(No Model.)

M. J. WIGHTMAN.

OVERHEAD FROG FOR ELECTRIC RAILWAYS.

No. 411,314. Patented Sept. 17, 1889.

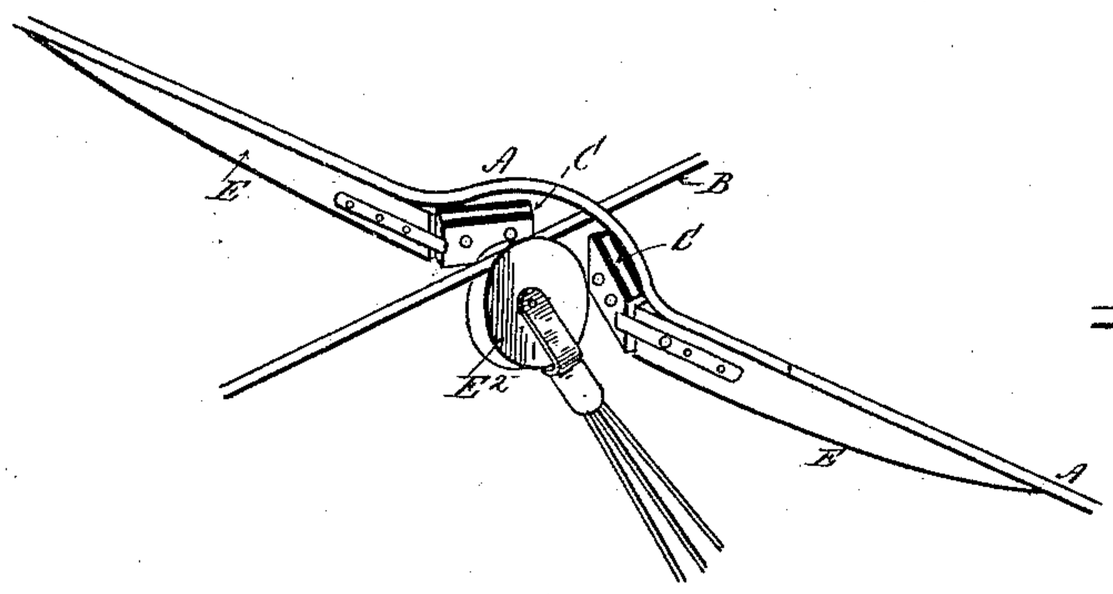


Fig. 1.

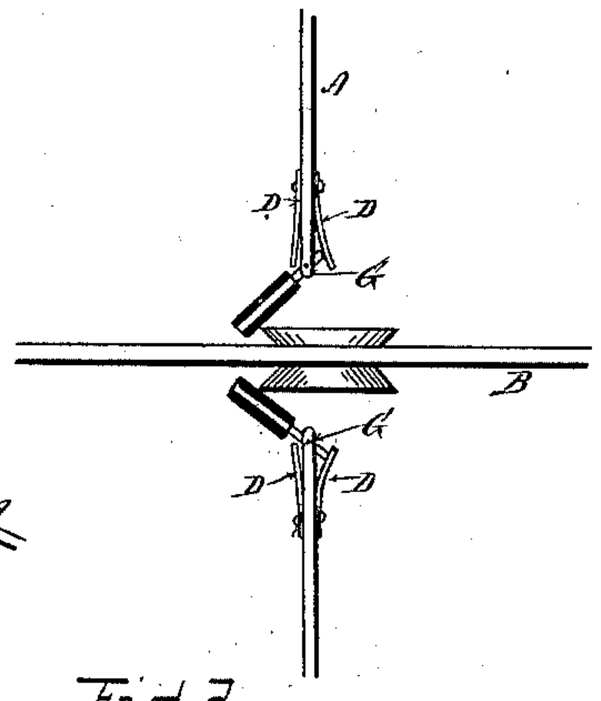


Fig. 2.

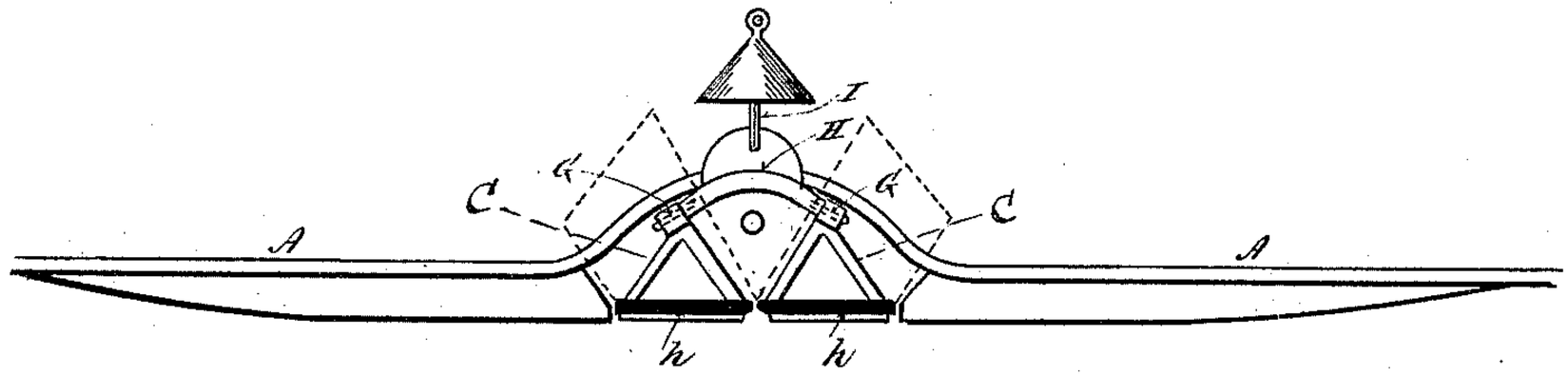


Fig. 3.

Fig. 4.

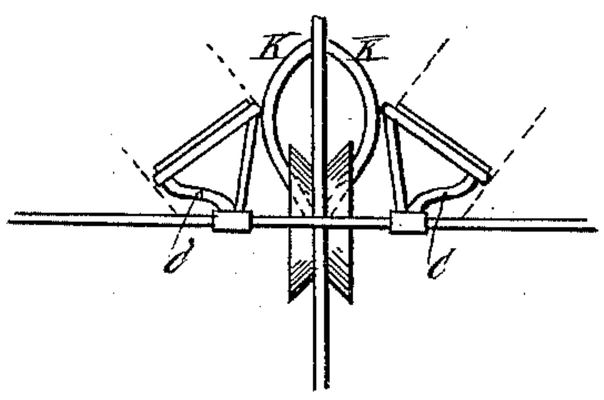


Fig. 5.

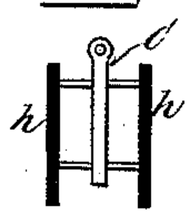
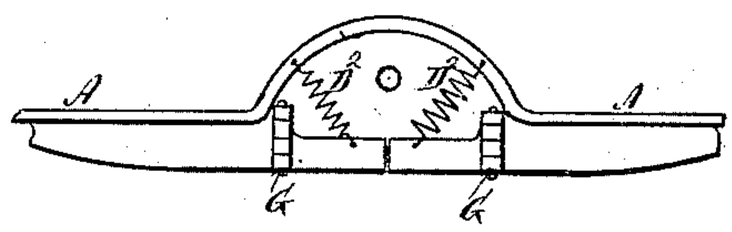


Fig. 6.



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UNITED STATES PATENT OFFICE.

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OVERHEAD FROG FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 411,314, dated September 17, 1889.

Application filed June 22, 1889. Serial No. 315,148. (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 Electric Railways, of which the following is a specification.

My invention relates to electric-power lines or circuits upon which move electric contact brushes, trolleys, or other devices carried by a vehicle and adapted to supply electrical energy continuously thereto from the conductor.

My invention is especially applicable to the power lines or conductors of electric railways; and its object is to provide a means whereby the contact devices of lines or circuits crossing one another at an angle may pass freely at the crossing-point without hinderance and without interruption of the electrical connection between each contact and its line, as well as without interconnection of the two lines at the instant of passage of the contact device.

My invention consists in the combination, with that one of the conductors which, although electrically continuous, is provided with a gap in the path of its traveling contact to permit the free passage for the travelling contact of the other, of a suitable contact bridge piece or pieces adapted to bridge such gap, but actuated or operated so as to be removed from its normal position by means of some device carried by the car or vehicle supplied from the other line, so that the traveling contact device of the latter may pass freely through the gap.

My invention consists, further, in mounting the bridge-piece—one or both—so as to swing freely in the line of movement of the contact-trolley of the crossing wire, so that the contact of the latter may engage directly with them and swing them out of position.

My invention consists, further, in facing the parts of the bridge-piece engaged by such contact or contact-arm with an insulating material.

Other features of my invention and other combinations claimed by me as new will be stated more specifically in the claims at the end of this description.

Referring to the accompanying drawings, Figure 1 is a perspective view of the apparatus embodying my invention at the crossing-point of two electric lines. Fig. 2 is a plan of said apparatus. Fig. 3 is a side view of the bridge-pieces mounted in a modified way, so as to swing on a horizontal instead of a vertical axis. Fig. 4 is a top view showing the parts in one of the positions assumed in operation. Fig. 5 is a detail plan view of the swinging bridge-piece, showing a particular manner of applying the insulation to its faces. Fig. 6 is a side elevation of the bridge-pieces at the crossing-point.

A B indicate crossing electric-power lines, one of which, as A, is continued over the first, thus leaving a gap in the path of the contact, such as a trolley, which travels on the under side of conductor A in the ordinary manner. To bridge this gap, I provide one or more conducting bridge-pieces C, properly pivoted at point G to either side of the gap and electrically connected with the line A by being mounted in a piece of conductor in electrical connection with such line. The conducting bridge-pieces C are normally held by centering-springs D in positions to form a way or contact-path upon which the trolley or contact device bearing on the under side of line A may move. Flanges E on the under side of conductor A bring the trolley down to a level with the under or contact side of the bridge-pieces. By means of these bridge-pieces the electrical connection with the line A of the contact or trolley moved on said line is preserved at the crossing-point.

When the contact or trolley moving on line B passes the gap, the bridge-pieces must be moved from its path. This I accomplish by means of some device carried by the vehicle which derives energy from the line B and carries such contact. For convenience I employ the contact or trolley arm, or the contact or trolley itself. In the present instance I have illustrated the employment of the trolley itself for this purpose. As shown, the trolley E^2, by engaging with the bridge-pieces or parts carried thereby, swings the same in the direction of the line B out of its way to prevent the trolley or contact device that engages with such bridge-pieces, as just stated, from establishing a circuit between the independent conductors. I propose to face the bridge-pieces with insulation at the parts or faces thereof engaged by the trolley. This

insulation may be applied or attached, as indicated at *h h'*, Fig. 5, in the form of plates supported on pins that extend from the conducting bridge-pieces. The insulation is preferably made to extend out beyond the vertical edge of the conducting portion of the bridge-piece, as shown. The gap thus left between the adjacent ends of the conducting bridge-pieces should not, however, be so short as to prevent the trolley which traverses over the same and in contact with them from making connection with both parts in passing, thereby preventing rupture of the circuit at the time of the passage.

In Fig. 2 the springs which move the bridge-pieces back to their closed position are shown as flat springs; but central spiral springs operating to center such bridge-pieces in line with one another and with the conductor A might be applied, as indicated at D^2, Fig. 6.

It will of course be understood that the conducting portion of the bridge-pieces extends below the insulating-facing forming the faces of the same, as is indicated in Fig. 3. This, however, is only necessary when a grooved contact-trolley is employed.

In Fig. 3 the bridge-pieces are shown as pivoted so as to swing in a substantially vertical plane instead of in a horizontal plane, and are supported from above by means of a suitable yoke H, which is carried by a depending arm I, extending downward from a suitable insulator, as shown. The conductor A curves over such yoke and is in electrical connection therewith, so as to form an electrical connection to the bridge-pieces. The contact bridge-pieces, Fig. 3, may also be conveniently operated by the trolley or contact, or a part carried therewith.

I have illustrated in Fig. 4 the use of bow-shaped projections K, for the purpose of moving the bridge-pieces out of the path of the contact-trolley moving over conductor B. As the trolley and actuating device moving therewith pass, the bridges are thrown upward and outward into the position indicated in Fig. 4 in plan. The position assumed is indicated in Fig. 3 by the dotted lines.

I do not limit myself to any particular number of contact bridging-pieces, but employ two preferably, because of the decreased angular motion necessary to permit the passing of the trolley or contact device.

While I have described the use of the trolley itself to impinge upon the swinging bridge-pieces, or a part carried by or connected with such bridge-pieces, so as to remove them from the path of the trolleys, I do not limit myself in this respect, since my invention consists, broadly, in pushing aside or automatically removing such contact bridge-pieces by means of some part moving with the vehicle, as, for instance, the trolley or contact arm carried thereby.

While I have described the electrical continuity of the line A as preserved by continuing the same by parts integral with it, it is obvious that the electrical continuity might be preserved by other means or devices over the conductor B without departing from my invention.

What I claim as my invention is—

1. The combination, with an electric conductor engaged by a traveling contact device, of a second conductor continued over the first so as to be electrically continuous, of a movable bridge-piece for the latter adapted to swing or move beneath and in the direction of the other conductor when engaged by a device carried by the car or vehicle operated by energy derived from the latter.

2. The combination, with crossing electric conductors, of a contact bridge-piece for one of them faced with insulating material on the surfaces engaged by the contact arm or device of the other.

3. The combination, with crossing electric conductors upon which contact devices travel, of a movable contact bridge piece or pieces normally standing in position to maintain the electrical connection for the traveling contact of one wire, means for actuating the same on the passage of the contact devices carried by the vehicle deriving energy from the other wire or conductor, and suitable electrical insulation for preventing electrical connection of the crossing conductors when the bridge-piece is engaged so as to be moved aside.

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

MERLE J. WIGHTMAN.

Witnesses:
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C. W. ROBERTS.