Oct. 9, 1945. B. SCHLESINGER 2,386,720

LIGHTNING ARRESTER

Filed July 3, 1942

Fig. 1.

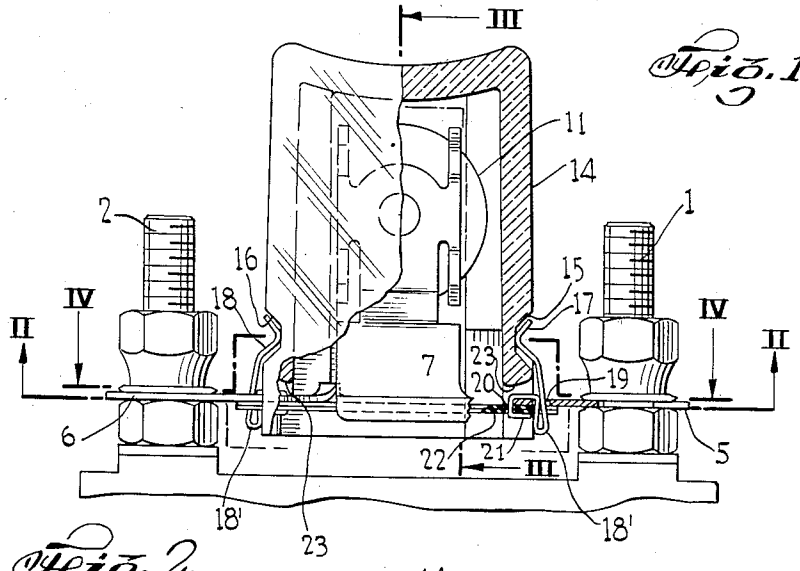


Fig. 2.

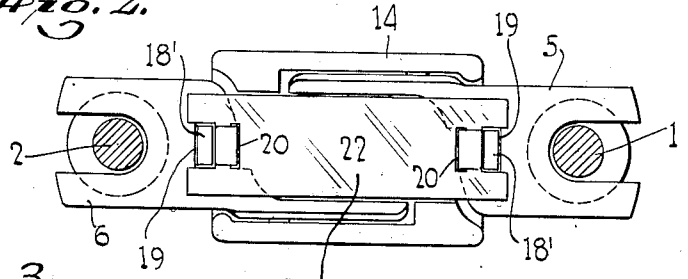


Fig. 3.

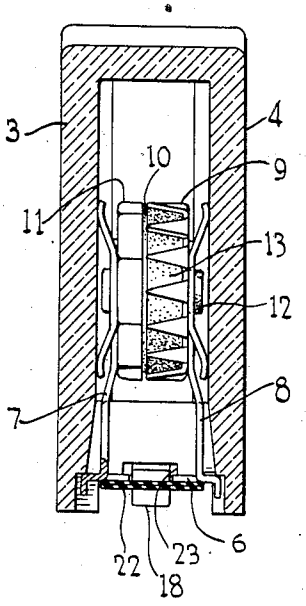
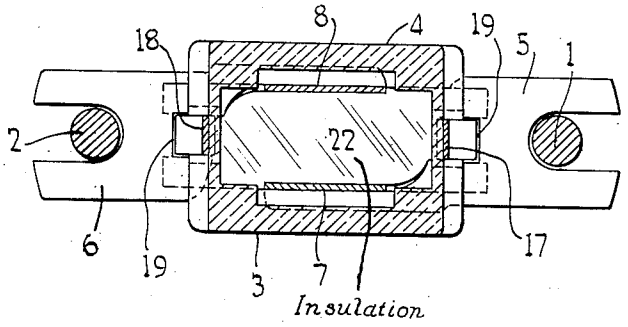


Fig. 4.



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LIGHTNING ARRESTER

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Application July 3, 1942, Serial No. 449,586

2 Claims. (Cl. 175—30)

This invention relates to lightning arresters.

A principal object of the invention is the production of a device of the type specified which is so constructed that the active discharge elements are enclosed, when in use, but are enclosed by a transparent cover which enables the condition of the enclosed discharge elements to be observed without removing the cover but which is so constructed that if, for inspection or cleaning or adjustment, it is desired to obtain access to the discharge elements, the transparent cover may be readily removed and as readily replaced and be held securely in place without removing the lightning arrester terminal connectors from the terminals to which they may be connected.

Other objects and advantages of the invention will appear as the description of the particular physical embodiment selected to illustrate the invention progresses and the novel features will be particularly pointed out in the appended claims.

In describing the invention in detail and the particular physical embodiment selected to illustrate the invention, reference will be had to the accompanying drawing and the several views thereon, in which like characters of reference designate like parts throughout the several views, and in which:

Figure 1 is a side elevational view of a device embodying the invention mounted on a terminal block, with some parts broken away and others shown in section; Fig. 2 is a cross-sectional view of the device as shown by Fig. 1 on the plane indicated by the line II—II of Fig. 1, viewed in the direction of the arrows at the ends of the line; Fig. 3 is a cross-sectional view of the device as shown by Fig. 1 on the plane indicated by the line III—III of Fig. 1, viewed in the direction of the arrows at the ends of the line; Fig. 4 is a cross-sectional view on the plane indicated by the line IV—IV of Fig. 1, viewed in the direction of the arrows at the ends of the line.

Lightning arresters, of the type to which the present invention relates, are those manufactured especially for connection to terminals, such as 1 and 2 of Fig. 1, which are about 2 inches and ⅜ of an inch on centers apart and which are placed so close together, in practice, side by side that the over all width of the lightning arrester can hardly exceed one inch, that is the distance from the side 3 to the side 4, as shown in Fig. 3.

Due to the close spacing of the arresters and the nearness of adjacent connecting parts, such as binding posts 1 and 2, there is very little available space in which to position means whereby an enclosing casing for the active discharge elements of a lightning arrester may be securely held in place and at the same time be so held that it may be readily removed without disturbing adjacent structures.

In the preferred form of the present invention, a terminal connector 5 and a terminal connector 6 are provided, one extending from the arrester to the right and the other to the left. These terminal connectors are adapted to be mechanically and electrically connected to electrical conducting binding posts as 1 and 2, respectively. It may be assumed that binding post 2 and may be connected to a line wire and that binding post 1 is connected to ground.

Each of the terminal connectors, 5 and 6, are so formed as to have extensions, as 7 and 8, respectively, between which are secured the discharge elements proper of the arrester. In the form shown, the metallic terminal connector 8 is in contact with a cup 9 having its edge formed into serrations or teeth, each tooth closely adjacent to a carborundum block 10 contained within a metallic cup 11. The cup 11 is in electrical contact with the metallic terminal connector extension 7. The various parts are held in adjusted position by a suitable pin, such as a lava pin 12 passing through all of them and supporting, in addition to the parts enumerated, the preferably, lava disk 13 spacing cup 9 from the carborundum disk 10 and the cup 11.

The portions 7 and 8 of the connectors have spring fingers which bear against the inside of the cover 14 and are thereby limited in sidewise separation.

When too high a potential exists on the line connected to the binding post 2, a discharge will occur from the serrations of the cup 9 to the carborundum block or disk 10 and to the metallic cup 11.

In the particular type of arrester illustrated, the adjustment is such that the ends of the serrations of the cup 9 stop just fail to touch the carborundum block 10.

After a discharge takes place between the discharge elements of the arrester, it may be necessary to clean and readjust the arrester.

It is also desirable to enclose the discharge elements of the arrester so as to prevent or minimize the danger of igniting adjacent objects when a discharge occurs.

For this and other reasons it is desirable to surround the discharge elements with a cover and to make this cover transparent so that the conditions may be readily observed and also to make this cover removable so that adjustments may be

made when necessary and the interior thereof cleaned if necessary.

The discharge elements in the lightning arrester are enclosed or covered by an enclosure or cover 14. This cover is preferably made of refractory, non-ignitible material and also transparent. The material is, preferably, glass which affords an opportunity to observe the condition of the discharge element without disturbing any part.

In order to provide for the necessary removability in view of the extremely limited space available, notches as 15 and 16, in the specific form shown, have been formed on each of two sides of the cover 14. Two spring fingers, 17 and 18, have been provided for resting in the notches and holding the cover glass properly in place.

Each spring finger, as 17 and 18, is attached to a terminal connector, as 5. The spring finger, as 17, has a return loop, as 18', formed therein which is passed through slot 19 in the terminal connector. One leg of the return bend forms the finger 17. The other leg of the return bend is bent substantially at a right angle and lies along the face of a terminal, as 5, then is again bent at a right angle and passes through another slot 20 in the terminal and the end 21 thereof is then bent again at a right angle so that it lies parallel with the terminal connector.

The end 21 is not bent into contact with the terminal connector because a piece of refractory material, preferably mica 22, is interposed between the end 21 and the terminal connector 5. The plate of mica 22 extends from the terminal connector 5 to the terminal connector 6 and at both terminals the spring fingers, as 17 and 18, extend through and connect the mica plate, by means of the ends, as 21, to the terminal connectors so that the mica plate acts as a spacer to maintain the fingers, as 17 and 18, properly spaced one from the other so as to properly cooperate with the cover 14 and the notches 15 and 16. At the same time, electrical connection is not made between the terminals, as 5 and 6, because the spacer 22 is formed of a non-conducting material. The material is also non-combustible so that if the discharge within the cover is excessive it will in no case ignite the spacer 22.

The construction described permits the cover 14 to be properly and securely held in place enclosing the discharge elements of the arrester. At the same time, it permits an inspector to readily see the interior of the cover and, if conditions require, to readily remove the cover without disturbing the electric terminal connectors 5 and 6 or adjacent structure and this removal can be accomplished with facility, as it merely requires the placing of two fingers, one on either side of the cover, that is, the right and left sides as viewed in Fig. 1, and exerting a pull. The cover may be replaced with a like simple motion, that is a mere push.

A further advantage of the method used for securing the cover lies in the fact that the removal of the cover does not disturb the positioning of the discharge elements except to slightly loosen the tension by which they are held together. In short, the removal of the cover does not result in all of the small parts within the arrester falling into a heap even when the lightning arrester is not connected by its terminal connectors 5 and 6 to binding posts but especially when these terminal connectors are connected to binding posts for then the discharge parts of the arrester are but slightly disturbed by the removal of the cover, which is most important, because of the slight clearances between adjacent lightning arresters when they are placed in banks.

The form of construction above described not only provides for a means for holding the cover glass in place, but it also provides a means whereby pressure generated within the cover glass may be relieved, as the mica plate 22 does not completely close the end of the cover 14, and as on diagonally opposite corners of the cover glass grooves 23 are formed which are not closed by the terminal connectors 5 and 6 and the mica spacer 22. If, upon a discharge of lightning, there is a pressure created within the glass, it may be readily relieved.

Although I have particularly described one particular physical embodiment of my invention and explained the operation, construction, and principle thereof, nevertheless, I desire to have it understood that the form selected is merely illustrative, but does not exhaust the possible physical embodiments of the idea and means underlying my invention.

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

1. A lightning arrester, including, in combination; an electrical conducting terminal connector extending in one direction; an electrical isolated conducting terminal conductor extending in an opposite direction; means interposed between said terminals for facilitating an electric discharge therebetween; a cover surrounding said last named means and limiting said terminals against sidewise movement away from each other; an insulating spacer extending between said terminal connectors; spring fingers, one associated with each terminal connector, each spring finger cooperating with its associated terminal connector attaching the adjacent end of the spacer to the connector and with the cover to hold it in place.

2. A lightning arrester, including, in combination; two electrically isolated spaced electrical conducting terminal connectors; electrical discharge elements interposed between said connectors adapted to allow a discharge therebetween; a transparent cover surrounding said discharge elements and portions of the terminal connectors and limiting sidewise separation thereof and provided with depressions for receiving spring fingers; spring fingers, one associated with each terminal connector, each spring finger having a portion positioned to engage with a notch of the cover and provided with means at its other end for attachment to a terminal connector; a non-conducting spacer interposed between the terminal connectors and attached to each terminal connector by means of material of the adjacent spring finger.

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