

(No Model.)

H. E. HEATH.
APPARATUS FOR WINDING ARMATURE COILS.

No. 535,105.

Patented Mar. 5, 1895.

Fig. 1.

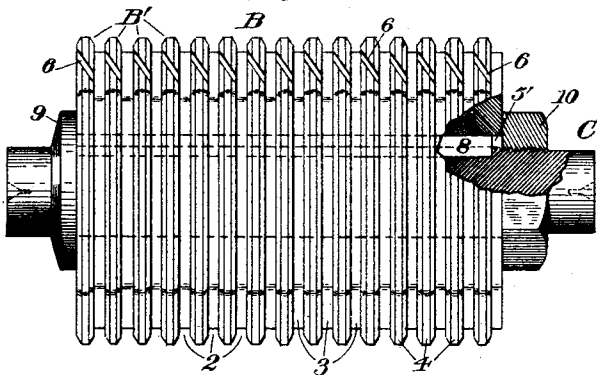


Fig. 2.

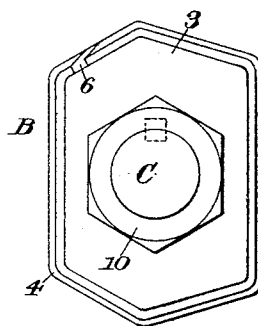


Fig. 3.

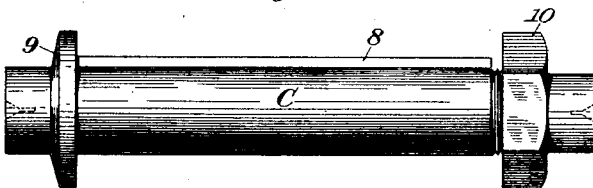


Fig. 6.

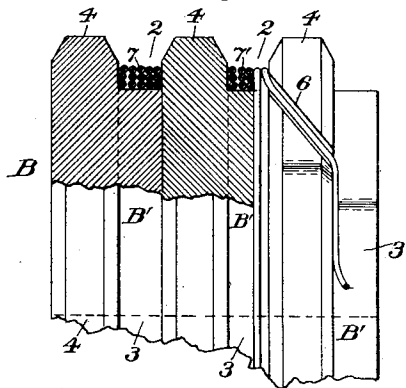


Fig. 4.

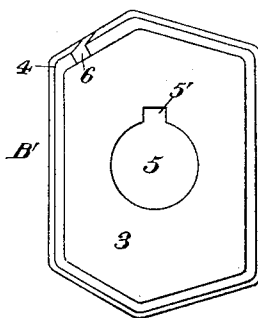
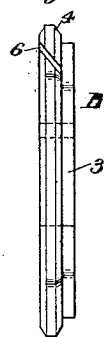


Fig. 5.



Witnesses:

J. L. Edwards Jr.
Fred. J. Dole,

Inventor:

Harry E. Heath.
By his Attorney,

F. A. Richards

UNITED STATES PATENT OFFICE.

HARRY E. HEATH, OF WINDSOR, CONNECTICUT, ASSIGNOR TO THE EDDY ELECTRIC MANUFACTURING COMPANY, OF SAME PLACE.

APPARATUS FOR WINDING ARMATURE-COILS.

SPECIFICATION forming part of Letters Patent No. 535,105, dated March 5, 1895.

Application filed May 15, 1894. Serial No. 511,299. (No model.)

To all whom it may concern:

Be it known that I, HARRY E. HEATH, a citizen of the United States, residing at Windsor, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Winding Armature-Coils, of which the following is a specification.

This invention relates to apparatus for winding coils for dynamo electric armatures; the object of the invention being, primarily, to provide improved means whereby a plurality of coils may be wound successively, simultaneously, or independently, and whereby the coils or coil may be uniformly wound with rapidity and economy.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation, partially in section, of a coil-winding apparatus embodying my invention, said figure illustrating a revoluble carrier with a sectional former revolubly-secured thereto. Fig. 2 is an end view of the same. Fig. 3 is a side view of the carrier. Figs. 4 and 5 are side and edge views, respectively, of one section of the former removed from the carrier. Fig. 6 is an enlarged sectional side view of a portion of the former showing three sections thereof, said figure illustrating the manner of winding the wire upon the sections and for holding the lag-end of the wire after winding.

Similar characters designate like parts in all of the figures.

In the present embodiment of my invention herein shown and described, the winding-apparatus comprises a revoluble carrier, a series of interchangeable former-sections of angular contour removably carried upon the carrier and each former-section comprising an axially-recessed hub having a peripheral flange at one end thereof with a transverse groove therein, and the entire series being so disposed one relatively to another that the transverse grooves in the flanges of said former-sections will be in alignment one with the other and the un-flanged end of the hub of one section will abut against the face of the flange of the adjacent section, and a clamping-device carried by the carrier in position and adapted for clamping the hubs of the several former-sections tightly together to

constitute a rigid but sectionally-separable former having a series of wire-receiving spaces with interposed wire-retaining and guiding flanges, as will be hereinafter more fully set forth.

In the preferred form thereof herein shown, the former B is of hexagonal contour, as clearly shown in Fig. 2 of the drawings, and is made up of a plurality of duplicate sections or independent formers, B', each of which consists of an axially-recessed main body-portion, or hub, 3, upon which the wire is to be wound, and a peripheral separating and wire-retaining flange, 4, formed at one end of said hub, as most clearly illustrated in Fig. 5. The flange 4 of each former-section B' is transversely grooved at one side thereof, as shown at 6, to form a way through which a continuous strand of wire may pass from one winding-space to the next adjacent space intermediate to successive wire-retaining flanges 4, when said former-sections are connected in working disposition, as will be hereinafter described. These spaces intermediate to the successive wire-retaining flanges 4 are herein designated by 2. The transverse grooves 6 in the several flanges 4 preferably extend diagonally across said flanges and have their inner edges terminating flush with the periphery of the body-portion or hub 3 of their respective former-sections.

The several former-sections B' are removably-carried upon a revoluble carrier, C, with the end of the hub of one section in close abutment with the adjacent face of the flange of the next adjacent section.

Owing to the angular construction of the several former sections, and owing to the fact that the leading grooves 6 of said sections for the best practicable purposes should be in alignment one with the other in a plane parallel to the axis of the carrier, it is very essential that said former-sections should coincide in disposition one relatively to the other upon the common carrier C, and as a means for facilitating the positioning of the several former-sections and secure a coinciding relation and at the same time provide a means for securing said sections to the common carrier so that they will be capable of rotation therewith, and so as to permit the ready removal of one or more sections from said car-

rier, the hub 3 of each section has an axial recess, 5, formed therein with a radial groove or key-way, 5', merged therein at the periphery thereof, and a combined guide and locking-device is provided, which, in the form thereof herein shown, consists of a longitudinally-disposed spline or key, 8, upon the carrier C constructed and adapted for entering the key-way 5' of the hubs 3 of the several sections, said key-way being located in coinciding position in the several former-sections so as to insure an alignment of the leading-grooves 6 when said sections are assembled upon the carrier C. It is obvious that this arrangement of key and key-way may be reversed without departure from my invention.

By the construction and organization just described, it will be seen that the assembling of the former-sections in proper working position is greatly facilitated, as no possible error in the correct positioning of one section relatively to another can possibly arise through carelessness in assembling said sections upon the common carrier, as might be the case where said sections were dependent for their relative positioning upon a common clamping-device or upon the independent fastening devices heretofore employed.

The carrier C is provided at one end thereof with an annular flange, 9, which forms a bearing for the end section of the series of former-sections when the same are assembled upon said carrier, and a clamping-device is provided at the opposite end of said carrier, which in the form thereof herein shown, consists of a nut, 10, screwed upon the end of the carrier and bearing against the opposite end-section of the series of former-sections, as illustrated in Fig. 1.

By forming leading grooves 6 in each former-section, as shown in the drawings, the winding operation is greatly facilitated, as one or more winding-spaces 2 may be filled with wire during the operation of winding, as shown in Fig. 6, and the wire may be carried through the leading groove 6 into the next winding-space and be wound upon the hub of the next adjacent section, which operation may be repeated until all the spaces 2 are uniformly filled with coils.

After the several spaces 2 have been filled with wire to constitute practically independent but connected coils, the nut 10 may be removed from the carrier, the former-sections slightly separated and the wire clipped between said sections, after which one or more former-sections may be slid off from the carrier together with the coil thereon.

The operation of winding the coils may be accomplished in any suitable manner, it usually being accomplished by rotating the carrier.

I do not desire to limit myself to any special shape of former as this may vary to suit the requirements in special cases.

Having thus described my invention, I claim—

1. The herein-described apparatus for winding coils, comprising a series of interchangeable former-sections removably mounted upon the carrier; each former-section having an axially-recessed hub, a peripheral flange at one end of said hub, and a locking member, said former-sections being so disposed relatively to one another upon said carrier that the respective axial recesses and locking-members are in alignment with one another and the unflanged end of the hub of one section will abut against the face of the flange of the adjacent section whereby regular spaces are formed between said flanges; locking means upon the carrier adapted to engage the locking members of the former-sections and maintain said former-sections against transverse movement with respect to the carrier, and clamping means for maintaining said former-sections against longitudinal movement with respect to said carrier, substantially as described.

2. The herein-described apparatus for winding coils, comprising a series of interchangeable former-sections removably mounted upon the carrier; each former-section having an axially-recessed hub, a peripheral flange at one end of said hub, a transverse-groove in said flange, and a locking member in the axial recess, said former-sections being so disposed relatively to one another upon said carrier that the respective axial recesses transverse-grooves and locking members are in alignment with one another and the unflanged end of the hub of one section will abut against the face of the flange of the adjacent section whereby regular spaces are formed between said flanges; locking means upon the carrier adapted to engage the locking-members of the former-sections and maintain said former-sections against transverse movement with respect to the carrier, and clamping means for maintaining said former-sections against longitudinal movement with respect to said carrier, substantially as described.

3. The herein-described apparatus for winding coils, it consisting of a revoluble carrier having a retaining flange at one end thereof, a series of duplicate interchangeable former-sections each comprising an annularly recessed hub with a transversely-grooved peripheral flange at one end thereof, a combined guiding and locking-device connected with said carrier and adapted for facilitating the positioning of the several sections relatively to each other and for locking them against rotation with relation to said carrier, and a binding-nut screwed upon the unflanged end of said carrier and clamping the several sections between said nut and the carrier-flange, substantially as described and for the purpose set forth.

HARRY E. HEATH.

Witnesses:

FRED. J. DOLE,
EMERY C. WHITNEY.