(No Model.) 2 Sheets—Sheet 1.

D. G. WEEMS.

ELECTRIC RAILWAY.

No. 406,805. Patented July 9, 1889.

Fig. 1.

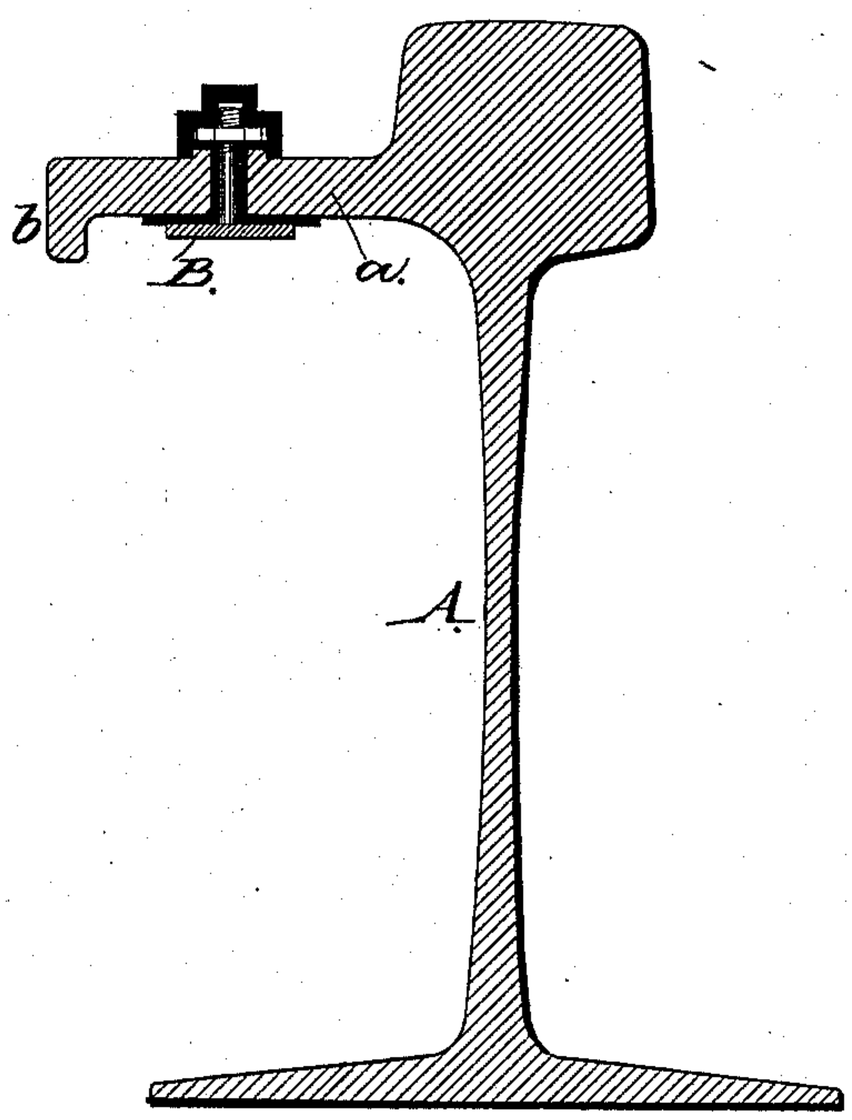
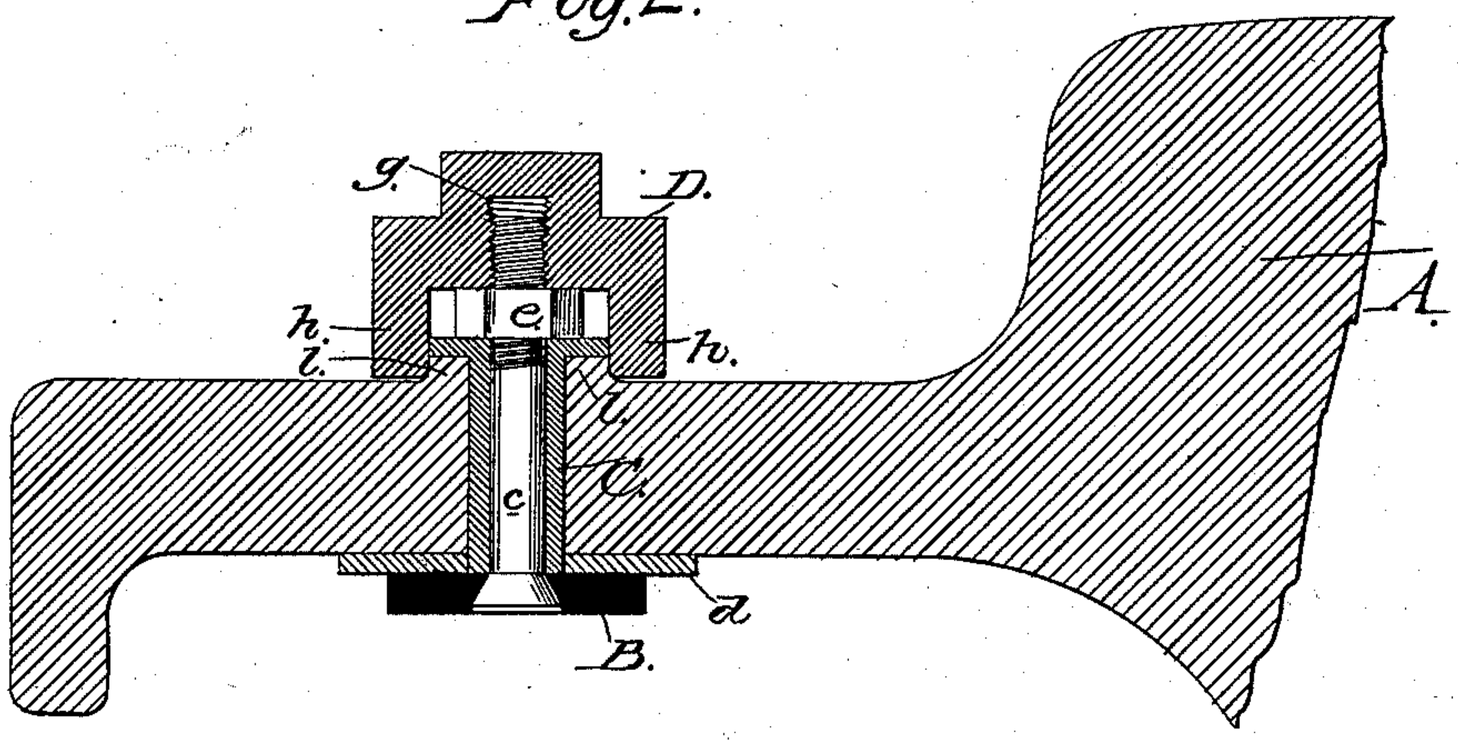


Fig. 2.



WITNESSES:

Wm. W. Pegram.

Benj. J. Dashiell, Jr.

INVENTOR

Daniel G. Weems

BY

A. H. Evans & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

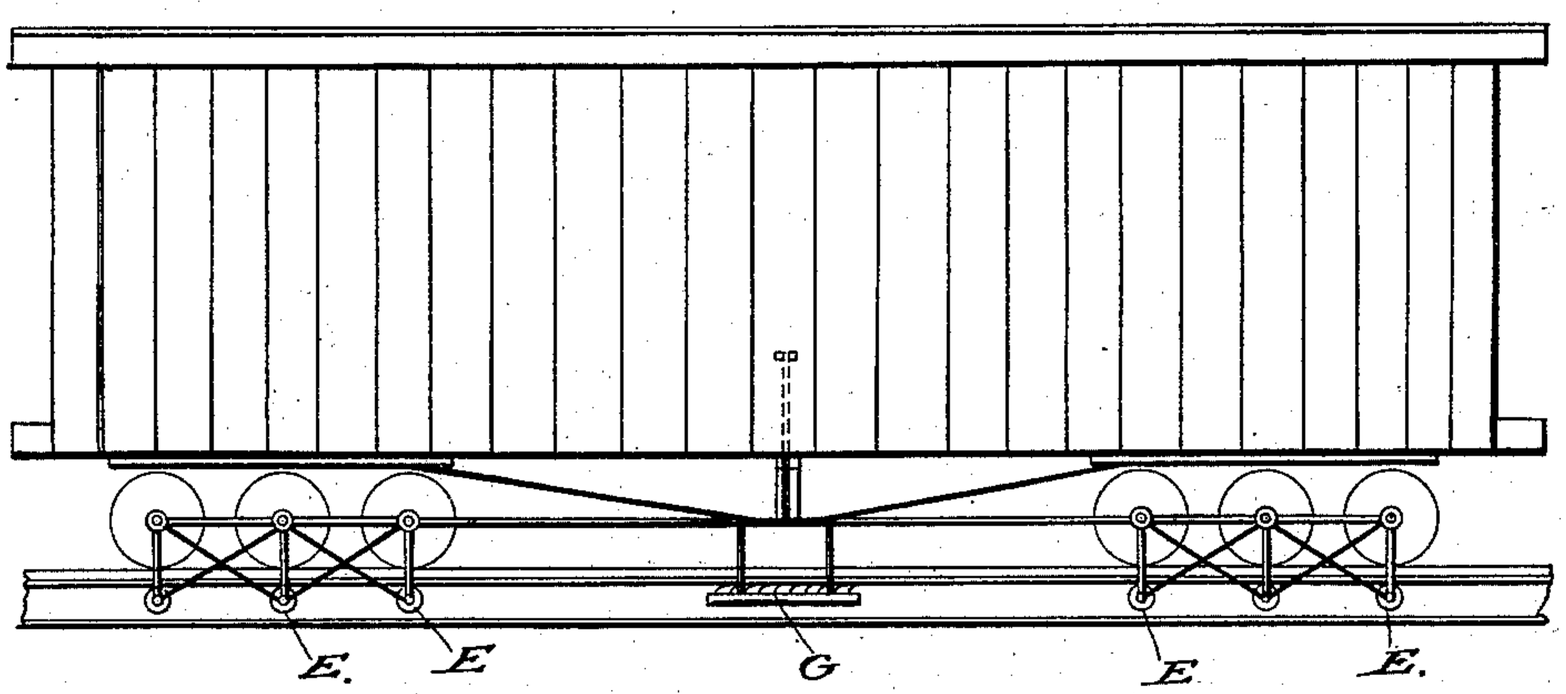


Fig. 4.

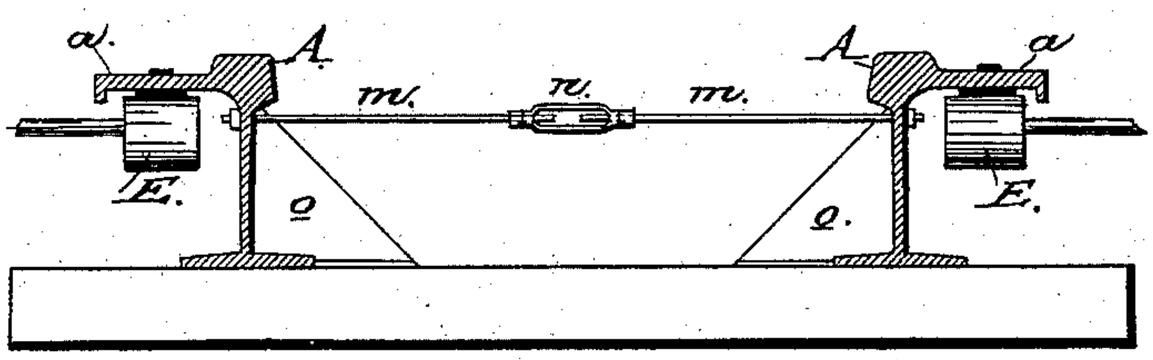
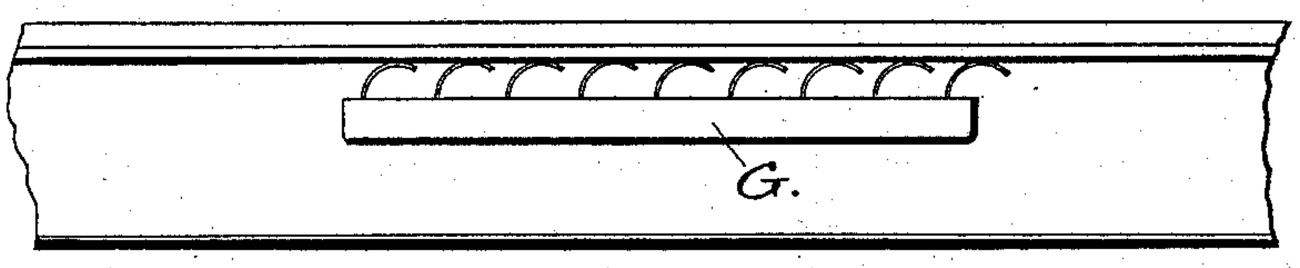


Fig. 5.



WITNESSES:

Wm. W. Pegram.

Benj. J. Dashiell, Jr.

INVENTOR

Dwight G. Weems

BY

A. H. Evans & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

DAVID G. WEEMS, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE ELECTRO-AUTOMATIC TRANSIT COMPANY, OF SAME PLACE.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 406,805, dated July 9, 1889.

Application filed March 7, 1889. Serial No. 302,317. (No model.)

To all whom it may concern:

Be it known that I, DAVID G. WEEMS, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Electric Railways, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a cross-sectional view of a rail, showing the conductor secured in position. Fig. 2 is a detail showing in section an enlarged view of a portion of the rail, the conductor, one of the securing-bolts, the insulating-cap, and non-conducting bushing surrounding the bolt and between the conductor and rail. Fig. 3 is a side elevation of a car having main wheels and supplemental wheels adapted to travel against the under surface of the flange of the rail, and showing a brush midway between the front and rear sets of main wheels, and traveling against the conductor on the bottom of said flange. Fig. 4 is a cross-sectional view of the track, showing the conductor, supplemental wheels, and tie-rods connecting the two rails. Fig. 5 illustrates a section of track and the brush which is designed to travel on the conductor beneath its flange.

My present invention relates especially to means for conveying the electric current for the propulsion of vehicles; and it consists, essentially, of a rail having an outwardly-extending flange, to the under surface of which an electric conductor is secured, the said conductor being suitably insulated from the rail by non-conducting strips or plates, bushings, &c., and the ends of the bolts and the nuts which secure the conductor in place being protected by caps or inclosing-nuts of non-conducting material, whereby a safety-rail is produced and the dangers of accidental shocks to passing pedestrians or teams reduced to a minimum, as I shall hereinafter fully disclose.

To enable others skilled in the art to which my invention appertains to make and use the same, I will now describe its construction and indicate the manner in which the same is carried out.

In the said drawings, A indicates a railroad-rail having an outwardly-extending flange *a*, whose outer edge is formed with a downwardly-extending lip or projection *b*, as shown in Figs. 1 and 2. To the under surface of the flange *a* is secured a copper or other strip B, which is connected with any suitable source of electric energy and conveys the outgoing current which propels the car or carrier, the said current being caused to enter the rail at the end of the line and to be returned to the generating-station in any well-known manner.

The conductor B takes the place of the overhead or underground wires, and is secured in position under the flange of the rail by bolts *c*, these being introduced between the conductor and the flange, a strip or plate of fibrous or other non-conducting material *d*, to properly insulate the conductor from the rail and to cause the entire outgoing current to pass through the strip B.

Surrounding each of the bolts *c*, which secure the conductor in position, is a bushing C, of fibrous or other non-conducting material, which prevents the current passing from the conductor through the bolts to the rail, the said bolts having their upper ends threaded and engaged by nuts *e*, which bear down upon the flange of the bushing and serve to draw the bolts upward, whereby the conductor is securely held against the non-conducting strip *d*, which in turn is held tightly against the lower surface of the flange *a*.

It is obvious that by so locating the conductor beneath the flange of the rail and forming the flange with a downwardly-extending portion or projection the conductor is housed and protected from the effects of the weather, thereby overcoming the liability of the current "grounding." To make this rail safe and to remove the dangers incident to accidental shocks to passing pedestrians, horses, &c., which occur when the conductor and its adjuncts are not properly insulated, I inclose the upper ends of the bolts, as well as the nuts *e* and upper surface of the bushing C, with flanged caps D, of fibrous or non-conducting material, and form said caps with threaded sockets *g*, whereby the caps may be screwed down upon the bolts, so that their annular flanged portions *h* may completely incase the nuts *e* and top of bushings C, and be

seated on the flange, so as to surround a raised portion *l* thereon, as shown in Fig. 2, whereby a practically water-tight joint is formed between the cap and the flange and conducting parts.

It will be seen that even though a person should step upon the rail with one foot upon one of the caps and the other upon the rail he would experience no shock, as the conducting parts are all so insulated that the whole current passes through the main conductor, and therefore makes the rail safe for pedestrians, horses, &c.

When long distances are covered, each rail will be provided with a conductor and adjunctive parts similar to those previously described, in which case the current may be sent out on one conductor and be returned through the other instead of through the rail, thus permitting me to place the generating-stations a greater distance apart, and the rails may be prevented from spreading and securely braced by means of tie-rods *m* and turn-buckles *n*, as shown in Fig. 4, the said rails being also provided with webs *o* to give them increased strength and durability.

In Fig. 3 I illustrate a car or carrier provided with supplemental wheels E, mounted in hangers depending from the main journal-boxes or other parts of the car or running-gear, and said wheels E are designed to extend under the flange *a* of the rail, as shown in Fig. 4, and as more particularly described and claimed in another application filed by me December 28, 1888, Serial No. 294,889. I have also shown in Figs. 3 and 5 of the present drawings a brush G, which is suspended from the car midway between the front and rear sets of main bearing-wheels, and travels under the flange of the rail and against the conductor, and picks up the current and conveys it to the motor on the locomotive of the train in any well-known manner.

I do not claim in this application the construction of the brushes nor the supplemental wheels, but illustrate these devices to disclose an operative invention.

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

1. In electric railways, a main rail having a laterally-extending flange, in combination with a conductor secured to the bottom of said flange, but insulated therefrom, and bolts passing through the flange and securing the conductor in position, substantially as described.

2. In electric railways, a main rail having a flange provided with a downwardly-extending projection, in combination with a conductor bolted to the under surface of the flange, and insulating material between the conductor and flange and between the securing-bolts and flange, substantially as described.

3. In electric railways, the combination of a rail having a conductor bolted to the under surface of its flange, but insulated therefrom, and a non-conducting cap fitted on the bolts, substantially as described.

4. In electric railways, a conductor bolted to the rail and insulated therefrom, and a cap or covering of non-conducting material fitted over the exposed portions of the bolts and their securing-nuts, substantially as described.

5. In electric railways, the combination of a main rail having an outwardly-extending flange, a copper or other plate or conductor bolted to the under surface of the flange, the bolts and nuts for securing the conductor to the flange, insulating material between the flange and conductor, an insulating-bushing between the bolts and their nuts and the flange, and caps inclosing the upper portions of the bolts and seated on the flange, said caps being formed of non-conducting material, substantially as and for the purpose specified.

6. In electric railways, a conductor bolted to the under surface of the flange of the rail, and a cap of non-conducting material screwed upon the outer exposed ends of the securing-bolts, said conductor and bolts being insulated from the rail, substantially as herein described.

7. In electric railways, the main rails having outwardly-extending flanges with down-turned projections, the copper strip or conductor, the bolts securing said conductor to the under surface of the flange, insulating material between the conductor and flange and between said flange and the bolts, in combination with caps of non-conducting material having annular flanges and threaded sockets, which engage the threaded ends of the bolts, whereby the caps are secured, substantially as described.

DAVID G. WEEMS.

Witnesses:
W. H. PATTERSON,
T. WALTER FOWLER.