No. 854,774. PATENTED MAY 28, 1907.

J. B. TAYLOR.

HIGH VOLTAGE TRANSFORMER.

APPLICATION FILED OCT. 10, 1906.

Fig.

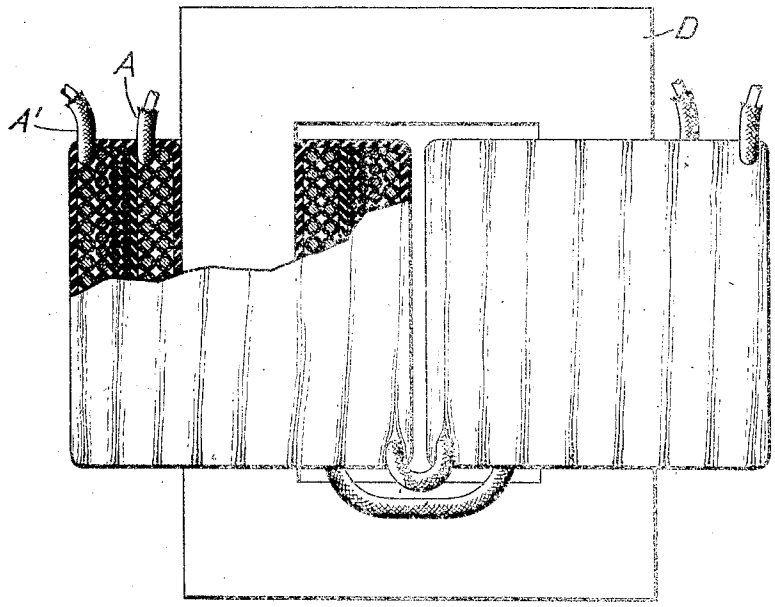
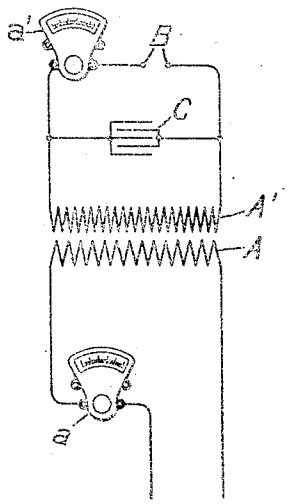


Fig. 2.



Witnesses:
George H. Tilden
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UNITED STATES PATENT OFFICE.

JOHN B. TAYLOR, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

HIGH-VOLTAGE TRANSFORMER.

No. 854,774. Specification of Letters Patent. Patented May 28, 1907.

Application filed October 10, 1906. Serial No. 338,206.

To all whom it may concern:

Be it known that I, JOHN B. TAYLOR, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in High-Voltage Transformers, of which the following is a specification.

My invention relates to high-voltage transformers, and its object is to provide a novel arrangement of the high-voltage winding for such transformers, so as to guard against over-heating and burn-outs due to oscillatory high-frequency current. In extra high-voltage transformers, especially those which are used for wireless telegraphy, high potential testing purposes, etc., and which are consequently liable to be connected to circuits in which there is a spark-gap, the high-voltage winding is subjected to a current which in part of the circuit may be oscillatory in character, which means that the value of the current in amperes in that part of the circuit may be appreciably greater than that in other parts of the winding. To guard against over-heating, due to this oscillatory current, I arrange the high-voltage winding with larger conductors near its terminals and smaller conductors near its center.

My invention will best be understood by reference to the accompanying drawings, in which

Figure 1 shows a view, partly in cross-section, of a transformer arranged in accordance with my invention; and Fig. 2 is an explanatory diagram.

Referring first to Fig. 2, A represents the low-voltage primary winding of a transformer, and A′ the high-voltage secondary winding, the terminals of which are connected to a spark-gap B with the condenser C in parallel therewith. Upon a discharge occurring across the gap B, a high frequency oscillatory current will flow, with the result that if ammeters *a* and *a′* are connected in series with the primary and secondary windings, respectively, under the conditions of oscillatory discharge the two ammeters will not register currents proportional to the numbers of turns of the two transformer windings, but the reading of the ammeter *a′* will be greatly increased.

Now if the condenser C be omitted, there may still be a great increase of current at the terminals of the high-voltage transformer, due to the electrostatic capacity of the winding itself and of the rest of the circuit. Since, under these conditions, the terminal portions of the winding A′ are acting as a condenser and supplying the oscillatory current. The current in these terminal portions is much greater than the current at the center of the winding. In order to guard against over-heating due to this oscillatory current without greatly increasing the size of the transformer, I arrange the high-voltage winding, as shown in Fig. 1. In this figure the primary and secondary coils A and A′ are shown mounted on the laminated magnetic core D. For the sake of clearness, the high-voltage winding A′ is shown with a smaller number of turns than it would ordinarily have in practice. This high-voltage winding is composed of conductors of different cross-sections; the smaller conductors being at the central part of the winding and the larger conductors near the terminals. The effective cross-section of the winding thus gradually increases from the center to the terminals, and the increased terminal cross-section enables the transformer to carry without over-heating the oscillatory currents, that have been described.

I do not desire to limit myself to the particular construction and arrangement of parts here shown, but aim in the appended claims to cover all modifications which are within the scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In a transformer, a high-voltage winding having a greater effective cross-section near its terminals than near its center.

2. In a transformer, a high-voltage winding having an effective cross-section gradually increasing from its center toward its terminals.

3. In a transformer, a high-voltage winding having its end turns formed of a larger conductor than its center turns.

In witness whereof, I have hereunto set my hand this 8th day of October, 1906.

JOHN B. TAYLOR.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.