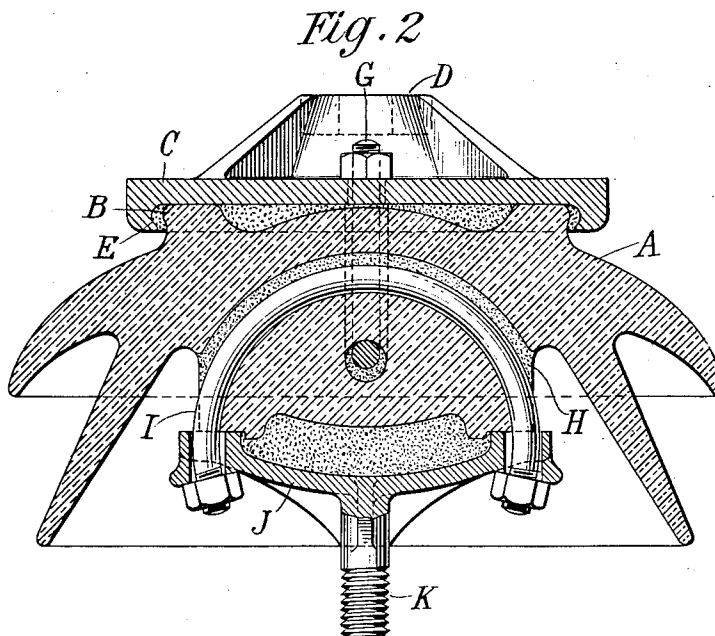
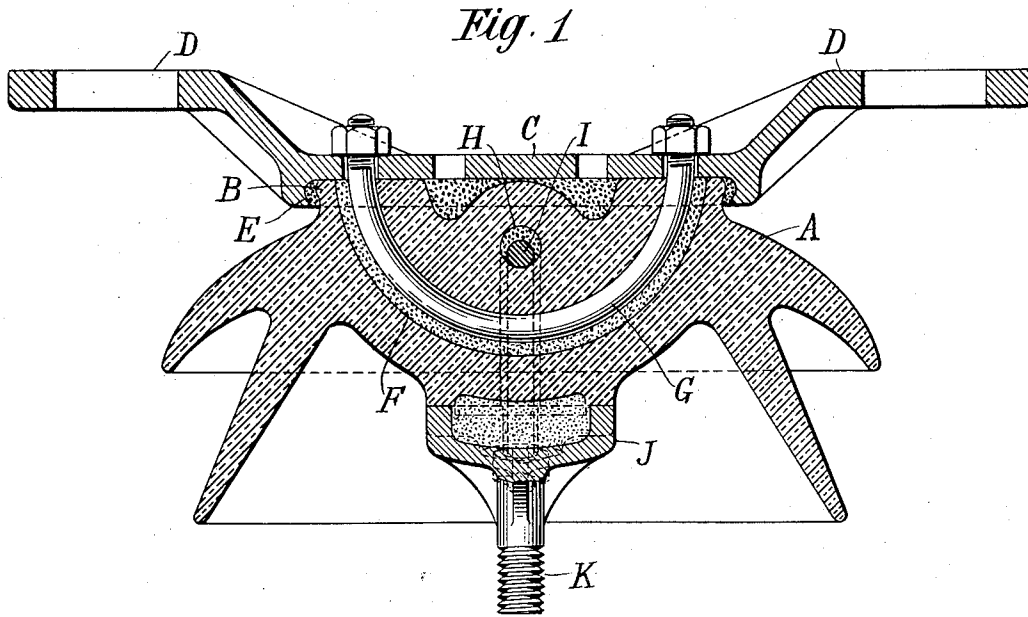


929,132.

Patented July 27, 1909.
2 SHEETS—SHEET 1.



Witnesses:
Raphael Ketter
A. Dunham

E. R. Hill, Inventor
By his Attorneys
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2 SHEETS—SHEET 2.

Fig. 3

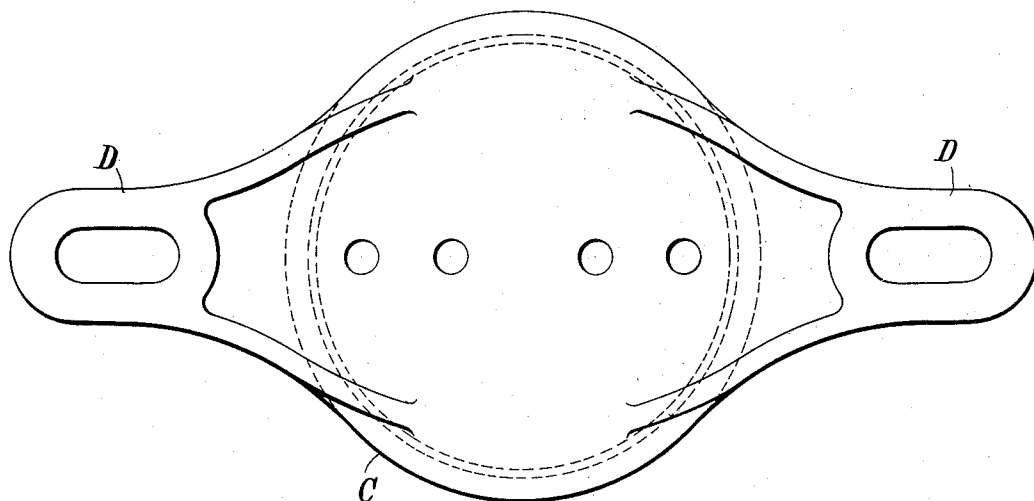
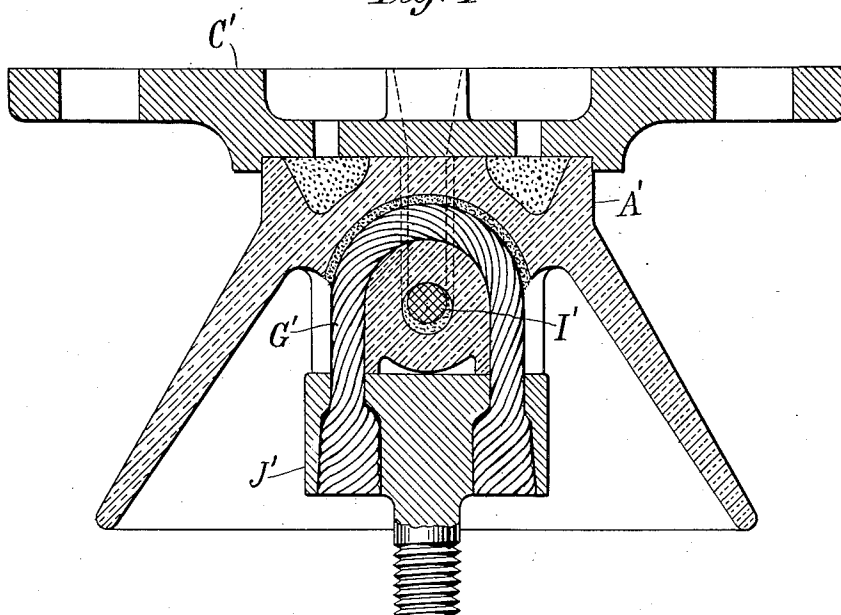


Fig. 4



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UNITED STATES PATENT OFFICE.

ERNEST ROWLAND HILL, OF EAST ORANGE, NEW JERSEY.

INSULATOR.

No. 929,132.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed May 25, 1908. Serial No. 424,715.

To all whom it may concern:

Be it known that I, ERNEST ROWLAND HILL, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Insulators, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

My invention relates to insulators, and has for its chief object to provide a simple, compact, and thoroughly reliable insulating device for suspending electric cables, trolley wires, or other conductors from the under side of structures of any sort, such as bridges, tunnels, mines, girders, brackets, etc.

An important field in which the invention finds special utility is that of alternating current railways where the trolley wire or wires from which current is taken are to be supported from overhead bridges or brackets, from bridge girders where crossing the same, and from the roof or arch of tunnels. Insulators for the class of service mentioned have heretofore been made by molding insulating material around pins and supports or by cementing the latter to porcelain bodies. The former type has not proved wholly satisfactory in many cases. It is generally conceded that porcelain is the superior material, especially for high tension work, but insulators with cemented parts are not satisfactory where reliance for mechanical strength is placed wholly upon the resistance of the porcelain or cement to tension or compression. Such insulators when broken, either from mechanical or electrical causes, allow the conductors to fall.

In the present invention, porcelain, glass, or other suitable material is depended upon for insulation, and to a limited extent for mechanical strength, but the distinguishing feature of the invention is a novel use of strong metal bonds for securing the wire-support to the insulating member and the latter to the supporting base; the arrangement of the metal bonds being such that they not only give the structure the desired mechanical strength but also serve to support the conductor or conductors in place, and prevent the same from sagging, if the insulating member should crumble away by reason of breakage from any cause.

The preferred embodiment of the invention is illustrated in the annexed drawings, in which—

Figure 1 shows the insulator in vertical section. Fig. 2 is a vertical section at right angles to the plane of Fig. 1. Fig. 3 is a plan view of base or supporting plate by which the insulating portion of the device is suspended. Fig. 4 is a vertical section of another embodiment.

Referring to Figs. 1, 2 and 3, A designates an insulating body, preferably a single piece of porcelain. This body may be, and preferably is, provided with one or more petticoats, as shown, varying in number, size and arrangement according to the voltage requirements and conditions of use. The top of the body, which in the form illustrated is circular in plan, is made slightly flaring, as shown at B. On this flaring top is a supporting member or base by which the insulator may be suspended. For some purposes it may be desirable to provide the supporting member with trunnions, to permit slight play of the insulator in the direction of the conductor, but in general I prefer to have the insulator mounted rigidly and hence prefer to make the supporting member in the form of a plate, C, provided with upwardly and outwardly extending ears D by which it may be securely bolted to the underside of the structure in which the insulator is to be used. On the bottom of supporting member or plate is an undercut recess E to receive the flaring top of the body A. The annular space between the two parts may be filled with cement if desired.

Extending through the body, and open at the top thereof, is an arc-shaped passage or aperture F, to receive an arc-shaped U-bolt G, which, extending through the plate or supporting member C, binds the body A firmly and rigidly thereto. At right angles to the passage or aperture F is a similar aperture, H, crossing above the former, so that the two are linked, so to speak. The aperture or passage H is downwardly disposed, and carries a U-bolt I, similar to the former.

On the underside of the body A is a conductor-supporting member or device J, provided with suitable means, as for example a downwardly extending threaded stem K, for supporting a conductor. The device J is preferably a dish-shaped plate, as shown, and is rigidly bound to the insulating body by the binding bolt or bond I in the manner shown. The space between the center portion of the device J and the insulating body, and also

any space between the body and the plate C, may be filled with grout or cement, if desired.

The body A is not molded around the U-bolts; instead, the apertures therefor are formed in the body and the bolts inserted afterward. Hence, in order to permit insertion of the bolts, the apertures therefor are made circular, with their centers outside the body, thus enabling the bolts to be slipped into place easily and quickly. Any space left in the passages may be filled with cement or grout.

Another form of binding members for securing the three parts of the insulator together is illustrated in Fig. 4. Here the form of the passages in the insulating body A' is such that unyielding bonds cannot be passed through them, and hence I use flexible devices for the purpose, such as short pieces of cable, G', I'. In order to secure the ends of the bonds, so as to bind the insulator parts together with the desired rigidity, the openings in the members C' and J' which receive the bonds are enlarged and the ends of the bonds are expanded tightly therein in any convenient and suitable way.

From the foregoing description it will be seen that practically the only stress on the insulating body when the device is in use is a compression between the binding members. If from any cause, either electrical or mechanical, the porcelain body should be broken, the insulating properties of the structure are not wholly destroyed unless the insulating material should actually be displaced from between the linked binding members, thus allowing the same to come into contact. In any case, however, the suspended conductor will still be supported instead of being allowed to fall to the ground as usually happens when breakage occurs in an insulator in which the supporting members are secured by cement.

The device can be made in very compact form, as in the forms illustrated, so as to take up only a small space, a feature of special advantage where clearance above a car or train is slight. The device is also simple in construction, can be assembled quickly, and the metal supporting members can be cheaply made by casting.

While I prefer the forms herein specifically described, as the best forms for most purposes, it is to be understood that the invention is capable of other embodiments without departure from its proper spirit and scope as defined by the appended claims.

What I claim is:

1. In an insulator, the combination of a one-piece insulating body; a member for supporting the said body in depending position; a U-shaped bond passing through the body and binding the same to the supporting member; a second U-shaped bond passing through the body and linked with the first

but spaced therefrom; and a conductor-supporting device secured to the underside of the body by the second U-shaped bond; as set forth.

2. In an insulator, the combination of a one-piece insulating body; a member for supporting the body in depending position; a U-bolt passing through the body and binding the same to the supporting member; an inverted U-bolt passing through the body and linked with the first U-bolt but spaced therefrom; and a conductor-supporting device secured to the underside of the body by the inverted U-bolt; as set forth.

3. In an insulator, the combination of a one-piece insulating body; a member for supporting the body in depending position; a U-bolt passing through the body and having its ends extending upwardly through the supporting member to secure the body thereto; a conductor-supporting device on the underside of the body; and an inverted U-bolt passing through the body and having its ends extending downwardly through the conductor-supporting device to secure the same to the body; as set forth.

4. In an insulator, the combination of a one-piece insulating body provided with upwardly and downwardly disposed arc-shaped passages or apertures crossing one above the other within the body; a supporting member for supporting the body in depending position; a conductor-supporting member on the underside of the body; and arc-shaped bolts arranged in the arc-shaped passages and binding the supporting members and the insulating body securely together; as set forth.

5. In an insulator, the combination of a supporting plate; a one-piece insulating body fitting the underside of the plate; said body being provided with upwardly and downwardly extending arc-shaped passages or apertures, crossing one above the other within the body; a plate on the underside of the body and provided with means for supporting a conductor; and arc-shaped bolts extending through the said passages or apertures and binding the said plates and the body securely together; as set forth.

6. In an insulator, the combination of a supporting member; a one-piece insulating body on the underside of the supporting member, provided with upwardly and downwardly extending arc-shaped passages or apertures crossing one above the other at right angles within the body; a supporting member on the under side of the body for supporting a conductor; and arc-shaped bolts extending through the said passage or apertures and binding the supporting members and the body rigidly together; as set forth.

7. In an insulator, the combination of a supporting plate having an undercut recess

on its under side; a one-piece insulating
body having a flaring top cemented in said
recess, said body being provided with up-
wardly and downwardly extending arc-
5 shaped passages or apertures crossing one
above the other within the body; a con-
ductor-supporting member on the under side
of the body; and arc-shaped binding bolts

cemented in the passages or apertures of the
body and binding the supporting plate, the 10
insulating body, and the conductor-support-
ing member rigidly together; as set forth.

ERNEST ROWLAND HILL.

Witnesses:

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