

No. 898,220.

PATENTED SEPT. 8, 1908.

J. HUTCHINSON.

CONTACT RAIL FOR ELECTRIC RAILWAYS.

APPLICATION FILED MAY 10, 1905. RENEWED MAR. 6, 1908.

3 SHEETS—SHEET 1.

FIG. 1.

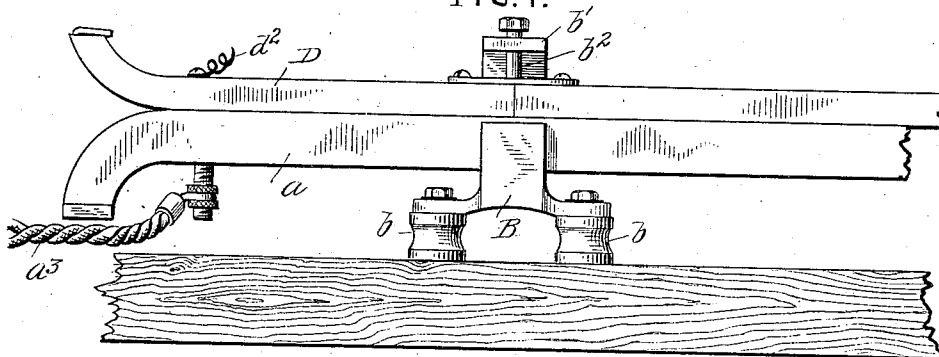


FIG. 2.

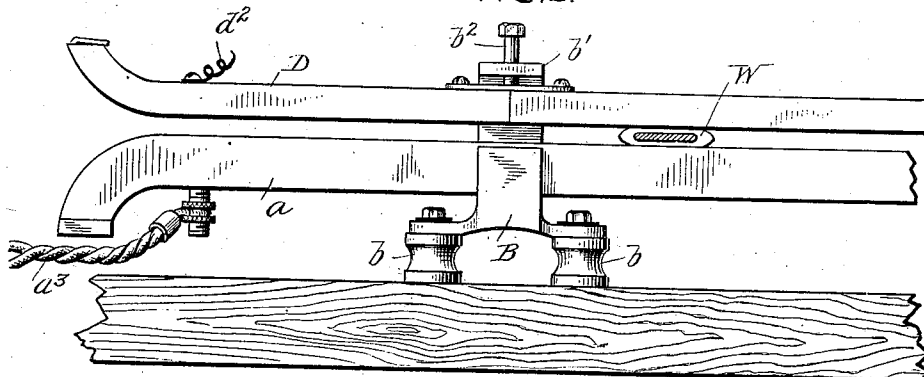
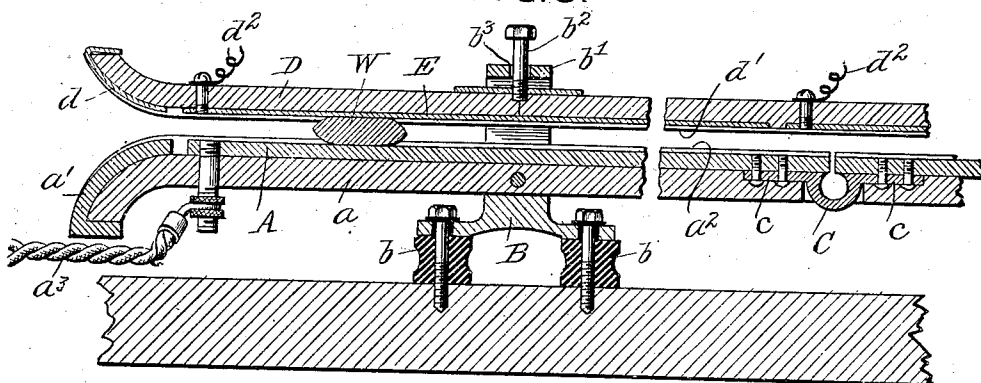


FIG. 3.



Witnesses  
Edwin L. Jewell  
W. L. Isel.

Job Hutchinson Inventor,  
By his Attorney Spencer B. Peattie

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3 SHEETS—SHEET 2.

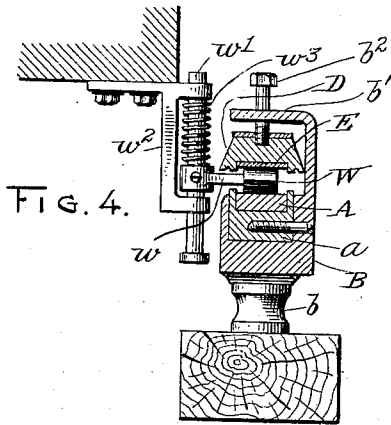


FIG. 4.

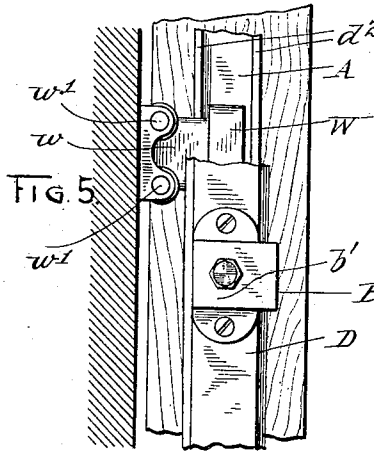


FIG. 5.

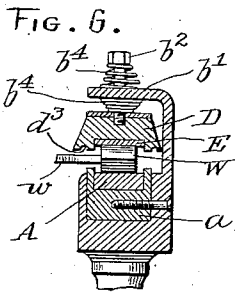


FIG. 6.

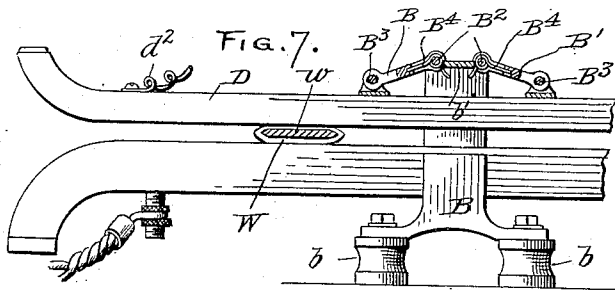
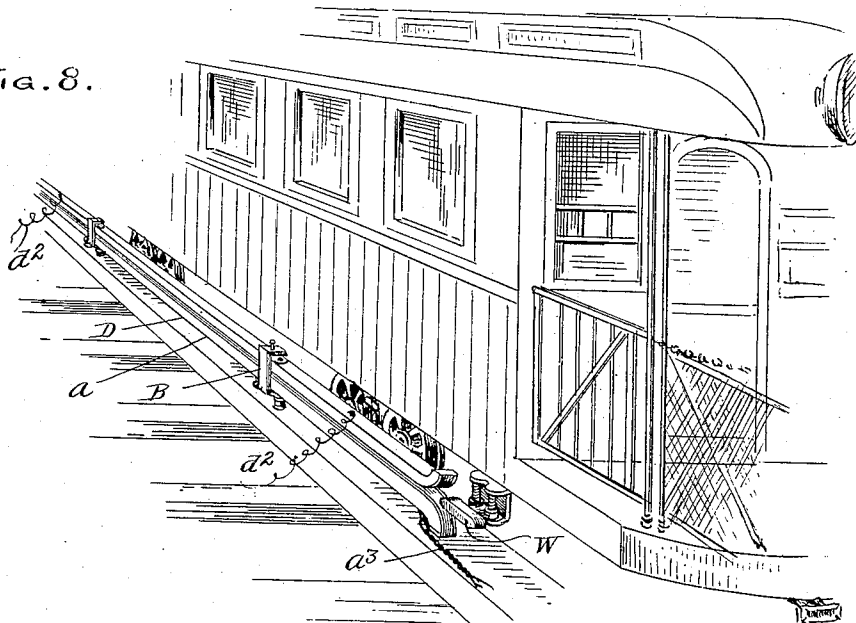


FIG. 7.

FIG. 8.



Witnesses  
Edmund L. Jewell  
W. C. Isel

Job Hutchinson Inventor,  
By his Attorney  
Nathan P. Perkins

No. 898,220.

J. HUTCHINSON.

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3 SHEETS—SHEET 3.

Fig. 9.

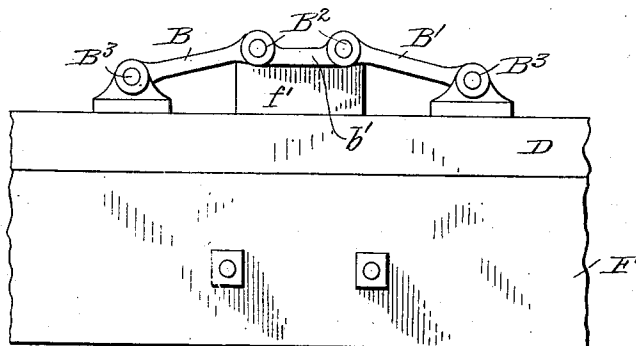


Fig. 10.

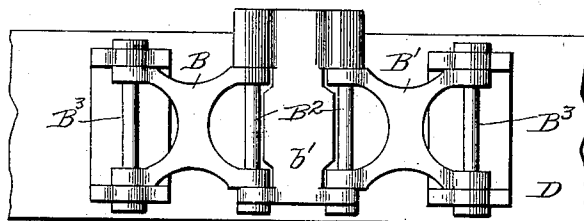


Fig. 11.

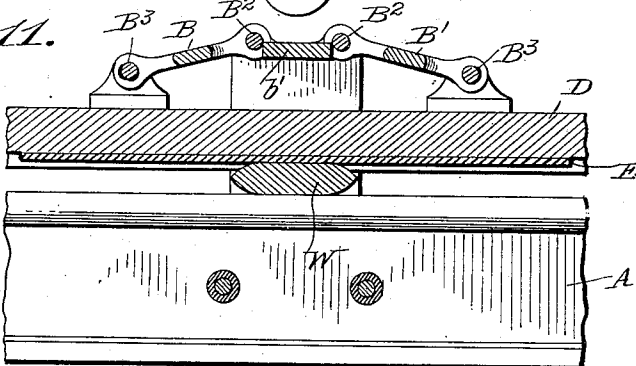
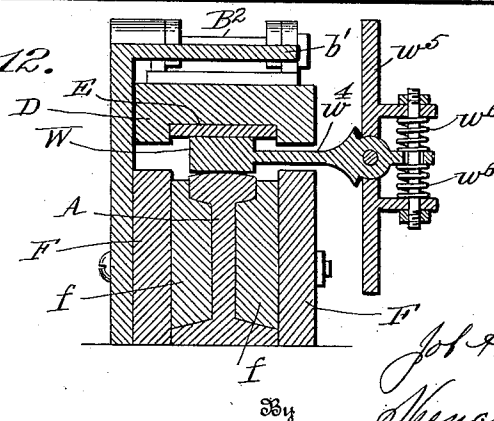


Fig. 12.



Witnesses  
Edwin L. Jewell  
W. C. Paul

Inventor  
J. Hutchinson,  
Spencer B. Prentiss,  
his Attorney

# UNITED STATES PATENT OFFICE.

JOB HUTCHINSON, OF NEW YORK, N. Y.

## CONTACT-RAIL FOR ELECTRIC RAILWAYS.

No. 898,220.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed May 10, 1905, Serial No. 259,829. Renewed March 6, 1908. Serial No. 419,568.

*To all whom it may concern:*

Be it known that I, JOB HUTCHINSON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Contact-Rails for Electric Railways, of which the following is a specification.

My invention relates to contact rails for electric railways, the most usual form of which is known as the common third rail mounted adjacent the traffic rails to supply motive current to, and form part of the circuit of, the car motors. This third rail is usually a steel rail similar to but smaller than the traffic rails, and is mounted close to one of these latter to be engaged by a collector or contact shoe carried by the car, the return circuit being completed through the car wheels and track rails. In the practical application of this general arrangement and its modifications many difficulties have been encountered, among which are the tendency of snow and ice to collect upon the third rail in cold weather so that the shoe can not make good electrical contact therewith and may be injured. Another serious difficulty is the danger to persons and animals, as this rail and its return circuit lie very close together, and the current is heavy and of high voltage.

Constructions and arrangements have been heretofore produced with a view to obviating the above difficulties, all of which lack the novel features and advantages which characterize my invention.

My invention is illustrated in the accompanying drawings, in which

Figure 1 is a view in side elevation of a contact rail constructed according to my invention; Fig. 2 is a similar view of the same showing the position of the parts when a contact shoe is passing; Fig. 3 is a side sectional view; Fig. 4 is a transverse section of the rail, with the contact shoe attached to a car track shown in elevation; Fig. 5 is a plan view of the arrangement shown in Fig. 4; Fig. 6 is a view similar to Fig. 4, and showing a spring mounting for the rail cover. Fig. 7 is a general view of a preferred form of rail and cover mounting; Fig. 8 is a perspective view of a car and rail equipped according to my invention; Fig. 9 is a side elevation showing a modification of my invention applied to contact rails of ordinary construction; Fig. 10 is a plan view of the same; Fig. 11 is a longitudinal

section, and Fig. 12 a transverse section, of the same.

Referring to the drawings, and first particularly to Figs. 1 to 5 thereof, A represents the rail proper mounted on a base strip *a* of suitable material channeled as shown to receive it. Base strip *a* is carried on chairs B placed at intervals and preferably mounted on insulators *b*. The joints of the pieces composing base strip *a* and the joints of rail A are staggered, so that a continuous strip is formed.

The joints of rail are preferably constructed as shown in Fig. 3, and consist of a U-shaped piece C of stout spring metal attached by its limbs or extensions *c* to the adjacent rail ends. The size and depth of the U or ring portion, and the thickness of the metal, may be varied as found desirable to obtain the proper firmness of connection and spring. This piece C constitutes a combined rail connector and bond.

Overlying the rail proper A I provide a cover D constructed to protect the rail A from moisture, ice and snow, and to prevent contact of persons and animals with the rail. Both this cover and base strip *a* are preferably of weather and fire proofed wood, but may be of any suitable material.

Chairs B have extensions or brackets *b*<sup>1</sup> projecting up and over cover D on which the cover D is mounted so as to be capable of an up and down or vertical motion. As shown in Figs. 1 to 5, and Figs. 6 and 8, this consists of a pin or bolt *b*<sup>2</sup> passing through a hole *b*<sup>3</sup> in bracket *b*<sup>1</sup> and secured to cover D. This construction prevents any lateral displacement of the cover.

Cover D may overlie rail proper A by gravity or its own weight alone, or in some cases I provide springs *b*<sup>4</sup> on pin *b*<sup>2</sup> either above or below the overhanging arm of bracket *b*<sup>1</sup>, or both above and below the same, as shown in Fig. 6 to assist or counteract the action of gravity. By providing these springs of different weights, or omitting either one or the other, the desired pressure of cover D may be secured.

Along the under side of cover D and near each edge thereof is provided a groove *d*<sup>3</sup> running longitudinally, and made the proper depth, to prevent water which runs down the sides of the cover from reaching contact strip E.

Another, and perhaps better way of mount-

ing cover D is shown in Figs. 7, 9, 10, 11 and 12, and consists of links  $B^1$  pivoted to bracket  $b^1$  at  $B^2$ , and to cover D at  $B^3$ . The pivot holes  $B^3$  are elongated, as shown in Fig. 11, to permit proper movement. Coiled springs  $B^4$  may be provided as shown in Fig. 7, for the same purposes as springs  $b^4$ .

The ends of the rail A and its base strip  $a$ , and cover D are preferably bent away from each other or flared, as shown at  $d$   $a^1$ , to permit the ready entrance of a car-carried contact shoe 11, which as it progresses lifts cover D and makes contact with rail A. When the car has passed, the cover again assumes its rail-protecting position.

In some cases I provide a supplementary rail E carried by the cover D in close proximity to, but not in contact with, rail proper A. This separation is effected in any suitable manner, as by flanges  $d^1$ ,  $a^2$  which maintain the proper distance between the rails. Supplementary rail E may be either a dead piece for protecting cover D from wear of the contact shoe, or it may be connected by its wires  $d^2$  with the same feed conductor as rail proper A; or it may be in sections, as shown in Fig. 3, either for a sectional railway system, or a sectional rail signaling system such as shown in my co-pending application. In this latter instance wires  $d^2$  are connected to the signal apparatus. A conductor  $a^3$  is provided to connect rail A with a transmission wire.

In Figs. 4, 5, 6 and 8, I have shown one arrangement of contact shoe adapted to my rail, which consists of a horizontal shank  $w$  carrying the shoe W. Shank  $w$  is mounted on rods  $w^1$  slidable in a bracket  $w^2$ , and pressed downward by light springs  $w^3$ .

In Figs. 9 to 12, I have shown my invention as applied to third rails now in use. A indicates the rail, as before, and to it are connected housing strips F bolted to cheek pieces  $f$  placed at intervals. Contact shoe W is carried by lever  $w^4$  pivoted for limited movement on a base-piece  $w^5$  designed for attachment to a car truck. Springs  $w^6$  tend to maintain lever  $w^4$  in its central position.

While I have described a specific embodiment of my invention, I do not wish to be understood as limiting myself or the scope of the invention thereto, as many modifications may be devised without departing from the spirit thereof, and these I intend to cover by the following claims.

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

1. In a contact rail, a rail proper with a support therefor, a continuous flexible cover comprising a series of strips placed end to end overlying said rail proper and movably mounted in relation thereto to permit the lateral insertion and movement of a contact shoe, and a strip upon the under side of said

cover overlapping the ends of said cover strips to maintain the same in alinement, substantially as described.

2. In a contact rail, the combination with a rail proper and supporting brackets therefor, of a cover resting by gravity over said rail proper and mounted for vertical movement on said brackets, substantially as described.

3. In a contact rail, a rail proper with a support therefor, a cover movably mounted to overlie said rail proper and carrying a supplemental rail, whereby pressure of said cover will produce intimate contact of said rails with a contact shoe, substantially as described.

4. In a contact rail, a rail proper with a support therefor, a cover movably mounted to overlie said rail proper and a supplemental rail carried by said cover adjacent said rail proper but separate therefrom, substantially as described.

5. In a contact rail, a rail proper with a support therefor, a cover movably mounted to overlie said rail proper, and a supplemental rail carried by said cover adjacent said rail proper but separate therefrom and made up of insulated sections, substantially as described.

6. In a contact rail, a rail proper with a support therefor, a cover movably mounted to overlie said rail proper and comprising a series of strips placed end to end, and a contact strip mounted within said cover composed of sections the joints of which are staggered with relation to the joints of said cover strips, substantially as described.

7. The combination with a rail proper and a support therefor, a cover movably mounted to overlie said rail proper and carrying a supplemental rail, of a contact shoe extending laterally to raise said cover and make contact with said rail proper and said supplemental rail, substantially as described.

8. In a contact rail, a rail proper with a support therefor, a cover movably mounted and resting by gravity over said rail proper, and spring pressure means tending to oppose the action of gravity on said cover, substantially as described.

9. In a contact rail, a rail proper with a support therefor, a cover overlying said rail, brackets placed at intervals along said rail, and a link connection between said brackets and cover, substantially as described.

10. In a contact rail, a rail proper with a support therefor, a cover overlying said rail, brackets placed at intervals along said rail, and a loose-link connection between said brackets and cover, substantially as described.

11. In a contact rail, a rail proper with a support therefor, a cover overlying said rail, brackets placed at intervals along said rail, and a link connection between said brackets

and cover constructed to permit vertical motion of said cover and prevent lateral displacement thereof, substantially as described.

5 12. In a contact rail, a rail proper with a support therefor, a cover overlying said rail, brackets placed at intervals along said rail, and obliquely extending links pivoted to said brackets and cover to permit vertical motion  
10 and prevent lateral displacement of said cover, substantially as described.

13. In a contact rail, a rail proper with a support therefor, a cover overlying said rail, brackets placed at intervals along said rail,  
15 and links extending obliquely in opposite directions from the brackets and pivoted to the brackets and cover to permit vertical motion and prevent lateral displacement of said cover, substantially as described.

20 14. In a contact rail, a base strip channeled to receive a rail, a rail proper located in said channel, a cover overlying said rail proper and a supplemental rail carried by said cover adjacent said rail proper but separated therefrom, substantially as described.

25 15. In a contact rail, a base strip having a channel between side flanges to receive a rail, a rail proper located in said channel but below the side flanges thereof, a cover carrying  
30 a supplemental rail and resting on said

flanges to maintain the rails out of contact with each other, substantially as described.

16. The combination with a rail proper with a support therefor, a cover overlying and movably mounted with relation to said  
35 rail, of a base-piece adapted to be attached to a car, a shoe-lever pivoted for limited movement to said base-piece and extending between said rail and cover to lift the latter, and springs tending to maintain said shoe-  
40 lever normally in a central position, substantially as described.

17. In a contact rail, a rail proper with a support therefor, a cover overlying said rail and movably mounted in relation thereto,  
45 said cover having longitudinal grooves near its edges to prevent moisture reaching the rail, substantially as described.

18. In a contact rail, a rail proper with a support therefor, a cover movably mounted  
50 to overlie said rail proper and having contact portion adapted to be engaged by a car-carried contact shoe, said cover having a longitudinal moisture-obstructing groove on each side of said contact portion, substantially as  
55 described.

JOB HUTCHINSON.

Witnesses:

W. S. HASKINS,  
GEO. F. GALLAGHER.