

Apr. 17, 1923.

1,452,143

J. BURKE

DYNAMO FRAME AND METHOD OF FORMING THE SAME

Filed Nov. 6, 1919

3 Sheets-Sheet 1

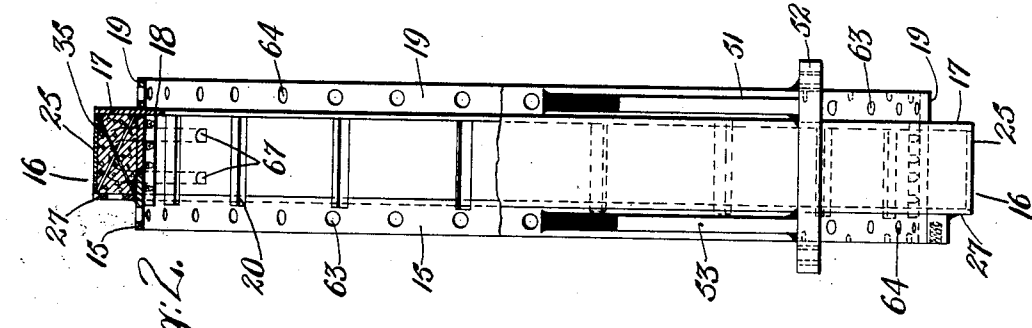


Fig. 2.

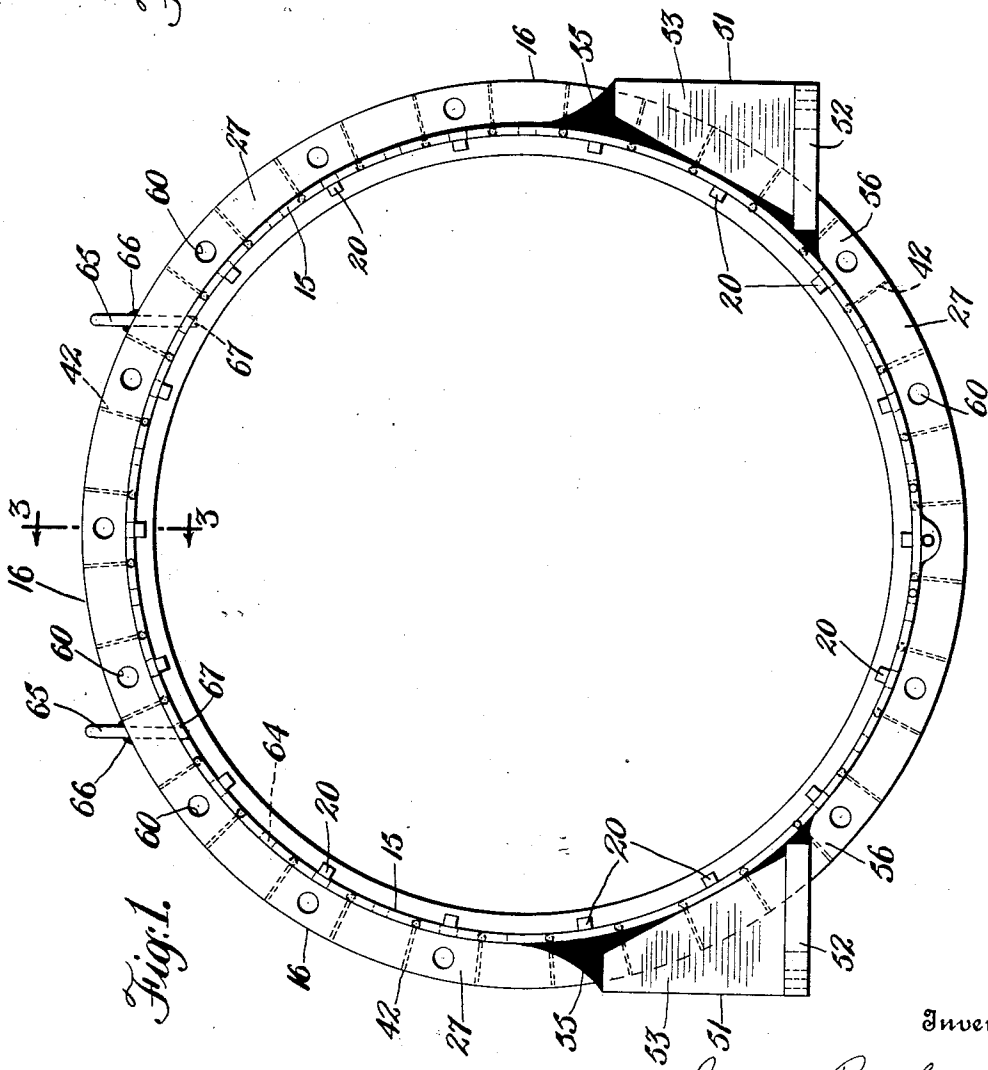


Fig. 1.

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3 Sheets-Sheet 2

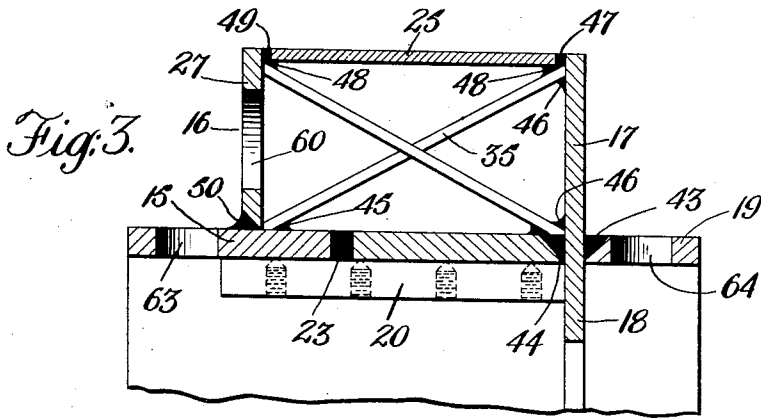


Fig. 4.

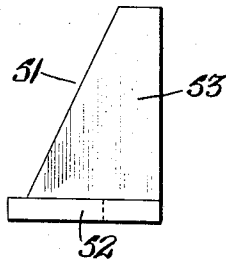


Fig. 5.

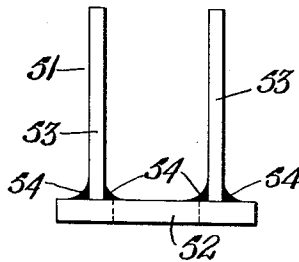


Fig. 6.

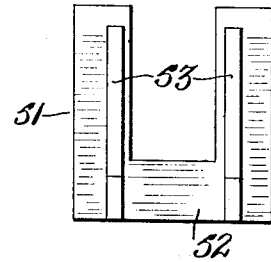


Fig. 7.

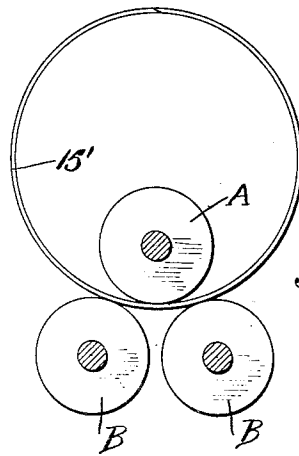
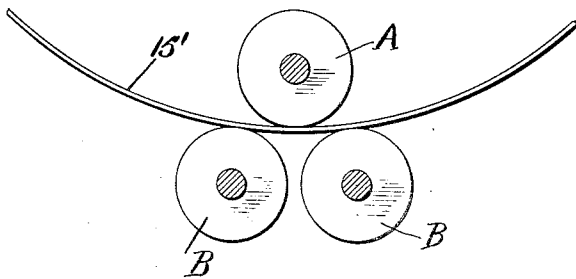


Fig. 8.

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3 Sheets-Sheet 5

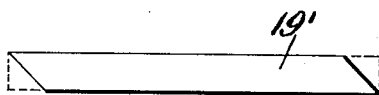
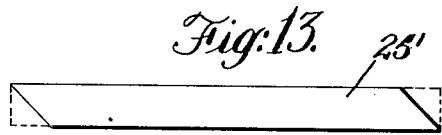
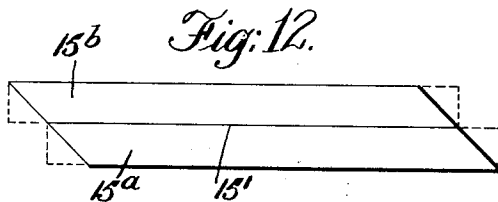
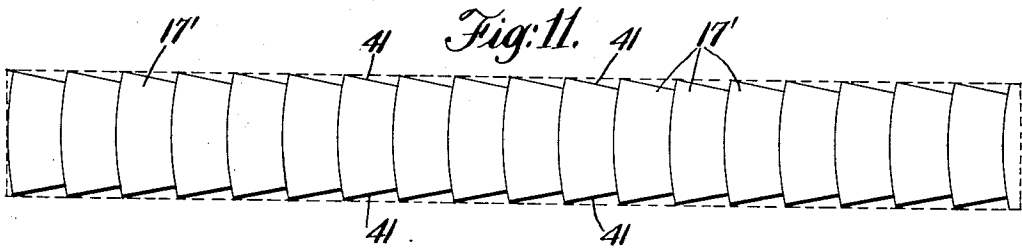
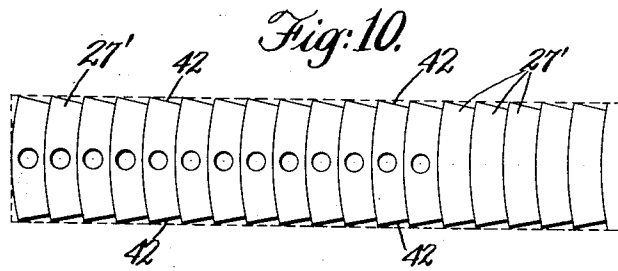
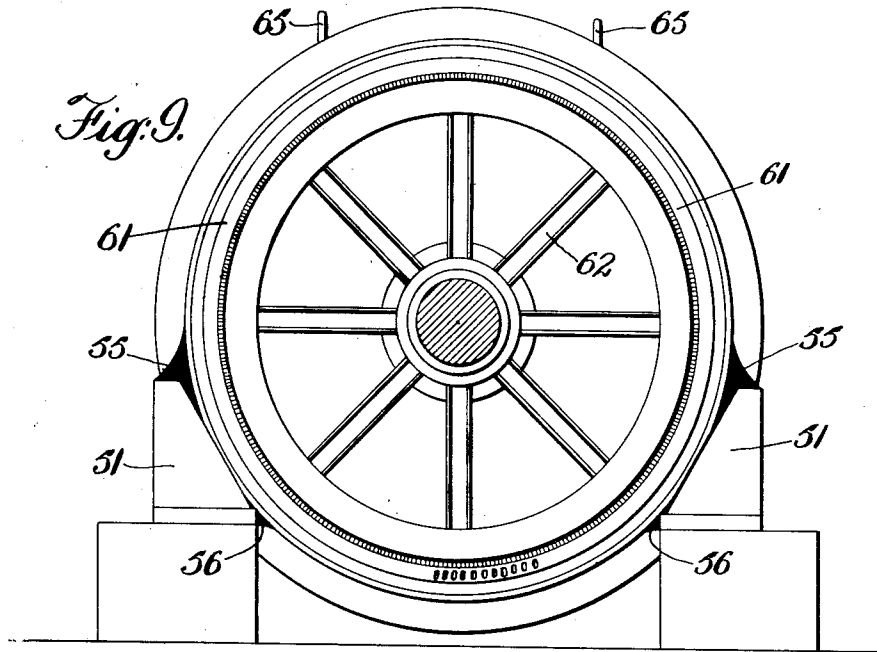


Fig. 14.

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UNITED STATES PATENT OFFICE.

JAMES BURKE, OF ERIE, PENNSYLVANIA, ASSIGNOR TO BURKE ELECTRIC COMPANY,
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DYNAMO FRAME AND METHOD OF FORMING THE SAME.

Application filed November 6, 1919. Serial No. 336,211.

To all whom it may concern:

Be it known that I, JAMES BURKE, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Dynamo Frames and Methods of Forming the Same, of which the following is a specification.

This invention relates to frames for electrical motors and generators and to methods for forming the same. The object of the invention is to provide a frame that will be strong and durable and inexpensively made without the formation of complicated and costly steel castings hitherto usual. A further object of the invention is to provide a frame combining with the metal structure a strengthening portion of reinforced concrete or similar material uniting and merging with the metal parts in a simple practicable construction.

In the accompanying drawings illustrating one embodiment of the invention

Fig. 1 is a side elevation of a generator frame made in accordance with the invention.

Fig. 2 is an end elevation of the same.

Fig. 3 is a sectional view on line 3—3 of Fig. 1.

Figs. 4, 5 and 6 are views of the frame foot.

Figs. 7 and 8 are diagrams illustrating the formation of circular frame elements.

Fig. 9 is a side elevation of the frame in place with the rotor mounted within it, and

Figs. 10 to 14 inclusive are diagrammatic illustrations of methods of shaping the plates to form the frame.

In the embodiment of the invention illustrated in the drawings the frame is composed in general of a circular body portion or ring 15 and an outer reinforcing structure 16, one end 17 of which extends inwardly within the edge of body portion 15 to form an end ring 18 for the core laminae carried by the frame. An overhanging flange ring 19 is carried by the end piece 17 in circular alignment with the body portion 15, and field laminae supporting strips 20 are fastened at intervals within the body portion as shown.

In the formation of this structure a strip of metal, preferably cold rolled steel of suitable gage and width, is cut to provide a diagonally ended length 15' (Fig. 12) and this length is then put in the bending rolls

AB (Figs. 7 and 8) and bent into circular form by passing back and forth between the rolls while the center roll is gradually fed down toward the two side rolls. When the strip is nearly circular in form it may be continuously revolved any number of times in each direction since the overlapping of the diagonal ends is such as to span the space between rolls B, B. The ends of the strip are thus bent into proper circular contour and the whole ring is a true circle with the ends brought closely together along a diagonal line. A weld is then formed along this diagonal line making the ring 15 a solid integral structure. As indicated in the drawing (Fig. 3) it is often desirable to first form the ring 15 of two rings 15^a and 15^b which are then welded together as indicated at 23. The ring 19 is similarly formed by bending a diagonally ended strip 19' (Fig. 14) and ring 25 of the outer housing 16 is likewise formed from strip 25' (Fig. 13).

The end rings 17 and 27 of the outer housing are composed of segments 17' and 27' respectively cut from blank steel plates as indicated in Figs. 10 and 11 respectively.

In the formation of the frame the rings 17, 18 and 27 are formed by welding together their respective segments along radial edges 41, 42 and rings 15 and 19 are then welded in alignment at 43 and 44 on opposite sides of ring 17, 18. The rods 35, thirty-six pairs in this particular instance, are then welded to rings 15 and 17 as shown at 45, 46, then ring 25 to the ring 17 at 47 and to these tie rods at 48, and end ring 27 to rings 15 and 25 at 49 and 50. The welding preferably supplies metal from the electrode to the spaces between the parts which are shaped to receive it and form tight and secure joints.

The steel ribs 20 for supporting the field laminations are then welded in place within ring 15 and the frame feet 51 are built up of shaped pieces of steel plate as indicated in Figs. 4 to 6. A base piece 52 (Fig. 6) is provided with triangular standards 53 welded thereto at 54. The feet 51 are then positioned on the frame straddling the housing 16 and welded to this housing and to the rings 15 and 19 at 55 and 56. Suspension eyes 65 may be added extending through recesses in plate rings 25 and 15 and welded thereto as indicated at 66 and 67.

A number of the segments 27' forming the end ring 27 have holes 60 in them which are

distributed throughout the assembled ring and give access to the interior of the outer housing 16 for the pouring in of a filler of cement material, such as concrete. The frame assembled as above set forth is laid flat on its side 19 exposing these holes 60 and the concrete mixture is run into all parts of the interior of the housing 16 through these holes. The concrete penetrates into all parts of the housing filling the same and binding with the housing walls and reinforcing rods 35 to form when hardened a complete reinforcing ring of concrete within the metal shell.

15 After the concrete has hardened the machine is ready for finishing and assembly. The field laminæ, windings, rotor 62 and end guard plates 61 are secured in position as shown in Fig. 9. Ventilating holes 63, 64 are provided, where desired, in the rings 15 and 19.

The metal frame is built up practically entirely of metal plate stock which may be of cold rolled steel having mechanical and electrical properties superior to the much more expensive steel castings. Such metal frames may also be installed where the difficulty of casting or transporting the cast steel frame would be prohibitive. The concrete filler ring combines with the frame structure to strengthen it and save in metal and is itself housed in and protected by the metal parts, while it forms a secure binder with the contacting portions of the housing forming the whole into a permanent unitary, solid structure.

I claim:

1. The process of forming a frame structure for a rotary electrical machine comprising forming a cylindrical body portion by bending flat strips of metal stock, forming annular disk portions by welding together segments formed from flat metal stock and welding to said cylindrical body portion, reinforcing said frame by filling cement material in between said disk portions and thus uniting and binding said metal parts, and securing axially extending cross bars to the interior surface of said cylindrical body portion for receiving and positioning the laminæ.

2. A frame for a dynamo electric machine comprising a cylindrical base of plate metal, a circular outwardly extending metal plate at right angles to said base, and a second circular outwardly extending metal plate, said second outwardly extending plate having an inwardly extending portion, the inwardly extending portion being adapted to support the laminæ on one side.

3. A frame for a dynamo electric machine comprising a cylindrical base of plate metal, a circular outwardly extending metal plate at right angles to said base, a second circular outwardly extending metal plate, said

second outwardly extending plate having an inwardly extending portion, the inwardly extending portion being adapted to support the laminæ on one side, and another cylindrical metal plate outside said second circular metal plate.

4. A frame for a dynamo electric machine comprising a cylindrical base of plate metal, a circular outwardly extending metal plate at right angles to said base, a second circular outwardly extending metal plate, said second outwardly extending plate having an inwardly extending portion, the inwardly extending portion being adapted to support the laminæ on one side, and bracing means between said circular metal plates.

5. A frame for a dynamo electric machine comprising a cylindrical base of plate metal, a circular outwardly extending metal plate at right angles to said base, a second circular outwardly extending metal plate, said second outwardly extending plate having an inwardly extending portion, the inwardly extending portion being adapted to support the laminæ on one side, and cement material occupying the space between said outwardly extending circular metal plates.

6. A frame for a dynamo electric machine comprising a cylindrical base of plate metal, a circular outwardly extending metal plate at right angles to said base, a second circular outwardly extending metal plate, said second outwardly extending plate having an inwardly extending portion, the inwardly extending portion being adapted to support the laminæ on one side, bracing means between said outwardly extending circular metal plates, and cement material occupying the space between said outwardly extending circular metal plates.

7. A frame for a dynamo electric machine comprising a cylindrical base of metal plate, a circular outwardly extending side portion of metal plate at right angles to said base and welded thereto at its inner edge, and a second circular outwardly extending side portion of metal plate at right angles to the base and welded thereto, said second side portion also having a portion extending inwardly beyond said base for supporting the laminæ at one side.

8. A frame for a dynamo electric machine comprising a cylindrical base of metal plate, a circular outwardly extending side portion of metal plate at right angles to said base and welded thereto at its inner edge, a second circular outwardly extending side portion of metal plate at right angles to the base and welded thereto, said second side portion also having a portion extending inwardly beyond said base for supporting the laminæ at one side, and a second cylinder of plate metal outside said second circular portion and welded thereto.

9. A frame for a dynamo electric machine

comprising a cylindrical base of metal plate, a circular outwardly extending side portion of metal plate at right angles to said base and welded thereto at its inner edge, a second circular outwardly extending side portion of metal plate at right angles to the base and welded thereto, said second side portion also having a portion extending inwardly beyond said base for supporting the laminæ at one side, and bracing cross bars between said circular side portions welded thereto. 10

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