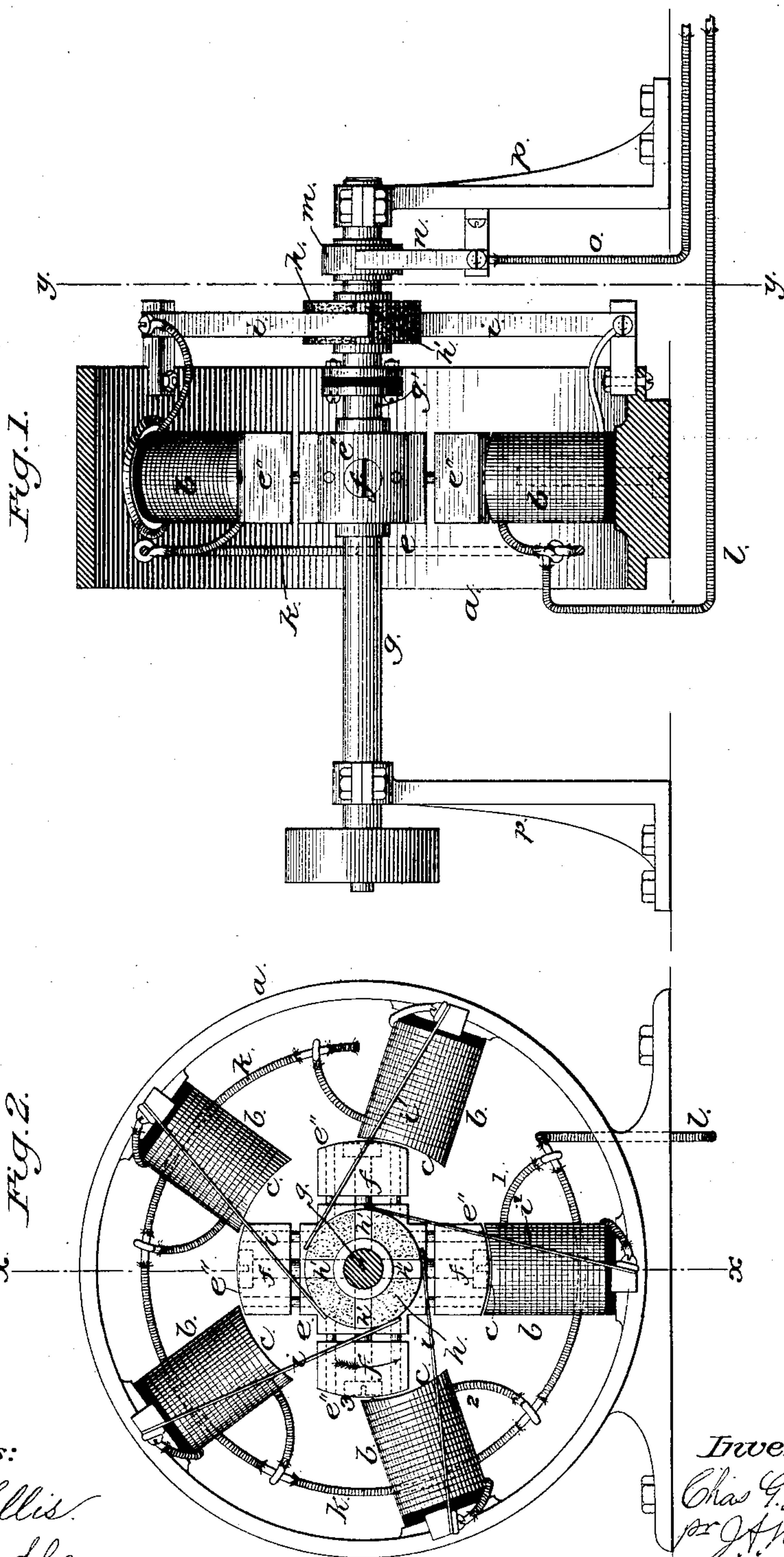


(No Model.)

C. G. PERKINS.
ELECTRO MAGNETIC MOTOR.

No. 315,161.

Patented Apr. 7, 1885.



Witnesses:
John A. Ellis
J. A. Murdle

Inventor:
Chas. G. Perkins
per J. A. Murdle

Atty.

UNITED STATES PATENT OFFICE.

CHARLES G. PERKINS, OF NEW YORK, N. Y., ASSIGNOR TO THE IMPERIAL
ELECTRIC LIGHT COMPANY, OF SAME PLACE.

ELECTRO-MAGNETIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 315,161, dated April 7, 1885.

Application filed February 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHAS. G. PERKINS, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electro-Magnetic Motors, of which the following is a specification.

My invention relates to that class of devices known "as electro-magnetic motors." In the form which I give to my motor a cylindrical shell or ring supports on its interior surface a number of electro-magnets, preferably placed at equal distances apart and extending inward on the radial lines of the cylindrical form to which they are attached. These electro-magnets surround an armature having radial projections. The number of the fixed electro-magnets and the number of the armature-projections are unequal and so related to each other that when at rest the majority of the armature-projections will be out of line with the fixed electro-magnets. The armature-projections are made adjustable. The armature is mounted on a shaft with which is connected or coupled an extension or secondary shaft. The extension-shaft is insulated from the armature-shaft, and upon it is mounted the commutator.

The commutator has as many strips as there are armature-projections. Resting upon and making electrical contact with the commutator-strips are brushes or springs, one from each fixed magnet, by which construction, as will be seen, the number of brushes making contact with the commutator-strips will always be unequal to the number of strips.

In the drawings, Figure 1 is an end elevation of the motor, some of the parts being removed. Fig. 2 is a sectional side elevation of the motor.

Similar letters refer to similar parts throughout the drawings, in which *a* represents the cylindrical shell, having in the form shown five electro-magnets, *b*, rigidly fixed on the interior surface of the cylindrical shell *a*.

The drawings show five fixed electro-magnets; but any other convenient number may be used instead of five.

c are the ends of the cores *d*, which ends cor-

respond in form with the sweep of the adjustable armature *e*.

e'' are the armature - projections, that are made adjustable by means of the screws *f*.

g is the shaft upon which the armature *e* is mounted.

g' is the extension-shaft carrying the commutator *h*.

h' are the metallic strips of the commutator.

i are the metallic brushes. One end of each bears upon the periphery of the commutator *h*. The remaining ends of the brushes are properly secured to and insulated from the cylindrical shell *a*. Each brush is electrically connected with one end of the wire forming the helix of one fixed magnet. The other ends of the helix-wires are electrically connected with the conductor *k*, here made in the form of an arc concentric with the cylindrical shell.

l is the main conductor connected therewith.

m is a metallic ring secured to the secondary shaft. This ring engages with a metallic spring, *n*, which is electrically connected with the main conductor *o*.

p are the bearings supporting both shafts *g g'*.

The circuit.—The circuit is represented in the drawings as passing through the conductor *k*, thence through the helix 1, from which it passes to the brush *i'*, to the metallic strip or plate *h'*, thence through the shaft *g*, to the metallic ring *m*, through which it passes to the metallic spring *n*, thence to the conductor *o*, back to the source of electrical energy.

It will be obvious that when the commutator strip or plate *h'* shall have nearly passed from beneath the brush *i'* the circuit will have been closed through the helix 2, whereby the extension 3 of the armature will be brought directly opposite the core of the helix 2, and so on throughout the series of helices. The speed of the revolving armature will depend upon the amount of current supplied. It will also be seen that by my peculiar arrangement of electro-magnets and armature-extensions and their numerical relation it will be impossible to place them in such relation to each other as that the current will not pass through one of the helices. The magnetic force will thus be operative in whatever position the armature may be when the electric current is

conducted to the motor, and the magnetic force will be transferred from one magnet to the next in series by the operation of the commutator and brushes, and the entire effect of the electric current will be confined to the electro-magnets that by their position will have the greatest efficiency.

The radial extensions of the armature are made adjustable by means of the set-screw, in order that they may be accurately fixed in position where they will traverse the greatest number of the lines of force of the magnetic field, and adjusted thereto as the conditions of the motor may suggest.

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

1. In combination with electro-magnets forming the field of an electro-magnetic motor, a revolving armature provided with adjustable extensions.

2. The electro-magnetic motor, consisting of a cylindrical shell or form having electro-magnets arranged radially on the interior thereof, in combination with a revolving armature provided with adjustable extensions.

3. The combination, substantially as shown and described, consisting of the cylindrical shell *a*, electro-magnets *b*, metallic springs *i*, commutator *h*, rotating armature *e*, provided with adjustable extensions *e'*, shafts *g g'*, metallic ring *m*, spring *n*, conductors *o k l*, and bearings *p*.

Signed at New York, in the county of New York and State of New York, this 5th day of February, A. D. 1884.

CHARLES G. PERKINS.

Witnesses:

J. A. HURDLE,
E. WM. EDWARDS.