(No Model.)

S. H. SHORT & J. W. NESMITH.

ELECTRIC RAILWAY.

No. 348,477. Patented Aug. 31, 1886.

Fig. 1.

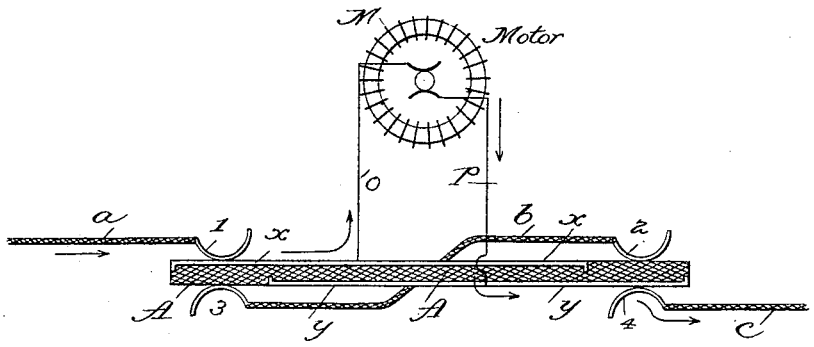


Fig. 2.

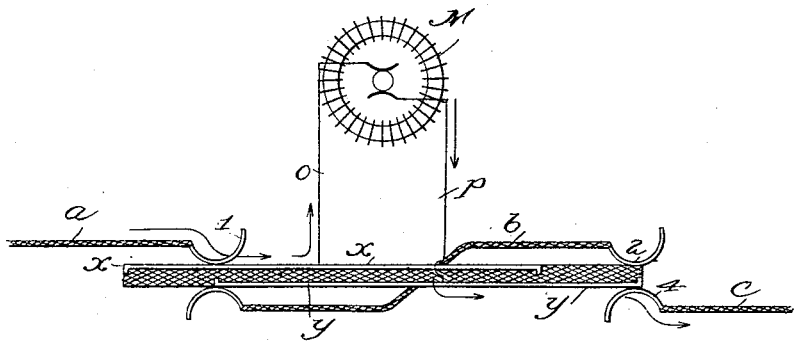
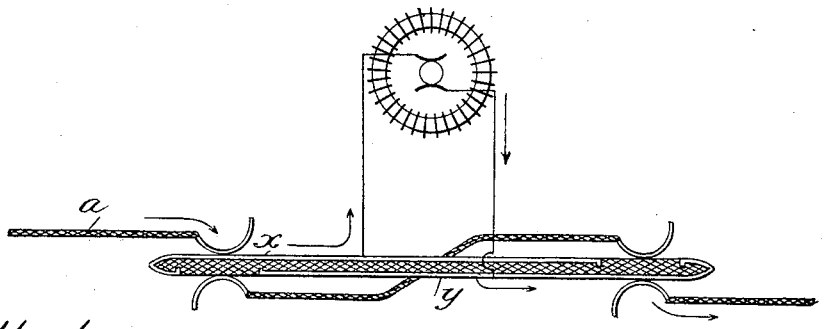


Fig. 3.



Attest

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UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT AND JOHN W. NESMITH, OF DENVER, COLORADO.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 348,477, dated August 31, 1886.

Application filed December 18, 1885. Serial No. 186,067. (No model.)

To all whom it may concern:

Be it known that we, SIDNEY H. SHORT and JOHN W. NESMITH, of Denver, in the county of Arapahoe and State of Colorado, have invented a new and useful Improvement in Electric Railways; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to an electric railway, such as that shown in an application filed by us in the United States Patent Office on the 27th day of November, 1885.

The invention relates to the non-conducting bar and its contacting-strips which are carried in connection with the motor or translating devices, and continually break the circuit of the main conductor and cause the current to be diverted through the motor or translating device.

The invention consists of the special construction of the conducting-strips which are fixed to the insulated bar, whereby any short-circuiting of the current through the main conductor at the instant when the non-conducting bar with its strips is in connection with the circuit-closers of two sections is avoided.

In connection with this invention we use the insulated conductor and circuit-closing pieces, the springs at their ends in connection with moving bar having strips, in the same general manner as explained in our aforesaid application.

Instead of the insulated block in one of the strips connected to the helix and an armature with connections to the motor to avoid short-circuiting, and to maintain the current upon the motor-connections, we use a simple construction and arrangement of the strips alternately arranged and extending to one end only of the non-conducting bar, and we have also devised an arrangement of the conducting-strips whereby one is around each end and extending a part of the way back upon the unoccupied part of the non-conducting bar to prevent sparking.

In the accompanying drawings, Figure 1 is a diagram representing an arrangement of the conducting-strips on the insulated bar. Fig. 2 shows the same construction with the position of the insulated bar shifted to the left. Fig. 3 shows the same general construction with a modified form of the strips on the insulated bar to prevent sparking.

The conductors are shown at *a b c*, each one of these representing an insulated section with bare contact-springs 1 2 3 4 at their ends, adapted normally to form the electric connections between the sections, and adapted also to be removed from each other and to return automatically into electric contact.

A represents the non-conducting bar, which is to be carried upon the car or other moving body proceeding upon the railway. It is made of a length adapted to reach and overlap two of the spring-connections at the same time—that is to say, it will reach the next pair of the spring-circuit closers before leaving the next preceding. It will be understood that the spring-contacts are the only points of the conductors which are bare, and the non-conducting bar A is always in contact with one pair at least of the springs. The bar has conducting-strips, as in our said application, arranged upon its surface on opposite sides to bear upon the springs, and thereby to form electrical connections between the conductor and the motor on the car. The conductor (as well as the motor) is carried upon this car or other moving body, as explained in said application; but to prevent short-circuiting through the conductor when the bar is in contact with two sections, the two metallic strips *x* and *y*, which are attached to the insulated bar carried by the car, are not applied to the bar on either side (as in our said application) with both their ends even at the ends of the insulated bar, but one end of *x* terminates at the end of the insulating-bar and the other end of *x* does not extend to the opposite end of said bar. On the opposite side of the insulating-bar the strip *y* is arranged in the same manner, but at the opposite end. Just as the bar is in connection with two circuit-closers at once the circuit-closer 1 has one of its contacts against the strip *x*, and the other contact, 3, of circuit-closer 1 is immediately on the insulated bar. The opposite side of circuit-closer 2 is also immediately on the bar. Therefore no current can pass over the wire *b* to short-circuit the motor or the line-wire. The other side, 4, of the circuit-closer 2 is against the strip *y*, and the current will flow over the wire *a* into the strip *x*

up through the wire *o*, the motor M, and the wire *p* to the strip *y*, and out onto the section of the wire *c*, as indicated by the arrow. Now, before the right-hand end of the insulating-bar with its strips shall have left the circuit-closer 2 to move in a left-hand direction, the two contact-pieces of circuit-closers 1 will be on the strips *x* and *y*, as shown in Fig. 2, and there is no possibility for a current from either the motor or the main line to pass over the section of wire *b* until the two parts of the circuit-closer at 2 shall have come together.

Fig. 3 represents another method of putting strips on the insulating-bar. As shown, *x* does not terminate at the end of the bar, but is bent around its end, so that it laps back on the same side to which the strip *y* is attached, but it does not come into contact with the end of *y*, and there is considerable space left between their ends, thus exposing the insulated bar. In the same manner *y* is bent around the other end of the bar. The object of this is to allow the contact-pieces of the circuit-closers to be short-circuited through the bent end of the metallic strip before it shall have passed from between them, thereby avoiding any sparking on leaving a circuit-closer.

We claim as our invention—

1. In an electric railway, an electric motor adapted to be carried upon the car and electrically connected with conducting-strips on an insulating-bar, also carried with the car, the contact-strips covering only part of the length of the bar and acting in connection with contact-pieces of a sectional conductor, the parts being combined and operating substantially as described.

2. In an electric railway, an electric motor adapted to be carried upon the car and electrically connected with conducting-strips on an insulating-bar, also carried with the car, the contact-strips covering only part of the length of the bar and being turned over the ends and acting in connection with contact-pieces of a sectional conductor, the parts being combined and operating substantially as described.

3. In combination with a suitable way, a conductor composed of insulated sections having bare contact ends adapted normally to close the connections between the sections and to be separated and return automatically to their normal position, an electric motor or translating device carried upon the way, a non-conducting bar carried with the motor adapted to separate the bare ends or contacts at any point and to hold them open until its forward end reaches the next contact-points, conducting-strips on said bar extending to one end only on one side and to the other end only on the other side of the bar, and electrical connections between said strips and the motor and translating device, all substantially as described.

4. In combination with a suitable way, a conductor composed of insulated sections having bare contact ends adapted normally to close the connections between the sections and to be separated and to return automatically to their normal position, an electric motor or translating device carried upon the way, a non-conducting bar carried with the motor, adapted to separate the bare ends or contacts at any point and to hold them open until its forward end reaches its next contacts, conducting-strips on said bar extending to one end only on one side and to the other end only on the other side and turned over the ends, and electric connections between said strips and the motor or translating device, all substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

SIDNEY H. SHORT.
JOHN W. NESMITH.

Witnesses:
WM. G. EVANS,
HOWARD EVANS.