April 8, 1924. 1,489,370

L. STEINBERGER

INSULATOR

Filed July 23, 1919

Fig. 1.

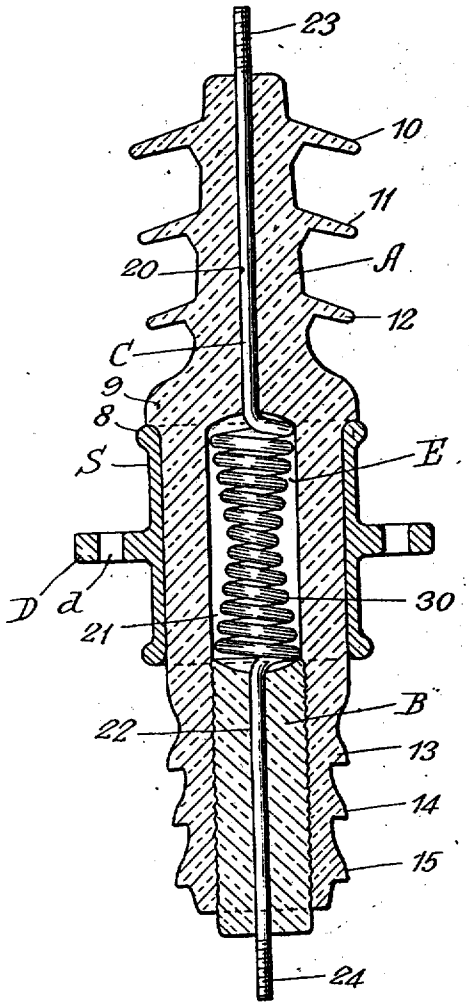
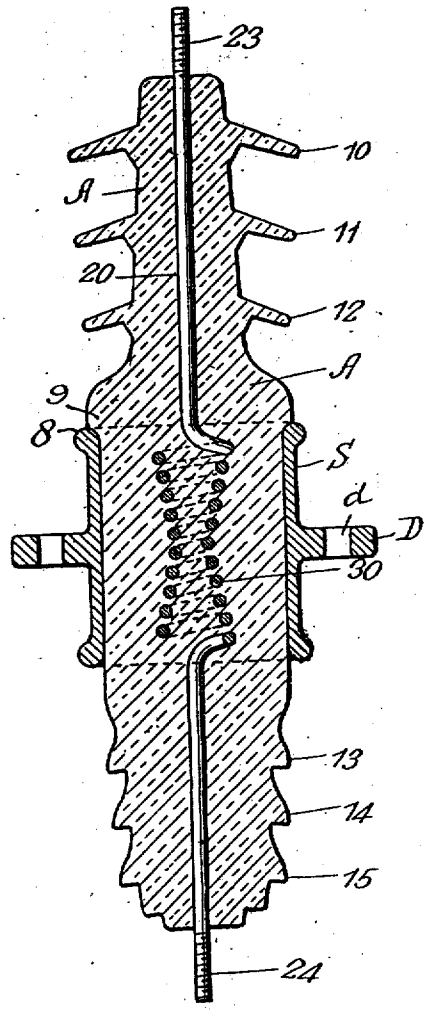


Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS STEINBERGER, OF BROOKLYN, NEW YORK.

INSULATOR.

Application filed July 23, 1919. Serial No. 312,668.

To all whom it may concern:

Be it known that I, LOUIS STEINBERGER, a citizen of the United States, and a resident of the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Insulators, of which the following is a specification.

This invention relates especially to an improved and novel type of insulator, for use in conjunction with ordinary lightning arresters, transformers or other electrical apparatus to prevent damage or destruction thereof by high frequency electrical disturbances, such as lightning.

One of the objects of the invention is to construct an insulator the conducting element of which is provided with a choke coil structure encased within the body of insulating material so constructed and arranged that the several parts may be readily assembled and disassembled.

Another object is to construct an insulator the conducting element of which is provided with a choke coil structure in connection with the conductor, all of which is embedded in the body of insulating material.

Another object of the invention is to construct an insulator the conducting element of which is provided with a choke coil structure in combination with a static shield structure for supporting the insulator and for redistributing the electrical stresses and strains throughout the central portion thereof.

Other objects will appear from the subjoined specification and claims.

Referring to the drawings in which the same reference character indicates the same part in the several views:

Fig. 1 is a vertical longitudinal section of an insulator embodying my invention with the conductor and choke coil in elevation.

Fig. 2 is a view similar to Fig. 1 of a modified form of my invention with the choke coil in section.

In the drawings, A represents a body of insulating material which may be formed of any moldable insulating material such as electrose, or of porcelain or other similar fireproof insulating material.

The main body of insulating material is elongated, as shown, and is provided at its upper end with a series of radially projecting hoods 10, 11 and 12 graded in diameter from top to bottom, and provided at its lower end with a series of radial annular projections 13, 14 and 15, as shown. The body of insulating material has a conduit provided axially throughout its center, which has two diameters in horizontal cross section as at 20 and 21. The upper portion thereof at 20 is of sufficient diameter to neatly fit the conductor C which is provided at its upper and lower ends with screwthreads at 23 and 24, as indicated, for the purpose of connecting thereto the terminal line wire, as well known.

Throughout the lower portion of the insulator body is the cavity 21 of sufficient cross section to receive the enlarged ends of a choke coil 30 formed from the wire of the conductor, as shown.

The choke coil 30 is in the form of inversely disposed helically wound cones integrally connected together at their apices, the base of the upper cone fitting against the end wall of the cavity 21. A plug or stopper B of insulating material provided with a central conduit for the lower portion of the conducting wire, is screwthreaded on its outer surface, which engages with the screwthreads on the lowermost portion of the inner wall of the cavity 21 so that when put into place it fits against the base of the lower cone portion of the choke coil and holds the choke coil tightly and snugly within the upper portion of the cavity 21.

As stated above, the insulator body may be made either of moldable insulating material, such as electrose, or of fireproof insulating material such as porcelain, and in either case it is so shaped that the central portion thereof neatly fits within the sleeve S extending from the flange D which latter is provided with bolt holes *d* for securing the same to a suitable support not shown.

When the body is fitted within the sleeve the lower portion of the flange at 9 fits on the upper portion of the beaded edge 8 of the sleeve.

In the construction shown in Fig. 1 the space E immediately surrounding the choke coil is air filled.

The structure shown in Fig. 2 differs from that shown in Fig. 1 in that in Fig. 1 the body of insulating material A and the plug portion B of insulating material which holds the choke coil on the wire in place are each separable from the other so that in order to dismantle the entire structure it is only nec-

essary to remove one from the other, whereas in Fig. 2 the body of insulating material A is formed of suitable insulating material such as electrose and is molded in the shape shown around the conductor and choke coil, the insulating material entering between the turns of the coil, thus filling the entire space within and around the coil and around the conductor so that but one solid body is formed.

From the above description in connection with Fig. 1 it will be seen that the insulator construction is such that I place within the approximate central portion of the insulator, a choke coil having extending portions through the upper as well as the lower portion of the insulator, the line wire (not shown) being connected to the same at one extension and the other extension being connected to apparatus or ground as may be desired.

The compound structure, as indicated, is as follows: A is the body of the insulator, B the removable plug section and 30 is the choke oil within the central portion of the insulator. D is the supporting flange for the sleeve-like static shields which is molded or placed about the body of the insulator at its approximate center. A space or cavity E is provided within the body of the insulator wherein the choke coil is disposed and installed.

The insulator body A may be molded and when molded is provided with an aperture extending axially therethrough. The aperture, as shown in Fig. 1, has an enlarged portion extending from a point approximately above the center of the body of the insulator and from there on upwardly the aperture is reduced in size sufficiently to allow the conducting wire to extend therethrough.

The insulating plug B is furnished with a centrally disposed aperture 22 extending therethrough for the purpose of receiving the lower portion of the conductor extending from the choke coil.

In assembling the insulator the upper portion of the conductor is passed through the axial conduit arranged therefor in the body of insulating material and the choke coil takes a suitable position within the cavity E in the body of insulating material. The plug member B is then fitted to the lower portion of the conductor and screwed into the insulator up to a point where it contacts with the lower portion of the choke coil, thereby supporting the choke coil in its operative position.

It is of course obvious that this insulator may also be used in a horizontal position, in which case the plug B is not really necessary to support the choke coil but simply closes up that end of the insulator and completes the insulation thereof.

The choke coil illustrated in the embodiment of the invention as disclosed in Fig. 1 is at all times removable, whereas the choke coil in Fig. 2 is permanently fixed to the body of insulating material.

From the above description it will be appreciated that the choking device which I have provided will retard instantaneous rush or surge of electrical current through the electrical apparatus in the event that the conductor passing through the insulator is charged by a stroke of lightning or other high frequency electrical disturbance of a similar nature, thus protecting the above mentioned electrical apparatus by affording in such an event a lightning arrester, for instance, sufficient opportunity to act before the high frequency current can pass by the choking device.

By means of this invention, therefore, an abnormally high voltage current is prevented from passing through the electrical equipment, while an ordinary current will flow along the conductor, past the choking device without difficulty, where the number of turns of the helix forming the choking device is of proper ratio to the amount of current flowing through the conductor.

The sleeve attached to the supporting flange upon which the insulator is mounted and which encircles the central body portion of the insulator causes a static shield effect by redistributing the field and preventing concentration thereof, which serves to prolong the life of the insulator.

As changes of construction could be made within the scope of my invention it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, an elongated body of insulating material, a choke coil secured in said insulator body having conductors secured thereto which extend beyond the opposite ends of said insulator body, and a metallic supporting ring having a sleeve formed thereon and surrounding the central portion of said insulator body, said sleeve coacting with the choke coil to redistribute the electrostatic stresses set up in the insulator.

2. In a device of the class described, an elongated body of insulating material having an annular shoulder formed on the upper portion thereof, a choke coil secured in said insulator body having conductors secured thereto which extend beyond the opposite ends of said insulator body, and a metallic supporting ring having a sleeve with annular beads formed on its opposite edges, said sleeve surrounding the central portion of said insulator body, the upper

bead of said sleeve engaging the shoulder formed on said insulator body to support the same.

3. In a device of the class described, an elongated body of insulating material having radially projecting hoods formed on the upper portion thereof and graded in diameter from top to bottom and a supporting shoulder formed below the lower hood, a choke coil having oppositely extending conductors connected thereto and projecting beyond the ends of said insulator body, a supporting ring having a sleeve formed thereon which surrounds the central portion of the insulator body, the upper edge of said sleeve being rounded and engaging the shoulder on the insulator body, the lower portion of said insulator body being of slightly smaller diameter than the interior of said sleeve to permit the insertion of the insulator body therein, said sleeve coacting with said choke coil to redistribute the electrostatic stresses set up in the insulator.

4. In a device of the class described, a body of insulating material, an electrical conductor extending therethrough and having a straight portion fitted in an aperture in said insulator and a choke coil portion contacting with said insulator body and a metallic sleeve surrounding said body of insulating material throughout substantially the length of said choke coil portion of said conductor.

In witness whereof, I have hereunto set my hand at the borough of Manhattan, city and State of New York, this 22 day of July, 1919.

LOUIS STEINBERGER.

In presence of—
ZITA M. GRAHAM.