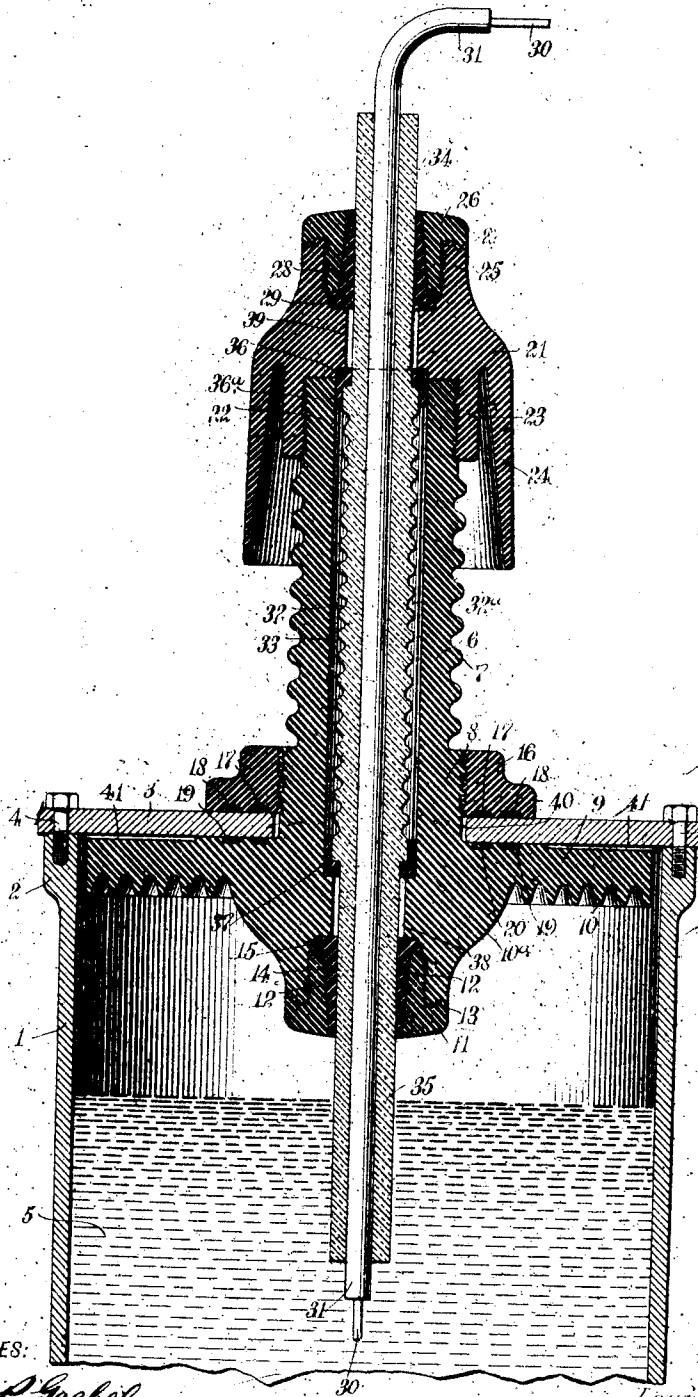


L. STEINBERGER.
HIGH POTENTIAL-INSULATOR.
APPLICATION FILED JUNE 6, 1910.

1,040,050.

Patented Oct. 1, 1912.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LOUIS STEINBERGER, OF NEW YORK, N. Y.

HIGH-POTENTIAL INSULATOR.

1,040,050.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS STEINBERGER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved High-Potential Insulator, of which the following is a full, clear, and exact description.

10 My invention relates to high potential insulators, and more particularly to such insulators of special form as are adapted to be mounted upon a wall, a floor, a roof or a partition; or adapted for use in connection with oil switches, and oil transformers, and in various analogous relations.

My invention comprehends quite a number of separate features among which are the following: I. The provision of a tubular member for holding the wire and means specially adapted for supporting this tubular member. II. To provide a body portion of insulating material with a flange having an irregular surface to reduce surface leakage and to facilitate the dripping of moisture, this irregular surface being disposed upon the face of the flange directed away from the barrier, ceiling, roof, or the like; that is, where the insulating member extends vertically from the top of a barrier, the flange is placed below the barrier and the irregular surface faces downwardly. III. To support the central tubular member by aid of locking rings, thus avoiding the necessity of using cement or the like to hold it in position. IV. To provide in connection with a central tubular member of the kind just mentioned, resilient members, thereby performing the double office of preventing the entrance of water or moisture and of enabling comparatively brittle material such as glass, porcelain or the like to be employed for the central tubular member. V. To so form and mount the various parts as to enable a central tubular insulating member to be made of brittle material and encircled by an insulating body portion of comparatively tough and strong insulating material, preferably "Electrose". VI. To provide a form of insulator in which the various parts or some of them may be subjected to extremes of heat and cold without impairing the value of the insulator. VII. To give the parts such construction that the central tubular insulating member may have considerable length or may be

made relatively short, at the will of the operator, without disturbing other parts. VIII. To protect the central tubular insulating member with a cap piece of the hood type, having a large protected surface, thus increasing quite materially the insulating value of the structure. IX. To provide a member of separate structural features whereby the general efficiency of the insulator is improved. X. To provide a form of insulator in which the central tubular insulating member is supported by yielding members which allow the central member a certain amount of movement, thereby preventing injury to or destruction thereof owing to movement of the conductor disposed within the central member. XI. To provide a form of insulator in which the central tubular insulating member is made of a fireproof material (porcelain for instance) thereby making the insulator especially well adapted for oil switches, transformers and the like; when thus employed only a portion of the central tubular fireproof insulating member is submerged in the oil, hence heating of the oil will not impair the usefulness of the insulator. XII. To provide a form of insulator in which the various parts which form the complete structure are detachable, hence should any of the parts become injured or destroyed it may readily be replaced with other parts. XIII. To provide a form of insulator in which provision is made for a very large amount of insulating surface between the conductor and ground, without making the proportions of the insulator excessively large.

Reference is to be had to the accompanying drawing forming a part of this specification, in which the figure shows one form of my insulator applied in this instance to an oil transformer, the lid or cap of the latter serving as a barrier for supporting the insulator.

A casing 1 is provided at its top with a thickened portion 2 and resting upon the latter is a lid 3 hereinafter called a "barrier". This barrier is held in position on the casing 1 by aid of screw bolts 4 and may for various purposes be considered as the equivalent of a roof, a partition, a ceiling or any form of barrier through which a conductor is to be extended and upon which an insulator is to be supported. A quantity of oil 5 is disposed within the casing 1 and serves the usual purpose of oil in an

oil switch or transformer. A member 6 having in part a cylindrical form is provided exteriorly with annular ribs or corrugations 7. The cylindrical member 6 is further provided with a portion 8 which is threaded exteriorly. Mounted upon the cylindrical member 6 and integral with it is an annular flange 9 having its lower surface formed into annular ribs or corrugations 10 and thus being roughened for the purpose of preventing surface leakage or destructive arcing of the current. The flange 9 is integral with a head 10^a which extends downwardly. The parts just described are of insulating material, preferably "Electrose."

At 11 is a removable bushing provided with a threaded portion 12 and with an annular flange 13, these parts being also of "Electrose". The flange 13 is sunken slightly into the adjacent lower end of the head 10^a.

At 14 is a gasket of soft rubber, this gasket having generally a frusto-conical form and being provided with an annular flange 15 extending outwardly.

A ring 16 of "Electrose" is threaded internally and is fitted upon the threaded portion 8. Two gaskets 17, 18 are sunken into the lowermost surface of the ring 16 and when this ring is screwed down upon the barrier 3, the gaskets 17, 18 are clamped tightly against it. At 19, 20 are similar gaskets which are sunken in the flange 9 and head 10^a.

A hood 21 serves as a cap piece and is mounted upon the upper portion 22 of the cylindrical member 6, this upper portion being threaded for the purpose. The cap piece 21 is provided with an annular sleeve 23 threaded internally for engaging the upper end of the cylindrical member 6. The cap piece 21 is provided with a hood 24 extending downwardly and covering several of the corrugations. The cap piece 21 is further provided with an annular portion 25 threaded internally, and fitting into this is a bushing 26 threaded externally, this bushing having an annular flange 27 which is sunken into the annular portion 25. A gasket 28 similar in form to the gasket 14 is partially encircled by the bushing 26 and is provided with an annular flange 29.

A wire 30 is provided with a covering 31 of insulating material, the wire and its covering extending through a central tubular member 32 which is of insulating material, preferably of porcelain. The middle portion of this tubular member is provided with corrugations 33 of annular form extending directly around it. The tubular member 32 is provided with cylindrical ends 34, 35, the end 34 extending upwardly through the cap piece 21, and the end 35 extending downwardly into the oil 5.

At 36 is a gasket which is provided with an annular portion 36^a and is held in position by aid of the cap piece. Another gasket 37 similar to the one just described is mounted lower down within the head 10^a. These two gaskets 36, 37 both encircle the central tubular member 32, at the top and bottom of an air passage 32^a, and press in opposite directions against portions of said tubular member.

At 38 is an annular air passage extending directly around the cylindrical portion 35, this passage also extending from the gasket 37 to the gasket 14. At 39 is a similar air passage extending from the gasket 36 to the gasket 29.

At 40 is an annular air passage representing the spacing of the inner edge of the barrier 3 from the outer surface of the portion 8 of the cylindrical member 6. At 41 is another annular space just below the barrier 3 and due to the fact that a portion of the flange 9 is spaced slightly from this barrier.

The operation of my device is as follows: The corrugations 33, by virtually increasing the external surface of the tubular member 32, tend to prevent surface leakage and destructive arcing. The tubular member 32 being concentric to the cylindrical member 6 and spaced apart therefrom by the air passage 32^a, still further increases the insulation. No moisture can get into the air passage 32^a because of the action of the various gaskets, and consequently the air passage last mentioned remains dry. Moreover, the external surface of the cylindrical member 6 is kept dry by aid of the hood 24. The annular air passage 40 improves the insulation. The air passage 41 between the flange 9 and the barrier 3 prevents leakage between these parts. Adjacent to the gaskets 36, 37 the air passages 38, 39 afford protection from the current, and the gaskets 14, 28 together with the bushings 11, 26 tend to still further improve the insulation.

The various gaskets employed, because of their resiliency, tend to prevent breakage of the parts which happen to be brittle and in this manner enable me to use the central porcelain tube and also to use a comparatively wide range of insulating materials in constructing each and all of the various parts. The gaskets 14, 28, 36 and 37, by neatly fitting around the central tube, and also by rendering the latter watertight enable this tube to be made of comparatively great length; and also enable it to resist shocks, blows, and other forms of concussion which might otherwise tend to break it. Moreover, the strains due to expansion and contraction from heat and cold are rendered in every sense harmless because of the action of these various gaskets. Again, the annular and cylindrical air chambers disposed within the insulator and bounded by

the gaskets greatly improve the insulating qualities of the device.

I do not limit myself to the exact form nor to the details of any or all of the parts above shown and described, nor to any particular combination of the elements entering into the construction of my insulator; neither do I limit myself to employment of any prescribed materials, but prefer to employ "Electrose" for the insulator proper, and to use porcelain for the central tubular member.

It will be evident to those skilled in the art that changes in the construction, form and arrangement of the parts may be resorted to without departing from the scope or spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a device of the class described, a barrier, and a cylindrical member extending through said barrier and provided with a head; said cylindrical member being further provided with an annular flange extending parallel with said barrier and having a portion separated from said barrier by an air space.
2. In a device of the class described, a horizontally disposed barrier, and a vertically disposed cylindrical member extending through said barrier and provided with a flange, said flange extending substantially parallel with said barrier and partially separated therefrom by an air space.
3. An insulator, comprising a tubular member of insulating material, a cylindrical member of insulating material encircling the same, a gasket engaging said tubular member and said cylindrical member, and a cap engaging said gasket and said tubular member, said cap having a hood extending partially along said cylindrical member for protecting the same from moisture.
4. In a device of the class described, a barrier provided with an opening, a cylindrical member provided with a head and further provided with a large flange disposed on one side of said barrier and partially separated therefrom by an air space, said cylindrical member being further provided with an enlarged portion extending through said opening, and an annular member engaging said barrier and also engaging said enlarged portion, said annular member being disposed upon the side of said barrier opposite from said head.
5. In a device of the class described, a barrier, a cylindrical member extending through the same, and a flange mounted upon said cylindrical member and extending parallel with said barrier, said flange being provided with a roughened surface facing away from said barrier.
6. In a device of the class described, a bar-

rier provided with a flat surface, and a vertically disposed cylindrical member extending through said barrier and provided with a flange, said flange having a flat surface and extending substantially parallel with said flat surface of said barrier and partially separated therefrom by an air space, said flange being provided with corrugations extending away from said barrier.

7. In an insulator; the combination comprising a tubular member having its central portion provided with corrugations and having its opposite end portions made relatively smooth; a cylindrical member surrounding said tubular member; gaskets fitting upon the smooth end portions of said tubular member engaging the end corrugations for supporting said tubular member against endwise movement, and for forming a dead air space between said cylindrical member and the corrugated surface of said tubular member.

8. In an insulator; the combination comprising a tubular member of insulating material; a cylindrical member of insulating material encircling said first member; and a cap engaging said members for retaining said members in cooperative relation, being formed with a protecting hood depending for a considerable distance around said members.

9. In an insulator; a combination comprising a tubular member of insulating material; a cylindrical member of insulating material encircling said first member; and a cap fixed to said cylindrical member engaging said tubular member for retaining said members in cooperative relation, being formed with a protecting hood depending for a considerable distance around said members.

10. In an insulator; the combination comprising a tubular member of insulating material; a cylindrical member of insulating material encircling said first member and formed with supporting means for retaining said tubular member against endwise movement; and a cap carried by said cylindrical member adapted to move said tubular member in the direction of its length so as to maintain the same in engagement with said supporting means, said cap being formed to provide an annular dead air space surrounding said tubular member.

11. In an insulator; the combination comprising a tubular member having its central portion provided with corrugations and having its opposite end portions made relatively smooth; a cylindrical member surrounding said tubular member; gaskets fitting upon the smooth end portions of said tubular member engaging the end corrugations for supporting said tubular member against endwise movement, and for forming a dead air space between said cylindrical

member and the corrugated surface of said tubular member; and a removable cap fitting over one end of said cylindrical member adapted for forcing said gaskets toward said
5 corrugations.

12. In an insulator, the combination with a barrier having means fixed thereto adapted to retain an insulating liquid; of an insulator member projecting through said barrier into said liquid; and insulating means
10 fixed to said barrier supporting said first

insulator member being formed with a moisture resisting surface surrounding said first insulator member and opposed to said liquid.

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In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS STEINBERGER.

Witnesses:

WALTON HARRISON,
PHILIP D. ROLLHAUS.