March 18, 1924.

1,486,893

W. H. HIMES

COLLECTOR RING

Filed May 11, 1921

Fig.1.

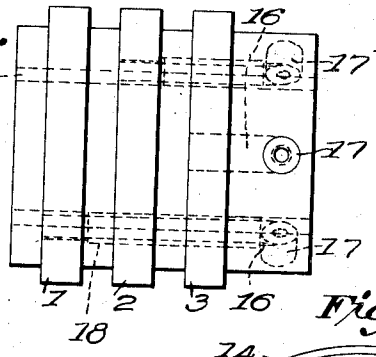


Fig.2.

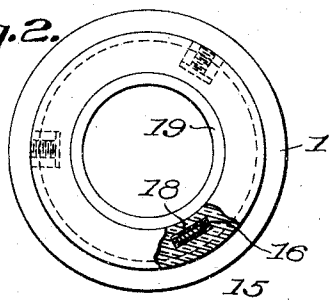


Fig.3.

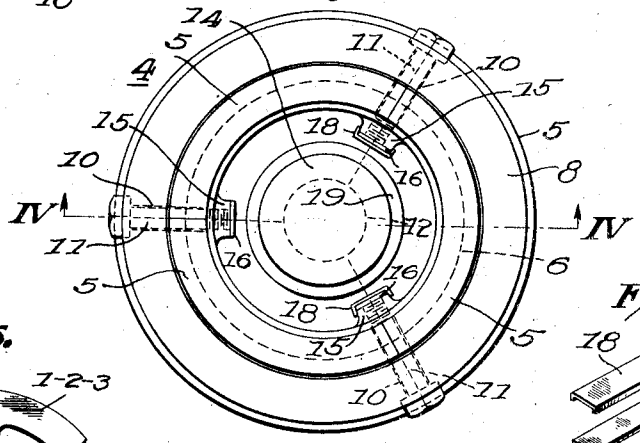


Fig.5.



Fig.6.

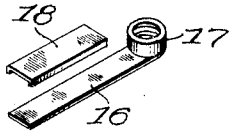
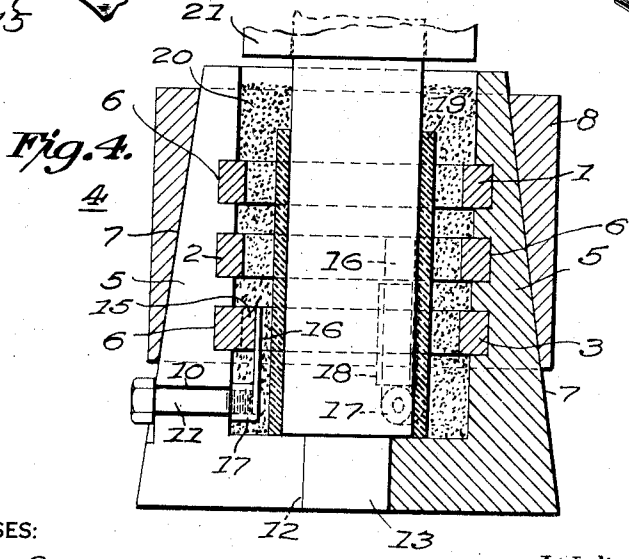


Fig.4.



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UNITED STATES PATENT OFFICE.

WALTER H. HIMES, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

COLLECTOR RING.

Application filed May 11, 1921. Serial No. 468,704.

To all whom it may concern:

Be it known that I, WALTER H. HIMES, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Collector Rings, of which the following is a specification.

My invention relates to dynamo-electric machines and it has particular relation to collector rings therefor and to methods of making the same.

One of the objects of my invention is to provide a device of the above indicated character in which a plurality of collector rings are arranged in spaced relation with respect to each other and molded into a unitary structure, with the individual rings maintained in proper spaced relation and electrically insulated from each other.

Another object of my invention is to provide a device of the character described which will require but little finishing after the same is removed from the mold.

A further object of my invention is to provide a method in which a plurality of collector rings may be assembled in a unitary structure with a minimum of time, labor and expense.

Another object is to provide auxiliary insulating means adapted to prevent the conducting members of the respective collector rings from being forced into short-circuiting engagement with the other collector rings during the molding operations.

In the accompanying drawings,

Figure 1 is a side elevational view of a plurality of collector rings constructed and assembled in accordance with my invention.

Fig. 2 is an end view of the structure illustrated in Fig. 1.

Fig. 3 is a plan view of a collector ring disposed within a mold.

Fig. 4 is a vertical longitudinal sectional view on line IV—IV of Fig. 3.

Fig. 5 is a fragmentary view of a portion of a collector ring illustrating the portion to which the conductor is adapted to be secured.

Fig. 6 is an exploded perspective view of a conductor and an insulating member which prevents the conductor from being forced into short-circuiting contact with collector rings to which it is not attached, during the molding operation.

Referring to the drawings, 1, 2 and 3, designate a plurality of collector rings which are disposed within, and supported in spaced relation by, a suitable mold 4. The mold 4 preferably comprises a plurality of segmental sections 5 which are provided with a plurality of spaced and parallel grooves 6 that extend around the inner circumference of the mold and in which the respective collector rings are seated. The mold 4 is of frusto-conical form externally, as indicated at 7.

The various segmental sections of the mold are retained in position by means of a ring 8, the inner surface of which conforms to the outer surface of the mold. It will be observed that, as the ring 8 is forced downwardly around the mold, it will force the segments 4 radially inward, with a wedging action, into close contact with each other.

Each of the segments 5 is provided with an aperture 10 which extends radially therethrough and is adapted to receive a bolt 11, the purpose of which will hereinafter be described. The floor of the mold 4 is provided with an axial aperture 12 which is engaged by the reduced portion 13 of a mandrel 14.

Each of the collector rings is provided with an inwardly projecting lug or boss 15 to which a conducting member 16 is secured, preferably by electric welding. The free end of each of the conductors 16 is provided with an internally screw threaded boss 17 which is adapted to register with a corresponding aperture 10 in the mold and is engaged by the threaded inner end of one of the bolts 11 to maintain the conductor in its proper position in the mold.

A channel strip 18 of insulating material is fitted between the outer face of each of two of the conductors 16 to prevent the conductor from being forced into short-circuiting engagement with the collector ring or rings through which it projects, during the molding operation.

When the various parts have been arranged in position, as above set forth, a sleeve 19 of insulating material, preferably green micarta, may be inserted, if so desired, over the mandrel 14 and in contact with the floor of the mold. Insulating material 20, preferably a phenolic condensation product, in plastic or comminuted condition is then

introduced into the mold between the collector rings and the sleeve 19 and is subjected to pressure, by means of a plunger 21, to compress it into a substantially solid mass and to cause it to flow into all irregularities or interstices that may exist.

The mold and contents thereof may or may not be then subjected to the action of heat, according to the nature of the insulating material employed.

By the above method, a very strong and compact collecting device may be constructed which not only effectually supports and insulates the various collector rings from each other but closely approaches a finished product, when removed from the mold, that requires but few, if any, finishing operations.

I claim as my invention:

1. A current-collecting device comprising a plurality of collector rings disposed in spaced relation with respect to each other, a plurality of conductors attached to said rings and an insulating material so molded around said conductors and between said rings as to maintain them in position as a unitary structure.

2. A current-collecting device comprising a plurality of collector rings disposed in spaced relation with respect to each other, a plurality of conductors attached to said rings, an insulating material molded around said conductors and auxiliary insulating members disposed between said conductors and said rings to prevent said conductors from being forced into short-circuiting engagement with said rings during the molding operation.

3. A current-collecting device comprising a plurality of collector rings mounted upon a cylinder of insulating material and a plurality of conductors secured to, and imbedded in, said cylinder, each of said conductors being provided at its extremity with a terminal member extending through said cylinder.

4. A current-collecting device comprising a plurality of collector rings mounted upon a cylinder of insulating material, a plurality of conductors secured to said collector rings and imbedded in said cylinder, each of said conductors being provided at its extremity with a boss, the outer face of which is flush with the surface of said cylinder, and a plurality of auxiliary insulating members interposed between said conductors and the inner faces of said rings to prevent said conductors from being forced into short-circuiting engagement with said rings during the molding operation.

5. A current-collecting device comprising a plurality of collector rings, a cylinder of insulating material disposed in axial relation with respect to said rings and an insulating material molded between said cylinder and said rings and adapted to maintain said rings in predetermined spaced relation.

6. The method of making a current-collecting device which comprises mounting a plurality of collector rings in spaced relation within a mold, disposing a sleeve of insulating material within said mold and in axial relation with respect to said rings, introducing an insulating material within said mold and between said sleeve and said rings, and compressing it to form a substantially solid body.

7. The method of making a current-collecting device which comprises supporting a plurality of collector rings having conductor members secured thereto in axial alinement and in spaced relation with respect to each other within a mold, disposing a sleeve of insulating material within said mold and in axial relation with respect to said sleeve, arranging auxiliary insulating members between said conductor and the rings adjacent thereto, introducing an insulating material into said mold and between said sleeve and said rings, and so compressing said material as to cause the same to flow into all cavities to form a substantially solid body.

8. The method of making a current-collecting device which comprises arranging a plurality of collector rings having conducting members attached thereto within a mold in substantial alinement and in spaced relation with respect to each other, drawing said conductors into engagement with the inner face of said mold, inserting a sleeve of insulating material into said mold and in axial alinement with respect to said rings, interposing auxiliary insulating members between said conductors and the adjacent rings, introducing insulating material into said mold and between said sleeve and said rings, and subjecting said material to pressure and heat to form a substantially solid body.

In testimony whereof, I have hereunto subscribed my name this 3rd day of May, 1921.

WALTER H. HIMES.