106-84 CROSS REFERENCE EXAMINER

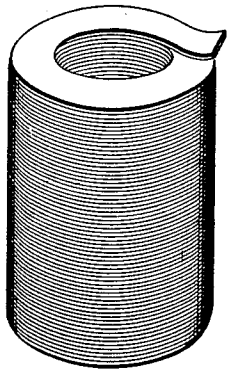
No. 824,048. PATENTED JUNE 19, 1906.

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E. THOMSON.

INSULATED COIL FOR ELECTRICAL APPARATUS AND PROCESS OF MAKING THE SAME.

APPLICATION FILED SEPT. 11, 1903.



Witnesses.
Harry M. Tilden
Helen Orford

Inventor.
Elihu Thomson.
by Albert G. Davis
Att'y.

UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

INSULATED COIL FOR ELECTRICAL APPARATUS AND PROCESS OF MAKING THE SAME.

No. 824,048. Specification of Letters Patent. Patented June 19, 1906.

Application filed September 11, 1903. Serial No. 172,739.

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Insulated Coils for Electrical Apparatus and Processes of Making the Same, of which the following is a specification.

This invention relates to electrodynamic apparatus; and its object is to provide an improved magnet-coil therefor which is strong and simple in construction, thoroughly insulated, and capable of withstanding a high temperature.

To this end the invention consists in a new coil possessing these characteristics and also in the process of manufacturing said coil, as hereinafter set forth, and particularly pointed out in the claims.

The accompanying drawing is a perspective view of a coil made in accordance with my invention.

In order to obtain a strong and rigid structure, the coil is composed of a single helix of a flat or ribbon conductor, preferably copper, wound edgewise with the turns close together, so that it forms a tube the thickness of whose wall is the width of the ribbon conductor. After the coil is wound and while there is still some space between the convolutions it is covered, preferably by immersion, with an insulating and cementing compound consisting of a silicious substance, preferably kaolin and silicate of soda. The proportions of these two ingredients may be varied to some extent, but must be such that the mixture is a fluid or viscous liquid, like a water varnish, which will soak into all crevices and form a thin layer between the metal coils. The entire coil is then closed together to form a solid rigid structure and is then subjected to a high temperature, preferably a low red heat, until the insulating compound is vitrified into an insoluble moisture-proof cement which binds the coils together without permitting contact between its turns. This insulation is a double silicate of aluminium and sodium and is refractory, being incapable of complete fusion except at a temperature which would melt the metal conductor. It is not necessary for it to have the same coefficient of expansion as the metal conductor, since it becomes somewhat soft at a high temperature. In place of the kaolin (aluminium silicate) I may use other silicates, such as magnesium silicate, or even finely-powdered silica.

This coil has been especially designed for arc-lamps; but it is capable of use in any location where it must withstand excessive moisture or high temperature, or both.

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

1. A coil for electrical apparatus, consisting of an edgewise-wound flat conductor whose convolutions are insulated from each other and cemented together by a compound of silicious matter and silicate of soda.

2. A coil for electrical apparatus, consisting of an edgewise-wound flat conductor whose convolutions are insulated and cemented by a compound of kaolin and silicate of soda.

3. A coil for electrical apparatus, consisting of an edgewise-wound flat conductor whose convolutions are insulated and cemented by a vitrified compound of kaolin and silicate of soda.

4. The process of making a coil for electrical apparatus, which consists in winding edgewise a flat metallic conductor, covering it with a liquid compound of kaolin and silicate of soda, closing the coil together, and heating it to vitrify the compound.

5. The process of making a coil for electrical apparatus which consists in winding a flat metallic conductor edgewise into an open helix, immersing it in a liquid compound of silicious matter and silicate of soda, closing the helix and heating it to vitrify the compound.

In witness whereof I have hereunto set my hand this 8th day of September, 1903.

ELIHU THOMSON.

Witnesses:

DUGALD McK. McKILLOP,

JOHN J. WALKER.