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W. H. HIMES

COLLECTOR RINGS AND METHOD OF MAKING SAME

Filed Feb. 16, 1922

Fig.1.

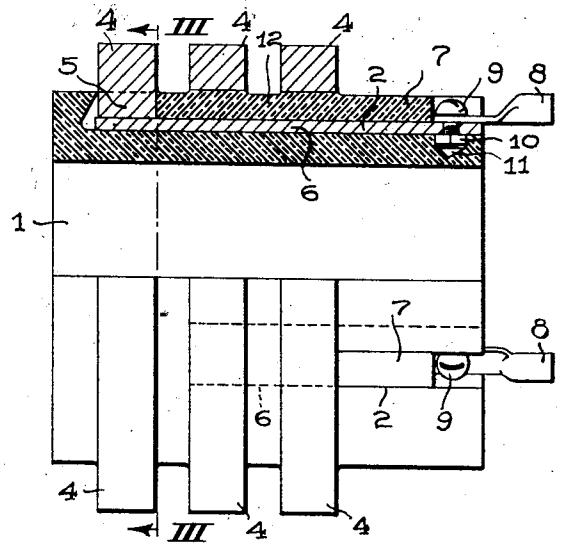


Fig.2.

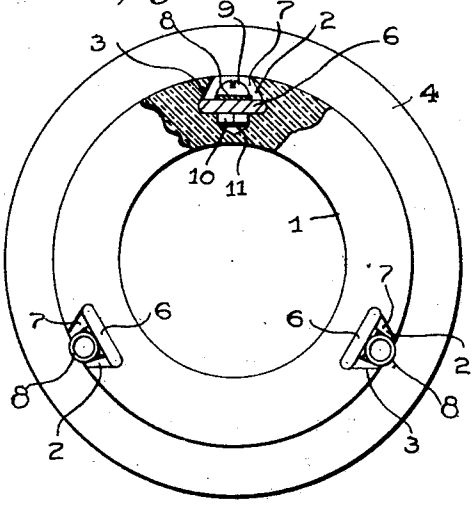
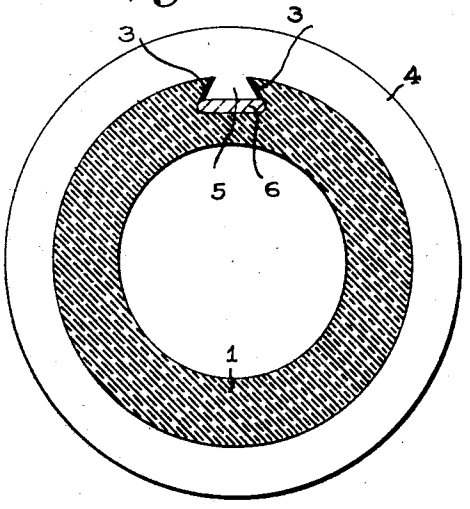


Fig.3.



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UNITED STATES PATENT OFFICE.

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COLLECTOR RINGS AND METHOD OF MAKING SAME.

Application filed February 16, 1922. Serial No. 536,862.

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 and Methods of Making Same, of which the following is a specification.

My invention relates to current collecting devices for dynamo-electric machines and it has particular relation to collector rings.

Heretofore, in the manufacture of collector rings, it has been customary to either mold a phenolic condensation product around the rings to maintain them spaced and insulated from each other or to force the rings onto a cylindrical support formed of a plurality of concentric micarta tubes. In the former method, it has been found, that the molded structure is brittle and is easily chipped or broken and in the latter method considerable time and labor was necessary to shape and assemble the various tube members to accommodate the connector members of the collector rings.

Furthermore, in the latter method above referred to, it was customary to wrap the support with wire adjacent to the perforations therein and to solder the various convolutions together and to the immediate connector. The surfaces of the wire bands thus formed were then machined and the various collector rings shrunk thereon. Inasmuch as the wire was wound on the support and soldered to the connectors after the various connectors were disposed in position between the concentric tubes, it was difficult to determine whether or not the connector was properly soldered to the wire band, as the effectiveness of the soldered connection was dependent entirely upon the amount of molten solder that succeeded in penetrating between the convolutions of wire. This method is known as "blind soldering".

One of the objects of my invention is to provide a collector ring structure that is very strong and rugged in construction and that may be quickly and easily assembled with a minimum of time and labor.

Another object of the invention is to provide a collector ring structure in which the various connectors may be welded, soldered, or otherwise secured to their respective rings before the rings are pressed onto their supporting member whereby a proper electrical connection is effected.

A further object of the invention is to provide a collector ring structure in which the connectors are provided with terminals by which the leads may be connected thereto which are so constructed and disposed as not to interfere with the assembling of the rings upon the support.

A still further object of the invention is to provide a current collecting device in which the body portion thereof is free from any projections that might interfere with wiping the same while the machine is in motion, to remove carbon dust and other foreign matter therefrom that might otherwise permit the formation of an arc between the collector rings.

In the accompanying drawings:

Fig. 1 is a view, partially in side elevation and partially in longitudinal section, of a collector ring structure constructed in accordance with my invention.

Fig. 2 is an end elevational view of the structure illustrated in Fig. 1, having a portion thereof broken away to show the construction of one of the terminal members.

Fig. 3 is a transverse sectional view taken on line III—III of Fig. 1, and illustrating the cross-sectional configuration of one of the connector slots and the connection between a connector and a collector ring.

Referring to the drawings, a collector ring structure is illustrated as comprising a substantially cylindrical supporting member 1 formed of tightly wound impregnated paper or other suitable fibrous insulating material. The periphery of the cylindrical supporting member 1 is provided with a plurality of longitudinally extending slots or grooves 2 formed with undercut side walls 3 and preferably disposed substantially 120° apart about the circumference thereof.

A plurality of spaced collector rings 4 are either shrunk or pressed upon the member and are each provided with an inwardly extending lug or boss 5 which is adapted to extend into one of the slots 2 and to abut the end thereof. The lugs 5 may be of dovetail shape if desired, to cooperate with the undercut walls 3 of the slot into which it projects as best shown in Fig. 3. The slots 2 are of different lengths and each terminates adjacent to the collector ring with

which it cooperates. When the rings are positioned on the support, the lugs 5 extend into the slots and limit the distance which the rings may be forced onto the member by engaging the end walls of the slots. The rings are thus accurately positioned in properly spaced relation with respect to each other.

A connector, in the form of a relatively flat strap 6 is disposed in each of the slots 2, one extremity of each of which is welded, soldered or otherwise suitably fastened to the boss 5 of a collector ring 4. The connectors 6 are maintained in the slots 2 by means of wedges 7 formed with beveled sides which are adapted to coact with the undercut walls 3 of the slots 2 to prevent the displacement thereof by centrifugal action.

Leads 8 are secured to the outer extremities of the connectors 6 by means of bolts 9. The heads of the bolts 9 are flush with the surface of the member 1 and the nuts 10 thereof are disposed in apertures 11 formed in the bottom of the slots 2. The apertures 11 are preferably drilled and the nuts 10 are pressed thereinto so that their edges or corners bite into the walls of the aperture to prevent them from turning when the bolt is inserted.

In assembling the structure, the rings 4 having the connectors 6 previously secured thereto are successively disposed on the member 1 with the lugs 5 and connectors 6 disposed in the slots 2. The wedges 7, each of the proper length, are then driven into the slots until their inner ends abut the lugs 5 of the rings. If desired all of the rings 4 may be disposed on the member 1 before the wedges 7 are driven into interlocking position.

After the rings are all secured in position, any interstices that may exist may be filled with a suitable filler such as shellac, and the periphery of the support 1 turned down or resurfaced, as indicated at 12, to remove any irregularities occasioned by assembling the rings thereon and the insertion of the wedges 7.

From the foregoing it will be apparent that my improved structure may be very easily constructed and assembled and eliminates the objectionable features heretofore encountered.

I claim as my invention:

1. A current-collecting device comprising a body member, a collector ring carried thereby, and a substantially straight conductor, electrically connected to said collector ring, extending entirely below the surface of said body member, substantially parallel to the axis thereof.

2. A current-collecting device comprising a body member, a collector ring carried thereby provided with an inwardly extending lug member for interlocking engagement with said body member, and a conductor connected to said lug and disposed longitudinally below the surface of said body member.

3. A current-collecting device comprising a body member having a plurality of longitudinally extending grooves provided therein, a plurality of collector rings carried by said body member, a conductor for each of said rings disposed in said grooves and a wedge member of insulating material disposed in each of said grooves and adapted to prevent the displacement of said conductors and to insulate said conductors from the adjacent rings.

4. A current-collecting device comprising a body member having a longitudinally-extending slot therein, a collector ring carried thereby having an inwardly extending projection adapted to engage said slot for interlocking engagement therewith, and means disposed in said slot to prevent the displacement of said projection therefrom.

5. A current-collecting device comprising a body member having a longitudinally extending slot therein, a collector ring carried thereby having an inwardly-extending projection adapted to engage said slot for interlocking engagement therewith, and a wedge member disposed in said slot to prevent the displacement of said projection therefrom.

6. A current-collecting device comprising a body member having a longitudinally-extending slot therein, a collector ring carried thereby having an inwardly-extending projection adapted to engage said slot for interlocking engagement therewith, and a wedge member adapted to be driven into said slot for interlocking engagement with the side walls thereof and in abutting engagement with said projection to prevent the displacement of said projection from said slot.

7. A current-collecting device comprising a body member having a longitudinally-extending slot therein, a collector ring carried thereby having an inwardly-extending projection adapted to engage said slot for interlocking engagement therewith, a conductor secured to said projection and disposed within said slot, and means for securing said conductor therein.

8. A current-collecting device comprising a body member having a longitudinally-extending slot therein, a collector ring carried thereby having an inwardly-extending projection adapted to engage said slot, a conductor secured to said projection and disposed within said slot, and a wedge member adapted to be inserted in said slot to close the same and to prevent the displacement of said conductor therefrom.

9. A current-collecting device comprising a body member having a longitudinally-extending slot therein, a collector ring carried thereby having an inwardly-extending

projection adapted to engage said slot, a conductor secured to said projection and disposed within said slot, means for preventing the displacement of said conductor therefrom, and a terminal connection carried by said conductor and disposed entirely within said slot.

10. A current-collecting device comprising a body member having a longitudinally-extending slot therein, said slot having undercut side walls, a collector ring carried by said body member and having a projection adapted to extend into said slot for interlocking engagement with the side walls thereof.

11. A current-collecting device comprising a body member having a longitudinally-extending slot therein, said slot being formed with undercut side walls and a collector ring carried by said body member and having a substantially dove-tail projection adapted to extend into said slot for interlocking engagement with the side walls thereof.

12. A current-collecting device comprising a body member having a longitudinally extending slot therein, said slot being formed with undercut side walls, a collector ring carried by said body member and having a projection adapted to extend into said slot for interlocking engagement with the side walls thereof, a connector member secured to said projection and disposed within said slot, and a wedge member having inclined side walls adapted to be inserted within said slots for interlocking engagement with the undercut side wall thereof to prevent the displacement of said connector from said slot.

13. A current-collecting device comprising a cylindrical body member of insulating material having a plurality of slots of different lengths in the periphery thereof, a plurality of collector rings mounted on said body portion and in spaced relation with respect to each other, and each provided with a projection adapted to extend into said slot and in abutting engagement with the end wall thereof, and wedge members disposed in said slots and in engagement with said projections to prevent the rotation of said rings with respect to said body member and axial movement with respect to each other.

14. A current-collecting device comprising a cylindrical body member of insulating material having a plurality of slots of different lengths in the periphery thereof, a plurality of collector rings mounted on said body portion and in spaced relation with respect to each other, and each provided with a projection adapted to extend into said slot and in abutting engagement with the end wall thereof, a connector member secured to each of said projections and disposed within its individual slot, and wedge members disposed in said slots to prevent the displacement of said collector rings and their respective connector members in axial and radial directions.

In testimony whereof, I have hereunto subscribed my name this 8th day of February 1922.

WALTER H. HIMES.