

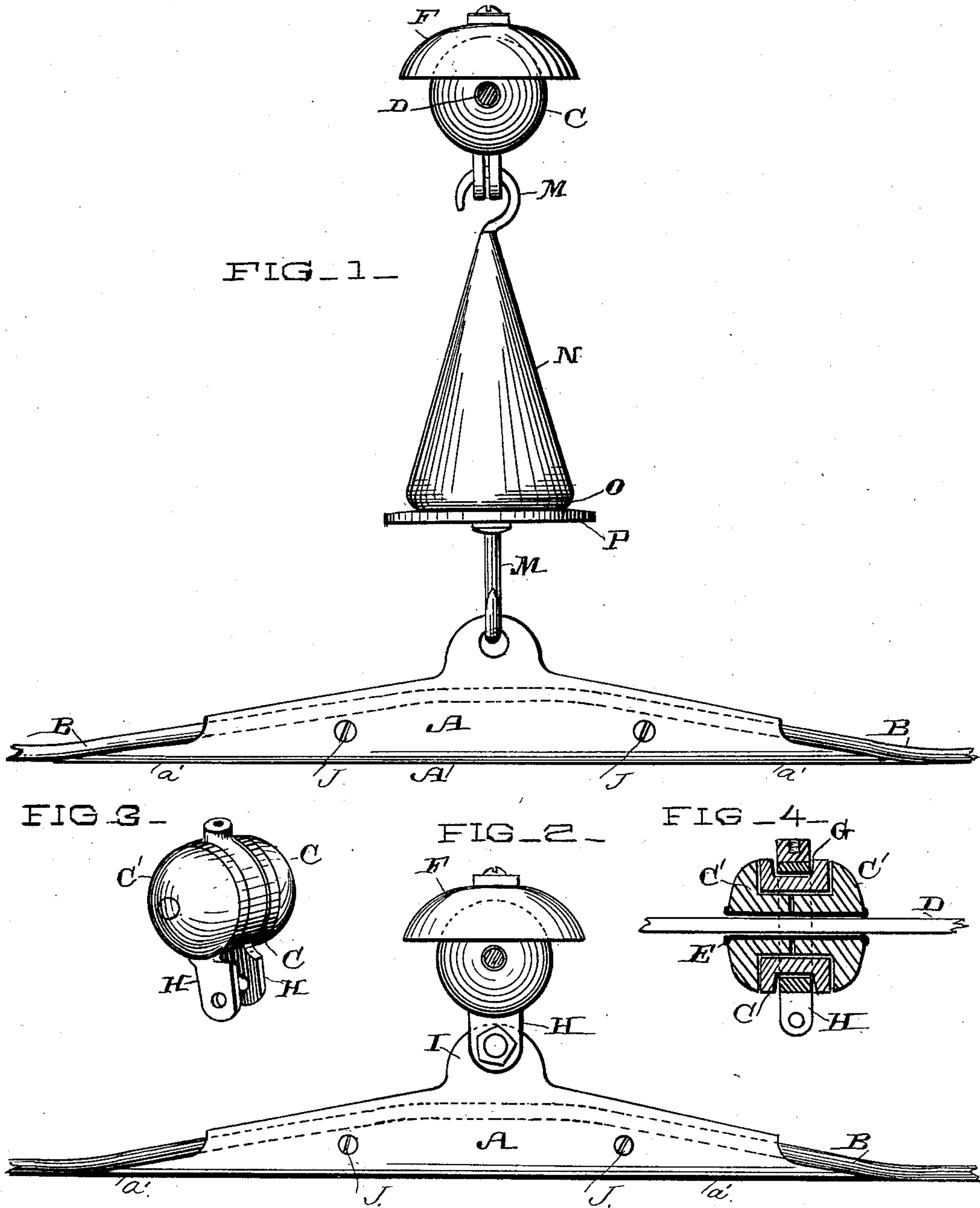
(No Model.)

2 Sheets—Sheet 1.

B. JENNINGS.
ELECTRIC INSULATOR.

No. 452,523.

Patented May 19, 1891.



Witnesses,
J. H. Morse
H. C. Lee.

Inventor
Byron Jennings

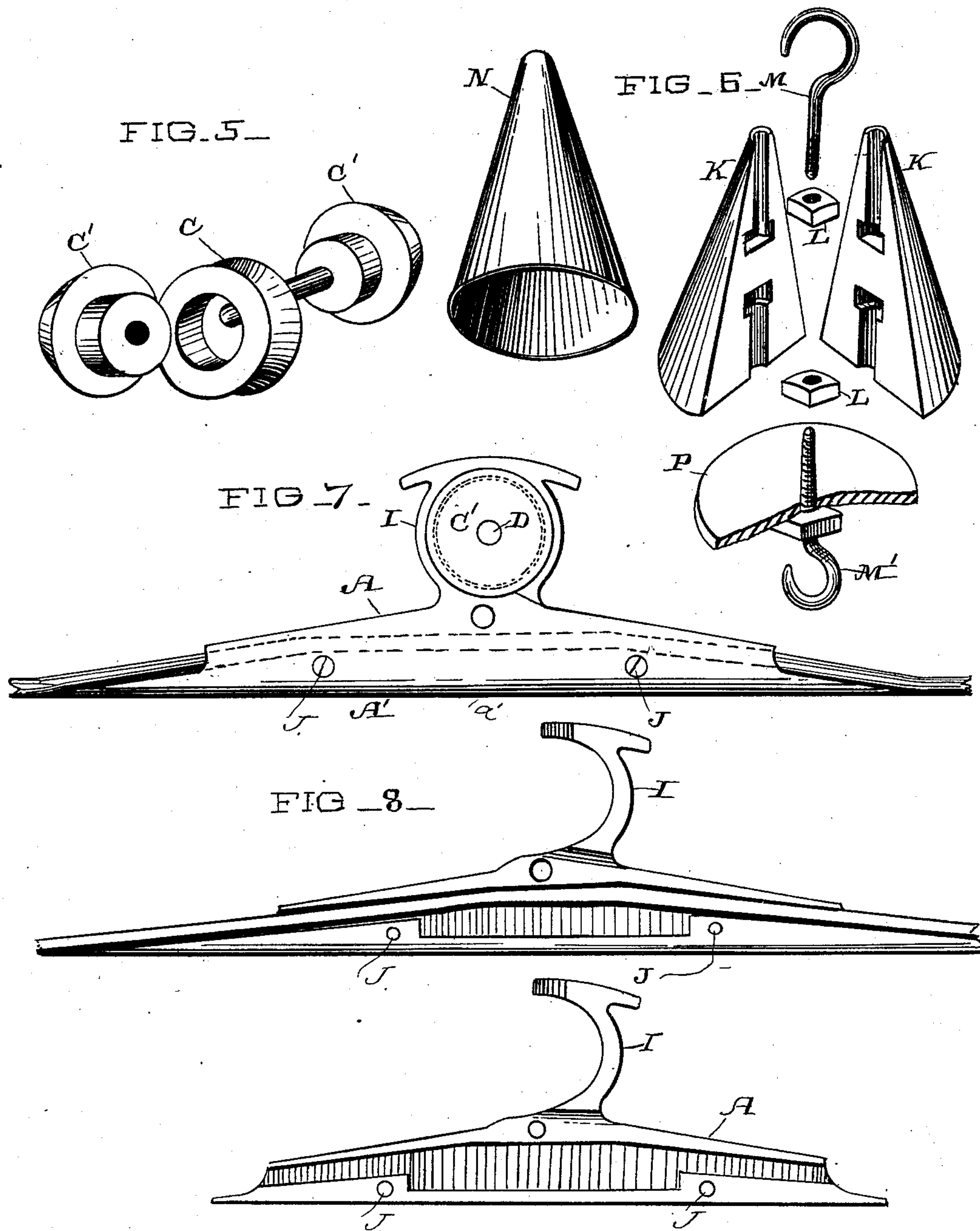
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UNITED STATES PATENT OFFICE,

BYRON JENNINGS, OF SAN JOSÉ, ASSIGNOR OF ONE-HALF TO JAMES BRUSIE,
OF OAKLAND, CALIFORNIA.

ELECTRIC INSULATOR.

SPECIFICATION forming part of Letters Patent No. 452,523, dated May 19, 1891.

Application filed September 12, 1890. Serial No. 364,794. (No model.)

To all whom it may concern:

Be it known that I, BYRON JENNINGS, a citizen of the United States, residing at San José, Santa Clara county, State of California, have
5 invented an Improvement in Insulators for Electric Railways; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel insulating
10 device for the conducting-wires of an electric railway.

It consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in
15 which—

Figure 1 is a side view of the insulators as used on a straight line of track. Fig. 2 shows the device with a portion of the insulator left out. Fig. 3 is a perspective view of one part
20 of the insulator. Fig. 4 is a vertical section taken through the plane of the axis of the suspending-wire. Figs. 5 and 6 are detail views of parts of the insulator. Fig. 7 is a view of one form of the ear or bail with clamp
25 and insulator. Fig. 8 shows the two parts of the ear separated from each other.

In the present case I have shown my device as adapted to that class of electric railroads in which the conducting-wire is suspended
30 directly over the line of travel of the electric car by means of transverse wires extending across the roadway at intervals from supporting-posts at each side of the roadway. At the points where these transverse wires
35 suspend the longitudinal conducting-wire it is necessary to have as perfect an insulation as possible to prevent the leakage or loss of the electric current, and at the same time to so support the longitudinal wire that it will
40 present a smooth surface for the travel of the trolley-wheel through which the electric current is transmitted to the motor on the car. In order to do this I have shown a supporting ear or bail, which in the present case is made
45 in two parts A and has a groove or channel passing through the upper portion, through which the main longitudinal conducting-wire B passes, this wire being clamped in place by bolts or screws which hold the two parts of
50 the ear together.

The wire B forms a small convex arc through

the upper part of the ear A, and the lower part of the ear is formed so as to stand approximately in a straight line with the parts of the wire which are upon each end of the
55 ear, and it is also rounded, so as to have about the same diameter and shape as the wire, as shown at *a'*. This lower edge of the clamp being nearly or quite in a straight line with parts of the wire which approach the ear on
60 each end, it will be manifest that the trolley-wheel will travel over the lower part of the suspended ear as if it were a portion of the wire, and the ear thus formed gives a smooth and continuous track for the travel of the
65 trolley. This construction is preferable to the method of securing the wire along the lower edge of the suspending-ear, from which it is liable to be detached by its own weight or by vibration.

In Fig. 1 I have shown the ear suspended by means of an intermediate insulator, which is in turn suspended from the insulator through which the transverse supporting-wires pass. When the intermediate insu-
75 lator is used, it will be upon straight portions of the track, where it is necessary to allow the conducting-wire to swing from side to side in unison with the movement of the car or the trolley-wheel, which is supported from the
80 car; but in passing curves where there is little or no side motion it will not be necessary to use this intermediate insulator, but only the insulator C, through which the transverse wire D passes. This insulator is shown in
85 Figs. 1, 3, 4, 5, and 7. It consists of a central band of insulating material having the two end pieces C', adapted to slip into the hole through the band and abut up closely against
90 each side of it, as shown in Figs. 3 and 4.

A tube or sleeve of metal E passes through the parts C and C', and by means of a suitable tool the ends are turned over outwardly, so as to clamp the parts together. This tube
95 is of sufficient diameter to allow the transverse wire D to pass through it, and the ear A may either be supported directly from the insulator C C', as shown in Figs. 2 and 7, or by means of an intermediate insulator to be hereinafter described.

F is a convex cover or roofing fixed above
100 the top of the insulator and extending out on

each side, so as to prevent the rain from falling upon it and destroying its insulation.

In Figs. 1, 2, 3, and 4 I have shown the insulator C as surrounded by a band G, having the suspending-lugs II projecting from the lower side and adapted to clasp a corresponding lug I upon the ear A, holes being made through the parts II and I for the reception of a pin or bolt by which they are retained together. Upon the upper part of the band G is a suitable lug or projection to which the cap F may be secured by a screw or bolt.

In Figs. 7 and 8 I have shown an ear made in two parts secured together, as in Figs. 1 and 2, but having the projection I made in the form of a ring having the interior of sufficient diameter to surround and clasp the insulator C, which is formed, as shown in Fig. 5, with a groove or channel around its periphery, which is clasped by the ring or lug I. This ring is made, as shown in Fig. 8, one-half upon each part of the clamp A, and the two halves are made to fit together and inclose the insulator, and may be secured by screws passing transversely through them, as shown at J.

K is the intermediate suspending insulator, which is used upon straight portions of the line. It is made in two halves, as shown in Fig. 6, having holes extending in from the top and bottom. It is preferably made conical, and in the enlarged openings at the ends of the holes within the insulator are placed the nuts L, which remain stationary in these holes, being separated by a considerable thickness of insulating material.

M M' are screw-eyes which pass into the holes at the top and bottom of the insulator and screw into the nuts L. The insulator may be made of any suitable insulating material; but I have found that wood boiled in paraffine makes a very good insulator. The halves are then put together with the nuts L in place and are fitted into an exterior cone N, which may be made of zinc or other metal, and the lower edges of this cone are turned under, as shown at O, so as to hold the insulator K firmly in its place.

Around the lower screw M' and fitting up against the bottom of the cone N is a disk P, made of insulating material and extending sufficiently beyond the bottom edges of the cone N, so that if by reason of violent movement the insulator is caused to swing from side to side sufficiently to touch the ear A this insulating-disk will be interposed between the metal cone N and the ear A, and will thus prevent any loss of the electric current in this manner. By this means I pro-

vide a strong and serviceable insulator, which is made of comparatively cheap material, since by being compressed within the metallic cone N it is made exceedingly strong, and by having the nuts L secured within it for the connection of the suspending screw-eyes M M' there is no danger of the screw-eyes pulling out, as is the case when they are simply screwed into the wooden insulators.

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

1. In an insulating and suspending device for the conducting-wires of electric railways, the two-part ear or bail channeled to receive and clamp the wire and having a ring formed in two parts, one of which is attached to each part of the clamp, said ring inclosing the insulator through which the suspending-wire passes, substantially as herein described.

2. A non-conductor consisting of the central annular disk, the end pieces fitted thereto, and a tubular rivet extending through said parts, having the ends turned down or secured upon the outer ends of the clamps, and the central hole through said rivet through which the supporting-wire passes, substantially as herein described.

3. The insulator consisting of the annular disk having the hole through which the transverse suspending-wire passes and eyes or loops depending therefrom, in combination with the ear and the intermediate insulator suspended from said disk and having a hook or connection whereby the ear of the conducting-wire may be suspended therefrom, substantially as herein described.

4. The insulator consisting of the semi-cones K, having the chambers formed therein, the screw-eyes M and M', the nuts L, and holes extending from said nuts to each end for the reception of the screw-eyes M and M', together with the exterior conical metallic casing fitted to the insulator and secured thereto, substantially as herein described.

5. The conical two-part insulator, with its inclosing metallic case, the nuts, and screw-eyes whereby it is suspended, in combination with the insulating-disk P, made of larger diameter than the bottom of the cone and secured thereto, substantially as herein described.

In witness whereof I have hereunto set my hand.

BYRON JENNINGS.

Witnesses:

S. H. NOURSE,
H. C. LEE.