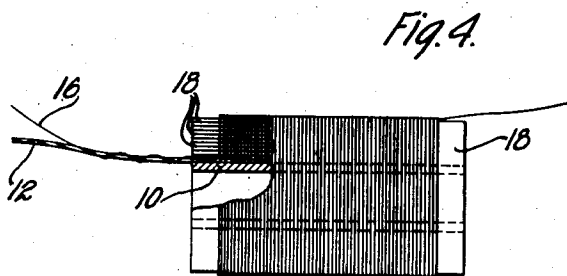
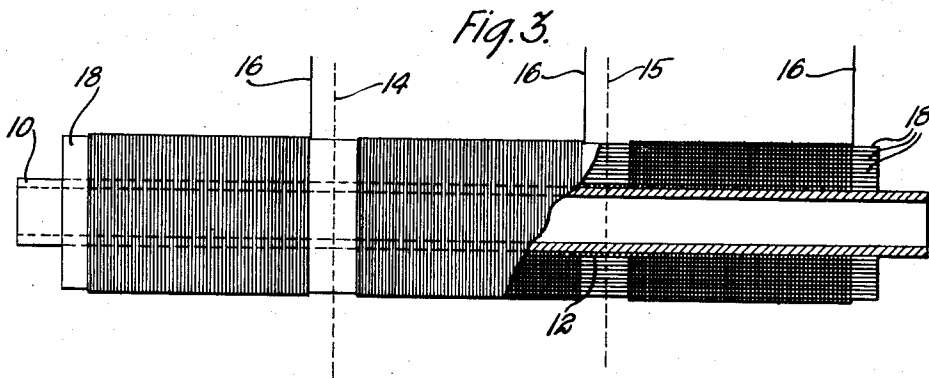
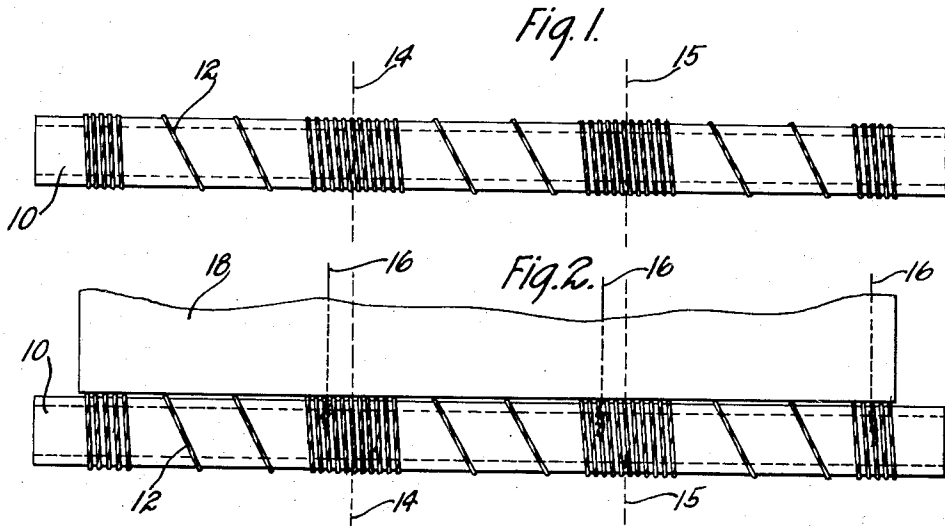


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A. H. ADAMS ET AL
METHOD OF WINDING COILS

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UNITED STATES PATENT OFFICE.

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METHOD OF WINDING COILS.

Application filed October 29, 1927. Serial No. 229,556.

This invention relates to a method of winding coils, and more particularly to a method of winding coils or helices of wire for electrical purposes.

5 The principal object of the invention is to provide a simple and inexpensive method of introducing improved leading-out conductors in electrical coils.

The present invention may be employed 10 to particular advantage in the manufacture of paper filled coils wherein a plurality of coils are simultaneously wound upon a single core at separated zones therealong, the individual coils being subsequently sep- 15 arated by severing the core between the adjacent coils of each pair. It should be understood, however, that the novel features of the invention are not to be limited to this particular type of electrical coils except in 20 so far as defined in the appended claims.

In accordance with the general features of the invention, an improved method of introducing leading-out conductors in electrical coils of the above type consists in applying 25 several turns of an uninsulated preferably stranded electrical conductor upon a core preliminary to starting the winding of the coils. These conductor turns are placed closer together at positions where the core is 30 subsequently severed to separate the individual coils. A sheet of paper or other suitable insulating material is then wrapped around the uninsulated stranded conductor, after which the winding of the coils is con- 35 tinued in the usual manner. The completely wound coils are separated into individual coils by severing the core at points intermediate each pair of adjacent coils, and the uninsulated conductor, together 40 with the inner end of the coil wire, are drawn out and twisted together to form the improved leading-out conductor.

In the accompanying drawing which illustrates the several steps in the present embodiment of the invention, 45

Fig. 1 is an elevational view of a tubular core illustrating the manner in which the uninsulated stranded conductor is applied thereon;

50 Fig. 2 is an elevational view similar to Fig. 1 illustrating the manner in which a plurality of coil wires are attached to the

stranded conductor and also showing a sheet of insulating paper placed in position to be wrapped around the core upon starting the 55 winding operation;

Fig. 3 is an elevational view, partly in section, of a plurality of coils which have been wound simultaneously upon a single 60 core, and

Fig. 4 is an elevational view, partly in section, of a single coil after it has been completely wound and separated from the remaining coils illustrating the manner in 65 which the uninsulated stranded conductor and the inner end portion of the coil wire are drawn out and twisted together to form the leading-out conductor.

Referring now to the drawing wherein like reference characters denote corresponding 70 parts throughout the several views, the numeral 10 designates a paper tube which is used as a spindle or core upon which a plurality of coils are simultaneously wound, and for this purpose the tube 10 may be 75 mounted in a winding machine (not shown) wherein the winding may be done automatically or, in so far as the present invention is concerned, the winding may be done 80 manually or semi-automatically.

Before starting the winding of the coils, a loosely stranded uninsulated electrical conductor 12 is wound around the full length of the tube 10 at varying helices which, as 85 clearly shown in Figs. 1 and 2, are placed closer together near the ends of the tube and at the positions indicated by the dotted lines 14 and 15, where it will be understood, the tube is severed in order to separate individual coils after they have been com- 90 pletely wound. Before starting the winding of the coils the supply wires 16 are attached to the stranded conductor 12, as shown in Fig. 2. This may be accomplished in any suitable manner, as for instance by looping 95 the ends of the supply wires around one or more helices of the conductor 12. A sheet of paper 18 or other suitable insulating material is placed in position to be wrapped around the conductor 12, after which the 100 plurality of coils are simultaneously wound in the usual manner, a sheet of paper 18 being inserted between each layer as the coils are built up.

After the coils have been completely wound, the tubular core 12 and the inter-leaving sheets of paper 18 are severed at or near the positions indicated by the dotted lines 14 and 15, thus separating the individual coils. A coil which has been completely wound and separated in this manner is illustrated in Fig. 4. The uninsulated stranded conductor and the inner end portion of the coil wire are drawn out and after the insulation has been removed from the coil wire it is twisted with the stranded conductor to form the inner lead of the coil.

It is obvious that many advantages are gained in practicing the present invention since a durable and flexible leading-out conductor is provided at a minimum expense. The leading-out conductor is rigidly secured in place by the superimposed coil windings. Furthermore, the soldering operation which has been necessary heretofore in connecting the lead to the coil is eliminated which, obviously, saves an appreciable amount of time and labor, thereby decreasing the cost of the coil.

Although the invention is herein illustrated and described in connection with the manufacture of one particular type of electrical coil, it is to be understood that the novel features thereof are capable of other applications within the scope of the appended claims.

What is claimed is:

1. A method of producing electrical coils, which consists in applying a conductor around a core, wrapping a sheet of insulating material around the conductor, winding the coil, withdrawing the conductor and the inner end portion of the coil and then twisting the conductor with the inner end portion of the coil to form the inner leading-out conductor of the coil.

2. A method of producing electrical coils, which consists in applying several turns of an electrical conductor around a core, attaching one end of the winding material to the conductor, wrapping a sheet of insulating material around the conductor and simultaneously starting the winding of the coil, and then withdrawing the conductor and the inner end portion of the completed

coil and twisting them together to form the inner leading-out conductor of the coil.

3. A method of producing electrical coils, which consists in applying an uninsulated electrical conductor upon a core, wrapping a sheet of insulating material around the conductor and simultaneously starting the winding of the coil, withdrawing the conductor and the inner end portion of the coil wire, removing the insulation from said end portion of the coil, and then twisting the uninsulated conductor with the end portion of the coil wire to form the inner leading-out conductor of the coil.

4. A method of producing electrical coils, which consists in applying a plurality of turns of an uninsulated stranded electrical conductor around a core, attaching one end of the coil winding material to the uninsulated conductor, wrapping a sheet of insulating material around the uninsulated conductor and simultaneously starting the winding of the coil, and then withdrawing the uninsulated conductor and the inner end portion of the coil wire and twisting them together to form the inner leading-out conductor of the coil.

5. A method of simultaneously winding a plurality of coils, which consists in applying a plurality of turns of an uninsulated conductor upon the full length of a core in such manner that the turns are placed closer together at separated zones thereon, attaching one end of a coil winding material to the uninsulated conductor at each of said zones, wrapping a sheet of insulating material upon the uninsulated conductor and simultaneously starting the winding of the coils, separating the completely wound coils by severing the core intermediate said zones, and then withdrawing the uninsulated conductor and the inner end portion of the coil wire of each individual coil and twisting them together to form the inner leading-out conductor for the coil.

In witness whereof, we hereunto subscribe our names this 18th day of October, A. D. 1927.

ARTHUR HERMAN ADAMS.
CLEM H. FRANKS.