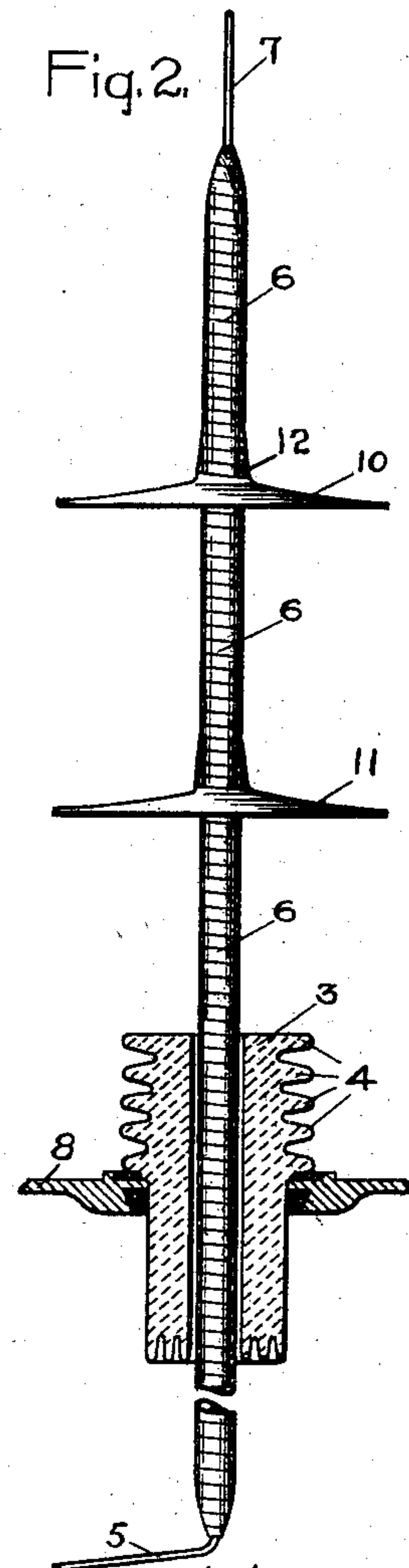
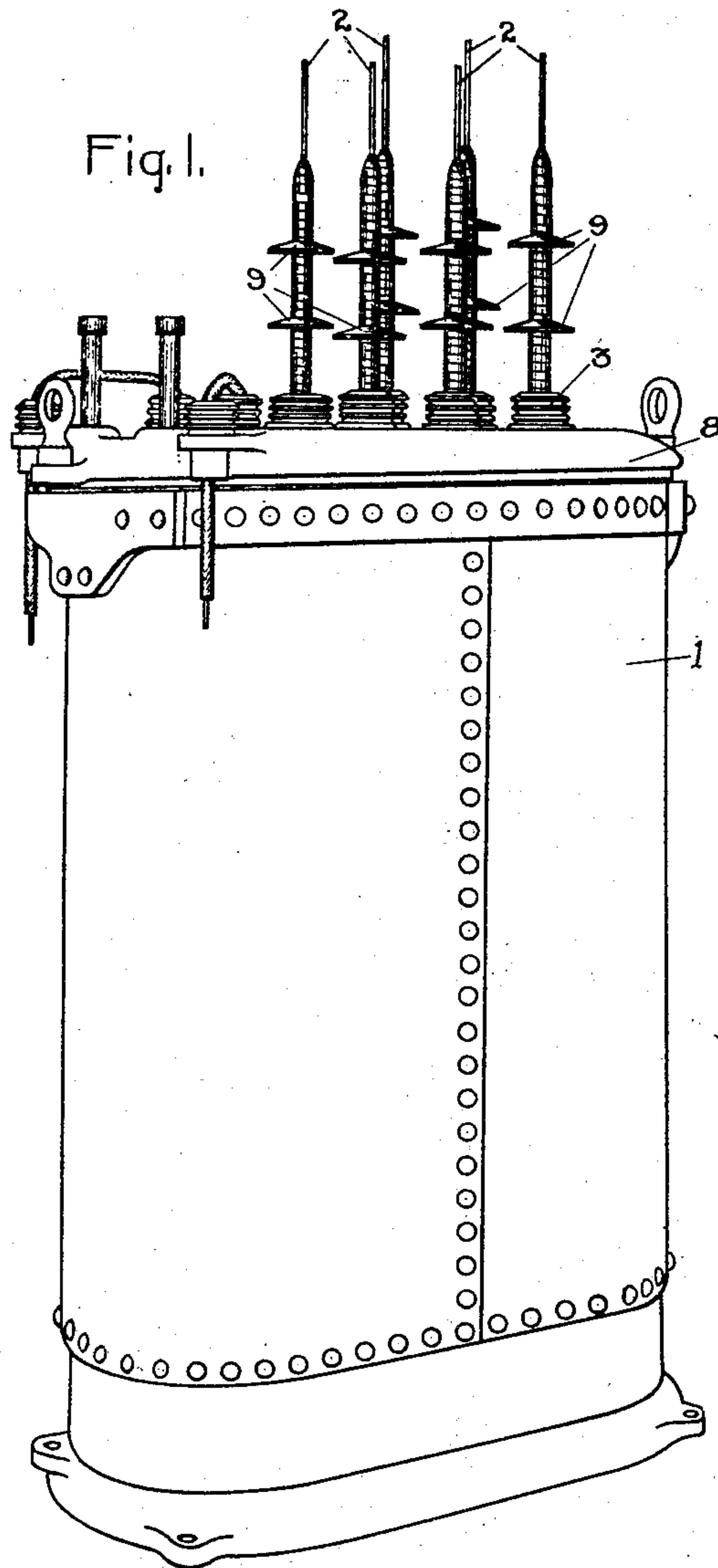


No. 719,600.

PATENTED FEB. 3, 1903.

W. S. MOODY.
INSULATING HIGH POTENTIAL APPARATUS.
APPLICATION FILED JULY 19, 1902.

NO MODEL.



WITNESSES:

W. L. Chapman
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UNITED STATES PATENT OFFICE.

WALTER S. MOODY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

INSULATING HIGH-POTENTIAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 719,600, dated February 3, 1903.

Application filed July 19, 1902. Serial No. 116,284. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. MOODY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Insulating High-Potential Apparatus, (Case No. 2,957,) of which the following is a specification.

Static discharges taking place from the surface of the insulation of high-potential apparatus—such, for example, as high-voltage transformers—frequently operate to reduce the effectiveness of the insulation by affording a conducting-path for the formation of an arc between exposed portions of the apparatus between which a high difference of potential may exist, as between an exposed transformer-terminal and the transformer-casing, the arc traversing the static or brush discharge produced on the surface of the insulation on the terminal. I have found that this objectionable result may be prevented by interposing barriers of insulating material in the path which would otherwise be followed by the arc, these barriers acting to interrupt the continuity of the brush discharge, and therefore the continuity of the conducting-path afforded by it.

The features of novelty which I believe are characteristic of my invention I have endeavored to point out with particularity in the appended claims, while the invention itself will be made clear as to its practical application by reference to the following description, which is to be taken in connection with the accompanying drawings, in which—

Figure 1 represents the application of my invention to a high-potential transformer for transforming alternating current of one voltage into alternating current of a different voltage, and Fig. 2 is a detailed view of a portion of the apparatus shown in Fig. 1.

The drawings are intended to illustrate one of the numerous ways in which my invention may be utilized in practice. My invention is therefore not to be considered as limited to the particular arrangement shown, but as capable of embodiment in many other forms than the particular one given as an illustration.

In the drawings the outside iron casing con-

taining the transformer proper is indicated at 1, the transformer being mounted within this casing and surrounded by insulating fluid, such as oil. The terminals extending from the windings of the transformer in the present instance happen to be six in number and are represented at 2. As the invention is concerned more particularly with the insulation of these terminals, no further description of the transformer itself is necessary. Each of these terminals projects through the cover of the transformer-casing and is insulated therefrom by a porcelain bushing 3, the construction of which is clearly indicated in cross-section in Fig. 2. The exposed surface of the porcelain bushing is corrugated, as at 4, in order to increase the surface of the bushing, and thereby present more opposition to the leakage of current along its surface.

The conducting portion of each terminal consists of a conductor, (indicated at 5,) the exposed portion of the conductor being wound with layers of insulating-tape, each layer being varnished and the varnish permitted to dry before the next layer is added. The length of the insulation thus added to the conductor may be considerable and may extend outward from the cover of the transformer for several feet.

Where excessively-high differences of potential exist between the terminal and the transformer-casing, which is usually grounded, the brush discharge, which is set up by induction on the outer surface of the insulation 6, may so far reduce the opposition to flow of current as to permit arcs to take place from the exposed portion of the terminal at 7 along the surface of the insulated terminal to the cover 8 of the transformer-casing. The arc may on occasions be five or six feet in length, so that the thickness and strength of the insulation on the terminal has practically no effect in preventing the striking of the arc. I have found, however, that if the brush discharge, which affords a relatively easy path for the arc, has its continuity interrupted at one or more points the arcing does not take place. The means whereby I thus interrupt the continuity of the brush discharge consists of one or more disks of

soft rubber, fiber, or the like slipped over the insulation on the terminal and the joint between the disk and such insulation carefully insulated. Disks of the character mentioned
 5 are shown in position on the transformer at 9, for example, in Fig. 1, and in an enlarged view at 10 and 11, Fig. 2. Where disks of soft rubber are used, the central opening is made somewhat smaller in diameter than the
 10 outside diameter of the insulation 6, so that when they are forced over the insulation the edge of the inner opening is stretched and forms a somewhat flange-like connection with the terminal insulation 6, as indicated at 12.
 15 The flange-like projection formed by the stretched inner edge of the disk is then carefully wound over with tape and the whole thoroughly varnished. If fiber disks are employed, the slight opening between the inner
 20 edge of the disk and the insulation of the terminal 6 is filled up by insulation forming fillets between the disk and the terminal.

The brush discharge set up by the excessively-high voltages extends outward from the
 25 terminals of the apparatus a given distance, so that when the disks of insulating material, such as 10 and 11, are of sufficient diameter to extend beyond the limits of the brush discharge the continuity of this discharge is in-
 30 terrupted, thereby preventing the arcing otherwise liable to happen.

It may happen that the transformer or other apparatus is not subject to the troubles mentioned while in normal operation; but in case

extraordinary differences of potential are apt
 35 to rise from any cause the use of the means above described for preventing arcing may in such emergencies be found exceedingly valuable and is of course of great utility where
 40 the normal voltages are of such character as to render the use of some such arc-preventing means desirable.

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

1. The combination with a conductor forming part of a high-potential electrical apparatus, of insulating material formed about and extending along said conductor, and a disk or disks of insulating material mounted
 45 thereon. 50

2. The combination with a terminal of a high-potential electrical apparatus, of insulating material placed upon and extending along said terminal, and means for interrupting the continuity of a brush discharge taking
 55 place from the surface of said insulating material.

3. The combination with a conductor forming part of a high-potential apparatus, of insulation thereon, and means for interrupting
 60 the continuity of an electric discharge taking place from the surface of said insulation.

In witness whereof I have hereunto set my hand this 17th day of July, 1902.

WALTER S. MOODY.

Witnesses:

BENJAMIN B. HULL,
 HELEN ORFORD.