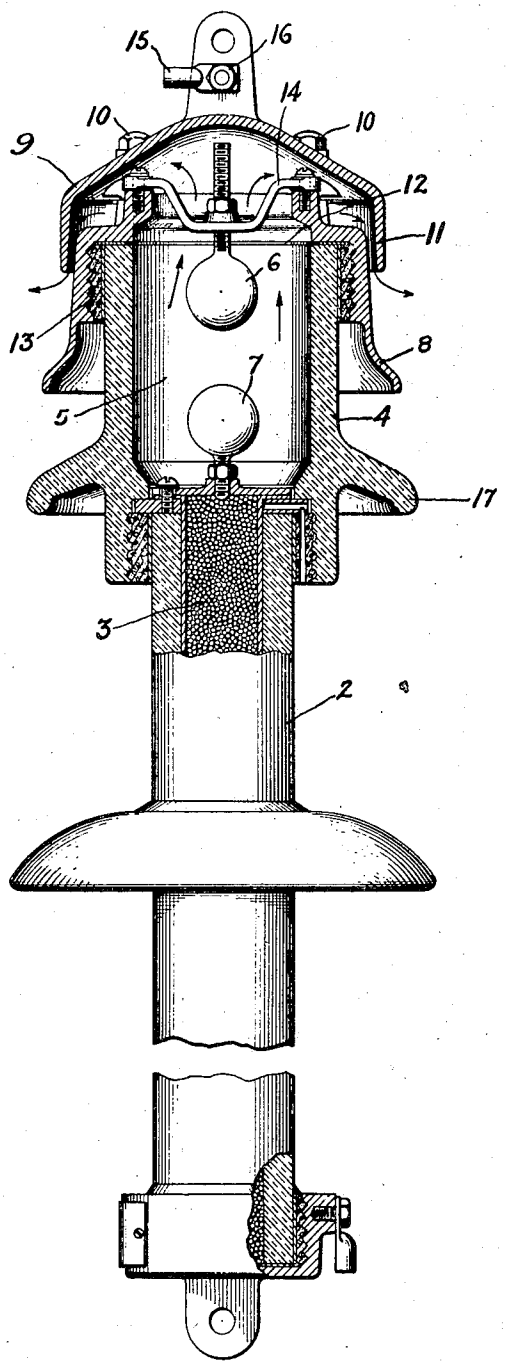
Dec. 6, 1927. 1,651,876

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LIGHTNING ARRESTER

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Inventor:
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UNITED STATES PATENT OFFICE.

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LIGHTNING ARRESTER.

Application filed September 14, 1925. Serial No. 56,166.

My invention relates to a protective device such as a lightning arrester for protecting a system of electric power distribution from conditions of excessive voltage. Devices of this class are commonly installed in the open and subject to the weather. Certain types of such devices are constructed with a spark gap enclosed in a housing of porcelain or other insulating material. The housing is designed to protect the gap from the weather conditions, but I have found that the sparking potential at the gap varies with the weather. If the weather is rainy and the housing is wet, the sparking potential is low. On the other hand, if the weather is dry, the sparking potential is high. It will be seen, therefore, that a lightning arrester which may be designed to afford sufficient protection under a given weather condition may not do so under different weather conditions. In other words, if a lightning arrester is designed to afford protection under dry conditions, it may not be safe against failure under wet conditions. On the other hand, if it is designed to protect under wet conditions, the sparking potential may be so high under dry conditions that its efficiency is greatly reduced. It is therefore essential that the sparking potential should be substantially constant under all weather conditions.

I have found that the sparking potential of a lightning arrester is affected when the porcelain housing is wet, as in rainy weather, because the housing becomes coated with water and a conducting body in the vicinity of the gap distorts the electric field between the gap electrodes. This condition will, of course, vary, depending upon the weather.

One of the objects of my invention is to stabilize sparking conditions in such a lightning arrester, notwithstanding variations in weather conditions, and this I propose to do by providing a metallic shield about the porcelain housing. The details of my invention by means of which the foregoing results are obtained are hereinafter set forth and claimed, reference being had to the accompanying drawing in which the figure shows the invention embodied in one form of lightning arrester, although it may be embodied in other forms.

In this figure, the arrester is shown in elevation and partly in section. It will be seen that I have elected to illustrate the invention with the arrester known as the oxide film type. It will be seen that the arrester comprises a porcelain tube 2 which serves as the container for the oxide pellets 3. The tube also serves as a support for the porcelain member 4 which has a chamber 5 in which chamber the spark electrodes 6 and 7 are located. The member 4 is capped with a hood in the form of a pair of metal elements 8 and 9. These elements are electrically connected by means of the bolts 10, the arrangement shown being such that the element 9 is screwed to the element 8. It will be seen that the metallic hood is cup shaped. The upper end of the member 4, as shown, projects into the hood and the upper rim of the element 4 serves as a seat for the hood, a metallic washer 12 being interposed between the member 4 and the hood element 8. It will be understood that the hood may be secured in place in any suitable manner, as for example by the use of cement 13. The chamber 5 is connected with the outside atmosphere by a passageway 11 between the elements 8 and 9. The object in providing this passageway is to enable the expanding gases to pass out when a discharge takes place through the arrester. It will be seen that the electrode 7 is connected in the usual manner with the pellets 3, while the electrode 6 is supported by the metal strip 14 which is connected electrically to the hood element 9. The line which is to be protected is connected to the top element of the hood in any suitable manner, as for example by means of a conductor 15 which may be bolted to the hood by the nut 16.

It will be seen that the porcelain element 4 is provided with an apron 17 which serves to drain off the water in case of rain instead of allowing it to run down along the body of the arrester. It will be observed that the lower element 8 of the hood is formed with a flaring rim for the same purpose.

The upper element 9 overlaps the lower element 8 and the rim of the element 9 serves as an apron which extends sufficiently below the upper limit of the hood element 8 to prevent the water from running up under the hood. It will be observed that the lower margin of the hood overlaps the spark gap between the electrodes 6 and 7. I have found that the best stabilizing results are obtained when the lower rim of the hood, that is of the element 8 in the form shown, completely

overlaps the spark gap as indicated in the drawing. I find that by thus providing a metallic hood into which the porcelain element 4 projects, the sparking condition in the chamber 5 between electrodes 6 and 7 is stabilized and that the sparking voltage remains constant or substantially so regardless of whether the arrester is wet or dry. In other words, the sparking voltage remains substantially constant in either dry or rainy weather.

While I have illustrated my invention in connection with a specific embodiment, I do not wish to be limited to such specific construction inasmuch as, in view of the disclosure, the principles involved may be embodied in other forms without departing from the spirit of the invention or from the scope of the claim herein.

What I claim as new and desire to secure by Letters Patent of the United States is:

A lightning arrester comprising a housing of insulation material, a cavity in said housing, a pair of electrodes in said housing separated to form a spark gap between them, a metal hood over said housing enclosing the upper section of the housing and extending along the outside of said housing to substantially below the upper electrode to protect all of the upper portion of the housing from the weather and for stabilizing the sparking conditions in said chamber, said hood formed in two sections one telescoped within the other and forming a vent between the two metal sections, said vent being connected by a channel with the upper end of the housing and with the chamber containing said electrodes.

In witness whereof I have hereunto set my hand this 4th day of September, 1925.

LEWIS WILLIAM EVANS.