May 13, 1930. J. BIERMANNS 1,758,820

ELECTRICAL INDUCTION APPARATUS

Filed Oct. 22, 1929

Fig. 1.

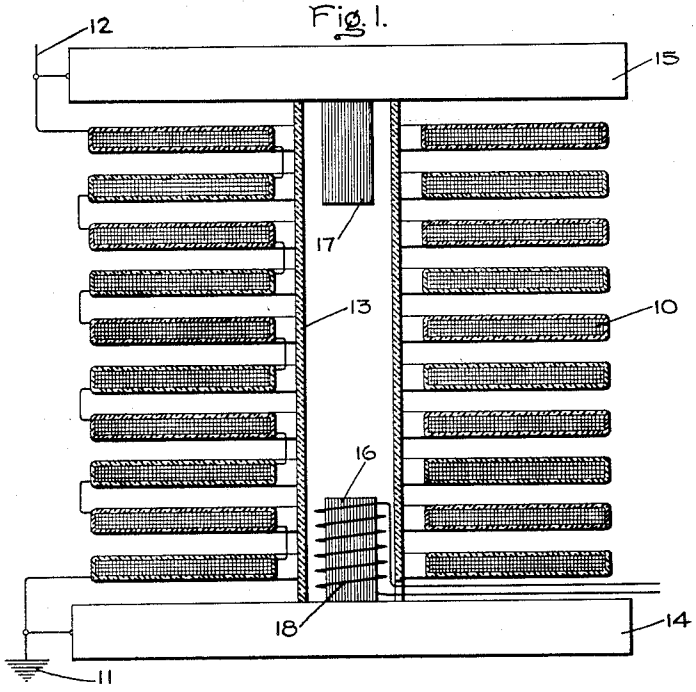
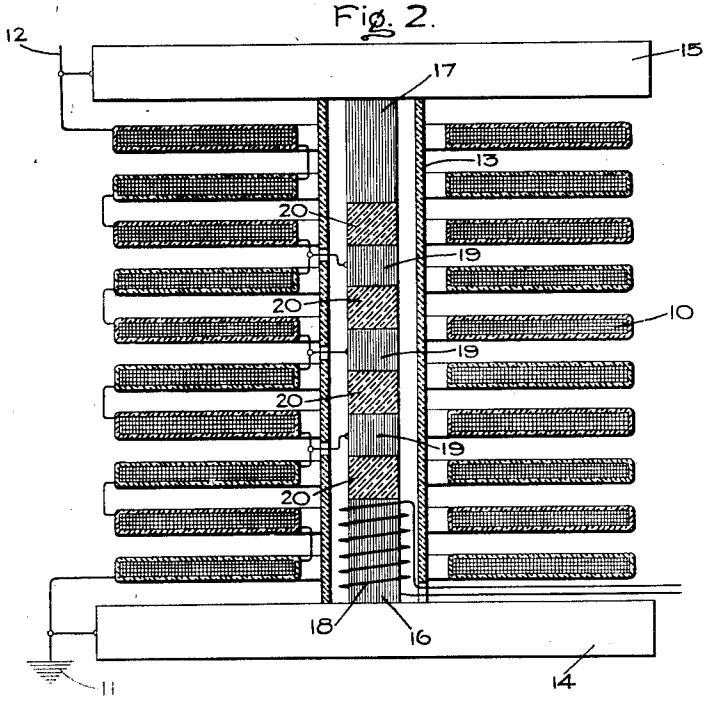


Fig. 2.



Inventor:
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UNITED STATES PATENT OFFICE

JOSEF BIERMANNS, OF KARLSHORST, GERMANY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK

ELECTRICAL INDUCTION APPARATUS

Application filed October 22, 1929, Serial No. 401,573, and in Germany November 1, 1928.

My invention relates to electrical induction apparatus having magnetic cores such as transformers and reactors. Certain difficulties have arisen in the design of such apparatus from the fact that all parts of the magnetic core have operated at the same potential while parts of the high voltage winding have operated at very different potentials, thus necessitating a considerable spacing between the core and high voltage winding for insulation purposes. The general object of the present invention is to provide such apparatus with a form of magnetic core having two or more spaced parts or sections with interposed insulation so that there is no conductive connection between the parts of the core adjacent to the two ends of the high voltage winding.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing in which Fig. 1 is a sectional view of a transformer construction in accordance with the invention, and Fig. 2 is a sectional view of a modified form of the transformer shown in Fig. 1. Like reference characters indicate similar parts in the different figures of the drawing.

In the form of transformer shown in Fig. 1, the high voltage winding 10 is built up of a plurality of disc coils connected in series between a ground 11 and a high voltage terminal 12. The high voltage winding 10 surrounds an insulating cylinder 13. Magnetic core yokes 14 and 15 are provided at the ends of the winding, each of these yokes being connected to the adjacent end of the high voltage winding 10. The yokes 14 and 15 are provided with magnetic projections 16 and 17 respectively, each of these projections extending into the adjacent end of the cylinder 13 and winding 10 and together forming the winding leg of the core. A low voltage winding 18 surrounds the projection 16 of the grounded yoke 14.

The transformer shown in Fig. 2 is similar to that shown in Fig. 1 except that in addition to the projections 16 and 17, the winding leg of the core includes other magnetic sections 19 insulated from each other and from the projections 16 and 17 by interposed insulating material 20. Each of the magnetic sections 19 of the winding leg is connected to an adjacent part of the high voltage winding. The high voltage winding 10 may be spaced close to the winding leg and yokes of the core because little insulation is needed, the voltage being small between any part of the winding and adjacent parts of the core

The invention has been explained by describing and illustrating certain transformer constructions but it will be apparent that various changes may be made without departing from the scope of the invention as covered by the appended claims.

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

1. An electrical induction apparatus including a magnetic core having end yokes, and a winding extending between said yokes, said yokes being insulated from each other, and each yoke being conductively connected to the adjacent end of said winding.

2. An electrical induction apparatus including a magnetic core having a winding leg, and a winding surrounding said winding leg, said winding leg having spaced sections insulated from each other, and each of said sections being conductively connected to an adjacent part of said winding.

3. An electrical induction apparatus including a magnetic core having end yokes and a winding leg between said end yokes, and a winding surrounding said winding leg, said winding leg including sections insulated from each other, said yokes and winding leg sections being conductively connected to adjacent parts of said winding.

4. An electrical induction apparatus including a magnetic core having a winding leg,

a high voltage winding distributed along and surrounding said winding leg, and a low voltage winding surrounding said winding leg and concentrated near one end thereof, said winding leg having sections insulated from each other, and each of said sections being conductively connected to an adjacent part of said high voltage winding.

In witness whereof, I have hereunto set my hand this 4th day of October, 1929.

JOSEF BIERMANNS.