(No Model.)

W. D. & J. W. PACKARD.

ELECTRICAL TRANSFORMER.

No. 590,852. Patented Sept. 28, 1897.

Fig. 1.

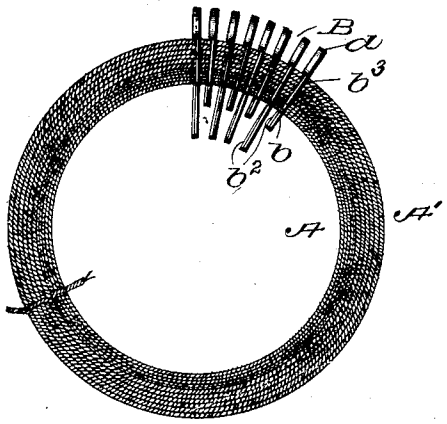


Fig. 2.

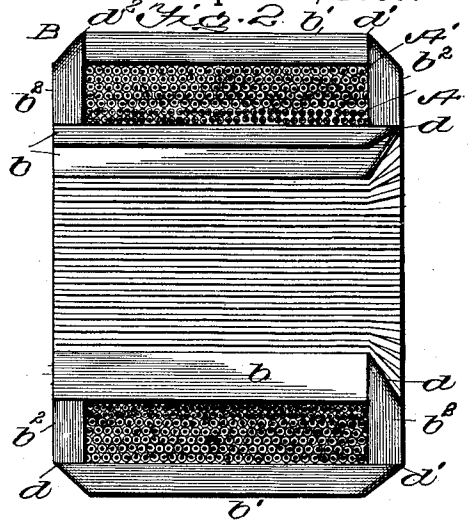


Fig. 3.

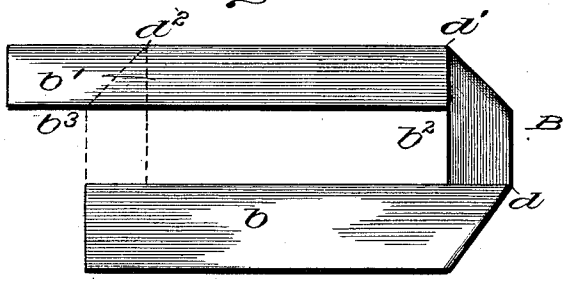


Fig. 4.

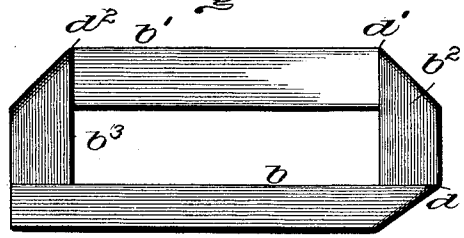


Fig. 5.

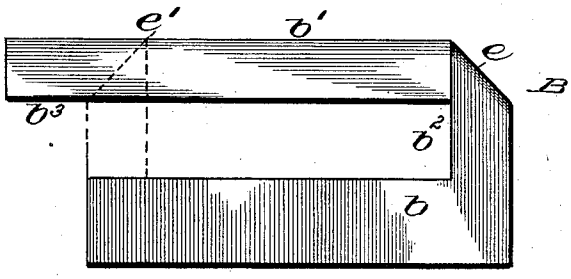
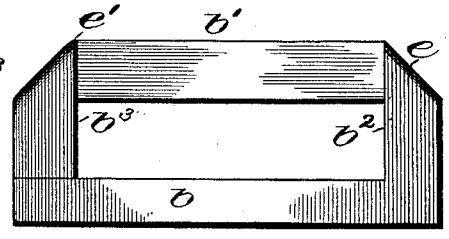


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM D. PACKARD AND JAMES W. PACKARD, OF WARREN, OHIO.

ELECTRICAL TRANSFORMER.

SPECIFICATION forming part of Letters Patent No. 590,852, dated September 28, 1897.

Application filed May 5, 1897. Serial No. 635,253. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM D. PACKARD and JAMES W. PACKARD, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Electrical Transformers or Converters; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in electrical transformers or converters, having reference more particularly to the core-plates employed in connection therewith.

In Letters Patent No. 527,070, granted to James W. Packard October 9, 1894, were shown core-plates capable of being used in connection with coils of circular arrangement. These plates were shown as having inner and outer parallel portions and corresponding end portions, the inner portion of each alternate plate being of greater width than the inner portion of the next adjacent plates, whereby the plates are made to fit snugly together and form inner and outer rings presenting even surfaces, the entire series of plates forming a compact nearly solid mass. These core-plates were formed by punching out a rectangular piece from the center of an iron plate; but as such piece is not capable of being utilized and the iron itself is expensive the waste is a very important item of expense.

The object of the present invention is to avoid this waste and at the same time obtain a core-plate possessing all the advantages of those covered by the before-mentioned patent. This we accomplish by forming the core-plates from strips of iron which are brought to the proper rectangular shape with a rectangular opening by bending the strips at two or three corners.

The invention will be hereinafter more fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is an end view of a transformer, a few of the plates being shown. Fig. 2 is a transverse sectional view. Figs. 3 and 4 are views of the plates, one being only partly formed and having its inner portion wider than that of the other, which latter is completed. Figs. 5 and 6 are corresponding views of a slightly-modified form.

Referring to the drawings, A A′ designate the two coils of a transformer, and B the plates composing the iron core, whose function is to carry the magnetic lines of force that are created in one coil through the convolution of the other. Each of these plates consists of inner and outer portions b and b' and end pieces b^2 and b^3. In the present instance each plate is made from a strip of iron. In the form shown in Figs. 3 and 4 this strip is bent back upon itself at the point d to form the end piece b^2, which extends at right angles from the inner portion b, and is again bent in like manner at d' to form the outer portion b', and then, for the third time, bent at d^2 to form the end piece b^3, the free end of which contacts with the edge of the portion b.

The core-plates may likewise be made from a strip of iron, which when first cut is in the form of a letter L. (See Fig. 5.) The end piece is already at right angles to the inner portion b and is bent, as at e, to form the outer portion b' and then again bent at e' to form the end piece b^3. In this form the strip is bent only twice and one corner is not folded.

It is necessary that the cross-section of the iron surrounding the coil shall be the same at all points. In the present form this is obtained, since the apparently cut-off corners are made up for by the double thickness of the metal at those points.

It will be understood, of course, that the plates are massed together in the manner set up in the before-mentioned patent—that is, the plates having wide inner portions alternate with those having such portions made narrow.

The advantages of our invention are apparent to those skilled in the art. It will be particularly noted that by forming the core-plates from strips of iron, instead of cutting or punching out the center of an iron plate, a very considerable saving is effected, since there is no waste of metal. The cross-section of iron exposed to the magnetic action is equal throughout and there is but one break in the magnetic circuit.

We claim as our invention—

1. In an electrical converter, core-plates

composed of strips of magnetic metal bent to form corners between the portions thereof, as set forth.

2. In an electrical converter, core-plates composed each of inner and outer portions and end pieces, all formed from one strip of magnetic metal, as set forth.

3. In an electrical converter, core-plates composed each of inner and outer portions and end pieces, all formed from one strip of magnetic metal which is bent at right angles at a plurality of its corners, as set forth.

4. In an electrical converter, core-plates composed each of inner and outer portions and end pieces, all formed from one strip of magnetic metal which is bent at right angles at two or more of its corners, as set forth.

5. A core-plate for electrical converters consisting of a strip of magnetic metal forming an inner portion, which strip is bent at right angles to form an end piece, then again bent at right angles to form an outer portion parallel with the inner portion, and then again bent to form a second end piece, as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

WILLIAM D. PACKARD.
JAMES W. PACKARD.

Witnesses:
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M. S. ANDREWS.