

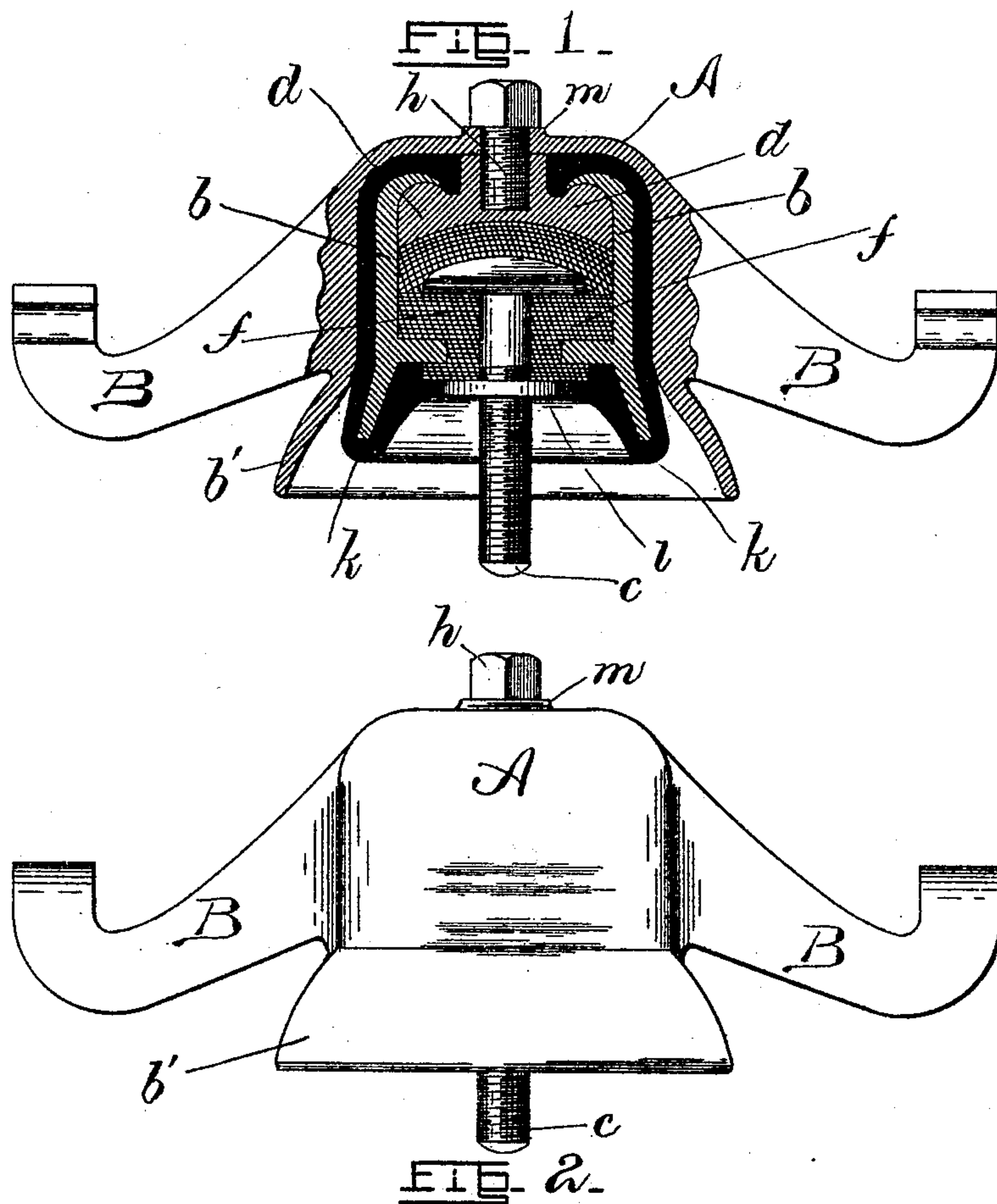
(No Model.)

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L. McCARTHY.  
TROLLEY WIRE INSULATOR.

No. 518,071.

Patented Apr. 10, 1894.



WITNESSES.

Arthur T. Randall,  
Alice H. Morrison

INVENTOR.

Louis McCarthy  
By Macleod Balver Randall  
his Attorneys.

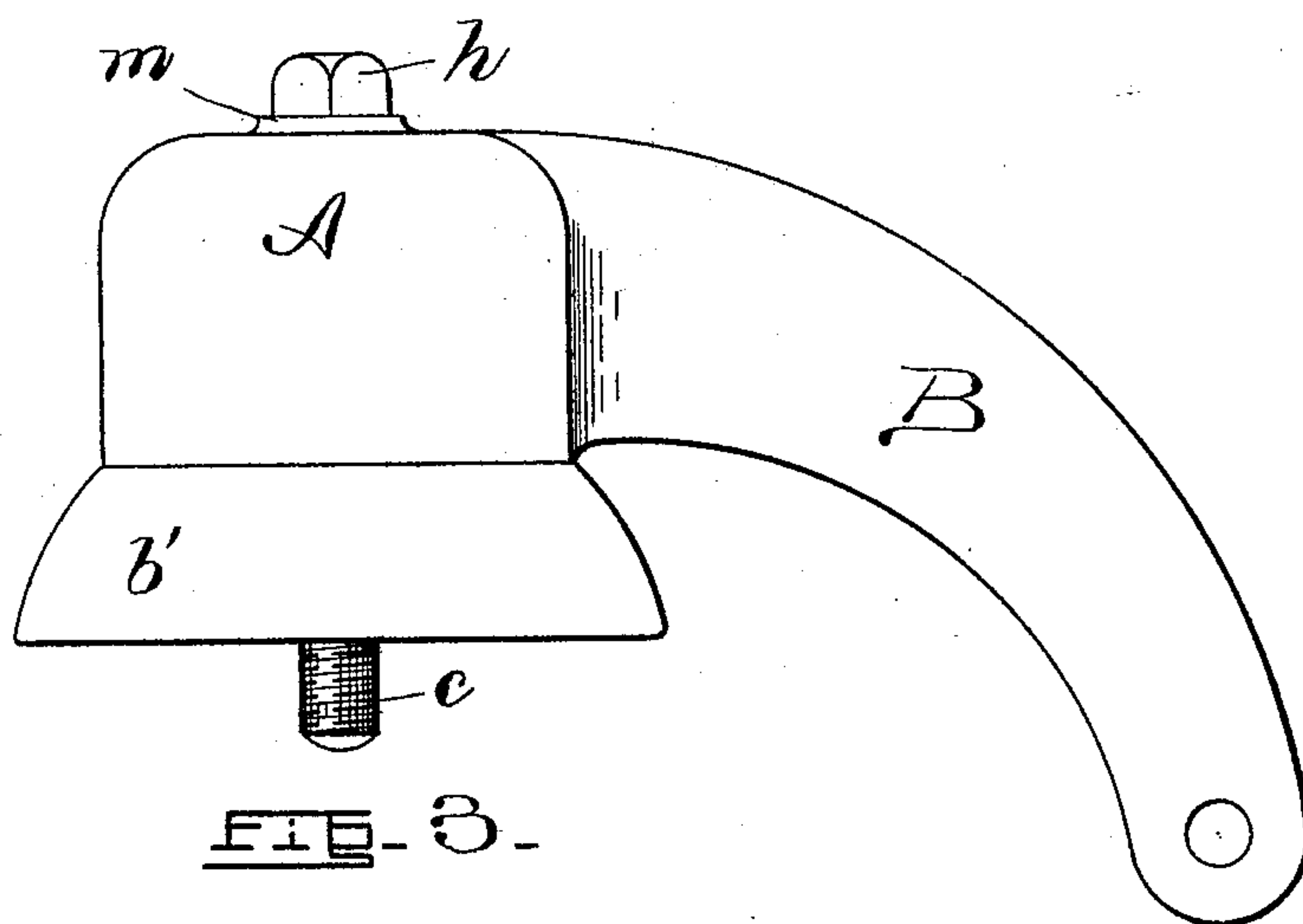
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# UNITED STATES PATENT OFFICE.

LOUIS MCCARTHY, OF BOSTON, MASSACHUSETTS.

## TROLLEY-WIRE INSULATOR.

SPECIFICATION forming part of Letters Patent No. 518,071, dated April 10, 1894.

Application filed June 8, 1893. Serial No. 477,015. (No model.)

*To all whom it may concern:*

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

In the overhead construction of electric railways, an insulated hanger or support is employed which is placed between the span wire and the trolley wire for the purpose of suspending or supporting the latter in the well known manner. An ear or clip is secured to the trolley wire at the point where it is supported, and the insulator or hanger is usually provided with a screw stud or downwardly projecting bolt which screws into a socket in the said ear or clip. It is important that the insulator or hanger should be secured firmly to the ear or clip and to this end it is important to be able to screw the downwardly projecting bolt or connecting piece of the hanger home in the socket of the ear. The insulated hanger is provided with oppositely projecting arms or well known equivalent devices by means of which it is made fast on the span wire, and these arms are usually connected by means of a screw bolt with the upper metallic portions of the insulated hanger. The hanger or insulator is therefore inserted between the arms by which it is made fast on the span wire and the ear by which it is connected with the trolley wire and is secured to each of these parts, that is, to the arms and to the ear by means of screw bolts. As the line of the trolley wire is not always at exactly the same angle with the span wire it follows that frequently the screws which secure the insulated hanger in place and connect it with the ear cannot be screwed home or if screwed home have to be "backed off," as it is termed, since if they are screwed home the ear would not be in exact line with the trolley wire as it must be for it is usually secured thereto by solder, the trolley wire lying in the groove lengthwise of the ear. To obviate these objections and provide a trolley wire hanger which may be firmly secured in place and to the trolley wire or the ear thereon regardless of the angle which the trolley wire

makes with the span wire is the chief object of my present invention.

My invention further has for its object to provide a strong and durable insulated hanger which shall be capable of sustaining severe lateral strain without breaking, and the outer metallic case of which shall be of such shape and relation to the insulator proper which is contained within the same, as to fully protect the insulator from any blow which it may receive from a misplaced trolley, and which might operate to injure the insulator, all as hereinafter more fully set forth.

In the accompanying drawings to which reference is made in the following description my invention is shown in the best form now known to me.

In said drawings Figure 1 is an elevation partially in section of a trolley wire hanger embodying my invention. Figs. 2 and 3 are elevations of trolley wire hangers having respectively double and single arms for connection with the span wire, the latter form shown and Fig. 3 is more especially adapted for use where the trolley wire is curved as in going around a corner.

An insulator embodying my invention may be described as consisting of two portions, the outer bell-shaped case A provided with an arm or arms B, said case serving as a holder or support for the insulator proper and also to protect the same fully, and the insulator proper, which comprises a case adapted to be received within the cavity of the outer bell-shaped case, said inner case, or case of the insulator proper, being covered, if desired, with a layer of molded insulating composition, a connecting piece projecting within the insulator, and a mass of insulating material insulating the connecting piece from the insulator case. As will be obvious the precise construction of the insulator proper is not material to my present invention, and various well-known forms of insulators may be employed. I have shown what I consider to be the preferred form of insulator, and to assist in making the invention as shown in the accompanying drawings more clear, I will briefly describe the same.

Referring to the drawings, Fig. 1 b is the case of the insulator proper which is prefer-



ably bell-shaped as shown. *c* is a headed connecting piece placed therein; the outwardly or downwardly projecting end of the connecting piece being threaded so that it may be 5 screwed into the threaded socket in the ear or clip.

For the purpose of insulating fully the connecting piece *c* from the case *b*, I prefer to use a series of sheets of mica *f*; a cap or fol- 10 lower *d* is placed within the top of the case *b* after the connecting piece *c*, and the insulation have been placed therein, and the upper edges of the case *b* are by means of strong pressure, bent over the cap *d* solidifying the 15 insulation and securely fastening the parts together. An insulator thus constructed is shown in Letters Patent No. 491,729, dated February 14, 1893, granted to me, and a more detailed description of this portion of the de- 20 vice will not be necessary in the present instance, because such a description may be obtained upon reference to said patent, and also, because, as previously stated, the precise construction of the insulator proper is not es- 25 sential to my present invention, and any well known form of insulator may be employed.

At *k* I have shown a layer or covering of molded composition. This layer is molded over the said case, and upon the interior of 30 the skirt thereof as also around the projecting portion of the cap or follower *d*. While I prefer to use this exterior layer it will be obvious that it is not essential to my present invention and may be omitted if desired. 35 The arms *B* project in opposite directions from the bell-shaped receiver or outer case *A* and are preferably cast integral therewith, but the precise shape of said arms is not essential, any well known form of projec- 40 tion or device by means of which the span wire may be firmly secured to the insulator may be employed instead of the arms *B* which are shown. The top of the receiver or case *A* is preferably slightly thickened or pro- 45 vided with a boss as shown at *m* to strengthen it and is at this point provided with an aperture through which a screw bolt *h* is passed which screws into a threaded socket in the cap *d*. As will be clear if any insulator proper 50 of different internal construction from that shown be employed the bolt *h* will screw into the top or upper metallic portion of such insulator instead of into the cap *d*. As previously stated the downwardly projecting end 55 of the connecting piece *c* is threaded so that it may be screwed into the ear or clip which is soldered or otherwise secured to the trolley wire in the well known manner. By this construction the upper bolt *h* is not subject to 60 lateral strain but serves simply as a retaining point and to hold the insulator proper in the cavity in the receiver or bell *A*. Any lateral strain on the insulator is borne by the sides of the bell-shaped case *A*, being transmitted 65 to said case from the case *b* of the insulator proper. The danger therefore of the insulator being broken or separated from the arms or de-

vices by which it is secured to the span wire by lateral strain is reduced to a minimum. The receiver or bell-shaped outer case *A* is pro- 70 vided with a downwardly projecting skirt shown at *b'* which projects below any portion of the inner case of the insulator proper and serves not only as an extra watershed to keep moisture from the insulation, but also as a 75 protection in case a misplaced trolley is moved past the insulator. Without such protection the insulator may be subject to a blow from a trolley which might seriously impair it and in case an exterior molded covering like that 80 shown at *k* were employed such a blow might fracture this covering and thereby destroy or impair the value of the insulator. The downwardly projecting skirt *b'* is therefore of great value in preventing such accidental in- 85 jury.

In securing my improved insulator in place it is only necessary to screw the threaded connecting piece *c* home in the socket in the ear or clip, the top of the ear coming to a bear- 90 ing on the under side of the insulator proper or on the metallic washer *l* which is firmly screwed or otherwise secured on the connecting piece *c*. When this is done (the hanger being properly secured on the span wire) if 95 the ear or clip is not in line with the trolley wire, it is only necessary to loosen the bolt *h*, turn the insulator proper in the outer bell or receiver *A* until the ear is in proper position with reference to the trolley wire, then screw 100 the bolt *h* firmly down. It will also be noted that if it becomes desirable for any purpose to remove the insulator it is only necessary to unscrew the bolt *h* which allows the insu- 105 lator to be taken out of the receiver or outer bell *A* and then to unscrew the insulator connecting piece *c* from the ear or clip. An insulator may thus be removed or another one put in its place quickly and easily and without taking down any other parts of the 110 construction. It will be noted that the arms *B* are shown as of such shape that the body of the insulator and receiver *A* are substantially in line with the span wire, so that any lateral strain to which the insulator may 115 be subjected is borne in the most effective manner.

It will be obvious that the downwardly projecting skirt portion of the receiver *A* may be omitted and many of the advantages of 120 my improvement obtained. I do not therefore wish to limit myself to a receiver having a skirt or portion thereof projecting below the insulator proper.

What I claim is—

1. An insulator for trolley wires comprising 125 an outer case or receiver having one or more arms by means of which the insulator may be secured to the span wire, an insulated portion fitting within said receiver, a screw bolt 130 passing through the top of the outer case or receiver and entering the upper part of such insulated portion for securing said insulated portion within said receiver and a screw con-



nection for securing said insulator to the ear or clip on the trolley wire, substantially as set forth.

2. An insulator for trolley wires comprising  
5 an outer case or receiver having one or more arms by means of which the insulator may be secured to the span wire, an insulated portion fitting within said receiver, and a screw connecting piece for securing said insulator  
10 to the ear or clip on the trolley wire, said receiver having a downwardly projecting skirt extending below the lower portion of the insulator proper which is within the receiver, for the purposes and substantially as set forth.  
15 3. An insulator for trolley wires comprising an outer case or receiver provided with one or more arms by means of which the insulator may be secured to the span wire, an insulated portion fitting within said receiver,  
20 said insulated portion having an exterior layer of insulating composition molded thereon, and screw connecting bolts for securing said insulated portion within the receiver as also for securing said insulated portion to the ear  
25 or clip on the trolley wire, substantially as set forth.

4. An insulator for trolley wires comprising

an outer case or receiver having oppositely extending arms by means of which the insulator may be secured to the span wire, an insulated portion fitting within said receiver a  
30 screw connecting bolt passing through the top of the outer case or receiver and entering the top of the said insulated portion for securing said insulated portion within said receiver, and a second screw connecting-bolt  
35 separate and independent from that afore-said for securing said insulated portion to the ear or clip on the trolley wire, said oppositely extending arms being in line with the body  
40 of the insulated portion when said portion is within the receiver whereby the span wire will be in line with the body of the insulated portion and below the securing bolt which  
45 secures said insulated portion within the receiver, substantially as and for the purposes set forth.

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

LOUIS McCARTHY.

Witnesses:

ROBERT WALLACE,  
ALICE H. MORRISON.