Oct. 19, 1926. 1,603,416

W. J. SHACKELTON

MAGNETIC COIL

Filed May 4, 1922

Fig. 1.

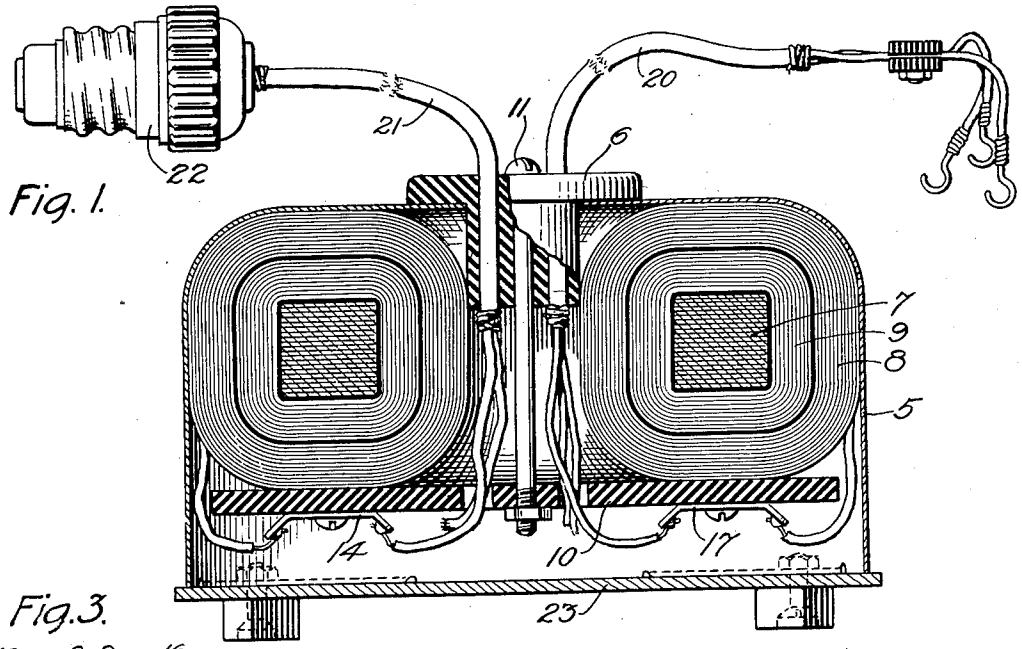


Fig. 3.

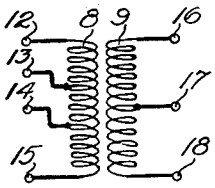
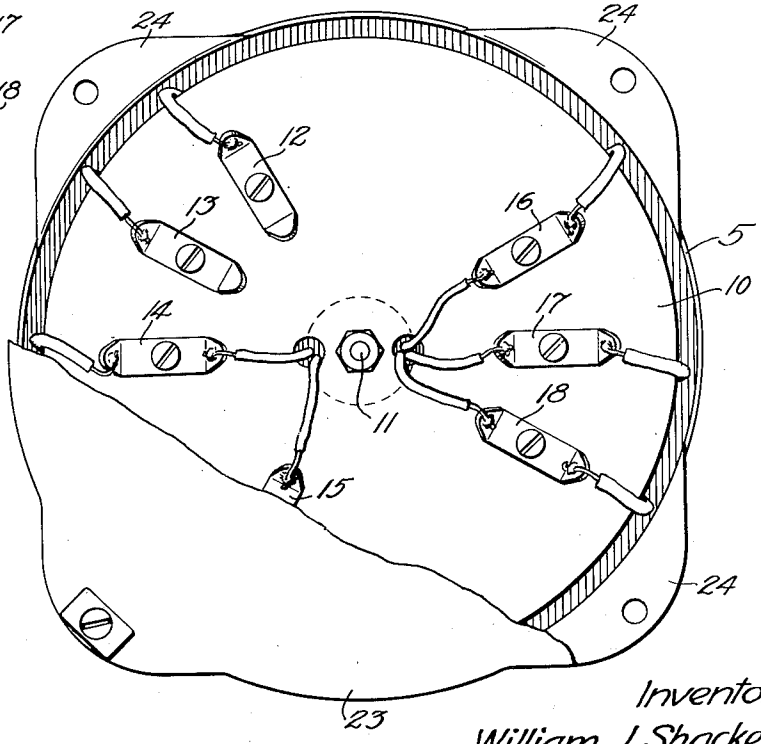


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM J. SHACKELTON, OF SCOTCH PLAINS, NEW JERSEY. ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MAGNETIC COIL.

Application filed May 4, 1922. Serial No. 558,549.

This invention relates to improvements in the construction of magnetic coils, such as transformers.

An object of the invention is to provide a magnetic coil or low-voltage transformer of rugged but simple construction and designed to meet the underwriters requirements for that type of apparatus.

One form of this invention comprises a substantially hemispherical or cup-shaped casing having in its top a small centrally disposed opening closed by an insulating plug through which pass the various connecting wires for the transformer windings. A terminal plate, on which are mounted the junctions of the connecting wires to the transformer leads, is supported from the plug and in turn supports the transformer windings and core. The plug and the terminal plate constitute clamping means for holding the transformer windings tightly in place against the upper part of the casing. The bottom of the casing may be closed by a suitable metallic base.

Referring to the drawings, Fig. 1 illustrates a transformer embodying this invention;

Fig. 2 represents a bottom view in plan of the transformer of Fig. 1, and

Fig. 3 is a schematic diagram of the circuit connections for the transformer.

The transformer disclosed in Fig. 1 comprises a hollow casing 5 substantially hemispherical in form, having a centrally disposed opening in its top closed by an insulating plug 6. The toroidal core 7 and primary and secondary windings 8 and 9 are supported by the terminal plate 10 which, in turn, is supported from the insulating plug 6 by a suitable bolt 11 which passes through both the plug and the terminal plate 10. The plate 10 may, therefore, be employed for holding the transformer windings clamped tightly against the upper part of the casing and the sides of the casing as shown in the drawing.

The terminal plate 10 (see also Fig. 2) is provided on its under side with a plurality of terminals 12 to 18, inclusive, for joining the transformer leads to the outgoing conductors. As shown in Fig. 3, terminals 12 and 15 may be connected to the outer terminals of the primary winding of the transformer, while terminals 13 and 14 are connected to intermediate points to provide various voltage transformations such as different secondary voltages from the same source or a definite secondary voltage from various supply voltages. Contacts 16 and 18 are shown to be connected to the external terminals of the secondary winding, while terminal 17 is connected to the midpoint of the secondary winding. The three external connections taken from contacts 16, 17, and 18 are combined in a three-conductor cord 20, which passes through an aperture in insulating plug 6 and ends in suitable connecting means for making connections to binding posts or the like. Connections from contact 15 and one of the contacts 12, 13, or 14 according to the voltage ratio desired, are formed into a two-conductor cord 21, which may terminate, if desired, in a plug 22, adapted to fit into an ordinary electric light socket.

The bottom of the casing 5 may be closed in any suitable manner such as by a metallic base plate 23 connected by a plurality of bolts or screws to projections 24, forming a part of the lower end of the casing.

By projecting plug 6 for an appreciable distance within the casing, the plug may be employed for preventing lateral shifting of the toroidal coil, particularly when it may be found desirable to use a casing slightly larger than the coil.

It is evident that the transformer above described is of simple construction and readily assembled. The transformer windings may be dropped into the casing, plug 6 inserted in the opening, and terminal plate 10 bolted to plug 6 in order to clamp the transformer windings in position. Connections to the terminals on plate 10 may then be made, after which the bottom plate 23 may be fastened in position and the transformer is then completed.

The transformer of this invention is particularly suited to be employed in systems such as those described in the patent to Heising, No. 1,432,022, issued October 17, 1922, for lighting the filaments of vacuum tubes with alternating current. The plug 22 may be connected in the ordinary alternating power circuit, the contacts 16 and 18, as shown in Heising's application, may be connected to the terminals of the filament, while the midpoint of the secondary

winding 9 may be connected to the control electrode and the anode of the tube. It is obvious, however, that this invention may be employed in other systems and for other uses. It is, furthermore, to be understood that this invention is not limited to the particular embodiment described above, since the above described embodiment may be modified to a considerable degree without departing in any wise from the spirit of this invention as defined in the appended claims.

The invention claimed is:—

1. A transformer comprising a toroidal-shaped winding, a hollow casing surrounding said winding and having a small centrally disposed opening therein, an insulating plug fitting into said opening and projecting for a substantial distance into said casing, said toroidal winding surrounding the projecting portion of said plug to prevent lateral motion of said winding and means supported by said plug for supporting said winding.

2. A transformer comprising a hollow casing, said casing having a small centrally disposed opening, an insulating plug fitting into said opening, a terminal plate within said casing and supported by said plug, and a transformer winding carried by said plate.

3. A transformer comprising a hollow casing having a small centrally disposed opening, an insulating plug provided with an aperture fitting into said opening, a terminal plate within said casing and carried by said plug, a transformer winding carried by said plate, and connecting wires from said plate passing through the aperture in said plug.

4. A transformer comprising a hollow casing having a large opening at one end and a small centrally disposed opening at the other end, a plate for closing said large opening, an apertured insulating plug for closing said small opening, a terminal plate within said casing, centrally disposed means for supporting said plate from said plug, a toroidal shaped winding surrounding said means and supported by said plate, and a connection for said transformer extending through an aperture of said plug.

5. A transformer comprising a casing having an opening therein, a transformer winding removably arranged within said casing, a plug fitted into said opening, a supporting plate for said winding, and means interconnecting said plug and supporting plate for clamping the winding against the inner surface of said casing.

In witness whereof, I hereunto subscribe my name this 1st day of May A. D., 1922.

WILLIAM J. SHACKELTON.