

No. 838,482.

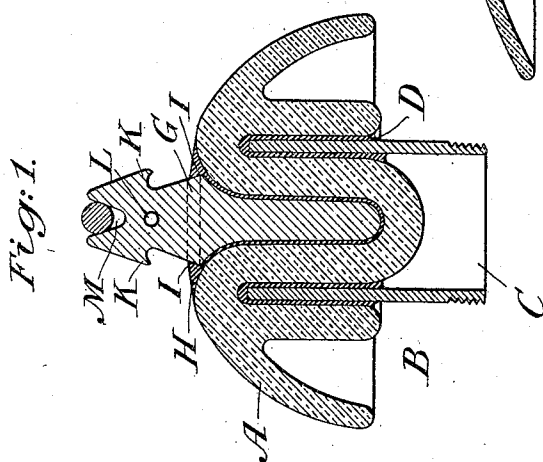
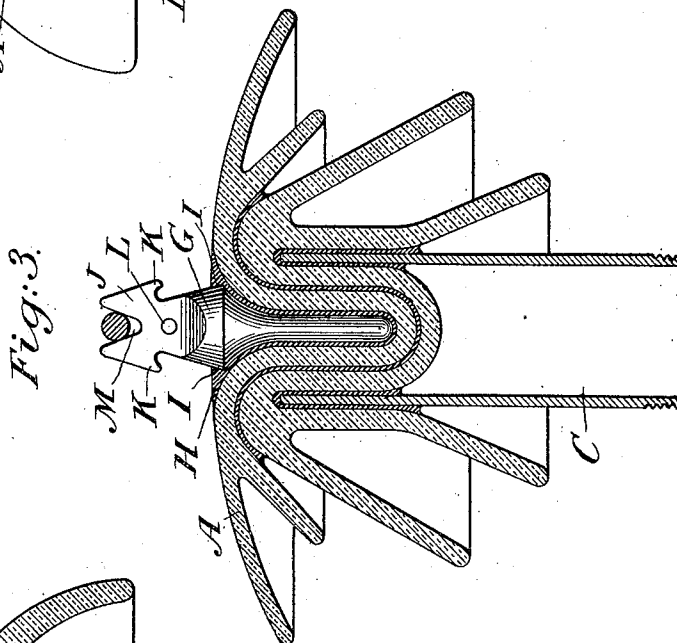
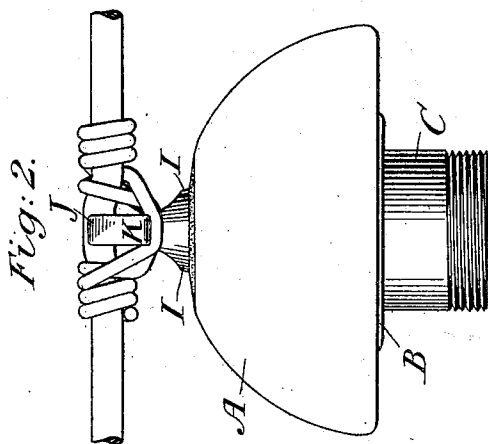
PATENTED DEC. 11, 1906.

J. M. WEED.

INSULATOR FOR LINE CONDUCTORS.

APPLICATION FILED AUG. 10, 1905.

2 SHEETS—SHEET 1.

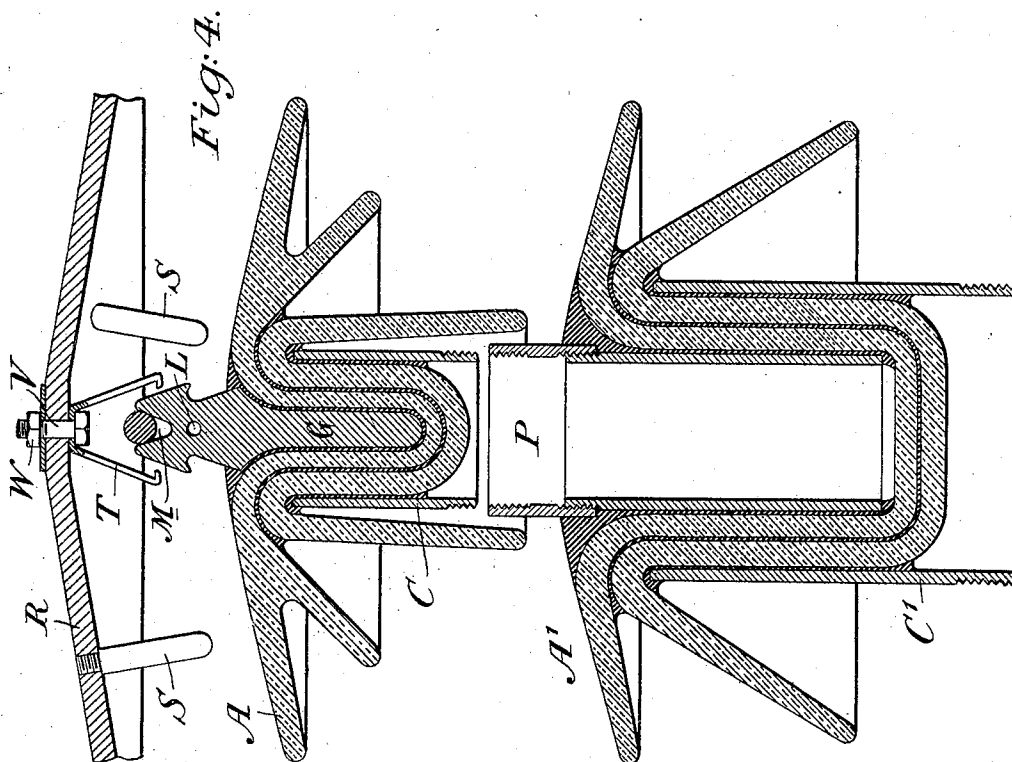
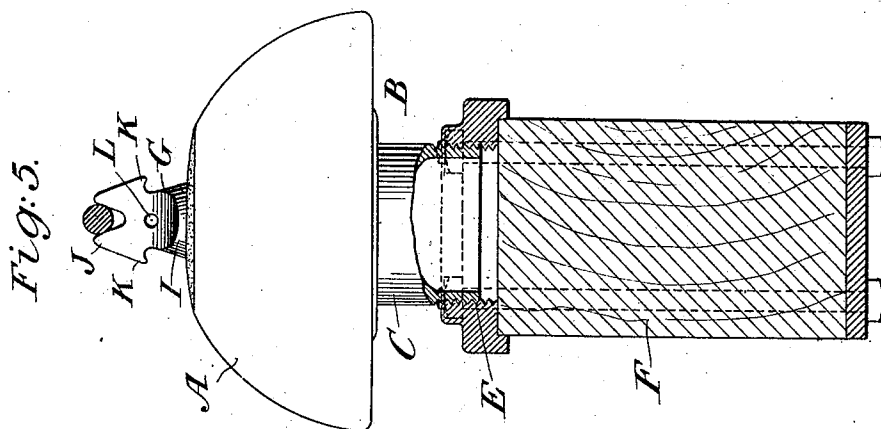


Witnesses
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Thomas J. Byrnes.

J. Murray Weed Inventor
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JAMES MURRAY WEED, OF DENVER, COLORADO.

INSULATOR FOR LINE CONDUCTORS.

No. 838,482.

Specification of Letters Patent.

Patented Dec. 11, 1906.

Application filed August 10, 1905. Serial No. 273,535.

To all whom it may concern:

Be it known that I, JAMES MURRAY WEED, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Insulators for Line Conductors, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

The invention, subject of my present application for Letters Patent is an improvement in line-insulators devised with the object of more perfectly and economically securing the two most essential prerequisites of devices of this class—viz., mechanical strength and insulating capacity.

The ordinary insulator, which may be taken as typical of the class to which my invention relates, is composed of a cap or hood of glass or porcelain supported by a pin which enters a socket in its center. In the upper portion of the insulating-hood is usually a groove in which the line conductor is secured by a tie-wire. This, however, limits the mechanical strength of the insulator, since the practical requirements of this principle of construction necessitate the use of a solid pin of comparatively small size, while the line-wire, owing to the way in which it is fastened, produces a strain tending to shear or break off the top of the insulator. Again, since the insulating capacity depends upon the amount and disposition of the vitreous or other insulating material high insulating power is attained by making the insulator in sections or layers cemented together and of such shapes as to offer as great a length of insulating-surface as possible between the line-wire and the supporting-pin and to secure large sparking distances. These results, however, are secured at the expense of mechanical strength, since they involve an increase in the length of the supporting-pin and in the distance between the end of the pin and the point of attachment of the wire.

The primary object of my invention is to avoid these objections; but I secure other important advantages by the improvements which I have devised. These latter may be described in general terms as comprising the following novel features: I employ an insulator of glass, porcelain, or other suitable material which differs from the more usual forms in being provided with an annular or substantially annular recess or socket on its under side to receive a tubular metal supporting-

pin and a central recess or socket to receive an upwardly-extending metal pin which serves as the point of attachment and support for the line-wire. This plan of construction enables me to employ to greater advantage a sectional insulator for supporting lines of high tension, to use two or more insulators in series upon a single supporting-pin, to more effectively secure the line-wire to its point of support, and to protect the insulator more perfectly from the effects of the weather. The details of construction by means of which these and other advantageous results are secured will be more fully described by reference to the accompanying drawings, in which—

Figure 1 is a central vertical section of a typical form of my improved insulator. Fig. 2 is a view of the same in elevation, showing the method of attaching the line-wire to its supporting-pin. Fig. 3 is a central vertical section of a modification of the insulator. Fig. 4 is a similar view of a further modification, showing the device for protecting the insulator against the direct precipitation of moisture; and Fig. 5 is a cross-section of a cross-arm provided with a convenient form of socket for the reception of the supporting-pin of the insulator.

For ordinary purposes and when high-tension currents are not involved the insulator is or may be made in substantially the manner illustrated in Figs. 1 and 2. In these figures, A is a glass or other suitable cup-shaped body formed with a depending central portion B, containing an annular recess or socket. The supporting-pin C is tubular or hollow and is preferably a section of wrought-iron pipe, the upper end of which is inserted into the annular recess or socket and secured therein by cement D of any suitable kind. The lower edge of the supporting-pin C is threaded or otherwise adapted for attachment to a cross-arm. A convenient means for this purpose is a socket E or similar device, such as shown in Fig. 5. This socket is shown as composed of a plate bolted to the cross-arm F and having a threaded flange with which the pin C engages.

In the top of the insulator and extending down concentrically with the annular socket is a seat or socket for the wire-supporting pin G. This latter is preferably composed of wrought-iron and is embedded in cement H, run in around the pin in quantity sufficient to fill the space about the same and provide

an even surface flush with the top of the insulator. The pin G has a peculiar shape, which will be understood from a statement of the purposes which it is designed to serve.

5 The shank of the pin is of substantially uniform size; but near its upper end the pin is gradually enlarged in diameter to form a shoulder I I. Above this shoulder it flattens into a head J, having ears or lugs K on each
10 side transverse to the direction of the line-wire. A hole L is drilled through the head, and a V-shaped groove M is formed in the top of the same above the hole and parallel therewith.

15 The line-wire is secured to the above-described insulator by the following device: The wire at its point of contact with the pin G is or may be slightly bent, as shown in Fig. 2, and laid in the V-shaped groove M. A
20 short length of tie-wire N is then passed through the hole L, so that its ends extend parallel with the line-wire on each side of the head. One end of this wire is then carried up over and around the line-wire close to the
25 head J, brought back over itself and under the ear K on one side of the pin G, then up over the line-wire a short distance from the head, and finally wrapped about said wire several times. The other end of the tie-wire
30 is treated in precisely the same way, being carried under the opposite ear from over the line conductor.

The most prominent advantage of the insulator constructed as above will be understood by a consideration of the relations existing between the supporting-pins and the insulating material which are secured in this device, for, as will be observed, the mechanical strain upon the insulating material is almost entirely one of compression and that
40 said material is so perfectly reinforced by the tubular supporting-pin wherever it is liable to be subjected to strain as to reduce the liability of crushing to a minimum. It will also
45 be seen that by enlarging the pin G at the point where it issues from the socket it has a much greater bearing-surface on the insulating material, thus adding to the capacity of mechanical resistance of the latter and
50 imparting to the pin itself the maximum strength at the point of greatest strain.

The special advantage of the mode of fastening the line-wire to the pin G resides in the fact that a maximum holding power is secured without twisting the tie so tightly as to injure the line-wire. It will be seen that the
55 latter is held in the V-shaped groove by no less than six strands of the tie-wire and that any pull upon the line in either direction not
60 only tends to tighten the tie, but also draws the line-wire more firmly into the groove in the head of the pin G.

For securing a high degree of insulation the insulator may be built up of two or more
65 sections cemented together, as shown in Fig.

3. In constructing my invention in this form the length of insulating-surface and sparking distance are made appropriate to the voltage for which the insulator is designed by properly proportioning the petticoats. The
70 method of reinforcement and supporting the insulator illustrated in Fig. 1 is retained and all of its advantages secured, as will be seen.

In Fig. 4 I have shown how by following my improved principle of support a very much
75 higher insulating capacity may be secured without sacrifice of mechanical strength. In this figure two insulators are shown in series, which is accomplished by using, as before, a tubular support for the first insulator
80 A and inserting this support in an enlarged socket in the top of a second insulator A', which in turn is supported by a still larger tube or pipe section C', inserted and secured in an annular socket concentric with that receiving the supporting-pin of insulator A. It will be understood, of course, that more
85 than two insulators may be thus combined in series, if so desired.

The tubular pin or support C of the first
90 insulator A may be inserted and cemented directly in the central socket of the second insulator, or it may be united to a tube-section previously cemented in said second insulator by a threaded sleeve P or otherwise.
95

An additional feature of improvement is shown in Fig. 4. This consists of a canopy R, of some strong weatherproof material, such as treated fiberoid, the function of which is to protect the upper surfaces of the insulator from direct precipitation of moisture, and thus to greatly increase the insulating capacity of the device for some climates. This canopy may be of any desired diameter to afford complete protection. It is supported
100 by three insulating pins or legs S, which rest upon the top of the insulator, and is held firmly in position by means of a spring-clamp T, which engages with the pin H or the tie-wires that fasten the line thereto. The
105 clamp T is secured to the canopy by a bolt V and nut W, which may be coated with an insulating material, so that the upper surface of the canopy will expose no conducting parts to receive charging or leakage currents.
115

I do not limit myself to the specific form of the devices herein described in illustration of my invention nor to the specific manner shown of attaching the tubular supporting-pin to a cross-arm; but
120

What I claim as new and of my invention is—

1. An insulator composed of insulating material and having in its under side an annular recess or socket for the reception of a
125 tubular supporting-pin, and in its upper side a central recess or socket for the reception of a wire-supporting pin, as set forth.

2. An insulator comprising an insulating-body, a tubular metal supporting-pin insert-
130

ed and secured in an annular recess or socket in its under side, and a wire-supporting pin inserted and secured in a central recess or socket in its upper side, as set forth.

5 3. An insulator comprising a body of insulating material, a tubular metal supporting-pin inserted and secured in an annular recess or socket in the under side of the same, and a wire-supporting pin inserted and secured in a
10 recess or socket extending down into the insulating material concentrically with the annular socket, whereby the insulating material subjected to strain will be reinforced by the tubular supporting-pin, as set forth.

15 4. An insulator comprising a body of insulating material, a tubular metallic supporting-pin inserted and secured in an annular recess or socket in the under side of the same, and a wire-supporting pin having an enlarge-
20 ment or shoulder near its upper end and secured in a recess or socket of corresponding shape in the upper side of the insulator and concentric with the annular socket therein, as set forth.

25 5. An insulator comprising a plurality of sections or layers of insulating material cemented together, a tubular metallic supporting-pin inserted and secured in an annular recess or socket in the under side of the lower-
30 most section and a wire-supporting pin inserted and secured in a socket in the uppermost section, extending concentrically into

the portion of the composite insulator surrounded by the tubular supporting-pin, as set forth.

35 6. A device for supporting and insulating line-wires, consisting of a series of insulators, each composed of a body of insulating material supported by a tubular metallic pin inserted and secured in an annular recess or
40 socket in its under side, and provided with a central recess or socket in its upper side for the reception of the supporting-pin of the next upper insulator of the series, and a wire-supporting pin inserted and secured in the
45 central socket in the top of the uppermost insulator of the series, as set forth.

7. The combination with an insulator comprising a body of insulating material having a wire-supporting pin secured in its central
50 socket in its upper side, of a canopy of insulating material having pins or legs resting upon the upper surface of the insulator and a catch for engagement with the wire-supporting pin whereby the canopy may be secured
55 over the point of attachment of the line-wire to the insulator for the purpose of protecting the same from the direct precipitation of moisture, as set forth.

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Witnesses:

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