July 17, 1928.

1,677,762

R. O. GILBURG

MOTOR ASSEMBLING FIXTURE

Filed July 5, 1927

2 Sheets-Sheet 1

Fig. 1.

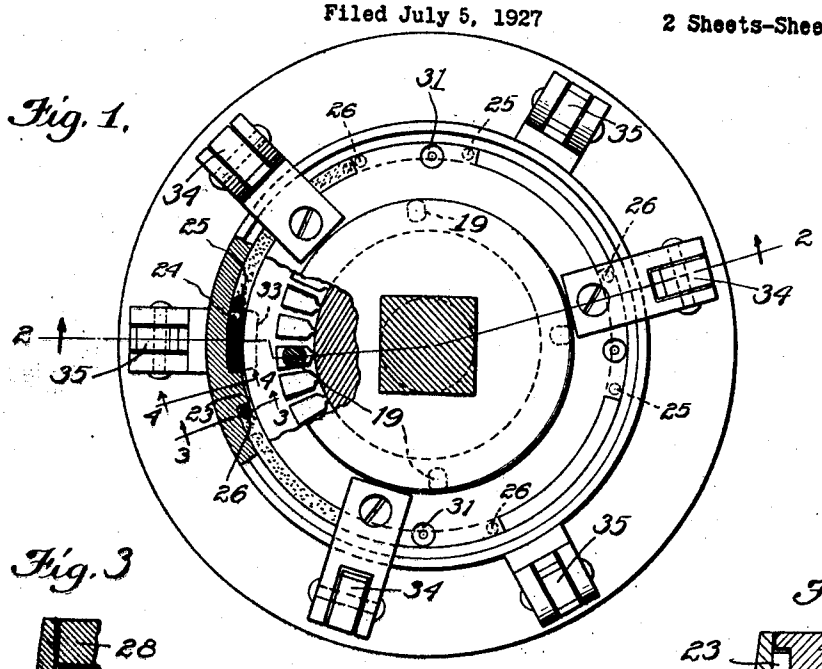


Fig. 3

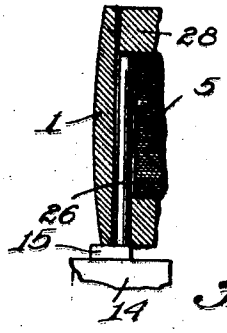


Fig. 4

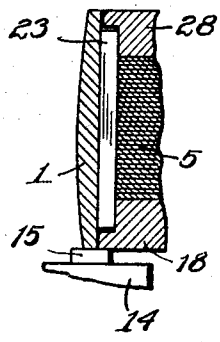
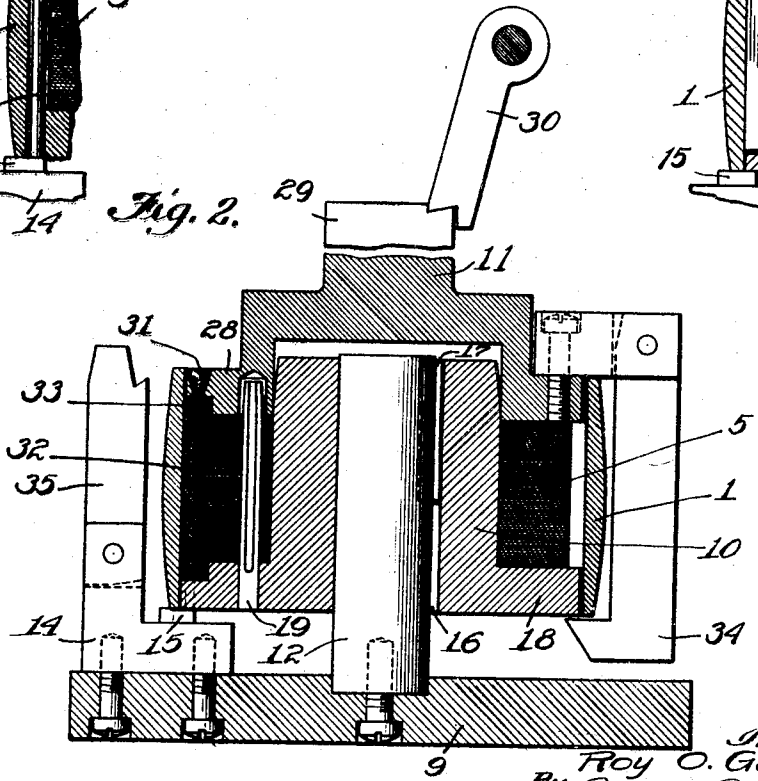


Fig. 2.



Inventor
Roy O. Gilburg
By Rummler & Rummler Attys.

July 17, 1928. 1,677,762

R. O. GILBURG

MOTOR ASSEMBLING FIXTURE

Filed July 5, 1927 2 Sheets-Sheet 2

Fig. 5.

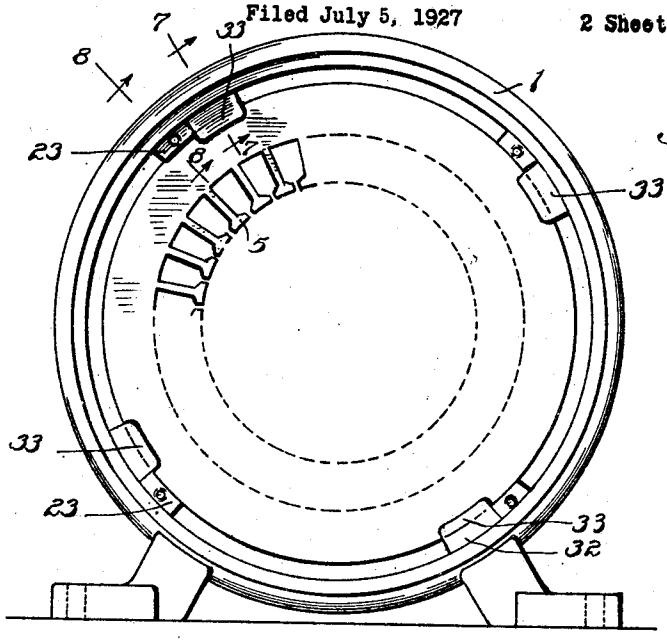


Fig. 6.

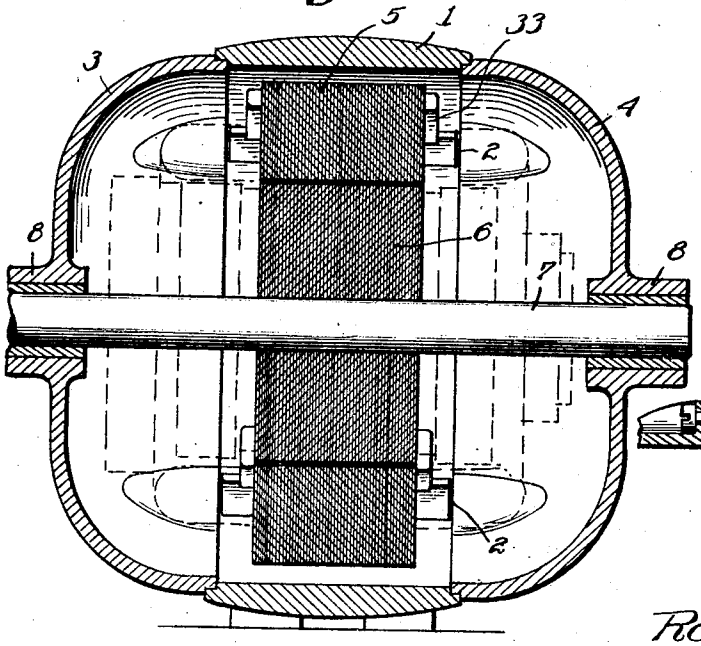


Fig. 7.

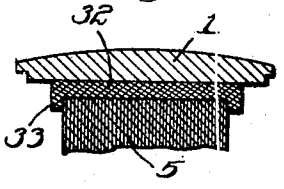
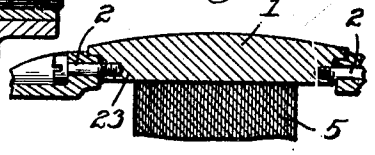


Fig. 8



Inventor
Roy O. Gilburg
By Pummler & Pummler
Attys.

Patented July 17, 1928. 1,677,762

UNITED STATES PATENT OFFICE.

ROY O. GILBURG, OF WAUSAU, WISCONSIN, ASSIGNOR TO MARATHON ELECTRIC MFG. CO., OF WAUSAU, WISCONSIN, A CORPORATION OF WISCONSIN.

MOTOR-ASSEMBLING FIXTURE.

Application filed July 5, 1927. Serial No. 203,428.

The invention relates to improvements in means for manufacturing motors, more especially small size, ring frame motors having laminated cores.

Heretofore in manufacturing such motors, the inside of the ring frame was machined, and the stamped laminations of the stator core were pressed into position. By the use of this invention, the machining is obviated by clamping the core in proper relation with the ring frame, and then casting low fusing metal preferably in strips into space between the core and the frame to anchor the core in position.

The main objects of this invention are to provide a fixture for holding the respective parts of the motor in proper relation for the casting operation; to provide a holding fixture in which the mold may be formed in a simple manner; to provide means for holding the laminated core under pressure during the casting operation; to provide means whereby the motor parts can be easily removed from the fixture after the casting is completed and to provide means for facilitating the casting operation in general and also securing the requisite accuracy, so as to reduce the cost of the motor.

An illustrative embodiment of this invention is shown in the accompanying drawings in which:

Figure 1 is a plan view of the fixture with the motor parts in place, as it appears just after the casting operation has been completed. The square stem of the fixture is shown in section, parts are broken away, and parts are shown in section.

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmental section taken on the line 3—3 of Fig. 1.

Fig. 4 is taken on the line 4—4 of Fig. 1.

Fig. 5 is an elevation of the motor frame with the core in position.

Fig. 6 is a longitudinal section illustrating the completed motor, shown for the purpose of explaining the uses of this invention.

Fig. 7 is a section on the line 7—7 of Fig. 5.

Fig. 8 is taken on the line 8—8 of Fig. 5.

Referring to the drawings, the motor frame consists of a central ring frame 1, in the open ends of which are secured, by means of screws 2, the end frames 3 and 4. The stator core 5 is rigidly mounted in the ring frame 1, and the rotor 6 is rigidly mounted on the motor shaft 7 which is rotatably mounted in the bearings 8, the bearings being centrally located in the end frames 3 and 4.

In order to secure efficiency in the performance of the motor, it is necessary that the rotor shall fit closely within the stator core, and be evenly spaced therefrom at all points. Therefore, in the manufacture, the stator core is first cast in place in the rough ring frame, and then the ends of said frame are machined with reference to the bore of the core to receive the end frames which are machined to conform with the machined surfaces in the ring frame so that the end bearings are co-axial with the bore of a stator core when the motor is assembled.

For mounting the stator core in the frame 1, before the frame has been machined, I provide a fixture which comprises, as shown in the drawings, a base 9, an arbor 10, and a pressure or cover member 11.

The base 9 consists of a circular disk which rests on the bed or abutment member of the press, and is provided with a cylindrical center post 12. Three brackets 14 are secured to the upper surface of the base on which are provided the locating pads 15. The brackets are, of course, equally spaced from each other and from the center post, and the pads provide a three point support for the ring frame 1 when the latter is in place in the fixture.

The arbor 10 fits slidably on the post, and is provided with a key slot 16 in which the key 17, fixed in the post, is engaged to hold the arbor against rotation. A flange 18 is provided on the lower end of the arbor, which seats on the same pads 15 which support the ring frame.

For straightening up the slots in the stator core 5, the four posts 19 are fixedly mounted in the flange 18. These posts are flattened on the opposite sides to fit slidably in the core slots.

The core laminations are first stacked, and then pressed on the arbor down to the flange 18. This alines the laminations on the inner diameter so that a smooth bore is obtained in the core. The inaccuracies in the laminations are thereby forced to the outer surface of the core, and no grinding is required. After the core is pressed on the arbor, the arbor is placed on the center post

12, with the flange resting on the pads 15. The rough casting of the ring frame 1 is then slipped down over the flange to also rest on the pads, so that the core is properly positioned in relation to the frame.

On the inner circumference of the frame are cast the ridges 23 to provide metal for receiving the threaded ends of the cap screws 2. The anchoring lugs 24 are also provided, located near the middle of the bore of the casting. When the frame is placed on the fixture, the ridges 23 and the lugs 24 are inserted between rods 25 and 26 which are arranged in pairs and fixedly secured in the arbor flange 18 so as to project into the annular space between the periphery of the core and the frame. The diametrical distances between the inner surface of the lugs 23 are gauged, and castings which will just slide easily over the core are used, accordingly the frame is roughly centered on the core by means of the lugs 23.

The cover member 11 is then placed in position. This member is recessed to fit snugly over the end of the arbor 10 which projects beyond the stack of laminations, and is also provided with recesses for loosely receiving the upper ends of the rods 19. The flange 28, of the member 11 fits inside the upper end of the ring frame to rest on the top of the core, and the ram of the press engages the upper end of the square stem 29 of the member 11 to compress and hold the core under pressure, a latch 30 being provided in the press for engaging the stem 11 to hold the laminations under pressure.

The flange 28 is cut away, as shown in Fig. 1, so that sand may be poured into the spaces between the pairs of posts 25 and 26. This forms the sides of the molds, and the ends of the molds are formed by suitable recesses in the flanges 18 and 28 of the members 10 and 11 respectively. Sprue holes 31 are provided in the flange 28, and communicate with the upper portions of the corresponding molds.

When the work has been assembled on the fixture and clamped under pressure, low fusing metal, such as type metal or babbitt, is poured into the mold to form the anchoring strips 32 including the flanges 33 which project at either side of the core for holding the same laterally.

When the metal is cooled, the cover member 11 is suddenly released to break off the pouring gates in the sprue holes, and loosen the member. The three hooks 34, which are pivotally attached to the cover member, are engaged under the frame and the arbor flange 18. When the member 11 is then raised, the arbor is drawn upwardly on the post 12. The supporting posts 35, which are pivotally mounted in the brackets 14, are then swung in to engage the lower edge of the motor frame 1. When the fixture is in this position, the cover member 11 is removed, and the ram of the press is engaged with the upper end of the arbor 10 to press the same out of the core. The rods 25 and 26 are withdrawn with the arbor, and the sand is removed and the motor parts are in assembled relation, ready for the finishing operations.

From the above description of the construction and operation of the device of my invention, it is apparent that the assembling operations may be rapidly and accurately performed, considerable expense is saved in constructing the motor, and the requisite accuracy is secured.

While but one specific embodment of this invention has been herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims:

I claim:

1. In a fixture for securing a laminated stator ring core in place in a motor frame, an arbor for receiving the core, a base for holding the arbor, the base having locating pads for positioning the frame in relation with the core, and rods mounted in pairs in the arbor for projecting into the annular space between the core and the frame so that the molds for casting strips of metal in said space may be formed by pouring sand into the spaces between the pairs of rods.

2. In combination in a fixture for securing a laminated stator ring core in place in a motor frame, a base having a post, a hollow arbor for the core removably mounted on the post, the base having locating pads for supporting the arbor and the motor frame, means for forming molds for casting strips of metal in the annular space between the core and the frame, a cover member for compressing the core on the arbor, said cover member having sprue holes for pouring the metal into said molds.

3. In a fixture for securing a slotted laminated stator core ring in a motor frame, an arbor for supporting the core in the fixture, and a post mounted in the arbor for projecting into one of the slots for alining the laminations at the sides of the slots.

4. In an arbor-press fixture for anchoring a laminated stator core ring in place in the motor ring frame by casting strips of low fusing metal between the ring and the frame, a base for resting on the bed of the press, the base having pads for supporting and locating the ring frame, an arbor for receiving the core, the arbor having a bottom flange for resting on the pads which support the frame, pairs of rods loosely mounted in the arbor flange and projectiing into the annular space between the core and frame to form partitions for holding mold sand poured in-

to the spaces between the pairs of rods, and a cover member fitting over the arbor for receiving the pressure from the ram of the press, the cover member having sprue holes for pouring the molten metal into the space between the rods of each pair to form the anchor strips.

5. In an arbor press fixture for anchoring a laminated stator core in a ring frame by casting strips of low fusing metal between the core and the frame, an arbor for receiving the core, the arbor having a bottom flange for supporting the core, a base having finished pads for supporting the frame and the flange of the arbor, rods loosely mounted in the arbor and projecting into the annular space between the core and the frame to define casting spaces, and a cover member fitting over the arbor and the core, said member having sprue holes for pouring molten metal into the casting spaces, said member and said flange having recesses for defining flanges on the strips at the sides of the core to hold the core laterally.

Signed at Wausau, Wis., this 29th day of June, 1927.

ROY O. GILBURG.