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J. S. ELLIOTT

COIL MOUNTING

Filed May 15, 1922

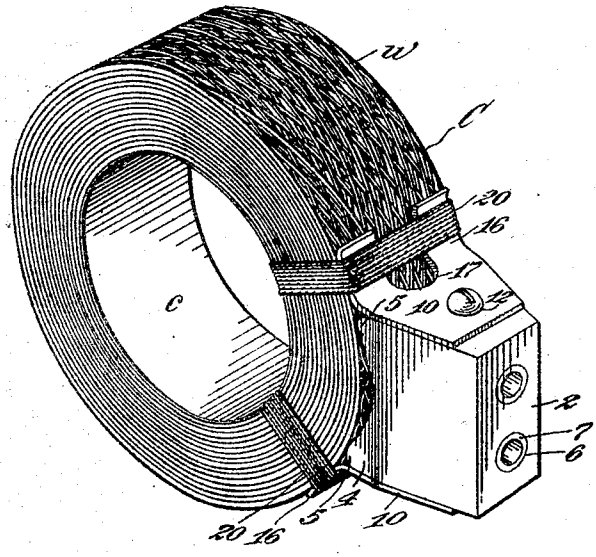


Fig. 1.

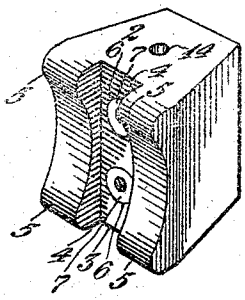


Fig. 2.

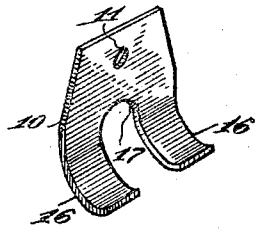


Fig. 3.

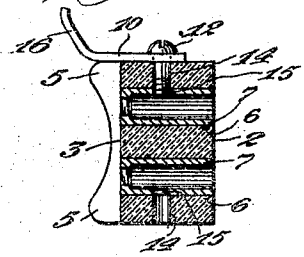


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN S. ELLIOTT, OF CRANSTON, RHODE ISLAND, ASSIGNOR TO COTO-COIL COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

COIL MOUNTING.

Application filed May 15, 1922. Serial No. 561,099.

To all whom it may concern:

Be it known that I, JOHN S. ELLIOTT, a citizen of the United States, residing at Cranston, in the county of Providence, State of Rhode Island, have invented certain new and useful Improvements in Coil Mountings, of which the following is a specification.

This invention relates to coil-mountings and consists in improvements in the means for supporting a hollow or substantially ring-shaped coil such as employed in radio apparatus.

One object of the invention is to provide a mounting which will rigidly and securely support the coil against lateral and longitudinal stresses.

Another object of the invention is to provide a mounting which will serve as a convenient means for connecting the leads from the coil with their terminals.

Another object of the invention is to provide a mounting which is neat in appearance, simple and economical of manufacture, and proof against damage or breakage under hard usage.

Further objects of the improvement are set forth in the following specification which describes a preferred embodiment of the invention as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a perspective view of a coil-mounting embodying the invention;

Fig. 2, a perspective view of the terminal-block which serves as a support for the coil;

Fig. 3, a perspective view of one of the clamping-plates by means of which the coil is connected to the terminal-block; and

Fig. 4, a vertical sectional view of the coil-supporting block taken through its center to illustrate the terminal sockets and also the means for securing the clamping-plates to the block.

Referring to Fig. 1 of the drawings my improved mounting is herein illustrated as applied to a ring-shaped coil C of the so-called "honeycomb" type now quite generally employed for inductances in radio sets. It is to be understood, however, that the present invention is also adapted for use with other types of coils as applied to various purposes in the electrical art.

Coils of the present type are usually wound on hollow cores which may consist of a fiber or paper tube *c* as shown in Fig. 1. The conductor or wire *w* is wound onto this core in helical convolutions which are disposed at relatively sharp angles to the axis of the coil. Each convolution or turn of wire crosses from one side of the coil to the other and is reversed in a sharp bend or "knuckle", whence it crosses in the opposite direction, is reversed again, and so on to build up the overlying layers. In the honeycomb type of winding each turn of the wire is spaced at a slight distance from the previously laid turn and consequently the turns of overlying layers cross each other in an open network or with a lattice effect which provides air spaces between the wire convolutions. In the true honeycomb coil these air cells are of substantially diamond shape and extend from the center or core of the coil clear to its outer surface, while in other similar types, such as the so-called duo-lateral coil, the turns of wire in each layer are disposed in slightly offset relation to those of the next layer so that a somewhat different appearance is given to the coil. In either case, however, the purpose of the open laying of the wire turns is the same, i. e., to separate the adjacent convolutions from each other whereby to reduce the amount of distributed capacity in the coil to render it more efficient for radio use. The above-described method of cross-winding the wire in the coil produces a self-supporting structure which holds its form without end flanges or other supports and the use of this type of coil has become quite general in the electrical arts. While the commonest form of this type of coil is cylindrical or ring-shaped as shown in Fig. 1, the same method of winding is also employed for producing coils of other generally hollow conformation in various polygonal shapes, and my present improved mounting is adapted for use with any of these. It is to be understood, therefore, that the term ring-shaped as herein employed is used in a general sense as designating all types of coils of hollow form.

Fig. 2 illustrates a preferred form of the terminal-block 2 or main support for the coil, which may be constructed of rubber, fiber, vulcanite, bakelite or any other similar hard material of a dielectric character. The block 2 is preferably of a general wedge shape, having its sides tapered from front to rear. In its forward face is a vertical slot 3 which forms two opposite outstanding

abutments or ribs 4. The abutments or ribs 4 are hollowed out or concaved between their ends to form rounded protuberances or lugs 5 at all four corners on the front of the block. The curvature of the concaved portion of the ribs is of relatively short radius so that when the block is set against the periphery of the coil, as shown in Fig. 1, the four lugs 5 will provide a plurality of bearing points on its surface. Through this arrangement the block 2 is adapted to be applied to use with coils of different sizes, which vary considerable in outside diameter, to insure a firm bearing against the surface of the coil even when the latter is irregular in contour.

Extending longitudinally through the block 2 from front to rear are two horizontal bores 6 in which are held the tubular, metal sleeves or bushings 7 forming the sockets for the plug-and-jack terminals by which the block is connected to the apparatus on which the coil is used. As shown in Fig. 4, the forward ends of the sleeves 7 are internally threaded to adapt them to receive suitable binding-screws (not herein illustrated) by which the wire leads from the coil may be connected to the sockets. The slot 3 on the face of the block provides a space for the heads of the screws, when such are used, and also for the ends of the wire leads which, in some instances, may be soldered to the terminal-sockets 7.

Adapted to fit against the top and bottom faces of the block 2 are two clamp-members or plates 10, preferably constructed from suitable sheet-metal stock. The main portion of each clamp-plate 10 is shaped to conform to the outline of the face of the block 2 which it overlies and is provided with a hole or perforation 11 adapted to receive a fastening-screw 12. The screw 12 is received in a hole 14 in the block 2 with its end engaging with a threaded hole 15 in the side of the socket-sleeve 7. The two clamp-plates 10 may thus be secured to the top and bottom of the block 2 by means of the screws 12 which are inserted in the block with their ends screwed into the walls of the sleeves 7.

Projecting forwardly from the main portion of each clamp-plate 10 are two opposite, spaced-apart arms 16 formed by cutting away the metal of the plate at 17, as shown in Fig. 3. The arms 16 overlie the ribs or abutments 4 on the front of the block 2 and are bent at an angle to the main portion of the plate to adapt them to conform to the exterior of the coil C. The outer extremities of the arms 16 are slightly curled upwardly to form a sort of trough across the arms for holding the cord or band 20 which binds the clamp 10 against the coil. For this purpose I may employ a strap, band or tape, but preferably I make use of a strong cord or twine 20 for lashing the clamps to the periphery of the coil. As shown in Fig. 1, the cord 20 is passed through the central opening in the coil, then around its sides and across the two arms of the clamp 10 with a number of turns as usually employed for lashing two parts together. This lashing or binding serves to draw the arms 16 of the clamps 10 tightly against the periphery of the coil C whereby the block 2 has its four lugs or abutments 5 snugly seated against the surface of the coil to serve as a firm and secure support therefor. The provision of the four protruding abutments 5 on the forward face of the block 2 results in a four-point contact of the block with the surface of the coil to render the block self-adjusting as regards any irregularities or unevenness of the windings. In the type of cross-wound coil herein illustrated and above described in detail the wire windings are laid in different planes with one set of turns or convolutions crossing the face of the coil above a series of turns crossing in the reverse direction. This results in "high" or "low" places on the peripheral face of the coil and the spaced-apart abutments 4 on the block 2 accommodate themselves to the different levels. Likewise, the four projecting arms 16 on the two clamps 10 are self-conforming to the surface of the coil, for being slightly resilient they flex as required to effect a firm bearing at their separate points of contact with the wire windings. In come cases the outer surface of the coil C may be enclosed by a thin protection strip of tape or other insulating material, but this is not essential. The wire leads from the interior and exterior of the windings are not herein illustrated as their showing might tend to confuse the other details of the drawing. Suffice it to state that the lead from the center of the coil is drawn across its side and through the concaved recess on the front of the block 2 with its end suitably joined to one of the sockets 7. The other lead from the periphery of the coil is joined to the other terminal-socket 7, with the joinder of both leads made in any preferred manner within the slot 3 which provides a clearance for the lead wires.

In operation the block 2 is supported on the apparatus with which the coil is used by means of suitable terminal plugs or pins which engage the jacks or sockets 7. In some cases an alternate arrangement of the plugs and jacks is provided with one plug and one jack on the block 2 and a similar arrangement on the supporting apparatus. In either case the block 2 is connected to the apparatus or instrument to serve as a support or mounting for the coil C. My improved means for effecting a firm bearing between the coil C and its support or block 2, and for securely fastening the two elements together eliminates all play or loose-

ness between the parts and provides a firm and rigid mounting for the coil which cannot work loose or become displaced. The coil is thus protected from damage or distortion to its windings, or interference with or rupture of its electrical connections, so that a much more convenient and durable unit is provided tending to greater efficiency in the purpose for which it is employed.

Various modifications may be made in the details of the structure and arrangement of the parts of my improved mounting without departing from the spirit or scope of the invention; therefore, without limiting myself to the precise embodiment herein shown and described, I claim:

1. An improved coil-mounting comprising a coil of substantially hollow form, a block fitted against the peripheral surface of the coil, and a lashing of cord passing through the opening in the coil a plurality of times and connected to the block to bind the coil against the block.

2. An improved coil-mounting comprising a substantially ring-shaped coil, a supporting-member adapted to fit against the surface of the coil and provided with arms, and straps extending through the opening in the coil around its sides and across the arms to bind the coil securely against the supporting-member.

3. An improved unitary coil-mounting comprising a substantially ring-shaped coil, a support provided with at least four projecting abutments adapted to fit against the outer surface of the coil at spaced apart points thereon, and means passing through the opening of the coil to bind it against the support.

4. In a coil-mounting, the combination with a substantially hollow coil, of a support fitted against the surface of the coil, clamping-members projecting from opposite sides of the support to bear against the coil, and means extending through the opening in the coil and across the clamping-members to bind the coil against the support.

5. In a coil-mounting, the combination with a substantially ring-shaped coil, of a support fitted against the surface of the coil, self-conforming arms extending from the support in contact with the coil, and means passing through the opening in the coil across the arms to bind the coil against the support to hold it rigidly thereon.

6. In a coil-mounting, the combination with a coil, of a block of insulating-material, clamping-plates secured to the opposite sides of the block to adapt them to bear against the surface of the coil, and bands passing around the plates and through the opening in the coil.

7. In a coil-mounting, the combination with a substantially hollow coil, of a block of insulating-material provided with terminals for the wire leads of the coil, clamping-plates fastened to the top and bottom of the block and each provided with spaced-apart angularly disposed arms adapted to bear against the outer surface of the coil, and lashings extending through the opening in the coil and across the arms of the plates to secure the coil to the block.

8. In a coil-mounting, the combination with a substantially hollow coil, of a block of insulating-material having one side formed with a pair of spaced-apart ribs with concave faces adapted to bear against the periphery of the coil, clamping-plates fastened to the top and bottom of the block and provided with angular extensions adapted to bear against the surface of the coil, and means extending from the plates through the opening in the coil to bind it against the block.

In testimony whereof I affix my signature.

JOHN S. ELLIOTT.