April 5, 1949. G. W. LENTZ 2,466,448

COMBINED CORE AND COIL CLAMP

Filed June 25, 1946

Fig.1.

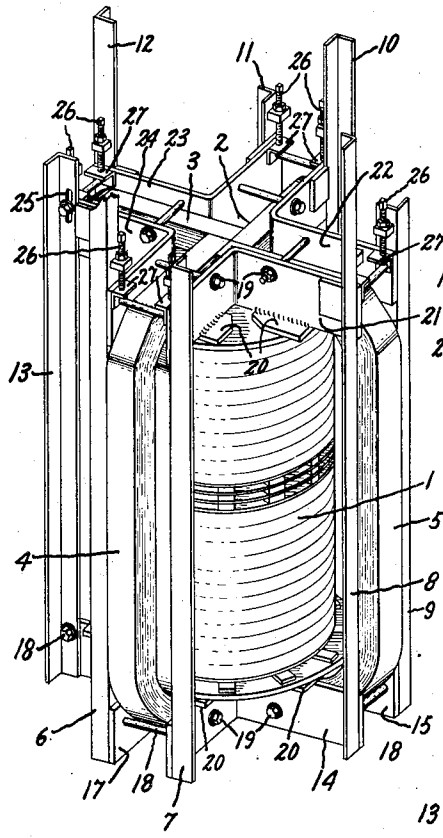


Fig.2.

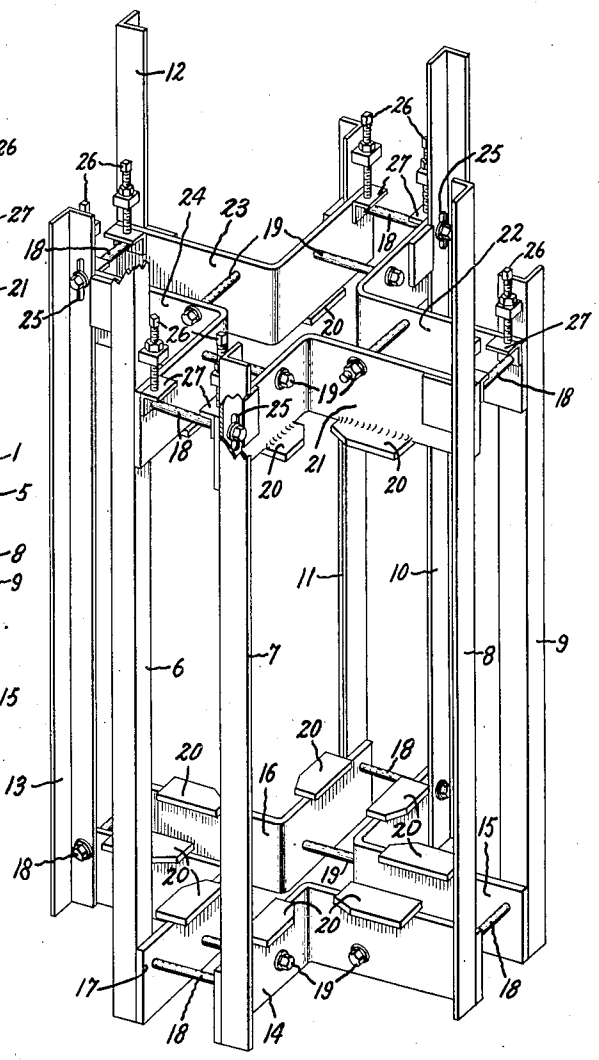
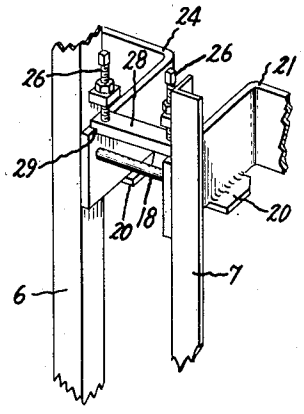


Fig.3.



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UNITED STATES PATENT OFFICE

2,466,448

COMBINED CORE AND COIL CLAMP

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1 Claim. (Cl. 175—356)

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This invention relates to electromagnetic induction apparatus and more particularly to improvements in frames for transformers.

Electromagnetic induction apparatus, such as transformers and reactors, usually include a magnetic core and a coil linking the core. In many cases the core is laminated and clamps are necessary for holding it together and holding it in position. Similarly, clamps or supports are usually necessary for holding the coil in position.

In accordance with this invention there is provided a new and improved frame for induction apparatus which is characterized by the high degree of accessibility of the means for adjusting the coil supports or coil clamps. The invention is particularly adapted for use in distribution transformers having distributed wound cores. In such transformers the core and coils assembled in their clamping frame are usually vacuum-dried before being placed in the casing and submerged in an insulating and cooling liquid, such as mineral oil. This vacuum drying often causes shrinkage so that the coil clamps need to be tightened and due to the numerous leads which ordinarily come out from the coil or coils on the core it is often difficult to retighten the coil clamps as heretofore they have been located behind the leads. However, with my new construction the adjustment of the coil clamps is made relatively easy.

An object of the invention is to provide a new and improved induction apparatus.

Another object of the invention is to provide a new and improved frame for electric induction apparatus.

A further object of the invention is to provide a new and improved coil clamping arrangement for transformers.

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.

In the drawing

Fig. 1 is a perspective view of the core and coil assembly of a distribution transformer mounted in my frame, Fig. 2 is an enlarged perspective view of the frame itself, and Fig. 3 is a detailed view of a modification.

Referring now to the drawing and more particularly to Fig. 1, there is shown therein a transformer comprising a coil assembly 1 and a core assembly consisting of four wound core members 2, 3, 4 and 5. Ordinarily the coil assembly 1 includes both a primary winding and a secondary

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winding and it will be understood that numerous leads of these windings ordinarily extend upwardly from the coil assembly but these have been omitted so as more clearly to illustrate the novel features of my invention.

The supporting and clamping frame for the transformer, the details of which are shown more clearly in Fig. 2, comprises eight bars 6, 7, 8, 9, 10, 11, 12 and 13 which may be conventional angle irons. As shown, these eight bars are all parallel and they are all distributed in symmetrically located pairs on the surface of an imaginary cylinder. Four angle brackets are located at each end of the bars. These brackets, which may be duplicates, are shown at the bottom as comprising a bracket 14 whose ends join the ends of the bars 7 and 8 and whose corner extends inwardly toward the center of the imaginary cylinder. Another bracket 15 joins the bars 9 and 10, a third bracket 16 joins the parts 11 and 12, and the fourth bracket 17 joins the bars 13 and 6. The ends of the bars and brackets may be attached in any suitable manner, such as by welding or by bolts 18 and additional bolts 19 are employed for drawing the parallel sides of adjacent brackets together for clamping the core parts between them. Flat pads 20 are attached to the top edges of the brackets.

At the other end of the frame a similar set of brackets 21, 22, 23 and 24. However, the bolts 18 pass through slots 25 in the bars so that the assembly of the four brackets 21, 22, 23 and 24, which is held together by the bolts 19, can be slid up and down, that is to say, toward or away from the lower set of brackets 14, 15, 16 and 17. Jack screws 26 are attached to the bars in any suitable manner and their ends may act directly on the edges of the main brackets or the latter may be provided with integral or permanently attached shelves or bearing surfaces 27 for receiving the thrust of the jack screws. The upper brackets, being duplicates of the lower brackets, also have corresponding pads 20.

As shown in Fig. 1, the coil assembly 1 is held firmly in place between the set of pads 20 on the lower group of brackets and the set of pads 20 on the upper groups of brackets. The jack screws 27 being as far out from the center of the assembly as the frame extends, and therefore being further out from the center than the pads 20 and the periphery of the coil assembly, are readily accessible. It is therefore relatively easy to insulate the coil leads (not shown) because

it is unnecessary to get behind them for adjusting the coil clamps.

It will be observed that the same structural elements, namely the right angle brackets, serve to support and clamp the core elements, through the action of the bolts **19** and also the bolts **18**, and also support and clamp the coil assembly **1** between their pads **20**, the pressure in the latter case being applied by means of the jack screws **26**. This coil clamping structure is substantially stronger mechanically and more stable than the old practice of having jack screws located directly over the coil assembly and therefore in towards the center of the transformer assembly and having the individual jack screws apply pressure directly to the coil structure.

In the modification shown in Fig. 3 the shelf members **27** are eliminated and a block of suitable structural material **28** is set in notches **29** in the top edges of adjacent sides of the main brackets under the jack screws **26**.

While there have been shown and described particular embodiments 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:

A frame for electric induction apparatus comprising, in combination, eight parallel metal bars distributed in symmetrically located pairs on the surface of an imaginary cylinder, four right angle brackets at opposite ends of said bars, the two ends of each bracket being attached respectively to the bars of different pairs with the corners of the brackets near the center of said cylinder, means for drawing the sides of said brackets together to clamp a magnetic core therebetween, pads on the edges of said brackets which face the brackets at the other ends of said bars, and means on the bars at one end for sliding said brackets along said bars so as to clamp a coil between said pads on the brackets at opposite ends of said bars.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,379,481	Sclater	May 24, 1921
1,411,619	Frank	Apr. 4, 1922