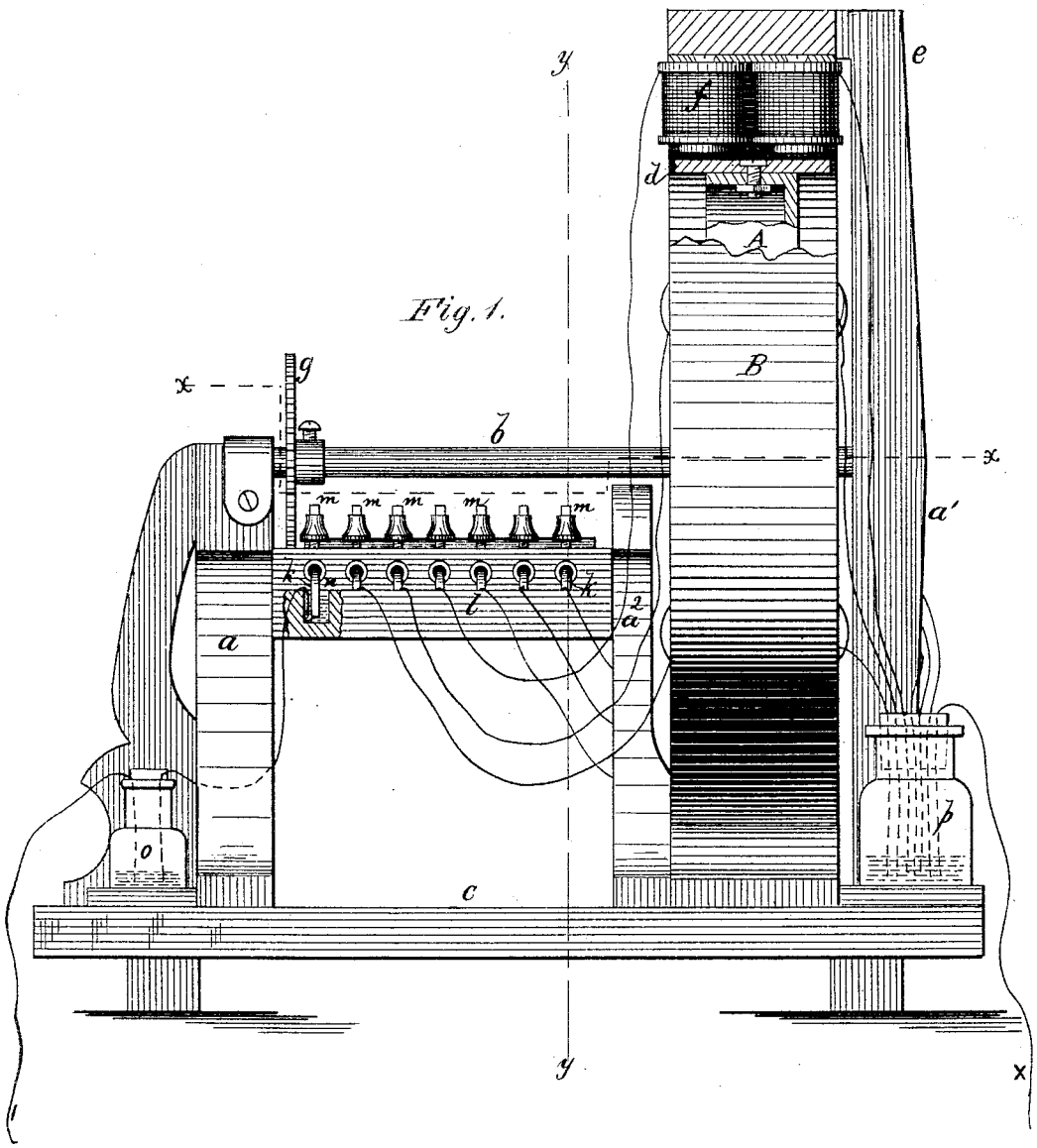
J. HOOVER.
Electric-Motor.

No. 217,617. Patented July 15, 1879.

Fig. 1.



WITNESSES:
Henry N. Miller
C. Bellgwick

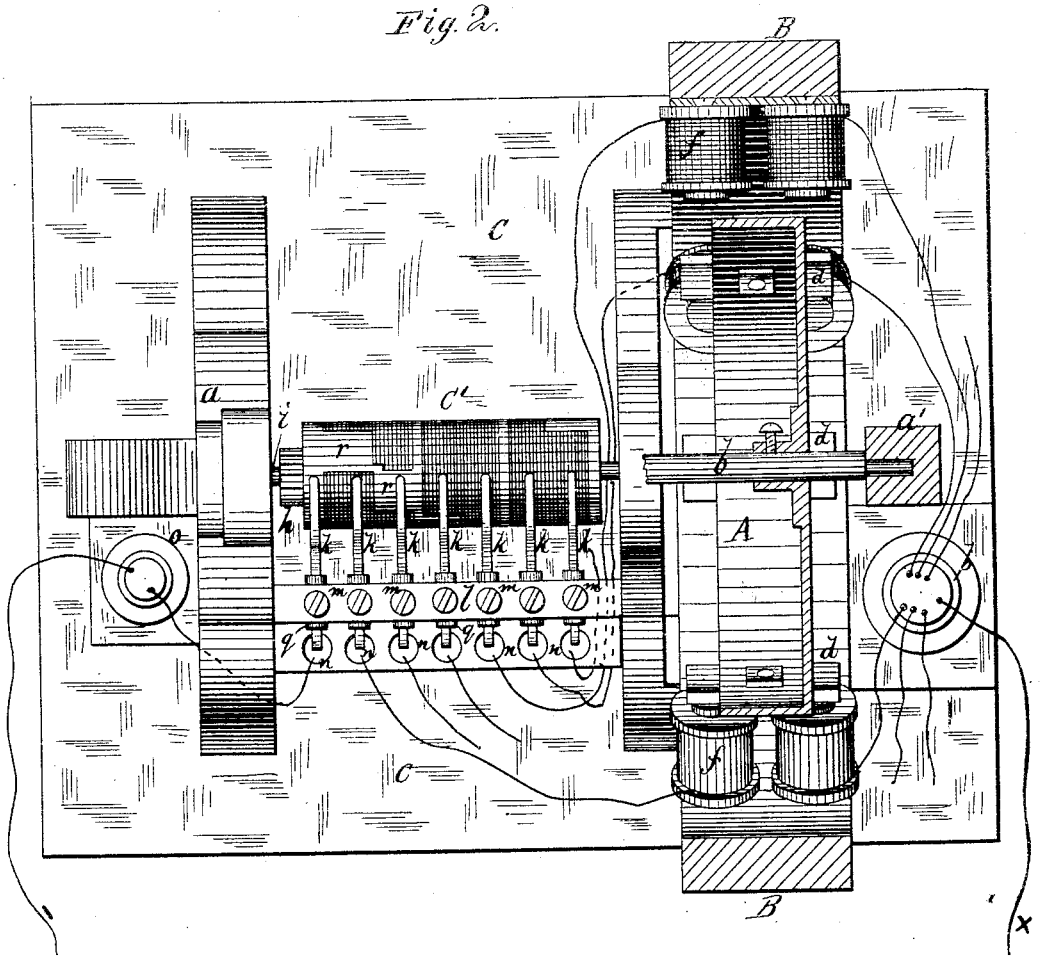
INVENTOR:
J. Hoover
BY Munn & Co
ATTORNEYS.

J. HOOVER.

Electric-Motor.

No. 217,617. Patented July 15, 1879.

Fig. 2.



WITNESSES:

Henry N. Miller

C. Sedgwick

INVENTOR:

J. Hoover

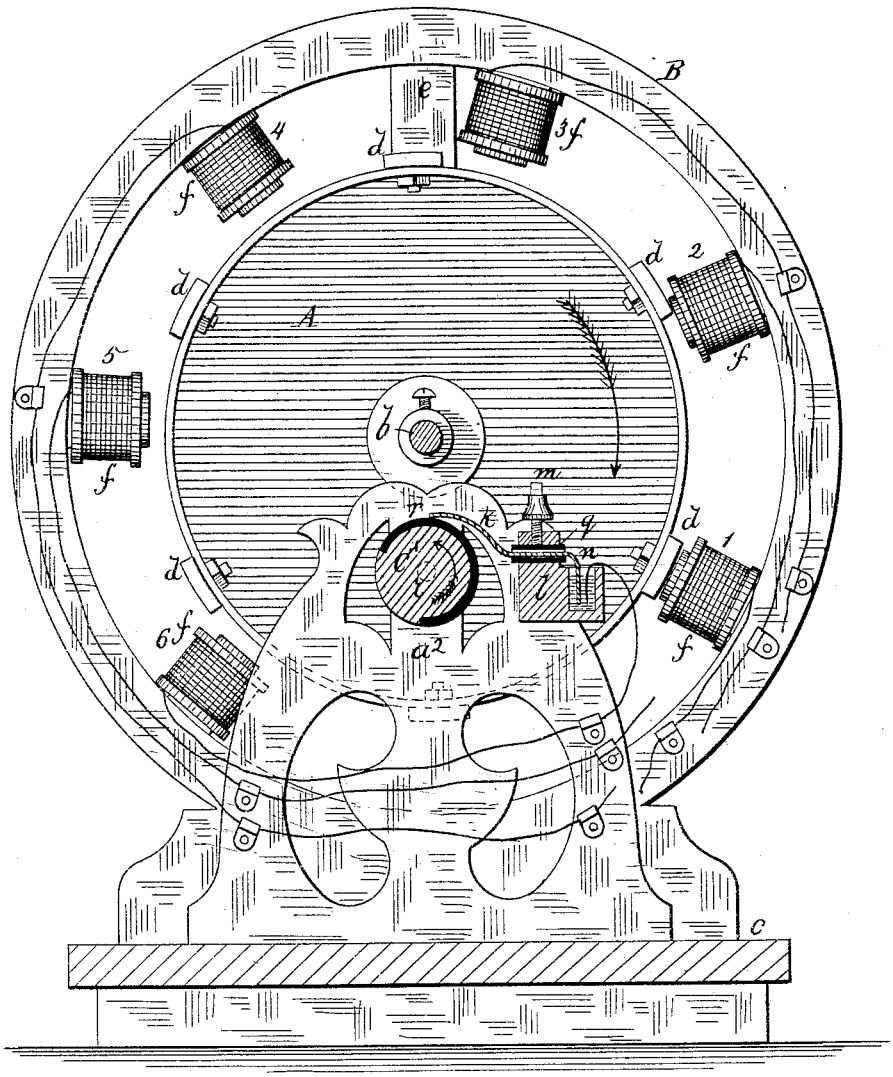
BY Munn & Co

ATTORNEYS.

J. HOOVER.
Electric-Motor.

No. 217,617. Patented July 15, 1879.

Fig. 3.



WITNESSES:
Henry N. Miller
C. Seagrick

INVENTOR:
J. Hoover
BY Munn & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES HOOVER, OF GRATIS, OHIO.

IMPROVEMENT IN ELECTRIC MOTORS.

Specification forming part of Letters Patent No. **217,617**, dated July 15, 1879; application filed December 31, 1878.

To all whom it may concern:

Be it known that I, JAMES HOOVER, of Gratis, in the county of Preble and State of Ohio, have invented a new and useful Improvement in Electric Motors, of which the following is a specification.

This invention relates to the class of electric motors in which a revolving armature-wheel is made use of in connection with fixed electro-magnets arranged in a circle around the armature-wheel.

The invention consists in a certain novel construction and arrangement, as set forth hereinafter, and shown in the accompanying drawings, wherein—

Figure 1 is a side elevation and partial section of my improved motor. Fig. 2 is a sectional plan view on line *x x*. Fig. 3 is a sectional elevation on line *y y* of Fig. 1.

Similar letters of reference indicate corresponding parts.

The armature-wheel A is fixed upon a horizontal shaft, *b*, which is fitted in suitable boxes in the bearing-blocks *a* a^1, that rise from the base C. The wheel A consists of a disk having a flanged rim, to which are secured the armatures *d*.

Around the wheel A is a fixed ring, B, that is attached to base C, and held at its upper side by being connected to a standard, *e*, which rises from bearing-block a^1. The interior diameter of the ring B is somewhat greater than the diameter of wheel A, so that there is a space between A and B sufficient for the electro-magnets *f*, that are attached to B, and project inward with their poles on radial lines from the axis of wheel A.

I have shown six magnets, *f*, on the ring B, and six armatures, *d*, on wheel A. The armatures are equidistant from each other, and the magnets are arranged with reference to the armatures, so that when one armature is at the minimum of attraction of one magnet the armature next behind it is coming into the range of attraction of the next magnet, the currents being broken, as hereinafter described, to render only one magnet active at once, and each one energized six times during one revolution of wheel A. For convenience of explanation the magnets are numbered from 1 to 6 in Fig. 3.

The commutator C′ consists of a cylinder of wood, rubber, or other non-conducting material, on a shaft, *i*, that is fitted in bearing-blocks *a* a^2 beneath shaft *b*, and a gear-wheel, *g*, on *b* meshes with a pinion, *h*, on the shaft *i*, so as to give six revolutions of the commutator-cylinder C′ to every one of wheel A. The cylinder C′ has a ring of metal around one end, and inlaid metal disks *r*, arranged spirally around its surface, connected together and to the ring.

The metallic circuit is formed by spring-tongues *k*, that are clamped in a table, *l*, by set-screws *m*, which permits adjustment of the tongues, so that they rest upon the commutator C′, and their opposite ends extend into the mercury-cups *n*, formed in table *l*, into which cups the circuit-wires extend also. The wire from the first cup *n*, connecting with the first tongue *k*, passes to a mercury-cup, *o*, on base C, where one pole of the battery is connected. The wire from second cup *n* passes to the magnet numbered 1; from the third cup to magnet numbered 2, and so on to the seventh cup, which is connected to magnet 6. The other circuit-wire from each magnet passes to a mercury-cup, *p*, on base C, where the other pole of the battery is connected.

The first tongue *k* is continually in contact with the metal surface of the commutator. The other tongues come in contact in succession, and close the circuit to their respective magnets six times during one revolution of wheel A, causing in all thirty-six pulsations.

By this construction and the use of one battery I obtain the full power of the magnet and current every time the circuit is closed. One magnet only being in circuit at once, there is only the resistance of that one magnet to the current, while the effect is the same as it would be were all the magnets energized at once with the stronger battery which would then be required.

The action upon the armature-wheel is almost continuous. It is to be understood that each magnet is to be cut out at the moment the armature reaches the dead-point of the magnet's attraction, and the next magnet quickened at the same moment for action upon the next armature.

The construction shown permits accurate adjustment of the tongues to obtain the desired effect. To thoroughly insulate the tongues where they pass through table *l*, they are covered with a rubber tube, *q*, upon which the set-screws *m* press.

The number of magnets may be increased, and the circuit-closing devices arranged to correspond. In all cases the attractive power exerted upon the armature-wheel will be represented by a number which is the square of the number of magnets. With six magnets the attractive power is represented by 36, with ten magnets it is 100, and so on.

The commutator-cylinder may be placed upon the main shaft, instead of being on a separate shaft and geared. In that case the metal disks will be arranged in six or more sections, according to the number of magnets, so as to obtain the same effect by one-sixth of a revolution as the geared cylinder produces by a complete revolution.

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

An electric motor in which are combined the wheel A, having flanged rim, with armatures *d*, the fixed ring B, having magnets *f*, with radial poles, and the commutator C′, making six revolutions to one of the wheel, as set forth, whereby a series of magnets may be used to lessen the attractive distance, and, by producing pulsations in quick succession, effect a constant impulse at nearly the full power of the magnets.

JAMES HOOVER.

Witnesses:
JAMES M. MAUS,
HENRY BOWMAN.