

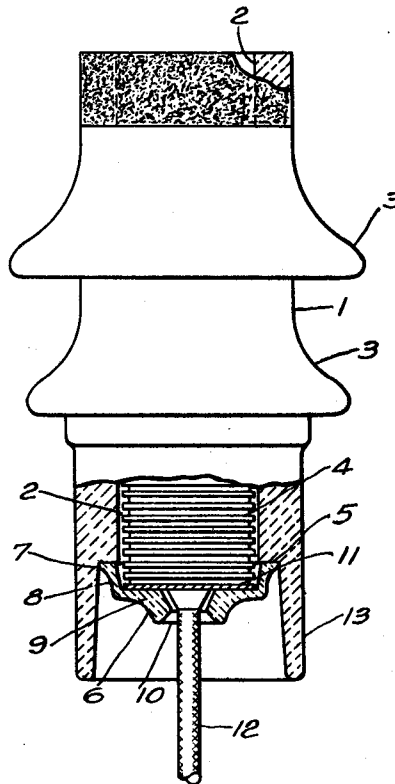
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L. R. GOLLADAY ET AL

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LIGHTNING ARRESTER

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WITNESSES:

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LIGHTNING ARRESTER

Application filed February 1, 1927. Serial No. 165,104.

Our invention relates to electrical protective devices and especially to casings for the same.

One of the objects of our invention is to provide a lightning-arrester casing having the rugged construction required in lightning arresters and yet having means for securing a positive destruction of the arrester due to a failure of the same.

Another object of our invention is to provide a lightning-arrester casing which will visibly indicate a failure of the same.

In the accompanying drawing, the single figure is a view, partially in elevation and partially in cross-section, of a preferred embodiment of our invention.

A substantially cylindrical casing member 1 is provided with an axially disposed cylindrical chamber 2. The casing member 1 is similar to a distribution-type insulator and has projecting flanges or skirts 3.

Disposed in the chamber 2 is a discharging means 4 comprising a stack of resistance disks or plates separated by mica spacers or washers. The discharging means is similar to that described in Slepian Patent No. 1,509,493, issued September 23, 1924.

Secured to the end face 5 of the casing member is a separate circular cup-shaped porcelain member 6 which retains the disks 4 in the chamber 2. The cup-shaped member 6 has an annular rim 7 which is glazed to the end surface 5 of the casing member 1, securing the cup-shaped member 6 thereto. Disposed adjacent to the annular rim 7 is a side-wall portion 8 of reduced thickness. The bottom 9 of the cup-shaped member 6 is provided with a perforation 10.

When abnormal heating occurs in the arrester, as a result of a failure thereof, which would permit the line current to follow a discharge therethrough, the portion 8 of reduced thickness will be subjected to a lateral stress, due to the expansion of the bottom disks 4 or the bottom terminal plate 11 of the discharging means thereby causing the cup-shaped member 6 to be severed at the said portion 8 of reduced thickness.

A flexible ground-lead 12 projects through the perforation 10 in the cup-shaped member

6, and one end of said ground lead is soldered to the metallic disk or terminal plate 11 upon which the stack of discharge elements 4 is supported.

When a failure of the arrester occurs, the cup-shaped member 6 will be fractured, as set forth above, and will permit both the stack of disks 4 and the flexible ground lead 12 to fall free of the casing member.

The inner diameter of the rim or upper portion of the cup-shaped member 6 is made slightly greater than the diameter of the chamber 2 in order that no restriction may be imposed upon the freedom with which the disks fall free of the casing member.

The lower end of the casing member 1 is extended to form a tubular projecting portion 13 which provides a protection for the cup-shaped member 6. This is necessary since, although the cup-shaped member 6 is relatively strong against axially applied stresses it is inherently weak as to radially applied stresses.

When it was first attempted to make a frangible drop-out bottom for lightning arresters the casing was made in one piece of dry-process-molded porcelain. This process consists in compressing a quantity of relatively dry ingredients between two faces of a die or mold, thereby forming the member which is subsequently fired. When the upper portion of the die was withdrawn, the thin wall portion was forced out by the suction created in removing this portion of the die, thereby causing an enormous loss in the process of manufacture. Furthermore, it was not easy, with the old process, to obtain exactly the dimensions desired, and it was practically impossible to inspect or gauge the finished casing to check the thickness of the thin-wall portion, owing to the fact that there was no room, in the finished product, to apply calipers or other gauging means to the thin-wall portion.

An attempt was made then to manufacture such a casing by the pugging process, which consists in forming the piece in approximately the desired shape and subsequently turning it to the exact dimensions required. It is very difficult to turn, on a lathe.

a piece having such shape as is shown in the accompanying drawing. In addition, it was substantially impossible to gauge the thickness of the thin-wall portion, as has already been mentioned.

The proper operation of the drop-out bottom is dependent upon the thickness of the section which is fractured by the occurrence of abnormal heating in the lightning arrester. It is necessary to make this reduced section so thin that it will be fractured very quickly after the failure of the arrester occurs. However, in order that the thin-wall portion may have sufficient strength to withstand the shocks incident to transportation and installation, it is necessary that it shall be as thick as possible without substantially impairing the heat-responsive qualities thereof.

By our invention, we provide a separate member having a thin-wall portion, said member being manufactured by the dry process. Since this member is made separately from the casing member, the dimensions may be checked very accurately before attaching the same to the main body of the casing.

The main body of the casing, being now of an easily-turned shape, may be made by pugging or extruding, which process not only provides a very good quality of porcelain, but also is relatively inexpensive.

The cup-shaped member is secured to the main casing member before either member has been fired, and the parts are glazed together during the firing operation. The flexible ground lead and the discharge elements are inserted in the casing through the open top thereof which is subsequently closed by suitable means (not shown).

It is apparent that our invention is a valuable contribution to the art of making lightning arresters, in that it provides a means for visibly indicating the failure of an arrester, which is positive and which may be predetermined to a high degree of accuracy.

Although we have described our invention with reference to a specific example of the construction thereof, it is apparent that our invention is not limited to the details shown, and we desire that the appended claims shall be accorded the broadest interpretation consistent with their wording and the prior art.

We claim as our invention:

1. An electrical protective device comprising a casing member having an axially disposed chamber, discharging means disposed therein, a separate cup-shaped cover member secured to one end of the casing member for closing the said end, thereby retaining the discharged means therein, said cover member having a thickened rim joined to said casing member and a thin side-wall portion arranged to be severed by abnormal

heating occurring in the electrical protective device.

2. An electrical protective device comprising a casing member having a substantially cylindrical chamber, discharging means disposed therein, a separate substantially circular retaining member disposed to fit one end of the casing member and secured thereto, closing the chamber, thereby retaining the discharging means therein, said retaining member having an annular rim portion of high thermal capacity, a circular central portion having a high thermal capacity, and a cylindrical side wall having a low thermal capacity interposed therebetween, thereby permitting the circular central portion to be severed from the casing member by abnormal heating occurring in the electrical protective device and to fall free thereof.

3. A protective device comprising a massive main casing member of wet-process porcelain, said casing member having an axial perforation or chamber and a downwardly depending protecting skirt extending below the lower end of said perforation or chamber, a cup-shaped bottom member of dry-process porcelain glazed to said main casing member near the junction of said downwardly depending skirt and said lower end of said perforation or chamber, said cup-shaped member having thin side walls constituting a continuation of said perforation or chamber in said main casing member, and discharge elements disposed in said perforation or chamber and supported by said cup-shaped member.

In testimony whereof, we have hereunto subscribed our names this 26th day of January, 1927.

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