Nov. 1, 1927.

J. O. GARGAN

1,647,615

ELECTRICAL COIL

Filed Feb. 7, 1924

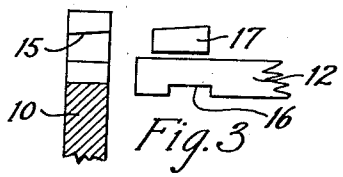


Fig. 3

Fig. 1

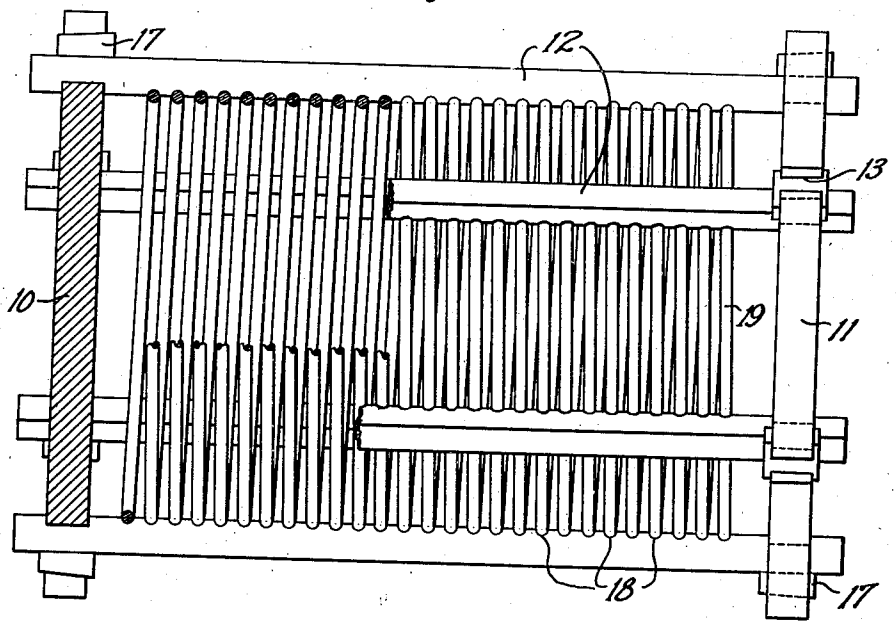


Fig. 2

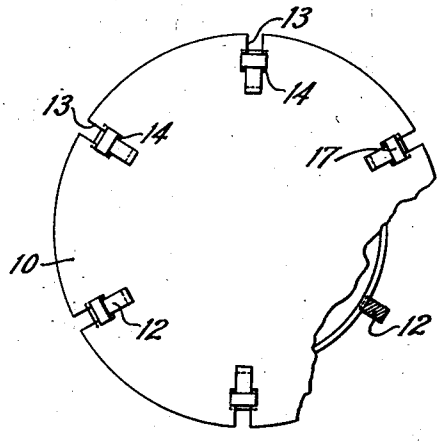


Fig. 4

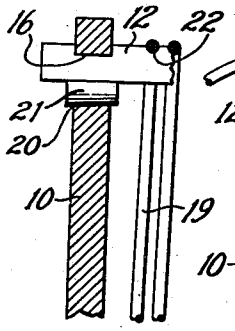
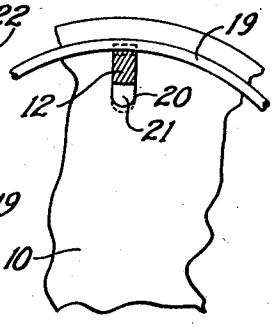


Fig. 5



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UNITED STATES PATENT OFFICE.

JOHN O. GARGAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTRICAL COIL.

Application filed February 7, 1924. Serial No. 691,181.

This invention relates to electrical coils and is particularly adapted to inductance coils suitable for use in high power radio transmitters.

An object of the invention is to provide an electrical coil of the above character which is simple in construction, combining great strength and rigidity with a minimum of weight, and in which the cost of manufacture is reduced to a minimum.

Another object of the invention is to provide an electrical coil in which the various parts and sections may be rapidly assembled, permitting the ready adjustment and replacement of parts that may become injured or broken down through carbonization or arcing over their surfaces. The invention provides a coil which would still be operative if a limited number of parts that are most likely to become carbonized, are removed.

Another object of the invention is to provide an electrical coil in which the winding may be internal to the supporting parts facilitating the attachment of electrical terminals to the supporting members and eliminating the necessity of additional or detached members for this purpose.

Another object of the invention is to construct a coil of the above type in which there are no metallic parts except those that may be in electrical contact with the conductor forming the coil.

The invention employs a helical conductor supported on a skeleton frame constructed entirely of insulating material. The skeleton frame employs a limited number of parts which are secured together by a simple slot and wedge construction thus permitting the coil to be readily assembled and disassembled. This construction entirely avoids the use of metallic fasteners thus preventing brush discharges from such isolated metal parts, and the loss of energy and the damaging effect on the insulation arising from such discharges, or from heating, etc.

Other features and advantages of the invention will be apparent from the consideration of the following description taken in connection with the accompanying drawings, in which,

Fig. 1 is a front elevation, partly broken away and partly in section, showing one form of the invention.

Fig. 2 is a reduced side elevation, partly broken away, of the structure shown in Fig. 1.

Fig. 3 is a detail view of the slot and wedge construction of the coil frame.

Fig. 4 is a fragmentary front view of a modified form of the invention.

Fig. 5 is a fragmentary side view of the structure shown in Fig. 4.

Referring particularly to Figs. 1, 2, and 3, the skeleton frame construction comprises a pair of substantially circular end discs 10 and 11 and a plurality of longitudinal cross bars 12 preferably of rectangular cross section. The discs 10 and 11 and the cross bars 12 may be of any suitable insulating material, such as wood. The edges of the end discs 10 and 11 are slotted radially at corresponding points 13 about the circumference. For the sake of strength, uniformity and neatness of construction, the slots 13 are spaced an equal distance apart, those shown in Fig. 2, for example, being separated a distance of about 60 degrees. Cross slots 14 are formed in the discs 10 and 11 extending through and substantially at right angles to each of the slots 13 thus forming shoulders in the slots 13. The outermost disposed shoulder 15 extending through each of the slots 13 is preferably beveled or inclined for a purpose hereinafter to be described.

The cross bars 12 are formed adjacent their ends with notches 16 corresponding in length to the thickness of end discs 10 and 11. The ends of the cross bars 12 are inserted through the open ends of the slots 13 and the notches 16 are positioned in the lower ends of the slots 13 to form a double notch joint therewith. The depth of the notches 16 is such that when the cross bars 12 are in position as shown in Figs. 1 and 2, there is sufficient clearance in the cross slots 14 to permit the insertion of wedge members 17 therein. The wedges 17 when forced between the cross bars 12 and the outer inclined faces 15 of the slots 14 serve to lock the end discs and the cross bars firmly together.

A plurality of grooves 18 are formed in the inner face of each of the cross bars 12. A helical conductor 19 which may be in the form of a copper tubing is disposed internally of the cross bars 12, the various convolutions of the conductor being supported and held in spaced relation in the grooves 18.

By means of the above construction the longitudinally disposed cross bars are insertible and removable in a radial direction with respect to the end discs 10 and 11 rather than through the ends thus effecting a material saving in the space required to assemble and disassemble the coil. It will be understood, of course, that the wedges 17 may be inserted from the inner face of the end discs, as shown in connection with the disc 10, Fig. 1, or from the outer face as shown in connection with the disc 11 as circumstances may require.

A modification of the coil construction is shown in Figs. 4 and 5. In this case, the slots 20 do not extend through the edges of the end frames 10 and 11, but are closed at both ends, the upper end being flat and the lower end being inclined and either flat or, as in the present case, rounded. The cross bars 12 are inserted through the slots 20 and are held firmly in place by means of wedges 21 having a flat upper face and a rounded and inclined lower face to cooperate with the slots 20. If desired, the helical conductor 19, instead of being held in adjusted position internally of the cross bars 12 may be mounted externally of the structure with respect to the cross bars, the various convolutions resting in grooves 21 in the outer disposed face thereof.

It is to be understood that the invention set forth herein is susceptible of various other embodiments and adaptations and, therefore, is not limited to the specific constructions shown and described, except as defined by the appended claim.

What is claimed is:

In combination, cross bars of insulating material, a coil supported thereby, a pair of substantially circular end members of insulating material each having open ended slots at intervals around the periphery whereby said cross bars may be inserted in said slots perpendicularly of the axis of said coil, said bars having slots registering with the outer edges of said members, and wedges of insulating material adapted to be inserted in slots in said end members extending across said open ended slots substantially at right angles thereto to form shoulders to retain said wedges in place.

In witness whereof, I hereunto subscribe my name this 2 day of February, A. D. 1924.

JOHN O. GARGAN.