

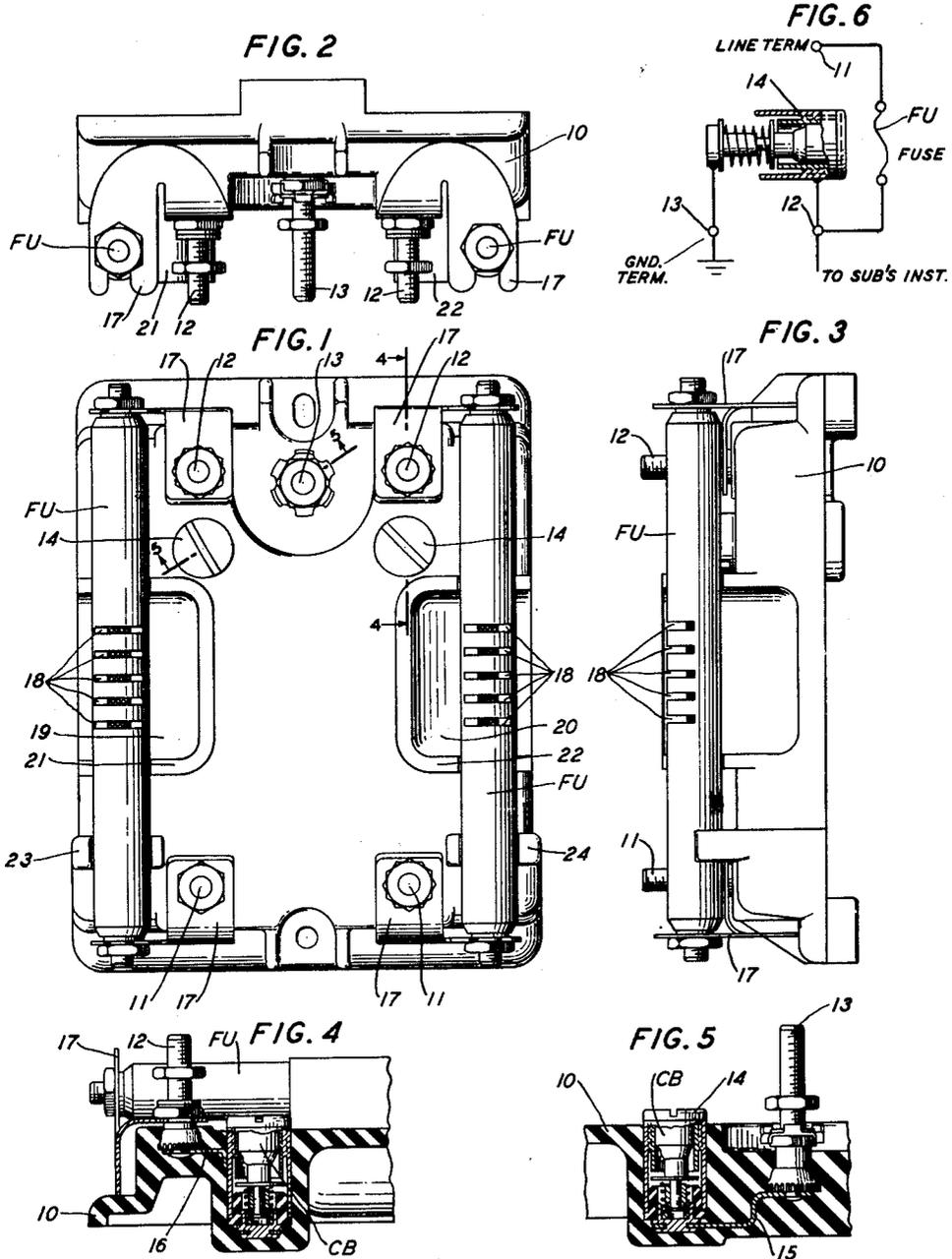
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2,600,407

PROTECTIVE DEVICE

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PROTECTIVE DEVICE

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1 Claim. (Cl. 200—115)

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This invention relates to protective devices and more particularly to a moisture-proof device, such as disclosed in my Patent 2,058,594, October 27, 1936, for protecting telephone lines from hazards resulting from lightning and exposure to power lines and is an improvement over the protective device.

For the protection of telephone lines, it is customary to install at the subscriber's premises, a protective device arranged to afford protection from high voltages induced by lightning discharges and also, where the occasion arises, afford protection from induced surges or accidental contact with neighboring power lines. Protection against light charges induced by lightning or other surges is afforded by open spaced cut-outs or spark gaps which provide a path to ground for the discharges. In order to protect against heavy lightning discharges or excessive current resulting from contact with a power line, fuse elements are provided to open the circuit when the flow of current is of an order to present a fire hazard.

One object of this invention is to improve protective devices from the standpoints of compactness and decrease in size without deleteriously affecting the operating characteristics.

Another object of this invention is to facilitate the construction of protective devices.

A further object of the invention is the provision of a protective device constructed of a suitable molded insulating material, in which the components are embedded and connected together in such a manner that they are impervious to the entrance of moisture.

A still further object of this invention is the elimination of a common, large open spaced cut-out.

The protective device of this invention comprises a body member of molded insulating material, for example a phenolic condensation product, having embedded therein suitable terminals for the connection of fuses thereto. Also embedded in the body member, adjacent certain of said terminals, and connected thereto by conducting straps embedded in said body, are open spaced cut-outs or spark gaps which provide a path to ground for lightning discharges.

Located adjacent certain of the terminals are upwardly projecting bosses having arcuate grooves therein to provide for the accurate positioning of the fuses with respect to their terminals and to provide a gas block if a cover, of the type shown in my Patent 2,058,584, heretofore mentioned, is used.

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These and other features of my invention will be clearly understood from the following detailed description when read with reference to the following drawing in which:

Fig. 1 is a plan view of a protective device illustrative of one embodiment of this invention;

Fig. 2 is a rear elevational view;

Fig. 3 is a side elevational view;

Fig. 4 is a fragmentary sectional view taken on line 4—4 of Fig. 4;

Fig. 5 is a fragmentary sectional view taken on line 5—5 of Fig. 1; and

Fig. 6 is a schematic of the open spaced cut-out and shows the circuit associated therewith.

As shown in the various figures of the drawing, the protective device of this invention comprises a block or body 10 member of molded insulating material, provided with line terminals 11—11, instrument terminals 12—12 and a ground terminal 13. Located adjacent the instrument terminals 12—12, and embedded in the body member 10 are the open spaced cut-outs 14—14. These cut-outs, as shown in detail in Figs. 4 and 5, are substantially the same as the protective units shown in my pending application Serial No. 131,884, filed December 8, 1949, and are of the air-gap type and comprise cylindrical shells having mounted therein a carbon block CB which under the influence of a coil spring is held in juxtaposition with respect to the grounded portion of the cut-out.

The carbon blocks CB, of the cut-outs 14—14, are at ground potential and are connected to the ground terminal 13 by straps 15 embedded in the block 10, as shown in Fig. 5, while the shells of the cut-outs are connected to the instrument terminals 12—12 by the embedded conducting straps 16, as shown in detail in Fig. 4. The ground terminal 13 is connected to a suitable ground when the protective device is in service.

Fig. 6 illustrates the manner in which the cut-outs 14—14 are connected in the circuit and also the internal construction thereof. The normal talking circuit may be traced as follows; from the line terminal 11, through the fuse FU to one side of the instrument terminal 12, to the subscriber's instrument (not shown). In the event of a lightning discharge impressed on the line, the circuit will be from the line terminal 11, through the fuse FU through the terminal 12, to the shell of the cut-out 14, across the air-gap in the cut-out to the carbon block, thence to ground through the ground terminal 13. When a high sustained voltage is impressed on the line, the fuse FU, will blow and open the circuit.

As shown in the drawing, fuses FU—FU are connected between the line terminals 11—11 and the instrument terminals 12—12 and are held in place by means of the spring clips 17. These fuses are of the well-known tubular type and are provided with one or more vents or slots 18.

Located in the sides of the body member 10, underlying the fuses FU and adjacent the slots 18, are arcuate channels 19 and 20. These channels are provided with upstanding walls 21 and 22, which serve as barriers to protect the terminals from ionized gases when the fuses blow and tend to direct the gases away from the protective unit.

Integral with the body member 10 and projecting from the upper surface thereof are the arcuate shaped bosses 23 and 24; these bosses are adjacent the line terminals 11 and serve as locating means for the accurate positioning of the fuses and also provide a gas block when, as shown in my Patent 2,058,594, a cover is used which employs a cap on the interior thereof.

While I have shown and described the preferred embodiment of my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention.

What is claimed is:

A protective device comprising a body member of insulating material, a pair of line terminals molded in said member at one end thereof and contiguous therewith, a pair of instrument terminals molded in said member at the other end thereof and contiguous therewith, a ground terminal molded in and contiguous to said member at the other end thereof and positioned between said instrument terminals, a pair of air gap ar-

restors each molded in and contiguous to said member and each adjacent a respective one of said instrument terminals and positioned adjacent said ground terminal, each of said air gap arrestors comprising a metallic shell, a carbon block in said shell but insulated therefrom and spring means positioning said carbon block in spaced juxtaposition to a portion of said shell, a first pair of conductive straps molded in and entirely surrounded by said member electrically connecting said shells to said instrument terminals within said member, a second pair of conductive straps molded and entirely surrounded by said member electrically connecting said carbon blocks to said ground terminals within said member, whereby the electrical connections effected between and by each of said terminals, air gap arrestors and conductive straps molded in said body member are impervious to the entrance of moisture, contact springs on said line and instrument terminals, venting fuses positioned between said springs and extending between said line and instrument terminals, and arcuate shaped bosses integral with said body member, extending above the surface thereof, adjacent said line terminals for accurately positioning said vented fuses.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,058,594	Kelsay -----	Oct. 27, 1936
2,223,540	Baker -----	Dec. 3, 1940