

(No Model.)

L. S. M. PYKE & E. S. HARRIS.

ELECTRICAL INDUCTORIUM.

No. 484,544.

Patented Oct. 18, 1892.

FIG. 1.

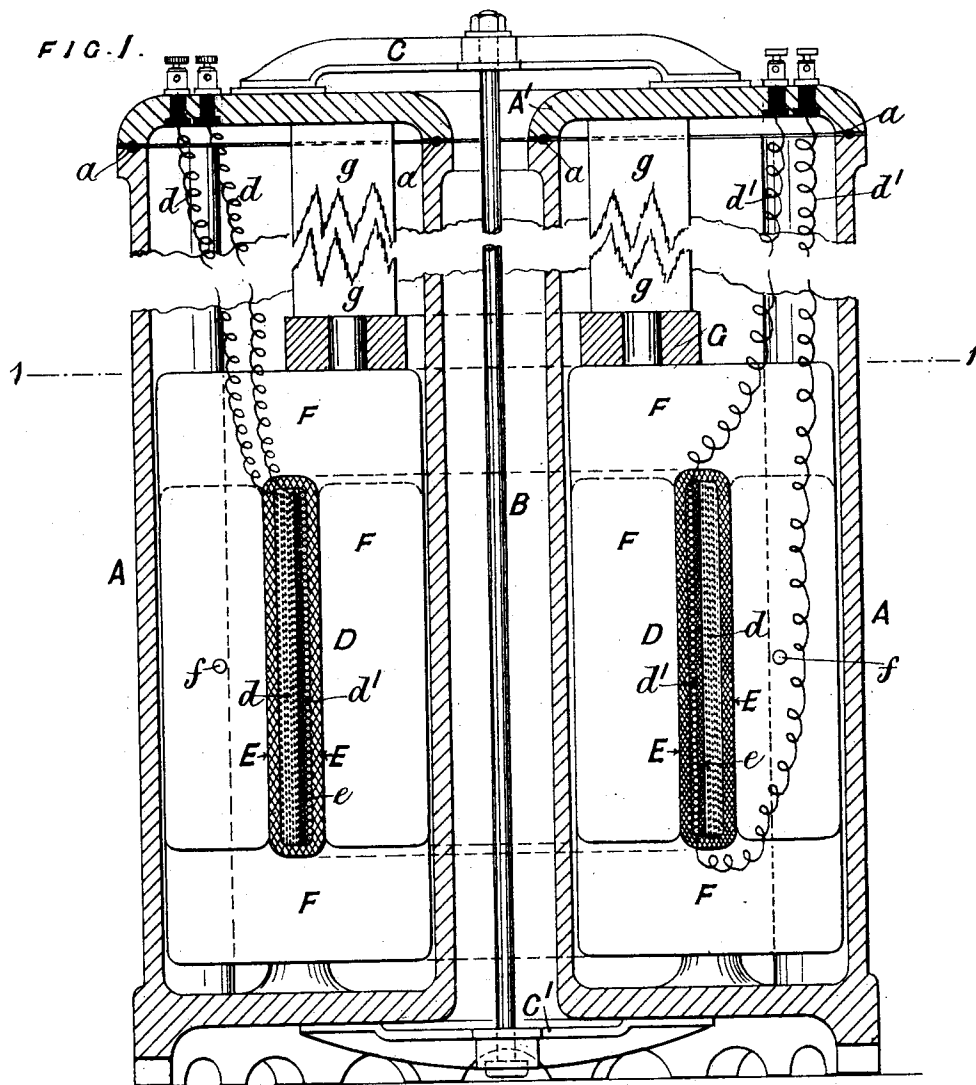
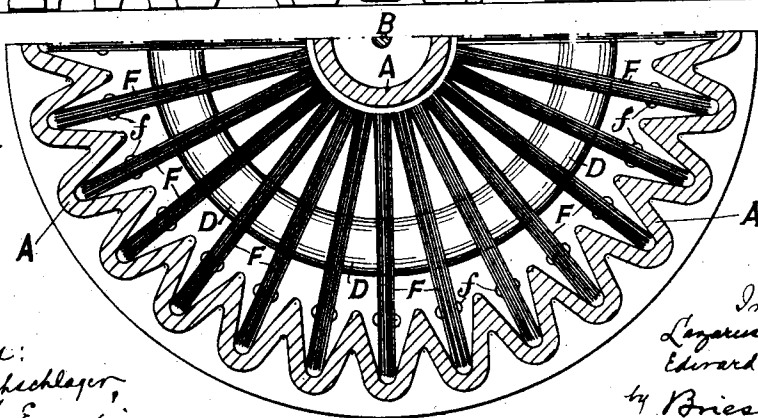


FIG. 2.



Witnesses:
L. M. Hachecklager,
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Lazarus S. M. Pyke,
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UNITED STATES PATENT OFFICE.

LAZARUS SIMON MAGNUS PYKE AND EDWARD STEPHEN HARRIS, OF
LONDON, ENGLAND.

ELECTRICAL INDUCTORIUM.

SPECIFICATION forming part of Letters Patent No. 484,544, dated October 18, 1892.

Application filed February 5, 1892. Serial No. 420,471. (No model.)

To all whom it may concern:

Be it known that we, LAZARUS SIMON MAGNUS PYKE and EDWARD STEPHEN HARRIS, electrical engineers and contractors, subjects
5 of the Queen of Great Britain, both residing at 34 New Tothill Street, Westminster, London, England, have invented certain new and useful Improvements in Electrical Inductoria, of which the following is a specification.

This invention relates to electrical inductoria—i. e., transformers—in which a liquid hydrocarbon is employed for insulation and reduction of temperature, as described in another application for Letters Patent of even
15 date herewith filed by the said Lazarus Simon Magnus Pyke and Harry Theodore Barnett, Serial No. 420,441, filed February 5, 1892.

The objects of the present invention are
20 mainly to simplify the construction and improve the insulation and cooling of the inductorium and reduce the volume of the insulating liquid required.

The improvement in the construction of the
25 inductorium or transformer consists, essentially, first, in the combination, with the coils, of a closed magnetic circuit formed of radial laminæ of U shape embracing the coils on the inner and outer circumference and at one end,
30 and alternate laminæ embracing opposite ends of the coil and overlapping each other, as hereinafter described; second, in the combination, with the coil thus constructed and mounted in a vertical position, of a containing-vessel
35 and a mass of insulating liquid permeating and surrounding the coil and rising to such a height above the same that an internal circulation of the liquid will be set up through the coil by the change of temperature of the liquid, whereby the heat developed by the coil
40 will be continually carried off and dispersed; third, in the construction of the said vessel of annular section, so as to expose an internal radiating surface for the dispersion of heat, and with its outer circumference vertically
45 corrugated, so as to augment the heat-radiating surface, and at same time provide a means of holding the laminæ securely in position during transport and insure regularity of the
50 spacing between groups of the same necessary

for the regular and efficient circulation of the liquid.

Reference is to be had to the accompanying drawings, wherein—

Figure 1 is a vertical sectional elevation of
55 the transformer; and Fig. 2, a half-plan of the same, in section, in line 11, Fig. 1.

The same letters of reference indicate the same parts in both the figures.

A is the annular containing and cooling vessel, made, preferably of earthenware, corrugated on the outer circumference (and which may be provided, also, with external gills) to increase the heat-radiating surface. The said
60 vessel is annular in cross-section and closed at top by an annular cover A', made to close
65 air-tight by a packing of rubber *a* and secured by a screw-bolt B, passing axially through the vessel and bridges C C', respectively, bearing on the cover A' and on the bottom of the vessel A.

D is the coil composed of the usual primary and secondary wires *d d'*, the former preferably wound with silk or cotton and the latter doubly wound with cotton. The primary is
75 separated from the secondary wire and both from the laminæ by layers *e E* of porous paper-linen or other mechanically-insulating material permeable by the liquid hydrocarbon.

F are the upper and lower series of radial
80 laminæ composing the closed magnetic circuit of the coil, each being a soft-iron plate of the U form shown in Fig. 1, so as to inclose on three sides a radial section of the coil. They
85 are applied alternately at opposite ends of the coil D, so that the arms of one series shall alternate with and overlap the arms of the other, as shown in Fig. 1, and any suitable number
90 of these overlapping laminæ may be bolted together in a group by bolts *f* of non-magnetic metal, so as to mutually hold each other in place on the coil and enable the transformer to be handled without falling to pieces. The laminæ are separated by similarly-shaped
95 pieces of porous paper interleaved between them. This alternate and overlapping arrangement of U-shaped plates admits of the transformer being very quickly put together. The transformer thus constructed should
100 stand in a vertical position, so that the insu-

lating liquid may circulate freely and uniformly between all of the laminæ, in order to prevent local heating, the vessel A being about twice the height of the coil, so as to contain sufficient liquid for circulation by convection currents set up in its mass and expose sufficient cooling-surface. With the latter object it is made annular to permit the circulation of air through it. In order to preserve the spacing of the groups of laminæ during transport, each group of plates F fits into a corresponding corrugation of the containing-vessel A, as shown in Fig 2. The coil is held down in place by a wood ring G and distance-pieces *g*, fastened thereto and abutting against the cover A'. The insulating liquid with which the vessel A is completely filled may be heavy petroleum free from all volatile distillates and thoroughly dehydrated, for which purpose a bag of powdered potassium or so-

dium may be placed in the space beneath the coil.

What we claim is—

In an electrical inductorium, the combination, with the annular coil and with U-shaped plates interleaved with porous insulating material and applied alternately to opposite ends of the coil and bolted together in groups, as described, of a containing-vessel having vertical grooves on its sides, in which the groups of plates are held, substantially as specified.

Dated this 12th day of January, 1892.

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Witnesses:

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