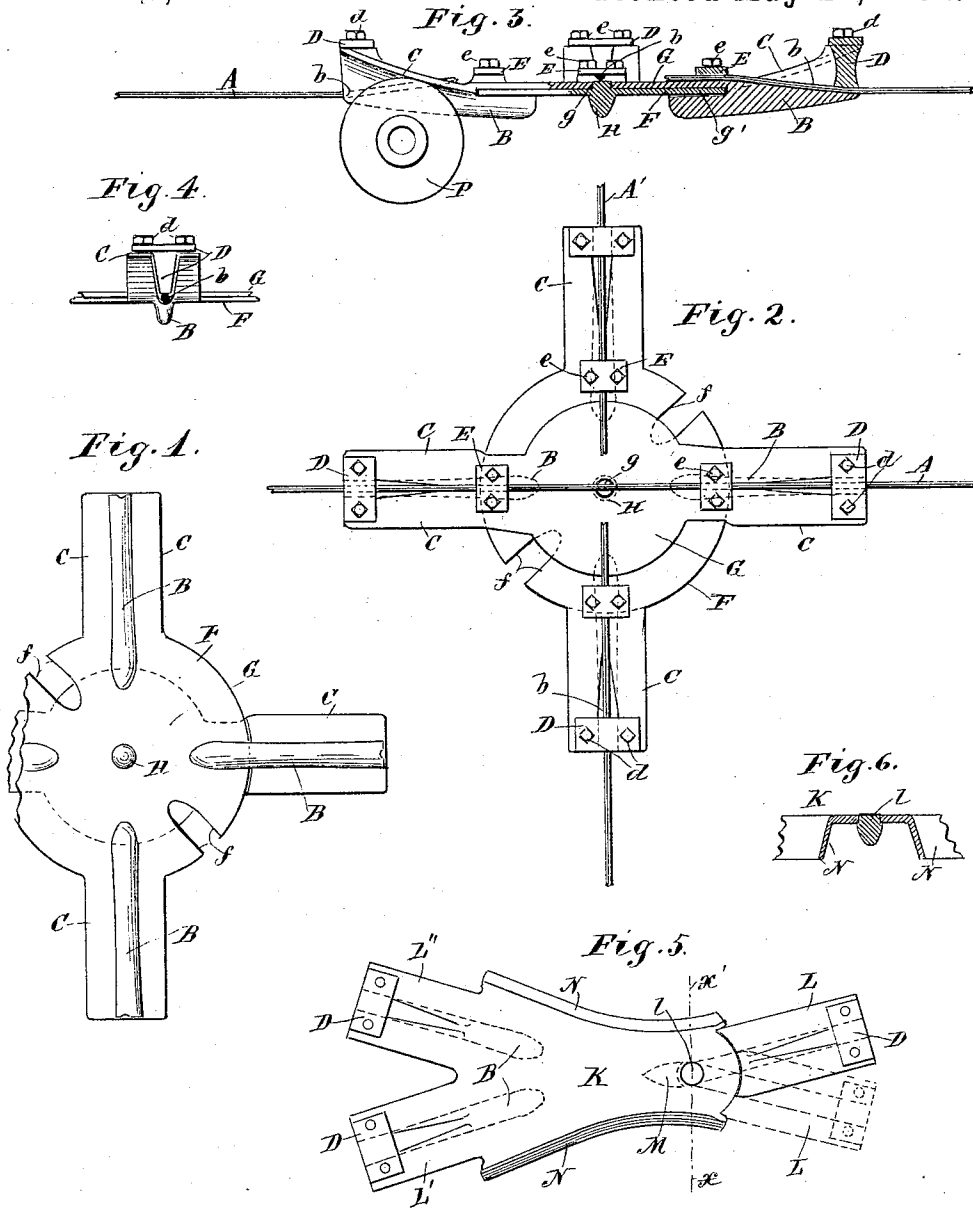


(No Model.)

A. O. HOYT & P. W. LEFFLER.
SWITCH FOR OVERHEAD WIRES.

No. 475,504.

Patented May 24, 1892.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALPHONZO O. HOYT AND PAUL W. LEFFLER, OF MINNEAPOLIS, MINNESOTA,
ASSIGNORS OF ONE-THIRD TO ALBERT W. HOYT, OF SAME PLACE.

SWITCH FOR OVERHEAD WIRES.

SPECIFICATION forming part of Letters Patent No. 475,504, dated May 24, 1892.

Application filed September 10, 1891. Serial No. 405,253. (No model.)

To all whom it may concern:

Be it known that we, ALPHONZO O. HOYT and PAUL W. LEFFLER, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Trolley-Guides for use on Crossing and Switch Pans; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to electric street-railways, and has for its object to provide an improved trolley-guide for use on crossings and switches. To this end we provide for use, in connection with the ordinary crossing or switch pan, a trolley-guide in the form of an arm, having a longitudinal rib or ridge on its under side of less depth at and near its inner end than the depth of the wheel flanges or grooves and having lateral flanges extended from the base of the ridge, whereby the trolley-wheel in its travel along the inner part of the arm will be made to ride with the peripheries of its flanges sustaining the strain and in contact with the lateral flanges of the arm as the bearing-surfaces. In virtue of this construction the ridge will prevent the lateral displacement of the wheel and the arm-flanges will cause the wheel to make the proper dip to the level of the under surface of the pan without jump or break. Both displacement and the sparking so common and annoying in the ordinary construction of crossings and switches is thereby entirely avoided. The lateral flanges upon the arm are upwardly curved on the arc lines of a true circle, substantially continuous with the margin or edge of the pan, and the ridge is preferably of greater depth at its outer end than the depth of the wheel-flanges at the greatest point of wear. The bearing-surface will therefore always be shifted from the wheel-hub and crown of the ridge at the outer limit of the arm to the wheel-flanges and the arm-flanges gradually and without break in the contact. The arm may be secured to the body of the pan in any suitable way. In our preferred construction both the ridge and the lateral flanges of the arm are curved upward and the outward pas-

sage of the trolley-wire is through the end of the arm and as near as possible to the crown or lowermost limit of the end of the ridge. To accomplish this result and provide a convenient means of removably securing the arm and the wire together with good contact, we slot the arm or ridge, leaving the same open at the top, and provide a retaining-piece fitting the said slot at its outer end and clamp the same in position against the wire by means of cap-screws or other similar devices. Removable cap-plates may also be provided for holding the wire in a grooved seat or passage-way for the same on the top of the inner end of the arm. When applied to crossing-pans, the pan is preferably formed of a pair of disks pivotally and detachably connected together, so that the one will turn on the other and may be removed therefrom, and the arms are preferably formed integral, one pair with each of the disks at opposite points on the same.

Our invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout—

Figure 1 is a bottom plan; Fig. 2, a top plan; Fig. 3, a view, partly in side elevation and partly in section, illustrating the arm as applied to crossing-pans of our preferred form. Fig. 4 is an outer end view of one of the arms. Fig. 5 is a top plan view of the invention as applied to a switch-pan, and Fig. 6 is a cross-section of the same on the line X X' of Fig. 5.

A A' represent a pair of trolley-wires.

B C C represents the arm, of which B is the rib or ridge and C C are the lateral flanges projecting from the base of the same.

b is the wire passage or seat, and D is the outer end retaining-piece for clamping the wire to the arm. As shown, the retaining-piece is T-shaped, the stem of the same loosely fitting the groove and the head-flanges resting on the top of the arm, and it is secured in position by cap-screws d engaging threaded holes on the arm.

E is the inner end retaining cap piece or plate, also secured to the inner end of the arm by screw-threaded bolts e.

F and G are the pair of disks constituting the crossing-pan, of which F is the under and G the upper member, having a pivotal connection at their center, as shown at g. The

under member F is provided with a pair of radial slots f opposite to each other, and the ridges of the upper member underreach and engage with the edge or margin of the lower member, as shown at g' , being slotted for that purpose. The arms are formed integral with their respective disks, as before stated, and the radial slots f in the lower member are to permit the inwardly-projecting ribs of the upper member to pass below the margin of the lower member for placing the disks and arms in their working position. It is of course evident that in virtue of their pivoted or swiveled connection the disks and their arms may be adjusted to any desired position and that they will automatically take or adjust themselves to the angle or lines of their respective trolley-wires. It is also evident that inasmuch as the arms and the disks are held on the wires by the clamping action of the retaining-pieces D they may be readily adjusted lengthwise of the wire. This facility of adjustment is a great convenience over the old forms employing a soldered connection between the arms of the wire.

H is the downwardly-projecting center stud fixed to the under disk F for preventing the lateral displacement of the trolley-wheel at the center of the pan, the spacing between the center stud and the inner ends of the ridges being such that the wheel will reach from one to the other.

Referring to Figs. 5 and 6, the arms are shown as applied to a switch-pan and, with the exception that the arm located at the point of the switch is pivoted, are in all respects similar to the arm shown in the other figures as applied to crossings.

In Figs. 5 and 6, K represents the switch-pan, which may be of any suitable construction; L, the arm at the point of the switch, pivoted to the pan, as shown at l , and L' L'' the arms for the branch line. (Shown as formed integral with the body of the pan.) M is the guide-stud at the point of the switch, and N are the side flanges of the pan. The pivoted arm L may be swung to stand approximately in line with either of the branch wires.

P in Fig. 3 represents the trolley in its travel along one of the arms or guides. It will be noted that the outer end of the ridge is practically continuous with the wire, the junction being effected practically without break. It is evident that the hub of the wheel will not leave the crown of the ridge until the flanges of the wheel have come into contact with the lateral flanges on the arm. It is also evident that the approach and departure from the pan is so graduated that the wheel cannot jump or be laterally displaced and that the contact is not liable to be broken. Actual experience in a working system of electric railways has demonstrated the great practical value of this trolley-guide. The trolley rides on the pan and departs from the same as smoothly as on the main wire. With the old constructions the bearing-sur-

face was the hub of the wheel throughout, and in order to make the flanges clear the edge or margin of the pan the guide was formed of triangular shape (approximately) with the point or angle under the edge of the pan and of considerably greater depth at that point than the normal depth of the wheel-flanges, in order to effect a clearance after the hub had worn down. The necessary result was to give to the wheel a violent jog over the angle of the guide, first downward and then upward, frequently causing the wheel to jump the track, breaking contact and producing a large amount of wear and tear both on the wheel and the pan. All these undesirable results are entirely avoided by our invention. Owing to the curvature of the arms and the location of the outward passages for the wires, the wires maintain their level in their normal lines of strain. It should be noted that so long as the lateral flanges C and the depending part having the outward passage b for the conductor A arranged in their relative positions, as shown and described, are retained the ridge B might be dispensed with. In other words, the absolutely essential features are the upwardly-curved lateral flanges constituting a part of the arm and the depending part depending from the outer extremity of said arm with an outward passage for the conductor, which compels the conductor to stand at a lower level than the tip of the said arm. It is obvious that so long as this arrangement of the said essential parts is preserved the bearing will be shifted from the wheel-hub and conductor at the outer end of the arm to the said lateral flanges and the trolley-wheel flanges toward the inner end of the said arm. The ridge B, increasing in depth from its inner to its outer end and formed on an upward curve corresponding to the said lateral flanges C, is, however, a valuable addition toward the perfect working success of the device.

What we claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A trolley-guide for use on crossing and switch pans, consisting of an arm having lateral flanges curving upward substantially continuous from the edge of the pan and having means at its outer end for holding the conductor at a point below the level of the outermost tip of the said flanges equal to or greater than the depth of the trolley-wheel flanges, substantially as and for the purpose set forth.

2. A trolley-guide for use on crossing and switch pans, consisting of an arm having a longitudinal rib or ridge on its under side of less depth at its inner end than the depth of the wheel-flanges and increasing toward its outer end and having lateral flanges extended from the base of the ridge, both the said ridge and the said flanges being upwardly curved, and the said arm being provided with a wire-passage through its outer end substantially

continuous with the crown of the ridge, substantially as and for the purpose set forth.

3. The combination, with the guiding-arm having the wire seat or passage through its outer end open at its top, of the removable retaining-piece for securing the wire and arm together by a clamping action, substantially as described.

4. The crossing comprising a pair of disks pivotally and detachably connected together and each bearing a pair of opposite radial arms constituting the trolley-guide, substantially as and for the purpose set forth.

5. The combination, with the disk F, having the radial notches *f*, the pivot-post *g*, and

a pair of guiding-arms B C, of the disk G, having a central seat for the said pivot-post, and a pair of guiding-arms B C with the rib portions of the same extended inward underneath and engaging with the margin of the disk F, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

ALPHONZO O. HOYT.
PAUL W. LEFFLER.

Witnesses:

JAS. F. WILLIAMSON,
A. H. OPSAHL.