

No. 652,949.

Patented July 3, 1900.

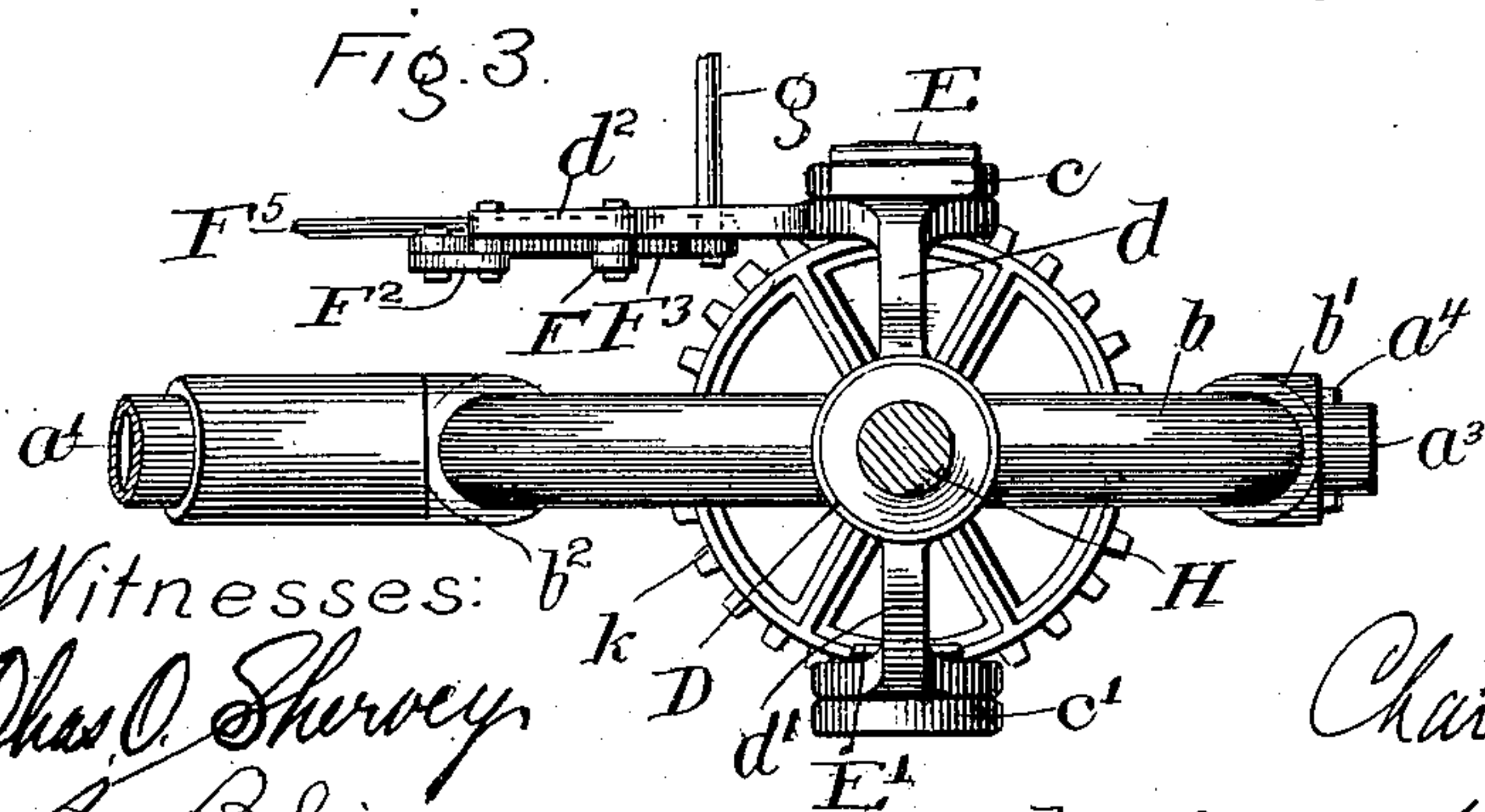
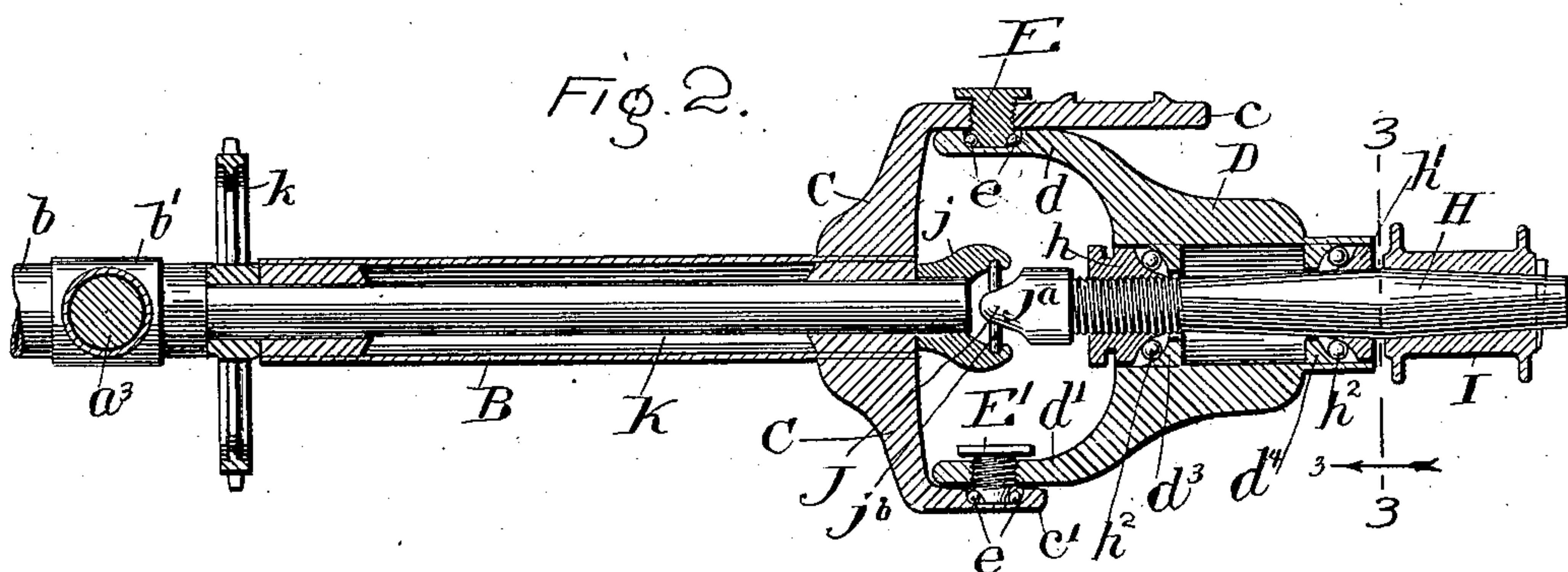
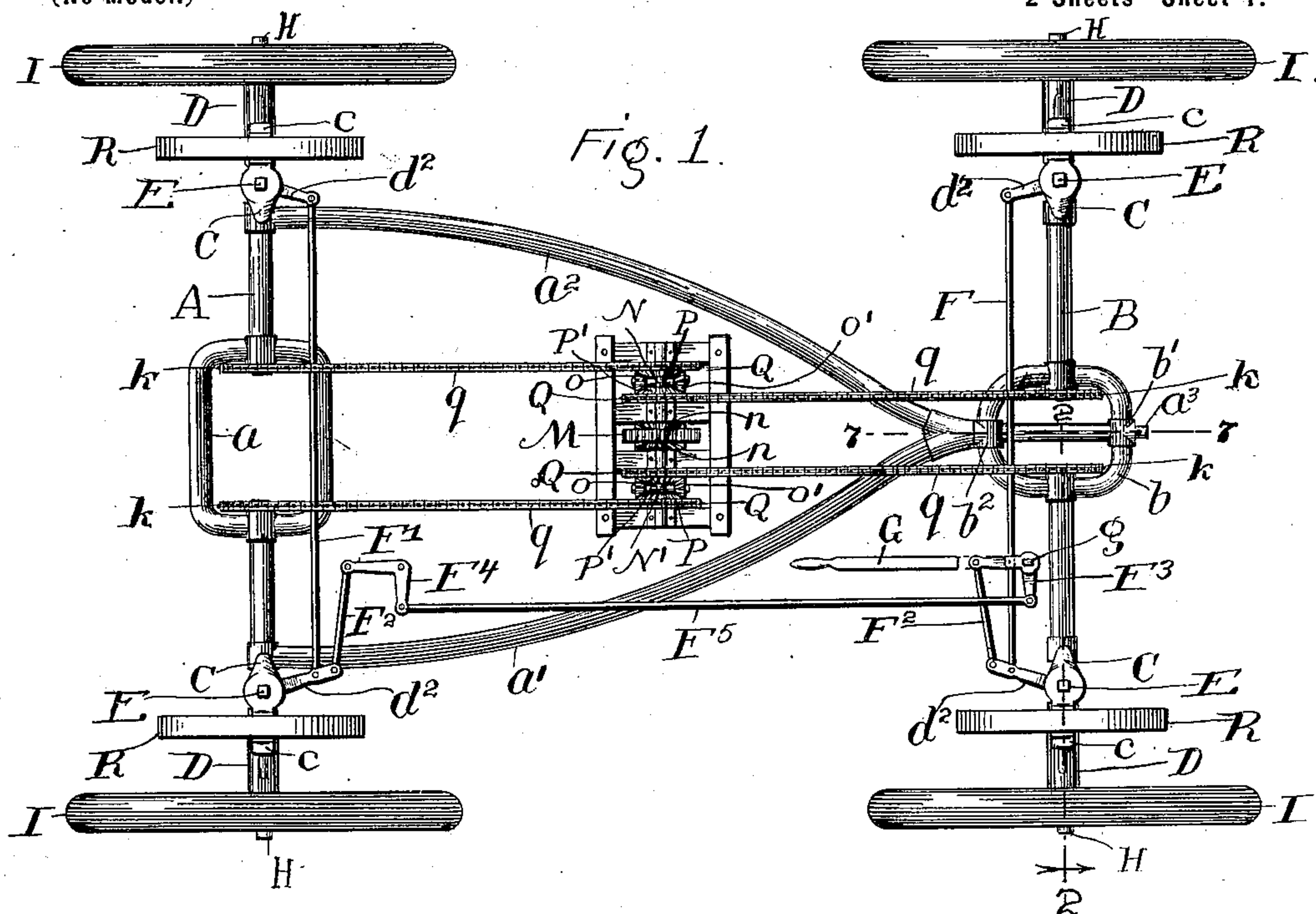
C. COTTA.

RUNNING GEAR FOR AUTOMOBILES.

(Application filed Jan. 17, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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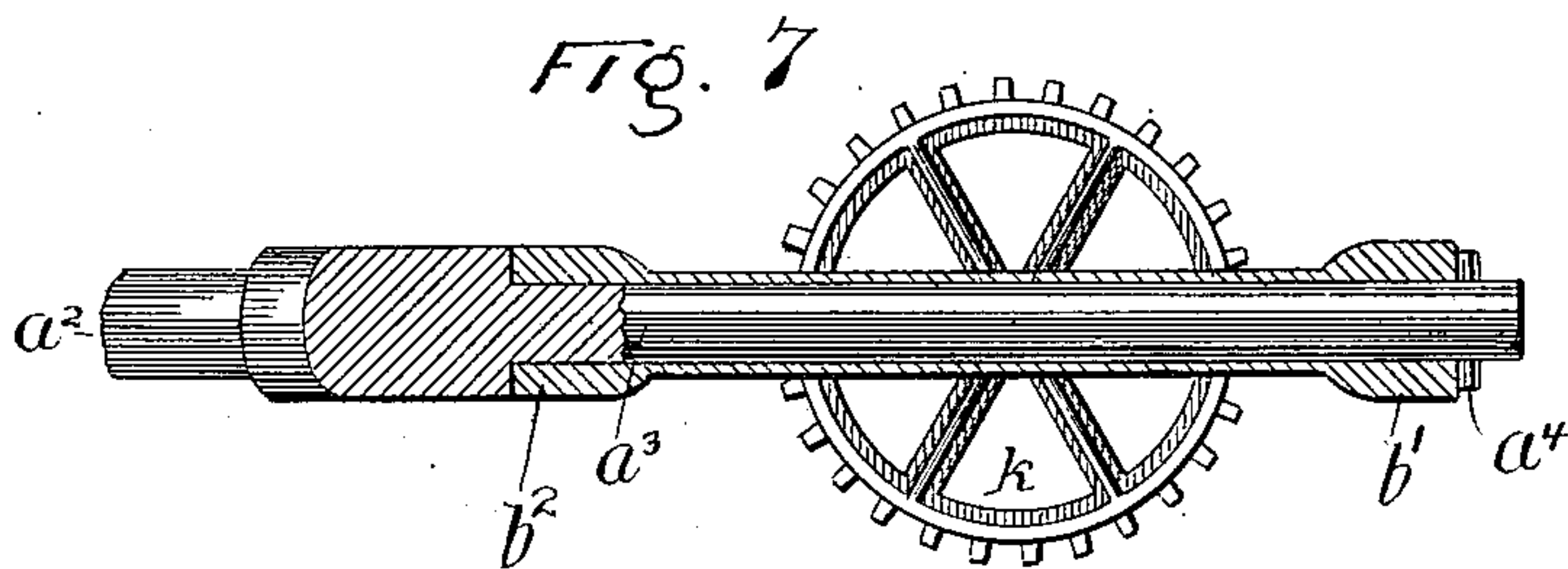
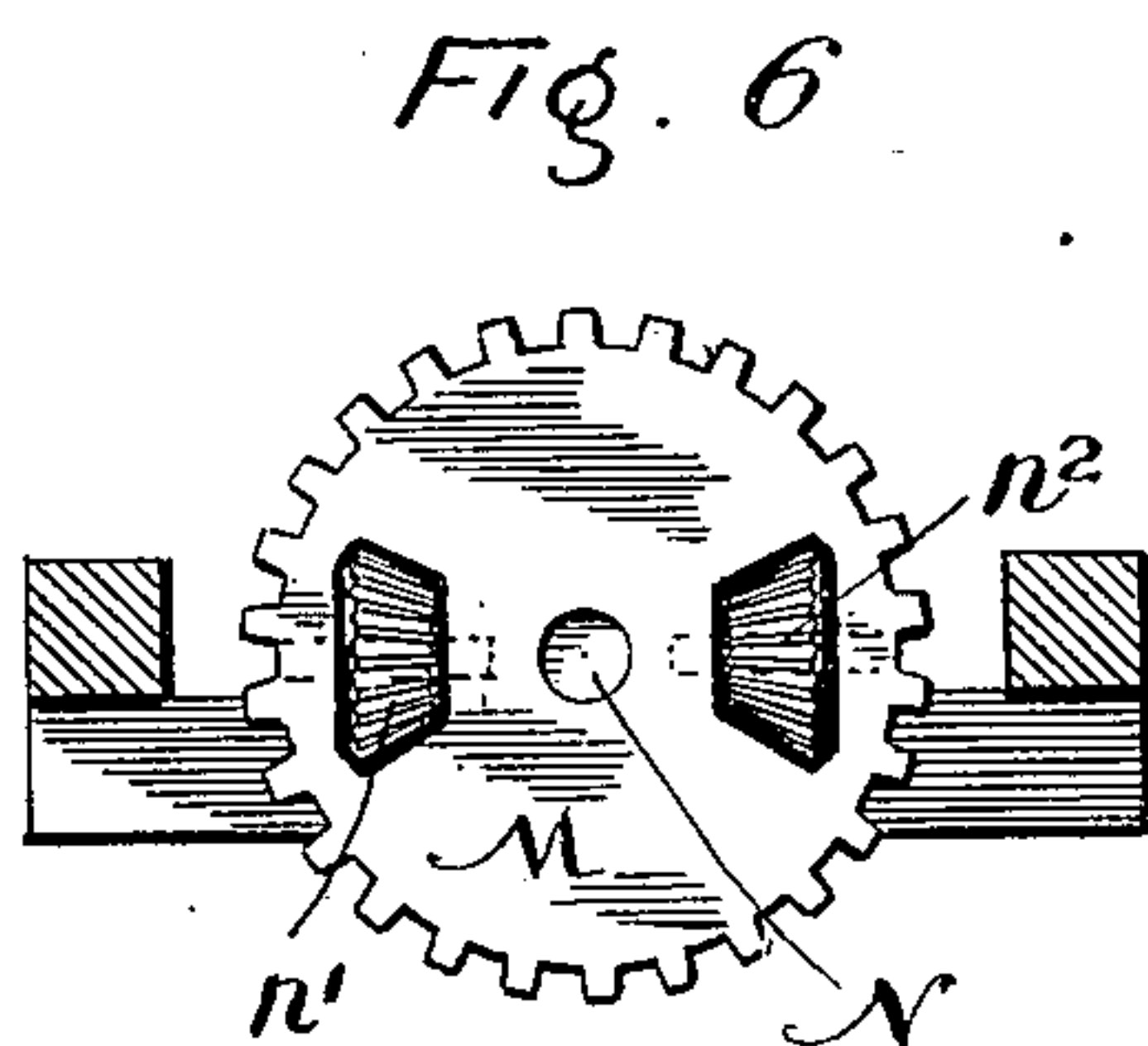
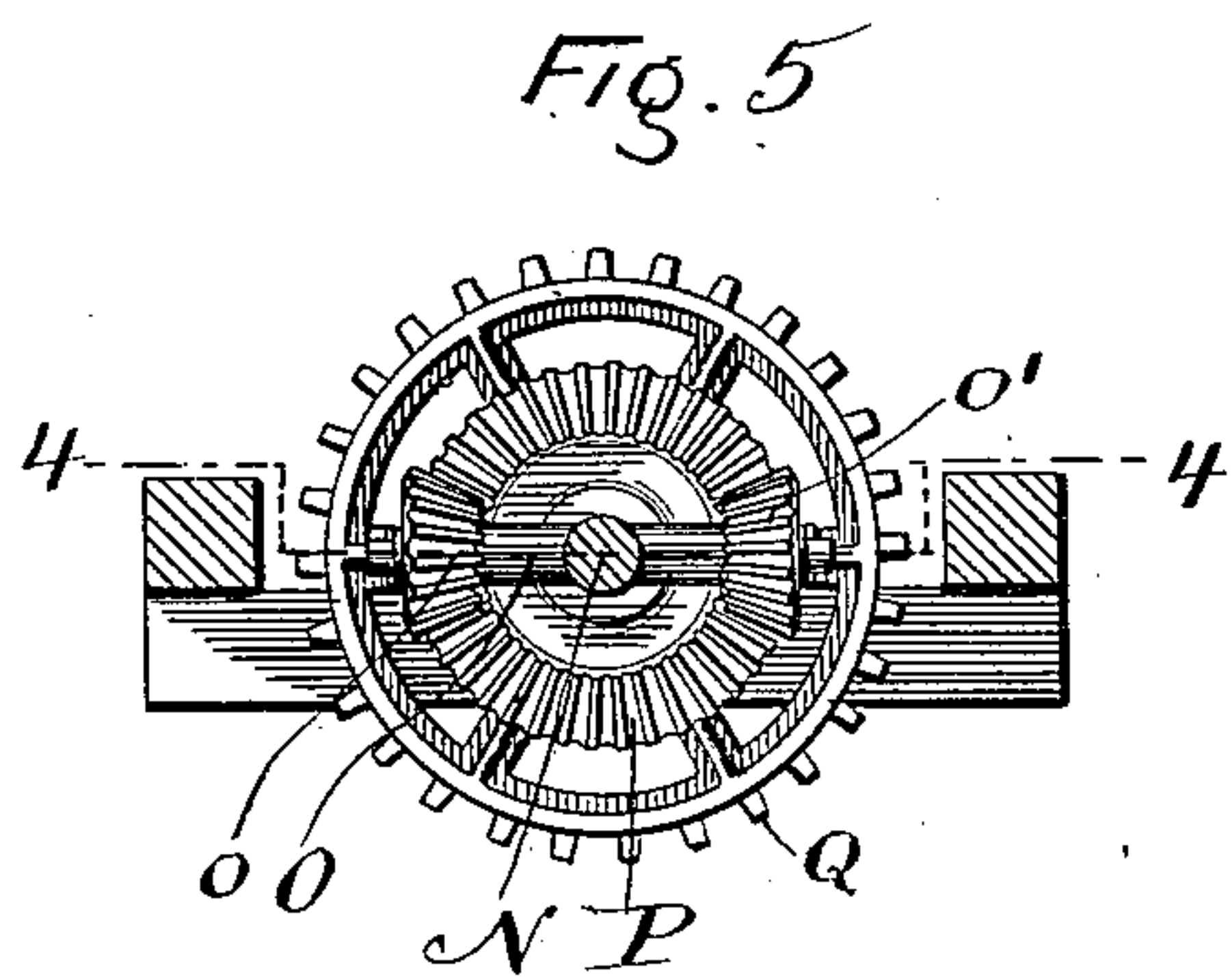
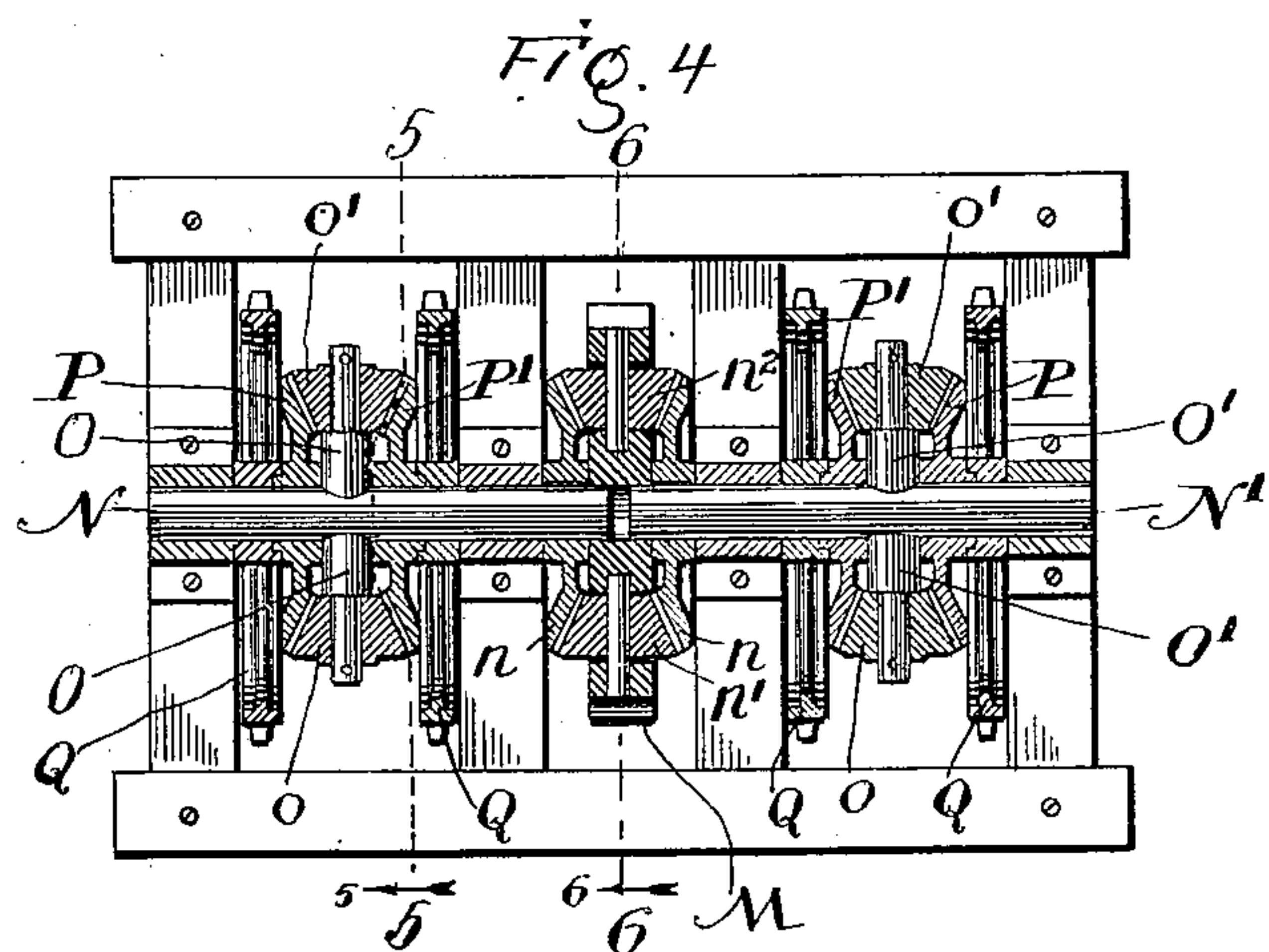
C. COTTA.

RUNNING GEAR FOR AUTOMOBILES.

(Application filed Jan. 17, 1900.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

CHARLES COTTA, OF SHANNON, ILLINOIS.

RUNNING-GEAR FOR AUTOMOBILES.

SPECIFICATION forming part of Letters Patent No. 652,949, dated July 3, 1900.

Application filed January 17, 1900. Serial No. 1,728. (No model.)

To all whom it may concern:

Be it known that I, CHARLES COTTA, a citizen of the United States of America, residing at Shannon, in the county of Carroll and State of Illinois, have invented certain new and useful Improvements in Running-Gear for Automobiles and the Like, of which the following is a specification.

My invention relates to certain improvements in running-gear for automobiles and the like, the purpose of which is to provide for driving said vehicles by means of all four wheels, to transmit the power of the motor independently to each one of the driving-wheels, and to simplify and perfect the construction in various other particulars.

To such end the invention consists in certain novel characteristics, which will be fully described hereinafter in connection with their preferred embodiment and which will be definitely pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a plan of the complete running-gear; Fig. 2, a vertical longitudinal section of one of the axles, taken in line 2 2 of Fig. 1. Fig. 3 is a vertical transverse section of said axle in line 3 3 of Fig. 2 looking in the direction of the arrow 3. Fig. 4 is a sectional plan in line 4 4 of Fig. 5. Fig. 5 is a vertical transverse section in line 5 5 of Fig. 4 looking in the direction of the arrow 5. Fig. 6 is a similar section in line 6 6 of said Fig. 4 looking in the direction of the arrow 6; and Fig. 7 is a vertical section in line 7 7 of Fig. 1, showing the pivotal connection between the front and rear axles by means of which vertical oscillation of one of said axles with respect to the other is permitted.

Referring to the drawings, A represents the rear axle, which contains a loop a at its middle portion and to which is attached two forwardly-extending converging braces a' a^2 , terminating in a single head or horizontal pivot a^3 . The front axle is lettered B and also has a central loop b , said loop containing bearing-pieces b' b^2 , through which the head or pivot a^3 extends. A pin a^4 , passed through the head beyond the bearing b' , prevents the withdrawal of the head. The front axle may oscillate freely in a vertical plane upon this pivot to allow the wheels to accommodate

themselves to any obstructions or depressions in the roadway. The axles are preferably tubular in form and have upon their opposite ends vertical arms C, preferably extending both upward and downward and provided with horizontal extensions at their upper and lower ends c c' , between which are pivoted horizontally-oscillating bearings D by means of diverging arms d d' , arranged within the horizontal extensions c c' . The bearings are pivoted to said extensions by means of pivot-pins E E', between which and the arms of the bearings I have shown antifriction-balls e . The bearings D have horizontal steering-arms d^2 extending rearwardly from the front axle and forwardly from the rear axle, said arms being connected in pairs by the transverse links F F', and the arms on one side of the vehicle being connected by links F² to angle-levers F³ F⁴, themselves connected by a link F⁵.

It is intended that the vehicle be steered by means of a handle G, connected by a vertical post g with one of the angle-levers, and it should be noticed that the oscillation of these angle-levers upon their pivots causes the front and rear wheels to swing in opposite directions, so as to make them follow the same track in rounding a curve.

In the bearings D are secured cups d^3 d^4 , and spindles H are provided with cones h h' , adapted to cooperate with said cups and inclose between them antifriction-balls h^2 . These spindles are adapted for the support of the wheels I at their outer ends, and at their inner ends they are provided with universal joints J, consisting of ordinary tumbling-rod knuckles j j^a , pivoted at right angles to each other to a common pivot-block j^b . The knuckle j is secured to the outer end of a shaft K, extending through the axle and bearing upon its inner end a sprocket-wheel k , by means of which power is transmitted to the driving-wheel at the end of the spindle. The universal joint is located in the line of the pivot-pins E E' and permits the horizontal oscillation of the spindles in guiding the vehicle without interfering with the transmission of the power to the wheels through said spindles.

For the purpose of applying power independently to all four wheels from a single motor I provide a system of gearing, (shown

upon a larger scale in Figs. 4, 5, and 6,) the same consisting of a central gear-wheel M, loosely journaled upon the inner ends of two shafts N N', each of which bears at its inner
 5 end a bevel-gear n in mesh with two bevel-pinions $n' n^2$, radially journaled in the gear M. This is one form of the well-known compensating gear and transmits the power of the motor equally and independently to the
 10 two shafts N N'. Each of said shafts bears radially-extending gudgeons O O', upon the ends of which are journaled bevel-pinions $o o'$ in mesh with bevel-gears P P', loosely mounted upon the shafts and secured against
 15 rotation to sprocket-wheels Q, connected by chains q to the various sprocket-wheels k , connected to the driving-wheels, as above set forth. By this gearing it will be seen that the power of the motor is applied first equally
 20 and independently to the two shafts and then is transmitted from said shafts equally and independently to the four sprocket-wheels, so that any one of the wheels of the gear receives the full force of the motor without re-
 25 gard to the rotation or lack of rotation of any one or all of the other wheels. In this way the difference in the length of the track followed by the outer and inner wheels in rounding a curve is provided for and also the differ-
 30 ence in distance traversed by the various wheels because of the passing of one over an obstruction or through a depression.

The frame of the vehicle is intended to rest upon the horizontal extensions c of the vertical arms C of the axles and in most cases will
 35 be supported by springs, (shown at R in Fig. 1.) The comparatively-long pivot-pin a^3 gives horizontal stiffness to the front axle and yet allows of absolute vertical play.

40 Taken all together, the running-gear and the driving connections apply the power and distribute the strains equally throughout the structure, giving it great ease of movement

and preserving it from any unnecessary shocks upon the various portions. 45

I recognize the possibility of considerable variation in the form and construction and for that reason do not limit myself to the specific details herein shown and described.

I claim as new and desire to secure by Letters Patent— 50

1. In a device of the class described, the combination with four wheels, suitable axles and independent shafts connected with said wheels, of compensating gearing adapted for
 55 connection with a motor, two sets of independent compensating gearing receiving power equally and independently from the first and means for connecting the wheel-shafts respectively with the respective members of the
 60 said two sets of compensating gearing, whereby the power of the motor is applied equally and independently to all four wheels; substantially as described.

2. In a device of the class described, the combination with an axle containing a middle, horizontal loop, of a second axle and a pivot-pin connected to said second axle and turning in bearings in the opposite sides
 70 of said horizontal loop; substantially as described.

3. In a device of the class described, the combination with an axle made up of tubular end portions, connected by a middle loop, of driving-shafts journaled within said end
 75 portions and provided with gear-wheels secured to their inner ends within said loop; substantially as described.

In witness whereof I have hereunto set my hand, at Shannon, in the county of Carroll
 80 and State of Illinois, this 11th day of January, A. D. 1900.

CHAS. COTTA.

Witnesses:

CHAS. SPATZ,

CHAS. W. BURT.