

(No Model.)

E. THOMSON.
ELECTRIC TRANSFORMER.

No. 415,749.

Patented Nov. 26, 1889.

Fig. 1.

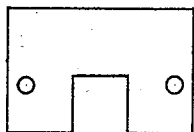


Fig. 3.

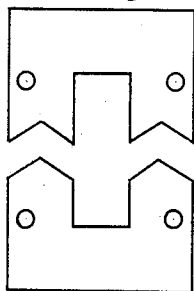


Fig. 5.

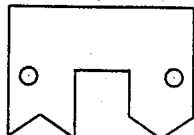


Fig. 2.

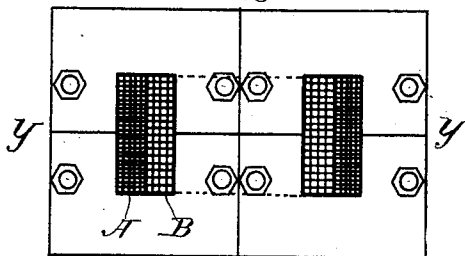


Fig. 4.

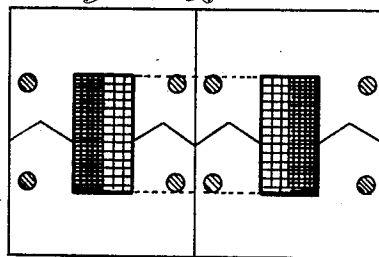
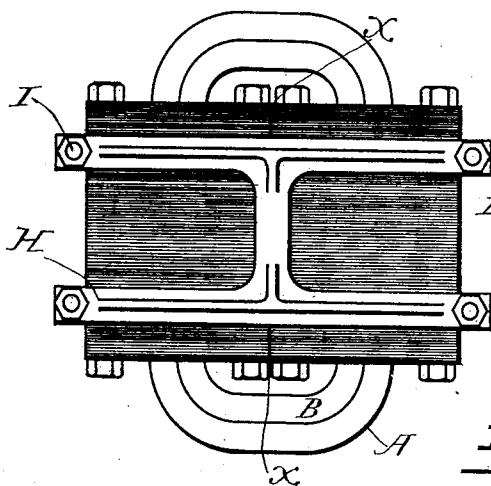
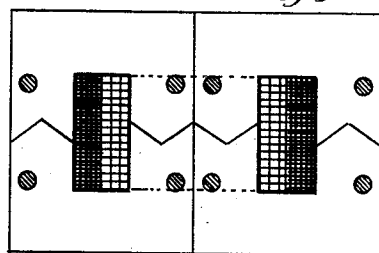


Fig. 6.



Witnesses:

J. Muddle
J. H. K. K. K.

Fig. 7.

Inventor:

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By

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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF LYNN, MASSACHUSETTS.

ELECTRIC TRANSFORMER.

SPECIFICATION forming part of Letters Patent No. 415,749, dated November 26, 1889.

Application filed September 2, 1889. Serial No. 322,738. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Transformers, &c., of which the following is a specification.

My invention relates to the construction of electro-magnetic coils, in which a coil of conducting-wire is provided with a core and envelope of iron.

My invention relates especially to the construction of the iron core and envelope, the general object being to provide a sectional core and envelope which may be built up around the coil after the same has been wound or to which the coil may be applied separately.

The invention is applicable to the construction of transformers, reactive coils, or other apparatus in which an electric coil or conductor is provided with an iron core and envelope passing around the outside of the coil, so as to form a practically continuous circuit through the coil and around its sides.

My invention consists, essentially, in making the iron core and envelope in four parts divided in two planes transverse to one another, and passing, respectively, through the coil in the general direction of its magnetic axis and in a direction transverse to such axis.

The invention consists, also, in making each of the four parts with two legs or prongs, one leg or prong of which lies within the coil and the other on the outside thereof, while both are in abutment with the similar prongs or projections of a part lying at the opposite end of the coil or coils.

The invention consists, also, in the combination, with the four-part core and envelope, of any suitable means for clamping the parts together against displacement in the direction of the axis of the coil.

My invention consists, further, in the specific combinations and organizations herein-after described and then more specifically claimed.

In the accompanying drawings, Figure 1 is a plan of one of the portions of a core and envelope constructed in accordance with my invention, and illustrates likewise the shape of

the iron plate which may be used in building up the part of the core and envelope after the manner well known in the art, so as to produce a laminated iron mass. Fig. 2 is a cross-section through a converter constructed in accordance with my invention. Fig. 3 illustrates the conformation which I prefer to give to the abutted ends of the prongs or projections. Fig. 4 is a cross-section through a converter constructed from parts such as illustrated in Fig. 3. Fig. 5 illustrates a modification in the form given to the ends of the prongs, while Fig. 6 shows in section a converter built up from parts of the shape shown in Fig. 5. Fig. 7 is a plan of a converter constructed in accordance with my invention, and illustrates means that may be used for clamping the parts against displacement in the direction of the axis of the coil.

I have illustrated my invention as carried out in connection with a converter, the primary and secondary of which are indicated, respectively, at A B; but, as will be obvious, the size and nature of the coil itself form no part of my invention.

Each of the parts making up the core and envelope, as shown in Fig. 2, is preferably built up from a series of thin plates of iron stamped out of sheet-iron in a form such as shown in Fig. 1, where a single plate is shown provided with the two legs or projections and with perforations through which bolts may be passed for the purpose of clamping all the plates of one part of the core and envelope together. Insulation may be applied, as well understood in the art, between the several plates of each bundle and between the bundles and the clamping devices. As will be seen on reference to Fig. 2, each part of the four-part core and envelope has two legs or prongs, one of which lies within and the other without the coil, but in abutment at its ends with a similarly-disposed part at the opposite end of the coil. The leg or projection of each part which is within the coil lies next a similar leg or projection at the same end of the coil, the two together filling a space at one end, while the two similar prongs or projections at the opposite end of the coil include the magnetic core. The ends of the prongs or projections are held against displacement in the direction of the axis of the coil by any

suitable clamping device—as, for instance, a plate H, Fig. 7—applied to opposite ends of the converter at the rear edge of the plates from which the several parts of the core and envelope are made up. The clamping-plates H are held together by suitable bolts I, as indicated.

The plane of division of the combined core and envelope corresponding to the line X X, Figs. 2 and 4, appears in Fig. 7, and passes down through the coil or coils in the direction of its magnetic axis. The plane of division in the direction transverse to such axis is indicated by the line Y Y.

In constructing the converter, reactive coil, or other apparatus the coil or coils of conducting-wire are preferably wound on a single form, and the several parts of the core and envelope are applied over the same in the position shown in Fig. 3, after which suitable clamping devices are applied for holding the parts together.

A more secure interlocking of the parts may be obtained by suitably conforming the ends of the prongs or projections where they abut, as illustrated in Figs. 3 and 4. The interlocking of the abutting ends when secured holds the parts firmly against displacement in a direction transverse to the axis of the coil.

The conformation given to the ends of the prongs or projections is immaterial, it only being necessary that each end should be the counterpart of the end against which it abuts. Thus it is not necessary that the two prongs of the same portion of the core and envelope should have the same conformation. This is illustrated in Fig. 5, and the construction of the core and envelope made from four parts similar in shape to that illustrated in Fig. 5 is clearly illustrated in Fig. 6.

What I claim as my invention is—

1. The combination, with an electric coil, of a four-part core and envelope, each part consisting of a bifurcated iron mass, one leg of which lies without and the other within the coil, but each in abutment at its end with

the legs or prongs of a similarly-located portion at the opposite end of the coil or coils.

2. The combination, with the four-part iron core and envelope, each part consisting of a bundle of bifurcated pieces having the ends of the prongs or projections abutted against the ends of similar prongs lying, respectively, within and without the coil, of means for clamping the abutted parts together against displacement in the direction of the axis of the coil.

3. The combination, with an electric coil or coils, of a four-part iron core and envelope divided in planes passing, respectively, through the middle of the coil in the direction of the magnetic axis and transversely to the magnetic axis and intersecting the coil or coils, and means for holding the parts in abutment against displacement in the direction of the axis of the coil.

4. The combination, with an electric coil or coils, of a four-part core and envelope, each of which consists of a pile of two pronged iron plates, one prong of which lies within and the other without the core and in interlocking abutment with a similarly-disposed part at the opposite end of the coil.

5. The combination, with the four bifurcated iron masses, each having a prong lying within the coil, of clamping devices for holding the parts at opposite ends of the coil or coils in abutment against displacement in the direction of the axis of the coil.

6. The combination, with an electric coil or coils, of a four-part core and envelope having prongs which enter the coil from the end and divided in a plane transverse to the axis of the coil, and clamping devices for holding the parts in abutment against displacement in the direction of the magnetic axis.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 30th day of August, A. D. 1889.

ELIHU THOMSON.

Witnesses:

JOHN W. GIBBONEY,
A. L. ROHRER.