

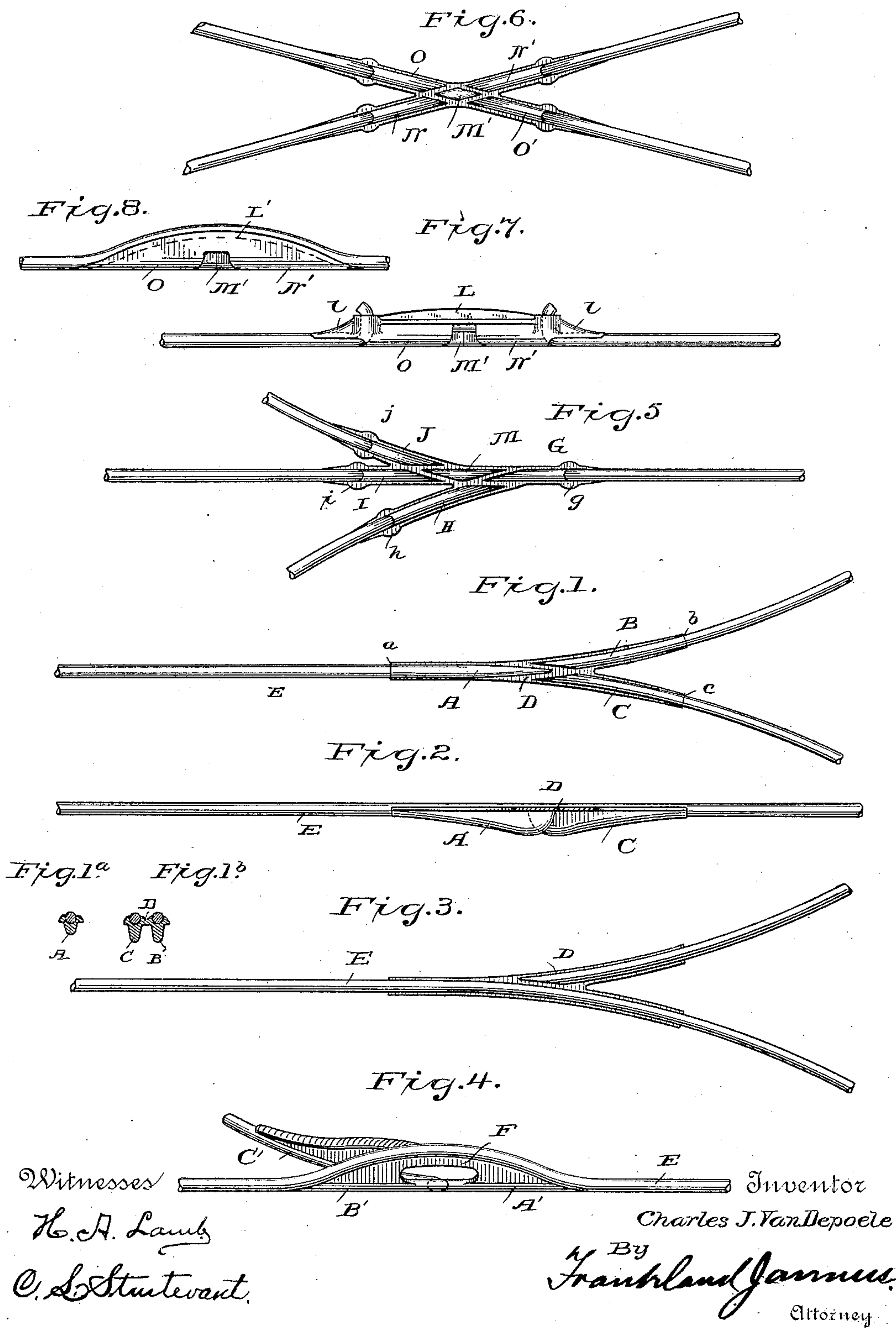
(No Model.)

C. J. VAN DEPOELE.

SWITCH FOR SUSPENDED ELECTRIC CONDUCTORS.

No. 405,627.

Patented June 18, 1889.





# UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF LYNN, MASSACHUSETTS.

## SWITCH FOR SUSPENDED ELECTRIC CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 405,627, dated June 18, 1889.

Application filed February 19, 1889. Serial No. 300,395. (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 Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Intersecting Rib-Switches for Suspended Electric Conductors, of which the following is a description, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon.

My invention relates to electric railways of the type in which the current is conveyed from the generator to the motor or motors upon the vehicles to be propelled by a suspended supply-conductor and the traveling contact device upon the vehicles; and it relates to improved means for switching the said several contact devices from one conductor to another, as where branch lines diverge from the main or where turn-outs are provided in order to allow of the cars passing on single-track roads.

The details of the invention, as well as the manner of carrying the same into effect, will be hereinafter fully set forth, and referred to in the appended claims.

In the drawings, Figure 1 is an inverted plan view of a switch for suspended conductors embodying my invention. Figs. 1<sup>a</sup> and 1<sup>b</sup> are cross-sections taken on the lines 1<sup>a</sup> 1<sup>a</sup> 1<sup>b</sup> 1<sup>b</sup> of Fig. 1. Fig. 2 is a side elevation thereof, partly in section, on the line 2 2 of Fig. 1. Fig. 3 is a top plan view of the switch. Fig. 4 is a perspective view showing a somewhat different mode of constructing the same. Fig. 5 is an inverted plan view of a three-way switch embodying the invention. Fig. 6 is an inverted plan view of a four-way switch. Fig. 7 is a side elevation of the switch seen in Fig. 6. Fig. 8 is a side elevation of a slightly-different form of the crossing shown in Fig. 6.

The principal features of the switch herein shown are simplicity, lightness, and certainty of operation. As indicated in the drawings, a two-way switch (seen in Fig. 1,) comprises the requisite number of ribs united by a central portion of metal, the conductor being entirely guided and carried upon the ribs, as distinguished from the switches in which the conductor leaves the ribs and comes in con-

tact with a switch-plate. For example, in my patent, No. 393,278, dated November 20, 1888, a two-way switch is shown, which comprises three ribs A, B, and C, the rib A, for example, being intended to indicate the point of entrance to the switch, and the ribs B and C the point of departure therefrom, B being the continuation of the main conductor and C the beginning of the turn-out or branch. The inner ends of the ribs A B C are tapered somewhat, so as to leave a space between their inner ends, in the center of which space the tapered extremity of the rib A has its beginning.

As indicated in Fig. 1, the extremities of the three ribs are arranged to lap or intersect in such manner that a grooved trolley-wheel of the proper size, running along one rib in either direction, will be compelled to follow the course of the vehicle on the tracks below, for the reason that its direction being determined by the line of its movement and the actual meeting-point of the ribs constituting the switch it will lap and thereby engage the desired rib before leaving the one upon which it entered the switch. This arrangement would not be possible where the ribs or parts of the switch would require to give the final direction to the trolley-wheel—as, for example, in track-switches, where a track-switch has already directed the course of the vehicle—and the trolley is arranged in such relation to the vehicle that the direction of the trolley will be indicated by the swing or tendency of the vehicle before the actual point of divergence is reached. Such a switch as here shown will answer all purposes and possess many elements of superiority on account of its extreme simplicity.

As indicated in Fig. 2, the rib B is omitted and the lapping of the rib A over the extremity of the rib C clearly indicated.

As seen in Figs. 1, 2, and 3, the switch is composed of the ribs, as described, which said ribs are united by a central metallic web D, desirably formed integral therewith by casting. The upper side of the switch is seen as presenting a level unobstructed surface, in which in the portions above the several ribs are formed grooves *a b c*, as indicated in Figs. 1<sup>a</sup> and 1<sup>b</sup>. The conductors, as clearly seen in Fig. 3, are let in the said grooves



and preferably soldered in place. The main conductor E may pass entirely across or along the top of the switch, the grooves *a* *b* being formed continuous, in order to receive the conductor, which is soldered permanently into said groove without being cut or in any way injured, so that a switch may be temporarily attached to a line and removed therefrom without severing the main conductor. The branch C is similarly or in any other desired manner secured in the groove prepared therefor, but need not be attached to the main conductor, with which, however, it is in electrical connection through the metal of the switch by which both conductors are united.

As indicated, the switch seen in Figs. 1, 2, and 3 is composed of intersecting ribs depending from the conductors. I do not, however, limit myself to this arrangement, as it may be preferable, for many reasons and in some instances, to so arrange the intersecting ribs or their equivalents that they shall remain in the plane of the conductor, and that the parts of the switch which unite the ribs into a solid substantial part project upwardly above the plane of the conductor.

As seen in Fig. 4, the switch is composed of three metallic ribs A' B' C'. The ribs A' B' are permanently united by a web or bridge F, passing over their separated but intersecting extremities, and to this bridge F is also connected or attached the third rib C'. The rib C' may be grooved at its under side to receive the branch conductor; but the ribs A' B' are grooved along their upper sides, so that the conductor need not be severed, but may pass over the arch F, being permanently secured thereon, and into the grooves on the upper sides of the tapering ribs A' B', so that they (the ribs A' B') shall be sustained in and form a continuation of the plane of the main conductor. The extremities of the ribs A' B' C' intersect below the bridge F, as indicated in the plan view, Fig. 1, so that the flanges of the trolley-wheel will engage the desired wheel before leaving the one upon which it entered the switch.

In Fig. 5 is seen an inverted plan view of a three-way switch, similar in all material respects to the two-way switch seen in Fig. 1, but differing slightly in the mode of attaching the conductor thereto. The switch is formed with four arms G H I J, all extending from a central body or portion of metal L, to which they are attached, or with which they are formed integral, the said body of metal serving to unite the several members composing the switch. As a desirable means of attaching the conductor to the switch I form or provide enlargements *g h i j*, through each of which there is a vertical aperture about the diameter of the conducting-wire. The ribs G H I J are formed solid or with an even surface from the point of intersection to the edge of the vertical apertures in the enlargements *g h i j*—that is to say, the said ribs are so

formed that their trolley-bearing edges will be in about the same plane as the conductor at the point where the lower edges of said ribs terminate at the vertical openings, within which the ends of the conductors are secured for the better securing of the conductor. A grooved part, in the form of a rib or projection, may extend from each of the enlargements *l* in the direction of the conductor to be secured thereto. The extensions may, however, be entirely dispensed with, and the several arms of the switch, whether two, three, or more be used, may terminate at the enlargements described, the switches secured in place by passing the ends of the several conductors up through the vertical openings in the enlargements at the termini of the several ribs, the parts being so arranged that when the conductor is placed in position its lower side will be in about the same horizontal plane as that of the several ribs. The ends of the conductors may be secured in their positions in the vertical openings in the enlargements at the ends of the switch ribs or arms by riveting, soldering, binding, or in any other desired manner.

When the enlargements *l* are provided, the grooves in their under sides should be tinned, and after the conductor has been otherwise secured it should be soldered in said groove. This will add somewhat to the strength and finish of the switch, but not necessarily to its effectiveness.

In Figs. 6 and 7 a crossing is illustrated, the formation of the several parts being substantially that described with reference to Fig. 5.

In Fig. 5 the arms G H I J connect with the ends of the several conductors and lead toward a central portion, where, instead of a flat plate or surface across which the trolley has to pass, in most instances unguided, there is placed a block M, the shape of which depends upon the number of arms in the switch. With a three-arm switch the block assumes the form of an elongated triangle, one point of which extends between and forms an intersecting tongue for the ribs I J, the opposite extremity lapping the point of the arm G, so that a trolley entering in the direction of the arrow upon the arm J would be guided by the block M to the arm G, and thence out of the switch. The separations between the block M and the extremities of the several ribs are a little wider than the thickness of the flanges of the trolley-wheel, so as to allow of free movement thereof, and they are in such direction that the inclination of the trolley imparted by the car will direct it with certainty to the proper channel. The block M is not indicated in a two-arm switch, since the parts will intersect and secure the desired results without such addition.

In the case of a crossing, as in Fig. 6, the block M', there seen, is of diamond shape, for the reason that the ribs N N' O O' are symmetrically arranged—that is, they are directly opposite to each other in lines crossing at an



angle. Therefore as one flange of the trolley leaves the beveled extremity of one of the ribs it will engage the point of the diamond-shape central block before its other flange has left the said rib, and in the same manner it will engage the opposing rib before leaving the block, and so be safely guided across. The shape of the block M' will depend upon the relative angles of the crossing-conductors, it being only essential that the shape of the block be such that its sides will be in the same plane as the ribs representing the opposing extremities of the crossing-conductors.

In Figs. 5, 6, and 7 I have shown and described means for attaching the conductors to the switch, which presupposes the severing of said conductors. Where the switch is to be permanent, this may be the best method of attachment; but the invention is not limited by any such details, as I may carry the conductor over the crossing or the main conductor over the switch without cutting the same, substantially as indicated in Fig. 8, in which a groove is formed over the bridge L', in which groove the conductor is either clamped or soldered, as is most convenient. When no longer needed, a switch or crossing so attached can of course be removed and the conductor or conductors left in their original condition and without piecing or patching, which is extremely undesirable, since every rough or uneven place in such a conductor will cause the trolley to jump and spark in passing.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A switch for electric conductors, comprising a rib or member for each conductor, the inner extremities of which are arranged to intersect or lap, and a bridge or body by which said members are connected, substantially as described.

2. A switch for electric conductors, comprising a rib or member for each conductor, and a bridge or body formed integral with said ribs by which they are connected, substantially as described.

3. A switch for electric conductors, comprising a rib or member for each conductor, the inner extremities of the ribs being arranged to intersect or lap, substantially as described.

4. A switch for electric conductors, comprising a rib or member for each conductor,

and a bridge or body by which said members are connected, the inner extremities of the several members being arranged to intersect or lap, substantially as described.

5. A switch for electric conductors, comprising a plurality of arms or members, to which the conductors are connected, the inner extremities of the members being arranged to intersect or lap, a block located at the point of intersection of the several members, and ways or channels between the intersecting members, substantially as described.

6. A switch or crossing for electric conductors, comprising arms or members the inner extremities of which are arranged to intersect or lap, said arms being connected to the crossing-conductors, a central block, and passages around the block and between the extremities of the conductors for the passage of the trolley-wheel in the desired direction, substantially as described.

7. A switch for suspended conductors, comprising a rib or member for each conductor, said members being supported and connected at their inner extremities and having said extremities arranged to lap or intersect, so that one flange of the trolley-wheel will engage the leaving rib before the other flange becomes disengaged from the entering rib, substantially as described.

8. A switch for suspended electric conductors, comprising a rib or member for each conductor, each member being formed with an opening or groove to receive the conductor and with a rib or part extending from the openings or grooves to carry the contact device to the point of divergence, substantially as described.

9. A switch for suspended electric conductors, comprising a rib or member for each conductor, each member being formed with an opening to receive the extremity of the conductor, and with a rib or part extending from the said openings, forming continuations of the conductor to carry the contact device to the point of divergence, substantially as described.

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

CHARLES J. VAN DEPOELE.

Witnesses:

FRANKLAND JANNUS,  
JOHN W. SIMS.