G. A. BURNHAM.

TRANSFORMER.

APPLICATION FILED SEPT. 28, 1916.

1,293,692.

Patented Feb. 11, 1919.

2 SHEETS—SHEET 1

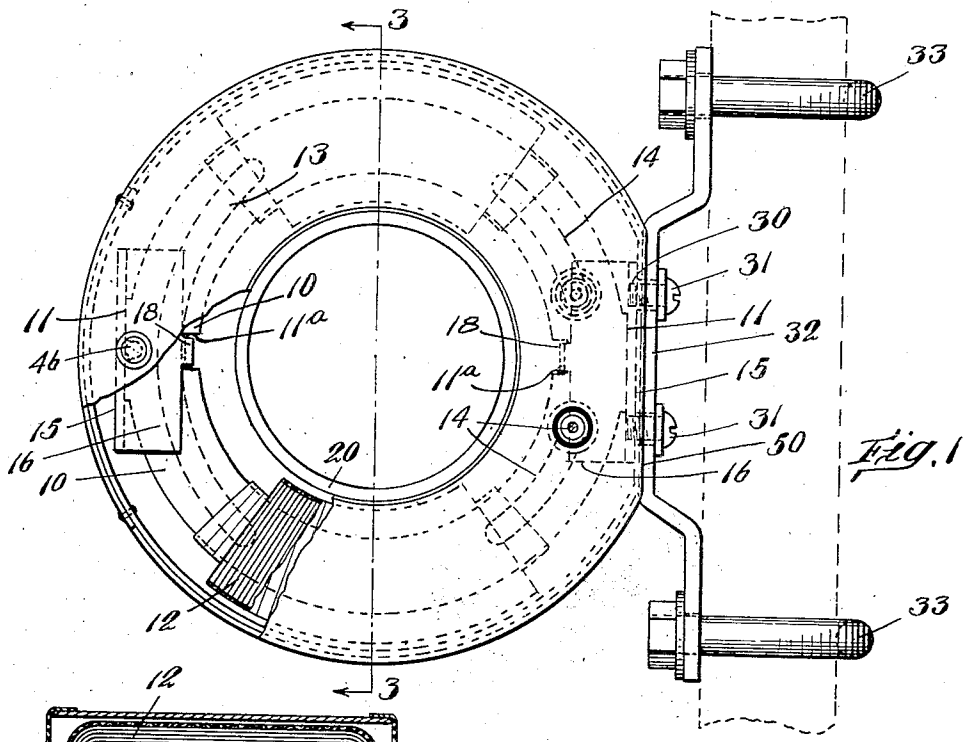


Fig. 1.

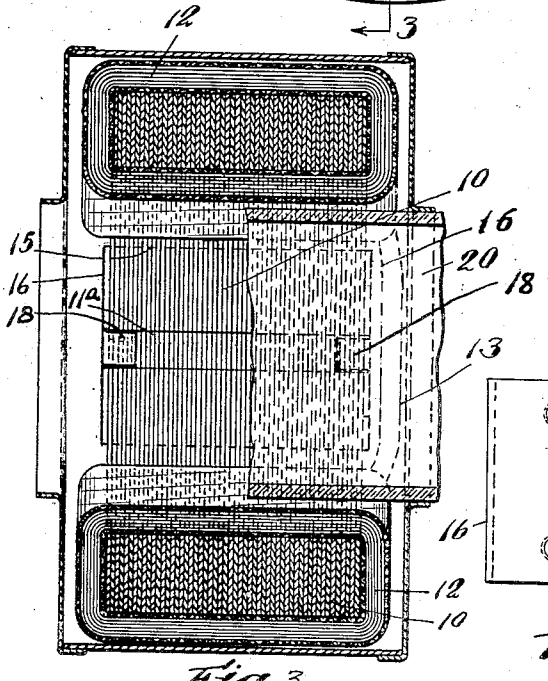


Fig. 3.

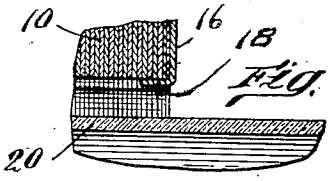


Fig. 6.

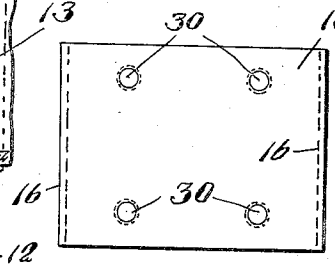


Fig. 4.

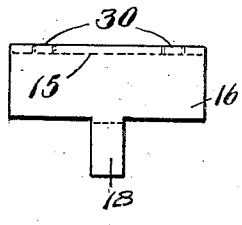


Fig. 5.

Witness.
H. B. Davis.

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G. A. BURNHAM.

TRANSFORMER.

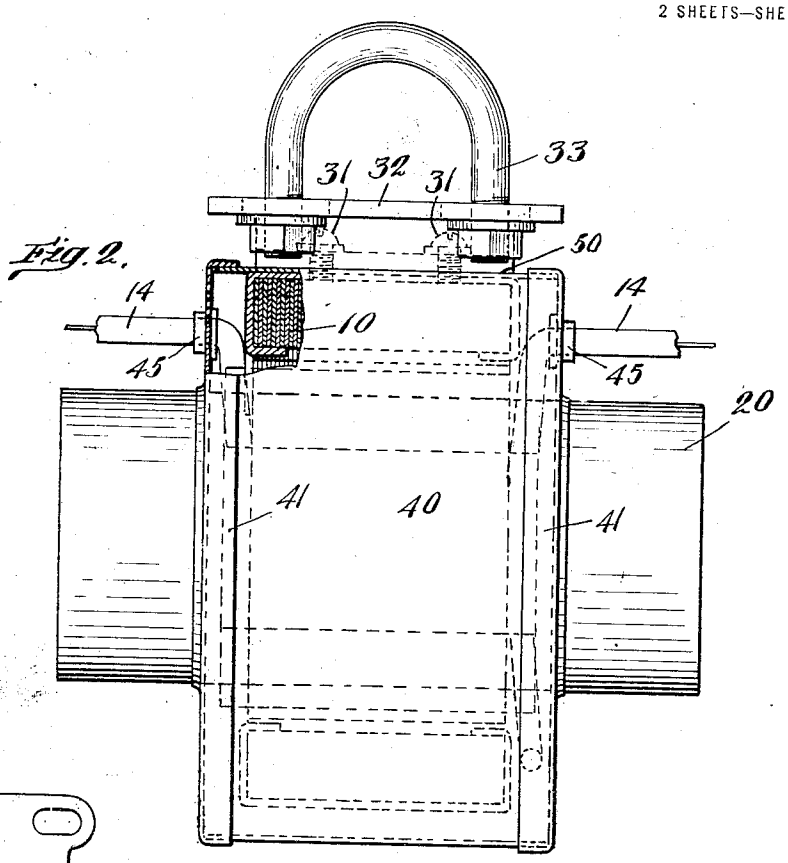
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2 SHEETS—SHEET 2.

Fig. 2.



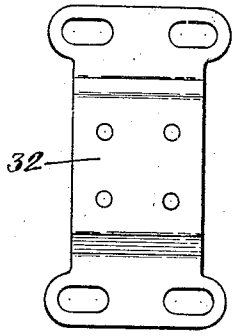


Fig. 7.

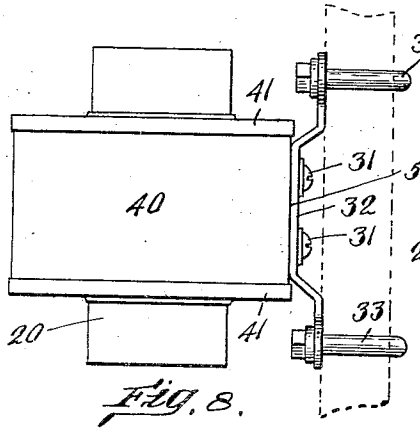


Fig. 8.

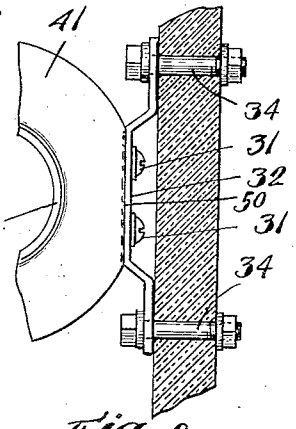


Fig. 9.

Witness,
H. B. Davis.

Inventor,
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UNITED STATES PATENT OFFICE.

GEORGE A. BURNHAM, OF SAUGUS, MASSACHUSETTS, ASSIGNOR TO SEARS B. CONDIT, JR., OF BROOKLINE, MASSACHUSETTS.

TRANSFORMER.

1,293,692. Specification of Letters Patent. Patented Feb. 11, 1919.

Application filed September 26, 1916. Serial No. 122,777.

To all whom it may concern:

Be it known that I, GEORGE A. BURNHAM, a citizen of the United States, residing at Saugus, in the county of Essex and State of Massachusetts, have invented an Improvement in Transformers, of which the following is a specification.

This invention relates to transformers. In the construction of transformers it is common to provide a core composed of a plurality of contiguously disposed annular plates and secondary windings arranged on the core, which windings may be arranged in series relation, and to provide an inclosing-case adapted to be attached to an object, such as a switch-board.

One of the objects of this invention is to provide improved means for holding the several plates composing the core in fixed relation to each other, independently of the windings.

Another object is to provide improved means for attaching the transformer to a switch-board, with its center opening which receives the primary conductor or winding, arranged at right angles to its support, or in parrallel relation therewith, thus adapting the transformer to supports of various kinds.

Figure 1 is a side elevation of a transformer, and supporting means therefor, embodying this invention.

Fig. 2 is a plan view of the same.

Fig. 3 is a vertical section of the transformer taken on the dotted line 3—3, Fig. 1.

Figs. 4 and 5 are details of the clamping-means for the core components.

Fig. 6 is a sectional detail of the clamping-means.

Fig. 7 is a plan view of an attaching-plate.

Fig. 8 is a side elevation of the transformer arranged in parallel relation with its support.

Fig. 9 is a fragmentary view illustrating a transformer arranged at right angles to its support.

10 represents the annular core of the transformer, which is composed of a plurality of contiguously disposed like flat annular plates, of iron or other magnetic material, and 12, 12, represent the secondary windings thereon, arranged at diametrically opposite places, said windings being connected electrically in series relation by a conductor 13, and having terminal conductors 14, 14, adapted for connection in an electric circuit. The flat sheet metal rings composing the core have, at their outer edges, shouldered portions 11, with straight edges, said shouldered portions being oppositely disposed, on the core between the windings; and also have recesses 11^a, at their inner edges opposite the shouldered portions.

My improved clamping-means for the core components is arranged at such portions of the core, between the windings thereof, and each consists of a clamping-element, see Figs. 4 and 5, composed of a sheet metal plate, which is bent transversely on two parallel lines to form an intermediate portion 15, and two end-portions 16, 16. The intermediate portion 15 is of a length co-extensive with the width of the assembled core components, and is adapted to overlie and engage the shouldered portions thereof. The end-portions 16, 16, are adapted to extend over the opposite sides of the core so that the core is received and held between said end-portions. The end-portions each have intermediately disposed thereon a tongue 18. The tongues 18 are adapted to be disposed over the recesses 11^a in the inner edge of the core, and to be bent angularly and extended into said recesses, thus to clamp the plate to the core.

The shouldered portions of the core components, when the latter are assembled, provide flat surfaces to receive upon them the intermediate portions 15 of the clamping-elements. The intermediate portion of one or both of said clamping-elements is provided with holes 30, adapted to receive the attaching-screws 31, for the transformer, which screws extend through an attaching-plate 32, having slots or holes at its ends which may receive U-bolts 33, adapted to embrace a pipe-support, see Figs. 1, 2 and 8, or may receive bolts 34, see Fig. 9, adapted to engage a switch-board, although it is obvious that other means may be provided for attaching the transformer to its support. An important feature in connection with the attaching-means consists in providing the intermediate portion of the clamping-element with holes adapted to receive screws extended from the attaching plate when the transformer is arranged in parallel relation with its support, see Fig. 8, or at right angles thereto, see Fig. 9. This provision

is easily made for, as here shown, there are four holes arranged in the intermediate portion of the clamping-element in the form of a square, and the same attaching screws may engage said holes with the transformer arranged in either position shown. In lieu of this arrangement and number of holes, any other number of equidistantly disposed holes may be employed.

The transformer is adapted to be arranged in an inclosing case, and, as here shown, said case comprises a tubular cylindrical portion 40, and two end caps 41, 41, having flanges adapted to fit snugly over or upon the ends of the tubular end-portions. These end-caps have holes provided with bushings 45, through which the conductors leading from the windings may pass. The end-caps are adapted to be held in fixed relation on the tubular portion. Said inclosing-case has a flattened portion 50, at one side, arranged opposite the shouldered portions of the core components, which is adapted to engage the attaching-plate, the attaching screws being extended through holes in said flattened portion when the transformer is attached to its support, as well as into or through the clamping-means for the core-components.

I claim:—

1. A transformer comprising an annular core with windings thereon, said core comprising a plurality of metallic plates, and clamping-means arranged between the windings for holding said plates assembled, consisting of a plate, bent to form an intermediate portion co-extensive with the width of the core, and two end-portions adapted to extend over the sides of the core, and inwardly extended tongues which engage the inner edge of the core.

2. A transformer comprising an annular core with windings thereon, said core comprising a plurality of metallic plates, having flat shouldered portions at their outer edges, and clamping-means arranged on said core, between the windings, for holding the components thereof assembled, which engage the shouldered portions thereof.

3. A transformer comprising an annular core with windings thereon, said core comprising a plurality of metallic plates having recesses at their inner edges, and clamping-means embracing the core components, between the windings, having tongues which extend into said recesses.

4. A transformer comprising an annular core with windings thereon, said core comprising a plurality of flat metallic plates having flat shouldered portions at their outer edges, and recesses at their inner edges arranged between the windings, and clamping-elements embracing the core components, having intermediate portions which engage the shouldered portions and tongues which enter the recesses.

5. A transformer having an annular core composed of a plurality of contiguously disposed metallic plates, clamping means for said plates having a flattened portion, an inclosing case for the transformer having a flattened portion to register with the flattened portion of the clamping means, an attaching plate having a flattened portion against which the flattened portion of the inclosing case is adapted to rest, the flattened portions of the clamping means, inclosing case and attaching plate being provided with equally spaced holes therein to permit the transformer to be attached to the attaching plate in a plurality of positions, and attaching screws adapted to enter the holes in this clamping means, inclosing case and attaching plate to secure said elements together.

6. A transformer, an annular core composed of a plurality of metallic plates contiguously disposed, clamping-means for holding said plates assembled having a flat intermediate portion provided with holes for the attaching-screws, an attaching-plate and attaching-screws and a cylindrical inclosing-case for the transformer having a flattened portion adapted to rest against the attaching-plate, the attaching-screws being extended through the attaching-plate and case and clamping-means.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEORGE A. BURNHAM.

Witnesses:
H. S. RAMSAY,
D. M. SCHIFFERT.