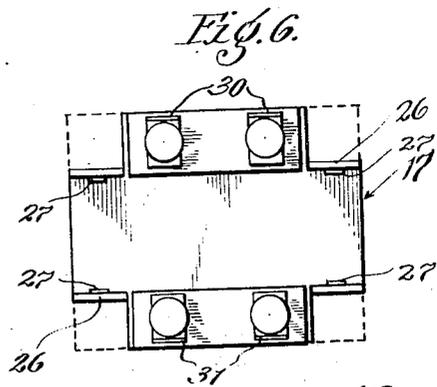
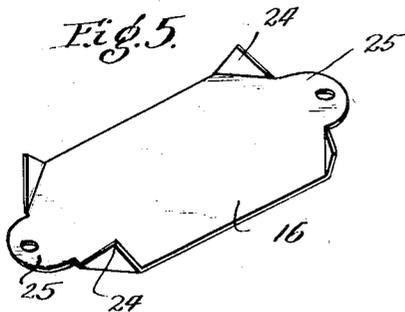
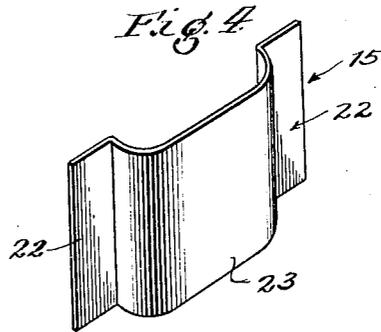
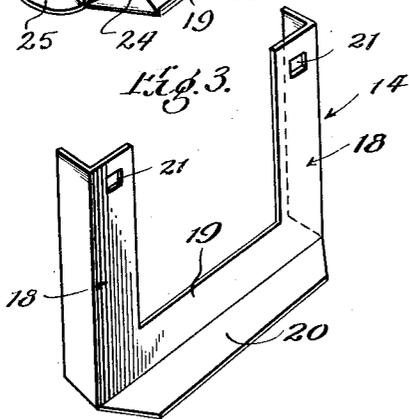
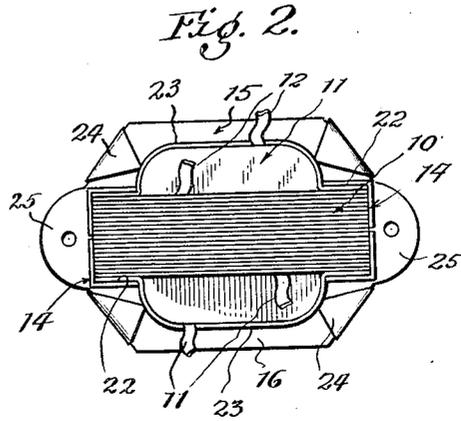
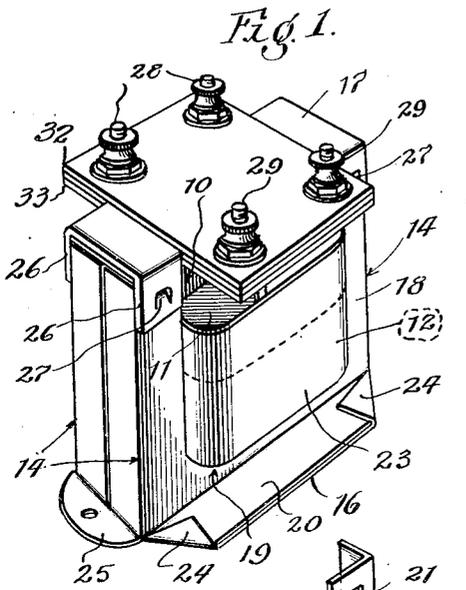


June 14, 1927.

1,632,101

C. H. THORDARSON
AMPLIFYING TRANSFORMER

Filed Oct. 18, 1922



Inventor

Chester H. Thordarson

By William H. [Signature] Atty.

Patented June 14, 1927.

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UNITED STATES PATENT OFFICE.

CHESTER H. THORDARSON, OF CHICAGO, ILLINOIS.

AMPLIFYING TRANSFORMER.

Application filed October 18, 1922. Serial No. 595,231.

This invention relates to improvements in transformers and is adapted more particularly for use as amplifying transformers in radio receiving sets or other places where small amperage high frequency current is used.

The object of the invention is to produce an enclosing shell or frame for such transformers, of such construction as to constitute a shield against magnetic leakage whereby two or more of such transformers can be connected up or disposed in close adjacency without the magnetic lines of one transformer influencing an adjacent transformer.

The invention consists in the elements and combination of elements shown in the drawings and described in the specification, and is pointed out in the appended claims.

In said drawings:

Figure 1 is a perspective view of a transformer embodying my invention.

Figure 2 is a plan view of the transformer with the top connecting plate removed.

Figure 3 is a perspective view of one of a pair of elements which comprise a portion of the supporting and enclosing casing or shell.

Figure 4 is a perspective view of a shield member.

Figure 5 is a perspective view of the base plate for the shell.

Figure 6 is a bottom plan view of the top connecting plate.

The transformer herein shown is of the shell type, though in this regard the type may be varied. So also the particular construction of the sheet metal parts and the manner of connecting them together and fitting them to the transformer elements may be varied.

As shown in the drawings, 10 designates the laminated magnetic core, and 11, 12 designate the primary and secondary windings of the transformer wound through the windows of the shell type core. The dimensions of said windings are indicated in Figure 1 by the dotted line.

The supporting and enclosing casing or shell for the transformer is shown as assembled upon the transformer in Figures 1 and 2, and the elements of said shell are illustrated in Figures 3 to 6 inclusive.

The frame of the shell comprises, in general terms, a pair of side members 14, one of which is shown in Figure 3; a shield plate

15, one of which is shown in Figure 4; a base plate 16, shown in Figure 5, and a top plate 17, shown in Figure 6.

Each said side members embraces two vertical angle section posts 18, 18 joined by a cross member 19 disposed in a vertical plane and in a plane of one of the flanges of each angle section post, and a lower laterally disposed flange 20. Corresponding members of the angle section posts are provided with openings 21.

The shield member 15 embraces end marginal portions 22, 22 disposed in the same plane, and a connecting outwardly curved portion 23, which latter portion comprises the larger part of the area of said shield and of the covering for the windings.

The base plate 16 has the general form of an oblong rectangle, departing from a true rectangle in the details now to be noted. The said base plate is made flat throughout the principal portion of its area, and is provided at each end with upwardly bent triangular lips 24 arranged at the ends of the side margins of the base plate, and with their bases disposed diagonally to said side margins. Said plate further includes at its ends, and between each pair of lips, lugs 25 which are apertured to receive fastening means to fasten the transformer fixedly in place.

The top connecting plate 17, shown in Figure 6, is made from a symmetrical oblong rectangular sheet of metal, the outline of the original plate including the full and dotted lines shown in Figure 6. At the ends of the plate are formed lugs 26 which, when assembled in the transformer shell or casing, as shown in Figure 1, extend downwardly at right angles to the plane of the plate. The said lugs at each end of the connecting plate are formed by cutting or shearing said plate inwardly from the side margins thereof and bending the parts between the shear cuts and the end of the plate at right angles to the plane of said plate to form the lugs 26. Said lugs 26 are each provided with inwardly bent spurs 27. The plate is preferably made of a heavier gauge metal than the other elements of the shell or casing.

The elements of the shell or casing are assembled as follows:

The side or curved shield members are first laid against the sides of the transformer with the curved connecting portion 23 enclosing the windings, and with the

straight marginal portions 22 thereof laid flat against the ends of the magnetic core. Thereafter, the side members 14 are laid with the inner or proximate flanges of the posts 18 against the said flat end marginal portions 22 of the shield member 15 and the parts of the core above and below said end marginal portions of the shield member. The angle cross section of the posts 18 embrace the corners of the core as best shown in Figure 2, and the outer flanges of the angle section posts are made of widths to closely approach each other on the end margins of the core, as indicated in Figures 1 and 2. The vertical widths of the cross members 19 are such that when the parts are thus assembled the upper edges of said cross members abut against that portion of the lower side of the secondary winding that protrudes from the core.

The transformer, with the elements 14 and 15 applied thereto as described, is then set upon the flat base member 16. The ends of the lateral flanges 20 of the elements 14 are bevel cut to conform to the angular shape of the base plate at the lines where the bases of the triangular lip 24 join said plate, and the bevel margins of said flanges 20 fit closely against the bases of said lips 24. Thereafter the lips 24 are turned downwardly over and clamped on the lateral or base flanges of the said members or elements 14. This operation serves to rigidly connect the side members or elements 14, the shield members 15 and the base members 16.

Thereafter the top connecting plate 17, with the lugs 26 thereof directed downwardly, is fitted over the upper ends of the angle posts, and the spurs 27 of the lugs 26 enter the openings 21 of said posts and interlock with the walls of said openings. It will be observed, from an inspection of Figure 1, that the said spurs 27 are free-ended at their upper ends; and the resiliency of the metal thereof permits the lugs of the top connecting plate to be fitted closely over the side or adjacent flanges of the posts so that when the top connecting plate is pressed home the said spurs spring into said openings and rigidly lock the side members 14 in place against the core. The said top connecting member constitutes in effect a key element which is last assembled in the shell or frame, to finally lock the members of the shell or frame rigidly together.

It will be observed that the turned over lips 24 and the said spurs 27 constitute means for rigidly interlocking all of the parts of the casing or shell, and that no bolts or screws are necessary for fastening the casing or shell members together. It is an advantage in a transformer for this use to permanently lock the casing or shell members together around the transformer to

support and enclose it inasmuch as such locking means, in addition to the rigidity of the connection thus effected, prevents the casing or shell from being dismantled to detrimentally expose the elements of the transformer.

The elements of the casing or shell, aside from the top connecting plate are, in accordance with the invention, made of metal possessing good electric conducting and distributing properties such, for instance, as copper or aluminum. Aluminum is preferred because of this property, and also because it can be readily formed without sharp angular lines, and because also it possesses a good finish and does not require plating to protect its finish or its surface against deleterious oxidizing or other destructive elements.

By reason of the electric conductivity and of the distributing properties of such metals, and of the absence of discharge points in their construction and along their areas, the casing or shell serves as a shield to absorb the lines of force from the transformer and to prevent inductive reaction of one transformer on another when placed closely adjacent to each other. Thus a number of transformers so encased may be used in series or banked relation without affecting the efficiency of the transformers.

The top connecting plate made as described can also serve as a mounting plate or element for the binding posts 28, 29 connected through the clips 30, 31 to the winding leads, said plates being properly insulated from the core by upper and lower insulating sheets 32, 33. It also becomes practical to apply to the topmost side of the structure a suitable sheet on which is printed the legends which identify the connections of the binding posts to the different circuits of a radio receiving apparatus, or other electrical apparatus in which the transformer is used.

I claim as my invention:

1. A transformer and magnetic shield casing comprising, in combination, a shell type core and primary and secondary windings thereon, said casing comprising side members, each consisting of a plate to bear at its ends against the transformer core and curved between its ends to embrace the transformer windings, and including also a pair of side members each consisting of angle post parts to embrace the corners of the core and to fit over said plate ends, and means to interlock the members of said casing together on the core and winding, said plates and post parts being made of metal having smooth, non-projecting areas and having the properties of a magnetic shield.

2. A transformer and magnetic shield casing comprising, in combination, a shell

type core and primary and secondary windings thereon, said casing comprising side members each consisting of a plate to bear at its ends against the transformer core and
5 curved between its ends to embrace the transformer windings and end members extending across the side edges of the core and flanged to overlap the end portions of the side members, and means to interlock the
10 members of the casing on the core and winding.

3. A transformer casing comprising two side plates having flat ends and curved central portions, end members between which
15 the side plates are arranged in spaced relation to each other, said end members having flanges adapted to overlie the end portions of said side plates, and means for locking said end members and side plates together.

20 4. A transformer and magnetic shield casing comprising, in combination, a shell type core and primary and secondary windings thereon, said casing comprising side plates and end plates, each side plate con-

sisting of an element bearing at its ends 25 against the transformer core and curved between its ends to embrace the transformer winding, and the end plates extending across the side edges of the transformer core and having flanges overlying the ends 30 of the side plates.

5. A transformer casing comprising two side plates having flat ends and curved central portions, a bottom plate, end members rising from the bottom plate between which 35 the side plates are arranged in spaced relation to each other, said end members having flanges adapted to overlie the end portions of said side plates, a top plate extending between and resting upon the upper ends of 40 said end members, said top plate having flanges extending downwardly past the upper ends of said end members.

In witness whereof I claim the foregoing as my invention, I hereunto append my 45 signature this 12 day of October, 1922.

CHESTER H. THORDARSON.