

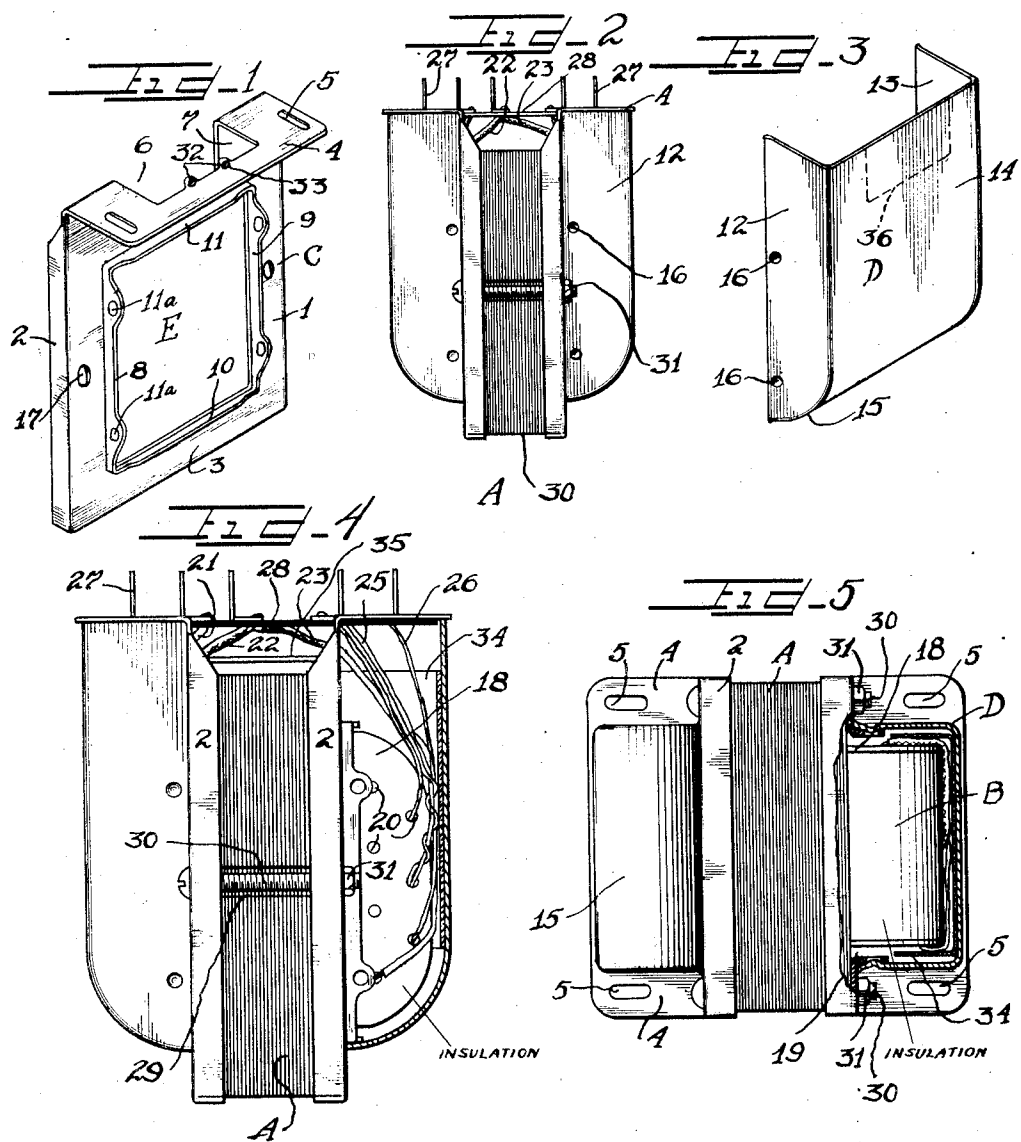
April 7, 1931.

A. HELGASON ET AL

1,799,790

TRANSFORMER SHIELD OR CASING

Filed June 4, 1930



INVENTORS
Arni Helgason
Nick Knuth
by Charles H. Mills ATTORNEYS

UNITED STATES PATENT OFFICE

ARNI HELGASON AND NICK KNUTH, OF CHICAGO, ILLINOIS, ASSIGNORS TO CHICAGO TRANSFORMER CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

TRANSFORMER SHIELD OR CASING

Application filed June 4, 1930. Serial No. 459,153.

The present invention relates to a transformer shield or casing.

An object of the present invention is to provide an enclosing shield or casing for such transformers of such construction as constitutes a shield against magnetic leakage whereby two or more of such transformers may be closely disposed without any of the transformers magnetically influencing any of the others and protected for external interference.

Another object of the invention is to provide a practical construction of shield or casing for transformers, which is economical to manufacture on a production basis and which may be readily assembled.

A further object of the invention is to provide a transformer shield or casing wherein end plates bear against the front faces of the transformer core and are clamped together to retain the core in compact relation and at the same time to fasten such plates to the transformer and removable side members or cover members frictionally engaging the end plates for enclosing the coil, which cover members may be removed without removing the end plates from the transformer.

A still further object of the invention is to provide a casing or shield for transformers consisting of plates and covers which may be readily formed from sheet metal or other suitable material by die pressing.

A yet further object of the invention is to provide a shield or casing for transformers stamped from sheet metal with a minimum number of parts which may be readily assembled.

A still further object of the invention is to provide a casing or shield for a transformer having a pair of end plates and a pair of side members, the side members frictionally engaging the plates when assembled.

The above, other, and further objects of the invention will be apparent from the following description, accompanying drawings, and appended claims.

An embodiment of the invention is illustrated in the accompanying drawings and the views thereof are as follows:

Figure 1 is an isometric view of one of the

end plates embodying the present invention.

Figure 2 is a side elevation of a transformer equipped with a shield of the present invention.

Figure 3 is an isometric view of one of the side members embodying the present invention.

Figure 4 is an enlarged side elevational view of a transformer provided with a shield of the present invention and with certain parts in section to show the relation of the shield to the transformer.

Figure 5 is a bottom plan view of a transformer provided with a shield of the present invention and with certain parts broken and in section to illustrate details of construction.

As shown on the drawings:

The transformer illustrated is of the shell type and comprises a core A and a coil B.

The core A is laminated preferably with E-shaped laminations and the coil B is arranged about the central arm of the core in the usual manner extending through the windows of the shell type core.

The transformer illustrated is arranged to be attached to the underside of a shelf, although, of course, it might be inverted and attached to the top side of a shelf or bracket. The position of the transformer has nothing at all to do with the formation, assembly, and arrangement of the magnetic shield.

The shield of the present invention comprises generally a pair of end plates C, one of which is shown in Figure 1 and a pair of side members D, one of which is shown in Figure 3.

Each end plate C comprises, in the illustrated form of the invention, a substantially rectangular frame having sides 1 and 3 and with flanges 2 formed as part of the sides, which flanges 2 extend substantially perpendicularly to the plane of the sides. A portion of the metal of which the end plates are made is bent in the opposite direction from that of the flange 2 and provides an attaching shelf 4 having apertures 5 therein through which the usual attaching screws, bolts, or like members may pass. The apertures 5 are shown as elongated in order that the transformer when assembled may be positioned properly.

The shelf or ledge 4 may be cut away at 6 while the upper face 7 is likewise cut away to form a gap or opening.

The formation of the end plates provides 5 an opening E in order that the end plates may fit about the coil B of the transformer. The inner margins of the sides 1 and 3 and the upper face 7 are flanged perpendicularly to these faces in a direction opposite to the 10 flanges 2, thus providing side flanges 8 and 9, a lower flange 10, and an upper flange 11. The side flanges 8 and 9 are further provided with ears which have holes or recesses 11a formed in the same.

15 The end plate C is pressed from sheet metal of suitable magnetic characteristics and provides the end plates illustrated in Figure 1.

Each side member D is likewise pressed 20 from sheet metal of suitable magnetic characteristics and includes two sides 12 and 13, a face 14, and in the illustrated form a curved lower end 15. The upper end of the side member D, as illustrated, is open. The sides 25 12 and 13 are each provided with inwardly extending detents 16 for entering the holes or recesses 11 in the flanges 8 and 9 of the end plate for assembly purposes. The members D might, of course, be reversed in position, 30 if desired.

Each of the side faces 1 of the end plate C is provided with an opening 17 for the reception of fastening bolts utilized to fasten the end plate to the transformer core.

35 The coil B has boards 18 and 19 secured against the ends of the same, which boards are perforated with a plurality of holes 20 through which the various leads from the winding of the coil may pass. However, the 40 use of such boards is not essential.

The boards 18 and 19 are fashioned from suitable insulating material.

Leads 21, 22, 23, 24, 25, and 26, and as many more or as many less as may be de- 45 sired, pass from the coil at selected positions and may be threaded through the holes 20 in the boards 18 and/or 19 and have the ends thereof fastened to connector lugs 27, a plurality of which are secured to a connector 50 board 28. The leads could be directly connected to external connections without the use of the connector boards and lugs.

The shield of the present invention is assembled about a transformer as follows:

55 Two opposite edges of the core A are recessed at 29 to allow the application of the bolts 30 for securing the end plates C in position.

The various leads from the coil B having 60 been attached to the suitable connecting lugs 27 on the connector board 28, the end plates C are then applied against opposite faces of the core A with the flanges 2 engaging against the ends of three of the end surfaces of the 65 core A whereupon the bolts, rivets or similar

attaching means 30 are passed through the holes 17 in the end plates through the recesses 29 in the core and fastened by nuts 31 applied to the opposite ends of the bolts against the 70 sides 1 of the opposing end plates C. There are two such bolts illustrated. These bolts secure the end plates C to the core of the transformer and when the nuts 31 are tightened compress the laminations of the transformer core and retain the same in com- 75 pressed condition.

The connector board 28 is then applied adjacent the out-turned ledges 4 of the end plates C and spaced from the adjacent face 80 of the core A. Projections 32 may be formed on the ledges 4 under which the ends of the connector board 28 may be snapped or passed, and fastened thereto by means of rivets passing through holes 33 in the projections or ears 32. The connector board is in this man- 85 ner securely fastened to the magnetic shield, and when the transformer is attached to a support, the lugs 27 will be available for making external connections to the transformer. The connector board might be 90 placed elsewhere than as shown, if desired.

It will be observed that the end plates C are securely attached to the transformer core A and remain so fastened.

Suitable pieces of insulating material 34 95 may be then placed about the projecting parts of the coil and the leads therefrom, whereupon the end members D are applied to cover the coil, the leads therefrom, and the insulating pieces 34. The side members D are re- 100 tained on the end plates by frictional engagement of the detents 16 thereof with the holes 11 formed in the flanges 8 and 9 of the end plates C, and may be readily removed and applied without disturbing any of the other 105 parts of the transformer.

The side members D when applied, cover the coil, the windings, and overlie the flanges 8 and 9, making the shield or casing of pleasing appearance. The open ends of the side member D, when assembled, bear against the 11 ledges 4 of the end plates C, while the curved ends 15 of said side members conform generally to the shape of the coil at the opposite end of the transformer. 11

It will be observed that the casing of the present invention completely covers the coil, the leads therefrom up to the connector board, and at the same time because of the novel arrangement of the side members D, 15 allows removal of the same for inspection of the coil and its leads at any time as desired.

Insulating material 35 may be interposed between the leads passing to the connector board 28 and the adjacent face of the core A protecting the leads from contact with the core as well as from contact with the end plates.

The provision of the cut-out 6 in the end 1

plates allows insulation of the connector board in the manner described.

The metallic casing of the present invention consists of the two end plates C and the two side members D, the end plates being secured to the transformer by means of two bolts 30 and the side members D removably supported on the end plates D by frictional engagement.

The end members D might be cut away as indicated by dotted lines 36 in Figure 3 and insulating boards inserted through which the coil leads might pass.

The invention has been described herein more or less precisely as to details, yet it is to be understood that changes may be made in the arrangement and proportions of parts and equivalents may be substituted without departing from the spirit and scope of the invention.

The invention is claimed as follows:

1. In combination with a transformer of the shell type having a laminated core and a centrally positioned coil, a casing for the transformer comprising a pair of dished members secured together in clamping engagement with marginal portions of the core, said members each consisting of a stamped plate having a normally bent end portion, and having a central aperture to allow the coil to extend through the plate and having a slot in the bent end portion, the central aperture being bounded by an upstanding flange, and a pair of scoop-shaped members, open at one end of the scoop, mounted on said plates removably engaging the outstanding flange, said scoop members being removable without disturbing said clamping members.

2. In combination with a transformer of the shell type having a laminated core and a centrally positioned coil, a casing for the transformer comprising a pair of dished members secured together in clamping engagement with marginal portions of the core, said members each consisting of a stamped plate having a normally bent end portion, and having a central aperture to allow the coil to extend through the plate and having a slot in the bent end portion, the central aperture being bounded by an upstanding flange, a pair of scoop-shaped members, open at one end of the scoop, mounted on said plate removably engaging the outstanding flange, said scoop members being removable without disturbing said clamping members, and a connecting board on the core entered in the slot of the bent end portion of the plate in engagement with a portion of said bent end portion, and means securing said board to said bent end portion.

3. In combination with a transformer of the shell type having a laminated core and a centrally positioned coil, a pair of dished clamping members secured together in clamping engagement with marginal portions of

the core, said members each having a central aperture to allow the coil to extend there-through, an integral upstanding flange on said members adjacent the aperture, and dished cover members removably engaging the flange to protect the coil, said cover members being removable without disturbing said clamping members.

4. In combination with a transformer of the shell type having a laminated core and a centrally positioned coil, a member on said core in clamping engagement with marginal portions of the core to clamp the laminations thereof, said clamping member having an opening therein through which the coil projects, integrally formed upstanding flanges on said member adjacent said opening, and a dished cover member on said clamping member removably engaging said flanges to protect the coil, said cover member being removable without disturbing the clamping relation of said clamping member to the core of the transformer.

5. A casing for a shell type transformer having a laminated core and a centrally positioned coil, said casing comprising a member for clamping engagement with marginal portions of the core to clamp the laminations and having an opening through which the coil may project, integrally formed upstanding flanges on said member adjacent said opening, and a dished cover member to protect the coil adapted to engage said upstanding flanges, and to be removable therefrom without disturbing the clamping relation of said clamping member when said clamping member is in clamping position on the core of the transformer.

6. In combination with a transformer of the shell type having a laminated core and a centrally positioned core, a clamping member on said core in clamping engagement with the marginal portions of the core and having an opening therein through which the coil projects, a dished cover pressed into supported position on said clamping member, and means on said clamping member frictionally engaging said cover whereby said cover is adapted to be removed without disturbing the normal clamping relation of said clamping member on said core.

In testimony whereof, we have hereunto subscribed our names at Chicago, Cook County, Illinois.

ARNI HELGASON.
NICK KNUTH.