H. R. SAXON.

COMMUTATOR.

APPLICATION FILED APR. 17, 1916.

1,351,926. **Patented Sept. 7, 1920.**

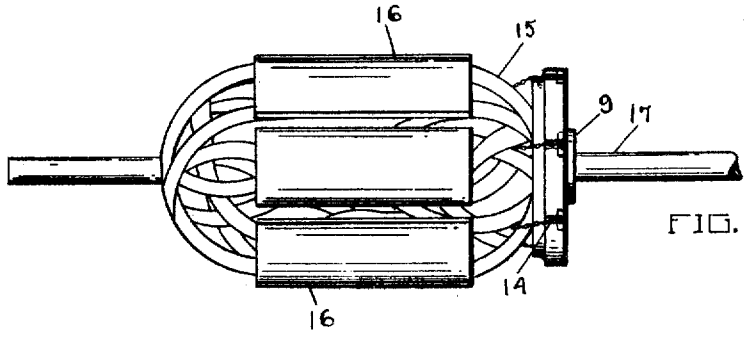


FIG. 1



FIG. 2

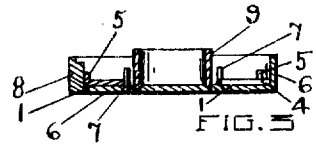


FIG. 3

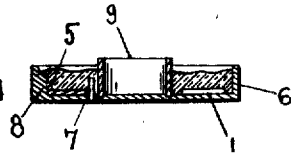


FIG. 4

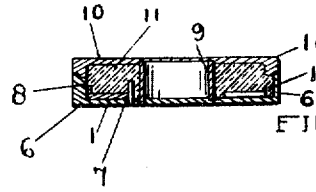


FIG. 5

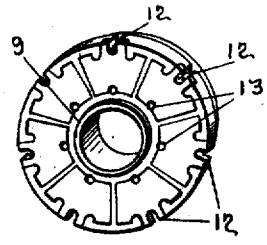


FIG. 6

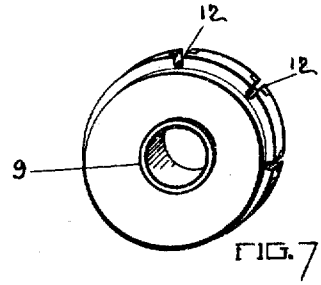


FIG. 7

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UNITED STATES PATENT OFFICE.

HERMAN R. SAXON, OF TOLEDO, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ELECTRIC AUTO-LITE CORPORATION, OF TOLEDO, OHIO, A CORPORATION OF DELAWARE.

COMMUTATOR.

1,351,926. Specification of Letters Patent. Patented Sept. 7, 1920.

Application filed April 17, 1916. Serial No. 91,754.

To all whom it may concern:

Be it known that I, HERMAN R. SAXON, a citizen of the United States of America, residing at Toledo, Lucas county, Ohio, have invented new and useful Commutators, of which the following is a specification.

This invention relates to features of insulation for a series of terminals.

The object of my invention is to provide a commutator of the disk type, in which the insulation material serves not only as a means for insulating the commutator elements from the shaft and from each other, but also as a means of support for the various elements. An additional object is to devise a form of commutator which may be readily molded in place. Further objects, and objects relating to economies of manufacture and details of construction, will definitely appear from the detailed description to follow. I accomplish the objects of my invention by the devices described in the following specification; my invention is clearly defined and pointed out in the appended claims.

A structure constituting a preferred embodiment of my invention, is illustrated in the accompanying drawings, forming a part of this specification, in which:—

Figure 1 is a side elevation of an embodiment of the invention in an armature;

Fig. 2 is a perspective view of a segmental terminal;

Fig. 3 is a transverse section of the mold with the segmental terminals disposed in an annular anchored series therein;

Fig. 4 is a view similar to Fig. 3 with the powdered insulation disposed over the series of terminals;

Fig. 5 is a view similar to Fig. 4 with the top of the mold in position and the powdered insulation compacted as by heat expansion into an integral cast or unit with the terminals;

Fig. 6 is a perspective view of the commutator unit removed from the cast and faced, ready to be applied to an armature shaft; and

Fig. 7 is a perspective view of the opposite side of the commutator of Fig. 6.

In the drawings, similar reference numerals refer to similar parts throughout the several views.

As illustrated, the commutator is composed of a series of flat truncated sectors 1, made of copper or any metal with similar electrical and mechanical properties. The narrowed end or top of the sector has formed in its edge, a radial recess 2; and the broad end or base has three radial recesses stamped in its edge, thus forming a serration of four prongs, the inner two, as 4, of which are extended to a greater degree than the outer, as 3. Between the prongs 4, extending at right angles from the base thereof, is a tongue 5, which is adapted to be embedded in the insulation and to serve as an anchoring means for securing each sector therein, and as a conductor connection for each of the conductor terminals.

The mold 6, for the commutator, is in the shape of a circular shallow cup. Circumferentially placed in the mold base, is a series of pins 7, adapted to seat within the sector recesses 2. On the outer base edge of the mold, a series of lugs 8 are formed, which are adapted to seat between the prongs 4, and engage the tongue 5. A cup 10 for the mold is also provided.

With these segments 1 grouped in the mold 6, the sleeve 9 is placed in position, the insulation compound which may be of finely divided material for the production of bakelite introduced into the mold, the cap or upper mold piece 10 placed in position and the insulation cast say by heat expansion thus embedding the annular series of terminals or conductor segments 1 in spaced relation. The mold members 10, 6, are then separated and the completed commutator unit removed axially.

Removal of the pins 7 leaves openings 13 in the commutator and the lugs 8 on the mold edge serve to form slots 12 in the molded insulation in which conductors 14 are inserted, the terminals of which are soldered to the sectors 16 providing electrical connection with the coils 15 of the armature 16 on the armature shaft 17 upon which the sleeve 9 is mounted. From the above description it should be apparent that a minimum of terminal metal as copper may be used and cheaply assembled in this annular series of radial face terminals to form a completed commutator of positively insulated terminal elements.

What is claimed and it is desired to secure by Letters Patent is:

1. A method of building commutators comprising the anchoring of an annular

series of terminals in a mold by means of interlocking elements on the mold and terminals respectively, casting of insulation about said terminals, and removing the terminals and insulation thus cast as a unit.

2. A method of building commutators comprising the anchoring of an annular series of terminals in a mold, the casting of insulation about said terminals in such a manner as to insulate the terminals from each other and from the armature shaft, and removing the terminals and insulation thus cast as a unit.

3. In the building of commutators, the anchoring at two points of each of an annular series of terminals, casting of an insulation about the anchored terminals, and removing the insulation cast and terminals from the anchoring.

4. In a commutator for armatures, the combination of a series of conducting contact elements; a one piece insulation support for said elements, said support having a series of transverse slots on its edge, adapted to form channels for the armature terminals; and a center ring adapted to support the commutator on the armature shaft.

5. In a commutator for armatures, a substantially flat insulation disk of substantially uniform thickness, a series of flat sectors embedded in one side thereof, and anchoring means extending into said disk for securing said sectors in position relative to the disk.

6. In a commutator for armatures, a substantially flat insulation disk of substantially uniform thickness, a series of flat sectors embedded in one side thereof having anchoring prongs extending into said disk for securing the sectors in position relative to the disk.

7. In a commutator for armatures, the combination of a series of contact elements, an insulation support in which said elements are embedded, said support having a series of transverse slots in its edge, axially extending prongs on the said contact elements extending into the insulation support and communicating with the said transverse slots for forming connections for the armature terminals.

8. A commutator comprising a series of plates, a disk of insulation having a flat face, said plates being embedded in said face and insulated one from another, and each of said plates having an anchoring portion extending rearwardly into said disk.

9. A commutator comprising a circular series of conducting plates, a disk of insulating material substantially uniform in thickness, in one face of which said plates are embedded and thereby insulated one from another, each of said plates having an integral lug extending rearwardly into said disk to anchor the plate to the disk.

10. A commutator comprising a circular series of conducting plates, a disk of insulating material having a substantially flat face into which said plates are embedded and thereby insulated one from another, each of said plates having a combined attaching and anchoring lug extending rearwardly into said disk.

11. A commutator comprising a support of insulating material, a series of contact plates embedded in said support, each of said plates having a lug extending in the plane thereof and another lug extending at an angle thereto into said insulating material, said lugs serving to firmly secure the plates to the support.

In witness whereof I affix my signature.

HERMAN R. SAXON.