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MOLD FOR SHAPING COILED WIRE.

Application filed Dec. 6, 1897.

(No Model.)

Fig 1

Fig. 2

Fig. 3

Fig. 7

Fig. 6

Fig. 5

Fig. 8.

Fig. 4.

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MOLD FOR SHAPING COILED WIRE.

SPECIFICATION forming part of Letters Patent No. 616,518, dated December 27, 1898.

Application filed December 6, 1897. Serial No. 660,904. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. BASSFORD, Jr., a citizen of the United States of America, and a resident of Bound Brook, in the county of Somerset and State of New Jersey, have invented certain new and useful Improvements in Electric-Coil Molds, of which the following is a specification.

In the manufacture of certain types of dynamos and other electric machines it becomes necessary not only to wind the electric conductors for the armature or iron core into coils, but to bend, twist, or otherwise shape the coils into predetermined configurations before or during their application to the iron core.

My present invention relates particularly to molding apparatus for dispensing with much time and labor in the shaping of coils for the armatures of dynamos or electric motors, and besides insuring rapidity in the preparation of the coils the coils are more truly formed than by hand, and consequently more workmanlike products result.

The coil to be operated upon by my apparatus is flat and long with rounded ends and covered, preferably, with insulation, which may consist of fibrous material saturated with shellac. The object of the apparatus is to change the long flat coil into a six-sided figure with rounded corners so that the halves of the coil lie in different planes.

The apparatus consists, essentially, of a single mold having independent angular bearing-surfaces separated from each other to a proper distance and of right and left handed cores, each consisting of a plate having triangular projections on opposite sides thereof and relatively laterally displaced as to each core and adapted to enter the corresponding angular spaces in the mold, the said plate occupying the said distance between said angular spaces. When either core is inserted completely into the mold without a coil, an empty space remains between diagonally opposite sides of each triangular projection and the mold, said space being equal to the thickness of the side of the coil. An empty space occurs also at the bottom of the mold for the coil's end, which becomes doubly curved.

The details of construction are set forth in the accompanying drawings, and the operation is explained by reference thereto.

Figures 1 and 2 show the side and front elevations of the coil to be operated upon, the solid black indicating that the convolutions of the conductor are covered with insulation. Fig. 3 shows the same coil in side elevation after being subjected to the complete molding process. All the coils are shown on a reduced scale. Fig. 4 is a full-sized molding apparatus, shown principally in elevation, with portions broken away to disclose the nature of the interior construction and exhibiting one of the cores partly inserted and partly broken off, the base-plate of the whole device being also partly omitted. Fig. 5 shows the same core by itself on a much-reduced scale and in perspective, so that its construction may become more easily apparent than when viewed in Fig. 4. Fig. 6 is a perspective elevation, on about the same scale as used in Fig. 5, of the mold minus the core. The coil of Fig. 1 is shown inserted into the mold to illustrate the first step in the operation. The shape of the opening at the top of the mold appears in Fig. 6. Fig. 7 is a perspective view in elevation, on about the same scale, showing the complete mold, the other core therein, the coil of Fig. 1 or Fig. 2 being compressed into shape at one end, and the handle or lever for forcing the core into the mold. The figure shows the coil in Fig. 3 only from a rectangular direction. Fig. 8 is a front elevation of the core which is partly shown at g' in Fig. 7. There are two cores treated of in this application. One of them is shown, as already set forth, in Figs. 4 and 5 and the other one in Figs. 7 and 8, the first being indicated by g and the latter by g'.

The mold a has two V-shaped surfaces b and c therein, separated from each other by a certain space and having their sides located in the same planes. The upper parts of the V-surfaces, near the ends, are parallel to each other, as indicated at d, and they lie, respectively, in the same planes. At the bottom of the mold the points of the V are cut off, leaving an empty space e. The space e is extended downward, forming a rectangular space for the entrance of the end of the coil and the projection f upon the core g. A rec-

tangular space bounded by the surfaces *i* and side walls of the V's exists between the V's for the reception of the plate *j* of the core *g*. The core *g* consists more particularly of a block or plate *j*, of proper dimensions to fit loosely into the space between the V's, bounded by the surfaces *i* and by the walls of the V's. The projection *f* extends from this plate and is rounded at *f'* to fit into the curved end *k* of the coil *l*. This projection or tongue *f* is of the proper size to fit loosely into the space *e* at the lower part of the mold *a*. Upon opposite sides of the plate *j* are V projections *m n*, laterally relatively displaced to the thickness of the side of the coil *l*. Thus it will be seen that the V projection *m* in full lines in Fig. 4 is not directly opposite the V projection *n* shown in dotted lines in Fig. 4. The distance between the planes of the surfaces of these V's is equal to the thickness of the side of the coil *l*. Furthermore, the V's *m n* on the core are similar, but not equal to those *b c* in the mold, but are narrower to the extent of the thickness of the side of the coil *l*. The discrepancy is equal, likewise, to the thickness of the side of the coil *l*, and consequently when the coil *l* and core *g* are tight within the mold the side of the coil extends downward along the side of one V projection and then into the space *e*, and then around the curved end of the projection *f* and upward along the side of the other V projection.

o is a post (shown as broken off in Fig. 6) acting as a fulcrum for the handle or lever *p*, which is provided with a slot *q* to receive the post *o*. The central portion of the handle *p* rests upon the core *g'*, and the slotted end is resisted by the head *r* of the post *o* when the handle end of the lever is depressed.

The complete operation of the device is as follows: The coil *l* in the shape shown in Figs. 1 and 2—that is, flat and long, curved at the ends and straight on the sides—is placed into the mold, as shown in Fig. 6, so that the curved end enters the space *e* as far as it will go. The core *g* is then pushed with great force into the mold *a*, while the hand guides the sides of the coil *l* to lie along between the V's of the core and mold, passing down one side of the core, around the curved tongue *f*, and up the other V projection. One's hand will be able usually to force the core only part way down. The handle *p* is then applied, as indicated in Fig. 7, so that the post *o* fits into the slot *q* and so that its center rests upon the core *g* or *g'*, as the case may be. The handle is then a lever which serves to drive the core home and to shape the coil as desired, as shown in Fig. 3. One core *g* is employed to form one end of the coil and the other core *g'* is for the purpose of shaping the other end.

Although the pressure applied is very great and the core, coil, and mold adhere together somewhat strongly, yet the coil *l* becomes a handle whereby the said elements may be quickly and easily separated.

The advantages are probably apparent without explanation further than to state that the thousands of coils to be shaped in a dynamo-factory may be run off rapidly by any ordinary workman not possessed of skill, and yet the coils will be exact duplicates and each will seem, as they really are, molded coils ready for accurate application to the electric machine.

I claim as my invention—

1. A device for shaping coiled wire, consisting of the combination of a core having a central plate, projections of a predetermined contour on the sides thereof, and a mold in which the plate and projections fit so as to leave a passage-way for the said coiled wire.

2. A device for shaping coiled wire, consisting of the combination of a single mold and two cores therefor, each core being a plate with projections on opposite sides thereof and relatively laterally displaced in both cores, but relatively laterally displaced in different directions in the respective cores, and a mold in which the projections fit so as to leave either a right-handed or a left-handed passage-way for the coiled wire according to which core is inserted.

3. A device for shaping coiled wire, consisting of the combination of a core having a central plate, triangular projections upon opposite sides thereof and relatively laterally displaced to the distance of the thickness of the said coiled wire, a tongue of predetermined contour extending from a third side of the plate, a mold cut to receive said plate, said projections and said tongue, and to leave a passage-way for the wire down one side of one triangular projection, around said tongue and up one side of the other triangular projection, a second core for the mold of exactly the same construction except that the triangular projections are laterally displaced in the opposite direction, and means for pressing the cores into the mold.

4. A device for shaping coiled wire, consisting of cores, whose shaping-surfaces are adapted to transfer the sides of a closed flat coil to planes outside of the plane of the original flat coil, and to bend said sides into a predetermined shape, and a mold for the cores.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day of November, 1897.

WILLIAM K. BASSFORD, JR. [L. S.]

Witnesses:

ULYSSES G. TINGLEY,

F. O. BALL.