A. C. EASTWOOD.

LIFTING MAGNET.

APPLICATION FILED MAY 13, 1910.

978,119. Patented Dec. 6, 1910.

FIG. 1.

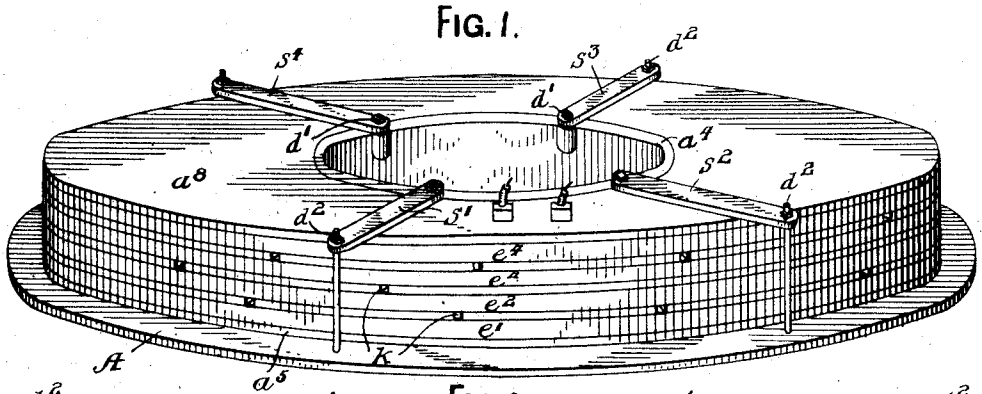


FIG. 2.

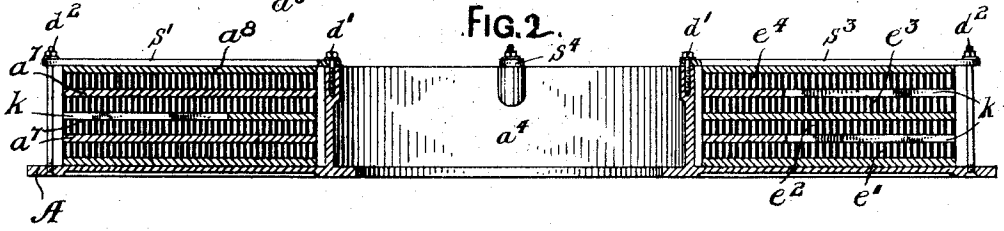


FIG. 3

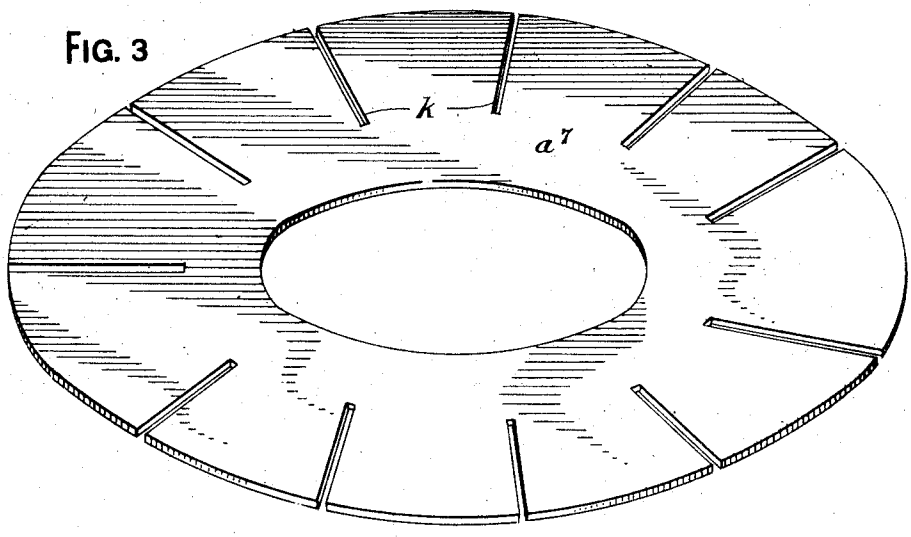
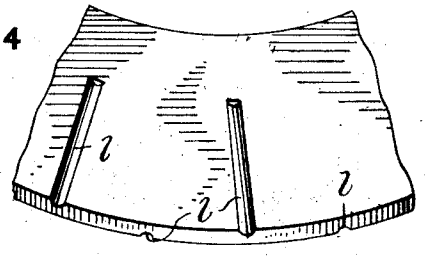


FIG. 4



WITNESSES

J. P. Appleman.

Elva Stanicek.

INVENTOR

A. C. Eastwood,

by F. N. Barber,

attorney.

UNITED STATES PATENT OFFICE.

ARTHUR C. EASTWOOD, OF CLEVELAND, OHIO.

LIFTING-MAGNET.

978,119. Specification of Letters Patent. Patented Dec. 6, 1910.

Application filed May 13, 1910. Serial No. 561,097.

To all whom it may concern:

Be it known that I, ARTHUR C. EASTWOOD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Lifting-Magnets, of which the following is a specification.

My invention relates broadly to electro-magnets, but has special reference to what are termed lifting magnets, and its object is to construct the same so that the magnetizing winding may be thoroughly insulated against grounding or short-circuiting due to the high inductive voltage generated in the winding when the source of energy is cut off or to other causes.

Referring to the accompanying drawing, Figure 1 is a perspective of a unit winding constructed in accordance with my invention; Fig. 2, a central vertical section of Fig. 1; Fig. 3, a perspective of one of the insulating spacers which I place between successive coil sections of the winding; and Fig. 4, a perspective of a portion of a spacer differing from the construction shown on Fig. 3.

To facilitate an understanding of the present invention, I refer to Letters Patent No. 928,510 granted to me July 20, 1909, in which Figs. 1 and 2 show a unit winding designed for the same purpose as the structure shown on Figs. 1 and 2 of the drawing of this application, but it is to be understood that my invention is applicable to windings designed for various uses and mounted and constructed in different ways from the way shown on the said Letters Patent. In fact, it is applicable to all electro-magnets having a number of superposed coil-sections, whether clamped together in units or not.

On the drawings, the bottom annular plate A, composed preferably of brass is provided at its inner edge with the upstanding tubular flange or mandrel a^4. On the top of the plate A, I place the unslotted annular insulating spacer or plate a^5, which supports the lowest winding section e'. On top of the winding section e' is the insulating spacer or plate a^7 provided with the slots or channels k preferably arranged radially and extending through the entire thickness of the plate a^7, but the slots may be grooves as shown at 1, on Fig. 4 or otherwise. I place another winding-section e^2 on the plate a^7 and another insulating spacer or plate a^7 on the section e^2. The winding section e^3 is placed on the second plate a^7, and another insulating spacer or plate a^7 is placed on the section e^3. The winding section e^4 is placed on the third plate a^7 and the insulating top plate a^8 is placed on the section e^4.

Radial clamping straps s', s^2, s^3, s^4 are placed over the top-plate a^8 and are drawn down by means of screws d' and d^2, the screws d' engaging with bosses in the upper end of the flange a^4 and the bolts d^2 passing through holes near the outer edge of the bottom plate A, these straps binding the winding sections, the bottom plate, and the insulating plates into a unit winding, which may be moved and assembled in a magnet case without injury to the winding. After this unit has been assembled, it is placed in a suitable impregnating air-tight receptacle which is preferably heated and in which it is dried under vacuum, both the moisture and the air being removed from the interior and the surface of the unit and at a temperature that prevents deterioration of the insulating material which goes to make up the unit.

When the unit is thoroughly dried and while under vacuum, a hot liquid insulating compound is admitted into the vacuum chamber, which now becomes the impregnating chamber. The moisture and air having been removed from the pores of the insulating fabric or material, this compound penetrates into the innermost parts of the same and into all vacant spaces throughout the unit. After the compound has covered the unit, compressed air is admitted to the chamber above the surface of the compound and forces the same into every interstice and pore in the unit. After the unit is removed from the chamber, the compound cools and hardens.

I have not illustrated the means for treating the unit winding, as those acquainted with the art of making magnets will readily understand how to construct such means; as such means are well-known to those acquainted with the art, the Emil Passburg system being specially adapted to the purpose; and as the magnet frame or casing may be employed as the vacuum and impregnating chamber, when connected to suitable pumps and a tank containing the hot liquid impregnating material.

Even if the winding were not subjected to

a vacuum, the passages in the plates a^7 would aid materially in causing the insulating compound to pass to the interior of the winding.

The spacers or plates a^7 may be variously constructed to provide passages leading to the interior of the winding; and these passages may be variously shaped and arranged.

I claim—

1. In a magnet-winding, two or more superposed winding-sections, each composed of a flat spiral having a plurality of convolutions, and insulating spacing means between adjacent winding sections, said means having passages therein leading to the exterior of the winding so as to lead moisture and air from between the successive convolutions of each section and to admit insulating compound between the said convolutions.

2. For a magnet-winding having two or more superposed winding-sections, insulating spacing means between adjacent sections, there being passages in each spacing means, by which a fluid insulating material may be introduced into the interior of the winding, or air and moisture may be extracted therefrom, or both.

Signed at Cleveland Ohio, this 11th day of May, 1910.

ARTHUR C. EASTWOOD.

Witnesses:
W. M. DIEMER,
H. S. RICHARDSON.