UNITED STATES PATENT OFFICE.

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METHOD OF BRAZING END RINGS.

1,341,682.


Application filed August 3, 1917. Serial No. 184,249.

To all whom it may concern:

Be it known that I, CHARLES W. STARKER, a citizen of the German Empire, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Methods of Brazing End Rings, of which the following is a specification.

My invention relates to the manufacture of the secondary members of induction motors and similar apparatus and particularly to that portion of the manufacture which consists in making a union between the projecting ends of bar conductors and an end ring having an annular recess in which the ends of the bar conductors are seated.

The object of my invention is to provide a particularly advantageous method of applying fusible conducting material to the bar conductor ends and the end ring recesses in which such bar ends are seated.

In the accompanying drawings, Figure 1 is a sectional view of a portion of a secondary member, together with the necessary auxiliary heating apparatus employed in connection with my method of brazing. Fig. 2 is an end view of the parts shown in Fig. 1; and Fig. 3 is a fragmentary view of a secondary member showing a modification of my invention.

The secondary member of an induction motor comprises a core member 1 that is provided with peripheral slots within which are located conducting bars 2, preferably composed of copper, that project beyond the ends of the core member 1. An end ring 3, preferably composed of metal having a relatively high electrical conductivity, is provided with an annular depression 4 that is adapted to receive the projecting ends of the conducting bars 2. The end ring 3 is secured to an end plate 11 of the core member 1 by a plurality of circumferentially arranged screw studs 5 and nuts 6 coating therewith which maintain the end surfaces of the conducting bars in close engagement with the bottom of the depression 4. The depression 4 is joined to the inner face of the body portion of the ring by an inclined or rounded surface 7, and the projecting ends of the bars 2 are cut away to substantially conform to the contour of the surface 7, the purpose of which will hereinafter be set forth.

The core member 1 is mounted on a rotatable mandrel 8 and is surrounded by a plurality of circumferentially arranged burners 9 which are adapted to deliver a substantially annular sheet of flame in a radial direction at points adjacent the outer periphery of the end ring 3. The specific construction and arrangement of the mandrel 8 and the burners 9 form no part of the present invention but are fully shown and described in my co pending application, No. 184,250, filed of even date herewith.

In the practice of my invention, the core member 1 is placed upon the mandrel as shown in Fig. 1. A quantity of fusible conducting material 10, preferably brass, spelter, or other suitable solder, is then placed upon the ring 3 adjacent to the surface 7. The ring 3 is then secured to the core member 1 by the studs 5 which, together with the end portions of the bars 2, serve to maintain the fusible material 10 in position. The fusible material 10 is preferably applied in the form of curved segments which are circumferentially arranged around the depression 4 and are respectively provided, at their ends, with notches 12 which are adapted to receive the studs 5, although a solid notched ring may be employed. The burners are then caused to deliver a blast of flame against the ring 3 and, at the same time, the core member 1 is rotated with the mandrel 8. The ring 3 is thus heated uniformly and it is obvious that the fusible material 10 will gradually melt and flow over the surface 7 into the depression 4 until it fills all portions thereof that are not occupied by the bar ends.

A modification of my invention is shown in Fig. 3 in which the ends of the conducting bars 2 extend only partially across the depression 4. The space between the edges of the bars 2 and the surface 7 is occupied by a ring 13 of conducting material which serves to maintain the bars 2 against the outer periphery of the depression 4. The method of applying the fusible material and of brazing is substantially the same as described with reference to Fig. 1.

From the foregoing, it is apparent that 115 the portions of the depressions of the end rings that are not occupied by the bar ends will be filled by a substantially unitary mass of conducting material because the conducting material, being indirectly heated, 110
will flow evenly and gradually into the depressions. It has also been found that the end rings and the adjacent portions of the bar ends are heated nearly to the melting point before the material 10 begins to flow so that a certain amount of fusion occurs between the conducting bars and the end rings.

Furthermore, end rings of like size and form may be employed for several sizes of motors the conducting bars of which have different radial widths, as will be apparent from an inspection of Figs. 1 and 3. The utilization of the studs 5 and of the bar ends 15 to secure the fusible conducting material in position before the brazing operation begins allows a rotor to be completely assembled before placed in the furnace. This is believed to be a material advantage, as it would be undesirable to place fusible conducting material in position after one end of the core member had already been heated.

While I have shown my invention in several preferred forms, it is not so limited but is susceptible of various minor changes and modifications within the scope of the appended claims.

I claim as my invention:

1. The method of manufacturing a dynamo-electric machine rotor comprising brazing a member provided with an annular depression to a plurality of circumferentially arranged bars having their ends located in said depression which consists in placing a ring of solid fusible material adjacent to the edge, but outside, of the depression and applying heat to fuse said material and to cause it to flow into the depression.

2. The method of manufacturing a dynamo-electric machine rotor comprising brazing an annular plate provided with a surface depression to a plurality of circumferentially arranged bars having their ends located in said depression which consists in placing a segmental ring of solid fusible material adjacent to the edge, but outside, of the depression and applying heat to fuse said material and to cause it to flow into the depression.

3. The method of manufacturing a dynamo-electric machine rotor comprising brazing an annular plate provided with an annular depression to a plurality of circumferentially arranged bars carried by a slotted member and having portions projecting beyond the end thereof in circumferential arrangement which consists first in placing a ring of solid fusible material adjacent to, but outside, of the depression, then securing the annular plate to the slotted member, with the projecting portions of the bars located in said depression and with the said fusible material held in position and finally applying heat to fuse said material and to cause it to flow into the depression.

4. The method of manufacturing a dynamo-electric machine rotor comprising brazing an annular plate provided with an annular depression terminating at one side in an inclined surface and a plurality of bars having their ends located within said depression which consists in placing a ring of solid fusible material adjacent to said inclined surface and outside of said depression and then applying heat to fuse the said material and to cause it to flow over said inclined surface into said depression.

5. The method of manufacturing a dynamo-electric machine rotor comprising brazing an annular plate provided with an annular depression and a plurality of circumferentially arranged bars of less radial width than that of said depression and having their end portions located within the depression which consists in placing a ring of solid fusible material adjacent to, and outside, the edge of the depression and then applying heat to fuse said material and to cause it to flow into the depression.

In testimony whereof I have hereunto subscribed my name this 17th day of July, 1917.

CHARLES W. STARKER.