Sept. 2, 1930. W. E. SCHWENZER 1,775,053

TRANSFORMER CORE

Filed Feb. 10, 1930

Fig. 1.

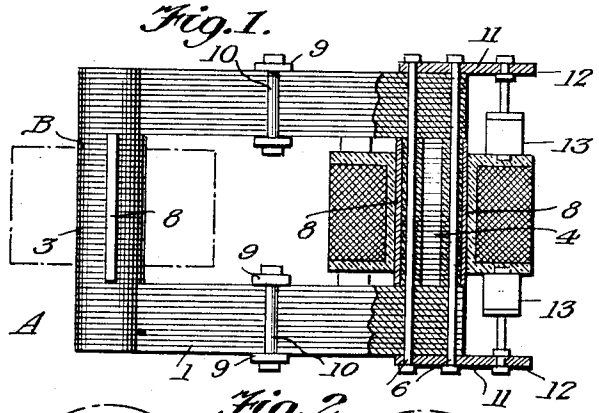


Fig. 3.

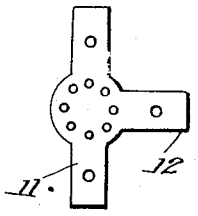


Fig. 2.

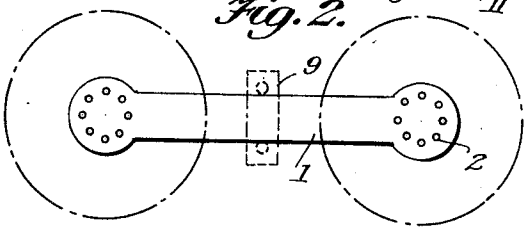


Fig. 5.

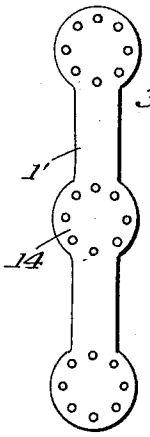


Fig. 4.

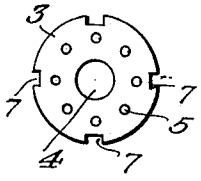


Fig. 6.

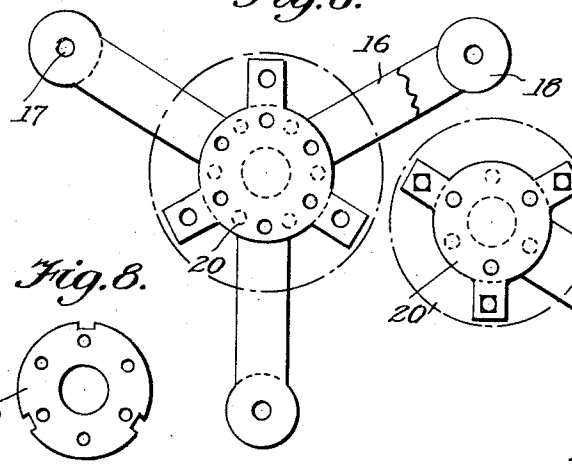


Fig. 10.

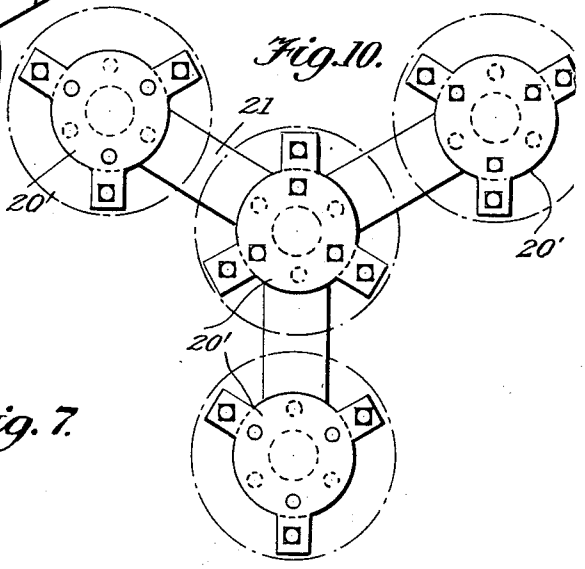
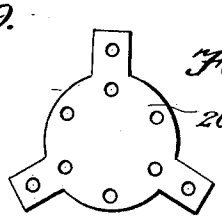


Fig. 8.

Fig. 9.



Fig. 7.



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UNITED STATES PATENT OFFICE

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TRANSFORMER CORE

Application filed February 10, 1930. Serial No. 427,326.

This invention relates to a transformer core, the general object of the invention being to make the core of compact form and allowing the coils to be placed close to the cores and making the transformer of light weight with low core loss.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an elevation of a core for a two-phase transformer.

Figure 2 is a plan view of Figure 1, showing parts in dotted lines, with parts omitted.

Figure 3 is a view of one of the clamping devices.

Figure 4 is a view of one of the post forming plates.

Figure 5 is a view of one of the plates used at the top and bottom of a three-phase device.

Figure 6 is a plan view of an arrangement for a cruciform transformer.

Figure 7 is a view of one of the clamping devices for a cruciform transformer.

Figure 8 is a view of one of the post forming plates for the cruciform device.

Figure 9 is a view of a disk used in the arrangement shown in Figure 6.

Figure 10 is a plan view of an arrangement used in a large cruciform device.

Referring to Figures 1, 2, 3 and 4, the numerals 1 indicate the plates used for forming the top and bottom portions of the frame of a two-phase transformer, as shown at A in Figure 1. Each plate is formed with circular end portions and a straight intermediate portion, the circular parts having the annular row of small holes 2 therein.

The posts B are each formed of a plurality of circular plates 3, each formed with a central opening 4 and an annular row of holes 5, these holes registering with the holes in the top and bottom plates so that bolts 6 can pass through some of the holes to hold the plates 1 and 3 in position, the remaining small holes forming oil passages. The plates 3 are also formed with notches 7 in their edges for receiving the wooden strips 8, as shown in Figure 1. The plates 1 of each of the top and bottom sets are clamped together at the centers by the strips 9 and the bolts 10.

Clamping members 11, each formed with the arms 12, are connected with the top and bottom parts of the device by the bolts 6 and support the insulators 13, as shown in Figure 1.

Thus I have provided a transformer frame composed of a plurality of plates placed one upon the other and connected together by the bolts, with oil passages passing through the parts and the openings 4 in the plates 3 form hollow cores for the posts of the device.

Figure 5 shows a plate 1′ used for forming the top and bottom portions of a three-phase frame, this plate having a central circular enlargement 14 in addition to the circular enlargements at the ends and all the enlargements are provided with the annular rows of holes, as before described.

Figure 6 shows plates 16 for forming the top and bottom portions of a cruciform frame, each plate being formed with a central circular enlargement and a small enlargement at the outer end of each arm, the central enlargements also having the annular row of holes, as before described.

The small enlargements each have a small hole 17 at their center for receiving the bolts which also pass through the disks 18 which form the outer cores, disks 19 forming the inner core or post, these disks being placed between the central enlargements of the top and bottom portions. The coil is placed on this central post and the insulators for the coil are supported by the projections carried by the top and bottom plates 20, one of which is shown in Figure 7.

Figure 10 shows a cruciform composed of the top and bottom parts formed of the plates 21 which have enlargements at their centers and at the ends of their arms, all of these

enlargements having the annular row of holes therein and the posts of this transformer are formed of plates similar to that shown in Figure 8. A low voltage coil is placed on the central post and high voltage coils on the outer posts, the insulators of all the posts being supported by the upper and lower plates 20′ which are made similar to the plates shown in Figure 7. The plates forming the posts may be provided with the central openings, as shown in Figure 8, so as to make the posts of hollow construction or these holes can be omitted, if desired.

Thus I have provided a transformer frame composed of a plurality of plates placed one upon another so that the core loss is reduced to a minimum and the arrangement of the parts permits the coils to be placed close to the cores.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

1. A transformer frame consisting of top and bottom portions formed of elongated plates placed one upon the other and post portions formed of plates placed one upon the other and means for connecting the portions together.

2. A transformer frame consisting of top and bottom portions formed of elongated plates placed one upon the other and post portions formed of circular plates placed one upon the other, means for connecting the portions together, each top and bottom plate having circular portions in alignment with the post portions and the said circular plates having central openings therein.

3. A transformer frame consisting of top and bottom portions formed of elongated plates placed one upon the other and post portions formed of circular plates placed one upon the other, means for connecting the portions together, each top and bottom plate having circular portions in alignment with the post portions and the said circular plates having central openings therein and the circular portions and the circular plates having annular rows of holes, some of the holes forming oil passages and the others receiving bolts which form the connecting means.

4. A transformer frame consisting of top and bottom portions formed of elongated plates placed one upon the other and post portions formed of circular plates placed one upon the other, means for connecting the portions together, each top and bottom plate having circular portions in alignment with the post portions and the said circular portions and circular plates having annular rows of holes therein, some of the holes forming oil passages and the others receiving bolts which form the connecting means, the circular plates having notches in their edges and wooden strips placed in the notches.

In testimony whereof I affix my signature.

WILLIAM E. SCHWENZER.