No. 878,646. PATENTED FEB. 11, 1908.

F. M. LOCKE.

HIGH POTENTIAL INSULATOR.

APPLICATION FILED APR. 18, 1904.

Fig. 1.

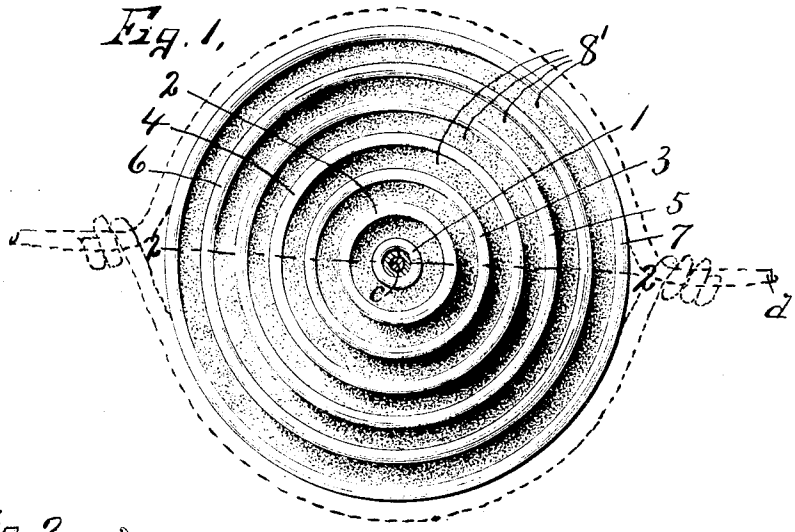


Fig. 2.

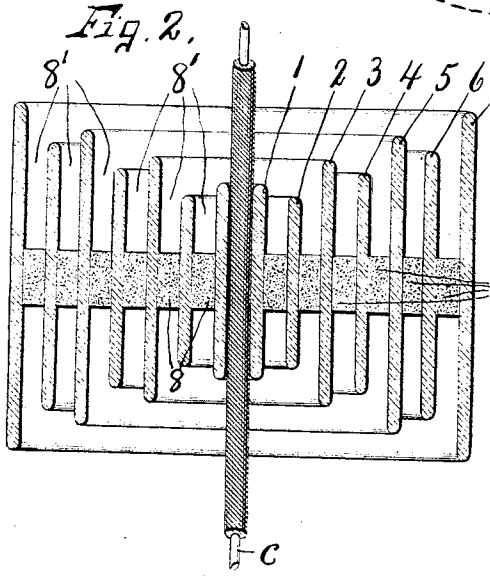


Fig. 3.

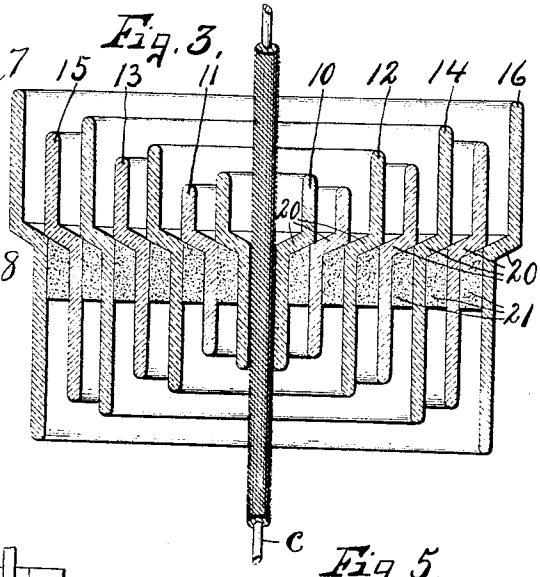


Fig. 4.

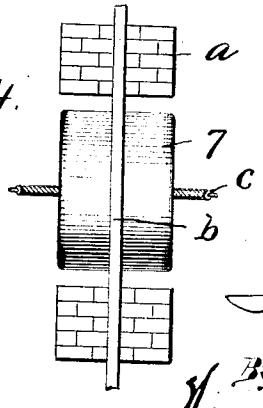
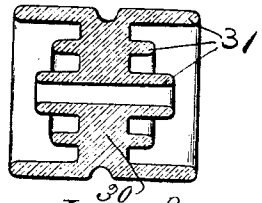


Fig. 5.



Witnesses:
J. E. Arthur,
B. E. Robinson.

Inventor:
Fred M. Locke,
By
Howard P. Denison
Attorney.

UNITED STATES PATENT OFFICE.

FRED M. LOCKE, OF VICTOR, NEW YORK.

HIGH-POTENTIAL INSULATOR.

No. 878,646. Specification of Letters Patent. Patented Feb. 11, 1908.

Application filed April 18, 1904. Serial No. 203,767.

To all whom it may concern:

Be it known that I, FRED M. LOCKE, of Victor, New York, in the county of Ontario, in the State of New York, have invented new and useful Improvements in High-Potential Insulators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to an improved high potential insulator which is especially useful in supporting and insulating electric conductors at points where they pass through walls and partitions and in other places where it is necessary to build up the insulation to meet the requirements of insurance underwriters or to reduce the liability of accident from short circuits or static discharges.

My object therefore is to concentrically combine a series of tubes or rings of insulating material of different diameters and lengths so as to form intervening annular spaces between the ends of adjacent rings, and to arrange the several rings so as to make the arcing distance between the extremities of adjacent rings greater than the distance directly across the intervening space.

Another object is to maintain the several rings in fixed relation to each other by interposing comparatively narrow rings of cement or similar insulating material in the intervening annular spaces and substantially midway between the ends of the insulator rings proper.

Other objects and uses will appear in the following description.

In the drawings—Figure —1— is an end view of my improved insulator. Fig. —2— is a sectional view taken on line 2—2 Fig. —1—, showing a conductor through the inner ring. Fig. —3— is a sectional view similar to Fig. 2 showing slightly modified form of rings. Fig. 4 is a side view on a reduced scale of the insulator seen in Fig. —1— shown as mounted in a wall. Fig. 5 is a sectional view of a slightly modified form of my invention.

Similar reference characters indicate corresponding parts in all the views.

In carrying out the object stated, I provide any number of tubes or rings of insulating material of different diameters and lengths, the number and sizes depending upon the amount of insulation required, and their rings are then selected and assembled concentrically around the smaller or center ring so as to leave intervening annular spaces between the sides of adjacent rings, while alternate rings gradually increase in length from the center outwardly, but those of one alternating set are shorter than the adjacent rings of the other set for the purpose of increasing the arcing distance between the extremities of the rings. For example I have shown in Figs. —1— and —2— an insulator composed of seven concentric tubes or rings of insulating material which gradually increase in diameter from the center outwardly and are numbered respectively from 1 to 7 inclusive. These rings are fastened together substantially midway between their ends by suitable bonds —8— of cement or other insulating material, which constitute comparatively narrow annular separators 8 to hold the rings in fixed relation to each other, and to form a series of intervening annular spaces —8′— between opposite ends of the rings at opposite ends of the separators the opposite ends of the rings forming annular flanges.

For the purpose of description the rings may be divided into two sets, those of one set, as the rings 1, 3, 5, and 7, alternating with those of the other set as the rings 2, 4, and 6 but each of the rings of the latter set is shorter axially than the adjacent rings of the other set, that is, the flanges or ends of the rings terminate in different planes so that the arcing distance between the extremities of adjacent rings, where the current or static discharge is most liable to occur is greater than the distance directly across the intervening space from one ring to the other and this reduces the liability of lateral discharge or short circuit of the current from the conductor.

The rings of each set gradually increase in length from the center outward and inasmuch as the conductor is supported on either the center or on the outer ring it is apparent that any leakage or lateral discharge of the current must, if at all, pass in tortuous paths from one ring to the other across the entire intervening space which is an improbable condition and therefore the dielectric properties of the insulator are not only materially increased and the insulator made comparatively light, but it is capable of being built up to any desired current resisting power by the simple addition of one or more rings.

The rings seen in Figs. 1 and 2 are of uniform diameter and thickness from end to end but this construction is not essential as in some instances it may be preferable to enlarge corresponding ends as seen in Fig. 3, in which I have shown a series of rings, numbered from 10 to 16 inclusive arranged concentrically as in Fig. 2, but each is offset at —20— intermediate its ends to make one end larger than the other and also to form an abutment for the separators or cement bonds as —21— which unite the rings to each other and also hold them at the desired distance apart.

In Fig. 4 I have shown my improved insulator as mounted in a wall or partition —*a*—, of a building and supported by a brace "*b*" and the conductor as "*c*" as passing through the center ring —1— but it is obvious that the conductor may be secured to the periphery of the outer ring —7— and the support or another conductor may be passed through the center ring, as shown by dotted lines in Fig. 1 in which "*d*" represents the second conductor or support. These insulator rings may be assembled in any suitable manner as for instance, placing them upon a suitable form in the order desired and so that a part of the form will constitute a backing or abutment for receiving the cement separators after which this cement or equivalent bond is mechanically applied in the intervening spaces and pressed into a compact homogeneous mass to the desired thickness and then left to set after which the completed insulator is removed and is ready for use.

In Fig. —5— I have shown an insulator having a central web —30— and end skirts or annular flanges —31— of unequal lengths projecting from the opposite faces of the web but this construction is to be used only for the smaller sizes of insulators, although the general objects are the same as for the forms previously described.

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

1. A wall insulator having at each end a series of flanges spaced apart forming a series of intervening spaces the center flanges projecting axially beyond the ones next to them.

2. A wall insulator comprising concentric tubes of unequal lengths, each of said tubes provided with an abutting offset, spacing rings between the intermediate portions of and of less length than the tubes.

3. A wall insulator comprising concentric tubes of insulating material spaced apart, spacing rings between said tubes holding them apart, said tubes being of greater length than the spacing rings and the center tube being of greater length than the one surrounding it, and provided with a central lengthwise opening therethrough for receiving an electric conductor and each of said tubes provided with an abutting offset.

4. A wall insulator having at each end a series of annular flanges spaced apart forming intervening annular spaces and terminating at different distances from their junction one with the other, alternate flanges from the center outward being of greater length than the intervening flanges.

5. A wall insulator comprising concentric tubes of insulating material having their ends spaced apart at one end forming intervening annular spaces, the center tube projecting beyond the one next to it and the outer tube projecting beyond one end of the first named tubes, said center tube having a lengthwise opening therethrough for receiving an electric conductor.

6. A wall insulator comprising concentric rings having their ends spaced apart and terminating in different transverse planes, alternate tubes being shorter than the ones next to them.

7. A wall insulator comprising concentric tubes having their ends spaced apart and terminating in different transverse planes, spacing rings between the intermediate portions of and of less length than the tubes, alternate tubes gradually increasing in length from the center outward.

8. A wall insulator comprising concentric tubes, spaced apart and terminating at one end in different transverse planes, one end of the center tube projecting beyond the adjacent end of the tube which surrounds it, and having a lengthwise opening for receiving an electric conductor.

9. A wall insulator comprising a central tube having a lengthwise opening therethrough from end to end for receiving an electric conductor, a second tube surrounding the center tube and having its ends spaced apart therefrom and of less length than said center tube, a third tube surrounding the second tube and having its ends spaced apart therefrom and projecting beyond the ends of the first and second tubes.

10. A wall insulator comprising a series of concentric tubes of greater diameter at one end than at the opposite end, each of said tubes provided with an abutting offset, spacing rings between the intermediate portions of and of less length than the tubes and contacting said offsets, the center tube having a lengthwise opening therethrough from end to end for receiving an electric conductor, alternate tubes gradually increasing in length from the center outward.

11. A wall insulator composed of a series of telescoping tubes united intermediate their ends and spaced apart at both ends forming intervening spaces the center tube being longer than the one next to it.

12. A wall insulator comprising concentric tubes having their ends spaced apart and

terminating in different transverse planes, each of said tubes provided with an abutting offset, spacing rings between the intermediate portions of and of less length than the tubes and contacting said offsets, alternate tubes being shorter than the ones next to them.

13. A wall insulator comprising concentric tubes spaced apart and at one end in different transverse planes, each of said tubes provided with an abutting offset, spacing rings between the intermediate portions of and of less length than the tubes and contacting said offsets, one end of the center tube projecting beyond the adjacent end of the tube which surrounds it, and having a lengthwise opening for receiving an electric conductor.

14. A wall insulator comprising a series of concentric tubes of insulating material, each of said tubes provided with an abutting offset, spacing rings between the intermediate portions of and of less length than the tubes and contacting said offsets and the ends of said tubes terminating in different transverse planes.

In witness whereof I have hereunto set my hand this eleventh day of April 1904.

FRED M. LOCKE.

Witnesses:

W. A. HIGINBOTHAM,

C. A. MOORE.