

H. P. BROWN.

TROLLEY SYSTEM FOR ELECTRIC RAILWAYS.

No. 428,072.

Patented May 20, 1890.

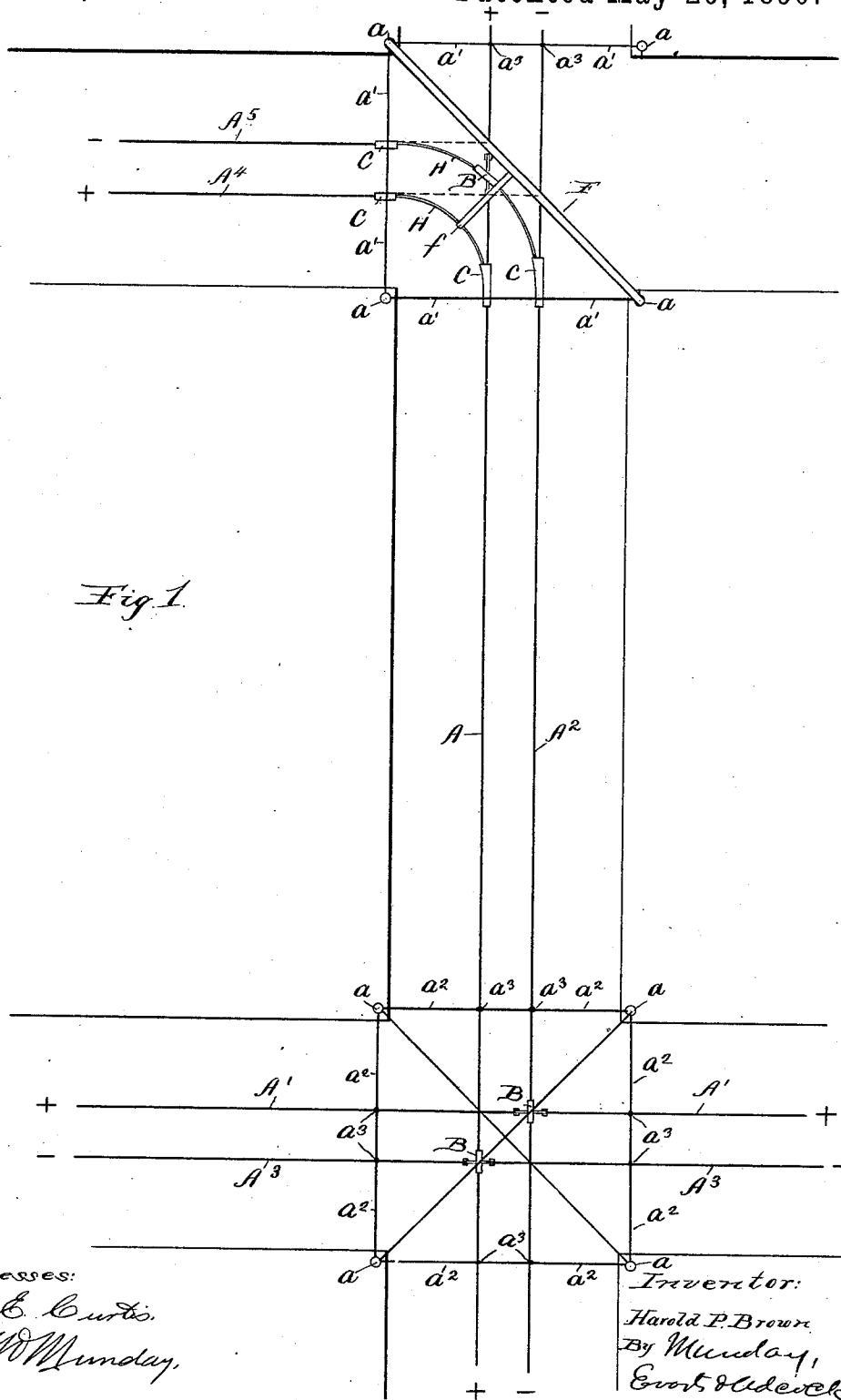


Fig 1

Witnesses:

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A. W. Munday.

Inventor:

Harold P. Brown.

By Munday,

Evans & Aldrich

his Attorneys.

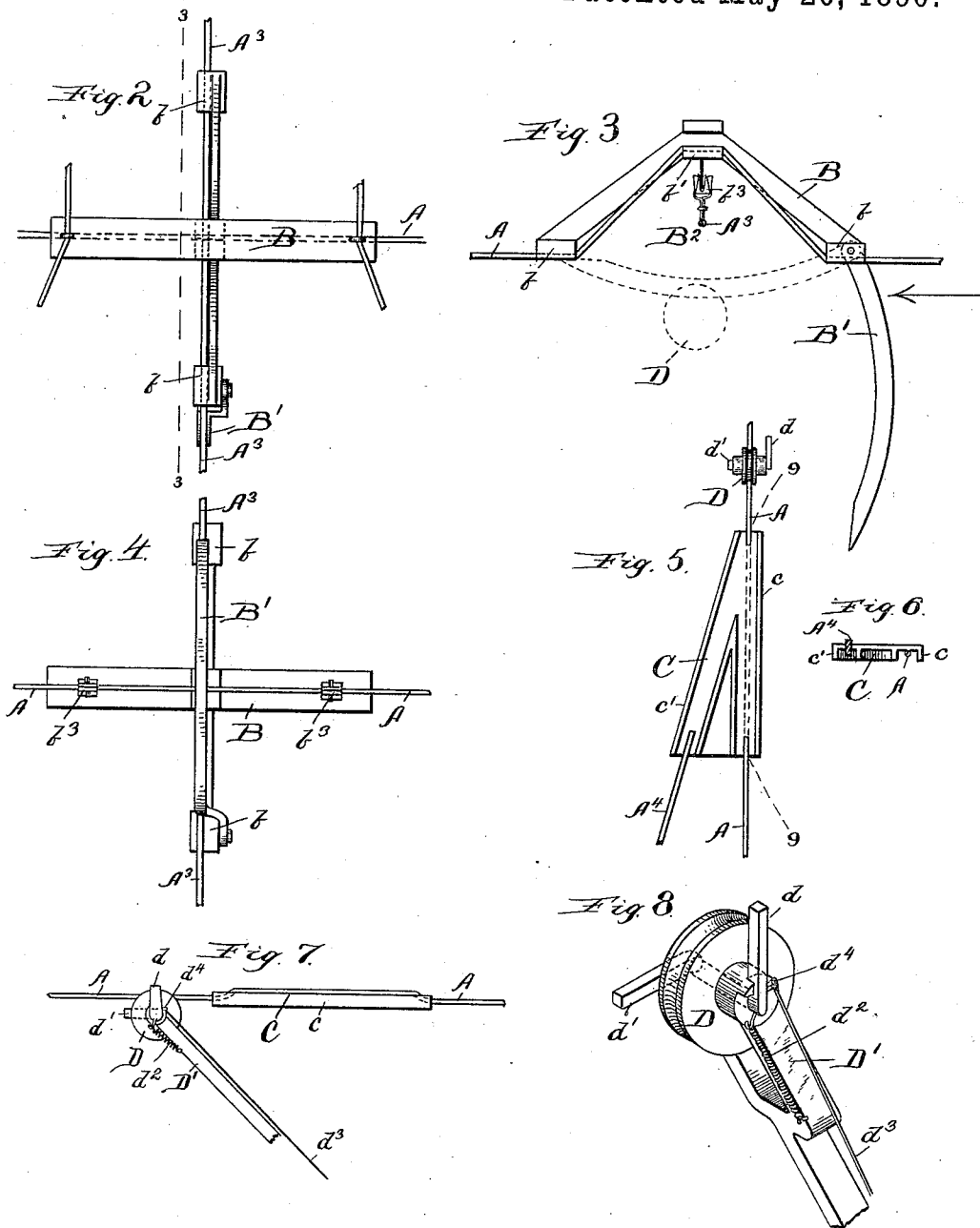
(No Model.)

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Witnesses:

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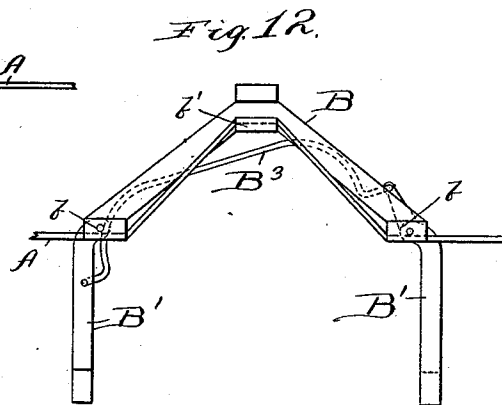
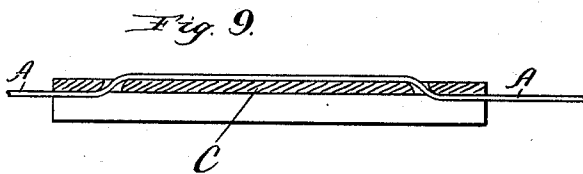
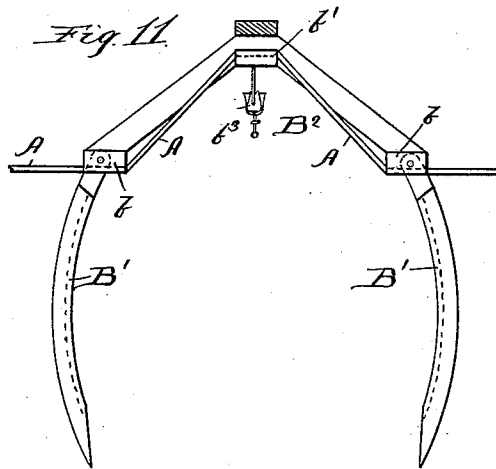
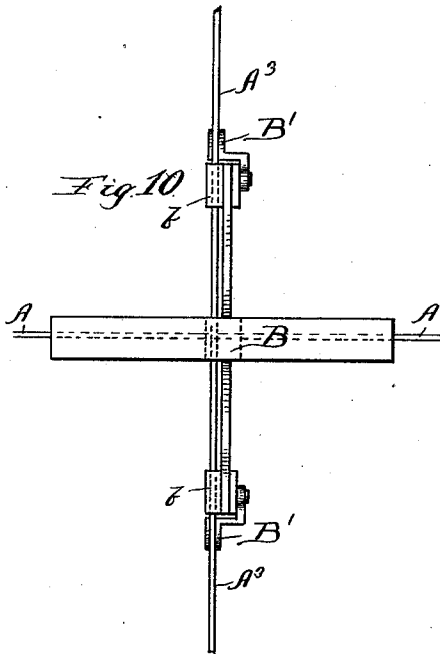
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Witnesses:

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UNITED STATES PATENT OFFICE.

HAROLD P. BROWN, OF NEW YORK, N. Y.

TROLLEY SYSTEM FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 428,072, dated May 20, 1890.

Application filed March 10, 1890. Serial No. 343,233. (No model.)

To all whom it may concern:

Be it known that I, HAROLD P. BROWN, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented a new and useful Improvement in Trolley Systems for Electric Railways, of which the following is a specification.

My invention relates to improvements in electric street-railway apparatus, and to that class wherein overhead wires are employed.

It relates more particularly to improvements in the mechanism or means for crossing the electric wires or lines and switching the trolley from one line to another at the street-crossings or street-intersections.

The object of my invention is to provide a device of a simple, efficient, and durable construction which will operate automatically, and whereby the trolley may pass along or follow its line continuously at the crossings without interruption or obstruction from the cross-wire, and whereby also the trolley may be positively deflected at the switch to the path desired.

A further object of my invention is to provide a means whereby the upward pressure of the trolley on the line-wire may be prevented from forcing such line-wire into too close proximity with the cross-wire at the crossing, and thus cause the current to flow from the positive to the negative wire.

My improvement consists, essentially, in providing one of the electric wires at the crossing with a rigid bent support furnished with an opening and closing latch or arm, so that the trolley will close the latch or arm as it advances, and thus bridge or span the space between the limbs of the bent support and afford a continuous smooth way or line for the trolley to follow, said bridge having attached thereto an insulator to support said cross-wire in position in the hollow or bend of the bent support or bridge. The bent support or bridge may be furnished with one or more movable latches or swinging arms, according as it is to be used on a double or single track. In a double-line track, where the cars approach the bent support or bridge on any one track always from the same direction, a single latch or swinging arm will suffice. Where the cars approach from both direc-

tions, as in a single-line track, each limb of the bridge or bent support will need be furnished with a latch. As the rigid bent support and its latch or swinging arm sustain both the line-wire and the trolley in a fixed position relatively to the cross-wire supported in the bend or hollow of the bridge, the upward pressure of the trolley on the line-wire will have no tendency to force the line-wire and the cross-wire near together.

The trolley or its shaft is furnished with a pair of movable arms, preferably about at right angles to each other, one of which is always adapted to engage the side of the switch-plate which is parallel with the branch or line it is desired to cause the trolley to follow. By this means the trolley is automatically and positively directed along the particular line or branch desired, and accidents and stoppages, due to the street-car taking one track and the trolley following another branch or track, are by this simple means entirely avoided. The trolley or its shaft is furnished with a latch or arm having a rod or other suitable connection by which the driver or operator may turn either one of the right-angle arms into the vertical position, according to the particular branch or line which he desires the trolley to follow.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a plan view of a device embodying my invention. Fig. 2 is a plan view of the bridge or bent support at the crossing of the wires. Fig. 3 is a sectional elevation looking from the line 3 3 of Fig. 2. Fig. 4 is a bottom view. Fig. 5 is a bottom view of the switch. Fig. 6 is an end view of the switch. Fig. 7 is a side elevation of the switch, showing the trolley-wire following the line and approaching the switch. Fig. 8 is a perspective view of the trolley and its right-angled guide-arms. Fig. 9 is a section on line 9 9 of Fig. 5. Fig. 10 is a plan view, and Fig. 11 a side elevation, showing the bridge or bent line-support furnished with two latches or swinging arms for use upon a single instead of a double line. Fig. 12 shows a modified form, which may be used either for a single or double line.

In the drawings, A A' A² A³ represent the

positive and negative wires of an overhead or trolley electric railway system, the wires crossing each other at the street-intersection. The wires $A A' A^2 A^3$ are supported overhead in the usual way by posts a , located at the sides of the streets and furnished with connecting and brace wires $a' a^2$, from which the electric wires $A A' A^2 A^3$ also are suspended by insulated supports a^3 . Any suitable or well-known means of supporting the wires may be employed.

B is the rigid bent support or bridge for one of the line-wires at its crossing with another line-wire A^3 . The rigid bridge or bent support B is furnished with lips or ledges $b b'$ to receive and hold the electric wire A , and thus cause the wire to assume a bent path conforming to the bridge B . The bridge B is further provided with one or more movable or pivoted arms B' , adapted to span the hollow of the bridge B , and when closed form a continuation of the line A for the trolley D to follow. The swinging arms or latches B' are preferably pivoted at their ends to the ends of the bridge B . The negative cross-wire A^3 is supported in the hollow or bend B^2 of the bridge B by an insulated support b^3 , attached to the bridge B . The latches or swinging arms B' will normally hang down by their own gravity, as shown in Fig. 3. When the trolley approaches, however, along the line A in the direction indicated by the arrow in Fig. 3, it will strike against the pivoted arm B' and close it over the hollow or bend of the bridge B , and thus afford a continuous way or guide for the trolley. At the same time the rigid bridge B and its closed arm B' will prevent the trolley from coming in close proximity to the cross-wire A^3 or otherwise interfering with the proper insulation and separation of the wires $A A^3$ at the crossing.

In the modification shown in Fig. 12 two arms or latches $B' B'$ are shown connected together by a pivoted link B^3 to cause the two to close and meet together; but the preferred construction is that before described, and shown in Figs. 2, 3, 4, 10, and 11.

At a street-intersection, where the cross-wires $A^4 A^5$ are desired to switch into or connect with the wires $A A'$ without crossing the wires $A A'$, a switch-plate or frog C is provided. The trolley D , which is carried by the trolley arm or support D' on the car, is furnished with two guide-arms $d d'$, preferably arranged about at right angles to each other, although their relative position may be varied somewhat without departing from the principle of my invention. One of these arms is mounted on one side of the trolley and the other on the other side.

As the trolley approaches the switch-plate or frog C , the arm d , if that is the one which is then projecting upward or vertical, will engage the side face c of the switch-plate or frog C , and thus cause the trolley to continue directly along the line A . If, however, the operator pulls the other guide-arm d' into the

upright position, it will engage the inclined face c' of the switch-plate C , and thus cause the trolley to switch onto the branch A^4 . The arm d or one of the guide-arms should or may be normally left in its upright or operating position, being held there by a spring d^2 . When the operator desires to switch off onto the line A^4 , he turns the guide-arm d down and the arm d' upright by pulling on the rod or line d^3 , which is connected to a projection d^4 on the arm d or on the shaft of the trolley. By this means the driver or operator may very easily and without stopping the car switch the trolley along any path desired with perfect safety and certainty.

F represents a cross-bar or support at the street-intersection where a switch or curve is located. This cross-bar or support rests upon the posts a . The purpose of this support or cross-bar is to take or sustain the tensile strain of the wires $A^4 A^5$, and also of the wires $A A'$ in case they should not extend beyond the support F , and thus relieve the rigid curved-bar connection $H H$ of the wires $A A^4 A' A^5$ from the tensile strain. Another purpose of the bar F is to support the rigid curved-bar connections $H H$, the bar F being provided with an arm f for this purpose. The curved-bar connections $H H$ are supported at their ends from the cross support-wires a' . By this means I avoid the necessity of employing a multitude of tie-wires such as have commonly been heretofore used to take the tensile strain of the wires $A A'$ and $A^4 A^5$ at a switch or curve, and which obstruct the light and interfere with the operations of firemen. I also by this means obviate the tendency of the curved portion of the line to crawl or get out of position by reason of contraction or expansion, and which in the constructions heretofore in use has been a serious difficulty.

I claim—

1. In an electric street-railway, the combination, with crossing electric wires, of a rigid bent support or bridge extending in the direction of one of the wires and having a hollow or bend to receive the cross-wire and provided with a movable arm or latch adapted to span the hollow of the bridge and afford a continuous way for the trolley, said bent support or bridge being further provided with an insulator to sustain the cross-wire in position in the hollow of said bridge, substantially as specified.

2. The combination, with the frog or switch-plate C , of the trolley furnished with guide-arms adapted to engage said frog or switch-plate and thus guide the trolley in the direction desired, substantially as specified.

3. The combination, with the frog or switch-plate C , of the trolley furnished with guide-arms adapted to engage said frog or switch-plate and thus guide the trolley in the direction desired, a spring for holding one of the guide-arms in position, and a rod or connection for moving the other guide-arm into position, substantially as specified.

4. The combination, with the wires A and A⁴, with the curved rigid connecting-bar H between them, of means for supporting said bar and relieving said bar from the tension or strain of said wires, substantially as specified.
5. The combination of the wires A A⁴, curved rigid connecting-bar H, post *a*, and cross-bar F, for receiving the strain of said wires A A⁴ and supporting said curved bar H; substantially as specified.

HAROLD P. BROWN.

Witnesses:

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