

No. 767,503.

PATENTED AUG. 16, 1904.

C. F. SCOTT.
EARTH SHIELD FOR TRANSFORMERS.

APPLICATION FILED SEPT. 16, 1903.

NO MODEL.

Fig. 1.

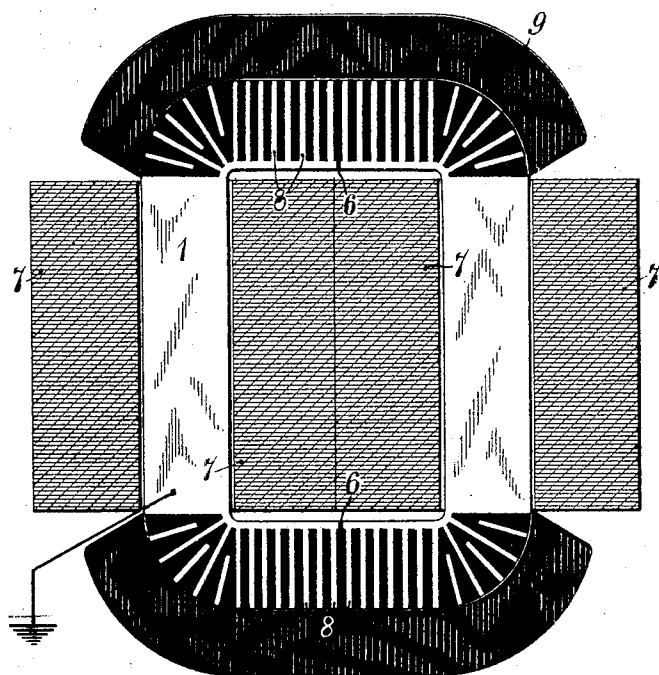
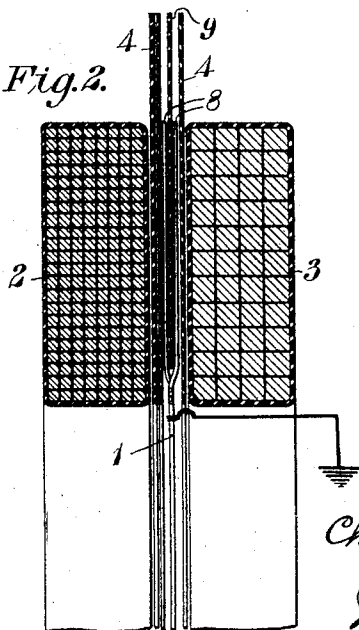


Fig. 2.



WITNESSES:

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CHARLES F. SCOTT, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

EARTH-SHIELD FOR TRANSFORMERS.

SPECIFICATION forming part of Letters Patent No. 767,503, dated August 16, 1904.

Application filed September 16, 1903. Serial No. 173,480. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SCOTT, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Earth-Shields for Transformers, of which the following is a specification.

My invention relates to protective apparatus for electrical transformers; and it has for its object to provide simple and efficient means for the prevention of heating of the grounded metallic shields which are sometimes placed between the high and low voltage windings of such apparatus.

In the accompanying drawings, Figure 1 is a view in section through a transformer between a pair of primary and secondary coils; and Fig. 2 is a view in transverse section through a pair of adjacent primary and secondary coils, showing a shield constructed in accordance with my invention.

Grounded sheets of metal are sometimes placed between adjacent coils belonging, respectively, to the primary and secondary windings of a transformer, so that in case of accidental injury to or break down of the insulation the high-voltage current passes through the metallic shield to the ground, thus effectually protecting the low-voltage winding from the high-voltage currents. However, when such shields are employed in transformers of the shell type considerable trouble is often experienced on account of the heating of these shields by local eddy-currents generated therein. This difficulty I have avoided by splitting the shields in those places where the eddy-currents are most likely to occur or by providing a shield the resistance of which is such as to prevent excessive currents.

Referring to the drawings, a metallic shield 1 is placed between the high and low tension coils 2 and 3 and is of substantially the same outline as the coils. It is placed between the sheets of non-conducting material 4, which separate and insulate the high and low voltage coils from each other. In order that the shield may not form a short-circuited turn around

the magnetic circuit 5, I provide breaks 6 in the metallic sheet at one or more places and separate and insulate the portions from each other at such point or points.

In that portion of the shield which is surrounded directly by the iron core 7 there is little tendency for local eddy-currents to circulate; but at the ends of the coils there is a considerable flux, which passes through the metallic sheet at angles thereto and produces local eddy-currents therein. In order to prevent such eddy-currents, I split the metallic shield 1 at the ends of the coils into a plurality of narrow transverse strips 8 and insulate adjacent strips from each other by introducing properly-shaped sheets of non-conducting material 9, as indicated in Fig. 2. It is evident that in this manner the local eddy-currents are kept down to a safe value, that very little heating of the shields is likely to occur, and that the waste energy from this cause becomes a minimum.

If desired, the shields may be made of any suitable high-resistance material, such as German silver, in which case the splitting of the shields into transverse strips at the ends of the coils may be dispensed with, if desired.

Although I have shown a shield in connection with only one pair of adjacent high and low voltage coils, it is to be understood that similar shields may be employed between all pairs of such coils.

I claim as my invention—

1. Protective apparatus for transformers having a plurality of coils and a magnetic circuit, comprising grounded sheets of high-resistance conducting material placed between adjacent coils, the resistances of said sheets being such as to reduce the eddy-currents therein to a safe value.

2. Protective apparatus for transformers having a plurality of coils and a magnetic circuit, comprising grounded sheets of conducting material placed between adjacent coils, the portions of the said sheets not directly surrounded by the magnetic circuit being subdivided to so increase the resistance as to reduce the eddy-currents to safe values.

3. Protective apparatus for transformers having a plurality of coils and a magnetic circuit comprising grounded sheets of metal which are placed between adjacent primary and secondary coils, said sheets having those portions not directly surrounded by the magnetic circuits split into a plurality of strips, and non-conducting material for separating adjacent strips.

10 4. Protective apparatus for transformers having a plurality of coils and a magnetic circuit comprising grounded sheets of metal which are placed between adjacent primary and secondary coils, portions of said sheets
15 being split into a plurality of strips, and non-

conducting material for separating adjacent strips.

5. An electrical transformer having a grounded metal sheet between adjacent primary and secondary coils at least a portion of which is subdivided to form strips, and a sheet of insulating material interposed between adjacent strips in alternation. 20

In testimony whereof I have hereunto subscribed my name this 1st day of September, 25 1903.

CHAS. F. SCOTT.

Witnesses:

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BIRNEY HINES.