

L. McCARTHY.

INSULATOR.

APPLICATION FILED FEB. 14, 1907.

922,313.

Patented May 18, 1909.

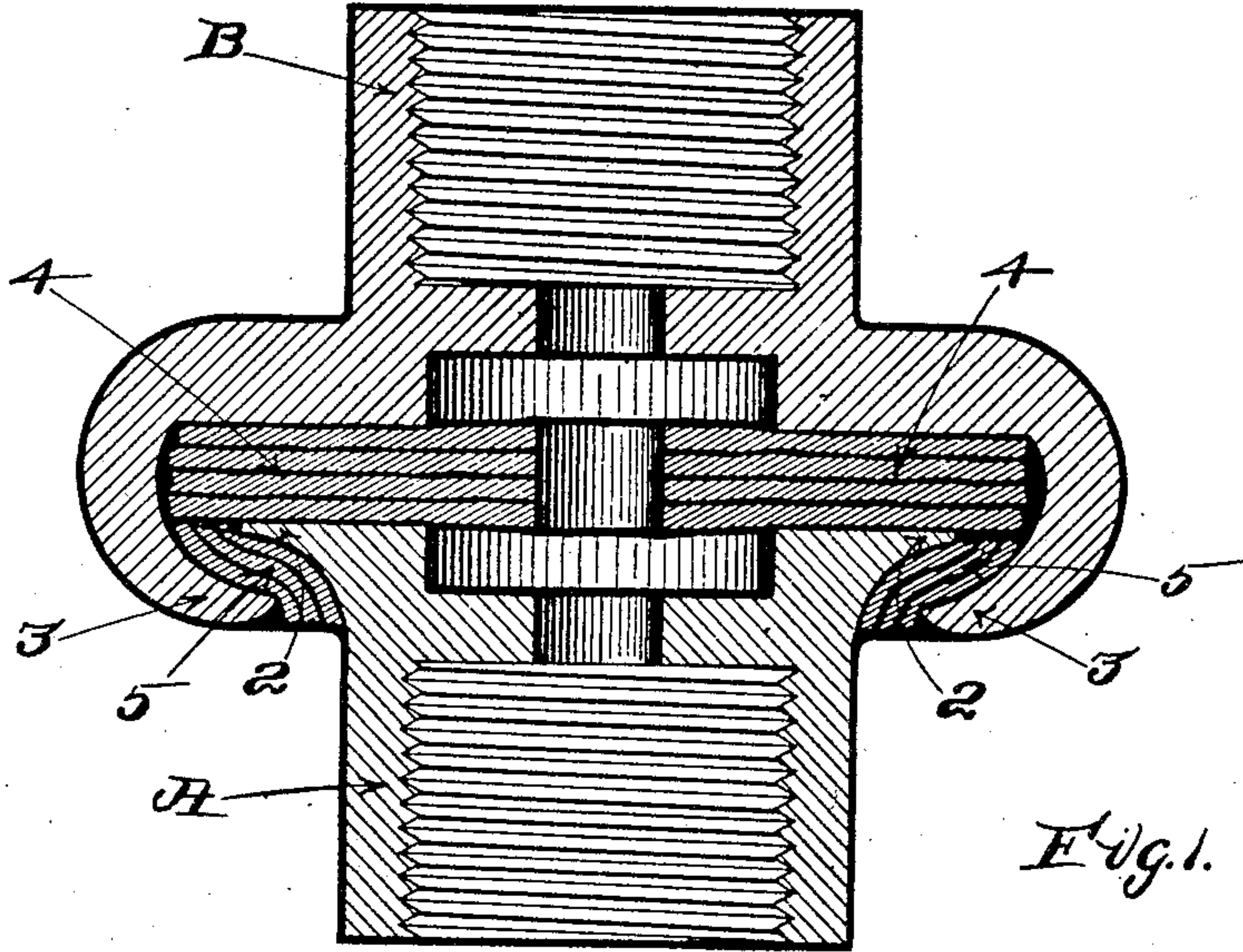


Fig. 1.

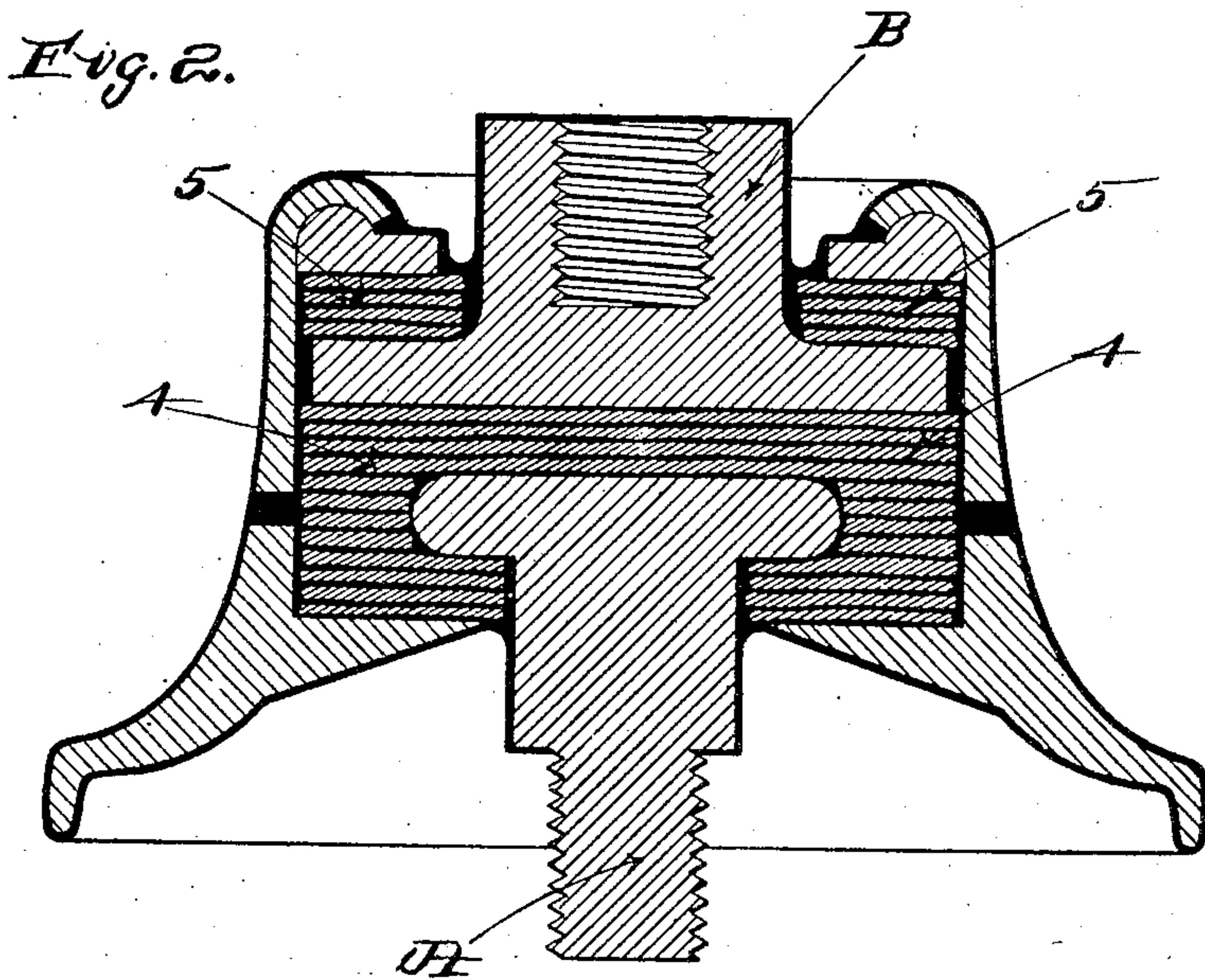


Fig. 2.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## INSULATOR.

No. 922,313.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed February 14, 1907. Serial No. 357,255.

*To all whom it may concern:*

Be it known that I, LOUIS McCARTHY, citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts,  
5 have invented a certain new and useful Improvement in Insulators, of which the following is a specification, reference being had therein to the accompanying drawings.

Heretofore, insulators for many purposes,  
10 such for example as insulating joints for gas and electric fixtures for insulating turnbuckles, hangers for trolley wires used in the over-construction of electric railways and insulators for many other purposes have been  
15 made with metallic members whose proximate ends are separated from each other by means of layers composed in whole or in part of sheet mica. Examples of such insulators may be seen by reference to various patents  
20 of the United States heretofore granted to me and especially to Letters Patent No. 449,943, April 7, 1891 and No. 478,518, July 5, 1892. Such insulators have been finished in various ways, as for example by the application to  
25 the whole or a portion of the exterior of a covering of molded insulating material. It has been my experience that the power of this mica insulation to withstand the passage of an electric current is increased when the  
30 mass of layers of mica composing the insulation is subjected to pressure. My belief is that this result is due to the fact that the pressure diminishes the interstices in the layered mass of insulation and lessens the amount  
35 of air and moisture which is contained in the insulating mass. If the insulating mass be subjected to a very high degree of pressure, I have found that its insulative quality is very considerably improved. Believing that the  
40 more perfect removal of all spaces containing air or moisture in the insulating mass, even although these spaces be very minute would increase still further the insulative quality of the mass, I have taken steps to this end and  
45 have in practice produced an insulator of much improved insulative quality.

In the production of my improved insulator, I take an insulator, the parts of which have been built up and mechanically combined and secured in the well known manner,  
50 and place it in a chamber from which the air is then exhausted by suitable exhaust mechanism. The exhausting of the air takes out from the insulator a very substantial portion

of the air and moisture which are contained 55  
in the crevices which are unavoidable in the mechanical construction thereof, as well as in the interstices which, although frequently very minute, are to be found in the insulation itself. When there is as great a degree 60  
of vacuum formed as is possible or practicable in the chamber containing the insulator, I admit into the chamber a mass of insulating compound or composition which is solid at the ordinary temperatures but which under 65  
the influence of a high degree of heat becomes a very thin liquid. In practice I have employed a composition known to those skilled in the art by the name of "Ohmlac" which I believe to consist of Egyptian asphaltum and 70  
animal and mineral oils. In this hot and liquid state the thin liquid fills every crevice and interstice of the insulator and to further insure its penetrating every opening however minute, I reverse the exhaust mechanism and 75  
apply an air pressure to the hot liquid. In practice I have used 60 pounds to the square inch. When the insulator has been subjected to this for a sufficient time to insure the thorough penetration of the liquid into 80  
every opening in the insulator, I open the connection between the receiver containing the insulator and the receptacle for the hot liquid and the pressure on the receiver operates to force all of the free liquid back into 85  
the receptacle, leaving only such liquid as is in the crevices or interstices or openings of the insulator and a thin film which adheres to the surfaces of the insulator. The insulator is then removed and the hot liquid insulation allowed to set and harden, after which the insulator may be finished in any of the well known ways, as for example by treatment with dry heat to further harden the material applied as above described or 95  
by applying to all or part of the surfaces or joints of the insulator an outer molded covering or in any other well known manner.

For convenience of illustration and explanation, I have in the accompanying drawings shown my invention as applied to two common forms of insulators—a pipe insulator and a trolley wire insulator. 100

My invention, which has for its object to provide an insulator of improved insulative 105  
quality, will be fully understood from the description herein contained taken in connection with the accompanying drawings,



I have pointed out and clearly defined the novel features of my invention in the claims at the close of this specification.

In the drawings,—Figure 1 is a vertical section of a pipe insulator. Fig. 2 is a similar view of a common form of bell insulator such as is used in electric railway work.

Referring to the drawings,—A and B indicate metallic coupling members which in the form shown are screw threaded and which it is the province of the insulation to electrically insulate from each other. In Fig. 1 the end of the member A is flanged as shown at 2 and the proximate end 3 of the member B, which is originally cup-shaped, is, after the said part 2 has been placed therein with the proper intervening insulation 4 and 5, crimped in or turned over the said insulation and the said part 2. The insulation is preferably subjected to as much compression as possible and the clamping of the part 3 over it to secure the whole construction together operates to maintain it in its compressed condition. As will be clear, however, a perfect fitting of the parts is mechanically impossible and in practice there are crevices which contain air and moisture between the insulation and the adjacent walls of the metallic coupling members, and also in the insulation itself. To remove the moisture and air from these openings, spaces and interstices I place the joint in a proper closed vessel or receptacle to which is connected an air pump or other suitable mechanism by which the air may be withdrawn from the said vessel and a substantial degree of vacuum produced. The removal of the air takes with it a very large degree of the moisture. From a suitable chamber connected with the said receiver I introduce therein by opening a valve in the connection an insulating compound or composition which is solid at normal temperature and which in the presence of a high degree of heat becomes a very thin liquid. In the liquid condition, this mass is permitted to pass into the receiver from which the air has been removed. It immediately permeates

and penetrates every crevice and opening in the insulator and even the infinitely small interstices are filled with it. The connection through which the hot liquid passes into the receiver is closed, the air pump is then reversed and a suitable air pressure is applied. This insures the penetration of the hot liquid into the openings in the insulation and the filling of every crevice and crack. The connection between the chamber containing the insulator and the hot liquid receptacle is then opened and the air pressure drives out all of the liquid from the chamber excepting only such as may adhere to the surface of the chamber, and such as is contained within the spaces and crevices and minute openings which are in the insulator. The insulator is then removed and may be finished either in the presence of dry heat or by being covered in whole or in part with a molded covering or in any other well known manner.

What I claim is:

1. An insulator comprising metallic portions separated by laminated insulation and having the crevices and interstices of said laminated insulation free from air and moisture and filled with an insulating compound commercially known as ohmlac.

2. An insulator comprising metallic portions separated by laminated insulation and having the crevices and interstices of said laminated insulation free from air and moisture and filled with an insulating compound consisting of Egyptian asphaltum and animal oil and mineral oil commercially known as ohmlac, said insulating compound being characterized by the quality that it becomes a thin liquid when subjected to a high degree of heat and solidifies at normal atmospheric temperature.

In testimony whereof I affix my signature, in presence of two witnesses.

LOUIS McCARTHY.

Witnesses:

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GEORGE P. DIKE.