism, in which the hub of the wheel is provided with a circumferential flange 31, having an internal rack 32. To engage said rack are pawls 33, pivoted to the drum and guided by arms 34, depending in opposite direction from collar 35, encompassing the axle.

I desire to have it understood that I do not limit myself to the above description, but reserve the right to make such changes as are within the scope of the invention.

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

1. In a lever-and-ratchet driving mechanism, a reciprocating lever, provided with a sector having a plurality of cable-bearing grooves, a ratchet mechanism on the axle of the driving-wheel, a cable connecting the ratchet with the sector, means for moving said cable from one bearing-groove to the other, consisting of an arm pivotally secured to the sector and adapted, when turned a sufficient distance on its pivot, to move later-

ally from the plane of one groove to the plane of the other.

2. In a lever-and-ratchet mechanism, the combination with a reciprocating lever provided with a sector having a plurality of cable-bearing grooves, a ratchet mechanism, a cable secured at one end to the ratchet, an arm with a head having an inclined surface, a stud secured to the sector, said stud having an inclined surface corresponding to the inclined surface on the head of the arm, a collar pivoted to the arm to which the other end of the cable is secured, and means whereby said arm may be rigidly held in a desired position, substantially as described.

3. In a lever-and-ratchet mechanism, the combination with a reciprocating lever provided with a sector having a plurality of cable-bearing grooves, a ratchet mechanism, a cable secured at one end to the ratchet, an arm having a head formed of inclined surfaces, a collar pivoted to the arm to which the other end of the cable is secured, a stud secured to the sector, said stud having an inclined surface corresponding to one of the inclined surfaces on the head of the arm, a screw entering a threaded recess in the stud, a washer on said screw having an inclined surface corresponding to the other inclined surface on the head of the arm, so that by turning the screw in the threaded recess the arm may be rigidly clamped between the washer and stud, substantially as described.

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