(No Model.)

H. H. PORTER.

ELECTRIC MOTOR.

No. 455,765. Patented July 14, 1891.

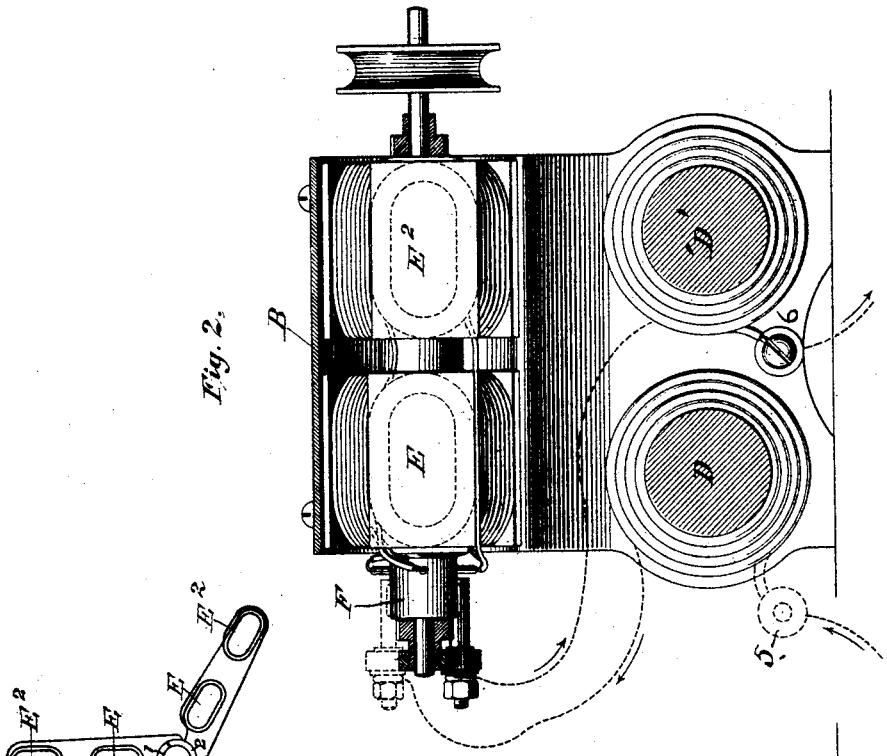

Fig. 2.

Fig. 3.

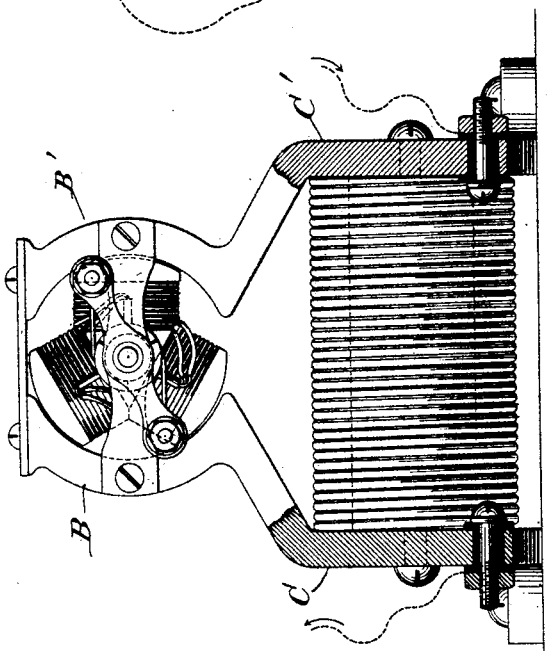

Fig. 1.

Witnesses
Geo. W. Breck.
Henry W. Lloyd.

Inventor.
Harry H. Porter.
By his Attorney
H. C. Townsend

UNITED STATES PATENT OFFICE.

HARRY H. PORTER, OF NEW YORK, N. Y.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 455,765, dated July 14, 1891.

Application filed January 17, 1891. Serial No. 378,078. (No model.)

To all whom it may concern:

Be it known that I, HARRY H. PORTER, 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 Electric Motors, of which the following is a specification.

My invention relates to electric motors; and its objects are to produce a motor that shall be simple and cheap to construct and that shall at the same time have a high efficiency. These objects I accomplish by the particular constructions and combinations of parts and connections of the parts of the apparatus hereinafter described, and more particularly specified in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a motor embodying my invention. Fig. 2 is a longitudinal section through the field-magnet of the motor, the armature being shown in elevation. Fig. 3 is a diagram illustrating the construction and connections of the armature.

B B′ indicate two curved pole-pieces of the field-magnet, which constitute the magnetic field in which the armature of the machine revolves.

C C′ are pole-plates which terminate in said pole-pieces and which are secured to the opposite ends of two parallel connecting-yokes D D′, that constitute the field-magnet cores and are wound with coils in the same direction, so that the two yokes will magnetize the pole-plates C C′ in a manner to make the same respectively north and south. The pole-plates C C′ may terminate at their lower ends in feet forming a support for the machine. The yoke-pieces D D′ are secured in place between them by means of bolts or screws, as indicated.

The armature which revolves between the two pole-pieces B B′ is constructed with two or more parallel sets of core-pieces E E^2, which project radially from the shaft of the machine and revolve together between the two pole-pieces B B′.

The radial cores E E^2, which make up the armature of the machine, may be cast in one piece with a central connecting-piece fastened on the shaft or constituting the shaft of the machine, and at their outer ends are provided with the usual curved poles, as indicated. Each armature core-piece E or E^2 is wound with its own coil of wire connected up into circuit with the commutator and with the coils on other cores, as will be presently described.

The armature, as shown, is a three-pole armature revolving between two pole-pieces arranged at diametrically-opposite sides of the armature, and therefore the machine will have no dead-point.

F indicates the commutator-cylinder of the machine, upon which the commutator-brushes bear at diametrically-opposite points on a line substantially at right angles to the diametrical line connecting the centers of the pole-pieces B B′. The commutator-cylinder has three commutator-segments.

The cores of the armature are wound and connected to the commutator-cylinder and to one another as follows: Starting with the segment 1, the inner end, for instance, of the coil upon one of the core-pieces E would be connected to said segment and the outer end of said coil to the inner end of the coil upon the core-piece E^2 in line with the first upon the armature-shaft. The outer end of the latter would be connected to the next segment 2 of the commutator, and the same segment would be connected to the next one E of the set of core-pieces E, proceeding around the armature-shaft. The outer end of the coil upon the last-named core-piece would be connected, as shown, to the inner end of the coil upon the radial core-piece E^2 next to it and the outer end of the latter to the segment 3, the circuit being completed through the coils of the two remaining radial cores in the same manner and joining the beginning of the circuit by connection to segment 1. The coils upon the two sets of radial cores for the armature are by this means connected up into a closed circuit with one another, connections being taken to the commutator-segments at points in said closed circuit between the coils on two cores E E^2 in the same horizontal line and the two neighboring coils in line parallel with the first.

I do not limit myself to employing two sets of radial core-pieces only, as the armature which revolves between the two pole-pieces

B B′ might be made up of three or more sets of radial core-pieces connected up in the manner already described.

The electric terminals of the machine, which are connected to a suitable source of electric energy, as a battery or dynamo-machine, are indicated at 5 6. The coil upon one of the yoke-pieces D connects with core 5, and the coil upon the other yoke-piece D′ connects with pole or terminal 6, while the circuit from one coil to the other is completed through the armature of the machine by connections, as shown, taken to the brushes of the commutator.

While I have shown the armature as having three poles, it is obvious that it might have five, seven, or other uneven number of poles, and while I prefer to construct the machine with three only I do not wish to be understood as limiting myself to such precise number, since five or seven would be the equivalent in the machine organized and constructed as herein described and claimed.

What I claim as my invention is—

1. In an electric motor, the combination, substantially as described, with pole-plates C C′, terminating in suitable pole-pieces B B′, of the parallel connecting-yokes D D′, wound with magnetizing-coils, as and for the purpose described.

2. In an electric motor, the combination, with a field-magnet consisting of two parallel horizontal connecting yoke-pieces D D′, of vertical pole-plates C C′, between which said yoke-pieces are secured, two pole-pieces B B′, forming terminations of the pole-plates above the yoke-pieces, magnetizing-coils wound on said yoke-pieces and connected in a manner to magnetize both core-pieces in the same direction, and an armature revolving between the pole-pieces and consisting of radial cores wound with coils, as and for the purpose described.

3. In an electric motor, the combination, with the two pole-pieces B B′, of a three-pole armature having two or more parallel sets of radial magnet-cores, and coils for said cores connected into a closed circuit, and connections from intermediate portions of said circuit to the segments of a three-part commutator, as described.

4. An electric motor comprising two vertical pole-plates C C′, terminating above in curved pole-pieces B B′, two or more horizontal connecting-yokes D D′, wound with magnetizing-coils, and a three-pole armature having two or more sets of electro-magnets parallel to one another on the armature-shaft revolving between said pole-pieces B B′, and a commutator common to said sets of electro-magnets.

Signed at New York, in the county of New York and State of New York, this 10th day of January, A. D. 1891.

HARRY H. PORTER.

Witnesses:
WM. H. CAPEL,
T. F. CONREY.