(No Model.)

J. M. ANDERSEN.

TROLLEY WIRE SWITCH.

No. 524,672. Patented Aug. 14, 1894.

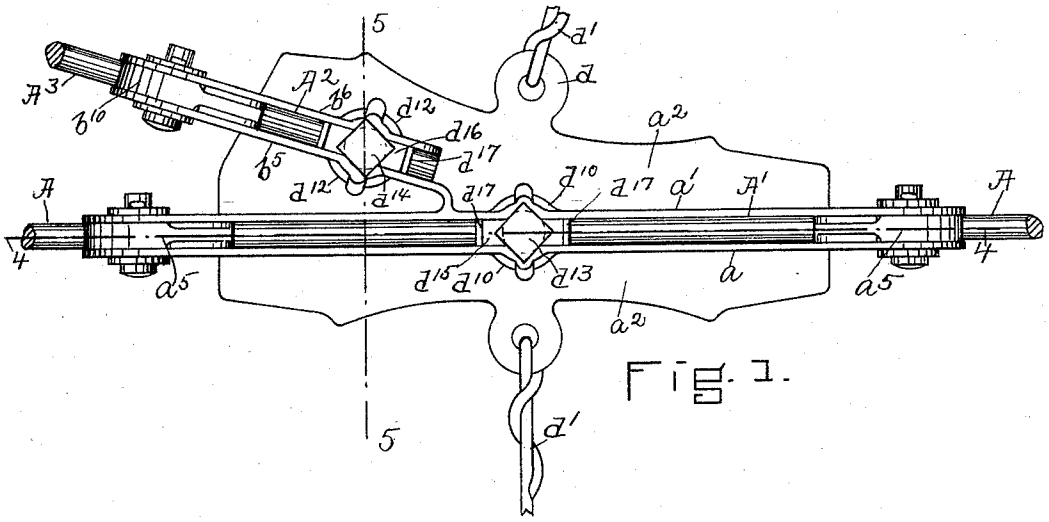

Fig. 1.

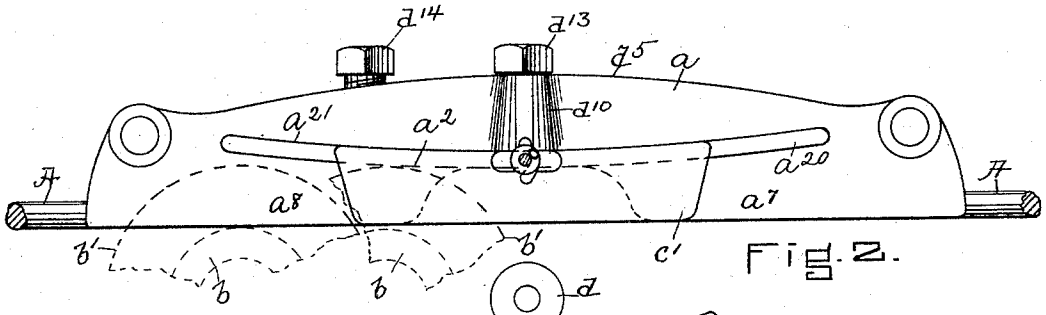

Fig. 2.

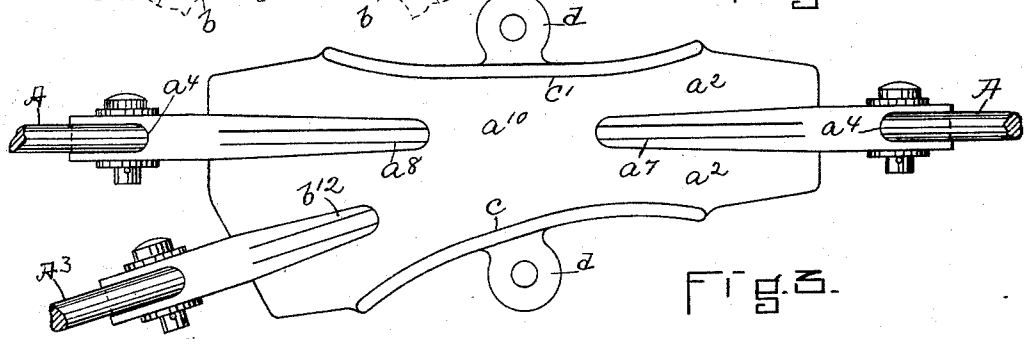

Fig. 3.

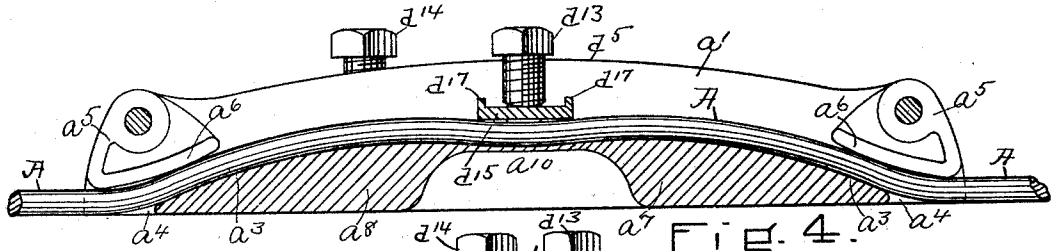

Fig. 4.

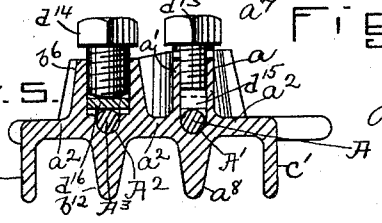

Fig. 5.

WITNESSES

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JOHAN M. ANDERSEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALBERT ANDERSON, OF SAME PLACE.

TROLLEY-WIRE SWITCH.

SPECIFICATION forming part of Letters Patent No. 524,672, dated August 14, 1894.

Application filed April 26, 1894. Serial No. 509,146. (No model.)

To all whom it may concern:

Be it known that I, JOHAN M. ANDERSEN, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Supports for Electric Conductors, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a novel support for electrical conductors or wires, and is herein shown as embodied in a frog, switch or turn-out, for the trolley wire of the overhead system of electric railways.

In accordance with this invention, the trolley wire support is provided with a groove, way or channel having upright walls between which are pivotally supported movable cams or locking dogs constructed so as to be operated by tension or longitudinal strain or movement of the trolley wire to firmly retain the said wire in its groove or channel. The trolley line support when embodied in a frog, switch or turn-out is provided with substantially flat side flanges, which in the completed frog approximate the form of a plate, the said flanges extending laterally from the side walls of the channel or groove in which the trolley wire is laid, the said plate or side flanges being shorter than the side walls of the channel or groove, so that the said side walls extend or project beyond the said plate.

The groove or channel in which the trolley wire is laid is inclined downwardly at its opposite ends, and the metal forming the bottom of the said channel or groove at its ends is thickened, so as to project below the plate or side flanges at or near the ends of the same, and to form guiding surfaces for the trolley wheel, the bottom portion of the said groove or way being thickened from the opposite end toward the center of the groove, but to such a distance as will leave a space or opening between the guiding surfaces sufficiently large to permit the trolley wheel to be moved out of line with the guiding surfaces.

The thickened portions of the bottom of the groove or channel forming the guiding surfaces referred to, are made of such depth as to lie in a substantially straight line or plane with the outer ends of the upright walls, so that when the trolley wire is clamped to its support, the ends of the wire projecting from the opposite ends of the support, will be in a substantially straight line or plane with the under side of the thickened portions of the channel or groove in which the wire is laid. The side flanges or plate extended from the upright walls are preferably upwardly inclined at its opposite ends, and the said plate is attached to the upright walls at such a distance above the bottom of the thickened portions of the groove or channel, that the trolley wheel on passing from the trolley wire to the thickened lower portion or guiding surface will make contact with the under side of the plate or side flanges before leaving the said guiding surface. This feature is of special importance in a frog, switch or turn-out, as this construction avoids all sparking and the formation of arcs by the trolley wheel jumping from one contact or guiding surface to another.

The laterally extended plate or flange referred to, is provided on its opposite sides with a downwardly extended flange suitably curved to enable the trolley wheel to be guided from one trolley wire to another.

The branch trolley wire is clamped in a groove or channel having its side walls integral with the laterally extended plate or flange, and for the best results, one of the said side walls is integral with a side wall of the main groove or channel. The laterally extended plate or surface may be provided with suitable ears by which the trolley line support may be sustained in position by suitable span or other wires.

The side walls of the groove or channel for the main trolley wire are made higher at or about the longitudinal center of the frog and taper to near the opposite ends of the said frog, so as to obtain an increased amount of metal at the central portion of the frog, whereby the latter is greatly strengthened, and danger of buckling or bending under severe strain is avoided. The side walls of the main groove or channel and also of the branch groove or channel may and preferably will be thickened at portions and provided with screw threads on the interior of the thickened portion, to form threaded sockets

into which may be extended threaded shanks or bolts, which for the best results, may act upon a clamping piece laid in the channel or groove above the trolley wire, so that the said trolley wire may be additionally secured to its support.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a top or plan view of a frog or switch embodying this invention; Fig. 2, a side elevation of the frog or switch shown in Fig. 1, a portion of the trolley wheel being represented by dotted lines; Fig. 3, an under side view of the frog or switch shown in Fig. 1; Fig. 4, a longitudinal section through the main trolley channel or groove, the section being taken on the line 4—4, Fig. 1, the locking dogs or clamps and the trolley wire being shown in elevation, and Fig. 5, a transverse section on the line 5—5, Fig. 1 looking toward the right the bolt in the branch groove being shown in elevation.

Referring to Fig. 1, A represents the main trolley wire, which, in accordance with this invention, is laid in a channel or groove A′ formed by side walls $a\,a'$ having integral with them laterally extended flanges a^2, approximating in the completed support the form of a plate, the said flanges being extended from the side walls substantially on a level with the bottom of the central portion of the channel or groove A′ as represented in Fig. 5.

The laterally extended plate a^2 is made shorter than the side walls $a\ a'$, so that the ends of the side walls project a considerable distance beyond the ends of the laterally extended plate, and the channel or groove A′ between the side walls $a\,a'$ is downwardly inclined at its opposite ends as at a^3 (see Fig. 5), and the said walls at their ends are open at the bottom as at a^4 and are provided with locking dogs or cams a^5 pivoted between the side walls and preferably having an elongated under surface a^6, which co-operates with the inclined bottom a^3 of the channel or groove A′ in such manner that the trolley wire A, when drawn upon longitudinally, exerts an upward force upon one end of the dog or cam, which upward force acts to turn the cam or dog so as to force its opposite end more firmly into engagement with the trolley wire, and thereby more firmly press the trolley wire against the inclined portion a^3 of its groove or channel, so that longitudinal movement of the trolley wire A automatically acts to clamp the said wire to its support.

The central portion of the groove or channel A′ is considerably higher than the ends of the said groove, and in order that the trolley wheel may pass under the frog in a substantially straight path, the bottom of the groove or channel A′ is made thicker from the opposite ends of the said groove toward the central portion of the same, as at $a^7\,a^8$, and these thickened portions extend toward each other beneath the laterally extended plate a^2, but are separated as at a^{10} (see Fig. 3) a sufficient distance to permit of the direction of movement of the trolley wheel to be changed. These thickened portions form guiding surfaces, which are in substantially the same straight line or plane with the bottom of the projecting side walls $a\,a'$ and with the under side of the trolley wire A extended from between the said side walls.

The laterally projecting plate a^2 is upwardly inclined at its ends as at $a^{20}\,a^{21}$, so that its outer ends will be located above the lower edge of the thickened portion of the groove or channel A′, a greater distance than the depth of the flange b' on the trolley wheel b, the central portion of the laterally extended plate being a less distance above the bottom of the thickened portion $a^7\,a^8$ of the groove or channel A′, so that the flange b' of the trolley wheel on its passage under the frog or switch, will make contact with the under surface of the laterally projecting plate a^2 before it leaves the thickened portion of the said channel or groove. By this construction, it will be seen that the trolley wheel has a metallic connection with the trolley wire during its passage under the frog or switch, and that there is no chance for the circuit to be interrupted, consequently avoiding sparking produced by the trolley wire jumping from one portion of the switch to another, or from passing from one guiding surface to another. The switch or frog is also provided with a groove or channel A^2 for the reception of a branch trolley wire A^3, the said groove or channel having side walls $b^5\,b^6$ extended at an angle to the side walls $a\,a'$ of the main channel or groove, the said walls $b^5\,b^6$ being provided with a movable cam or dog b^{10} pivoted between them similar to the cams or dogs a^5, and co-operating with the downwardly extended end portion of the groove or channel A^2.

The branch side wall b^5 is preferably extended and cast integral with the side wall a' of the main groove or channel to strengthen the frog at its center. The bottom of the branch groove or channel A^2 is thickened so as to project below the laterally extended plate and form the thickened portion or guiding surface b^{12}, which lies at an angle to the thickened portions or guiding surfaces $a^7\,a^8$ of the main groove or channel, but in substantially the same horizontal plane.

The laterally extended plate a^2 is provided at its opposite sides with downwardly extended flanges $c\,c'$, which are curved to properly guide the trolley wheel on its passage beneath the switch or frog, the said plate in the present instance, being represented as provided with lugs or ears d by which the said frog or switch may be supported in proper position by means of the span or other wires d'.

The side walls $a\,a'$ of the main groove or channel are, for the best results, thickened or made of greater height at substantially the longitudinal center of the frog or switch as

at d^5 (see Fig. 2), and taper downwardly to near their opposite ends, so that an increased amount of metal is provided above the laterally extended plate a^2 at the central portion of the frog, whereby the latter is greatly strengthened at its center, so as to resist the tendency to buckle or break by excessive strain placed upon the trolley-wire at the opposite ends of the frog. The upright walls a a' of the main groove or channel, and the side walls b^5 b^6 of the branch groove or channel may and preferably will be provided with thickened portions d^{10} d^{12} having screw threads on their interior surface to form threaded sockets and be engaged by threaded bolts d^{13} d^{14}, which, for the best results, engage clamping pieces d^{15} d^{16} by which the trolley wires A A′ may be additionally secured in their respective grooves or channels. The clamping pieces d^{15} d^{16} are preferably provided with transverse upright portions or lugs d^{17}, which act to prevent the said clamping pieces turning edgewise when dropped into their respective grooves, thereby enabling the said clamping pieces to be more quickly placed in proper position.

I claim—

1. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor and provided on their inner sides with screw threads co-operating to form a threaded socket for the reception of a threaded clamping bolt, between the said side walls of the said threaded clamping bolt inserted into its socket to secure the electric conductor in the said groove, substantially as described.

2. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor and provided on their inner sides with screw threads co-operating to form a threaded socket for the reception of a screw threaded clamping bolt, of the said clamping bolt to secure the electric conductor in the said groove, and a clamping bar fitted into said groove and adapted to be engaged within the groove by the said clamping bolt to engage the clamping bar with the electric conductor, substantially as described.

3. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor, of a locking dog or cam supported in said groove between the said side walls, and a clamping bolt extended into a threaded socket in the side walls to operate, substantially as described.

4. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor, the bottom of the said groove or way being downwardly inclined at one end, of a locking dog or cam secured to the said side walls in said groove or way substantially above the lower end of the downwardly inclined bottom of the said groove, substantially as described.

5. In a support for electric conductors, the combination with side walls forming a continuous groove, channel or way for the reception of the electric conductor, the bottom of the said groove or way being downwardly inclined at its opposite ends and provided with thickened portions extending from the outer end of the downwardly inclined portion of the said bottom toward the central portion of the groove or way, lateral flanges extended from the said sides below the top thereof and means to secure the electric conductor in said groove or way, substantially as described.

6. In a support for electric conductors, the combination with side walls forming a continuous groove, channel or way for the reception of the electric conductor, the bottom of the said groove or way being downwardly inclined at its opposite ends and provided with thickened portions extended from the outer ends of the downwardly inclined portions of the groove or way toward the central portion of the groove or way to form separated guiding surfaces in substantially the same straight line or plane, and means to secure the electric conductor in said groove or way, substantially as described.

7. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor, the bottom of the said groove or way being downwardly inclined at its opposite ends and provided with thickened portions extended from the outer ends of the downwardly inclined portions of the groove or way toward the central portion of the groove or way to form separated guiding surfaces in substantially the same straight line or plane, laterally extended flanges of less length than the said side walls and provided with upwardly curved ends, and means to secure the electric conductor in the said groove or channel, substantially as described.

8. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor, the bottom of the said groove or way being downwardly inclined at its opposite ends and provided with thickened portions extended from the outer ends of the downwardly inclined portions of the groove or way toward the central portion of the groove or way to form separated guiding surfaces in substantially the same straight line or plane, branch side walls forming a groove or way for a branch conductor and having its bottom downwardly inclined, side flanges laterally extended from the said side walls substantially on a level with the central portion of the groove or way for the main conductor, and of less length than the side walls of the main groove or way and provided with upwardly curved ends, and means to secure the said conductors in their respective grooves or ways, substantially as described.

9. In a support for electric conductors, the combination with side walls a a' forming a groove or way for the reception of the main conductor, and side walls b^5 b^6 forming a groove or way for the reception of a branch conductor, both of said grooves or ways being inclined downwardly as described and having thickened bottom portions to form guiding surfaces lying in substantially the same straight line or plane, and laterally extended flanges integral with the said side walls and provided with upwardly curved ends, substantially as described.

10. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor and made thicker or of a greater height at or near the center of the support to strengthen the said side walls, downwardly inclined bottom portions of the said groove terminating in an open bottom between the ends of the said side walls, thickened bottom portions of said groove extended from the open bottom portion toward the center of the support, and means to secure the electric conductor in said groove or channel, substantially as described.

11. In a support for electric conductors, the combination with side walls forming a groove, channel or way for the reception of the electric conductor, the bottom of the said groove or way being downwardly inclined at its opposite ends and provided with thickened portions extended from the outer ends of the downwardly inclined portions of the groove or way toward the central portion of the groove or way to form separated guiding surfaces in substantially the same straight line or plane, branch side walls forming a groove or way for a branch conductor and having its bottom downwardly inclined, one of the branch walls being attached to one of the side walls of the main groove or channel, side flanges laterally extended from the said side walls below the top thereof substantially on a level with the central portion of the groove or way for the main conductor, and of less length than the side walls of the main groove or way, and means to secure the said conductors in their respective grooves or ways, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHAN M. ANDERSEN.

Witnesses:

JAS. H. CHURCHILL,

J. MURPHY.