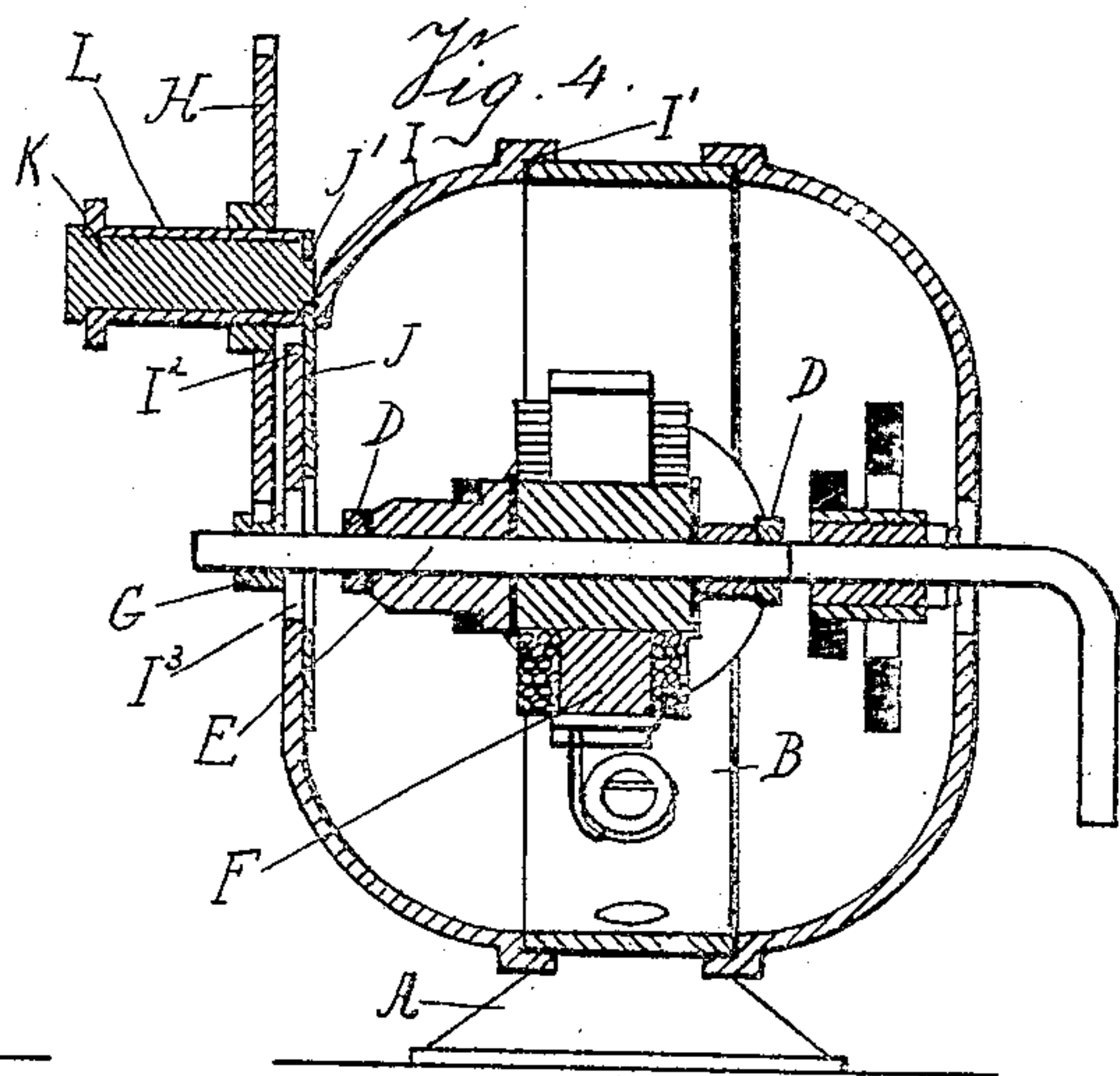
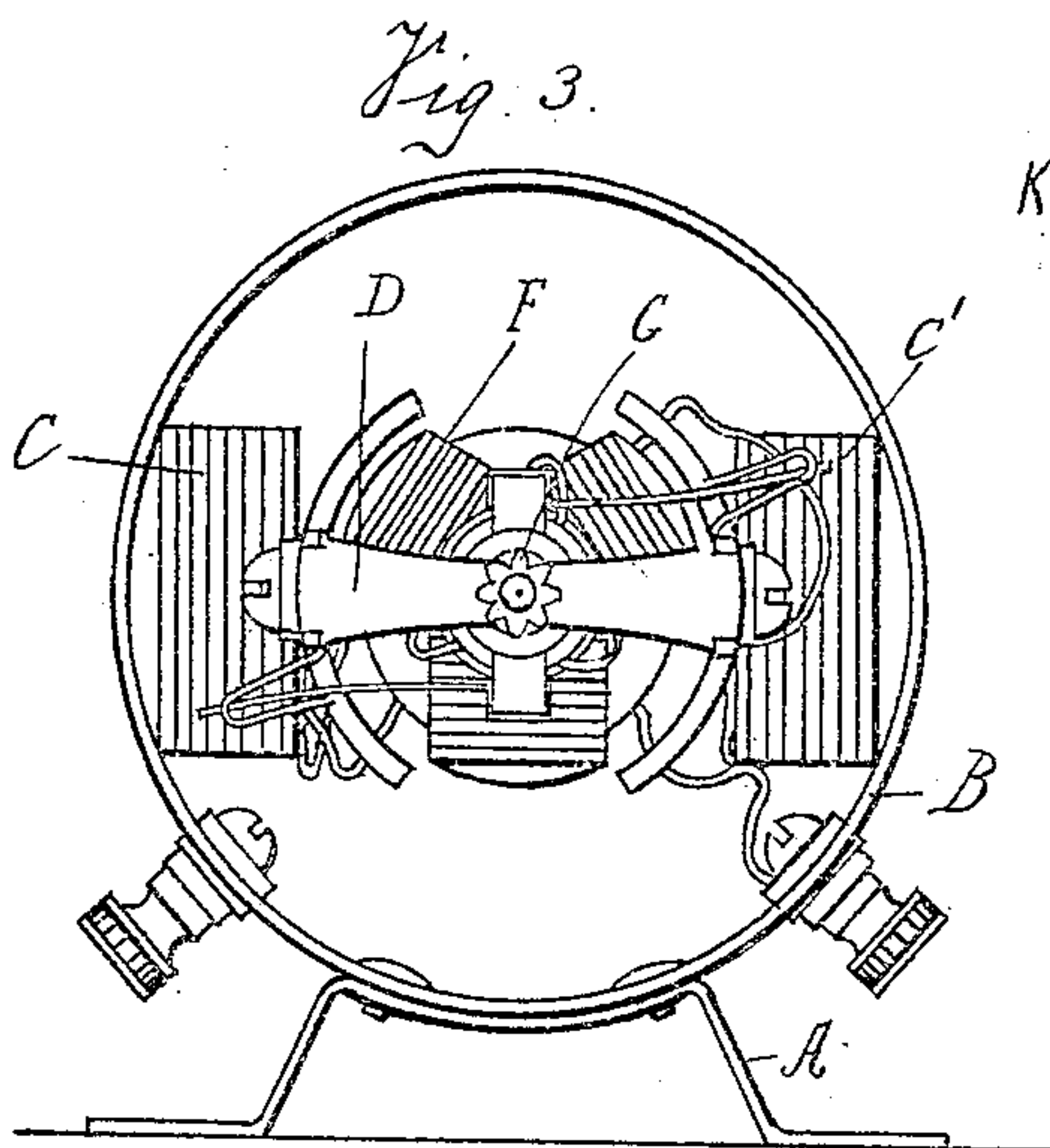
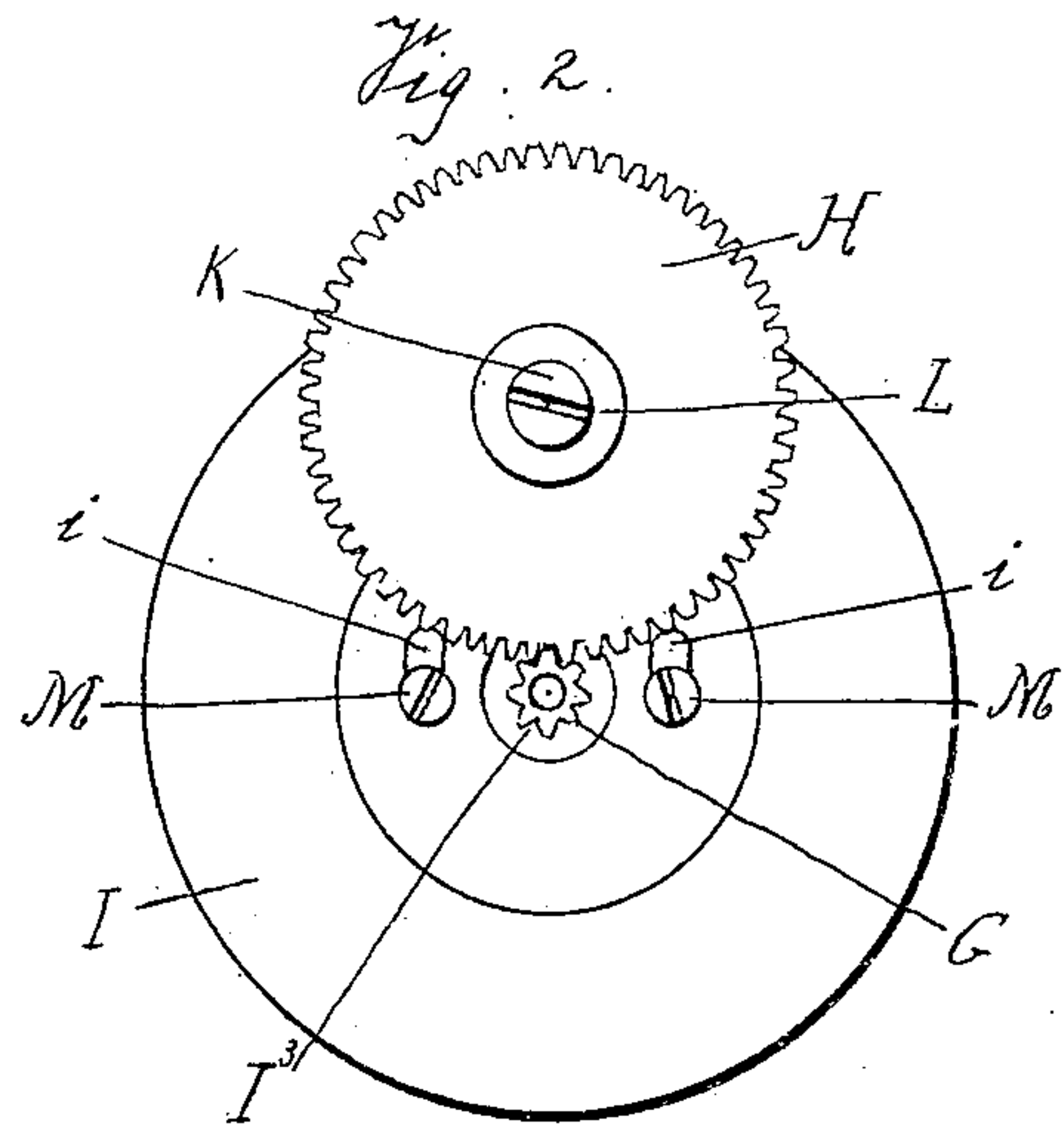
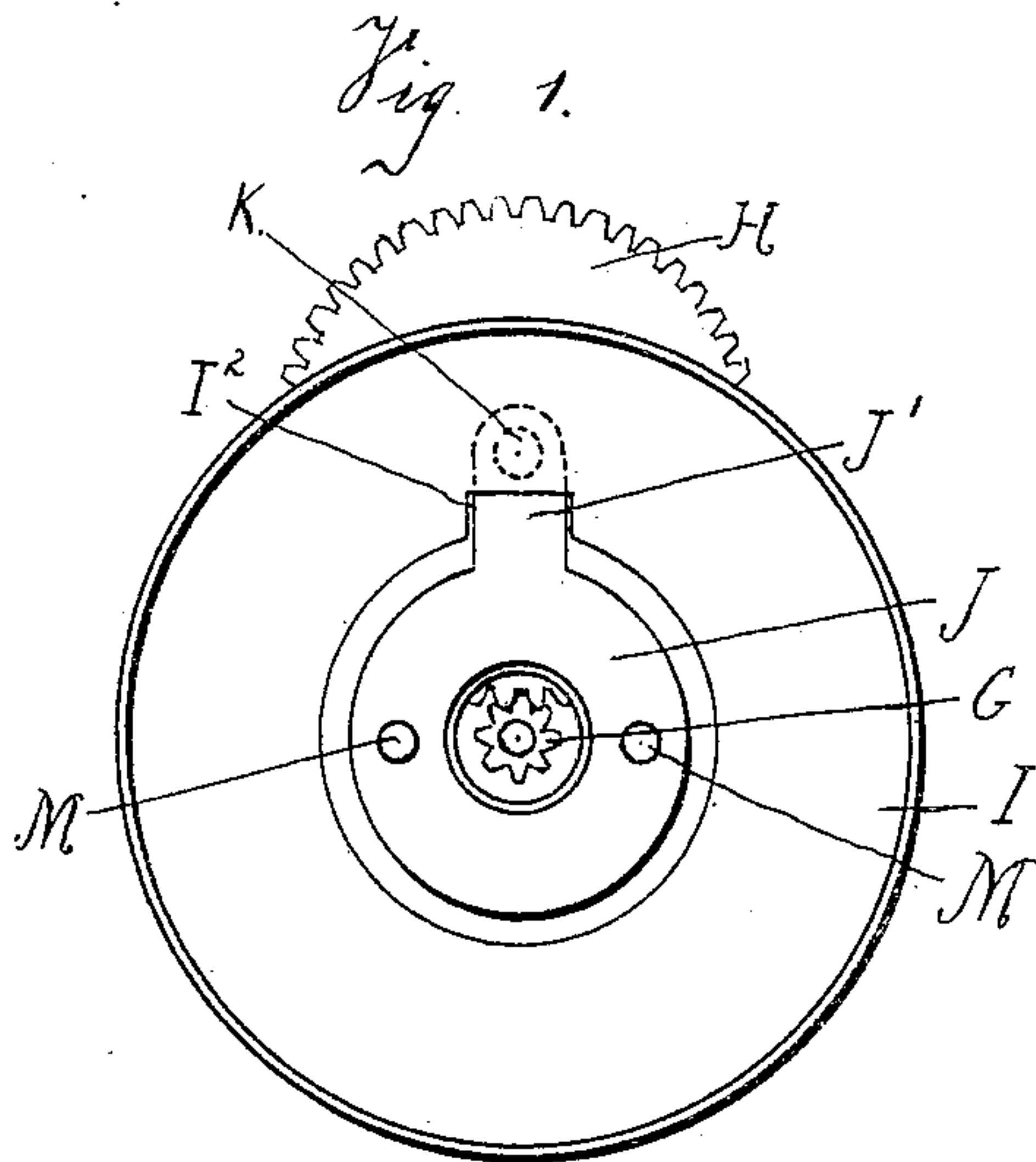


H. C. GRANT.  
ELECTRIC TOY MOTOR.  
APPLICATION FILED JUNE 6, 1908.

931,417.

Patented Aug. 17, 1909.



Witnesses  
L. H. van Raften.  
Virginia Zeis.

Inventor  
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By his Attorney  
Frank W. Ashley.



# UNITED STATES PATENT OFFICE.

HARRY C. GRANT, OF BAYONNE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE LIONELL MANUFACTURING COMPANY, A CORPORATION OF CONNECTICUT.

## ELECTRIC TOY MOTOR.

No. 931,417.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed June 6, 1908. Serial No. 437,118.

*To all whom it may concern:*

Be it known that I, HARRY C. GRANT, a citizen of the United States, and resident of Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Electric Toy Motors, of which the following is a specification.

My invention relates to toy electric motors, and the object of same is to improve certain parts of the construction and to provide means whereby the gear wheels may be adjusted in proper coöperative relation. The size of the motor is shown in the drawings which form a part of this specification, the gear wheels being shown of somewhat coarser pitch than those used in practice.

Referring to the drawings, Figure 1, is a view of one of the covers from the inside thereof, illustrating the means used for supporting the driving gear wheel. Fig. 2, is an exterior view of the cover and gear. Fig. 3, is an end view of the motor with the cover removed, and Fig. 4, is a cross sectional view through the motor.

A, indicates a strip of metal bent to serve as a base and supporting a ring B, which in turn is connected to and supports the pole pieces which carry the coils C and C', and the frame D, which in turn supports the shaft E. The shaft E is driven by the armature F, and carries a small driving gear G, which drives the gear H. The end cover I is formed to engage the ring B at its outer periphery with a tight friction fit, as illustrated in Fig. 4, and is provided with a shoulder I', which abuts the edge of the ring B at every point of its periphery, and when in its proper position on the ring B, the plane surface of the wheel H will stand at a true right angle to the axis of the shaft E, so that the faces of the gear teeth will bear evenly across their entire width. The gear wheel H is supported from the cover I through the instrumentality of a disk J, which is provided with a projection J', which passes through a slot I<sup>2</sup> in the cover I. A stud shaft K is fastened to said projection J' and mounted thereon in rotatable relation is a thimble L carrying the gear H, the surface of said thimble between the gear hub and flange, serving as a friction driving surface for a belt. The disk J is provided with two holes, one at each side thereof, in each of which a screw M is threaded, and the

cover I is provided with two slots i—i, through which the screws M—M project, and this construction allows the disk J to be raised and lowered, whereby a perfect adjustment between the gears G and H may be attained. It will be observed that the hole I<sup>3</sup> is larger in diameter than the diameter of the gear G, so that the cover I may be removed from the ring B and replaced without disturbing the adjustment between the gears after they have once been secured in proper relative positions.

To properly adjust the gears in such small motors where one gear is supported from the inner frame and the other from the cover, has been found to be very difficult, owing to the fact that a very small variation in the proper distance between them would cause them to wear out very fast and to break the gear teeth when driving a fan or load, due to the small contact between the teeth of the gears.

By the present construction, the screws M—M are relieved from a part of the strain due to the projection J' being supported by the sides of the slot I<sup>2</sup>, and the disk J is firmly held in any desired position by setting the screws M—M, thus clamping the disk J tight against the cover I in proper vertical position to attain the desired adjustment.

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

1. A toy motor having a frame; an armature and shaft supported thereby; a gear wheel on said shaft, a cover supported by said frame having a slot, a disk having a projection extending through said slot and adjustable relative to said cover, and a gear wheel carried by said disk and engaging said first named gear wheel.

2. A toy motor having a frame; an armature and shaft supported thereby; a gear wheel on said shaft, a cover supported by said frame having a hole at its center larger than said gear, a gear wheel supported by said cover; and means for adjusting one of said gears relative to the other.

Signed at New York in the county of New York and State of New York this 4th day of June, A. D. 1908.

HARRY C. GRANT.

Witnesses:

FRANK M. ASHLEY,  
A. T. SCHARPS.

It is hereby certified that the name of the assignee in Letters Patent No. 931,417, granted August 17, 1909, upon the application of Harry C. Grant, of Bayonne, New Jersey, for an improvement in "Electric Toy Motors," was erroneously written and printed "The Lionell Manufacturing Company," whereas it should have been written and printed *The Lionel Manufacturing Company*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 25th day of October, A. D., 1910.

[SEAL.]

E. B. MOORE,  
*Commissioner of Patents.*