

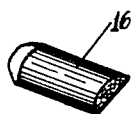
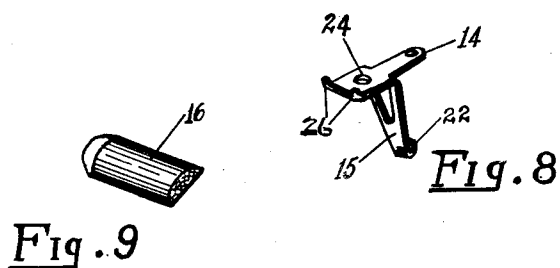
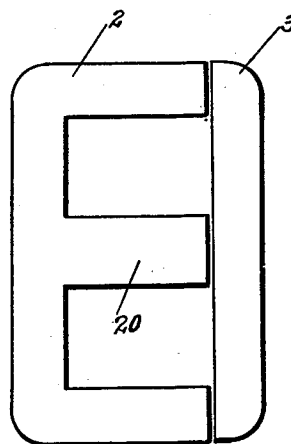
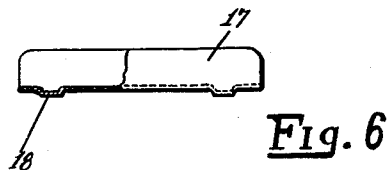
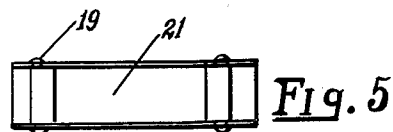
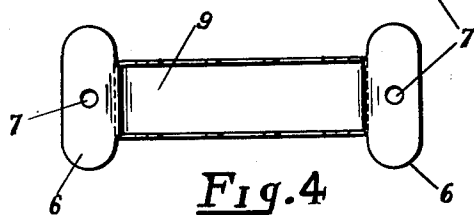
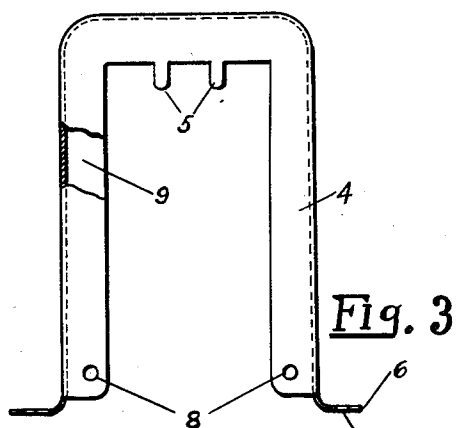
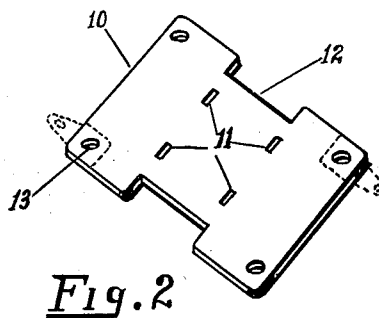
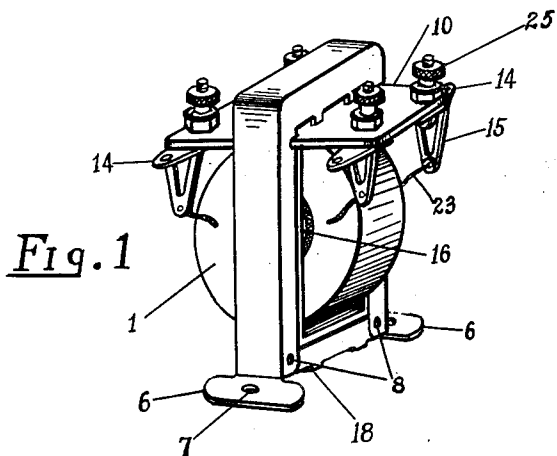
April 6, 1926.

1,579,955

J. L. SCHERMERHORN ET AL

TRANSFORMER

Filed Dec. 17, 1923



INVENTORS
JOHN L. SCHERMERHORN
BY FREDERICK GOERTZ
A. D. T. Libby
ATTORNEY

Patented Apr. 6, 1926.

1,579,955

UNITED STATES PATENT OFFICE.

JOHN L. SCHERMERHORN, OF NEWARK, AND FREDERICK GOERTZ, OF HILTON, NEW JERSEY, ASSIGNORS TO AMERICAN TRANSFORMER COMPANY, OF NEWARK, NEW JERSEY.

TRANSFORMER.

Application filed December 17, 1923. Serial No. 681,068.

To all whom it may concern:

Be it known that we, JOHN L. SCHERMERHORN and FREDERICK GOERTZ, citizens of the United States, residing at Newark and Hilton, respectively, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in a Transformer, of which the following is a specification.

19 This invention relates to a transformer, which is particularly adapted for use in radio circuits, but it will be appreciated that it may find uses in other fields.

15 The main purpose of such a transformer is to amplify, not only without distortion, but in proper proportion to the natural volume of the sound transmitted. The particular transformer illustrated herein is one which will produce an audibility curve, having a flat distortionless form, which makes it possible to use this transformer in any or all stages of amplification.

20 It is the object of this application to set forth certain of the details of the transformer by which uniform inductance, which is a necessary qualification of a good radio transformer, is obtained.

25 Another object of our invention is to provide a transformer which is relatively simple in construction, yet a construction which makes for rigidity and ease of making connections to the transformer, as well as for mounting it in the radio set.

30 These and other objects will be apparent to one skilled in this art after a study of this specification taken in connection with the annexed drawing wherein:

Figure 1 is a perspective view of our complete transformer.

35 Figure 2 is a view of the connecting board showing a part of two of the connectors in dotted position.

Figure 3 is a view of the frame member.

40 Figure 4 is a view looking upward from the bottom of Fig. 3.

45 Figure 5 is a plan view of the bottom locking member.

Figure 6 is a side view of Fig. 5.

50 Figure 7 is a plan view of the core laminations.

Figure 8 is a view of one of the connectors, while

55 Figure 9 is a view of a wedge member used for securing the coil or windings in position on the core.

Referring now to the details, wherein like numbers refer to corresponding parts in the various views, 1 illustrates a coil including both primary and secondary windings, the ends of the windings 23 being brought out to a downwardly projecting part 25 of the connector. We prefer to arrange these windings so that the ends of the primary winding are brought out to a pair of connectors on one side of the core and the secondary ends to connectors on the opposite side of the core. These connectors 24 are mounted on a connecting board 10, which has notches 12 in two sizes to fit around the frame member 4, which engages the core.

60 The core as illustrated consists of an E-shaped lamination 2 on the central arm 20 of which the coil 1 is positioned, being preferably held rigidly in place thereon by two wedges 16, one of which only shows in Fig. 1. The open side of the E-shaped lamination is closed by an I-shaped or bar lamination 3. As shown in Fig. 7, these laminations are somewhat separated in order to show the parts more clearly. When these laminations are assembled in the transformer, they are placed alternately in reverse position; that is to say, that the next bar of laminations that will be placed above those shown in Fig. 7, the E lamination will be to the right and the lamination 3 will be on the left-hand side, and so on alternately until the core is built up to the required dimension, which is quite definitely fixed as to the total number of laminations by the particular construction of the frame member 4. As shown in Fig. 3, the frame member 4 is preferably made of one piece of special steel and is constructed in the form of a U-shaped channel member, the channel being illustrated by the numeral 9. This construction is of such a nature that the channel 9 encompasses the laminations and is so designed that it will hold a definite number of them, and it also holds the laminations 2 and 3 rigidly together so as to get a good joint therebetween, whereby the inductance of the transformer is kept at a uniform value.

65 The lower ends of the arms of the frame member have ears 6, preferably formed integral therewith and these ears have holes 7 for the purpose of mounting the transformer. It is to be noted that the holes 7

are so positioned that they are out of line with the connectors 24 so that in handling a screw driver in mounting the transformer, there is no danger of injuring the connecting board or the connectors, in case of accidental slipping of the screw driver. The lower end of the frame member 4 has holes 8 therein, which are adapted to receive the projections 19 in the member 17. The operation of the holes 8 and projections 19 act to lock the open legs of the U frame member together and at the same time the member 17 grips the lower part of the core within the channel 21. We prefer to throw bosses 18 outward on the member 17 in order to stiffen it. It will be readily appreciated that the feet or lugs 6 instead of being on the frame member 4 may be on the locking member 21, and the locking member 21 may be held to the frame member 4 in a different manner from that illustrated, as by means of lugs on the member 4 projecting downward through holes in the member 21 in a manner similar to the lugs 5, which we prefer to use to hold the connecting board 10 in position, it being understood that the lugs 5 will pass through the holes 11 in the connecting board and are bent over on the other side of the said board, which we prefer to make of one piece of special insulating material.

As illustrated in Fig. 8, the connectors 24 are mounted on the bottom side of the connecting board 10 by means of screws passing thru the holes 13. On the upper ends of the screws are binding posts 25. As shown the lug 14, which acts as a connector for an incoming wire, is punched outwardly from the portion 15 which has its end curled up at 22 to receive the ends of the wires on the windings of the transformer. Dogs 26 are also formed in the connector for the purpose of gripping into the connecting board after the screw is tightened up, thereby preventing the connectors from twisting around and getting out of place.

It will be understood that in the construction shown, in assembly, the connecting board 10 is positioned between the windings and one arm of the core and then the complete assembly of the core, coil and connecting board are slipped into the frame, after which the lugs 5 can be bent over, but it will be readily appreciated that the lugs 5 may be even dispensed with and the connecting board be held in position by the side notches 12 and the fit between the outer periphery of the coil and the core, wherein the outer periphery of the coil may engage the bottom part of the connecting board and thereby assist in holding it in position. Such changes as well as others, however, are clearly within the scope of our invention, as it will be apparent to one skilled in the art

that numerous changes may be made in the details without departing from the spirit of our invention and the scope of the appended claims.

Having thus described our invention what we claim is:

1. In a transformer, a core, windings carried on the core, a connecting board having connectors thereon for the ends of said windings and outside wires, said board being positioned between the windings and a part of the core.

2. In a transformer, a shell type core having E-shaped laminations, primary and secondary windings on the middle arm of the core and a connecting board having connectors thereon for the ends of said windings and outside wires, said board being positioned through one window of the core between the outer periphery of the windings and a leg of the core.

3. In a transformer, an E-shaped core, primary and secondary windings on the middle arm of the core, a one-piece connecting board extending through one window of the core between the windings and an outer leg of the core, and having a pair of connectors on either side of the core, one part of the connectors extending downward from the bottom side of the board and the other part extending upward from the top of the board.

4. In a transformer, a core having E-shaped laminations and a bar member closing the E, a U-shaped channel frame for fitting over and closely engaging the core edges on one end and two sides, a locking member for clamping the other end of the core and fastened to the two open ends of the U frame, windings on the core, and a connecting board having connectors for the windings and wires coming thereto.

5. In a transformer, a shell type core, windings on an inner arm of the core, a U-shaped channel frame for fitting over and closely engaging the core edges on one end and two sides, a locking member fastened to the two open ends of the frame and engaging the core end beneath it, and a connecting board having connectors thereon for making connections to the transformer windings.

6. In a transformer, a shell type core, windings on an inner arm of the core, a U-shaped channel frame for fitting over and closely engaging the core edges on one end and two sides, a locking member fastened to the two open ends of the frame and engaging the core end beneath it, said open ends of the frame having mounting feet extending outwardly therefrom, and a connecting board positioned between the windings and an arm of the core.

7. In a transformer, a shell type core, windings on an inner arm of the core, a U-

shaped channel frame for fitting over and closely engaging the core edges on one end and two sides, a locking member fastened to the two open ends of the frame and engaging the core end beneath it, said open ends of the frame having mounting feet extending outwardly therefrom, and a connecting board extending through a window of the core and held in position by said frame.

8. In a transformer, a shell type core, windings on an inner arm of the core a U-shaped channel frame for fitting over and closely engaging the core edges on one end and two sides, a locking member fastened to the two open ends of the frame and engaging the core end beneath it, said open ends of the frame having mounting feet extending outwardly therefrom, a connecting board extending through a window of the core between it and the windings, and co-operating means on the frame and board for holding the board in position.

9. In a transformer, a shell type core, primary and secondary windings on an inner arm of the core, a frame for fitting over and closely engaging the core edges on all sides and having mounting feet projecting from the bottom part of said frame, a connecting board extending through a window of the core between it and the windings and connectors on the board on either side of the core, the set on one side being for the primary and the set on the other side being for the secondary wires.

10. In a radio transformer, a shell type core having E and I shaped laminations with windings on the middle arm, means for holding said laminations in close and uniform co-operation consisting of a stiff channel frame, and means for making connections to said windings, consisting of a connecting board carried through a window of the core between the windings and the core, said board having connectors mounted thereon.

11. In a radio transformer, a shell type core having E and I shaped laminations with windings on the middle arm, means for insuring the proper and uniform inductance so far as the core is concerned consisting of a stiff channel frame for gripping the core substantially all around its outer area, said channel being of a width to determine the proper number of laminations which are to be assembled therein, and a connecting board having connectors thereon for the transformer positioned in one of the windows of the core between the windings and the core.

12. In a radio transformer, a shell type core, windings carried on an arm of the core, a channel frame substantially enclosing the core around its outer periphery, a connecting board having connectors thereon positioned in one of the windows of the core between the windings and the core and means included in a part of the frame for mounting the transformer.

13. In a radio transformer, a shell type core, windings carried on an arm of the core, a channel frame substantially enclosing the core around its outer periphery, a connecting board positioned in and extending through one of the windows between the windings and the core, connectors on the board on both sides of the core, mounting feet extending from a part of said frame and having holes therein out of alignment with said connectors for the purpose described.

14. In a radio transformer, a shell type core, windings carried on an arm of the core, a channel frame substantially enclosing the core around its periphery, a connecting board positioned in and extending through one of the windows between the windings and the core, connectors on the board on both sides of the core, said connectors having a portion extending downward from the bottom of the board and a portion on the top of the board, mounting feet extending from a part of the frame and having holes therein out of alignment with said connectors, as and for the purpose described.

15. A transformer having a vertical core member and a coil member arranged within the core member and around a portion thereof, and a frame comprising a sheet metal channel shaped to encase the sides and top of the core member, and a sheet metal base having upturned stiffening flanges, said base being rigidly secured to the upright part of the frame.

16. In a transformer the combination with the core and coil members, of a frame having a metal upright of channel shape encasing the adjacent core member of the transformer, a base rigidly secured to the upright member, and a table arranged transversely on the frame, said table straddling the side members of the frame and having means for attachment to the top part thereof.

In testimony whereof we hereunto affix our signatures.

JOHN L. SCHERMERHORN.
FREDERICK GOERTZ.