No. 666,315. Patented Jan. 22, 1901.

F. A. JOHNSON.

METHOD OF CONSTRUCTION OF ELECTRIC MOTORS.

(Application filed Aug. 30, 1900.)

(No Model.)

Fig. 2.

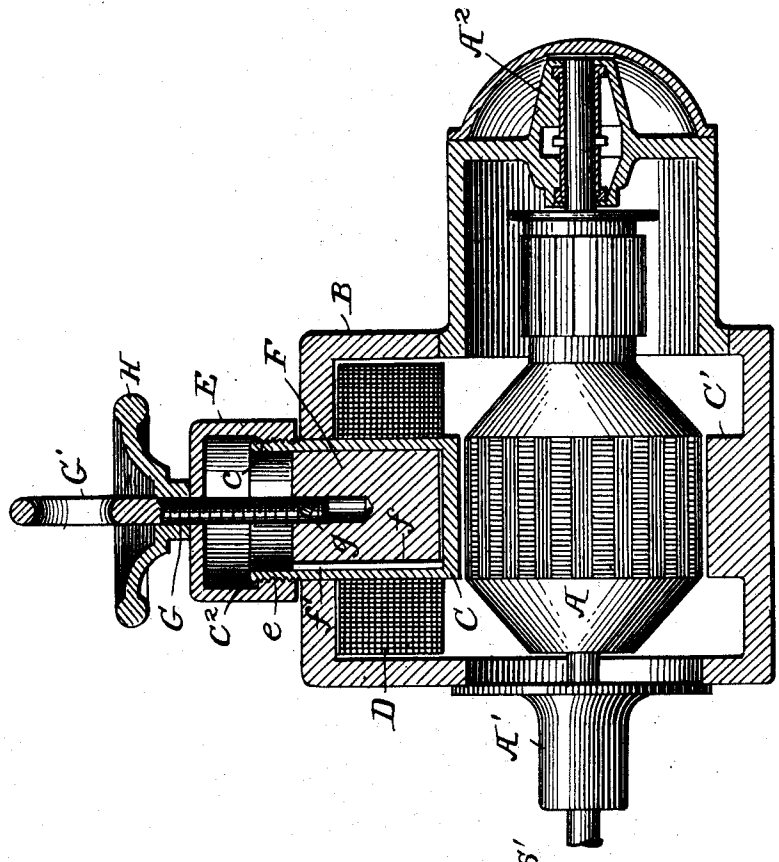
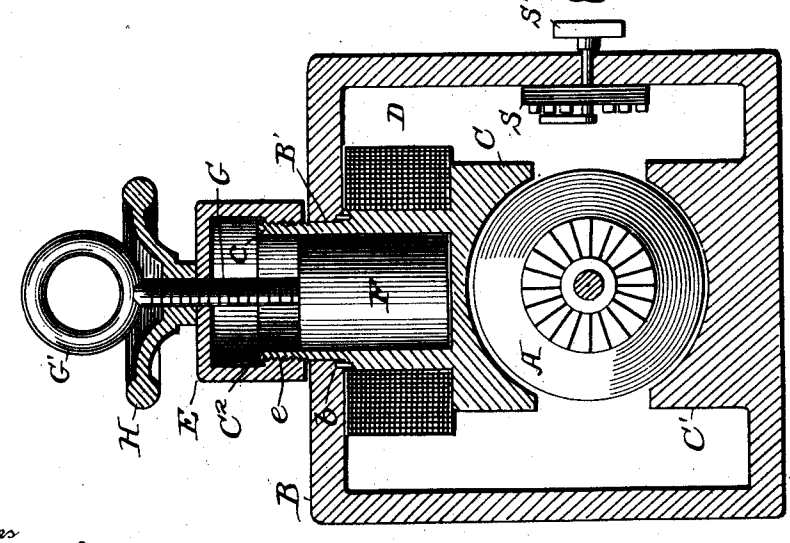


Fig. 1.



Witnesses

J. J. Hinkel

H. B. Gilman, Jr.

Inventor

F. A. Johnson

by

Foster Freeman

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FREDERIC AYRES JOHNSON, OF BINGHAMTON, NEW YORK, ASSIGNOR TO THE STOW MANUFACTURING COMPANY, OF SAME PLACE.

METHOD OF CONSTRUCTION OF ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 666,315, dated January 22, 1901.

Application filed August 30, 1900. Serial No. 28,550. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC AYRES JOHNSON, a citizen of the United States, residing at Binghamton, Broome county, State of New York, have invented certain new and useful Improvements in Methods of Construction of Electric Motors, of which the following is a specification.

My invention relates to means for controlling electric motors, and has for its object to provide a simple and effective means for accomplishing this result; and it consists in the various features of construction and arrangement of parts, having the mode of operation substantially as hereinafter more particularly set forth.

Referring to the accompanying drawings, Figure 1 is a vertical transverse section through a motor embodying my invention, and Fig. 2 is a vertical longitudinal section of the same.

While my invention is intended more particularly for use in connection with electric motors, it can be used with electric generators. It is based on the general principles set forth in my Patent No. 597,418, granted January 18, 1898, and I do not deem it necessary herein to explain those principles nor to set forth *in extenso* the advantages of this general method of speed regulation for motors.

While my invention can be applied to motors of various forms and constructions, I have chosen to show it in connection with a very simple form wherein there is but a single exciting-coil, and this will illustrate the invention sufficiently to enable those skilled in the art to adapt it to the particular form of motor or generator desired.

Referring to the drawings, A represents the armature, which may be of any desired form and construction and is provided with the usual appurtenances, and B represents the field-magnet, it being shown in the present instance in the form of a rectangular frame having pole-pieces C C′, and the latter are formed integral with the frame, and the armature is supported in bearings A' A^2, connected to the frame, and the whole forms an inclosed or iron-clad motor. If desired, a switch S can be arranged on the interior of the frame, as shown in Fig. 1, operated by the switch-arm S′, projecting through the frame, and in this way all the operative parts of the motor and the switch controlling the circuits thereof are inclosed and protected.

In the present instance the pole-piece C is supplied with a field-magnet coil D, surrounding the neck or reduced portion of the pole-piece, and the pole-piece is made detachable from the frame, so that the coil can be slid over the neck. In the present instance the frame is provided with an opening B′, through which a reduced portion C^2 of the neck extends, and this portion is provided with some suitable means whereby the pole-piece can be secured in position, it being shown as screw-threaded at *c*, and there is a cup-shaped nut E, having an internal screw-thread *e* engaging the reduced portion of the neck of the pole-piece, and by this means the pole-piece can be securely held in proper position.

In order to prevent the pole-piece from turning and to keep it in proper alinement, I provide some suitable means—as, for instance, dowel-pins *b*, mounted in the inner portion of the frame B and engaging dowel-holes in the neck of the pole-piece; but any other mechanical means may be utilized to insure the proper relation of the pole-piece to the armature.

The reduced portion C^2 of the neck is hollow, and mounted therein is a block F of magnetic material capable of sliding therein, and some sort of means are provided for preventing its rotation when the block is cylindrical, and to accomplish this in the present instance I provide a longitudinal keyway or slot *f*, into which extends a pin or projection *f*′, which permits the block or plunger to move longitudinally, but prevents rotation therein.

Some suitable means should be provided for adjusting the block or plunger in the pole-piece, and while various means may be used I have shown a screw-bolt G, secured to the end of the block or plunger, as by a pin *g*, and this bolt passes through the cup-shaped nut E and in the present instance is provided with an eye G′. Engaging the bolt is a hand-wheel or nut H, bearing on the cup-shaped nut, and it is manifest that by ad-

justing this hand-wheel the block or plunger can be adjusted in the hollow portion of the neck of the pole-piece.

This being the preferred construction, the mode of assembling and operating my device will be largely understood from what has preceded, and it will be seen that the block or plunger F can be adjusted so as to vary the magnetic flux passing through the armature, and at the same time the flux through the tips of the armature will not be varied materially, so that there will be no danger from sparking. It is understood, of course, that the speed of the motor, other things being equal, depends upon the number of lines of force or amount of magnetic flux passing through the armature, and when the block or plunger is in the position shown under a constant-potential current the maximum flux is passing. When, however, the block or plunger is raised, the flux through the center of the pole-piece is reduced and the speed of the moter is increased, while the flux through the polar tips is maintained substantially constant, so that the commutated coils are still in a strong field, avoiding sparks.

While I have shown but one field-magnet core arranged and constructed as above described, it is manifest that other cores in a multiple-core motor may be similarly constructed and arranged.

Having thus described the preferred embodiment of my invention, it will be evident that the specific means may be varied, and without limiting myself to the precise details shown what I claim is—

1. In an electric motor, the combination with the frame, of a field-magnet pole having a hollow reduced neck, a coil around said neck and means for detachably connecting the pole to the frame, substantially as described.

2. In an electric motor, the combination with the frame, of a field-magnet pole having a reduced neck, the frame having an opening through which the neck is passed, and a nut engaging the neck supporting and securing the same to the frame, substantially as described.

3. In an electric motor, the combination with the frame having an opening, of a field-magnet pole the neck of which is provided with a reduced screw-threaded portion passing through the opening in the frame, and a cup-shaped nut engaging the reduced portion for securing the pole in place, substantially as described.

4. In an electric motor, the combination with the frame having an opening, of a hollow field-magnet pole detachably connected thereto, a block mounted in the hollow neck of the pole-piece, and means for adjusting the block therein, substantially as described.

5. In an electric motor, the combination with the frame having an opening, of a hollow field-magnet pole detachably connected thereto, a cup-shaped nut engaging the neck of the pole-piece to secure the same in position, a plunger moving in the hollow neck, a bolt secured to the plunger, and a hand-wheel engaging the bolt for adjusting the plunger, substantially as described.

6. In an electric motor, the combination with the frame having an opening, of a field-magnet pole having a hollow neck extending through the opening, a cup-shaped nut for securing the pole in position, a plunger fitting the hollow neck, means for preventing rotation of the plunger therein, a bolt engaging the plunger, and means for adjusting the bolt, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERIC AYRES JOHNSON.

Witnesses:

D. S. RICHARDS,

R. B. RICHARDS.