April 12, 1949. A. F. MITTERMAIER 2,467,218

CAST CORE CLAMP

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Fig. 1.

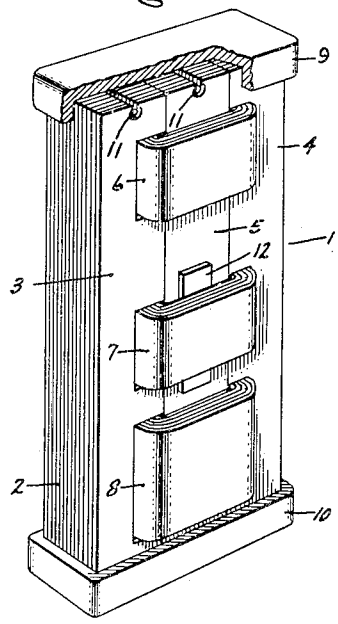


Fig. 3.

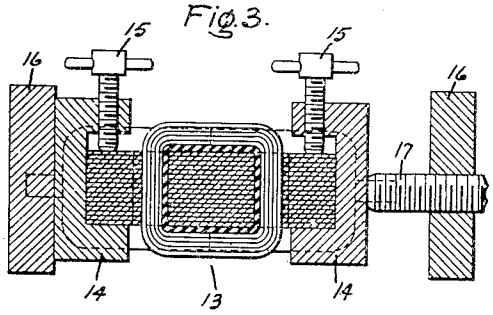
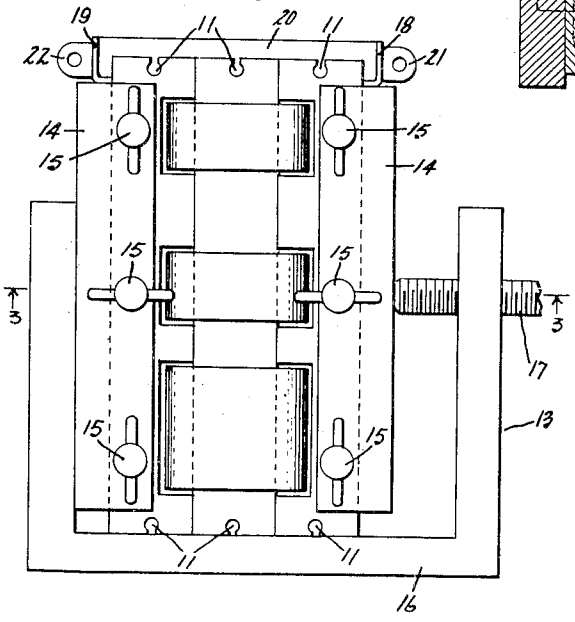


Fig. 2.



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2,467,218

CAST CORE CLAMP

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1 Claim. (Cl. 175—356)

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This invention relates to a cast clamp and more particularly to a cast clamp for electrical induction apparatus having a magnetic core structure comprised of stacked punched laminations.

Certain losses in iron cored induction devices can be reduced by making the core out of punched laminations. When this is done it is necessary to use some type of clamping arrangement to hold the stacked laminations together. In the case of small type induction apparatus the conventional means of binding the laminations is to use a prefabricated clamp which is installed by using a nut and bolt causing the laminations to be pressed together. This method, or any similar method using a prefabricated clamp has the disadvantage of involving two processes. One, the manufacture of the clamp, two, the installation of the clamp.

It is well known in the art that the more firmly the laminations are bound together the less will be the power losses and the vibratory noises.

In accordance with this invention the manufacture and installation of the core clamp are combined into one operation, and the laminations are bound more firmly together than has hitherto been the case.

An object of this invention is to provide a new and improved method for clamping together the laminated core structure of electrical induction apparatus by incorporating into one operation the fabrication and installation of the clamp.

Another object of the invention is to decrease the power losses and noise due to vibration by more firmly binding the laminations together.

Still another object of the invention is to provide a simple means for casting a one piece clamp which will bind together the laminated core structure of electrical induction apparatus.

Still another object of the invention is to provide a means for insuring the fastness of the cast clamp.

The invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claim.

Fig. 1 is a perspective view of a preferred form of the invention incorporated as the clamping means for a fluorescent lamp ballast. Fig. 2 is a front elevation of the fluorescent ballast showing a temporary adjustable clamping arrangement and the mold preparatory to casting the clamp. Fig. 3 is a cross-section of the balast and temporary adjustable clamping device taken through the section 3—3 of Fig. 2.

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Referring now to Fig. 1 there is shown therein by way of example a fluorescent lamp ballast 1 constructed from stacked laminations 2 of a ferro-magnetic material and made up in three parts—the core outer legs 3 and 4 and the core center leg 5 which has on it three coils 6, 7, and 8 of copper wire or other metal of high conductivity. Binding the laminations 2 and the three core sections 3, 4 and 5 together are two cast metal clamps 9 and 10. Clamp 9 is shown in a cutaway section revealing keyhole grooves 11 in two of the three main sections. There is a similar groove in the third section 4 and one in the opposite end of each of the three sections 3, 4, and 5.

It is necessary before attempting to join the main core sections 3, 4 and 5 together as a unit to tightly stack the properly aligned laminations 2, and, then, securely hold the three main core sections 3, 4 and 5 in firm proximity to one another. This is done in the following manner.

The laminations 2 of the core center leg 5 are stacked, and on the core center leg 5 are placed the three coils 6, 7 and 8. In order to firmly hold the laminations together a wedge 12 of wood or other suitable material is driven between, in the illustrated case, coil 7 and the stacked laminations 2. The laminations which make up the outer core legs 3 and 4 are stacked and aligned, and these as well as the already prepared center core section 5 are placed in a temporary adjustable clamping device 13 similar to that shown in Figs. 2 and 3. The two outer core legs 3 and 4 fit into C-shaped clamps 14 having screws 15 passing through them which when tightened press together firmly the stacked laminations 2. In order to firmly hold together the three core sections 3, 4 and 5 another C-shaped clamp 16 which rests against the clamps 14 in the manner shown in Fig. 2 is used, so that by tightening the screw 17 which presses against one of the clamps 15, the three main core sections 3, 4 and 5 are forced together. This can be better seen in Fig. 3. It will be noted in Fig. 2 that the clamps 13 and 14 are shorter in length than the main core sections 3, 4 and 5 of the ballast. This is to allow for the installation of the permanent clamp 9. Since the clamp 9 is cast its manufacture and installation are combined into one operation. A split mold made up of two similar sections 18 and 19 is placed over the exposed end of the three main core sections 3, 4 and 5, and into the mold 18 and 19 is poured molten type metal 20 or some other similar non-magnetic material such as babbitt having a relatively low melting point

and which contracts as it cools and hardens. When the metal 20 hardens it is securely fastened to the laminated portions of the ballast. Additional fastening means such as keyhole grooves 11 may be supplied in the core to provide for locking keys which are formed as an integral part of the clamp 9. In cooling the metal 20 contracts and binds the laminations 2 more firmly together as well as forcing the three main core sections 3, 4 and 5 into more positive contact. Clamp 10 is cast in a similar manner. When both clamps 9 and 10 have hardened in position the temporary adjustable clamp 13 is removed by loosening the screws 15 and 17 and the mold 18 and 19 is separated from the casting 20 by pulling on hooks which are passed through the hookeyes 21 and 22.

While there has been shown and described a particular embodiment of this invention it will be obvious to those skilled in the art that various changes and modifications can be made therein without departing from the invention and, therefore, it is aimed in the appended claim to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

In combination, a generally rectangular magnetic core having at least two abutting laminated members extending the full length of said core, core clamps in the form of cast metal caps over the opposite ends of said core for holding said members and their laminations together, said caps and said members having integral interfitting key projections and complementary recesses therefor which permanently lock said caps in position over the ends of said core.

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