

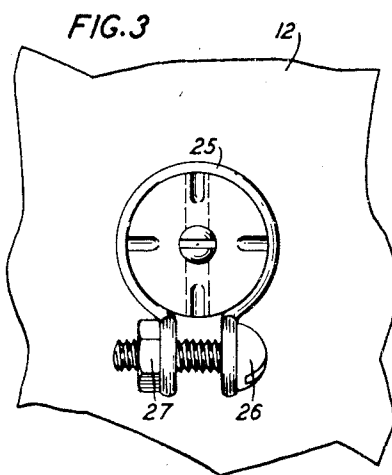
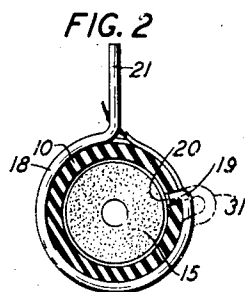
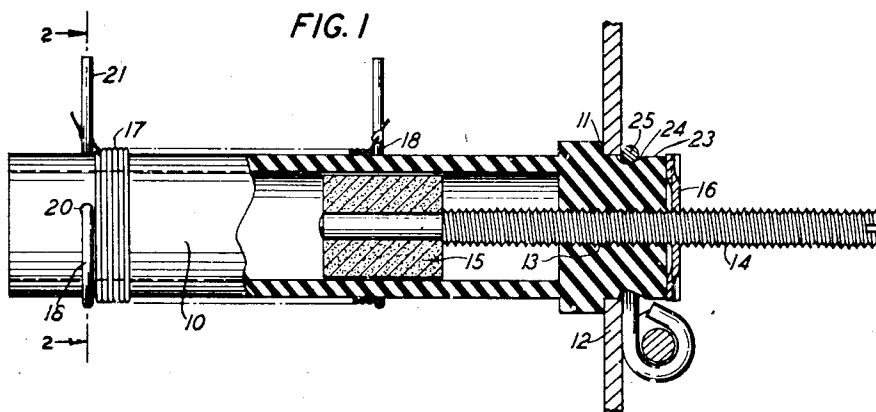
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ELECTRICAL COIL

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ELECTRICAL COIL

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This invention relates to electrical coils, particularly to radio or high frequency induction coils.

An object of the invention is to provide a simple and efficient terminal for electrical coils.

A further object of the invention is to provide a simple and efficient mounting structure for electrical coils employing cylindrical core forms.

The usual method of constructing an electrical coil, particularly an inductance unit for high frequency apparatus, is to wind the solenoid on a cylindrical form of ceramic or other insulating material and to provide terminals for securing the ends of the coil and for making connections to the circuit by means of pins driven into the cylinder wall or rivets extending there-through. It is often desirable to make the inductance of the coil adjustable by the use of a cylindrical core of magnetic or conducting material which is movably mounted within the core form. When the cylindrical walls are thin or the unit is provided with such an adjustable core, such methods of securing terminals have obvious disadvantages.

The accompanying drawing shows a high frequency inductance coil provided with terminals which overcome such disadvantages and which is further arranged to permit ready mounting of the coil on a panel or similar structure. In the drawing:

Fig. 1 shows an elevation of the inductance unit partly in cross-section;

Fig. 2 is a cross-sectional view of the unit of Fig. 1 taken through the line 2—2; and

Fig. 3 is a right-hand view of the unit of Fig. 1.

The inductance unit comprises a cylindrical core form 10, preferably of ceramic material, such as that sold under the trade name of Isolantite. Throughout most of its length the form 10 is a hollow cylinder. The right-hand end, however, is solid except for a threaded hole 13. This right-hand end is also provided with a shoulder portion 11 to facilitate mounting on a panel or chassis plate 12, as will be later described in detail. A threaded rod 14 is mounted in the threaded hole 13. This rod carries on its inner end a cylindrical core 15 of compressed finely divided magnetic material which is movable within the hollow member of the cylindrical core form 10 by adjustment of the threaded rod 14. This movement of the core 15 permits adjustment of the inductance of the coil. A spring washer 16 secures the threaded rod 14 against accidental movement. A similar adjustment of the in-

ductance may be achieved by the use of a hollow cylinder of conducting material, such as bare or silver-plated copper, in place of the magnetic core 15.

The winding is formed by a helical coil of insulated wire 17 wound around the outside surface of the form 10. In some cases it may be desirable to provide a helically threaded groove in the surface of the form 10 to carry this winding, particularly where few turns are required and bare wire is used. These and other similar methods of winding the coil on the form are well understood in the art and do not form part of the present invention.

The ends of the winding 17 are secured to the form by means of the terminal members 18, which also provide soldering terminals by which the winding may be connected in the circuit in which the unit is used. The terminal members 18 are made of some spring wire, such as spring tempered phosphor-bronze wire, and are preferably formed in a circle of diameter slightly smaller than the outside diameter of the form 10 so as to fit securely thereover. One end 19 of each terminal member 18 is bent inwardly to fit into a hole 20 of the cylindrical form 10. This hole 20 may extend through the cylindrical wall of the form 10, as shown, or only partially there-through, in the latter case being formed by spot drilling the form. In either case the effect is to aid in maintaining the terminal member 18 in position and particularly to secure it against rotation about the form.

The other end 21 of the terminal member 18 is bent outwardly to provide a larger surface to which the winding 17 and the external connection may be soldered. This end 21 could also be bent into a loop or other shape for a similar purpose.

It will be noted that this construction of the terminal members 18 provides means for securely fastening the winding 17 without interfering with the movement of the core member 15 within the cylindrical form even when the walls thereof are very thin.

If further resistance against movement of the terminal members 18 is required, the outer surface of the form 10 may be provided with a groove into which each terminal 18 is snapped. In case the form 10 is provided with a helical threaded groove for the winding 17 the terminals 18 may be mounted in this threaded groove.

The shoulder 11 on the right-hand portion of the coil form 10 abuts against one surface of the panel or chassis mounting plate 12 which is

provided with a circular hole through which the smaller diameter portion 23 of the right end is inserted. This smaller diameter portion 23 is provided with a peripheral groove having a sloping wall 24. After the unit is inserted through the hole in the plate 12 a clamping ring 25 is mounted in this groove. A bolt 26 is inserted through the looped ends of the clamping ring 25. As the nut 27 is tightened on the bolt 26 the diameter of the ring is decreased and the resulting camming action between the ring 25 and the tapered wall 24 causes the plate 12 to be clamped between the shoulder 11 and the ring 25, thus securely mounting the unit on the plate 12.

If it is desired to attach the winding 17 nearer to the end 19 of the terminal 18, a small loop 31 (shown dotted in Fig. 2) may be made to provide a larger soldering surface.

It may also be desirable to employ the spring terminals to keep the wire of the winding under tension to prevent loosening. In such case, one or both of the terminals 18 can be constructed by bending the resilient wire of which they are formed into a circle larger in diameter than the form 10. Such a terminal is placed on the form and compressed to the form diameter during the process of winding the coil 17. When the winding process is complete the compression is removed and the resiliency of the wire of the terminal tends to maintain the wire forming the coil 17 in tension.

What is claimed is:

1. An electrical coil form comprising a cylindrical coil form of insulating material, a winding on said form and a terminal securing said winding to said form, said terminal comprising a split loop of resilient wire, the unstressed diameter of said loop being slightly smaller than the diameter of said form so that said loop will clamp tightly thereon and one end of said loop bent inwardly to engage a hole in said form.

2. An electrical coil comprising a cylindrical coil form of insulating material, a winding on said form and a terminal for securing said winding to said form, said terminal comprising a split loop of resilient wire, the unstressed diameter of

said loop being slightly smaller than the diameter of said form so that said loop will clamp tightly thereon, one end of said loop being bent inwardly to engage a hole in said form and the other end of said loop being bent outwardly to form a soldering terminal.

3. An electrical coil comprising a hollow cylindrical coil form of insulating material, a cylindrical core adapted to be mounted in and moved longitudinally within said coil form, a winding on the outer surface of said form, and a terminal securing said winding to said form, said terminal comprising a split loop of resilient wire, the unstressed diameter of said loop being slightly smaller than the diameter of said form so that said loop will clamp tightly thereon, one end of said loop being bent inwardly to engage a hole in said form.

4. An electrical coil comprising a hollow cylindrical coil form of insulating material, a cylindrical core adapted to be mounted within said form and movable axially therein, a winding on the outer surface of said form, and a terminal for each end of said winding securing said winding to said form, each of said terminals comprising a split loop of resilient wire, the unstressed diameter of said loop being slightly smaller than the outside diameter of said form so that said loop will clamp tightly thereon, one end of said loop being bent inwardly to engage a hole in said form and the other end of said loop being bent outwardly to form a soldering terminal.

5. An electrical coil comprising a cylindrical coil form, a winding on said form, and a terminal securing said winding to said form comprising an open circular loop of resilient material having one end bent inwardly and engaging a hole in said coil form, the diameter of said circular loop in the unstressed condition of said resilient material being slightly larger than the outside diameter of said coil form and said loop being compressed to the diameter of said coil form during the winding process whereby when the compression is removed the resiliency of said material tends to maintain the winding under tension.

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