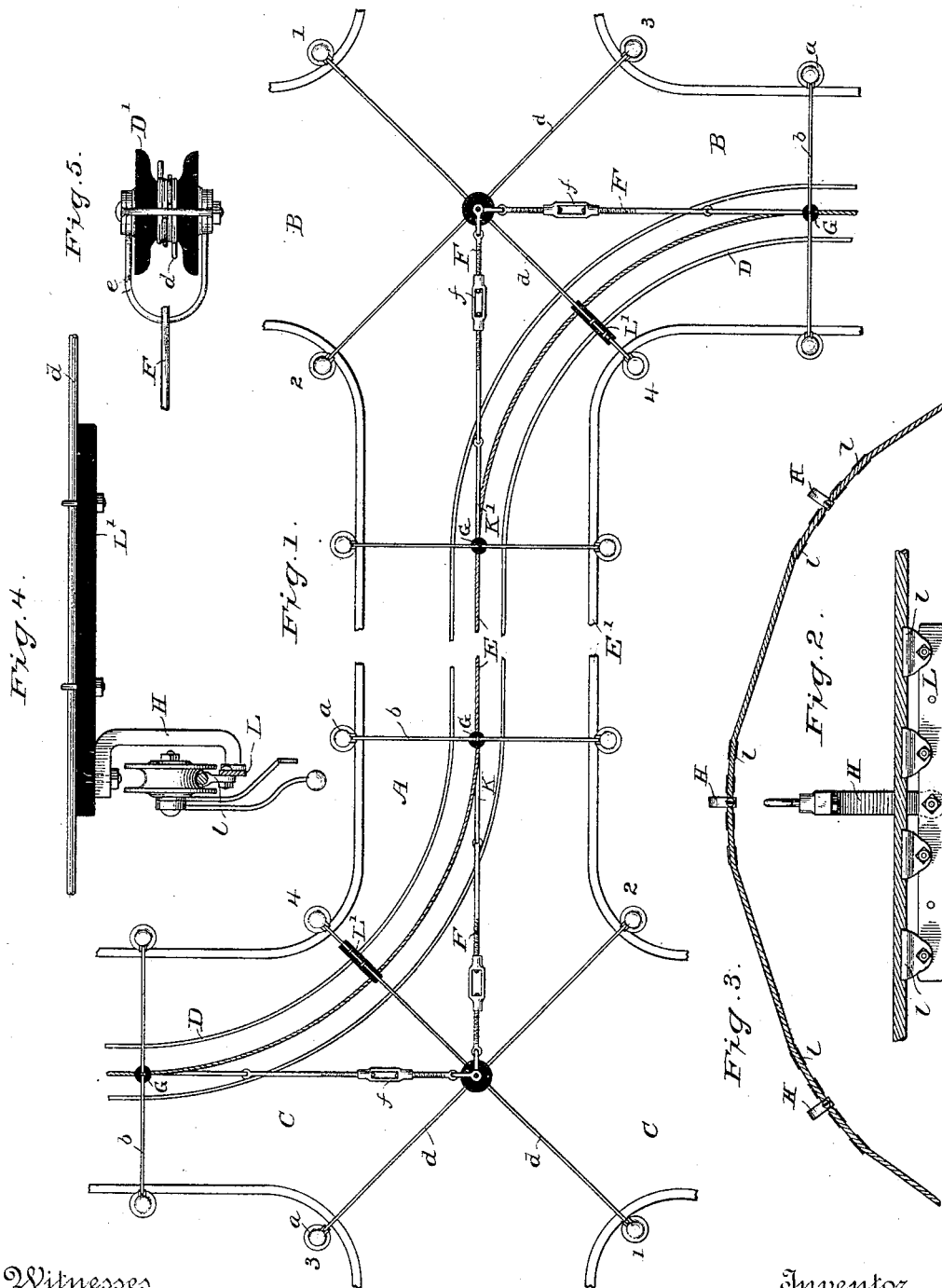


C. J. VAN DEPOELE.

SUSPENDED ELECTRIC CONDUCTOR.

No. 344,425.

Patented June 29, 1886.



Witnesses  
Geo. W. Young  
H. A. Lamb.

Inventor

*Charles J. VanDepoele*

By his Attorneys

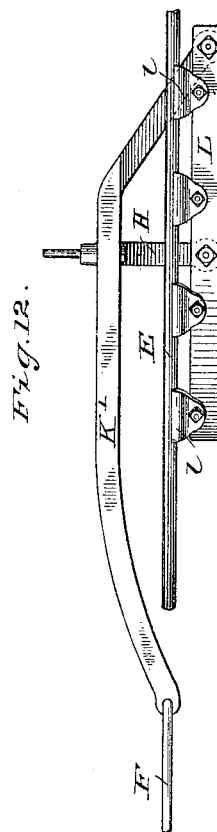
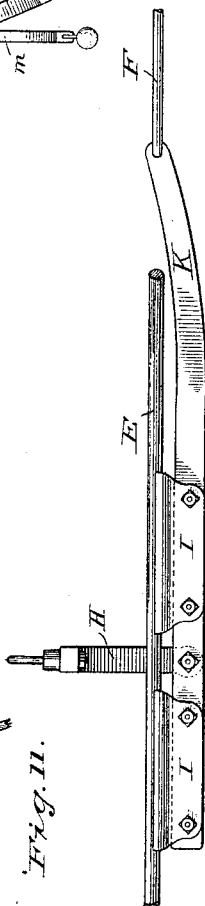
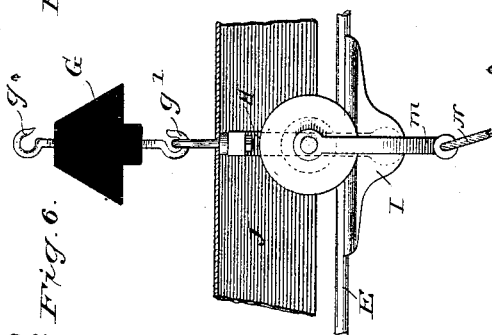
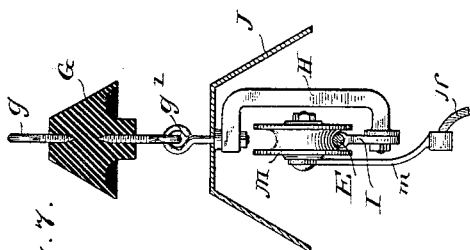
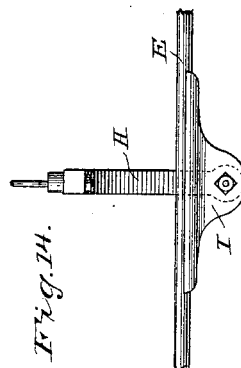
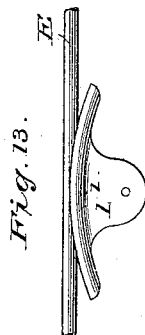
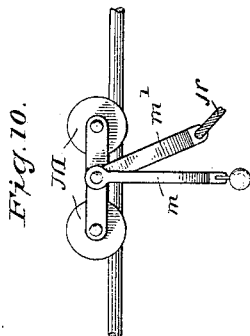
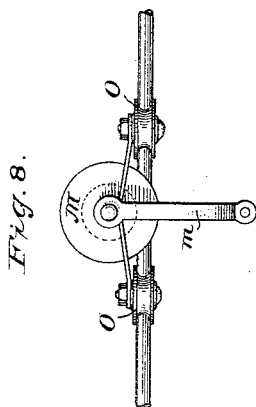
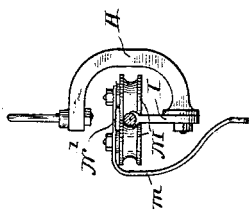
James Skinkle

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# UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

## SUSPENDED ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 344,425, dated June 29, 1886.

Application filed January 9, 1886. Serial No. 188,126. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES J. VAN DEPOELE, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Systems of Suspended Electric Conductors, of which the following is a description.

The present invention relates to various improvements in the details of construction and arrangement of electric railways, and more particularly to the system shown and described in an application filed by me October 26, 1885, Serial No. 180,988, and the particulars thereof will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a plan view of an electric railway arranged according to my invention. Fig. 2 is an elevation in detail showing the means of supporting the conductor on curves. Fig. 3 is a plan view of a conductor and its supports as arranged upon curves of comparatively large radius. Fig. 4 shows one of the hangers adjustably insulated, by which the curved portion of the conductor is supported. Fig. 5 shows the central insulator, to which the lateral supports are secured at curves. Fig. 6 is an elevation, partly in section, showing the main conductor, its support, a cover therefor, a traveling contact, and an insulating device from which the parts are suspended. Fig. 7 is an end view of what is shown in Fig. 6. Figs. 8, 9, and 10 are details showing various forms of traveling contact. Fig. 11 is a detail showing the method of attaching the tension-rods to the main conductor at the beginning of a curve in one direction, and Fig. 12 is a similar view of the device used when the curve is in the opposite direction. Fig. 13 shows the main conductor and one of its supports as arranged when the support is not secured to the conductor. Fig. 14 shows the conductor and one of its fixed supports.

Similar letters denote like parts.

A represents a street, B and C being cross-streets.

D is the track traversing the streets A, B, and C, and E is an electric conductor following the line of said track.

E' represents the line of the curb, near which are planted suitable poles on opposite sides of the street, which poles are provided with in-

sulating-caps *a*, to which are secured suitable metallic rods or wires, *b*, extending across the street transversely of the track at a suitable height and for the purpose of supporting the conductor. At the intersection of streets, as also where the track would for any cause be required to make a sharp turn, poles are to be placed at all four corners, as indicated by the numbers 1 2 3 4, from which are strung wires, cables, or rods *d*, which unite in the center, and are secured to a suitable insulator, *D'*, to which are also secured, by suitable stirrups, *e*, the tension-rods *F*, which are provided with turn-buckles *f*, and connected to the main conductor *E* at each end of all curves; and it will be readily understood that the straight sections of the main conductor are longitudinally secured wholly from these tension-rods, the tension of the conductor being readily adjusted, according to circumstances, by means of the turn-buckles *f*, the insulator *D'* being securely held by the system of poles and guys already described.

G is a conical or rounded insulator, consisting of a block of wood which has been boiled in paraffine, and is provided with upper and lower hooks, *g g'*, which are firmly screwed thereinto, there being at least an inch of solid wood between their respective ends. Any other equally suitable material may, however, be used for the insulator, which is then suspended from the cross-rods *b*. From the lower hook, *g'*, of the insulator depends a suspender, *H*, which is so curved over to one side as to leave its central line free, as shown, to accommodate and allow the passage of the traveling contact upon the conductor *E*, which is supported upon the upper surface of bail *I*, one of which is secured to the lower extremity of each of the suspenders *H*. A continuous light metallic cover or roof, *J*, is placed above the suspenders *H*, being secured thereto in any convenient manner, and it may be continuous throughout the line, so that the cover itself may assist the main conductor in conveying the current, all the metallic parts of the system directly connected with the conductor being in metallic contact. The cover may, however, be so arranged as to extend over the suspenders only. It is neither necessary nor desirable that the main conductor should be rigidly fixed at each point of suspension,

as every such fixed point increases the difficulty of maintaining an equal tension throughout the line. Therefore bails soldered to the conductor are only used at intervals of a quarter or half mile, or as the requirements of practice show to be necessary, and at all intermediate points of support bails I', as shown in Fig. 13, are used. The bails themselves are rigidly secured to the suspenders, the only difference in structure being that their upper gooved edge is curved to accommodate the slack of the conductor, instead of being straight, or substantially so, as in the case of the bails I, which are permanently secured to the conductor. The peripheral groove may also be somewhat deeper in the bails I' than in those which are permanently attached to the conductor.

It will readily be understood from the description thus far given that all the supports for the main conductor must be attached at the same side, no matter what the direction of the necessary curves.

In Fig. 11 is shown the means for attaching the tension-rod F for a curve of one direction; and it consists of a flat bar or anchorage-plate, K, to which the rod F is attached, and to which are also secured the two or more bails I, connecting it to the conductor, under which it passes, being connected to the tension-rod, which extends in a straight line from the point of suspension, the conductor curving away from said point.

In Fig. 12, the bar K', instead of passing under the conductor, as does the bar K, is attached thereto at the same side, and is provided with a suspender, also attached to or formed integral therewith. It then rises and passes over the conductor, which goes off in a reversed curve underneath the frame K', which is here shown as secured to the curve-plate L; but it can be continued back and provided with bails I, as is the plate K. In order to carry the conductor round sharp curves, and to preserve curved lines of sufficient ease to prevent undue strain on the contact-carriage, with the consequent liability of said carriage leaving its tracks, as would be the case were the conductor carried in a straight line from each point of suspension, I use a light steel curve plate or strip, L, which is permanently curved in the desired direction, and provided at its upper edge with a number of small ears, l, which are permanently secured to the conductor. This plate is then connected to the ordinary suspender, H. In the case of sharp curves the plate L is carried all the way around, a suitable number of suspenders H being attached thereto; but on short curves one will be found sufficient, as indicated in Fig. 4, this suspender being attached directly to a plate, L', of insulating material, secured to the guy-rod d. In curves of larger radius it is not necessary that the curve-plate L be continuous, a number of short sections thereof, placed at intervals, as indicated in Fig. 3, being sufficient to break

the curve into a number of obtuse angles, easily traversed by traveling contact.

In the previous application hereinbefore referred to by me the conductor was wholly suspended from ears, which in turn were secured to the overhead structure.

Great variations of temperature are apt to injure soldered joints or connections, dependence on which I have sought to obviate by the present invention; according to which, it will be observed, but few such connections are required, as they are only an absolute necessity at curves, and in a few other places—say every quarter or half mile—to prevent the conductor falling to the ground in case of breakage.

Various forms of traveling contact are shown, consisting of a deeply-grooved metallic wheel, M, resting directly upon and above the conductor. As shown in Figs. 6 and 7, a single wheel is used, from the axis of which depends a weighted arm, m, to the extremity of which is attached a flexible conductor, N, by which the current is conveyed to the translating devices upon the vehicle to be propelled.

In Fig. 10 is shown a carriage having two contact-wheels, M, and a supplemental arm, m', to which the flexible conductor is attached.

In Fig. 9 a carriage having a series of pairs of wheels is shown, the said wheels grasping the conductor from opposite sides, and being united across their upper side and above the conductor by a piece or pieces, N', of non-resilient material.

In Fig. 8 is shown a carriage particularly adapted to higher speeds, the main contact-wheel M being provided with small side wheels, O, which bearing laterally against the conductor from both sides, as shown in Fig. 9, hold the wheel M in position thereon.

I have described the present invention in connection with a single-track street-railway. All portions of the suspending-conductor being in electrical connection and of the same polarity, the rails of the track are to be utilized as the return-conductor, in the well-known manner; but it readily will be understood how the present system can be applied to two sets of overhead conductors, one being used for the return and each insulated from the other and from the ground.

The method of and means for switching from one track to another are not herein described, as they will form the subject-matter of another application.

The contact-carriage having both horizontal and vertical wheels pressing upon the conductor, as shown in Fig. 8, is not herein claimed, as it forms part of the subject-matter of a separate application for Letters Patent.

Having described my invention, what I claim is—

1. In a system of electric conductors, the combination, with the track or tracks of a railway, said track including reversely-curved portions within its length, of a conductor or conductors supported from below, tension de-

vices for keeping taut the straight portions of the conductor, said tension devices being secured to the conductor, and extending from one side thereof for a curve of one direction, and secured at the same side, but bridging the conductor, when the curve is in the opposite direction, thereby freeing the same side of the conductor throughout the line, substantially as set forth.

2. In a system of suspended electric conductors, the combination, with the conductor E, suitable tension devices, and supports therefor, of an anchorage-plate, K, and means, consisting of upwardly-extending bails attached thereto and to the conductor, for securing one end of said plate to the conductor, and the suspender H, for vertically supporting the anchorage-plate and conductor, substantially as described.

3. In a system of suspended electric conductors, the combination, with a conductor supported from below, of suspending devices all arranged upon the same side thereof, a contact traveling upon said conductor, and having an arm for connection with the traveling conductor, said arm depending from the side opposite to the supports, and tension devices for keeping taut the straight portions of the conductor, said tension devices being connected to anchorage-connections secured to the conductor, and extending from one side thereof for a curve of one direction, and secured to the same side, but bridging said conductor, when the curve is in the opposite direction, thereby freeing the path of the depending arm, as set forth.

4. In a system of suspended electric conductors, the combination, with the conductor, tension devices, and suitable supports therefor, of an anchorage device secured to the tension devices, and bridging said conductor and suitably secured thereto, as set forth.

5. In a system of suspended electric conductors, the combination, with the conductor E, suitable tension devices, and supports therefor, of an anchorage-plate, K', secured at one end to the tension devices, and bridging the conductor, and a curved plate, L, from which the conductor is supported, and to which the extremities of the anchorage-plate K' are permanently secured, as set forth.

6. In a system of suspended electric conductors, the combination, with the conductor E, having taut straight portions connected by curved sections from which longitudinal strain is removed, of means for supporting the said curved sections, consisting, substantially, of rigid plates or strips secured in position below and connected to the curved portions of the conductor, as set forth.

7. In a system of suspended electric conductors, the combination, with suitably-secured straight portions of the conductor E, of curved plate or plates L, bails l, secured thereto and to the conductor, suitable suspenders, H, and supports therefor, as set forth.

8. In a system of suspended electric con-

ductors, the combination, with the supports 1 and 4 and suitable cross-rods, d, of the longitudinally-adjustable insulator L', a suspender, H, the curve-plate L, bails l, and the conductor E, secured thereto, and by means of which said conductor is supported on curves, as shown and described.

9. In a system of suspended electric conductors, the combination, with the conductor E, having taut straight portions, of a system of posts at about the center of a curve, guy-rods extending from said posts to a central insulator-point, and adjustable tension devices extending from said central point to the straight portions of the conductor, whereby said straight portions are kept taut, as set forth.

10. In a system of suspended electric conductors, the combination, with the conductor E, of a series of posts, 1 2 3 4, at opposite corners, guy-rods extending from said posts to a central point between them, and the tension-rods F, provided with turn-buckle f, extending from said central support and connected to the straight portions of the main conductor, as set forth.

11. In a system of suspended electric conductors, the combination, with the conductor E, having taut straight portions, of a system of posts at about the center of a curve, guy-rods extending from said posts to a central insulated point, adjustable tension devices extending from said central point to the straight portions of the conductor, whereby said straight portions are kept taut, and an adjustable support for said curved portion attached to one of said guy-rods, as set forth.

12. In a system of suspended electric conductors, the combination, with suitable supports located along the track of the conductor, of suspending devices therefor connected thereto, as described, and the insulator G, as described.

13. In a system of suspended electric conductors, the curved bails I', located below the conductor, in combination with suitable suspender and the conductor to be supported, as set forth.

14. In a system of suspended electric conductors, the bail I, located below the conductor, in combination with the conductor E and a suitable suspender, as set forth.

15. In a system of suspended electric conductors, a traveling contact consisting of two or more pairs of contact-wheels arranged to bear horizontally against opposite sides of the conductor, and united across their upper sides by a rigid plate, substantially as shown and described.

In testimony whereof I hereto affix my signature in presence of two witnesses.

CHARLES J. VAN DEPOELE.

Witnesses:

RUSSELL S. BATES,

ADRIAN J. REMONDINS.