(No Model.) 2 Sheets—Sheet 1.

M. J. WIGHTMAN.

OVERHEAD FROG FOR ELECTRIC RAILWAYS.

No. 411,313. Patented Sept. 17, 1889.

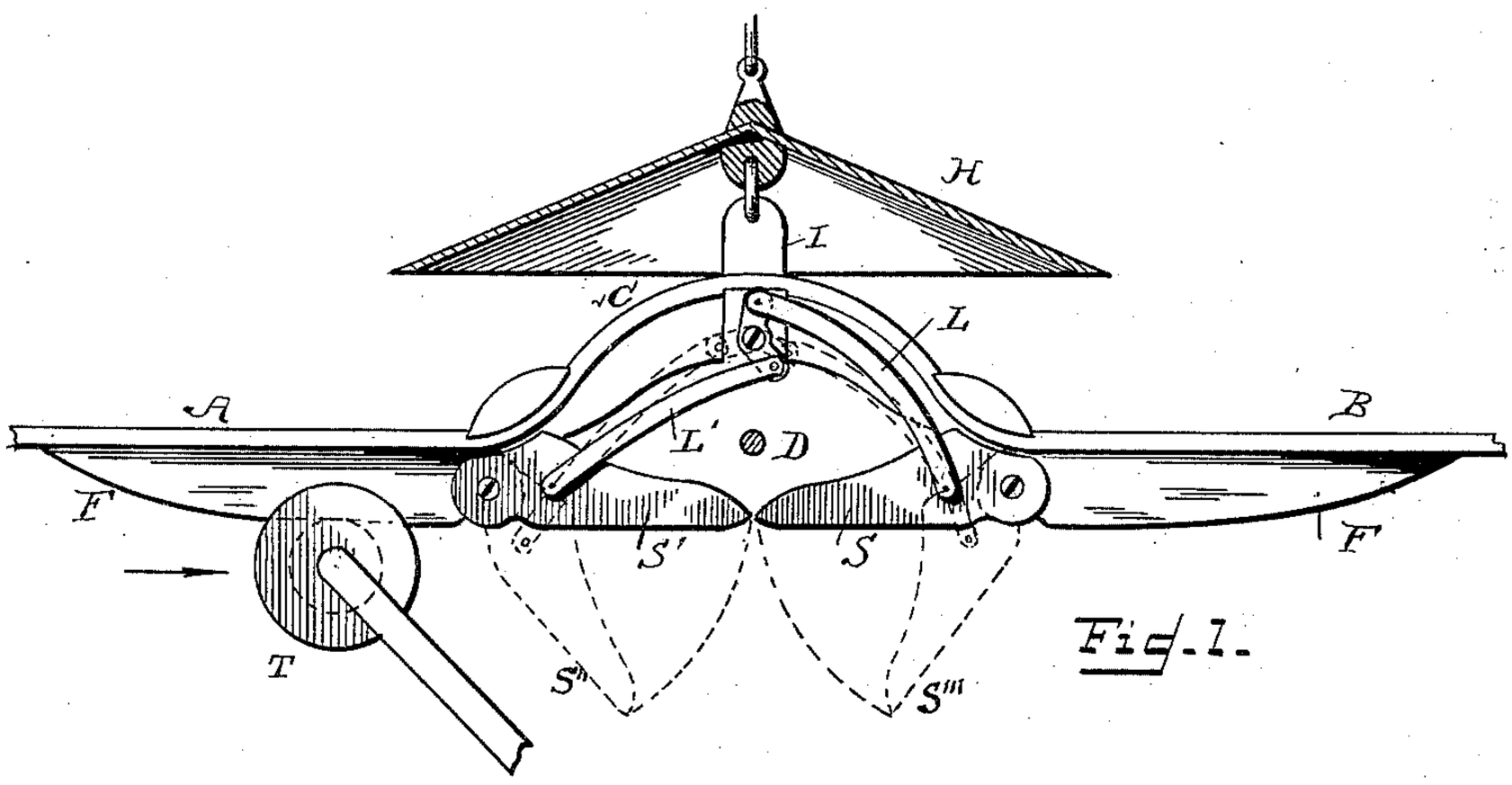

Fig. 1.

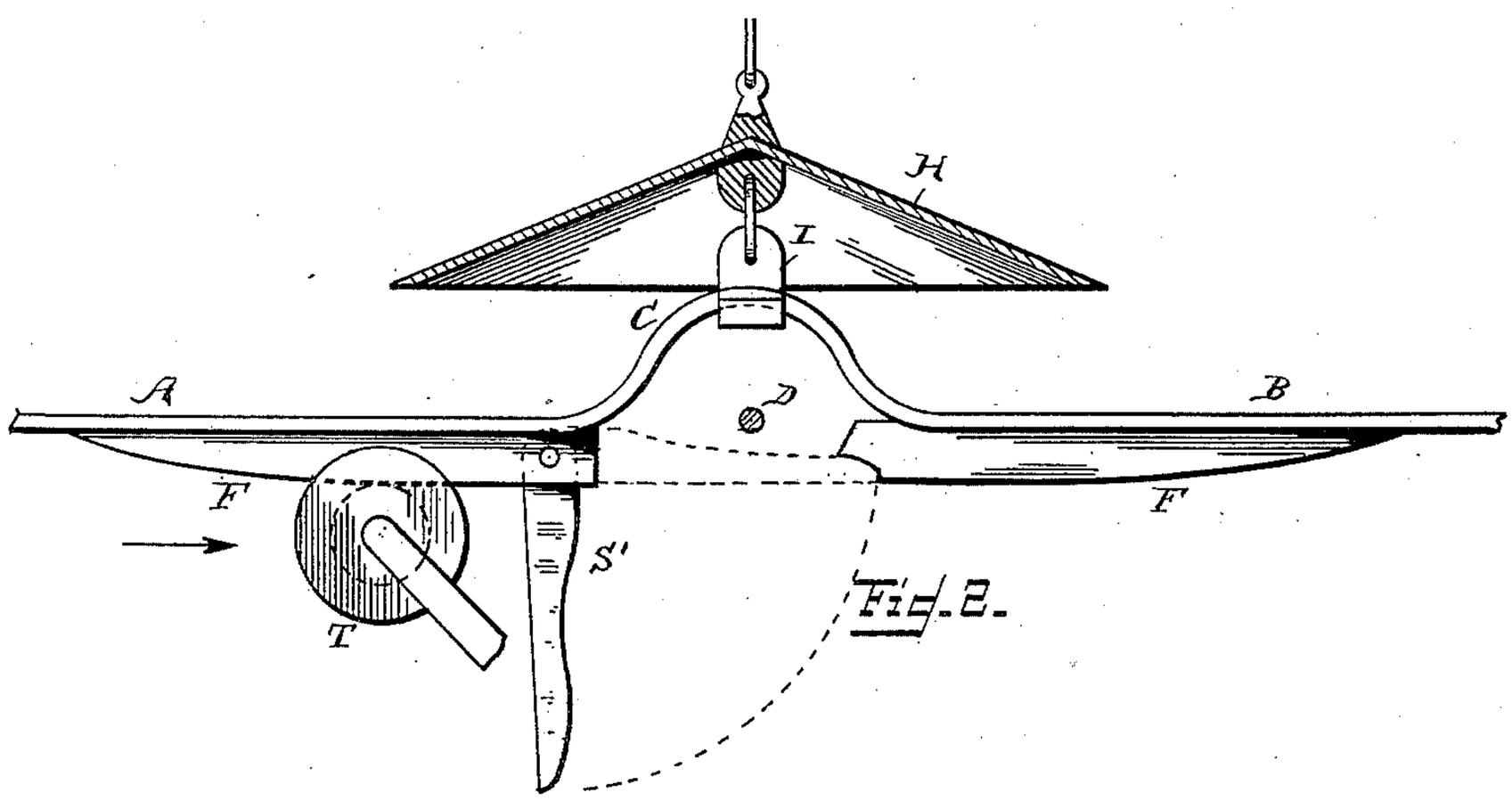

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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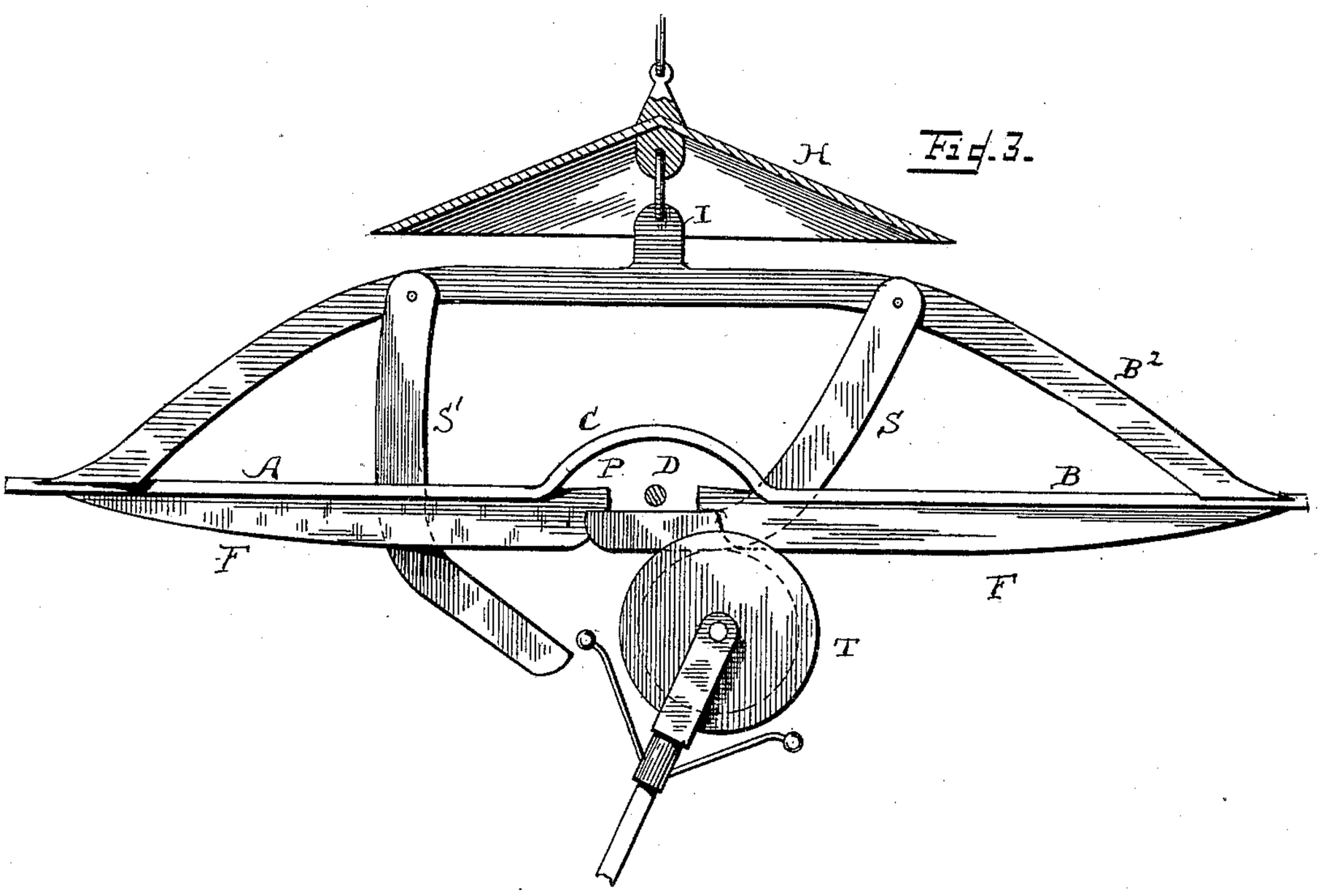

Fig. 3.

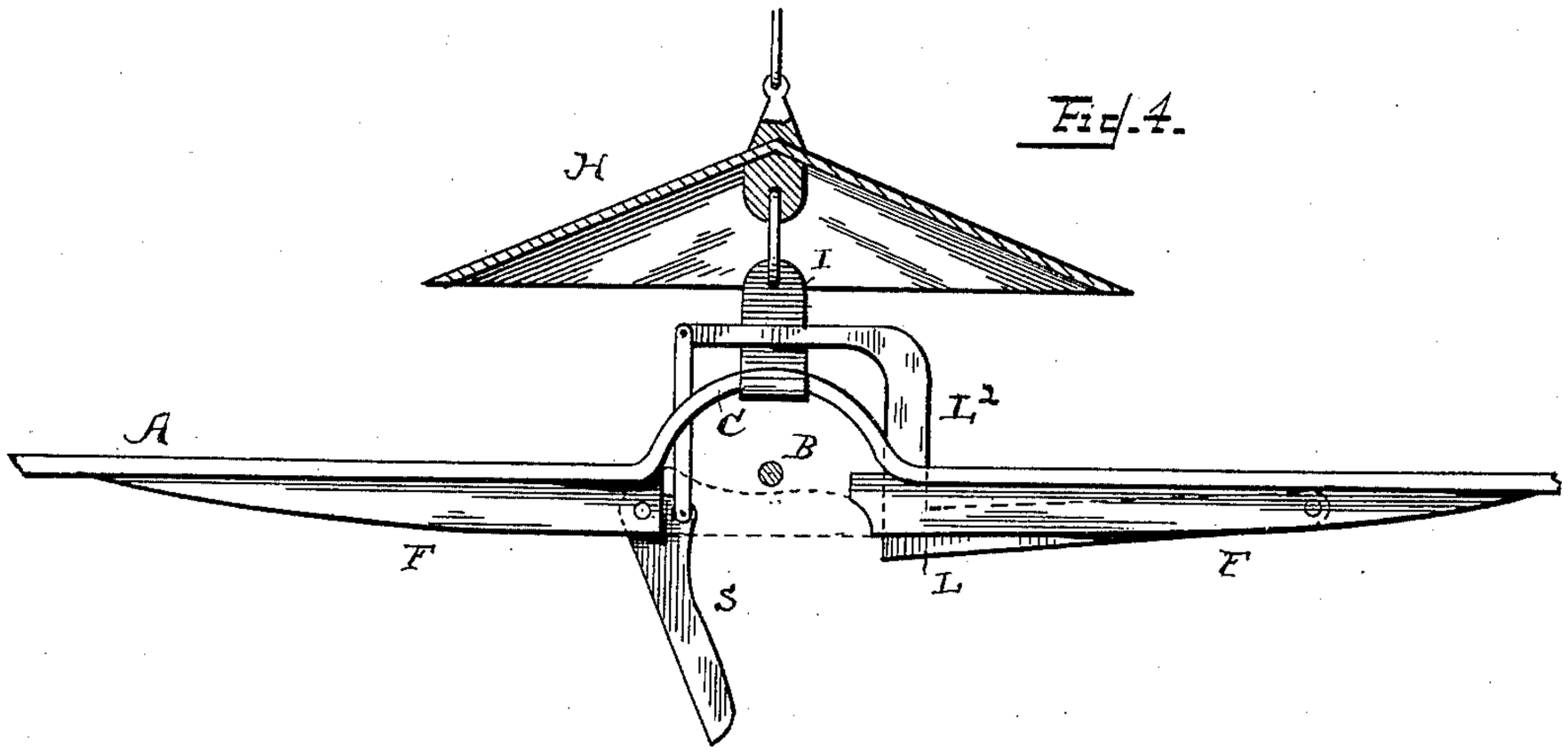

Fig. 4.

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UNITED STATES PATENT OFFICE.

MERLE J. WIGHTMAN, OF LYNN, MASSACHUSETTS.

OVERHEAD FROG FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 411,313, dated September 17, 1889.

Application filed June 22, 1889. Serial No. 315,147. (No model.)

To all whom it may concern:

Be it known that I, MERLE J. WIGHTMAN, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented a certain new and useful Overhead Frog for Electrical Railways, of which the following is a specification.

My invention relates to frogs or crossings for the contact devices carried by the cars of electric railways and adapted to bear upon and make electrical connection with an electric-power line that supplies energy constantly to the electric motor upon the car.

My invention applies more particularly to electric-power conductors of electric railways when such conductors are suspended in the air from cross-wires, poles, brackets, or other suitable supports.

The object of my invention is to provide a means whereby at the point where one electric-power line or conductor of an electric railway crosses or passes under another at an angle the trolley-wheel, brush, or other contact device for passing the current to the motor on the car will not break circuit with its own wire or line nor establish electrical connection between its own circuit and that of a neighboring and independent conductor, while at the same time the trolley or contact device of the latter line may pass the crossing-point without interruption to the electrical connection.

My invention consists, essentially, in the provision of an automatically-operated bridging-piece of conducting material electrically connected with one of said lines and adapted to bridge the gap in the latter left for the passage of the contact device or trolley of the crossing line. Such bridge-piece of conducting material maintains the electrical connection for the trolley or contact device moving upon it, and as the car or vehicle passes the crossing is actuated by means of the trolley or contact or the trolley-arm or some other part moving with the vehicle, so as to be swung or moved into position to temporarily bridge the gap.

My invention consists, further, in special combinations of devices and apparatus whereby the bridge-piece may be operated by a trolley or contact moving in either direction.

The invention consists, also, in the special manner of mounting the trolley, so that it may be permitted to swing in a vertical plane out of position where it bridges the gap at the crossing-point.

In the accompanying drawings, Figure 1 is a side elevation of a form of apparatus embodying my invention. Fig. 2 illustrates a modification in which a single bridge-piece is employed. Fig. 3 illustrates in side elevation a further modification in which separate bridge-pieces are employed at each side of the gap. Fig. 4 illustrates a modification whereby a single bridge-piece may be operated by a car moving in either direction.

Referring to Fig. 1, A B C indicate a power conductor or line curved or extended upward at C, so as to cross over or under an independent conductor D, which crosses the conductor A B C at an angle. The conductor A B C may be suitably suspended by an insulating-piece I and covered by a hood H, which latter will shed water and preserve the integrity of the insulation.

By extending the conductor upward above the conductor B, as shown, near thé latter, it is obvious that a gap is left in the path of the contact device moving in a substantially-straight line on the conductors A B. To bridge this gap and afford a rail or bearing for the contact device at such gap, while at the same time preserving the electrical connection of such contact in conductor A B, I provide a swinging or movable contact piece or bridge, one or more, as indicated at S S′ in the various figures. This bridge-piece is of good conducting material, and is preferably pivoted on a suitable support in electrical connection with the line, and is adapted to swing about its center or point of pivoting, as indicated, from the position where it will be out of the path of the contact or trolley moving on conductor B into a position where it will bridge the space below such conductor to allow the contact T of the conductor A B to move upon it.

In Fig. 1 I have shown two movable bridge-pieces S S′. In their normal position they hang downward, as indicated at S″ S‴, be-

ing put in such position preferably by gravity or a spring. These pieces are interconnected by links or other actuating mechanism, such as indicated at L L′, so that an upward or downward movement of one is accompanied by a similar movement on the part of the other. For the sake of simplicity in the operation of these contact-bridges by means of the trolley or contact device carried by the car, I mount them to swing in a vertical plane. The simplest manner of operating them is by the impingement of the trolley itself upon them, which trolley, moving with the car, prepares a path for the contact device of such car by moving the bridge into bridging position. Thus, for instance, the contact or trolley T, indicated in Fig. 1 and carried by the car, on striking the bridge-pieces S S′ or extensions therefrom, will cause both to move upward simultaneously until they meet or nearly meet, and thus form a track for the trolley T, which can thus pass without rupturing the circuit to the electric motor on the car, and without danger of cross-circuits being established between the conductor A B and the conductor D.

F F′ are flanges or projections from the conductor A B to bring the trolley-wheel T down to the same level with the pieces S S′.

It will be seen that the pieces S S′ will travel upward and downward together whether the trolley-wheel T passes in the direction indicated by the arrow or oppositely. When the trolley-wheel T has passed the frog, the pieces S S′ drop to the positions S″ S‴, leaving a free path for the contact to the line D. Springs may be arranged to act on the levers L L′ or the pieces S S′, as required for the best operation of the apparatus.

Fig. 2 illustrates a modification for use upon a belt-line or a line upon which the car travels only in one direction. In this case the piece S entirely bridges the gap, and is operated from the side to which it is attached by the trolley-wheel or brush or other part moving with the vehicle.

Fig. 3 is another and preferred modification. In this case the pieces S S′ depend freely from above, as indicated, and the contact wheel or brush T, passing either way along the line, will engage with one or the other of the pieces S S′ and carry it across the gap, thus preserving the electric contact with the trolley through the piece S first engaged. In this instance the bridge-pieces are supported from a yoke-piece B^2, of conducting material, which sustains the power-conductor, as shown.

In the modification indicated in Fig. 4 the bridge-piece is long enough to entirely bridge the gap by itself. As the contact or trolley moves from from left to right it actuates the bridge-piece directly. As the contact or trolley moves in the opposite direction it moves said bridge-piece S in substantially the same manner that it is moved in Fig. 1—that is to say, by a lever at the opposite side of the gap engaged by said trolley. Such a lever is indicated at L^2, and is connected with the bridge-piece S by a link, as shown. The only difference between this arrangement and that in Fig. 1 is that the lever L corresponding to S′, Fig. 1, does not bridge any portion of the gap and need not be of conducting material. In Fig. 1 it is obvious that each bridge-piece S S′ performs for the other the function of the lever L, Fig. 4.

What I claim as my invention is—

1. The combination, with one of the crossing electric conductors or power-lines for an electric railway, of a self-opening conducting bridge-piece, as and for the purpose described.

2. The combination, with crossing electric conductors for an electric railway, of one or more conducting bridge-pieces suitably hung or supported to swing in a vertical plane and adapted to bridge the gap left in the path of the trolley or contact for one of said conductors at the point where the trolley or contact of the crossing conductor passes.

3. The combination, with the crossing electric conductors for an electric railway, of a conducting bridge-piece supported at one side of the gap, and a lever at the other side connected with said bridge-piece, as and for the purpose described.

4. In an electric railway, a vertically-swinging contact-bridge S, operated by the trolley and normally standing in position to permit the contact or trolley of a crossing conductor to pass without obstruction.

5. The combination of a conductor D, adapted to be engaged by a traveling contact, a second conductor A B, crossing over the first, and a swinging contact-bridge pivoted to swing in a vertical plane in the space below the conductor D and electrically connected with the line or conductor A B.

6. The combination, with electric conductor D, parts of which, at opposite sides of conductor D, are electrically united, of the conducting bridge-piece adapted to bridge the space beneath the conductor D, as and for the purpose described.

Signed at Lynn, in the county of Essex and State of Massashusetts, this 14th day of June, A. D. 1889.

MERLE J. WIGHTMAN.

Witnesses:
JOHN W. GIBBONEY,
C. W. ROBERTS.