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 CATENARY SUSPENSION DEVICE FOR TROLLEY WIRES OF ELECTRIC RAILWAYS.
 APPLICATION FILED MAY 24, 1909.

995,621.

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Fig. 1.

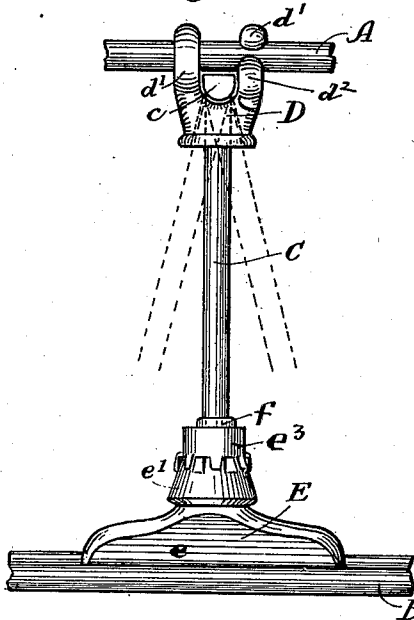


Fig. 2.

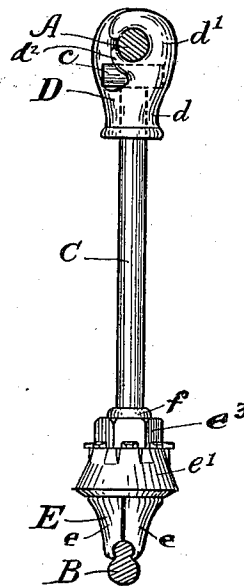


Fig. 3.

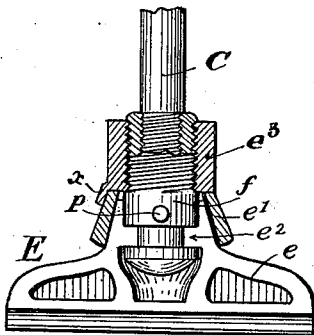


Fig. 4.

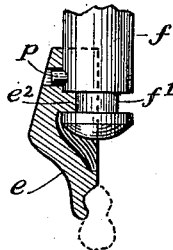


Fig. 5.

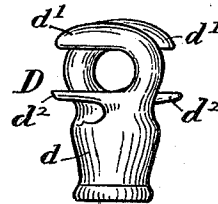


Fig. 6.

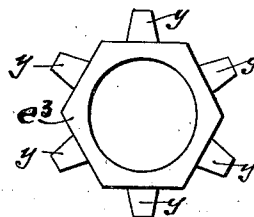
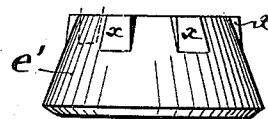


Fig. 7.



Witnesses.
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UNITED STATES PATENT OFFICE.

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CATENARY SUSPENSION DEVICE FOR TROLLEY-WIRES OF ELECTRIC RAILWAYS.

995,621.

Specification of Letters Patent. Patented June 20, 1911.

Application filed May 24, 1909. Serial No. 498,099.

To all whom it may concern:

Be it known that I, WILLIAM A. McCALLUM, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Catenary Suspension Devices for Trolley-Wires of Electric Railways, of which the following is a specification.

10 My invention relates to suspension devices or hangers for the trolley wires of electric railways, and particularly to those employing the catenary system of overhead conductors; its object being to provide a suspending device for sustaining the conductor beneath the messenger cable that shall be relatively light in weight, strong and durable in construction, and economical in cost.

20 A further object is to provide a construction that shall be completely efficient with respect to its functions—that is: completely adapted to perform its functions efficiently with due regard to the situation in which it is placed; and also one that is entirely complete, self-contained and ready to be applied easily and quickly without the addition of extraneous parts or of bolts or nuts, etc.

30 A still further feature of my invention is the avoidance of parts or surfaces particularly liable to rusting—such as bolt connections, exposed threads, etc.

35 To these ends my invention in preferred form consists in the structure herein shown and described.

My invention is illustrated in the accompanying drawings, in which,

40 Figures 1 and 2: are corresponding elevations, from different sides, of the device complete and as attached in use to the messenger cable and the trolley wire. Fig. 3: is a detail showing the structure of the device for attaching the trolley wire to the suspending stem or link. Fig. 4: is a detail showing the holding pin seated in one member of the two part trolley ear to prevent interrotation of the suspending link and ear. Fig. 5: is a perspective elevation of the grip device or head for connecting the link with the messenger cable. Fig. 6: is a plan view of the holding nut for seating the compression collar upon the two part clamp showing the radial lugs; and Fig. 7: is a side view of the compression collar showing the seats

for the retaining lugs to prevent back-rotation of the nut when in place.

Referring now to the drawings, A designates the messenger cable which hangs between its fixed supports in catenary curves (not shown), and B the trolley wire. The device for suspending the latter upon the former, consists of a metal rod or link C, hung from the messenger cable A by means of a grip device or head D, and at its lower end engaging and upholding a trolley ear E—which parts will now be described in order.

The grip device or head D consists of a substantially cylindrical or oval hollow base d , extended above at opposite sides into so-called "sister-hooks" d^1 d^1 which open in opposite directions. Each of these hooks is provided with a relatively thin projection d^2 which may be integral with or inserted through the shank or base d , and extending outward beneath and parallel with the prong of the hook, and when the device is hooked over and upon the messenger cable, the main prongs d^1 rest upon the cable and suspend the link, while the lower projections d^2 beneath the cable, are bent upward around the cable and, together with the hooks, complete the inclosure sufficiently to retain the hooks in position upon the cable.

The rod or link C terminates at its upper end in a T-head c , which, when the body of the rod is passed downward through the cylindrical base d of the hook device D, extends outward at each side and seats upon the upper margin of the base d between the hooks d^1 d^1 . The prongs of the T-head c are formed at their underside to a semi-cylindrical contour, and its bearing seats in the part d are correspondingly formed so as to permit a pendulous movement of the rod C for a purpose to be explained, to accommodate which the hollow base d is enlarged or made oval below.

The clamp ear E for holding the trolley wire consists of two corresponding clamp-members e meeting in the vertical axial plane of the grooved trolley wire B which is held between the lower portions of the said members which are formed to the contour of the grooved wire (see Figs. 2 and 4). The upper parts of said members e together form the frustum of a cone, diminishing upwardly, and constitute the seat of a compression ring e^1 which when forced down-

wardly compresses the clamping members e together.

The clamping ears e when placed together inclose within their conical portions, a socket with an inner concentric ledge e^2 to seat and retain a centerpiece or stem F . The stem f is formed with circumferential groove f^1 to be engaged by the ledge e^2 as shown in Figs. 3 and 4, and a laterally projecting pin p , engaging in a corresponding slot in one of the ears e , to prevent rotation. (See Figs. 3 and 4). The stem f is axially countersunk at its upper end and may be internally threaded to receive and engage the lower threaded end of the rod C . (Fig. 3), or the link may be held to the stem by a pin passing diametrically through the parts as is common in connections of this nature. The stem is also exteriorly threaded to engage a nut or collar e^3 which, when screwed down upon the stem f against the compression collar e^1 forces the ears e together and clamps the trolley wire B between the ears and completes the connection with the rod C through the stem f .

The trolley wire B may be inserted in or removed from the ear E by slightly receding the nut or collar e^3 and lifting the compression ring e^1 which allows sufficient play to separate the lower edges of the clamping ears for the purpose without becoming detached; but by receding the nut or collar still farther, the two clamping members and the conical compression ring may be entirely removed from the stem without loosening the latter from the link.

Thus constituted, the device as a whole forms a suspending device adapted to be secured at any point on the messenger cable, and suspend the trolley wire below. All parts are formed preferably of cast iron (excepting the link or rod C), rendered malleable by known processes, and coated by "galvanizing" as a protection against rusting. It will be observed that the construction is such as to prevent to a great degree, access of moisture to the inner parts and surfaces, and to completely cover and protect threaded surfaces. Being malleable, the parts are not subject to breakage through brittleness, and weight may be minimized.

The device as a whole is self contained, and requires no extraneous additions nor detachment of its own parts to apply it to use. The manner of its application is as follows: The grip device or head D is slipped upon the messenger cable and suspended by its prongs d^1 . The projections d^2 being malleable are hammered upward into position shown in Fig. 1 to partially embrace and retain the parts in position. The head D will hang in a more or less inclined position according to the inclination of the messenger cable at the point of sus-

pension; but this, as will be readily perceived, does not prevent the link C from hanging in a normally vertical position, which is assured by the pendulous mode of suspension afforded by its T-head e upon the curb of the hollow shank d its pendulous function being indicated by the downwardly-diverging dotted lines in Figs. 1 and 2. The pendulous function, it may be noted, also accommodates any inequality in expansion and contraction between the messenger cable and trolley wire, and also allows a slight play upward of the link under the lifting action of the trolley collector, and thus tends to relieve sudden jars. To attach the trolley wire, it is necessary only to turn the screw collar e^3 of the ear E a few times in reverse, which permits the compression ring e^1 to be lifted from its seat and allow separation of the members e sufficiently to seat the trolley wire B between, whereupon the collar is screwed home to force the compression ring to its seat and clamp the trolley wire between the members e .

The compression ring e^1 is formed with a concentric series of raised projections x of its conical exterior surface at and extending below its frustum edge. The screw collar e^3 is formed with a corresponding series of radially projecting tongues y at its lower edge. When the collar is screwed home upon the compression ring, the tongues y , are bent downward upon the outer face of the compression ring between consecutive projections x , and thus lock the collar against rotation and thus maintain the connection secure.

I claim as my invention and desire to secure by Letters Patent of the United States:—

1. A gripping device or head for catenary hangers embodying two "sister-hooks" opening in opposite directions, formed integrally with a common shank, provided with bearing supports for a pendulous link.

2. A gripping device or head for catenary hangers, embodying a bearing support for a link, extended upward integrally into two sister hooks opening in opposite directions, provided with an extended lip beneath each of the hooks, adapted to be bent upward toward the points of the hook to constitute an approximate closure of the hook opening.

3. In a catenary hanger a grip device consisting of a hollow shank extended at one end at opposite sides, into two sister-hooks, in combination with a link, adapted to pass vertically downward through the shank, and provided with a T-head extending over and resting upon the upper edges of the shank between the sister-hooks, forming a pendulous suspension for the link.

4. In a catenary hanger, the combination of a grip-device adapted to engage a mes-

senger cable; a link suspended from said grip-device in a pendulous connection; a stem formed to engage rigidly with the lower end of said link; and a trolley ear or clamp removably secured to said stem.

5 5. In a catenary hanger, the combination of a grip-device adapted to engage the messenger cable, a link having a pendulous connection with said device, a stem having a terminal head adapted to be inclosed within and thereby engage and support a trolley ear, and a two-part trolley ear having a conical compression ring seating upon a correspondingly formed shank of the ear members, and a threaded collar or nut seated upon threads of said terminal head, and bearing upon the compression ring to clamp the trolley wire by rotation of said collar.

10 20 6. In a device for supporting a trolley wire, the combination of a two part clamp-

ing ear, a compression ring seated on correspondingly formed shanks of the ear members, a stem socketed in and between the ear members and projecting above the same, and a collar or nut threaded upon the stem bearing upon the compression ring—said compression ring being provided with projections upon its conical exterior and said nut or collar with radial tongues, which tongues when the nut is screwed to its seat may be bent downward and lie between the successive projections of the compression ring.

25 30 35 In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM ANDREW McCALLUM.

Witnesses:

WALTER A. KNIGHT,
A. L. TILDESLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."