(No Model.)

J. M. ANDERSEN.

ELECTRIC CONDUCTOR SUPPORT.

No. 531,354. Patented Dec. 25, 1894.

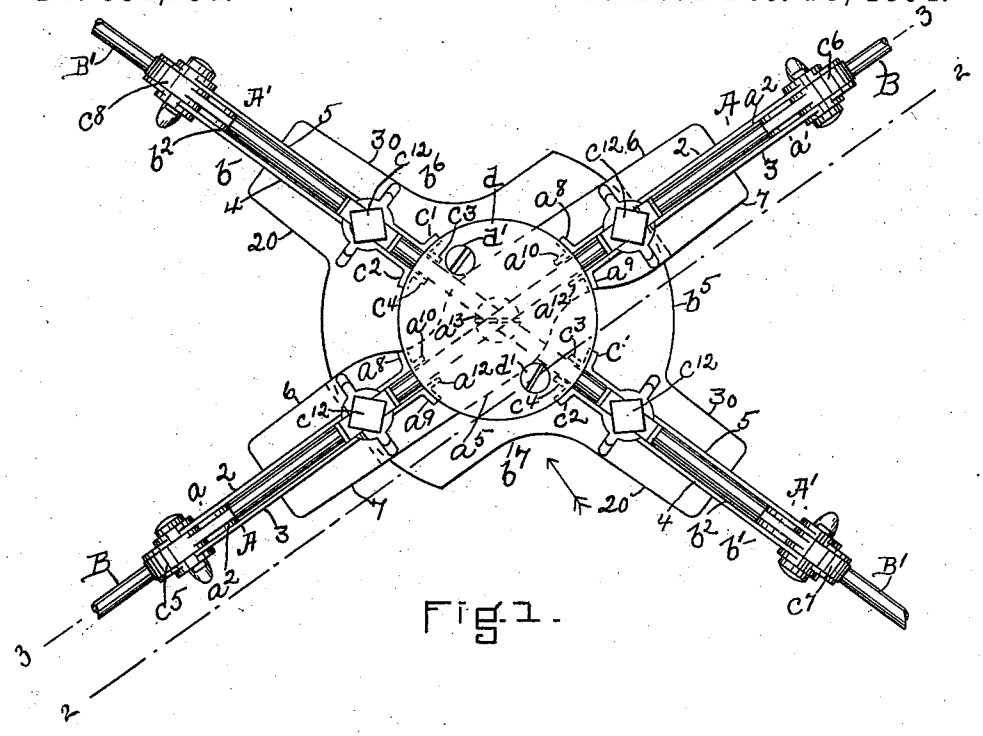


Fig. 1.

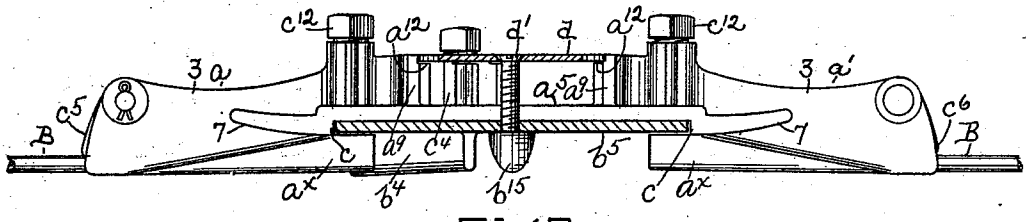


Fig. 2.

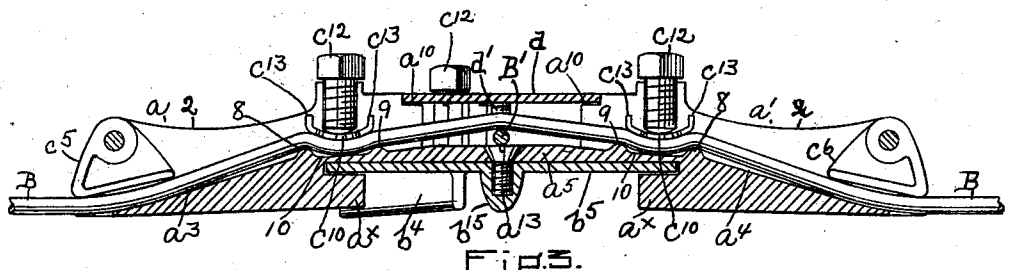


Fig. 3.

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ATT'Y.

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UNITED STATES PATENT OFFICE.

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

ELECTRIC-CONDUCTOR SUPPORT.

SPECIFICATION forming part of Letters Patent No. 531,354, dated December 25, 1894.

Application filed July 9, 1894. Serial No. 516,891. (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 Electric-Conductor Supports, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to electric conductor supports of that class, which, in practice is subjected to severe strain, and has for its object to improve the construction of the same, so that the support may be made of a minimum weight of metal without sacrifice to its strength and without danger of buckling or breaking. This form of support for electric conductors is especially applicable to cross-overs for the trolley wires of overhead electric railway systems, and particularly to cross-overs comprising members which are adjustably secured to each other.

In accordance with this invention, the trolley wire support is made lighter at its center than at its ends, and the said lighter portion is reinforced and made sufficiently strong to resist buckling or breaking, by means of an anti-buckling device or bridge secured to the said support and co-operating with the end portions of the same, as will be described.

In the present instance, the invention is shown as embodied in an adjustable cross-over comprising two trolley supporting members pivotally secured together and cut away at their central portions, and suitably shaped to permit them to be pivotally secured together, but which are strengthened at their cut-away portions by means of an anti-buckling device or bridge, shown as a disk or plate secured to one of said members and co-operating with the end portions of both members, as will be described.

The end portions of the trolley wire supporting members of the cross-over may and preferably will be made after the manner shown in United States Patent No. 524,672, granted to me August 14, 1894, which construction will be more specifically referred to hereinafter.

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 an adjustable cross-over embodying this invention; Fig. 2, a sectional view on the line 2—2, Fig. 1 looking in the direction of the arrow thereon, and Fig. 3, a longitudinal section on the line 3—3, Fig. 1, one of the trolley wires and its clamping devices being shown in elevation.

The cross-over herein shown as embodying this invention comprises two members A A′ pivotally secured together as will be described. The member A is shown as composed of two end portions $a\ a'$, each comprising two vertical walls 2, 3 forming a groove or channel a^2 for the reception of a trolley wire B, the bottom of which groove is downwardly inclined toward the outer ends of the said walls as at $a^3\ a^4$ (see Fig. 3) and the said bottoms are thickened from the outer ends toward the center of the member A as at $a^\times$, to form substantially straight guiding surfaces in substantially the same straight line or plane, which construction is substantially the same as shown and described in the patent above referred to.

The walls 2, 3 of the groove a^2 are preferably formed integral with a substantially flat bar a^5, which extends toward the outer extremeties of the end portions $a\ a'$ below the top of the vertical walls 2, 3 to form side guiding flanges 6, 7, which are for the best results preferably inclined upward toward the outer ends of the said side walls. The bottom of the groove a^2 between the vertical walls 2, 3 of the end portions $a\ a'$ near the inner ends of the said walls, is preferably provided with nubs or raised portions 8, 9, forming a recess or depression 10, for a purpose as will be described, and the inner ends of the vertical walls 2, 3 of the said end portions $a\ a'$ of the member A are separated preferably a considerable distance and connected at their bottom by the bar a^5.

The vertical walls 2, 3 of the end portions $a\ a'$ are preferably provided on their outer sides with strengthening ribs $a^8\ a^9$, and the said walls at their extreme inner ends are prefer-

ably reduced in height to form shoulders a^{10} a^{12} (see dotted lines Fig. 1 and full lines Figs. 2 and 3), for a purpose as will be described.

The connecting surface or bar a^5 is pivotally secured as by a countersunk screw a^{13} to the member A′ of the cross-over.

The member A′ is preferably made as herein shown and consists of end portions b b', each comprising vertical walls 4, 5, forming a groove b^2 for the reception of a trolley wire B′, and having the bottom of the groove downwardly inclined toward its outer ends and thickened at its rear portion as at b^4, so as to form substantially straight guiding surfaces lying in substantially the same horizontal plane with the guiding surfaces $a^\times$ of the member A.

The end portions b b' of the member A′ are connected by a preferably flat surface or plate b^5, preferably of circular form for the greater portion of its periphery, and having on diametrically opposite sides, re-entrant portions b^6 b^7, for a purpose as will be described, and the said plate is extended toward the outer extremeties of the end portions b b' below the top of the vertical walls 4, 5, to form side guiding flanges 20, 30, preferably inclined upward toward the outer ends of the said side walls.

The connecting plate b^5 is provided on its under surface with a substantially central stud or projection b^{15}, preferably cast integral with it, and co-operating with the guiding surfaces of the members A A′.

The bottom of the groove b^2 between the upright walls 4, 5, at or near the central portion of the member A′, is also preferably provided with nubs or raised portions similar to the nubs or raised portions 8, 9, and not nerein shown.

The thickened bottoms $a^\times$ of the end portions a a' are preferably made of sufficient length to project under the connecting surface or plate-like central portion b^5 of the member A′ and form locking projections, and the flat or bar-shaped portion a^5 of the member A is preferably provided with a downward bend as at c (see Fig. 2) to bring the under surface of the side flanges 6, 7 substantially on a line with the under surface of the plate b^5, so that the trolley may pass from the flanges 6, 7 to the plate b^5 without sparking.

The inner extremities of the vertical walls 4, 5, of the end portions b b' are preferably provided on their outer sides with substantially vertical strengthening ribs c' c^2 and with reduced inner end portions forming shoulders c^3 c^4 similar to the shoulders a^{10} a^{12}.

The member A may be provided at its opposite ends with locking dogs or cams c^5 c^6 pivoted between the side walls 2, 3, and the member A′ may also be provided at its ends with like locking dogs or cams c^7 c^8 pivoted between the side walls 4, 5 and co-operating with the trolley wire B′, substantially as shown and described in the patent referred to.

The trolley wires B and B′ are laid in the grooves of the members A, A′, and as shown in the present instance, the wire B crosses over the wire B′ (see Fig. 3), and the said wires are preferably secured in their respective grooves by means of clamping devices, which are preferably of substantially the same construction as shown in the patent referred to, each device consisting of a bar c^{10} and a threaded bolt c^{12}, the said bar being preferably provided with upright ends c^{13} to keep the said bar from tipping sidewise in the groove. The side walls of each end portion of the member A A′ are thickened and provided on their inner sides with screw threads to form a threaded socket for the reception of the threaded bolt c^{12}, which acts on the clamping bar c^{10} and forces the trolley wire against the nubs or projections 8, 9 on the bottom of the groove and into the depression or space 10 between the said nubs, thereby forming a bend or irregularity in the trolley wire and more securely holding the said wire against longitudinal movement as clearly shown in Fig. 3.

From the above description, it will be seen that the central portions of the members A A′ comprising the cross-over are much lighter than the end portions of the same, and in practice, when the trolley wires are supported thereon and strung in operative position, the central portions are submitted to an excessively heavy transverse or breaking strain, by the tension on the trolley wire aggravated by the underneath action of the trolley upon the trolley wire, and in order to strengthen the cross-over or support at its central portion, I have provided an anti-buckling device or bridge, which, in the present instance, is made in the form of a disk or plate d adapted to rest upon the shoulders or ledges a^{10} a^{12}, c^3 c^4, formed on the inner ends of the vertical walls of the grooves a^2, b^2, the said plate in practice being secured to the member A′ by screws d' or in any other suitable manner.

The member A′ of the cross-over, for the purpose of this invention, may be regarded as the stationary member, and the member A the adjustable or movable member, it being free to be turned on the head of the screw a^{13}, and by means of the rearwardly extended portions $a^\times$ of the thickened bottoms or guiding surfaces, the adjustable member A is locked to the central portion of the stationary member A′ against upward movement, as clearly shown in Figs. 2 and 3.

In practice, the movable member A may be turned into the proper or desired angle with relation to the member A′, so as to permit of the proper stringing or running of the trolley wire B. For instance, the trolley wire B′ may be passed through the groove a^2 of the member A′, and the member A may then be turned

on its pivot a^{13} until it occupies the desired position at which it is desired the trolley wire B should cross the trolley wire B′, and when in this position, the trolley wire B is run through the groove b^2 and the bridge d is then secured in place, after which both wires may be fastened in their grooves as above described. The member A may be turned on its pivot, so that the locking extensions $a^{\times}$ come opposite the re-entrant portions b^6 b^7 of the plate or disk a^5 when it is desired to move the said member from the member A′.

I prefer to employ a bridge of circular shape as shown, but I do not desire to limit my invention in this respect, as the said bridge may be made of other forms, and in one or more pieces.

I claim—

1. The combination with a support for electric conductors comprising grooved end portions, and an intermediate portion weaker than the said end portions, of a bridge or anti-buckling device intermediate of the said end portions and reinforcing the weaker intermediate portion of the support, for the purpose specified.

2. The combination with a support for electric conductors comprising two crossing members, each comprising grooved end portions, and intermediate connecting weaker portions, of a bridge or anti-buckling device secured to one of said members intermediate of the end portions of the said members and reinforcing the weaker connecting portions of the said members, for the purpose specified.

3. The combination with a support for electric conductors comprising thickened end portions, and an intermediate connecting weaker or thinner portion, of a bridge separate from the said support but secured thereto between the thickened end portions to operate, substantially as described.

4. The combination with a support for electric conductors comprising two members, one of which is composed of thickened end portions, and an intermediate connecting thinner or weaker portion, the other of which is composed of thickened end portions having locking projections or extensions co-operating with the under side of the connecting portion of the first member, and a bridge intermediate of the thickened portions of said members, and means to secure said bridge to one of said members, for the purpose specified.

5. The combination with a support for electric conductors comprising end portions composed of upright walls forming a groove downwardly inclined at its ends, thickened bottom portions for said grooves rearwardly extended from its outer ends, an intermediate substantially flat portion connecting the said end portions and forming practically a continuation of the bottom of said groove, shoulders on the inner ends of said upright walls, and a bridge resting on said shoulders and secured to the said support, for the purpose specified.

6. The combination with an adjustable support for electric conductors comprising two members, adjustably secured together and each composed of end portions consisting of upright walls forming a groove having its bottom downwardly inclined at its outer ends and thickened toward the central portion, an intermediate substantially flat connecting portion joining the thickened end portions, of a bridge or anti-buckling device interposed between the thickened end portions to strengthen the substantially flat intermediate connecting portions, substantially as described.

7. The combination with a support for electric conductors comprising side walls forming a groove for the reception of the conductor and having its bottom provided with nubs or projections forming between them a recess or depression 10 in the bottom of the said groove, of a clamping device co-operating with the said nubs to crimp or bend the electric conductor into said depression, for the purpose specified.

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.