

(No Model.)

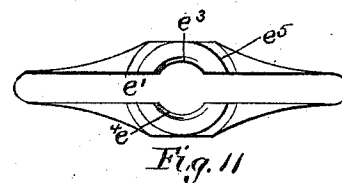
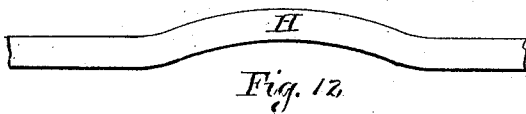
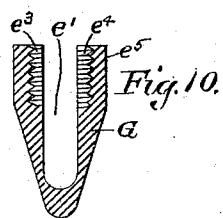
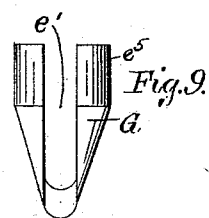
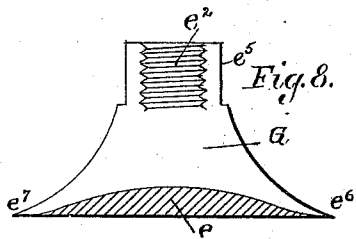
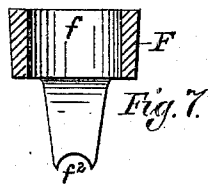
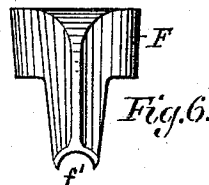
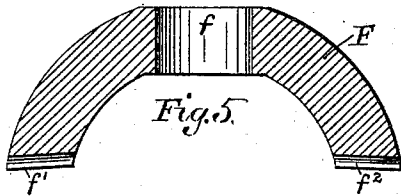
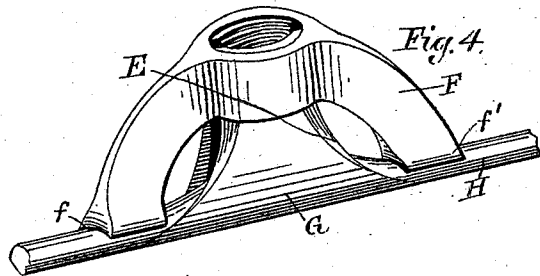
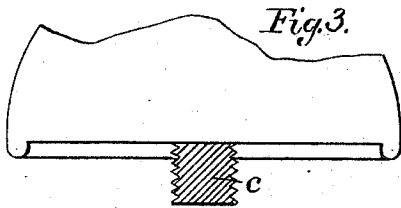
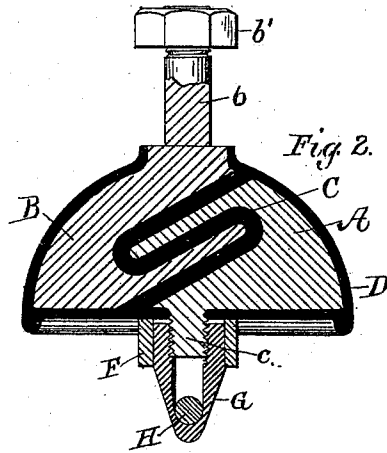
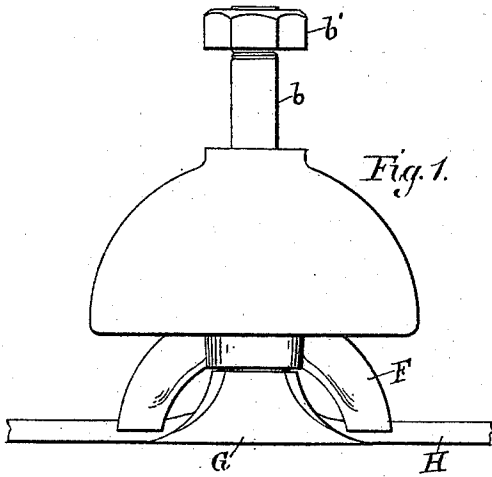
3 Sheets—Sheet 1.

H. D. WINTON.

INSULATOR FOR OVERHEAD ELECTRIC RAILWAYS.

No. 470,356

Patented Mar. 8, 1892.



Witnesses:
J. A. Titman
J. N. Walsh

Inventor:
Henry D. Winton

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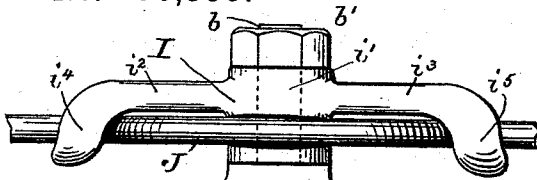


Fig. 13.

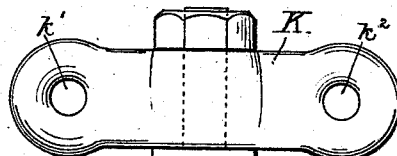


Fig. 14.

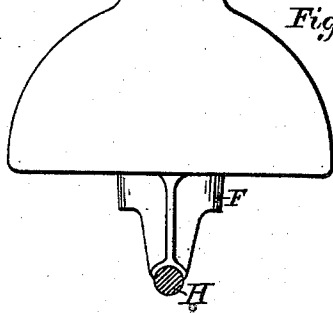


Fig. 15.

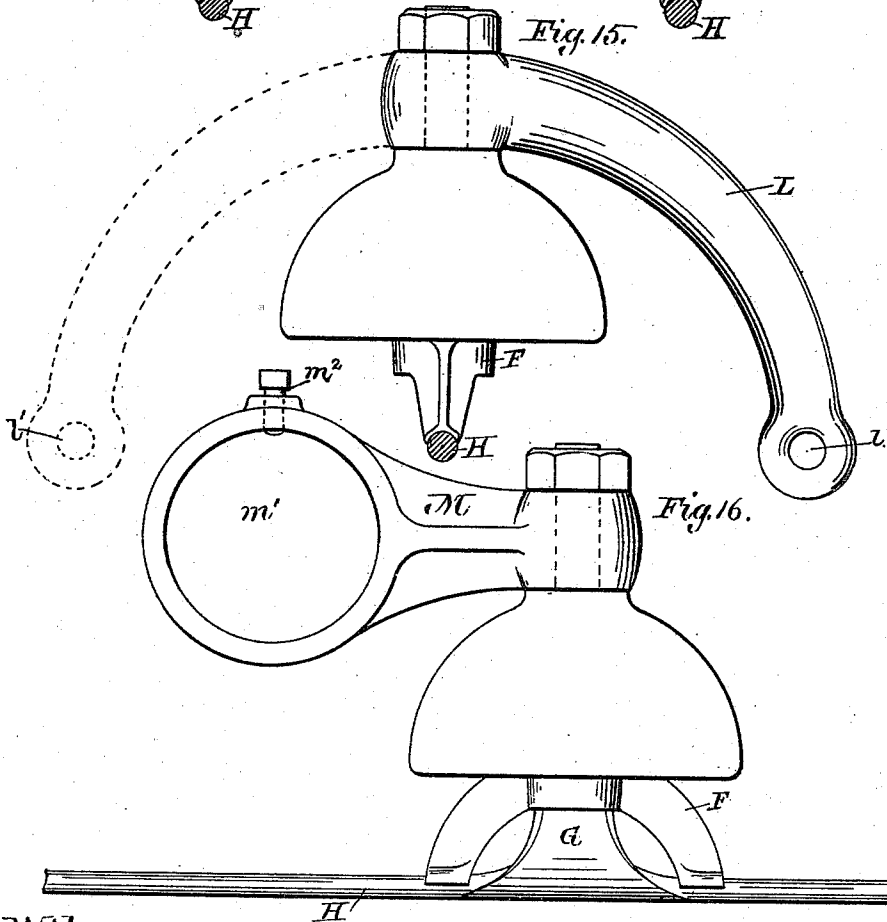
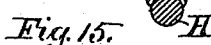


Fig. 16.

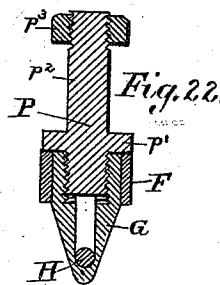
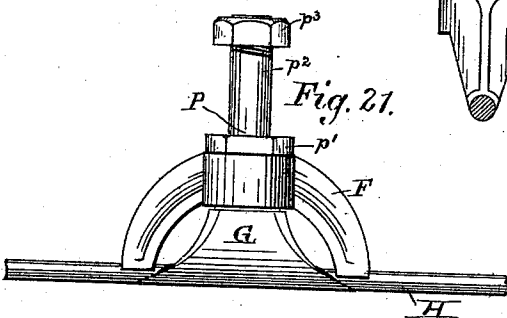
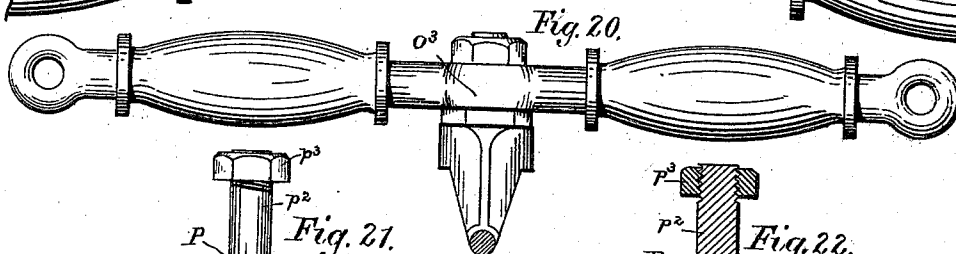
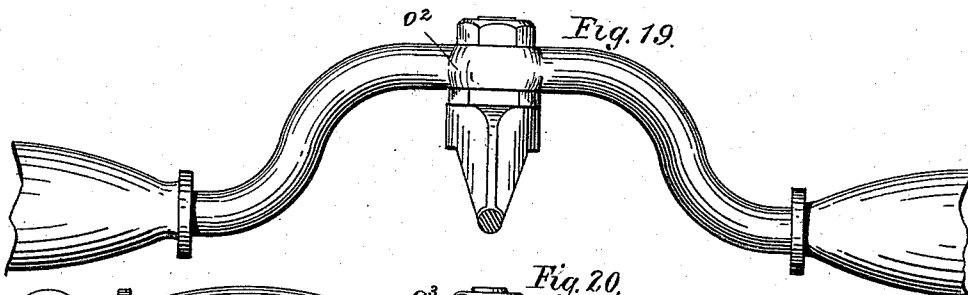
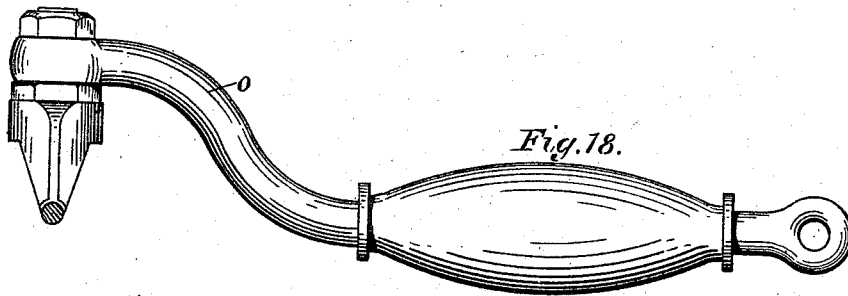
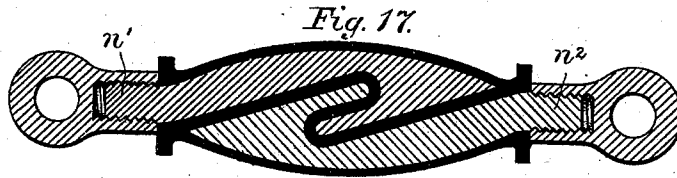
Witnesses
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Inventor
Henry D. Winton

(No Model.)

3 Sheets—Sheet 3.

H. D. WINTON.
INSULATOR FOR OVERHEAD ELECTRIC RAILWAYS.
No. 470,356. Patented Mar. 8, 1892.



Witnesses:
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Inventor
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UNITED STATES PATENT OFFICE.

HENRY D. WINTON, OF WELLESLEY, MASSACHUSETTS, ASSIGNOR TO THE HERSEY MANUFACTURING COMPANY, OF PORTLAND, MAINE, AND OF BOSTON, MASSACHUSETTS.

INSULATOR FOR OVERHEAD ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 470,356, dated March 8, 1892.

Application filed October 22, 1891. Serial No. 409,562. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. WINTON, a citizen of the United States, residing at Wellesley, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Insulators for Overhead Electric Railways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

This invention relates to insulators for overhead electric railways, and is designed especially for supporting the trolley-wires for such lines.

My invention, as herein described, comprises certain improvements in insulators which are shown and described in Letters Patent to me of February 3, 1891, and numbered 445,790. The insulators there described comprise interlinking hooks embedded in an insulating material, the extremities of which are provided with means of attaching wires to them.

The improvements herein contained have reference to special methods of securing the wires to the extremities of the interlinking hooks, by which I am enabled to obtain a more substantial and interchangeable system of insulators for overhead railways.

In the drawings, Figure 1 represents a view in elevation of one of my insulators with the attachment for securing the trolley-wire shown upon it. Fig. 2 is a sectional view of the same. Fig. 3 is a bottom portion of the insulator. Fig. 4 is a perspective view of the wire-clamping device by which the trolley is secured to one of the extremities of the insulator. Fig. 5 represents a sectional view of the yoke forming part of this clamping device. Fig. 6 is an end view of the same. Fig. 7 is a cross-sectional view of the same. Fig. 8 is a sectional view of the clamping part of this same fixture. Fig. 9 is an end view of the same. Fig. 10 is a cross-sectional view of the same. Fig. 11 is a plan view of the same. Fig. 12 is a piece of the trolley-wire, showing the shape given to it to hold it in the clamping device. Fig. 13 is an elevation showing the same insulator with the trolley-wire-clamping device

secured to it and a fixture for spanning the supporting-wire secured to the other extremity of the insulator. Fig. 14 is a view representing the same insulator with a modified form of fixture for securing the supporting-wires at each end. Fig. 15 represents the same insulator, showing a modified form of fixture for pulling the trolley-wire upon a curve. This figure also indicates by dotted lines a double-curve fixture which is used in connection with the insulator. Fig. 16 represents the same insulator with a fixture adapted to secure the same upon a bracket. Fig. 17 represents a sectional view of a slightly-modified form of my interlinking insulator. Fig. 18 represents this same form of insulator provided with the trolley-wire-clamping attachment applied in a modified way. Fig. 19 represents portions of two of these insulators arranged to attach the trolley-supporting clamp to them. Fig. 20 represents two of these insulators with the clamping fixture secured to them in a modified form. Fig. 21 is an elevation of the trolley-clamping device as arranged to be attached to this particular form of insulator. Fig. 22 is a sectional view through the same.

Referring now to Fig. 2, which is a sectional view of my interlinking insulator, A represents one of the metallic hooks forming part of the insulator, and B represents the other hook. These hooks are separated by a layer of rubber (represented at C) and are entirely covered with a layer of rubber, as at D, and the whole is cured as one solid piece, the form or shape of the insulator being given by the shape of the metal forming the interlinking hooks, as described by me in my patent, No. 445,790, by which I am enabled to obtain a form of insulator composed of a cheap material, like malleable iron, and at the same time insulate the parts perfectly by means of a high grade of insulating material, using a small bulk or quantity of such expensive material. In the construction here shown I provide the extremity of one of these insulating-hooks B with a projecting stud *b* and a nut *b'*. The other interlinking hook A, I provide with a projecting stud *c*, having a thread cut on the same. This form of insulator I use as

a universal insulator, to which I can attach interchangeable fixture parts, which I will hereinafter describe.

In order that I may hold the trolley-wire 5 securely and firmly, I construct what I will term a "clamping-ear" E, Fig. 4, which is formed in two parts, F representing what I call the "yoke" and G the clamp.

Referring to Fig. 8, which is a sectional 10 view of the clamp G, it is preferably formed of brass, having the sectional shape e , to which the trolley-wire is conformed. This casting is split, as shown at e' , Figs. 9 and 10, to allow it to slip over the wire. The upper portion of the clamp is provided with an internal 15 thread e^2 , which is formed in each side of the casting, as at e^3 and e^4 . The upper or outside surface of this casting, as at e^5 , is turned to correspond to the hole f in the yoke F, as shown in Fig. 5. This yoke is formed 20 with grooves f' and f^2 , so that when it is fitted over the casting G it fits over the trolley-wire, as shown at f' and f^2 , Fig. 4, H representing the trolley-wire. Upon the lower portion of the insulator, as shown in Fig. 3, is 25 the threaded extremity c of the interlinking hook. It will be seen that if I place the trolley-wire H, Fig. 12, into the slotted clamp G, so that it conforms to the sectional shape e 30 shown in Fig. 8, then slide the clamp into the hole f of the yoke, and screw the insulator into the threaded portion of the clamp c , I bind the wire firmly to the extremity of the insulator. The sectional form given 35 the clamping-piece, which tapers off at each end at e^7 and e^8 , allows a perfectly smooth run for the trolley. As it passes over the line, the clamp being cut away on the sides and tapered off to a point and given the same curve that 40 the wire has, makes a perfectly smooth true runway for the trolley. In making the upper portion of this clamp I do not allow the turned portion e^5 to project way through the hole f of the yoke, leaving one-sixteenth of an inch 45 (more or less) shorter than the distance through the hole, so that the tighter the insulator is screwed into the threaded portion the tighter it will bind the hook against the outer edges of the trolley-wire and the tighter the 50 whole thing becomes bound together. This threaded portion of the clamp cannot spread, as the yoke forms a perfect collar to bind it together, so that, while the thread is not a perfectly solid one in a complete circular hole, 55 in the peculiar construction it is quite as strong and durable as if it were, on account of the collar which the yoke forms for it. Having thus described this trolley-clamping ear, I would, by means of Fig. 13, illustrate 60 my method of supporting the insulator and trolley-wire upon the cross-wire, as it is usually placed across the street, where the trolley-wire is to be supported.

I, Fig. 13, represents a casting, through which 65 there is a hole (represented at v') which is of dimensions to slip over the projecting stud b

at the extremity of the interlinking insulator and which is secured thereto firmly by means of the nut b' . Projecting from each side of this casting are two arms v^2 and v^3 , which are 70 formed with hooks v^4 and v^5 , so that the insulator may be hung upon the cross-wire J by placing one of the hooks, as at v^4 , over the wire J, and then straining the other hook portion v^5 over the wire, so that it be- 75 comes woven through the casting, which it spans, thereby forming a holding support which can neither lift off nor slide one way or the other. On account of the various cir- 80 cumstances and conditions met with in supporting these trolley-wires it becomes necessary in some instances to support the insulators by means of sections of supporting-wire, instead of upon a straight wire stretched over them. In event of this being necessary I 85 provide a fixture K, which can be put upon the stud in the same manner as that just described. This fixture is provided with two eyes k' and k^2 , in the ends of which the sections of wire may be twisted or hooked. Fur- 90 ther than this, it sometimes becomes necessary to strain the wires upon curves and angles, and in event of this I provide a curved fixture L, so that it will fit upon the stud in the same manner as those just described, 95 and is provided with an eye l , which is approximately in a line with the trolley-wire. Further than this, I form a casting with a double curve, as indicated in the dotted lines, which will fit upon this same stud, and which 100 is provided with two eyes, as at $l'l'$, so that it can be supported by sections of wire. It also becomes necessary in some instances to support the trolleys upon projecting arms or brackets, and in event of this I provide a 105 bracket-fixture M, adapted to go upon this same stud and provided with a hole m' of the proper size to fit over the projecting arm. I have therefore so formed this insulator with the projecting stud and designed the various 110 fixtures so that they will interchange upon this same insulating device. In Fig. 17 I illustrate one of these interlinking insulators of a modified form from that just described, but similar in principle, which I have pro- 115 vided with projecting threaded extremities, as at n' and n^2 , upon which I may secure a variety of fixtures, something after the manner I have just described. In a great many cases it is desirable to obtain a strong sub- 120 stantial insulator to strain up wires by providing two eyes which can be secured upon the extremities of the interlinking hooks, as shown in Fig. 17. This provides a perfectly strong and durable strain-insulator. By 125 moving one of these eyes, as at n' , I may in lieu of this substitute a fixture having a double curve, as at o , to the extremity of which I secure my trolley-supporting ear to form an insulator for straining trolleys at curves or 130 angles. The only modification that I make in the clamping-ear for this purpose is the

substitution of a stud P, Figs. 21 and 22, having a nut p' formed upon it, so that it may be secured into the threaded portion of the clamp and bind the trolley-wire. I project
 5 this stud, as at p^2 , and provide it with a nut, as at p^3 , and in thus forming it I can secure it in the end of the fixture o , as just described. This same form of insulator may be used as a double-curved trolley-support, as at Fig. 19.
 10 The two extremities of the insulators therein shown are provided with eyes, as at Fig. 17, and in lieu of the eyes on the other extremities I provide a double-curve fixture o^2 , which is screwed upon the threaded extremities of
 15 the insulator, and which is provided with a hole to receive the stud forming a part of the clamping-ear, which I have just described. A further modification of this is shown in Fig. 20, in which the short straight fixture o^3
 20 is screwed upon the extremities of the insulator and receives the clamping-ear. The two forms of insulators here described are particularly arranged to receive the interchangeable fixtures, as described, and when
 25 provided with the clamping-ear, as described, become a universal interchangeable trolley-supporting insulator.

In order that I may curve the trolley-wire so that it will fit the clamping-ear perfectly,
 30 I use what I term a "kinking-machine," so constructed that it can be hooked upon the wire and give it the proper bend or kink by the turning of a lever-handle. This kinking-machine is fully set forth in specification
 35 forming part of a separate application to be filed by me.

Modifications in the insulator, as shown in my patent, 445,790, in which the interlinking
 40 hooks are embedded in a solid material, in combination with these parts, are included in my invention.

Having thus fully described and set forth my invention, what I desire to claim as new and secure by Letters Patent is—

45 1. An insulator for overhead electric-railway trolley-wires, composed of an insulated body portion formed to shed rain or moisture and having at its extremities projecting studs
 50 formed to receive interchangeable attaching-pieces for clamping the trolley-wire and securing the insulator to supports, substantially as shown and described.

2. An insulator for overhead electric-railway trolley-wires, composed of an insulated
 55 body portion formed to shed rain or moisture and having at one extremity a projecting threaded stud to receive a trolley-clamping ear composed of a clamp portion slotted to receive the trolley-wire and having an internal
 60 thread partly cut in each portion of the slotted part to screw upon the threaded stud, a yoke formed to fit over said split portion of the clamp to prevent its spreading and having extended curved portions to grasp the
 65 trolley-wire so that it is bound tightly in the clamp, and a projecting stud at the other extremity provided with a thread and nut to

receive and hold interchangeable attaching-pieces for attaching said insulator to supports, substantially as shown and described. 70

3. An insulator for overhead electric-railway trolley-wires, composed of an insulated
 75 body portion formed to shed rain or moisture, having at one extremity a projecting threaded stud to receive a trolley-clamping ear composed of a clamp portion slotted to receive
 80 the trolley-wire and having an internal thread partly cut in each portion of the slotted part to screw upon the projecting stud, a yoke formed to fit over said split portion to prevent its spreading and having extended
 85 curved portions to grasp the trolley-wire, whereby it is bound tightly in the clamp, a projecting stud upon the other extremity provided with a thread and nut, and an attaching-piece adapted to span and weave over a
 supporting-wire, substantially as shown and described.

4. As an improved article of manufacture, an insulator for overhead electric-railway trolley-wires, composed of hooks having straight
 90 shanks threaded at their outer ends and interlinked in insulating material which separates the hooks and partially incloses the shanks, but does not extend to the threaded
 95 sections, whereby the threaded sections are oppositely arranged in relation to each other and are left exposed or projecting from the insulating material, as and for the purposes described. 100

5. An insulator for electric-railway trolley-wires, composed of interlinking hooks cast,
 105 embedded, or otherwise permanently inclosed within an insulating material and separated thereby from each other and having a projecting stud forming part of one of said interlinking hooks, provided with a thread to receive a trolley-clamping ear, and a stud forming part of the other interlinking hook,
 110 provided with a thread and nut to receive and hold firmly an attaching-piece adapted for attachment to a support, substantially as shown and described.

6. An insulator for overhead electric-railway trolley-wires, composed of interlinking
 115 hooks cast, embedded, or otherwise permanently inclosed within an insulating material and separated thereby from each other and having a projecting stud forming part of one of said hooks, provided with a thread to receive a trolley-clamping ear composed of a
 120 clamp portion slotted to receive the trolley-wire and having an internal thread partly cut in each portion to screw upon the threaded stud, a yoke formed to fit over said split portion to prevent its spreading and having
 125 extended portions to grasp the trolley-wire, whereby it is bound tightly into the clamp, and an attaching-piece secured upon the stud forming part of the other interlinking hook, adapted to span and weave over a supporting-wire, substantially as shown and described. 130

7. In an insulator for overhead electric-railway trolley-wires, the combination, with

the body portion formed to shed rain or moisture and having projecting threaded studs at its extremities, of a clamping-ear for receiving and holding the trolley-wire, composed of
 5 a slotted clamp portion adapted to receive a trolley-wire and provided with an internal thread cut partially in each portion and having a curved sectional form to which the trolley-wire is shaped and cut away to points at
 10 each end to make a smooth run for a trolley, a yoke formed to fit over the outside of said clamp portion to prevent it from spreading and having projections slotted to grasp the wire, whereby it is bound firmly within the
 15 clamp, and an attaching portion secured to the other threaded extremity, whereby it may be secured to a support, substantially as shown and described.

8. In an insulator for overhead electric-
 20 railway trolley-wires, the combination, with

the body portion formed to shed rain or moisture and having projecting threaded studs at its extremities, one of which is formed to receive a supporting-fixture, of a clamping-ear
 25 composed of a clamp portion G, slotted, as at e' , to receive a trolley-wire and having a thread e^2 cut partially in each portion of the clamp, as at e^3 e^4 , and a curved sectional portion e , to which the trolley-wire is shaped, and a clamp
 30 F, formed to fit over said clamp portion G to grasp the trolley-wire, so that the whole may be bound together to hold the wire firmly when secured to the projecting stud by means of the thread e^2 , substantially as shown and described.

HENRY D. WINTON.

Witnesses:

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 W. M. J. SMITH.