

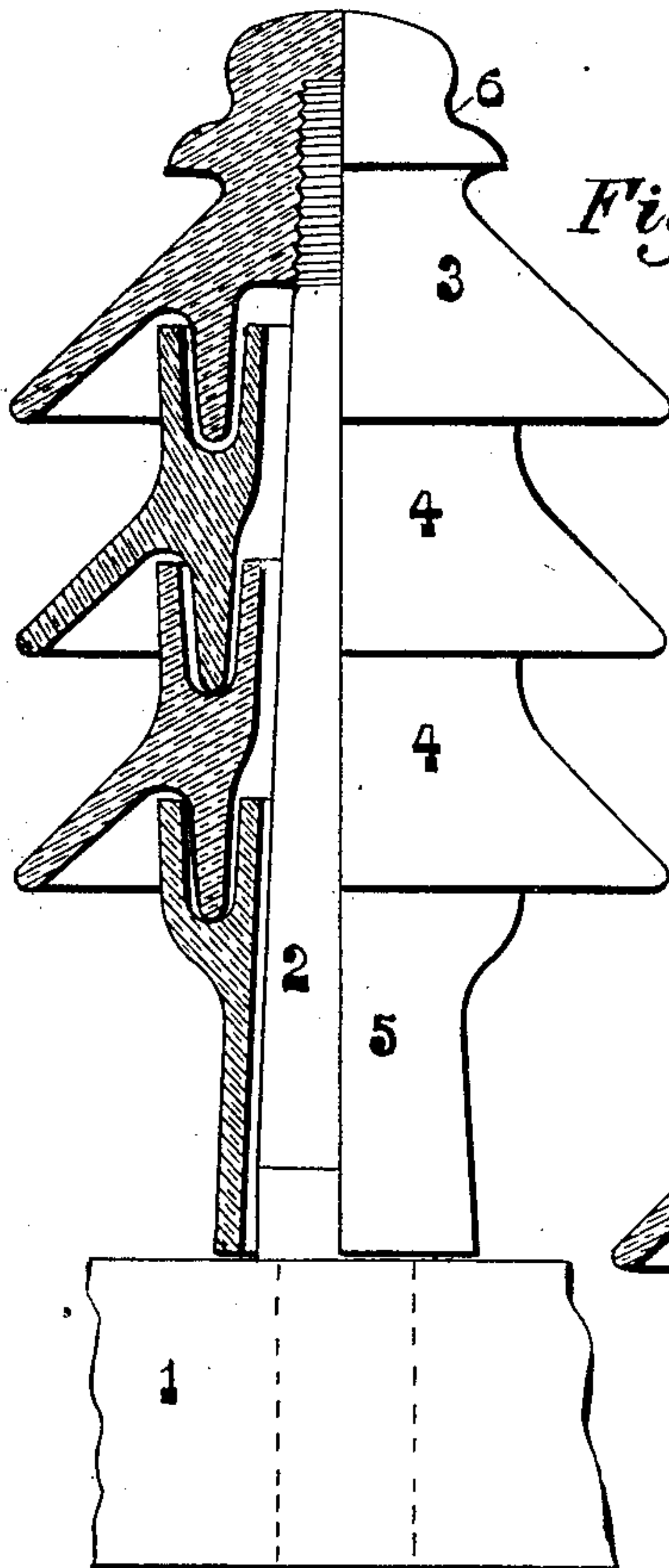
No. 701,847.

Patented June 10, 1902.

V. G. CONVERSE.  
INSULATOR.

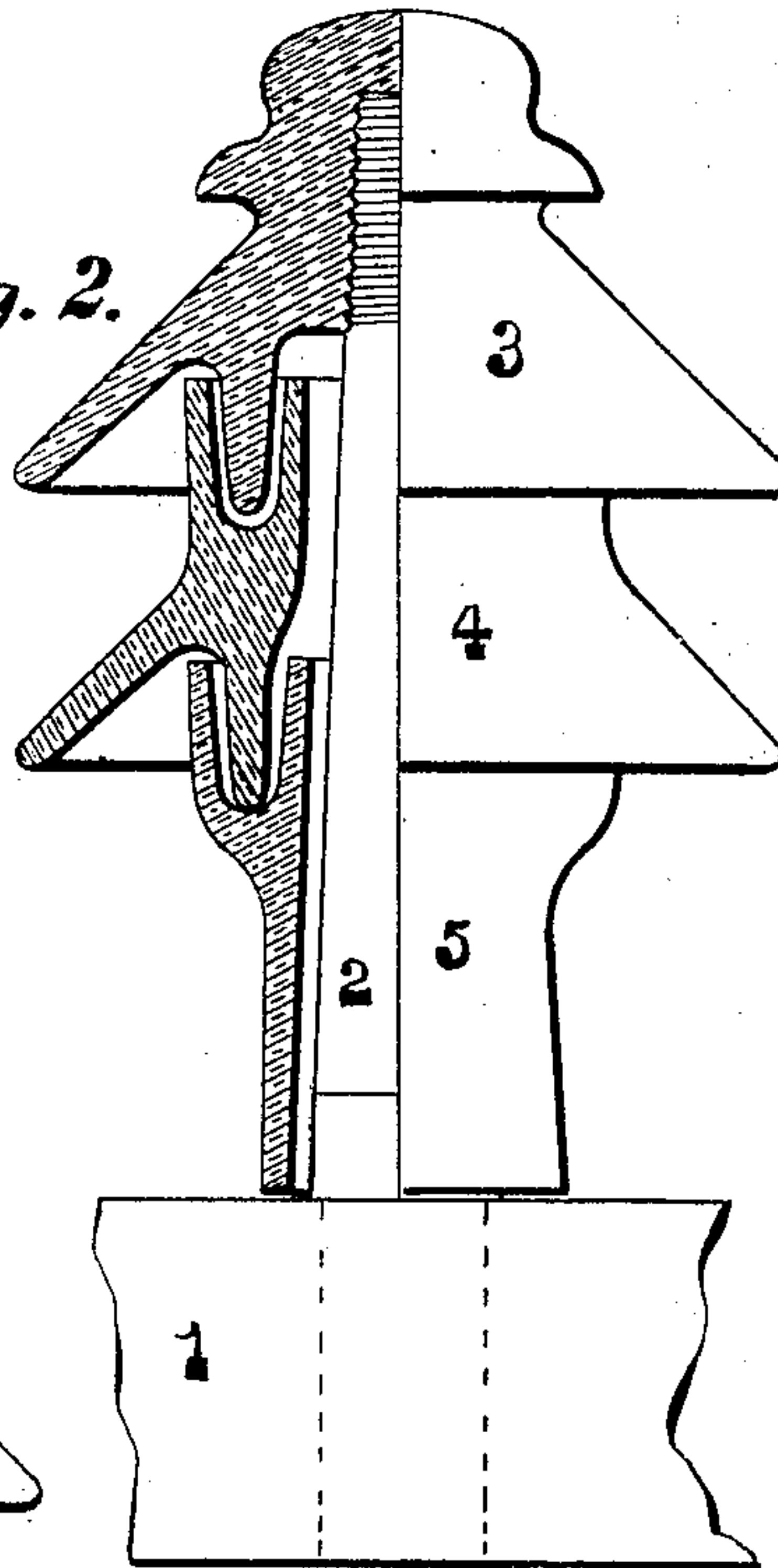
(Application filed Aug. 2, 1901.)

(No Model.)

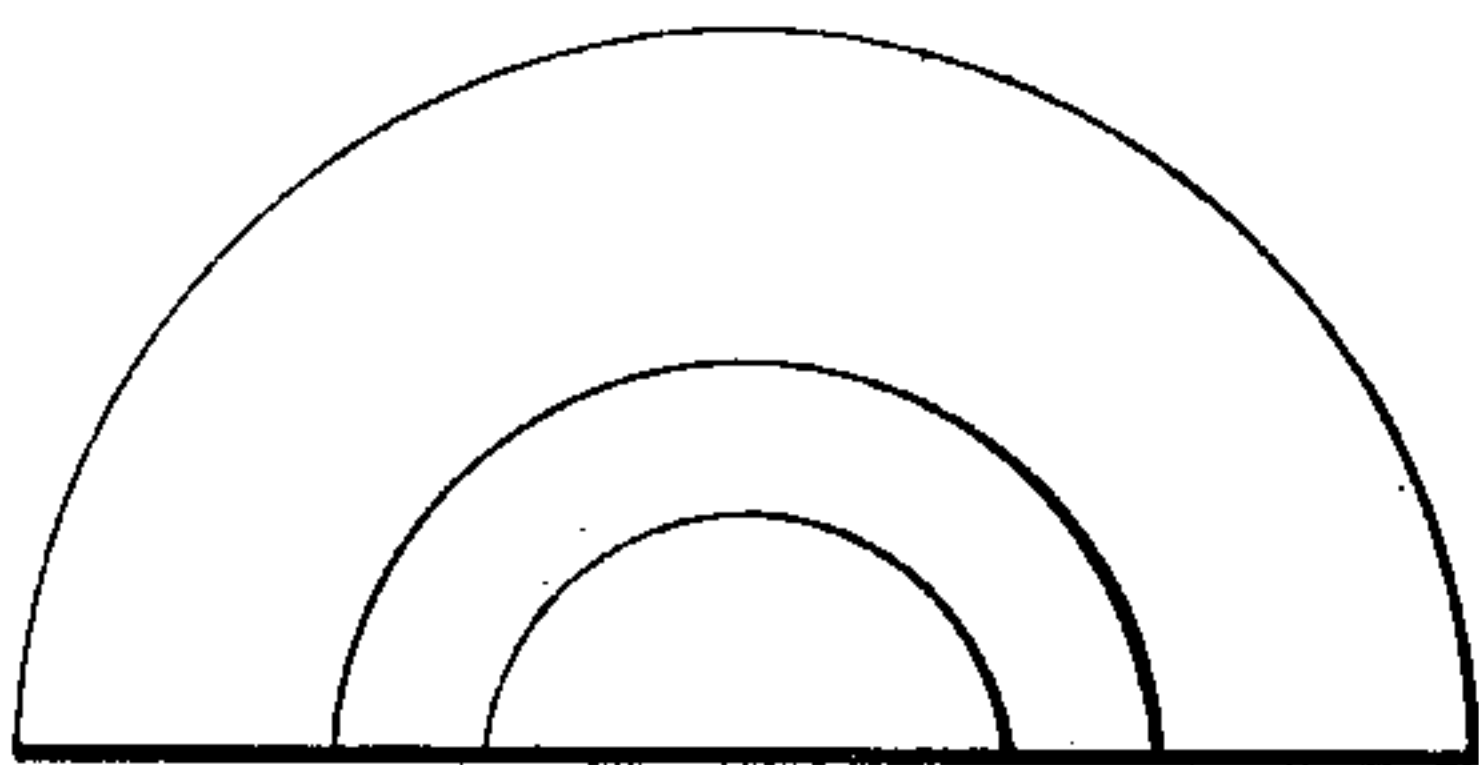
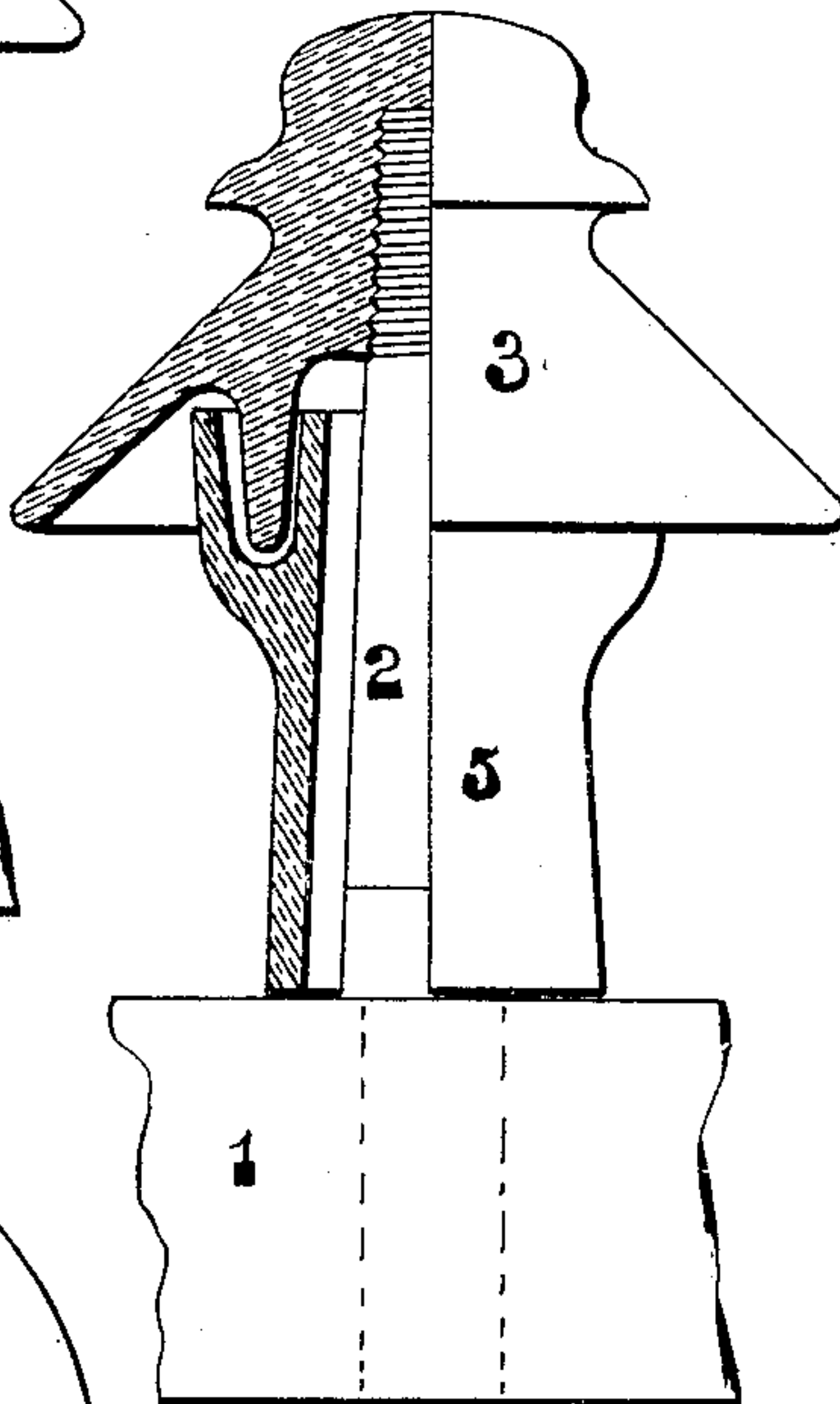


*Fig. 1.*

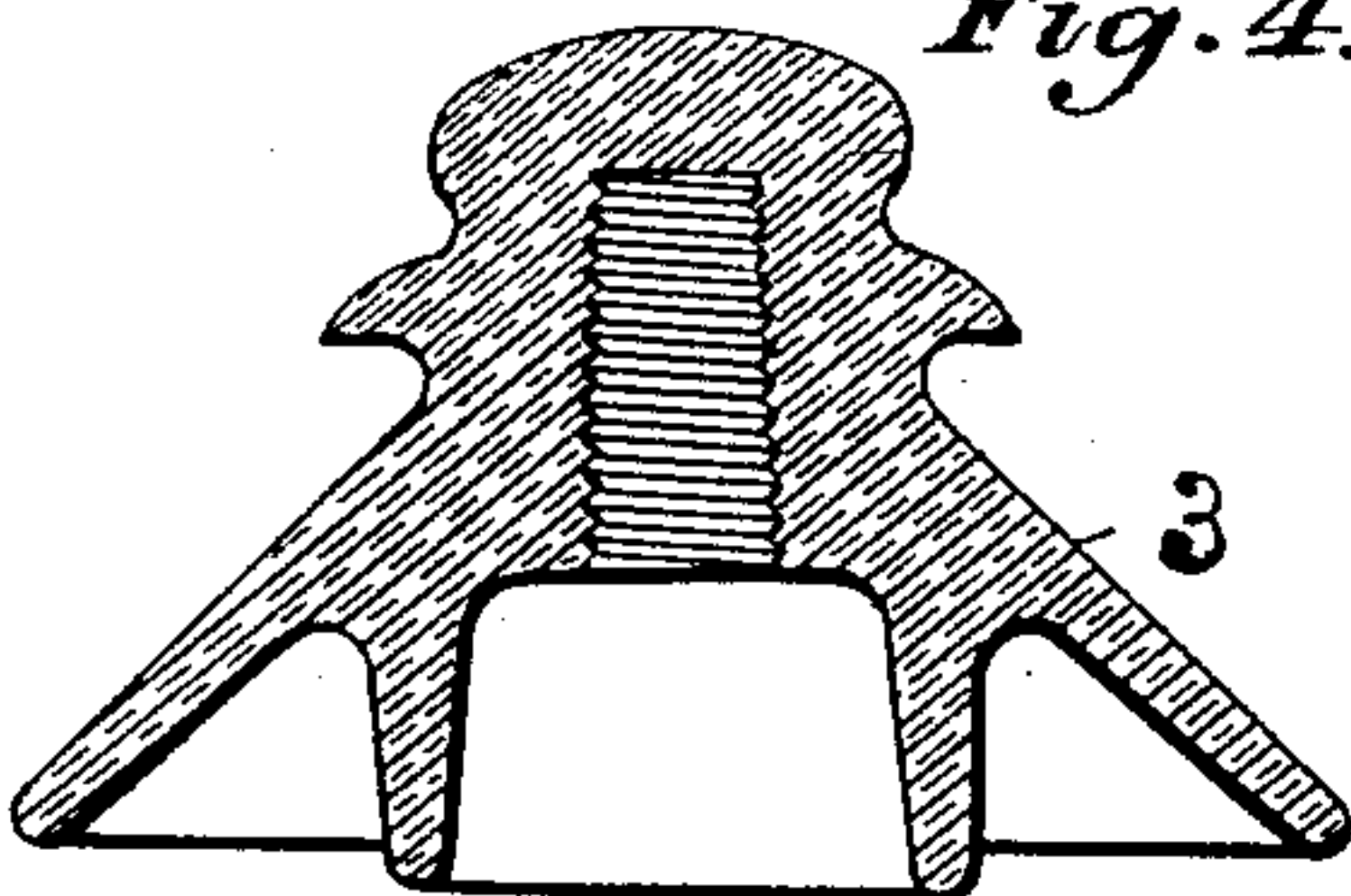
*Fig. 2.*



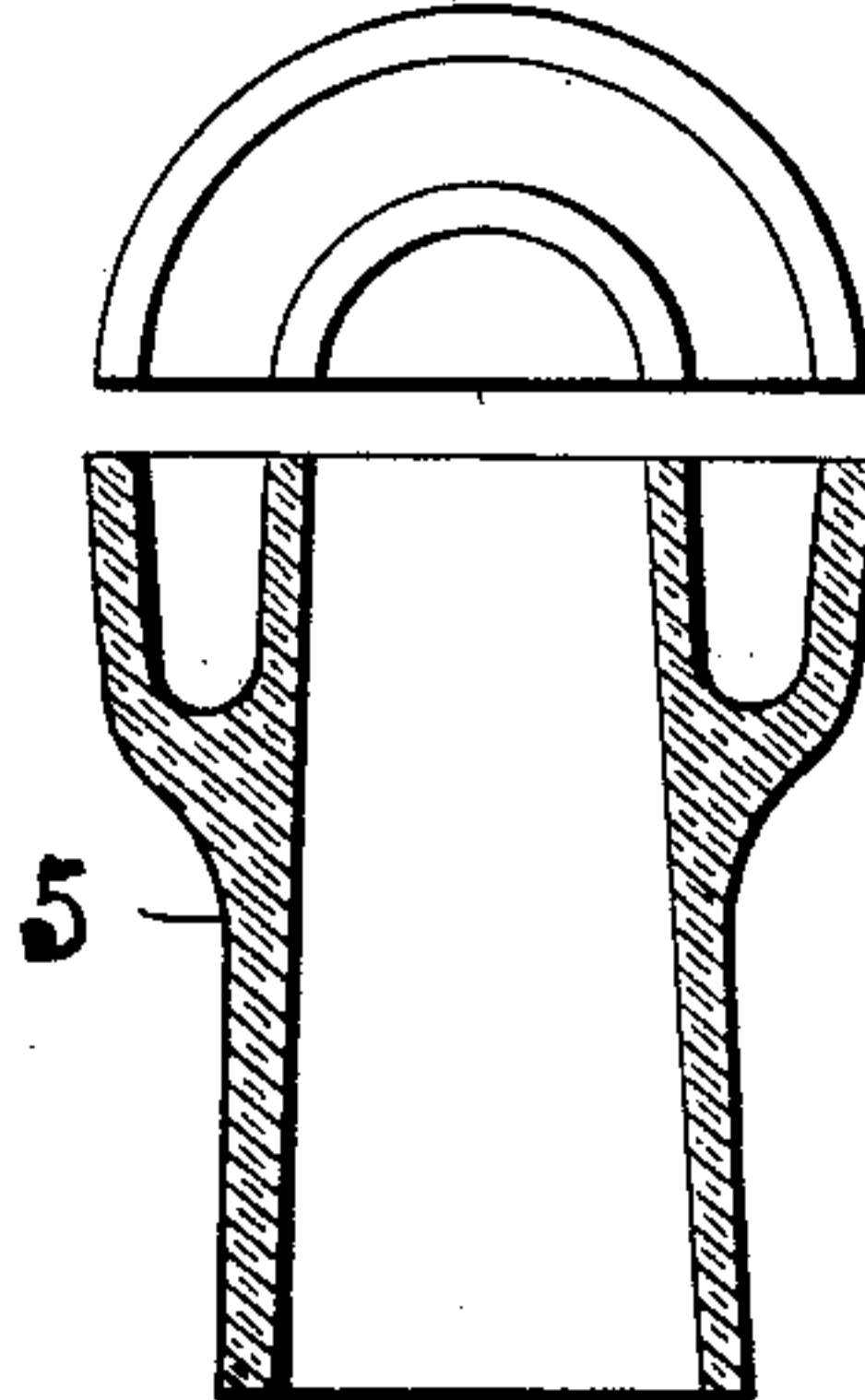
*Fig. 3.*



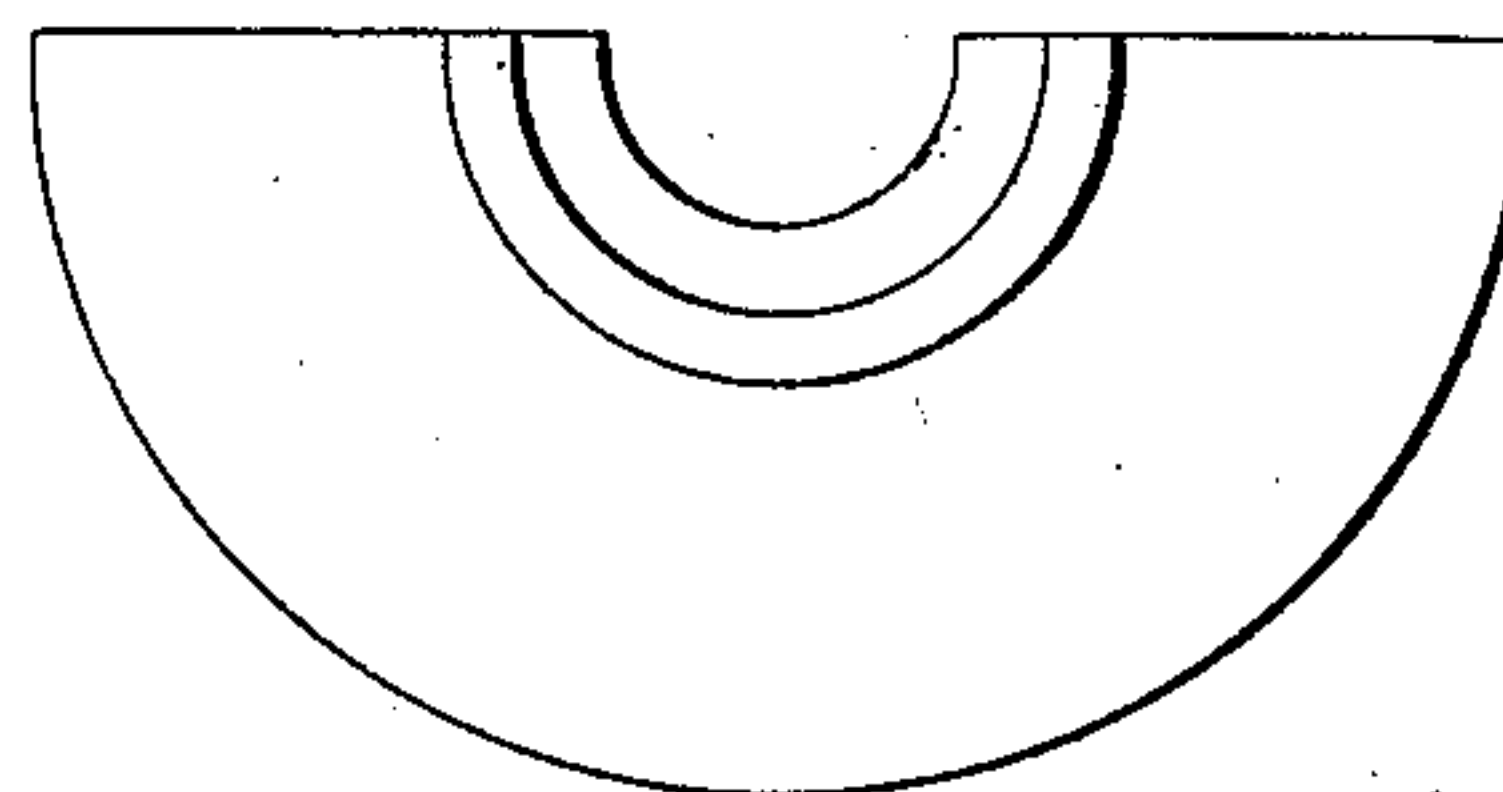
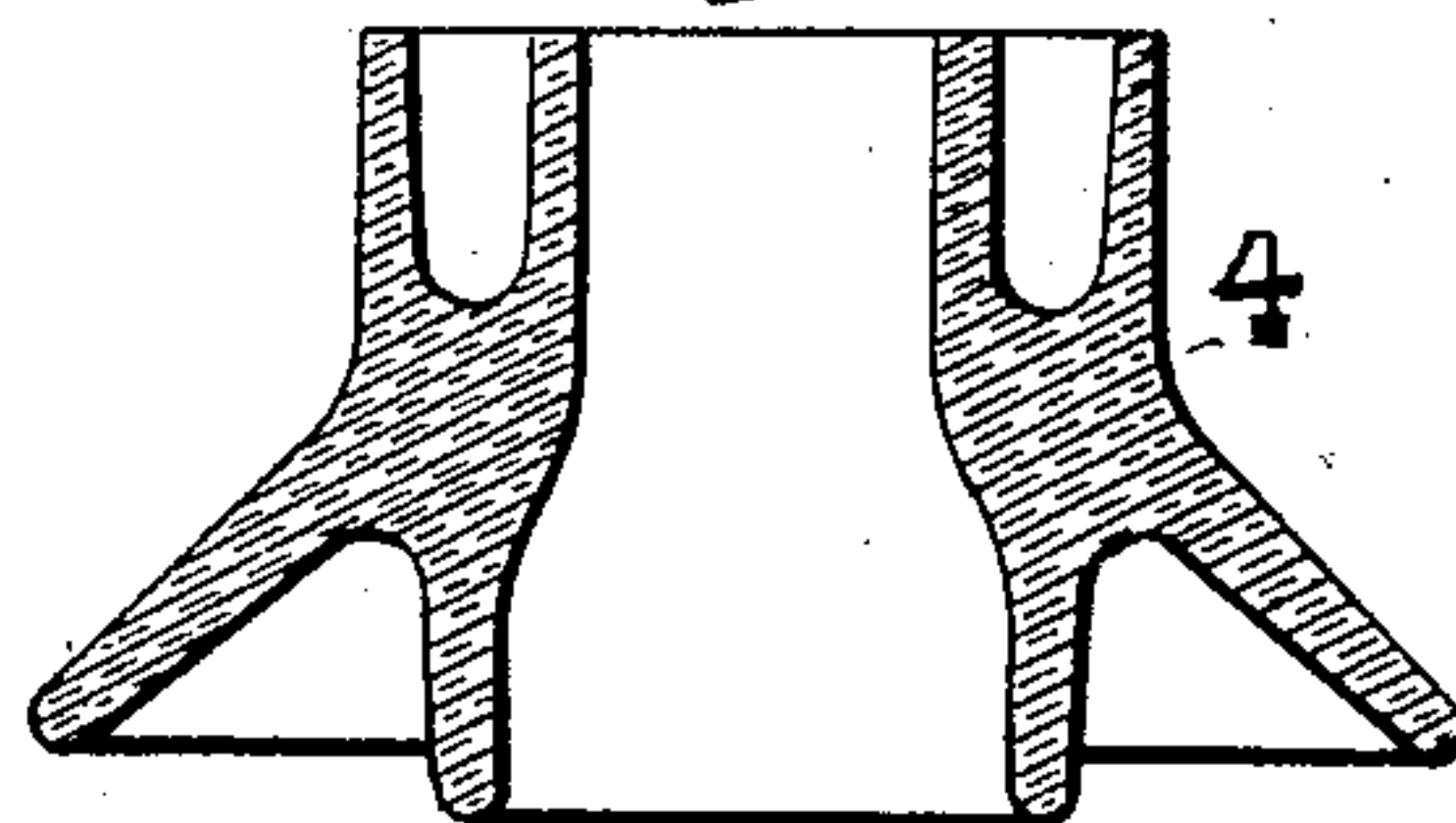
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



witnesses:  
J. M. Fowler Jr.  
Grover S. Harvey.

Inventor:  
Vernon G. Converse,  
by Wm. L. Pierce  
his Atty.



# UNITED STATES PATENT OFFICE.

VERNON G. CONVERSE, OF PITTSBURG, PENNSYLVANIA.

## INSULATOR.

SPECIFICATION forming part of Letters Patent No. 701,847, dated June 10, 1902.

Application filed August 2, 1901. Serial No. 70,574. (No model.)

*To all whom it may concern:*

Be it known that I, VERNON G. CONVERSE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Insulators, of which the following is a specification.

My invention has relation to devices for the support of electrical conductors, and particularly for conductors when used with currents of high voltage.

Electrically the essential features of a high-voltage insulator are that it shall have a high resistance to puncture through the material of the insulator to the pin or supporting medium and thus to ground, that it shall have a high resistance to leakage of current over the surface to the pin or supporting medium and ground, and that its shape shall be such that there shall be sufficient distance through the air or over the surface, or both through the air and over the surface, so that the current will not actually arc from the wire to the pin or cross-arm or other support. The first feature is not a fundamental one, but depends upon the kind and grade of material used in the insulator and upon the equipment and skill of the manufacturer. The second feature is easily overcome by putting enough surface distance between the conductor and pin or support; but the third feature is not so easily overcome in that an extension in the present form of insulator leads to a larger size of insulator, which must necessarily have a less surface resistance and is also a difficult and expensive piece to manufacture.

I have found by experiment that the current follows the course of the exposed parts of the insulator or those which are free to catch any falling moisture, dirt, or other conducting matter and that under such conditions that the current will jump or arc from the outermost lowest exposed point of the insulator, which is usually the outer petticoat or flange, through the air to the cross-arm or pin or other support or partly through the air and over the surface to the pin or support.

As it appears that the value of a high-voltage insulator to resist arcing, as above described, depends upon the distance between the exposed surface and the pin or cross-arm

or support, it has occurred to me that as it is not feasible or advisable to increase the diameter of the insulator to obtain the distance, as above stated, for the reason stated, the most practicable and sensible way is to use several insulators or pieces which are not so large but that they offer a high resistance to surface leakage and are easy of manufacture and to build them up in such a way that a series of breaks or gaps will be made between the conductor and the support for the insulator or insulators.

It is possible that an insulator can be made in one piece and have the essential features that I describe; but it is to gain in ease of manufacture and to afford an article that is flexible in its use that I make my insulator in several parts, as hereinafter described.

Figure 1 shows my insulator half in longitudinal section with two petticoat-sections intervening between the top and bottom sections. Fig. 2 is a like view with one intervening petticoat-section. Fig. 3 is a like view with no intermediate section. Figs. 4, 5, and 6 are details of the parts.

In the accompanying drawings, which make part of this specification, 1 is the cross-arm or any means of support.

2 is a pin or support resting on the cross-arm and terminating at the top in a screw-thread, onto which is screwed or turned the uppermost piece of my insulator; but it is not necessary that the insulator be supported on such a pin, and this part is not a feature of my invention.

3 is the cap or uppermost part of the insulator, and an essential one, as it intervenes between the conductor and pin or support which may be connected to ground. This piece is shown in the figure to be circular in one plane and to have a certain shape and number of petticoats or projections and to be otherwise fixed in its character. The point for the support or fastening of the wire or conductor is shown at 6; but it is not necessary that the conductor be held at this point any more than on the top, and this feature, together with the shape of piece 3, the number of petticoats, &c., are unimportant features.

The two intermediate pieces 4 are preferably similar in shape and construction, the



upper one resting on the lower one and coming up under and around the piece 3. The lower piece 4, which supports the upper piece 4, is in turn supported by the piece 5, which rests on the cross-arm or support. There may be contact between the upper piece 4 and the piece 3; but it is not essential and is probably undesirable if the pieces 4 and 5 are built up from the cross-arm, as shown. The pieces 4 and 5 are shown half in section and are circular in one plane. Each of these has a deep circular groove at the top, which carries the piece above or supports it on the downwardly-extending flange or petticoat. This is true, with the exception of the joint between the pieces 3 and 4, where it is not necessary, as above stated. The groove in the pieces 4 and 5 furnished a receptacle for oil or other insulating material, and the downwardly-extending petticoat where the pieces 3 and 4 enter this groove checks or stops any leakage or arcing from the conductor, either over the surface or through the air to the pin or support. The pieces are shown further in detail in Figs. 4, 5, and 6. Their shape is entirely immaterial, as well as is any of their other features described or detailed. They may be made of glass, porcelain, or any suitable insulating material. The advantages of this building up of several pieces will be understood and appreciated when the flexibility of the insulator is considered. Fig. 3 shows an insulator in which use is made of two of the pieces, Fig. 2 shows an insulator in which use is made of three of the pieces, and Fig. 1 an insulator in which use is made of four of the pieces. The pieces 4 are to be added as the requirements of voltage demand. The pieces 4 are not limited to two in number, as shown in Fig. 1, but may be any number as required by the voltage. It will thus be seen that I have, as shown in Figs. 1 and 2, my insulator made up in part of outwardly-flanged sections 4 4. Gaps are therefore provided between the flanges of the sections 4 4 and also beyond the flanges of the outer ones of these sections or between the flanges of the extreme sections of the series of sections 4 4 and the cap 3 and section 5.

It is not necessary that the pieces of the insulator be built up from the cross-arm or support. They may be held in any manner, and the insulator is not limited to one in which the wire or conductor is fastened at the top. The invention applies as well to an insulator depending from the cross-arm or support and where the wire or conductor is fastened to

the bottom of the insulator or to an insulator which builds up at any angle.

Having thus described my invention, what I claim is—

1. An insulator for currents of high voltage, consisting of separable sections, the number employed dependent upon the amount of insulation required, and means for holding the sections assembled against any force applied.

2. An insulator for currents of high voltage, having extreme sections and one or more separable mean sections, the number of the latter employed dependent upon the amount of insulation required and means for holding the sections assembled against any force applied.

3. An insulator for currents of high voltage including in its organization separable insulating-sections with outwardly-extending flanges, a gap being between the flanges of adjacent sections and beyond the flange of an extreme one of said sections, and means for holding the sections assembled against any force applied.

4. A high-voltage insulator made up of three or more parts which are separate articles of manufacture, one of which acts as a cap to cover or protect the pin or support from the elements, the second a tube or cylinder of a smaller diameter than the first part which surrounds or incloses the pin and electrically protects it, and the third one or more parts with outwardly-extending flanges or petticoats which intervene between the first and second parts.

5. A high-voltage insulator made up of three or more parts which are separate articles of manufacture, one of which acts as a cap to cover or protect the pin or support from the elements and has a downwardly-extending flange or petticoat, the second a tube or cylinder of a smaller diameter than the first part which surrounds or incloses the pin and has an upwardly-extending groove which will hold oil or other insulating material, the third one or more parts with outwardly-extending flanges or petticoats which intervene between the first and second parts and have downwardly-extending flanges or petticoats, and upwardly-extending grooves which hold oil or other insulating material.

Signed at Pittsburg this 31st day of July, 1901.

VERNON G. CONVERSE.

Witnesses:

GEO. H. HARVEY,  
D. C. HAWES.