C. A. HUSSEY.

Electro-Magnetic Motors.

No. 211,404. Patented Jan. 14, 1879.

Fig. 1

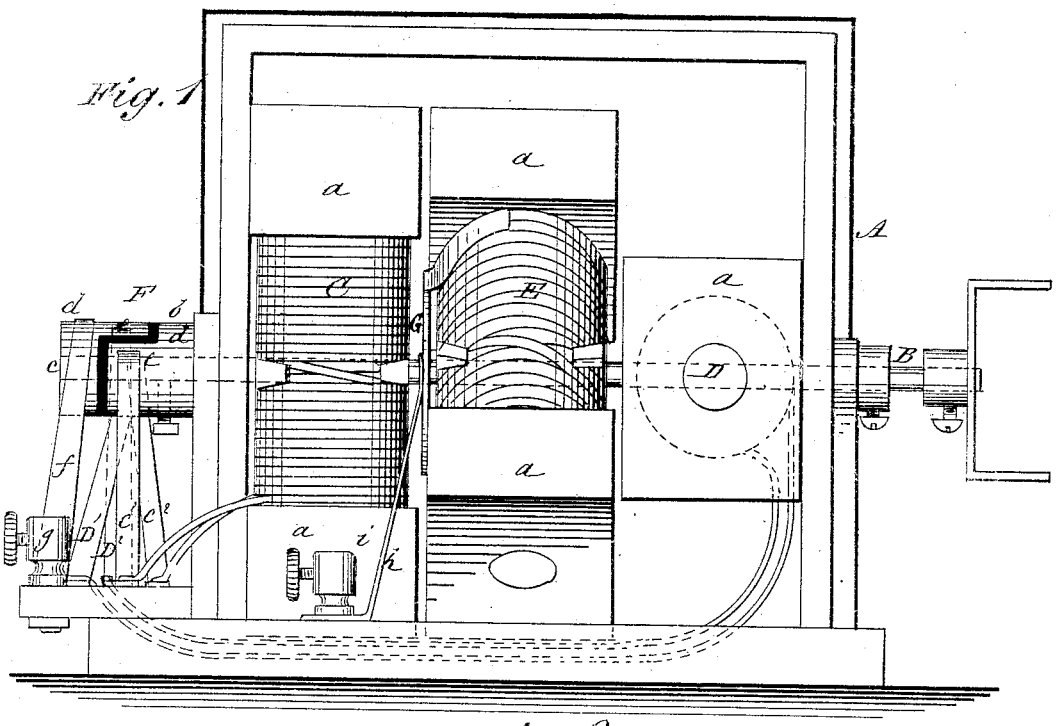


Fig. 2

Fig. 3

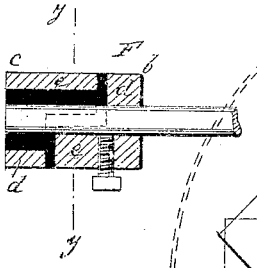
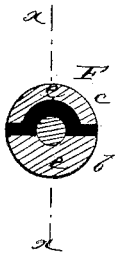
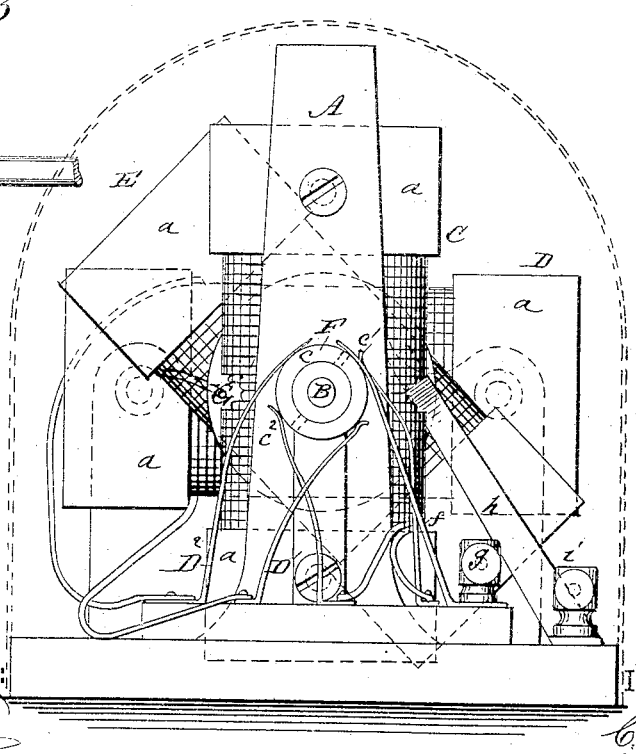


Fig. 4





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UNITED STATES PATENT OFFICE.

CHARLES A. HUSSEY, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTRO-MAGNETIC MOTORS.

Specification forming part of Letters Patent No. **211,404**, dated January 14, 1879; application filed November 8, 1878.

To all whom it may concern:

Be it known that I, CHARLES A. HUSSEY, of the city, county, and State of New York, have invented a new and Improved Electric Motor, of which the following is a specification:

Figure 1 is a side elevation of my improved motor. Fig. 2 is an end elevation. Fig. 3 is a longitudinal section of the commutator, taken on line *x x* in Fig. 4. Fig. 4 is a transverse section of the commutator, taken on line *y y* in Fig. 3.

Similar letters of reference indicate corresponding parts.

The invention consists in providing an electric motor with two stationary and one intermediate rotary magnet, the latter arranged with regard to the other magnets and the commutator, as hereinafter more fully described.

Referring to the drawings, A is a frame having a suitable base, and supporting a small horizontal shaft, B. A bar electro-magnet, C, is attached vertically to one end of the frame A, and a similar magnet, D, is attached to the opposite end of the frame in a horizontal position. Between these two stationary magnets another similar magnet, E, is placed on the shaft B, and secured to it. The magnets C D E are arranged at right angles to the shaft, which passes loosely through the stationary magnets, but is fixed in the middle or rotating one. All of the magnets have upon each end a head or enlarged portion, *a*.

Upon one end of the shaft there is a commutator, F, which consists of two parts, *b c*, both of which are sections of a cylinder. The part *b* is in electrical communication with the shaft B, and the part *c* is insulated from the shaft. Each section of the commutator has a cylindrical portion, *d*, and a semi-cylindrical portion, *e*. The portion *e* of the part *b* overlaps the portion *e* of the part *c*, but is insulated from it. The cylindrical portion *d* of the part revolves in contact with a spring, *f*, connected with the binding-post *g*.

There are four commutator-springs, C^1 C^2 D^1 D^2, which bear upon the commutator. Two of these springs, C^1 C^2, are connected with the terminals of the coil of the magnet C, and the other two, D^1 D^2, are connected with the terminals of the magnet D. The springs C^1 C^2 touch diametrically opposite sides of the commutator, and the springs D^1 D^2 touch the commutator on diametrically opposite sides, but at points intermediate between the ends of the springs C^1 C^2.

An insulated disk, G, is fastened to the side of the magnet E, and connected with one terminal of the coil of the said magnet. This disk is pressed by a spring, *h*, that is connected with the binding-post *i*. The other terminal of the magnet E is connected with the shaft B, which is in contact with the part *b* of the commutator F.

The operation of the machine depends upon both the attractive and repulsive force of the magnets. The polarity of the rotating magnet is always the same, while that of each of the stationary magnets is changed twice during each revolution of the rotary magnet, the polarity of the fixed magnets being unlike that of the rotating magnet, while the latter is attracted by and approaches the former; but immediately the median line of the rotating magnet comes opposite the middle of the fixed magnet the polarity of the latter is reversed, so that the repulsive force of the magnets is realized.

The shifting of the electrical current is effected by the commutator in the well-known way—that is to say, the current enters through the binding-post *g*, passes through the spring *f* to the cylindrical portion of the part *c* of the commutator, and is communicated by the semi-cylindrical portion of the said part *c* at the proper instant to the springs C^1 C^2 D^1 D^2. The binding-post *i* receives the other battery-wire, and is in communication with the disk G. From this disk the current passes through the rotating magnet to the shaft, thence to the part *b* of the commutator which contacts with all of the springs C^1 C^2 D^1 D^2 in the course of its revolution, and is complementary to the part *c*.

By this arrangement the rotating magnet E is always in the circuit, and is therefore not subject to the losses consequent to a breaking or reversal of the current; and the rapid magnetization and demagnetization of the fixed magnets is effected by changing the direction of the magnetizing-current.

By employing two fixed magnets placed at

right angles to each other, dead-points are practically overcome, and the power is rendered even and continuous throughout the entire revolution.

Besides these advantages, the extra current is utilized, as it is of the same nature as the inflowing current, and is available in demagnetization. The tendency of spirals to assume a position at right angles to the axis of a magnet is also used as an element of power.

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

An electric motor provided with two stationary magnets, C D, and an intermediate rotary magnet, E, said magnets being arranged, with respect to each other and a commutator, as shown and described.

CHARLES A. HUSSEY.

Witnesses:
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