Sept. 3, 1929. W. L. COOK 1,726,807

DISCHARGE BLOCK

Filed May 1, 1924

Fig. 1

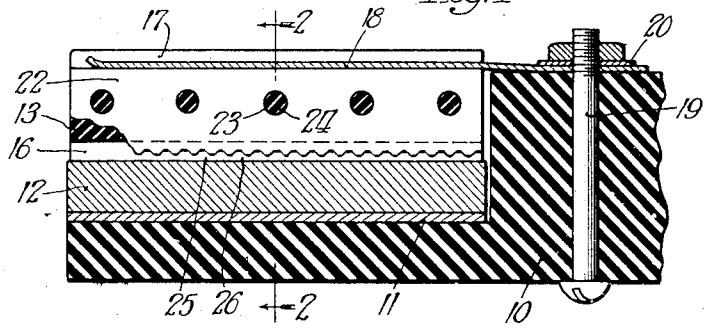


Fig. 2

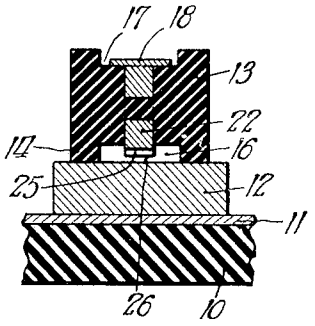


Fig. 3

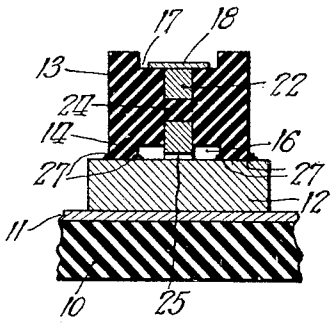


Fig. 4

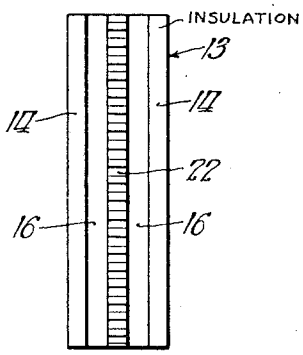
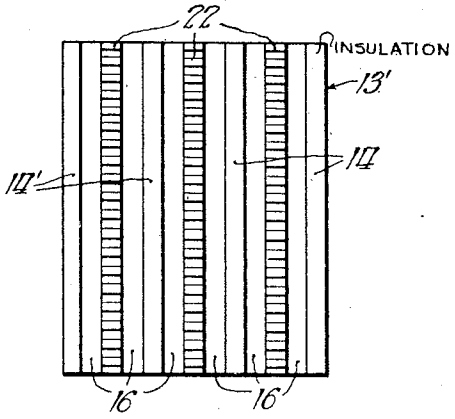


Fig. 5



Inventor
Wallace L. Cook
by Ulay & Dabl Atty

Patented Sept. 3, 1929. 1,726,807

UNITED STATES PATENT OFFICE.

WALLACE L. COOK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE RELIABLE ELECTRIC CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DISCHARGE BLOCK.

Application filed May 1, 1924. Serial No. 710,281.

My invention relates to lightning arresters and more particularly to a discharge block for lightning arresters.

It is a purpose of the invention to provide a new and improved discharge block for a lightning arrester which comprises a saw-tooth edged member or other member having sharp projections thereon that is placed in close proximity to a ground plate or block of conducting material connected with the ground, and to provide new and improved means for mounting the same in an insulating supporting member. Said member having the plurality of projections or discharge points thereon is preferably molded in the insulating material in any suitable manner as by providing openings in the conducting member having the discharge points into which the insulating material enters when the device is molded to firmly hold the conducting member in position in the insulating material.

It is another purpose of the invention to provide an insulating mounting for a conducting member which is provided with means for spacing the conducting member with its discharge points at a predetermined distance from the ground plate or block and with means for receiving a holding member such as a spring to hold the insulating member and the conducting member in a predetermined relationship relative to the ground plate or block and to prevent lateral shifting of the insulating member relative to said ground plate.

It is still a further purpose of the invention to provide an insulating mounting for the conducting member having the discharge points which has the property of becoming somewhat plastic upon heating thereof so that the pressure of the holding spring thereon will cause the same to be somewhat flattened to thereby bring the conducting member having the discharge points into positive grounding engagement with the conducting member mounted on the ground plate so as to insure absolute discharge to the ground through said conducting member and said ground plate. The insulating member is preferably provided with flanges that engage with the conducting member connected with the ground so that said flanges will be readily distorted and thus shortened due to pressure of the holding spring on the insulating member when heated to provide a positive grounding connection as referred to above. Such heating, of course, takes place when a discharge of lightning occurs through the device.

Any number of conducting discharge members may be provided, the one device being shown in the drawings as having a single discharge member and in another form a plurality of discharge members is shown.

Other objects and advantages of the invention will appear as the description of the accompanying drawings proceeds. However, I desire to have it distinctly understood that I do not intend to limit myself to the exact details shown or described but that I intend to include as part of my invention all such obvious changes and modifications of parts as would occur to a person skilled in this art and as would fall within the scope of the claims.

In the drawings:

Fig. 1 is a transverse section partly broken away of a supporting member showing my improved discharge block mounted thereon in co-operative relationship with a ground plate and a conducting material block mounted thereon;

Fig. 2 is a section taken on the line 2—2 of Fig. 1, partly broken away;

Fig. 3 is a similar section showing the position of the parts after heating;

Fig. 4 is a bottom plan view of the discharge block shown in Figs. 1 to 3 inclusive; and

Fig. 5 is a similar view of a slightly modified form of the device.

Referring in detail to the drawings, a supporting member of any form of insulating material 10 is shown in Fig. 1 to Fig. 3 inclusive upon which is mounted a ground plate 11 and co-operating with said ground plate are carbon or other conducting material blocks, one only being shown in the drawings and being indicated by the numeral 12. With each of said blocks 12 a discharge block cooperates which forms the subject matter of the present invention.

The discharge block comprises a main body portion 13 of insulating material, said member 13 being provided with flanges 14. The flanges, it will be noted, define a recess 16 in one face of the block. The opposite face of the block 13 is provided with a longitudinally extending groove or recess 17 which is adapted to receive the holding spring 18 which is mounted on the member 10 by means of the bolt or other securing member 19 which also clamps said member 18 to a conducting strip 20 that leads to any suitable apparatus that

may be connected in circuit with the device. The holding member 18 is of spring metal and engages a discharge member 22 of conducting material mounted in the block 13. The member 22 is provided with a plurality of openings 23 and is molded in the block of conducting material 13 so that the material extends through the openings as indicated at 24 so as to key the conducting discharge member 22 in the block of insulating material 13. The discharge member 22 is provided with a plurality of discharge points which in the drawings are shown as being in the form of a sawtooth edged portion 25, the extreme outer edges or peaks 26 of said saw teeth being spaced a slight distance from the carbon block 12 in the normal position of the device, as will be clear from Fig. 2. Thus, the ordinary currents passing through the apparatus to which the spring 18 is connected will not discharge across the gap between the point of the saw teeth 26 and the carbon block 12. However, in the case of a lightning discharge or other high potential being applied to the apparatus, a discharge will occur across the gap from the saw teeth to the carbon block and as a result of said discharge a large amount of heat will be generated. Preferably, the member 13 is made of such non-conducting material that the same will melt somewhat or become somewhat plastic when such heating occurs. This will cause the flange portions 14 to be distorted or break down in the manner indicated in Fig. 3 by the numeral 27 and the flattening or shortening of the flanges 14 will continue to such an extent that the saw teeth 25 will finally engage firmly with the block 12 thus acting as a stop to limit the movement of the block 13, due to pressure of the spring 18 thereon, and when this occurs there will be a positive connection between the sawtooth discharge member and the ground plate 11 through the block 12, or, in other words, there will be a positive ground between the conducting strip 20 and the ground plate 11.

In Fig. 5 a slightly modified form of the device is shown, in which the insulating block 13′ is provided with flanges 14′ defining a recess 16′, said block having mounted therein a pluralitv of discharge plates or strips 22′ which are preferably sow-tooth edged and are mounted by molding in the said block in a similar manner to the strips 22.

It will be noted that by providing the discharge member 20 molded in the insulating block 13 a predetermined spacing between the saw-teeth points and the carbon or other conducting material block connected with the ground is obtained as the said members can be molded in the material with almost absolute accuracy as to the spacing thereof relative to the flanges 14 without any necessity of grinding any parts.

The material used for the discharge blocks may be of any suitable insulating composition which will soften when heated sufficiently to cause the action to take place which is illustrated in Fig. 3. A composition embodying shellac is preferably used.

Having thus described my invention, what I desire to claim and secure by United States Letters Patent is:

1. In a device of the character described, a support, a grounded conducting member mounted thereon, and a discharge block cooperating therewith, said discharge block comprising an insulating member of material becoming plastic when heated above a predetermined temperature and a conducting discharge member moulded in said insulating member, said insulating member carrying and supporting said discharge member in spaced relation to said grounded member, said discharge member having a plurality of discharge points spaced a predetermined distance from said grounded conducting member when said insulating member is in engagement therewith and having openings therein into which the material of said insulating member extends to hold said discharge member in fixed position in said block.

2. In a device of the character described, a support, a plane faced grounded member of conducting material mounted thereon, a discharge block comprising a body portion of insulating material, a conducting discharge member carried by said body portion and normally held in spaced relation to said grounded member, and means for clamping said discharge block in engagement with said grounded member, said insulating body portion having spaced supporting flange portions on opposite sides of the discharge member engaging the plane face of said grounded member yieldable under the influence of said clamping means at a temperature above normal atmospheric temperature.

3. In a protective device of the character described a discharge block comprising a rectangular body portion of insulating material becoming plastic when heated above a predetermined temperature, and having grooves in two opposing sides thereof, a conducting discharge member moulded in said body portion having opposite side edges exposed in said grooves, one of said edges extending into one of said grooves and spaced from the top thereof whereby said body portion serves as means to space the discharge edge from a grounded surface and as a protecting means for said edge.

4. In a device of the character described a support, a grounded member of conducting material mounted thereon, a discharge block comprising a body portion of insulating material, becoming plastic when heated above a predetermined temperature, in contact with said grounded member and having a groove in the face thereof adjacent said grounded

member and a conducting discharge member mounted in said body portion having a portion thereof extending into said groove but normally spaced from said grounded member and means mounted on said support for pressing said discharge block against said grounded member, the groove in said body portion being open to atmosphere to allow escape of the gas therein when it is expanded by the rise in temperature and the electric discharge.

5. In a device of the character described a grounded member, a discharge member cooperating therewith comprising a body portion of insulating material which becomes plastic when heated above a pre-determined temperature and a conducting member moulded in said body portion and protected thereby, means contacting with said body portion and conducting member for pressing the body portion against said grounded member, said body portion normally holding said conducting member in spaced relation to said grounded member and distorting out of its normal shape when heated above a predetermined temperature under the pressure of said contacting means to bring said conducting member into engagement with said grounded member.

In witness whereof, I hereunto subscribe my name this 17th day of March, A. D. 1923.

WALLACE L. COOK.