No. 649,179. Patented May 8, 1900.

# A. F. RIETZEL.

## TRANSFORMER SECONDARY.

(Application filed Sept. 23, 1899.)

(No Model.)

Fig. 1.

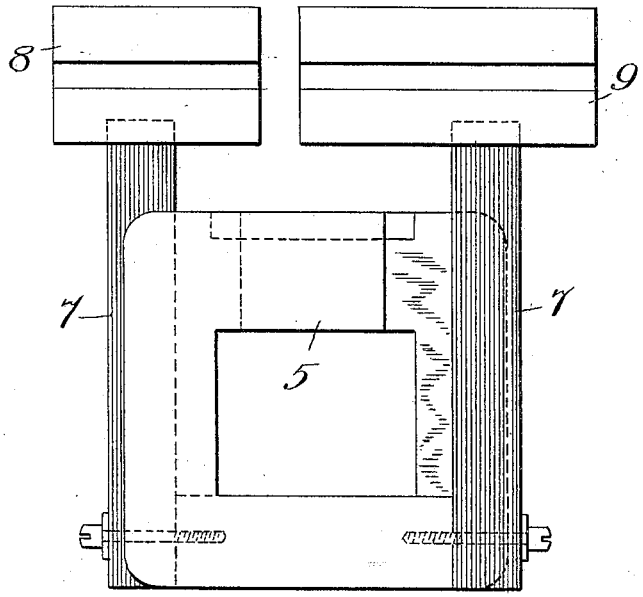



Fig. 2.

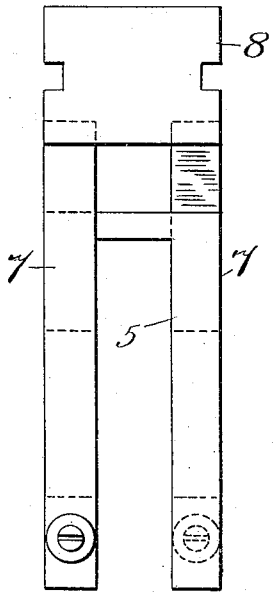



Fig. 3.

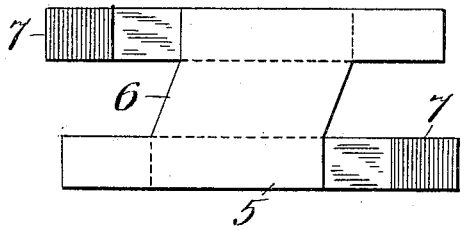
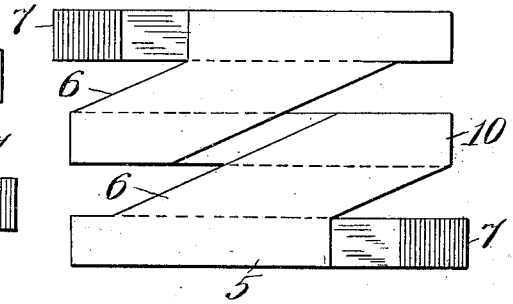



Fig. 4.

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# UNITED STATES PATENT OFFICE.

ADOLPH F. RIETZEL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE THOMSON ELECTRIC WELDING COMPANY, OF SAME PLACE.

## TRANSFORMER SECONDARY.

SPECIFICATION forming part of Letters Patent No. 649,179, dated May 8, 1900.

Application filed September 23, 1899. Serial No. 731,398. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH F. RIETZEL, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented a certain new and useful Transformer Secondary, of which the following is a specification.

This invention relates to an improvement in static transformers, and practically to an improvement in the secondary of that class of static transformers used in metal-working apparatus.

The main object of the invention is to avoid joints and sliding contacts between the secondary and the work-holders and as nearly as possible to make the work-holders integral with the terminals of the secondary; also, to do this and still retain the work-holders in close proximity to the turns of the secondary and at the same time to allow sufficient movement for the work-holders.

Another object of the invention is the construction of a secondary for the purpose specified that shall be durable and inexpensive.

With these objects in view the invention consists in the construction and formation of parts, as hereinafter fully set forth and claimed.

In the accompanying drawings, which form a part of this specification, Figure 1 represents in side elevation the preferred form of improved secondary. Fig. 2 is an edge view, and Fig. 3 is a plan thereof with terminal blocks removed, while Fig. 4 is a plan of a modified form of secondary with the terminal blocks removed.

The secondary is preferably formed from copper, and the principal portion 5 thereof is cast and is therefore rigid. Said portion may, however, be of wrought metal or be formed from a rolled bar bent into substantially the form shown. It consists of two partial turns placed in parallel planes and joined by the crossover 6. These turns are spaced apart to form a depository for the primary coil. Each partial turn of the coil is completed or has the last side thereof formed by a flexible bar, as seen at 7, which is preferably made from strips of copper. The plates forming these bars may be riveted or otherwise held together and may be bolted to the main portion 5, as shown, or cast or brazed therein after the manner shown for securing the terminals 8 and 9 to said bars. In practice it has been found best to braze together the laminæ of the bars 7 for about one inch at each end. To said terminals 8 and 9 the usual work holders or clamps are directly attached. They are, because of the flexible supporting-bars 7, capable of being forced to and from one another by any of the well-known means usually employed in metal-working apparatus of the kind to which this invention belongs.

The work-holder bases or, as they have been termed, the "terminal" blocks may both be movable to the extent of the flexibility of the bars 7, or one of them, as 8, may be fixed and the other, as 9, may be movable to and from the fixed one. The work-holders and such manipulating mechanism form no part of the present invention and are not shown.

The secondary may consist of more than two turns, as indicated, for example, in Fig. 4, wherein there is seen one complete cast turn, as 10, and a partial cast turn at either side thereof completed by a flexible or laminated bar. It will be noted that the plates of one flexible bar are parallel to those of the other, which insures freedom of movement or flexure of said bars toward and from one another. The crossovers or connections which join the turns and partial turns in series electrically may obviously be separate pieces bolted or brazed to the other parts, but are, as shown, preferably cast integrally with the turns and partial turns.

The invention claimed is—

1. A transformer secondary consisting of a rigid structure forming the major portion of the coils or turns thereof, and flexible bars secured to the ends of said turns.

2. A transformer secondary consisting of a rigid structure forming the major portion of the coils or turns thereof, and flexible bars secured to the ends of said turns and carrying at their free ends the supports for the work.

3. A transformer secondary consisting of a rigid structure forming the major portion of

the coils or turns thereof, and flexible bars secured to the ends of said turns and carrying at their free ends the work-holder bases or supports.

4. A transformer secondary consisting of two or more turns or partial turns of cast metal spaced apart to provide a depository for the primary of the transformer and a bar composed of metal strips secured to the ends of said partial turns and serving therewith to complete the secondary and to provide movable supports for work-holders.

5. A cast-metal structure for a transformer secondary comprising two or more turns or partial turns lying in parallel planes united by a transverse connection integral with them to join them electrically in series.

6. A cast-metal structure for a transformer secondary comprising two or more cast-metal turns or partial turns lying in parallel planes and united by a transverse connection or connections to join them electrically in series.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 7th day of September, A. D. 1899.

ADOLPH F. RIETZEL.

Witnesses:
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