

(No Model.)

G. WEBER & C. W. MARCLEY.

ARMATURE BAR AND METHOD OF MAKING SAME.

No. 523,027.

Patented July 17, 1894.

FIG. 1.

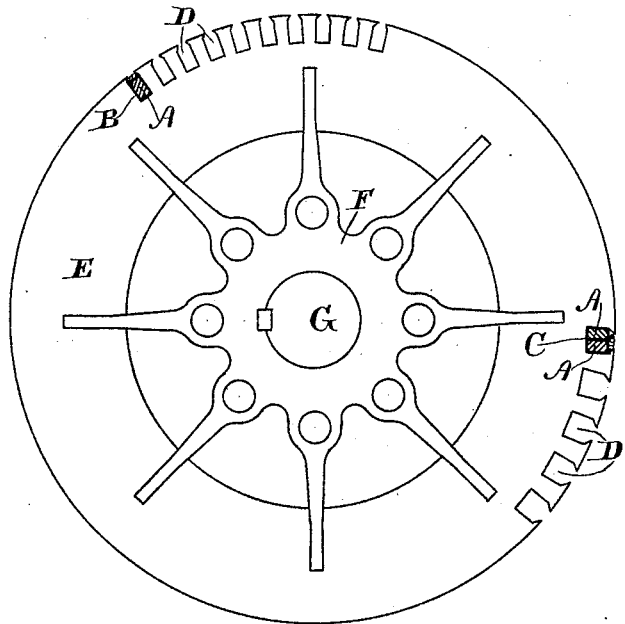


FIG. 2.

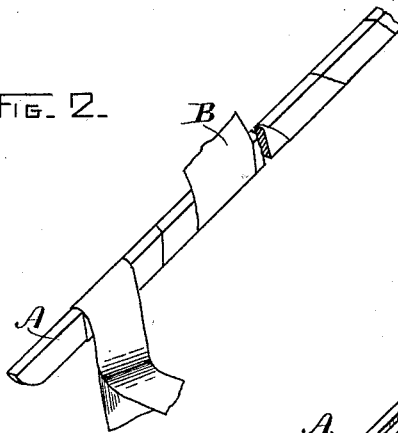
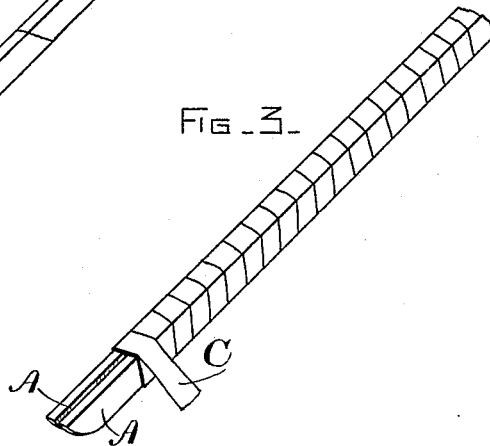


FIG. 3.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

GEORGE WEBER AND CHARLES W. MARCLEY, OF ROTTERDAM, NEW YORK, ASSIGNORS TO THE GENERAL ELECTRIC COMPANY, OF BOSTON, MASSACHUSETTS.

## ARMATURE-BAR AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 523,027, dated July 17, 1894.

Application filed December 22, 1893. Serial No. 494,408. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE WEBER and CHARLES W. MARCLEY, citizens of the United States, and residents of Rotterdam, county of Schenectady, State of New York, have invented certain new and useful Improvements in Armature-Bars, of which the following is a specification.

Our invention relates to armature bars, and has for its object to provide an efficient and economical method of insulating such bars, particularly such as are used in the construction of large armatures designed for heavy currents. In such armatures, bars are required to carry large currents, and if of large size, are apt to become heated by the eddy currents generated in the copper of the bar itself; it has therefore become a practice to divide such large bars into two or more parts, so as to prevent such eddy currents arising. It has also been the practice to insert bare copper rods in slots in the surface of the armature body; it is usual to cover the sides of such slots with insulating material, generally with mica; but this has given rise to much trouble, principally from the fact that when the sides of the slots are irregular, the copper rod would not slide over the insulation, and if forced to do so, would tear it in its passage, thus causing short circuits and damage in the armature. With the increase in size of such generators as were made in the manner described came the necessity for subdividing the armature conductors, and when two or more such parts were placed side by side in the slot, with a strip or strips of insulation between them, this difficulty was even more apparent.

It is to remedy the difficulties herein briefly pointed out, that we have devised our invention, which consists in a method of insulating the bars, which leaves them upon their outside surface, or, to speak more accurately, which leaves their insulation upon its outside surface, smoothly finished, so that the bar may be conveniently inserted in its slot. It also enables us to use a multiplicity of bars if necessary, leaving the outer surface of the composite bar as smoothly finished as that of a single bar; at the same time we are enabled

to reduce the thickness of insulation between the bar and the armature core by reason of the diminished liability to damage in assembling the armature which our improved method and bar permit. To the ends pointed out we first insulate each component of the composite bar (although each component is in itself a bar adapted to a smaller current than the composite bar, of which it may form a part), and further insulate the composite bar itself; the first we insulate with mica or mica paper, and the second either with mica or mica paper, or preferably by wrapping the composite bar with oiled cotton tape; we further submit the bar during its manufacture to heat and pressure in a mold, which gives it a polished or glazed surface of great smoothness, permitting it to be slipped into place in the armature-slot and secured therein by the usual wedges of insulating material, in a manner giving not only highly efficient insulation, but great mechanical strength.

In the accompanying drawings, hereby referred to and made part of this specification, we show an embodiment of our invention, wherein—

Figure 1 is a side elevation of the armature, showing a portion of the slots, and both a single bar and a composite bar in section. Fig. 2 is a perspective showing a single bar partially wrapped, and Fig. 3 is a perspective showing a composite bar made according to our invention.

Referring by letter, E, E are the laminated plates of the armature core having the slots D, D', &c., arranged to receive the bars forming the subject of our invention; F is the spider and G the shaft. All of these parts are old and in common use, and form no part of our invention.

In the slot D we show in section a single bar made according to our invention while in the slot D' we show in section a composite bar.

In Fig. 2 is shown in perspective a single bar adapted to be inserted in the slots D, D; A is the body of the bar, which is of copper, as is usual; and B is a wrapping of mica paper, preferably composed of scales of mica and thin, flexible Japanese paper combined

with shellac, as is commonly practiced in the art.

Fig. 3 shows the composite bar adapted to be inserted in the slot D'. Therein C is the tape to which we have referred as holding together the bars forming the composite bar. After the bars have been wrapped with the mica paper, they are inserted in a mold of the proper form, and therein subjected to heat and pressure, which softens the shellac and to some extent the mica, and at the same time polishes the external surface of the insulation so that the bar readily slides into place in the armature slot.

To form the bar shown in Fig. 3, two of those shown in Fig. 2 are assembled and wrapped with tape, and then again pressed as already described, making them have the same smoothly finished exterior surface.

By our invention as thus described, we obviate efficiently and cheaply the difficulties which we have pointed out.

Having thus described our invention, what we claim, and wish to protect by Letters Patent of the United States, is—

1. The process of insulating armature bars, which consists in wrapping the bar with mica paper formed of mica scales and thin paper

cemented together with shellac, and then subjecting the bar to heat and pressure. 30

2. The process of forming a composite armature bar, which consists in wrapping two bars with mica paper formed of mica scales and paper united by means of shellac, and subjecting the bars to heat and pressure, and placing the two bars together and wrapping them with oiled cotton tape, and then subjecting the composite bar so formed to heat and pressure. 35

3. As a new article of manufacture an armature bar wrapped with mica paper having a smooth finished surface. 40

4. As a new article of manufacture a composite armature bar composed of a plurality of single bars, each wrapped with mica paper, such bars being united into a composite bar by a wrapping of oiled cotton tape, and having a smooth or glazed outer surface. 45

In witness whereof we have hereunto set our hands this 20th day of December, 1893.

GEO. WEBER.

CHARLES W. MARCLEY.

Witnesses:

ARTHUR CHURCHILL,

WOOSTER B. CURTISS.