

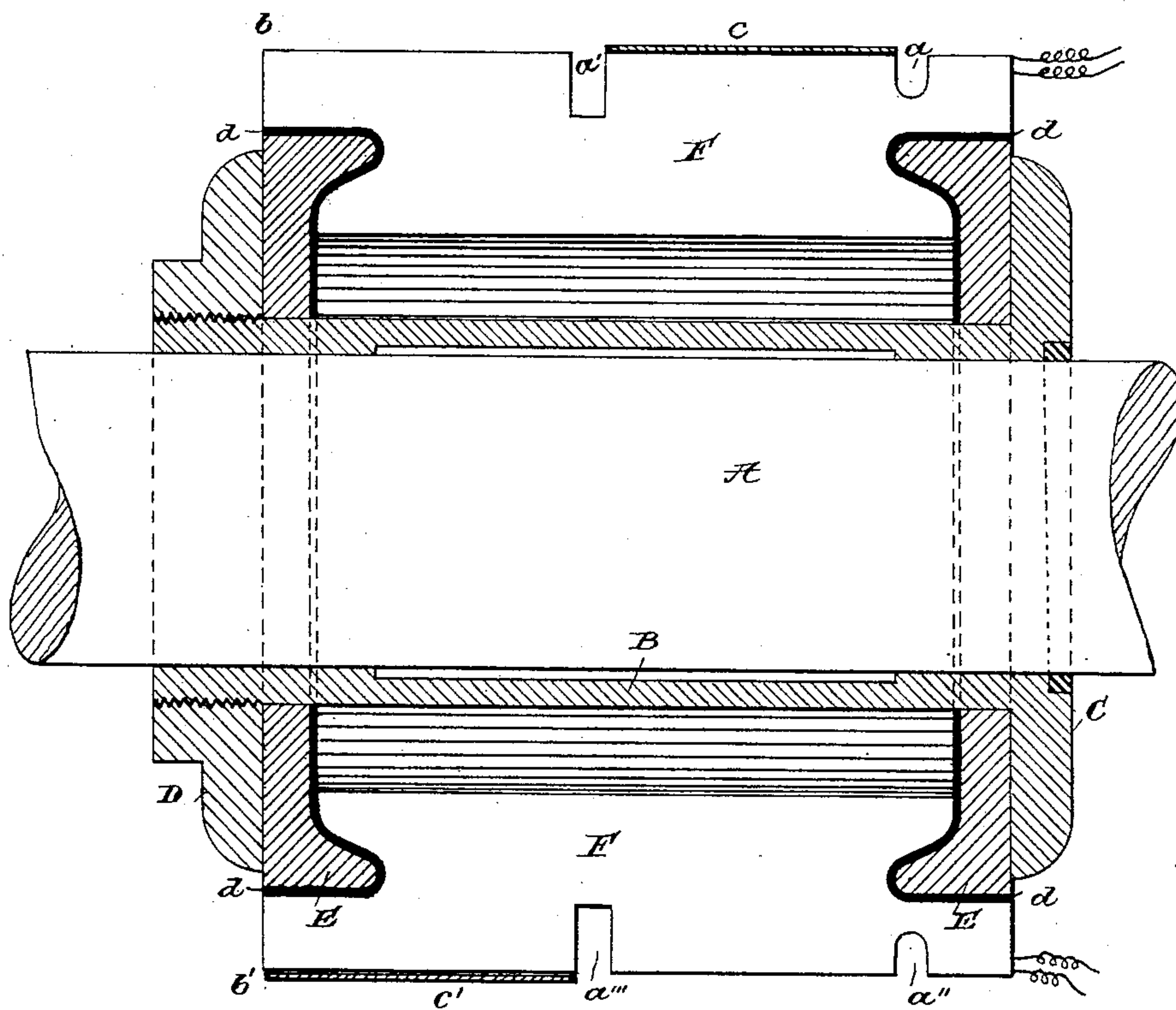
(No Model.)

E. R. KNOWLES.

COMMUTATOR FOR DYNAMO ELECTRIC MACHINES.

No. 396,942.

Patented Jan. 29, 1889.



WITNESSES:

Wm. H. Fitchell
Harvey Y. Davis

INVENTOR,

Edward R. Knowles

BY

Ernest C. Webb

ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD R. KNOWLES, OF BROOKLYN, ASSIGNOR TO THE MUTUAL ELECTRIC MANUFACTURING COMPANY, OF NEW YORK.

COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 396,942, dated January 29, 1889.

Application filed August 5, 1885. Renewed December 21, 1888. Serial No. 294,285. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Commutators for Dynamo-Electric Machines, of which the following is a full, clear, and exact description.

In dynamo-electric machines of the Gramme type and similar devices a commutator with many faces has to be employed. Such faces are generally formed by the use of strips of metal—one for each face—arranged around an axis radially and in parallelism with the axis in question. It is necessary that they should be insulated from the axis; and my invention has for its object an improved construction and arrangement of such insulation, and an improved construction of insulator-blades to prevent uneven wear by the brushes.

In the accompanying drawing I have shown a sectional view of my invention.

A represents the shaft of the dynamo-armature, to which the commutator is fastened in any suitable manner.

B represents a hollow shell with a fixed flange, C, at one end and a movable flange or nut, D, at the other end, that screws in and out upon it.

E E designate two disks or collars, having annular projections or flanges which face each other when the disks are in position, so as to hold the commutator-leaves F F and enter into recesses on the ends of the same.

As usually constructed, these disks or collars E E are made of insulating material; but this has in practice been found extremely dangerous, because of the liability of the flanges to crack or burn off when the machine is in operation, thus releasing the leaves of the commutator, which would in such case be thrown with great force in different directions. To obviate this I make the disks or collars E E of metal, with flanges of the same material, and combine them with thin disks *d d*, of similar construction, composed of some suitable insulating material—such, for instance, as canvas impregnated or coated with shellac. These disks or collars E E and their

insulating-disks *d d* are slipped over the shaft B into their proper positions, the commutator leaves F F are introduced, suitably insulated from one another, and fitted in place, the insulated flanges or projections of the disks entering the recesses in the commutator-leaves. By screwing up the nut D the flanges or projections of the disks are forced into the recesses in the commutator-leaves, and all the parts are firmly bound together, the commutator-leaves thus forming a nearly-continuous cylindrical surface.

It has been found in practice that the surface of such commutators originally cylindrical becomes worn into ridges and hollows by the brushes. To avoid this difficulty I form two grooves around the periphery of the commutator, as shown at *a a'*. The surface between *a* and *a'* is preferably equal to that between *a'* and *b*. The two brushes *c c'*, that bear upon the opposite sides of the commutator, are made as nearly as possible of the exact width of the spaces between the points *a* and *a'* and *a'* and *b*. One brush presses on one section between *a* and *a'*, the second brush on the other section between *a'''* and *b'*. The end motion of the commutator in its revolutions is enough to cause the brushes to come in contact with the entire length of each section of the commutator, so that they are evenly worn, and no ridges are formed.

By having a brush-holder so constructed that it may hold two brushes side by side in the one rigid holder it is possible to change the brushes in the dynamo without stopping the running of the machine—as, for instance, one may be put in between *a'* and *b* while one is running between *a* and *a'*, and also the same between *a''* and *a'''* while one is running between *a'''* and *b'*, and the ones between *a* and *a'* and *a'''* and *b'* withdrawn, and vice versa.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, substantially as shown and described, of the shaft A, the leaves provided with circumferential grooves dividing the surface of the commutator into brush-segments, and the sleeve B, head C, nut D,

and insulating-disks for securing such leaves to and insulating them from the shaft, as set forth.

2. In a commutator, the leaves provided
5 with circumferential grooves dividing the surface of the commutator into brush-segments, substantially as described.

3. In a commutator of the general construc-

tion described, the grooves *a a'* in and around the face, as shown, for the purposes specified. 10

In testimony whereof I have hereunto set my hand this 17th day of July, A. D. 1885.

EDWARD R. KNOWLES.

Witnesses:

E. GRENING,

ARTHUR C. WEBB.