(No Model.)

J. HOFFMAN.

COMMUTATOR FOR DYNAMO ELECTRIC MACHINES.

No. 523,663. Patented July 31, 1894.

FIG. 1.

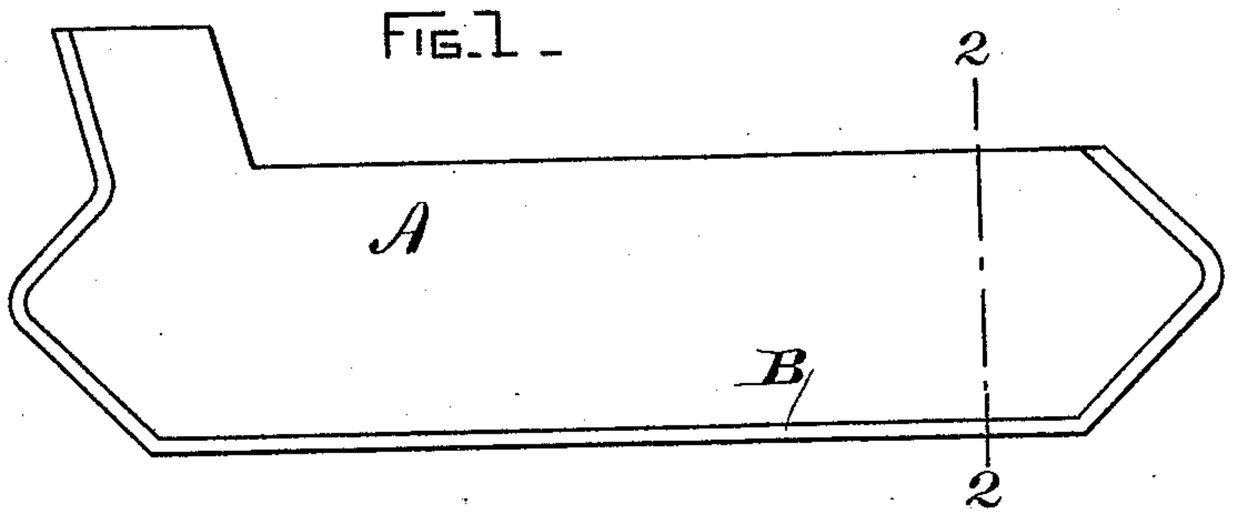


FIG. 2.

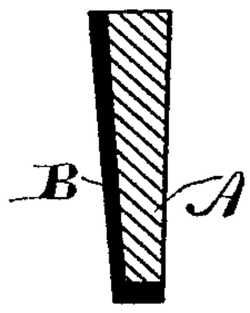


FIG. 3.

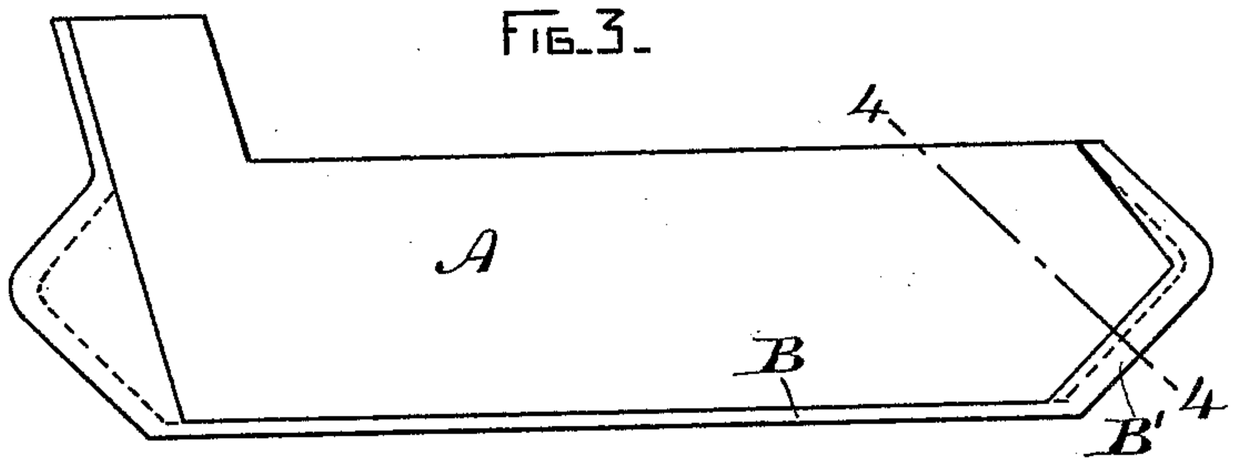


FIG. 4.

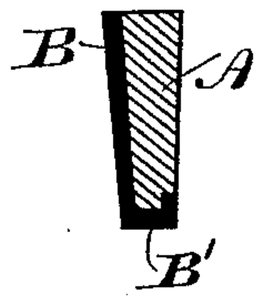


FIG. 5.

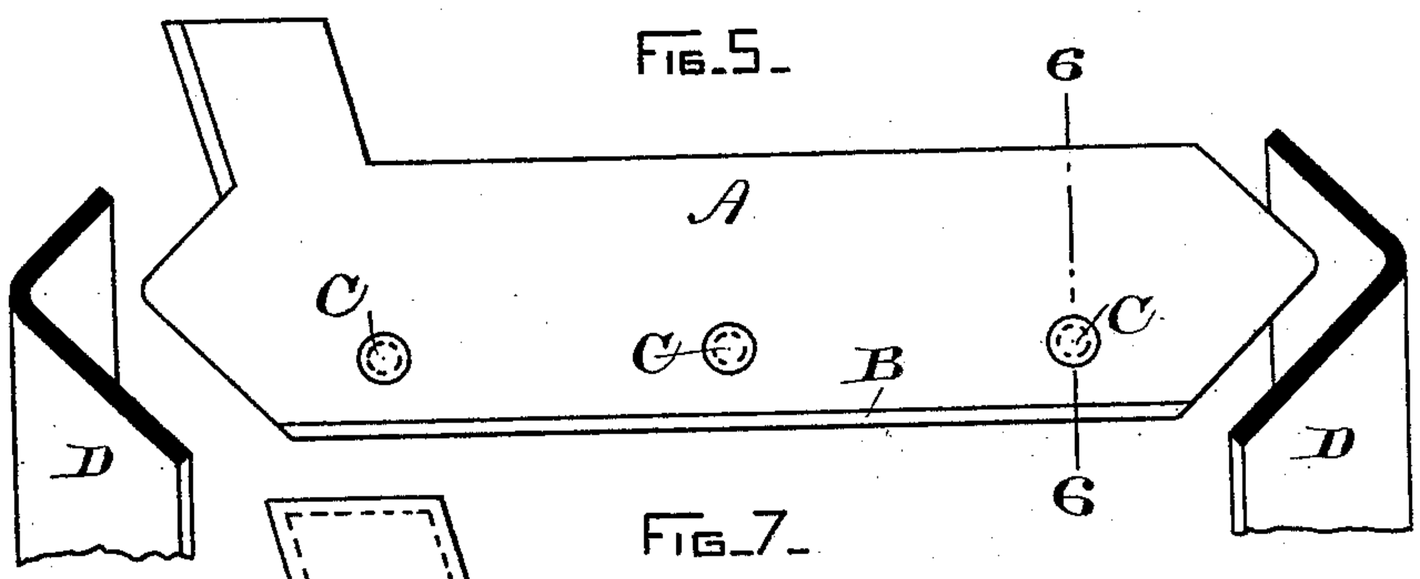


FIG. 6.

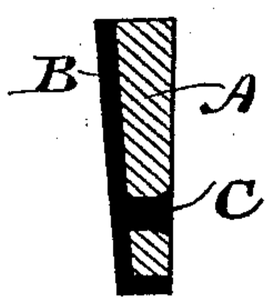
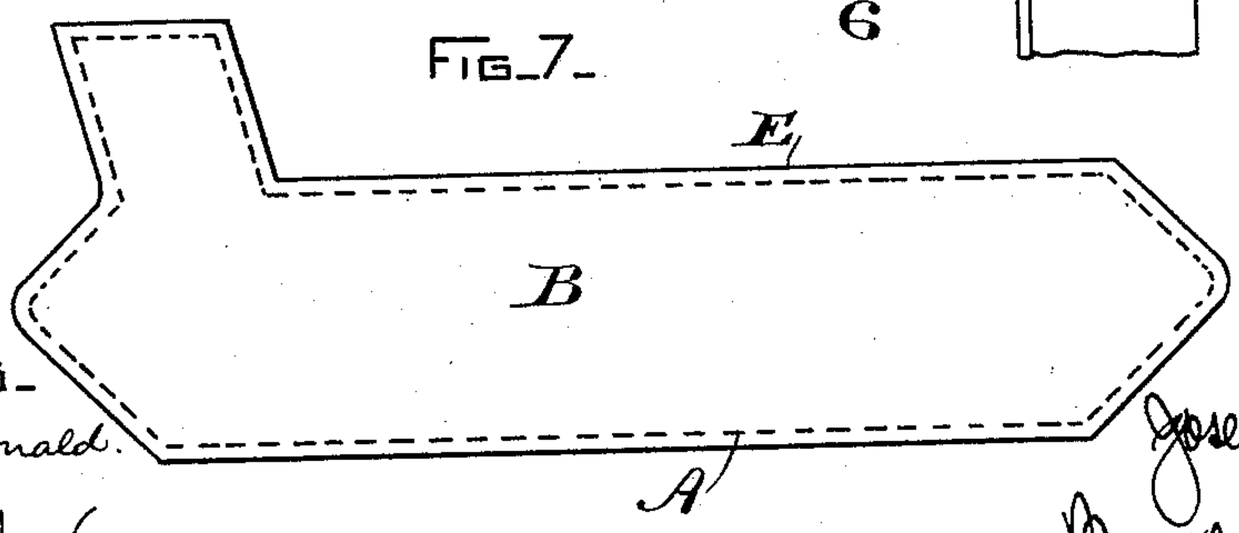


FIG. 7.



WITNESSES.

A. F. Macdonald.

J. J. Johnston

INVENTOR.

Joseph Hoffman

by Bentley and Blodgett,

attys.

UNITED STATES PATENT OFFICE.

JOSEPH HOFFMAN, OF SCHENECTADY, NEW YORK, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF BOSTON, MASSACHUSETTS.

COMMUTATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 523,663, dated July 31, 1894.

Application filed December 21, 1893. Serial No. 494,285. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HOFFMAN, a citizen of the United States, and a resident of Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Commutators for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to commutators for dynamo-electric machines or motors, and has for its object to provide a ready means of making the commutator bars with the insulation molded upon them so that they may be readily assembled and may be tested separately, if desired, before such assembling, thus greatly reducing the danger of short circuits between the segments, and cheapening the construction. To this end, as already indicated in the statement of invention, I mold the insulation around two sides and by preference around two ends also of the commutator bar, which is of the usual form; although, if desired, I may form the insulation, where a special thickness of greater or less extent is necessary, around the entire commutator bar, and after the parts are assembled, turn off the face against which the brushes will bear when the machine is in operation.

In the accompanying drawings hereby referred to and made part of this specification, Figure 1 is a commutator bar in side elevation, made after my improved process. Fig. 2 is a section upon the line 2—2 of Fig. 1. Fig. 3 is a bar of different design. Fig. 4 is a section upon the line 4—4 of Fig. 3. Fig. 5 is a modified form, and Fig. 6 is a section upon the line 6—6 of Fig. 5. Fig. 7 is a modification.

Referring by letter to Fig. 1, A is the body of the commutator bar or segment, and B is the insulation extending around the bar. As shown in Fig. 2, the insulation is slightly thicker at the top than at the bottom, for the purpose of giving a taper to the bar so that all the segments may be set upon radii of the commutator; the same effect may be produced however in the body of the bar itself and the insulation may be made of uniform thickness.

In Fig. 3 I show a modification designed to protect the ends of the commutator more effectually against short circuits, which I accomplish by making the insulation of greater thickness, as shown at B′, and further by extending it slightly around the other side of the bar, as seen best in Fig. 4.

In order to provide for the ready inspection of the ends of the bars, after the commutator is assembled, I may omit the insulation from the ends and put it on separately in the form of the ordinary commutator ring or cone. In this event it may be found expedient to bore tapered holes through the body of the bar itself into which also the insulation may be inserted, being formed integrally with the insulation upon the side of the bar. Such a construction is illustrated in Figs. 5 and 6, wherein C, C are the tapered holes referred to, and D, D are the ordinary commutator rings or cones, which may be formed of mica or any other suitable insulating material capable of resisting the high potential differences found at this part of the commutator.

In Fig. 7 I show the insulation molded around the entire body of the commutator segment; in this case it is intended that the segments shall be assembled and then the face E upon which the commutator brushes are to rest shall be turned off in the lathe, exposing the copper to the brush.

It has been found difficult to obtain a material which when molded upon a copper bar would have sufficient adhesion for the purposes of my invention. Such a material however I have found in the substance now known in the art as liebite, which is composed of asbestus and certain binding materials, and is described and claimed in my Patent No. 505,916, dated October 3, 1893, which may be readily molded under heat and great pressure so as to adhere firmly to the commutator bar; and this material I have employed with good results. I do not however mean to limit myself to the precise materials named, as so far as I am aware I am the first to make a commutator segment having insulating material firmly adherent thereto; and I therefore wish to cover broadly the use of other materials in place of the one specified, which I name only as an example, and as having been the first with which my improved process has been successfully practiced.

What I claim, and wish to secure by Letters Patent of the United States, is—

1. The process of insulating commutator bars, which consists in molding the insulating material thereon so as to make it firmly adherent thereto.

2. The process of insulating commutator bars which consists in covering the bar with insulating material molded thereto under heat and pressure so as to become firmly adherent.

3. The process of making commutators for dynamo-electric machines, which consists in insulating the bars by molded material firmly adherent thereto, then assembling the parts in the commutator and then turning off the brush face so as to expose the copper, substantially as set out herein.

4. As a new article of manufacture, a commutator segment for a dynamo-electric machine, having insulating material firmly adherent thereto.

5. As a new article of manufacture, a commutator bar for the commutator of a dynamo-electric machine, having an insulating material firmly adherent thereto, such insulating material being thicker upon the parts having greatest potential difference.

In witness whereof I have hereunto set my hand this 13th day of December, 1893.

JOSEPH HOFFMAN.

Witnesses:
ARTHUR CHURCHILL,
WOOSTER B. CURTISS.