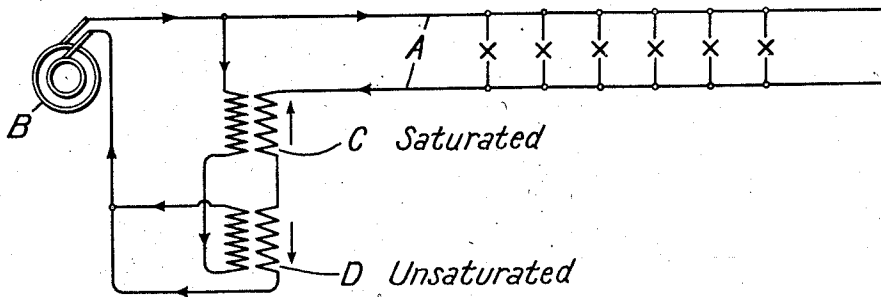


W. STANLEY.
COMPOUNDING ALTERNATING CURRENT CIRCUITS.
APPLICATION FILED MAY 13, 1909.

946,829.

Patented Jan. 18, 1910.



WITNESSES:

J. Earl Ryan.
J. Ellis Elen.

INVENTOR
WILLIAM STANLEY.

BY

Wm. H. Davis

ATTY.

UNITED STATES PATENT OFFICE.

WILLIAM STANLEY, OF GREAT BARRINGTON, MASSACHUSETTS, ASSIGNOR TO
GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

COMPOUNDING ALTERNATING-CURRENT CIRCUITS.

946,829.

Specification of Letters Patent.

Patented Jan. 18, 1910.

Application filed May 13, 1909. Serial No. 495,755.

To all whom it may concern:

Be it known that I, WILLIAM STANLEY, a citizen of the United States, residing at Great Barrington, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Compounding Alternating-Current Circuits, of which the following is a specification.

My invention relates to voltage regulation of alternating current circuits, and its object is to provide simple and efficient means for compounding the voltage of the circuit with varying load.

My invention consists in employing two transformers having their primaries connected in series with each other and in shunt to the source of voltage for the circuit, and their secondaries connected in series with each other and with the load. In the particular embodiment of my invention which I have illustrated, the two transformer secondaries are also connected in series with the source of voltage for the circuit, so that the voltage of the load circuit is the resultant of the voltages generated by the source and the two transformer secondaries. The cores of the two transformers are so proportioned that one is saturated and the other unsaturated. The relative connections of the two transformers are reversed, so that their secondary voltages are in opposition; the secondary voltage of the first transformer opposing the voltage of the source in the load circuit, and the secondary voltage of the second transformer assisting the voltage of the source. At no-load the secondary voltages are equal and opposite. As the circuit is loaded, the load current flowing through the transformer secondaries cannot affect the magnetization of the saturated transformer, but increases the magnetization of the unsaturated transformer, and therefore increases the secondary voltage, which is in a direction to add to the voltage of the source, so as to increase the voltage supplied to the load.

My invention will best be understood by reference to the accompanying drawing, which shows diagrammatically a load-circuit provided with compounding means arranged in accordance with my invention.

In the drawing A represents a circuit carrying a varying load.

B represents a generator for supplying current to the circuit A.

C and D represent two transformers, the primaries of which are connected in series with each other and in shunt to the generator B, and the secondaries of which are connected in series with each other between the generator and the load-circuit A. The primary connections of the two transformers are relatively reversed, so that the secondary voltages are in opposition in the load-circuit. The direction of current-flow at a given instant in the circuit connections is indicated by arrowheads, and the direction of the induced secondary voltages in the two transformers by arrows. It will be seen that the secondary voltage of the saturated transformer C is in opposition to the current-flow, while the secondary voltage of the transformer D assists the current-flow, or, in other words, is added to the voltage of the source. At no-load the secondary voltages of the two transformers C and D are equal and opposite. As the load comes on the flow of current through the secondary of the saturated transformer C cannot change its magnetization, but in the transformer D produces an increase of magnetization which increases the secondary voltage. Since this voltage is in series with that of the source, the resultant voltage supplied to the load is increased. In this manner the voltage drop in the generator, transmission circuit, transformers, etc., is compensated for.

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

1. In combination with a load circuit and a source of alternating current therefor, means for compounding the voltage supplied to the circuit under varying load comprising two transformers having their primaries connected in series with each other and in shunt to the source and their secondaries connected in series with each other and with the load, the cores of the two transformers being so proportioned that one is saturated and the other unsaturated.

2. In combination with a circuit and a source of alternating current therefor, means for compounding the voltage supplied to the circuit under varying load comprising two transformers having their primaries connected in series with each other and in shunt to the source and their secondaries connected in series with each other and with the load, the cores of the two transformers being so

proportioned that one is saturated and the other unsaturated, and the relative connections of the transformers being reversed so that their secondary voltages are in opposition.

3. In combination with a load-circuit and a source of alternating current therefor, means for compounding the voltage supplied to the circuit under varying load comprising two transformers having their primaries connected in series with each other and in shunt to the source and their secondaries connected in series with each other and with the load, the cores of the two transformers being so proportioned that one is

saturated and the other unsaturated, and the relative connections of the transformers being reversed so that their secondary voltages are in opposition, the secondary voltage of the saturated transformer opposing the voltage of the source in the load circuit and the secondary voltage of the unsaturated transformer assisting the voltage of the source.

In witness whereof, I have hereunto set my hand this 6th day of May, 1909.

WILLIAM STANLEY.

Witnesses:

ENSIGN WORTHY,
P. A. SMITH.