

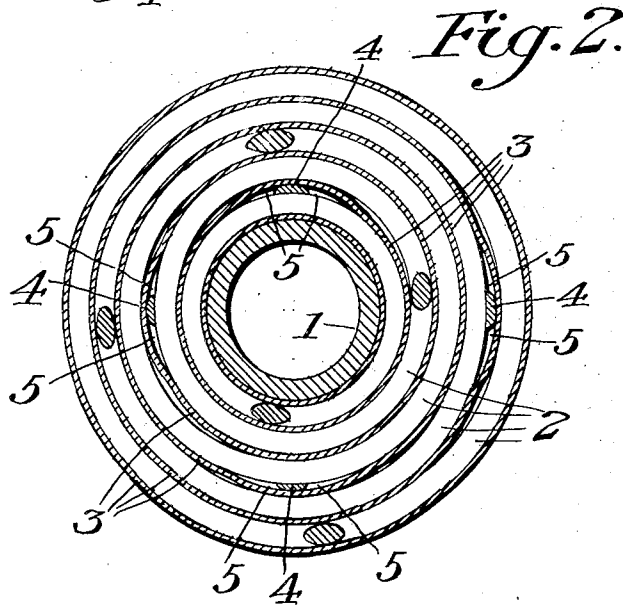
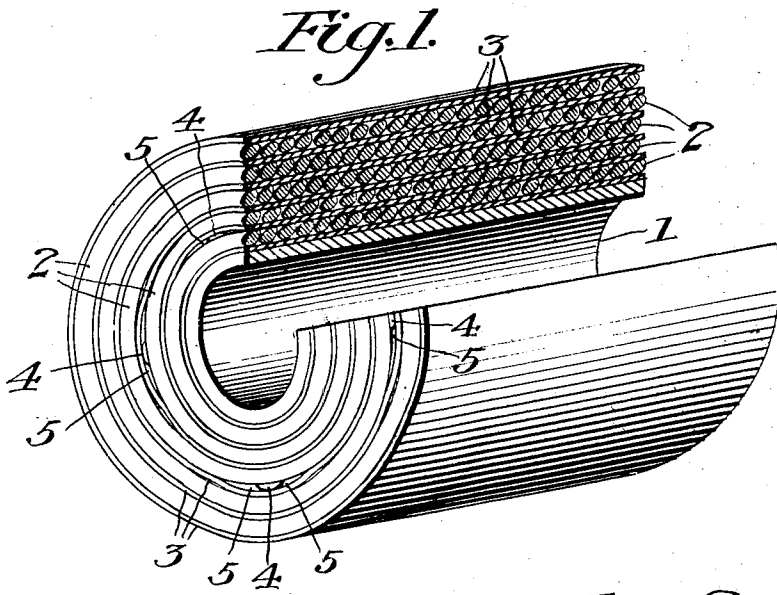
May 27, 1924.

1,495,823

C. R. UNDERHILL

ELECTRICAL COIL AND METHOD OF MAKING THE SAME

Filed Jan. 14, 1921



Inventor:
C. R. Underhill
By C. F. Ware
att'y.

UNITED STATES PATENT OFFICE.

CHARLES R. UNDERHILL, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE ACME WIRE COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ELECTRICAL COIL AND METHOD OF MAKING THE SAME.

Application filed January 14, 1921. Serial No. 437,303.

To all whom it may concern:

Be it known that I, CHARLES R. UNDERHILL, a citizen of the United States, and resident of New Haven, in the county of New Haven and State of Connecticut, have invented a certain new and useful Electrical Coil and Method of Making the Same, of which the following is a specification.

The invention relates to the construction of electrical coils involving alternate layers of conductor windings and sheet or strip fabric, usually of insulating material, and has for its object to provide such coils with means to facilitate the introduction and penetration of a suitable binding medium throughout the structure of the coil.

Heretofore, in the construction of wound coils with fabric material interposed between adjacent layers of the conductor, it has been found extremely difficult and in many cases practically impossible to force viscous melted binding media or compounds into the structure of the coil, owing to the resistance of the fabric material, such as sized paper, oiled linen, and the like, to impregnation. This is particularly true in cases in which the conductors are initially covered with a liquid proof insulating sheet and laid up in successive layers with the conductor turns in contact with said sheet.

The present invention relates to an improved coil in which a separating fabric, either in sheet or strip form, is interposed between the successive layers of the conductor windings, said coil involving a series of ducts or passageways formed longitudinally of the coil in the interposed layers of the fabric, preferably by the insertion of small rods, cords, or the like, between the layers of the conductor windings and the superposed fabric, which cause the fabric to be deformed or arched to a sufficient extent to provide longitudinal openings adjacent the rods or cords which afford a ready passage for the impregnating medium. The latter, therefore, may find ready access to all parts of the coil structure between the convolutions of the various layers of the conductor windings, the same being preferably introduced into the ducts or passageways at one end of the coil, whence it works its way throughout the body of the coil.

The invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view, partly in sec-

tion, showing a simple helical coil involving the invention; and

Fig. 2 is a sectional elevation thereof.

Referring to the drawings, 1 indicates the core or mandrel upon which the coil is wound, and 2 the successive layers of the conductor windings which are laid up in helical form, each of the layers of the conductor windings being separated from the layer adjacent thereto by a sheet or strip of fabric 3, such as paper or other material usually employed for this purpose and which is usually impervious to the ordinary forms of impregnating and binding media which are applied to the coil, and which would therefore prevent the binding media penetrating the coil structure to any material extent.

In order to provide, during the formation of the coil, an effective means for admitting the binding medium to the interior of the coil and distributing the same throughout the structure of the coil, there is interposed between each of the layers of the conductor windings and the superposed fabric, one or more rods or cords 4, preferably of insulating material, which are disposed longitudinally of the coil and preferably extend from end to end thereof. These rods or cords cause the superposed fabric to be deformed or arched where it passes over them and thereby produce ducts or passageways 5, 5, through which the viscous or fluid impregnating medium may be introduced and distributed throughout the body of the coil to impregnate the structure thoroughly and uniformly.

The number and disposition of the rod or cord like elements 4 applied between each conductor layer and the superposed fabric layer may, obviously, be left to the judgment or discretion of the designer of the coil, and it has been found that in some cases a single rod or cord for each layer of winding will suffice. While it is apparent that the interposition of the rod or cord will cause a slight deformation of the coil, by disposing the rods adjacent the successive layers in definite angular relation around the axis of the coil, the desired contour of the coil will be maintained.

The invention is applicable to coils of various types and configurations, and may also be applied to operations involving the simultaneous winding of multiple coils,

which are subsequently separated or subdivided transversely. It is also applicable to coils of various types in which the interposed fabric is applied either in sheet form or in strip form, either longitudinally or circumferentially applied to the successive conductor layers.

What I claim is:

1. A wire coil comprising alternating layers of conductor windings and separating fabric, and longitudinal spacers between adjacent conductor and fabric layers forming ducts in the fabric layers to facilitate the penetration of a binding medium throughout the coil structure.

2. A wire coil comprising alternating layers of conductor windings and separating fabric, and longitudinal spacers between adjacent conductor and fabric layers forming ducts to facilitate the penetration of a binding medium throughout the coil structure.

3. A wire coil comprising alternating layers of conductor windings and separating fabric, and longitudinal rod-like elements disposed between adjacent conductor and fabric layers to form ducts in the fabric layers to facilitate the penetration of binding media throughout the coil structure.

4. A wire coil comprising alternating layers of conductor windings and insulating fabric, and longitudinal rod-like elements disposed between adjacent conductor and

fabric layers to form ducts in the fabric layers to facilitate the penetration of binding media throughout the coil structure. 35

5. A wire coil comprising alternating layers of conductor windings and insulating fabric, and longitudinal spacers of insulating material disposed between adjacent conductor and fabric layers to form ducts to facilitate the penetration of binding media throughout the coil structure. 40

6. The method of constructing electrical wire coils, which comprises forming alternating layers of conductor windings and insulating fabric, interposing rod-like elements longitudinally of the coil between the conductor and fabric layers to form open ducts in said fabric layers, and applying a binding medium to the interior of the coil structure through said ducts. 50

7. The method of constructing electrical wire coils, which comprises forming alternating layers of conductor windings and insulating fabric, interposing spacers longitudinally of the coil between the conductor and fabric layers to form open ducts therebetween, and applying a binding medium to the interior of the coil structure through said ducts. 60

Signed at Hamden, in the county of New Haven and State of Connecticut this 13th day of December A. D. 1920.

CHARLES R. UNDERHILL.