No. 623,989. Patented May 2, 1899.

H. W. CORSE.

ELECTRIC MOTOR.

(Application filed Sept. 9, 1898.)

(No Model.)

Fig. 1

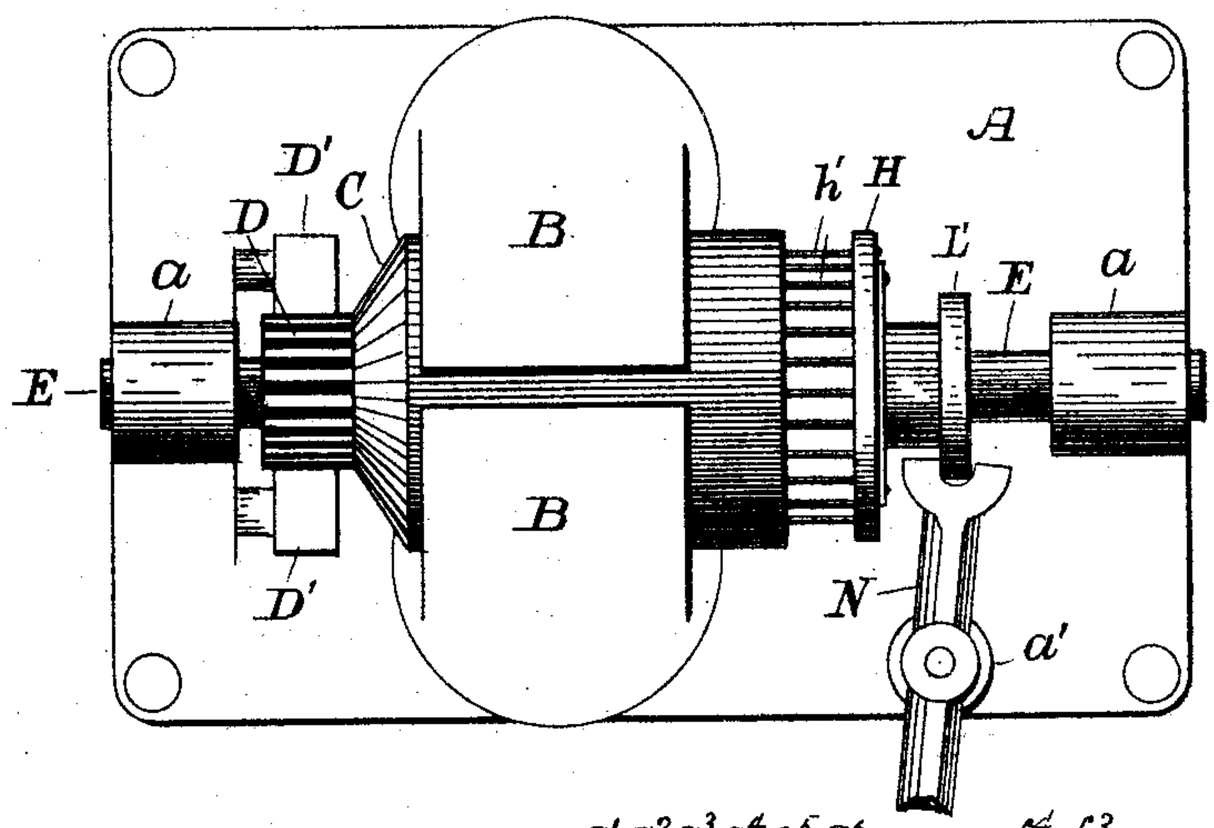


Fig. 2

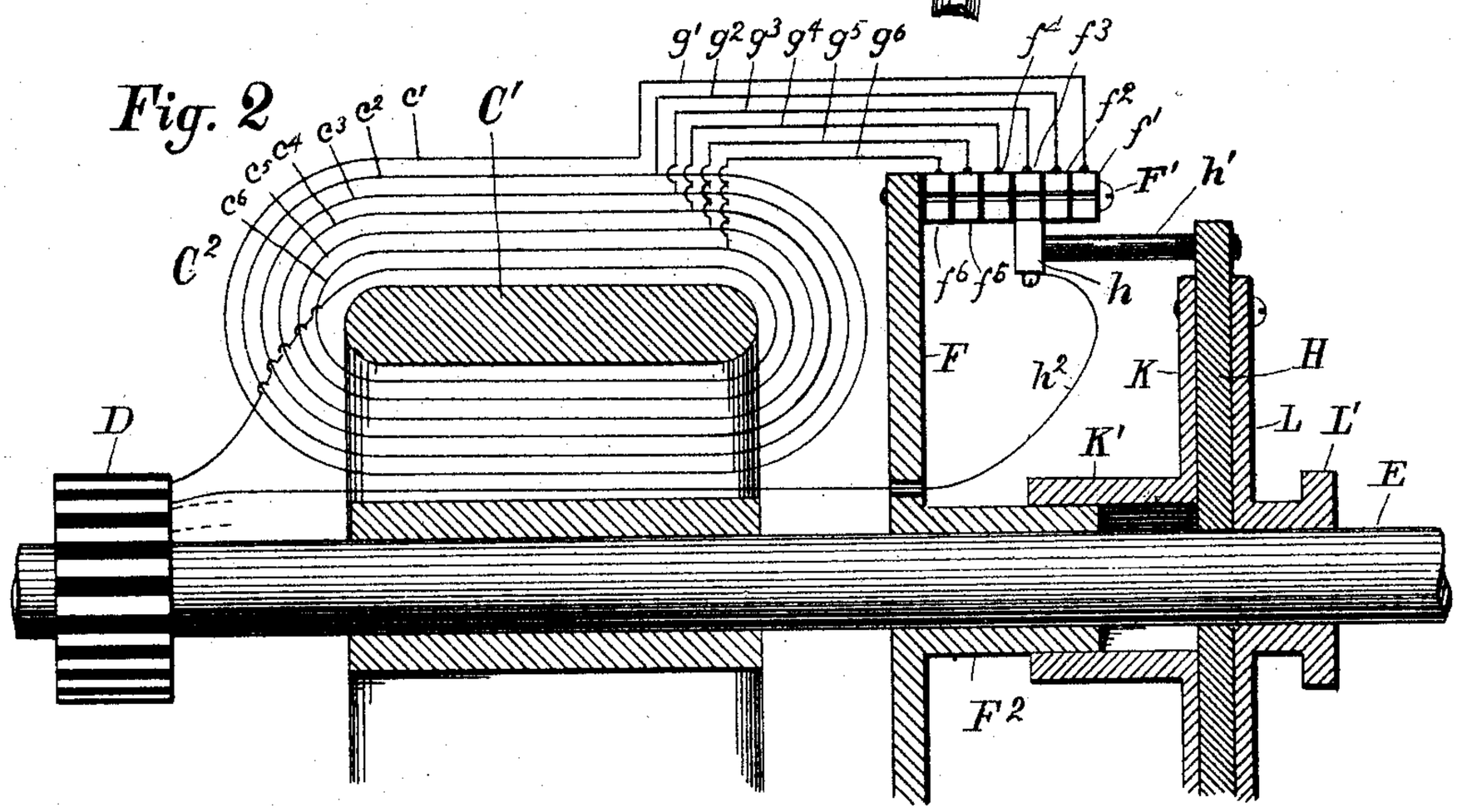
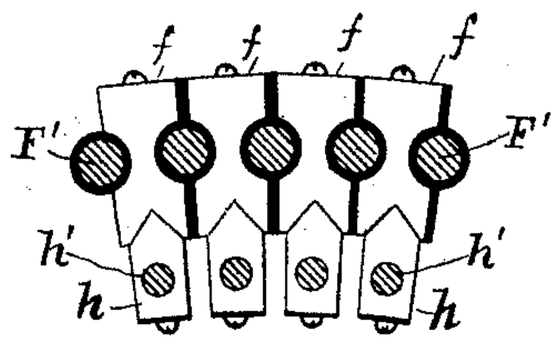


Fig. 3



Attest;

W. B. Richards

Grace Knight.

Inventor,

Homer W. Corse;

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UNITED STATES PATENT OFFICE.

HOMER W. CORSE, OF MELROSE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO THOMAS S. SIMONDS, OF SAME PLACE.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 623,989, dated May 2, 1899.

Application filed September 9, 1898. Serial No. 690,558. (No model.)

To all whom it may concern:

Be it known that I, HOMER W. CORSE, a citizen of the United States, residing at Melrose, in the county of Middlesex and State of Massachusetts, have invented a new and useful Electric Motor, of which the following is a full, clear, and exact description.

My invention pertains to that class of electric motors in which the armature is of the ring type; and it has to do with an improved means for cutting out successive sections of the armature-coils, and thereby diminishing the resistance and increasing the speed. My construction for this purpose comprises, essentially, a series of contact-points for each armature-segment, each point connected with successive sections of each coil and the whole revolving with the armature, and contact-brushes revolving with the armature, but longitudinally movable with respect thereto, and adapted by such longitudinal adjustment to cut in or cut out said successive sections of the armature-coils.

Referring to the drawings forming part of this specification, Figure 1 is a plan view of an electric motor embodying my invention. Fig. 2 is a longitudinal section of the armature and allied portions, partly diagrammatic; and Fig. 3 is a detail view of the contact-points and contact-brushes.

In Fig. 1, A indicates the base-plate of a motor; *a*, the bearings rising therefrom; B, the pole-pieces of the field-magnets; C, the armature; D, the commutator; D′, the brushes, and E the armature-shaft, revolving in said bearings *a*.

Referring to Fig. 2, C′ indicates the core of one of the segments of the armature C, while C^2 indicates the armature-windings of such segment. These windings may be of any required number and of different sizes of wire; but it is sufficient for my purpose to represent the windings to be but six in number and of uniform wire throughout.

As shown in Fig. 2, there are as many contact-points *f* as there are sections in each armature-coil, and these points are connected therewith, as *f′* with the section *c′* through the wire *g′*, f^2 with c^2 through g^2, and so on. These contact-points are supported by means of the long screws F′, rigidly projecting from the disk F, whose elongated hub F^2 is pinned upon the shaft E; but said screws do not pass through said points, but between the different series thereof in notches formed in their sides, as shown in Fig. 3. As indicated, said points are insulated one from the other and from the screws F′ by suitable insulating material applied between, the heavy black representing such insulation.

The contact-brushes comprise a head *h*, supported at the extremity of a slender and resilient screw *h′*, whose threaded end screws into the fiber disk H, and said disk H is firmly clamped between the metal disks K and L, the hub K′ of one of which is slidable upon the hub F^2, while the other is slidable upon the shaft E and is provided with a flange L′, by means of which the adjusting-lever N is enabled to engage it and move it longitudinally upon the shaft. Said lever is pivoted upon a boss *a′*, rising from the bed-plate A.

As shown in Fig. 3, there is an equal number of contact-points *f* and spring-contacts *h*, and the contacting surfaces thereof are made sharply and respectively concave and convex. The object of thus shaping the contact-surfaces is twofold: first, to increase the surface in contact between each point, and, secondly, to insure that each spring-contact shall at all times remain in contact with its respective series of contact-points. Without such conformation it would be practically impossible for said contacts to thus remain in accurate position, for a feather or spline upon the shaft for preventing the disk H from shifting thereon would soon wear, or the pins or screws *h′* might become bent, and the spring-contacts would be completing the circuit with the wrong set of contact-points.

The terminal of the inner windings c^6 is connected with its appropriate commutator-segment, while the next following segment is joined through the wire h^2 with the head *h* of the proper spring-contact. Said wire h^2 is of course suitably insulated in its passage through the disk F and is given sufficient slack to insure its non-injury when the spring-contacts are being shifted from one end of the contact-points to the other.

The screws or pins *h′* are made slender and resilient not simply to insure their contact

with the contact-points *f* through the spring-pressure inherent in said pins, but I have found in practice that by making the same somewhat slender the action of the centrifugal force upon the heads *h* increases to a marked degree the contact-pressure of the latter with the points *f*.

In using this motor all that is needed to be done in order to vary its speed of rotation and increase or diminish its torque is to move the lever N, and thereby shift the position of the spring-contacts *h* to the appropriate contact-points *f*.

What I claim as my invention, and for which I desire Letters Patent, is as follows, to wit:

1. In a motor, the combination with the armature and commutator, of a series of contact-points turning with said armature and electrically connected with respective sections of the armature-coils, and contacts electrically connected with said commutator and turning with said armature but longitudinally movable with respect thereto, whereby different sections of the armature-coils can be cut in or cut out of circuit as desired, and the speed of the dynamo correspondingly varied.

2. In a motor, the combination with the armature and commutator, of a series of contact-points for each segment of the armature and electrically connected with respective sections of the coils, a disk fixed upon the shaft of said armature and adapted to rigidly support said contact-points, a disk slidably mounted upon said shaft, and the spring-contacts held by said latter disk and insulated one from the other but electrically connected with the commutator of the armature, whereby different sections of the armature-coils can be cut in or cut out of circuit at will.

3. In a motor, the combination with the armature, its shaft and commutator, of a series of contact-points for each segment of the armature-coils electrically connected with respective sections of said coils, said points being held concentric with said shaft and having the V-shaped grooves parallel therewith, and the spring-contacts surfaced to fit said grooves and adapted to be moved in the direction of said shaft and in electrical connection with the armature.

4. In a motor, the combination with the armature, its shaft and commutator, of the disk fixed upon said shaft, the screws tapped into said disk parallel with said shaft, the contact-points supported by said screws and electrically connected with different sections of the armature-coils, and the sliding spring-contacts electrically connected with said commutator.

5. In a motor, the combination with the armature, its shaft and commutator, of the disk fixed upon said shaft, the contact-points having the lateral grooves, the screws passing between said contact-points in said grooves or notches, and tapped into said disk, suitable insulation, electric connection between said points and different sections of the armature-coils, and the sliding spring-contacts electrically connected with said commutator.

6. In a motor, the combination with the armature, its shaft and commutator, of the contact-points held concentric with said shaft and turning therewith and electrically connected with different sections of the armature-coils, the non-conductive disk slidable on said shaft, and the spring-contacts comprising the heads having the pins or screws tapped into said disk and electrically connected with said commutator.

7. In a motor, the combination with the armature, its shaft and commutator, of the contact-points held concentric with said shaft and turning therewith and electrically connected with different sections of the armature-coils, the non-conductive disk, the smaller metallic disks slidable on said shaft and clamping said non-conductive disk between them, one thereof having the flanged hub, the slender pins or screws tapped into said non-conductive disk and each carrying the head at its outer end electrically connected with the proper segment of the commutator, and means engaging said flange for longitudinally adjusting said disks and allied parts upon said shaft, in order to cut in or cut out of circuit any one or more of the sections of the armature-coils and to thereby vary its speed at will.

In testimony that I claim the foregoing invention I have hereunto set my hand this 31st day of August, 1898.

HOMER W. CORSE.

Witnesses:
A. B. UPHAM,
W. B. RICH.