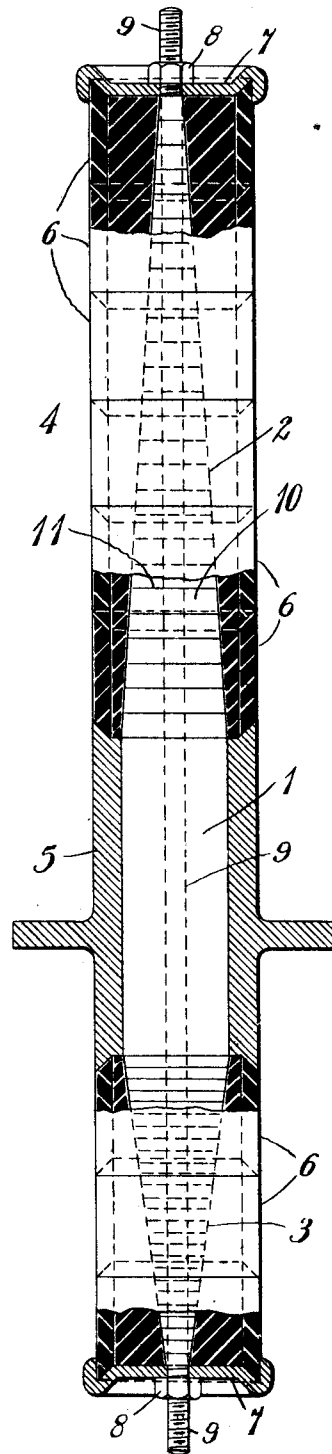


F. W. HARRIS.
 INSULATING STRUCTURE.
 APPLICATION FILED JAN. 7, 1911.

1,129,486.

Patented Feb. 23, 1915.



WITNESSES:

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INSULATING STRUCTURE.

1,129,486.

Specification of Letters Patent.

Patented Feb. 23, 1915.

Application filed January 7, 1911. Serial No. 601,401.

To all whom it may concern:

Be it known that I, FORD W. HARRIS, a citizen of the United States, and a resident of Wilksburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Insulating Structures, of which the following is a specification.

My invention relates to insulating bodies for use with electric apparatus and it has special reference to such insulating sleeves or bushings as are utilized with very high-voltage transformers and other electric devices inclosed in metal tanks or casings.

The object of my invention is to provide an insulating body of the aforesaid character, which shall be capable of sustaining or withstanding a high voltage, relative to the amount of insulating material employed in its structure and which, at the same time, shall be suitable for operation out of doors or under other adverse conditions.

In order to accomplish the aforesaid objective results, I utilize a bushing of the so-called condenser type, which is composed of alternate layers of insulating and conducting materials and is substantially cylindrical in form. The cylindrical body of the insulator is surrounded by a close-fitting metal sleeve and its ends, which are tapered, are inclosed in segmental sleeves, preferably composed of a series of porcelain rings which are cemented together and to the metal sleeve.

The single figure of the accompanying drawings is a sectional elevation of an insulating bushing constructed in accordance with my invention.

Referring to the drawing, a cylindrical bushing having a body 1, and gradually tapering ends 2 and 3 is entirely inclosed in a sleeve or jacket 4. The jacket 4 comprises a sleeve or bushing 5 which is preferably made of metal and fitted closely onto the cylindrical body 1 of the main bushing, a plurality of rings or short sleeves 6 of porcelain or other similar insulating material, and metal caps 7. The rings 6 and the sleeve 5 have cooperating beveled edges and are assembled end to end to constitute a hollow cylindrical jacket of substantially the same length as the main bushing. The parts of the sleeve or jacket are cemented together and are held in place by the caps 7 which are fitted onto the end rings. The caps are

drawn toward each other by a metal rod or bar 9 which extends entirely through the main bushing and is screw-threaded at its ends to receive binding nuts 8. The rod or bar 9 may be replaced by a tube of suitable material and constitutes a conducting lead, to the respective ends of which electric line conductors may be connected.

The space within the sleeve 4 is filled with insulating gum or some other suitable airtight sealing compound in order to hermetically seal the exposed edges of the insulating and conducting layers of the main bushing and thereby render it free from deterioration.

The main bushing itself is preferably of the condenser type and is built up of alternate layers 10 and 11 of insulating and conducting materials, as set forth in Patent No. 952,513, granted March 22, 1910, to the Westinghouse Electric & Manufacturing Company, on an application filed July 5, 1907, by James C. Dow.

In bushings that are to be utilized for high voltage service, it may be economical to use cylindrical envelops for the tapered ends 2 and 3 of the body 1, as shown in the drawing, because, in this manner, varying thicknesses of dielectric material may be disposed adjacent to the otherwise exposed edges of the several conducting layers of the bushing. The exposed edges of the conducting cylinders, which are of smallest diameter and nearest to the electrical conductor to be insulated, are embedded in dielectric material of sufficient thickness to preclude corona discharges therefrom under certain maximum potentials. At the same time, the edges of the remaining conducting layers are also embedded in dielectric material of adequate thickness. In view of the aforementioned insulating qualities and the ease of assembling and the low cost of supplying insulating rings 6 which are of substantially the same dimensions, it is preferable to supply cylindrically-shaped insulating envelops for the tapered ends of the body 1.

Variations in size and arrangement of parts may, of course, be effected within the spirit and scope of my invention.

I claim as my invention:

1. A terminal bushing for electric circuits comprising a tubular body having a substantially cylindrical portion and tapered

ends and composed of alternate layers of insulating and conducting materials, a sleeve fitted upon the cylindrical portion of the body, insulating rings assembled end to end as extensions of the sleeve, metal caps for the outer rings and means for clamping the sleeve rings and caps together.

2. A terminal bushing for electric circuits comprising a tubular body having tapered ends and a substantially cylindrical intermediate portion, a sleeve fitted upon the cylindrical portion of the body, insulating rings assembled end to end around each tapered portion of said body, metal end caps for the outer insulating rings and means for drawing the caps toward each other to hold the insulating rings in position.

3. An insulating bushing comprising a body having a substantially cylindrical portion and tapered ends and composed of alternate layers of insulating and conducting materials, a plurality of insulating rings superposed upon one another to constitute an envelop for each tapered end of said body, an insulating compound interposed between said rings and said body to seal hermetically

the exposed edges of the insulating and conducting layers of the body, metal caps engaging the outer rings of each envelop, and means for clamping said rings and caps together.

4. An insulating bushing comprising a body having a substantially cylindrical portion and tapered ends and composed of alternate layers of insulating and conducting materials, a plurality of insulating rings of equal diameter superposed upon one another to constitute a cylindrical envelop for each tapered end of said body, an insulating compound interposed between said rings and said body to seal hermetically the exposed edges of the insulating and conducting layers of the body, metal caps engaging the outer rings of each envelop, and means for clamping said rings and caps together.

In testimony whereof, I have hereunto subscribed my name this 3rd day of Jan. 1911.

FORD W. HARRIS.

Witnesses:

WILSON L. WRIGHT,
B. B. HINES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."