

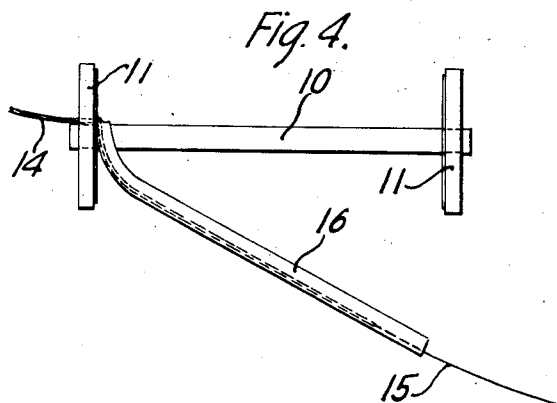
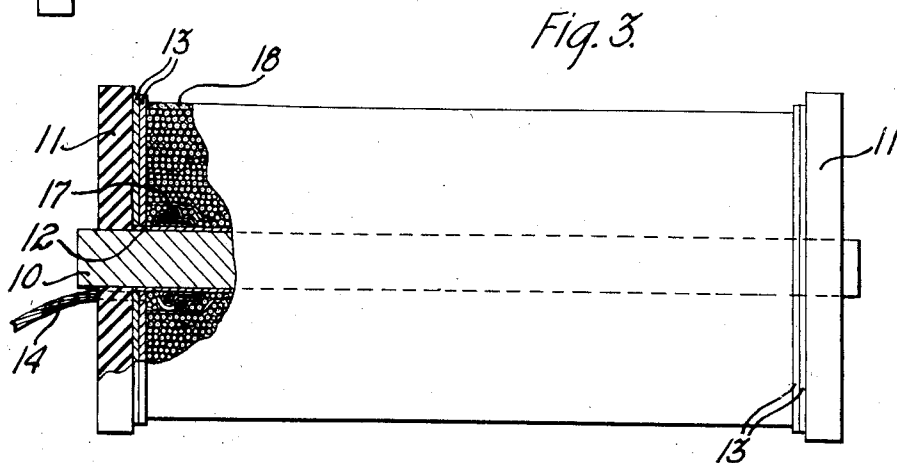
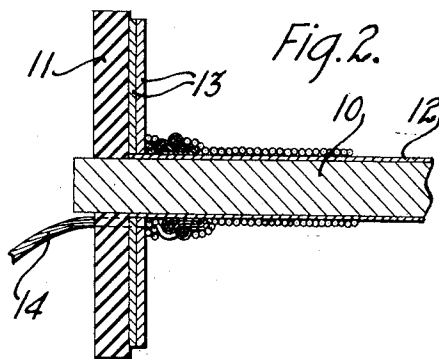
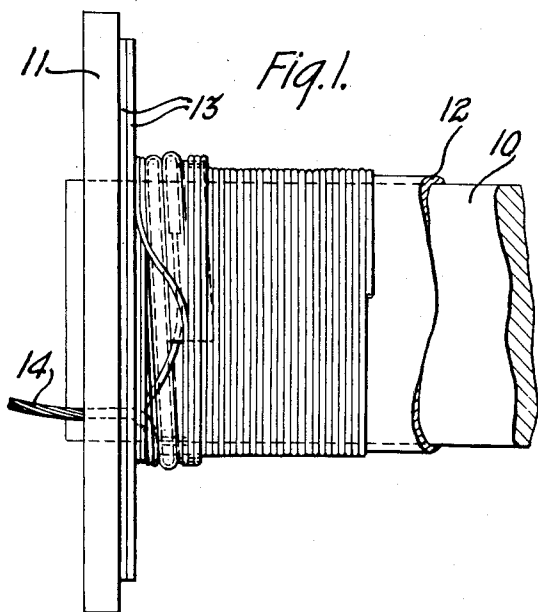
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S. C. WILEY

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METHOD OF WINDING COILS

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UNITED STATES PATENT OFFICE.

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METHOD OF WINDING COILS.

Application filed November 30, 1926. Serial No. 151,757.

This invention relates to a method of winding coils, and more particularly to a method of winding electrical coils.

In the manufacture of electrical coils particularly of enamel insulated wire, it is the practice in some instances to connect an uninsulated terminal or stranded lead-in wire to the end of the enamel insulated wire preliminary to starting the winding of the coil. The free end of the lead-in wire is then inserted through an aperture provided in one of the spool heads of the core and the portion of the lead extending from the inner face of the spool head is covered with paper or other suitable insulating material, after which the winding of the coil is continued in the usual manner. In practicing this method of winding electrical coils a very high degree of care and skill is required in the winding of the coil in order to eliminate the possibility of the first one or two turns of enameled wire in the first two or three layers from working their way downwardly along the inner side of the spool head and coming into contact with the bare lead-in wire, which condition may, in some instances, result in portions of the insulating enamel becoming removed from the enameled wire, thus rendering it possible for one or more layers of the coil being shorted from the remainder of the coil.

The principal object of this invention is the provision of an improved and simplified method of winding electrical coils wherein the possibility of deleterious short circuits due to the above causes is eliminated.

In order to attain this object, in accordance with the features of the invention, the uninsulated terminal or lead-in wire is connected to the enamel insulated winding material in the usual manner and then covered with paper or other suitable insulating material. At the starting of the winding operation, the first few turns of the insulated wire are superimposed upon the terminal or lead-in wire adjacent the inner face of the spool head, after which the winding of the coil is continued in the usual manner. This protects the bare lead from contact with the wire in any of the layers applied thereover.

It is believed that the invention will be clearly understood from the following detailed description read in conjunction with the accompanying drawing, wherein

Fig. 1 is an enlarged fragmentary view of a coil which has been partially wound in accordance with the improved method;

Fig. 2 is a fragmentary longitudinal section of the coil shown in Fig. 1;

Fig. 3 is an elevational view, partly in section, of a completed coil, and

Fig. 4 is a detail view illustrating the method of insulating the lead-in wire preliminary to starting the winding of the coil.

Referring now to the drawing in detail, in which similar reference numerals refer to like parts throughout the several views, the numeral 10 indicates a core, composed of magnetic material, and having attached thereto at each end a spool head 11 which may be of metal. The core 10 is preferably insulated by one or more layers of paper or other suitable insulating material 12, and one or more insulating washers 13 are usually provided on the inner faces of the spool heads 11.

Before starting the winding of the coil a suitable length of a bare stranded lead-in wire 14 is connected to the end of the enamel insulated winding wire 15, as best shown in Fig. 4. The free end of the lead-in wire is then inserted through an aperture provided in the spool head 11 adjacent to the core 10 and a strip of paper 16 (Fig. 4) or other suitable insulating material is wrapped around the portion of the lead-in wire extending from the inner face of the spool head. The paper insulated lead-in wire is then wrapped around the core 10 adjacent to the spool head through which it enters the spool. Before starting the usual winding of the coil several turns of the enamel insulated winding material are wrapped around the lead-in wire adjacent to the spool head through which the lead-in wire enters the spool, as best shown in Fig. 2. The winding of the coil is then continued in the usual manner. Sheets or strips 17 of paper or other suitable insulating material may be inserted between each layer of wire as the coil is built up and the completed coil is usually provided with an outer covering 18 as shown in Fig. 3.

In the manufacture of electromagnetic coils in accordance with the present invention, the possibility of deleterious short circuits due to the enamel insulated wire impinging against and electrically contacting with the bare lead-in wire is practically elim-

inated. If for any cause one of the first few turns of the enamel insulated wire comes in contact with the bare lead-in wire it could only result in a comparatively short length of wire being shorted from the remainder of the coil and would probably not materially affect the electrical characteristics of the coil. Moreover, the possibility of one or more layers of wire being shorted from the coil is eliminated, since the enameled wire in the above applied layers is prevented from contacting with the lead-in wire due to the intermediate turns of enameled wire which have been superimposed upon the lead-in wire before starting the winding of the coil. Thus it is apparent that by practicing the present invention coils of uniform electrical characteristics may be very readily manufactured, it only being necessary to insure that approximately the required amount of winding material is used. Furthermore, the possibility of coils manufactured by this method becoming unsuitable for use due to deleterious short circuits caused by the bare lead-in wire contacting with the enameled wire of the upper layers of the coil is eliminated.

What is claimed is:

1. A method of winding electrical coils upon headed spools, which consists in electrically connecting an uninsulated lead-in wire to an end of a supply of winding material, passing the end of the lead-in wire through a spool head, superimposing a plurality of layers of winding material upon the lead-in wire and upon each other adjacent to said spool head, and then starting the winding of the first layer of the coil.

2. A method of winding electrical coils upon headed spools, which consists in electrically connecting an uninsulated lead-in wire to an end of a supply of insulated winding material, passing the end of the lead-in wire through a spool head, covering the inner portion of the lead-in wire with insulating material, wrapping the portion of the lead-in wire so covered around the core adjacent the said spool head, superimposing a plurality of layers of the insulated winding material

upon the lead-in wire and upon each other adjacent to said spool head, and then starting the winding of the first layer of the coil.

3. The method of winding electrical coils, which consists in electrically connecting an uninsulated lead-in wire to an end of a supply of insulated winding material, wrapping a portion of the lead-in wire around one end of a core, superimposing a plurality of layers of the insulated winding material upon the wrapped portion of the lead-in wire and upon each other, and then starting the winding of the first layer of the coil.

4. A method of winding electrical coils upon headed spools, which consists in electrically connecting an uninsulated lead-in wire to an end of a supply of insulated conducting material, passing the outer end portion of the lead-in wire through a head of the spool, covering the inner portion of the lead-in wire with a sleeve of insulating material, wrapping the portion of the lead-in wire so covered around the core adjacent to the said spool head, superimposing a plurality of layers of the insulated conducting material upon the lead-in wire at the junction between the insulating sleeve and the inner face of the adjacent spool head, and then starting the winding of the first layer of the coil.

5. A method of winding electrical coils upon a core, which consists in electrically connecting an uninsulated, stranded lead-in wire to an enamelled wire, insulating the lead-in wire and the junction with the enamelled wire, wrapping the insulated portion of the lead-in wire around the core near one end thereof, applying several indiscriminately arranged layers of enamelled wire on said lead-in wire at the end of the insulation thereof opposite the end in contact with the enamelled wire to insulate any exposed portion of the lead-in wire, and thereafter applying sufficient additional layers to constitute the coil.

In witness whereof, I hereunto subscribe my name this 22nd day of November A. D. 1926.

SCHUYLER COLFAX WILEY.