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CUTOUT SUPPORT INSULATOR

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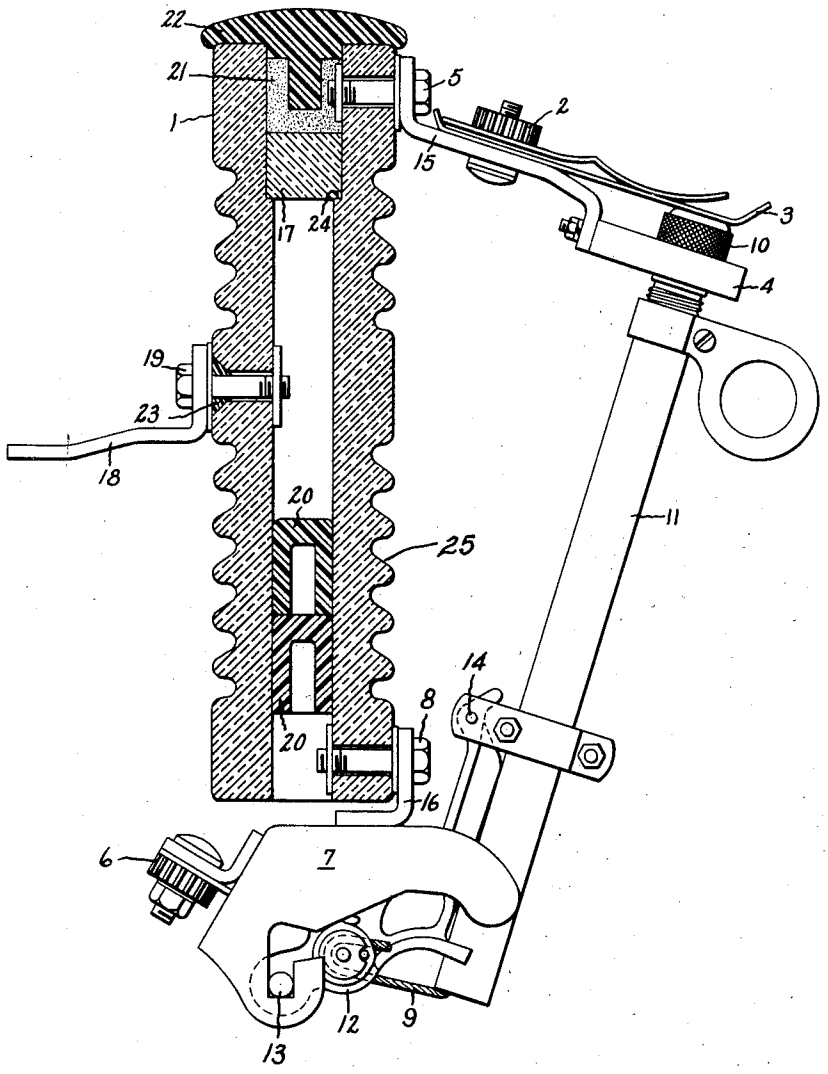


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# CUTOUT SUPPORT INSULATOR

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3 Claims. (Cl. 174—139)

This invention relates to a cutout support insulator, and more particularly, to a hollow cutout support insulator.

A known form of cutout support insulator is the elongated cylindrical hollow type. At each end of the insulator is located a line terminal and contact portion. To obtain secure fastening of a fuseholder to the insulator the line terminals and contact portions are fastened to the insulator by fastening means extending through the walls of the hollow insulator. The insulator is positioned on a pole line. To securely position the insulator on a pole line the insulator is connected to a support means by fastening means extending through the wall of the hollow insulator.

The fastening means for the contact terminal portions and support means extend into the hollow or cavity of the hollow insulator. These various fastening means are each at a different electrical potential. Since high voltages are involved there is always danger of an internal electrical flashover between the various fastening means.

It is an object of this invention to provide means for ensuring against internal electrical flashover between the through fastening means of the contact terminal portions and support means of a hollow type cutout support insulator.

In an elongated hollow support insulator having a line terminal contact portion connected adjacent each end of said insulator, and support means connected to said insulator longitudinally between said terminal contact portions, said support means and terminal contact portions connected to said insulator by through fastening means, my invention comprises means positioned within the hollow of said insulator for preventing internal electrical flashover within said hollow between said fastening means.

In an elongated hollow support insulator having a line terminal contact portion connected adjacent each end thereof by through fastening means and a support means connected longitudinally between said terminal contact portions to said insulator by through fastening means, my invention also comprises means positioned within the hollow of said insulator for preventing internal electrical flashover between said fastening means, and means for keeping the hollow of said insulator dry.

The invention will be better understood by considering the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing, there is shown a hollow cutout support insulator supporting an open type fuseholder by through fastening means, and support means for said insulator connected to said insulator by through fastening means.

Referring now to the drawing, shown therein is an elongated hollow cylindrical insulator 1 constructed out of an insulating material, as porcelain, having an open type fuseholder mounted thereon on one side of said



insulator. The fuseholder structure is well known in the art and is of the type described in W. C. Lesher Patent No. 2,574,400 issued November 6, 1951 and assigned to the same assignee as the instant application.

Mounted adjacent the uppermost portion of said insulator 1 is an upper line terminal 2 and upper contact portions 3 and 4. Said upper terminal and contact portions are connected to the insulator by through fastening means, as bolt means 5.

Adjacent the lowermost portion of insulator 1 is mounted a lower line terminal 6 and lower contact hinge element 7. Said lower terminal and contact element are connected to the insulator by through fastening means, as bolt means 8.

Electrical contact is made between the upper and lower terminals and contacts by a fusible element 9, which is electrically connected at its upper end to a fuse tube cap 10 screwed on the upper end of a fuse tube 11. The lower end of the fusible element 9 is electrically connected to a hinged contact element 12 which is pivotally hinged to lower contact hinge element 7 at 13 and pivotally connected to the fuse tube 11 at 14.

When the cutout structure is connected across an electrical distribution line at terminals 2 and 6 current will flow from terminal 2 to contacts 3 and 4, thence through cap 10 and fusible element 9 to contact 12, thence through contact 7 to terminal 6. If a fault occurs in the line the fusible element 9 will fuse within the fuse tube 11 and break. Thereafter, since fusible element 9 is broken, fuse tube 11 is free to pivot outwardly and downwardly with respect to contact 12 about pivot point 14 and contact 12 is free to pivot outwardly and downwardly with respect to contact 7 about pivot point 13. Thus, the fuse tube 11 flips open away from the upper contacts 3 and 4 and the line is fully opened.

The upper and lower contacts, terminals and fastening means are electrically interconnected by metallic brackets 15 and 16 respectively. Metallic materials and through fastening means are necessary to obtain a sturdy mounting of the fuseholder structure to withstand the high expulsive forces built up within the fuse tube 11 when the fusible element 9 fuses. Also, through fastening means makes it possible for the fuseholder to be positioned close to the insulator 1.

However, this means that the through fastening means 5 and 8 are at high electrical potentials and there is always danger of an internal electrical flashover between fastening means 5 and 8 within the hollow or cavity of the hollow insulator 1 whether the cutout is in the open or closed position.

To provide against internal electrical flashover between through fastening means 5 and 8 a cylindrical barrier or cookie 17 of insulating material like porcelain is snugly inserted within the cylindrical hollow of the insulator 1. A suitable shoulder 24 is formed in the interior of the insulator so that the barrier 17 can be easily positioned longitudinally below the fastening means 5. Also, the diameter of the barrier 17 should be such that barrier 17 makes intimate contact with the walls of the hollow of the insulator. If desired, a ceramic glaze can be incorporated in the joint between the barrier and the hollow so as to insure a thorough electrical and mechanical seal at this point.

The support insulator with its mounted fuseholder is supported from a pole line by a support means located longitudinally between the upper and lower terminal contact portions, as support arm or bracket 18. The insulator 1 is connected to the support means 18 by through fastening means, as bolt means 19. Here also the bracket is metallic and the fastening means extends through the wall

of the insulator to give a sturdy support for the insulator and fuseholder.

It is to be noted that the support means **18** is positioned on a side of the insulator diametrically opposite from the side of the insulator on which the upper and lower terminals and contacts are located. This is for birdproofing. That is, with this diametrical positioning a bird perched on the support means **18** for instance, will not be able to cause a short circuit between the upper or lower terminals and contacts and the support means, similar to the previously mentioned Lesher Patent No. 2,574,400. However, in contrast to the solid insulator of said Lesher patent, I employ a hollow insulator. A hollow insulator is lower in cost. Further, a hollow insulator has greater mechanical strength due to minimization of the thermal stresses inherent in a heavy section, solid type insulator.

Internal electrical flashover is also possible between the upper and lower fastening means and the support arm fastening means. Barrier **17** also guards against internal flashover between fastening means **5** and **19**. To provide against flashover between fastening means **8** and **19** an insulating material barrier is snugly positioned within the hollow of the insulator longitudinally between fastening means **8** and **19**. This insulating barrier can comprise one or a plurality of rubber plugs **20**. Each of the rubber plugs is similar to an inverted cup whose walls flare outwardly and downwardly conically. The plugs are given this configuration so that they can be readily driven into the hollow of the insulator by positioning them on the end of a rod and then pushing them into the hollow of the insulator. The conical walls of the plugs have an outer diameter slightly greater than the inner diameter of the hollow of the insulator **1**. When the plugs are driven into the hollow the conical walls will collapse and make snug contact with the walls of the hollow.

To further guard against internal flashover it is desirable to keep the hollow or cavity of the insulator dry or moisture free. Thus, the plugs **20** can be coated with a suitable adhesive or sticker to ensure that this barrier is moisture proof. Also, a suitable potting or calking compound **21** is placed in the hollow of the insulator above the barrier **17** and an insulating material cap **22** is used to close and cover the upper end of the insulator. Further, closure means, as a rubber grommet **23**, is used to make the fastening means **19** and passage therefor in the insulator moisture proof. Thus, internal flashover between the various fastening means is prohibited by keeping the hollow of the insulator dry or moisture free, and also by locating insulating barriers between the various fastening means.

It should be noted that external flashover has not been overlooked at the expense of preventing internal flashover. By placing the support means hardware on a side of the insulator diametrically opposite from the side on which the terminal and contact hardware is located external flashover is guarded against. Also, potting or calking compound **21** and cover **22** prevent flashover between fastening means **5** and the support means hardware. Furthermore, the insulator **1** has suitable petticoats **25** formed thereon externally to increase the external flashover distance between the upper and lower hardware and the support means hardware.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention, and that it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.



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

1. In a rigid insulating material elongated hollow cut-out support insulator having a cylindrical hollow extending entirely therethrough, and through passage means in the side walls of said insulator adjacent the upper, lower, and central portions thereof for connecting hardware of different electrical potentials to said portions by through fastening means extending through said through passage means into said hollow, means for preventing internal electrical flashover amongst said fastening means within said hollow and for keeping said hollow dry comprising a rigid insulating material barrier positioned within said hollow between said upper and central through passage means, said barrier and said support constructed out of the same insulating material, and said barrier making intimate contact with the walls of said hollow, an inverted cup like rubber plug located within said hollow positioned between said central and lower through passage means, said plug having collapsible conical walls, the outer diameter of said plug being slightly greater than the diameter of said cylindrical hollow and the collapsible walls of said plug making intimate contact with the walls of said hollow, and closure means for making the central through passage means moisture proof.

2. In an elongated hollow electrical insulator having upper and lower metallic terminal contact portions positioned adjacent opposite ends of said insulator and metallic support means positioned between said terminal contact portions, said terminal contact portions and said support means connected to said insulator by metallic through fastening means extending through the walls of said insulator into the hollow of said insulator, both of said terminal contact portions and the fastening means therefor being positioned on one side of said insulator and said support means and the fastening means therefor being positioned on an opposite side of said insulator, and means for preventing internal electrical flashover amongst said through fastening means within the hollow of said insulator comprising an electrical insulating material barrier which is positioned within said hollow between the fastening means for the upper terminal contact portion and support means and another electrical insulating material barrier which is positioned within said hollow between the fastening means for the lower terminal contact portion and support means, said barriers making intimate contact with the surfaces of said hollow and electrically isolating all of said fastening means from each other.

3. In an elongated electrical insulator as in claim 2, wherein said another insulating material barrier comprises at least one inverted cup-like rubber plug, the walls of said plug flaring outwardly and downwardly, the width of said plug being slightly greater than the width of the hollow of said insulator, and the walls of said plug being collapsible and making intimate contact with the walls of said hollow.

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