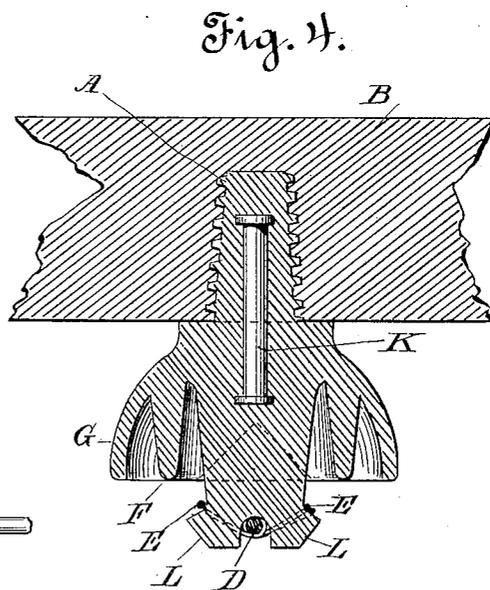
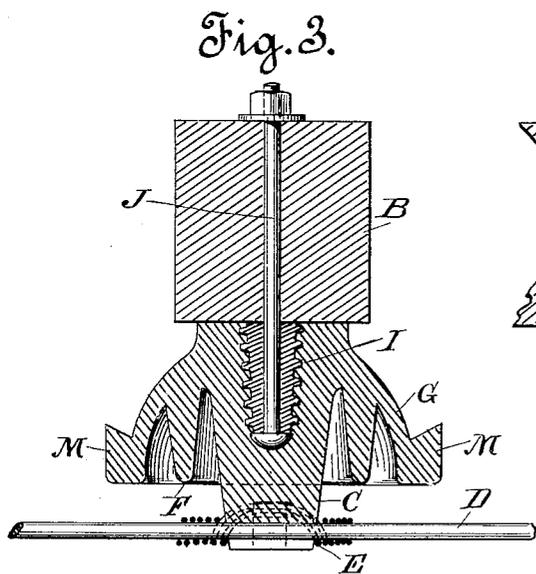
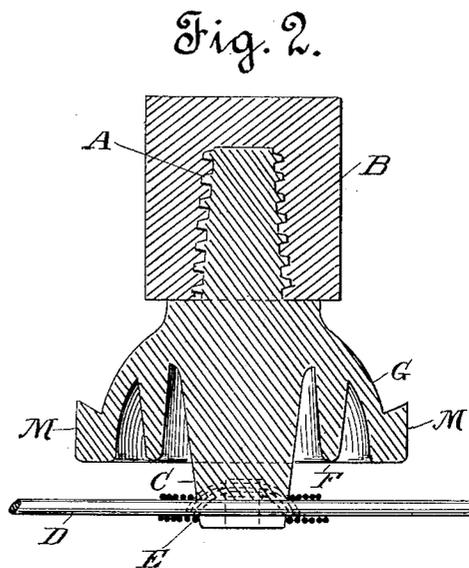
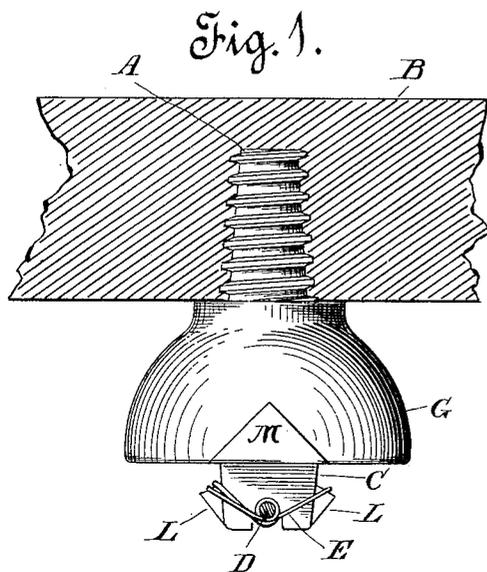


C. N. BEAL.  
INSULATED SUPPORT FOR ELECTRIC WIRES.

(Application filed Nov. 17, 1897.)

(No Model.)



Witnesses.

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# UNITED STATES PATENT OFFICE.

CARROLL N. BEAL, OF SAN FRANCISCO, CALIFORNIA.

## INSULATING-SUPPORT FOR ELECTRIC WIRES.

SPECIFICATION forming part of Letters Patent No. 634,568, dated October 10, 1899.

Application filed November 17, 1897. Serial No. 658,832. (No model.)

*To all whom it may concern:*

Be it known that I, CARROLL N. BEAL, a citizen of the United States, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Insulating-Supports for Electric Wires; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings; forming a part of this specification.

My invention relates to insulated supports for conducting-wires for transmitting electric current, especially currents of high voltage, and to the construction, arrangement, and functions of such supports.

My improvement consists in improved means for securing the insulator-support to the cross-arm and in providing the outer annular guard or "petticoat" which surrounds the central supporting member for the line-wire with intercepting ledges to protect the main wire from drip.

The objects of my invention are to secure complete insulation of such supports by their better protection from exposure to rain, moisture, and other influences and to reduce their dimensions.

Referring to the drawings, Figure 1 is a side elevation of one of my improved insulating-supports looking parallel to the course of the line, a portion of the cross-arm being shown in section. Fig. 2 is a central section through Fig. 1, taken at a right angle thereto. Fig. 3 is another section corresponding to Fig. 2, showing a method of attaching the insulating-supports when formed without a shank and to sustain the conducting-wire from below. Fig. 4 is another section taken at a right angle to Fig. 3, showing the same support made with a common screw-shank reinforced integrally with a strengthening-core.

Similar letters of reference are applied to corresponding parts in the different figures of the drawings.

In erecting insulating-supports for wires conducting currents of high voltage such supports, so far as I am aware, are placed on the top of horizontal cross-bars projecting from the supporting post or poles, thus directly exposing the point of contact between the insulating-supports and the wire to the

weather, rendering complete insulation difficult, if not impossible, especially in the case of currents of high voltage. By the inversion of the supports and placing them beneath the cross-bars, also inverting the member to which the wire is attached, there are gained several important advantages. One is the protection afforded by the cross-arm itself, which in a measure deflects rain, snow, or sleet. Another advantage gained is complete protection of the point of contact between the insulating-support and the wire from precipitated moisture by the annular guard rings or flanges, commonly called "petticoat-guards," that in this case surround the central supporting member and extend down near to the wire and not in a reverse or opposite direction away from the wire, as in the present practice.

Insulated main-wire supports of the class to which my invention pertains, as heretofore made, can be said to consist, essentially, of a mass of insulating material of a form to which the line-wire can be attached, and so constructed as to be susceptible of attachment to a cross-arm or other static bearing-structure by means of a pin inserted in both insulator and bearing-structure, the form of such insulated main-wire supports being such that the point at which the line-wire is attached is devoid of all protection from contact with the elements.

In my invention there is a shank A or other means of attachment to some static structure, commonly a cross-arm B, of wood, in which the shanks A are fastened, as shown in Figs. 1, 2, and 4, a pendent member C, to which the main wire is fastened by binding-wires E, that pass over or around lugs L, formed on the side of the member C, and annular guard-flanges F and G to interrupt the surface or capillary flow of electricity from passing over the insulator to the static supporting structure, thereby affording to that point full protection from precipitated moisture.

These insulating-supports are commonly made of glass, porcelain, vulcanite, or other non-conducting material having the required properties of strength, capable of being cast or molded, impervious to moisture, and non-corrosive.

As these insulated supports are commonly made, the shanks A are set oppositely to the member C, so as to be inserted downward into the cross-arm B, while the member C, to which the wire D is attached, projects upward or inverted from the position shown in the drawings. In my invention this arrangement is reversed and the supports are mounted in a pendent position. The annular guard flanges or ledges F and G, commonly called "petticoat-guards," I place to project oppositely from the shanks A and as nearly as possible in the same plane horizontally as the member G, so as to extend close down to the main wire D, as shown in Figs. 2 and 3. This is equivalent to the inversion of these guards in respect to the main wire and its attachments.

As the supports are commonly made of crystalline material and liable to fracture when subjected to concussion or overstrain, I provide an additional safety factor in the case of exceptional strains on long reaches and heavy main wires by either of the methods shown in Figs. 3 and 4.

Referring first to Fig. 3, there is formed in the support a tapering socket having either a screw-thread or concentric grooves to receive a plug I, formed of some strong plastic material or of wood when the socket has a screw-thread on the interior. Through this plug I passes a bolt J, by means of which the support can be drawn up firmly against the bottom of the cross-arm B and held securely under all circumstances. This method possesses the advantage of greater strength and affords additional convenience in erecting. If, however, screw-shanks are preferred and the probable strain is greater than the insulator will bear without reinforcement, I place in the material a strengthening-core K, having heads on each end or corrugations on the sides to fasten it in the material, as shown in Fig. 4, using by preference some material that has a degree of expansion and contraction by heat approximately the same as the substance of which the main support is formed.

To prevent water from dripping off the outer guard-flange G on the main wire D, I provide intercepting-ledges M, that slope each way to clear the main wire and also inward

toward the guard G, as seen in Figs. 2 and 3. These deflecting-ledges M, while not available in common practice or for supports mounted on the top of the cross-arms, form an important part of my invention by keeping the main wire D clear of the drippings of moisture precipitated upon the exposed parts and dry at the point of contact with the support and constitute the third agent directed to the avoidance of moisture and the attainment of complete insulation.

Having thus explained the nature and objects of my invention and the manner of applying the same in practice, what I claim as new, and desire to secure by Letters Patent, is—

1. A main-line insulator and support provided with central pendent member C, surrounding annular guard-flanges F, G, tapering screw-threaded plug I in screw-threaded socket, and bolt J, headed beneath the plug, and provided on its outer extremity with screw-threads and a nut, whereby the insulator may be securely attached to the cross-arm, substantially as specified.

2. In a main-line insulator and support, a screwed shank or other suitable means of attaching the insulator in a pendent position, a central member to which the main wire is attached, surrounding this member one or more guard-flanges, the outer one provided with deflecting ledges or projections to direct dripping water from the main wire, substantially as specified.

3. In a main-line insulator and support, means of attaching the support to a cross-arm, a pendent central member to which the main wire is attached, annular guard-flanges around this member and in the same plane therewith, and deflecting-ledges on the outer annular guard-flange to prevent precipitated moisture from dripping on the main wire, the whole in combination, substantially as specified.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

CARROLL N. BEAL.

Witnesses:

K. LOCKWOOD-NEVINS,  
H. SANDERSON.