No. 728,324. PATENTED MAY 19, 1903.

S. B. STEWART, JR.

THIRD RAIL ELECTRIC RAILWAY.

APPLICATION FILED JULY 5, 1902.

NO MODEL.

Fig. 2.

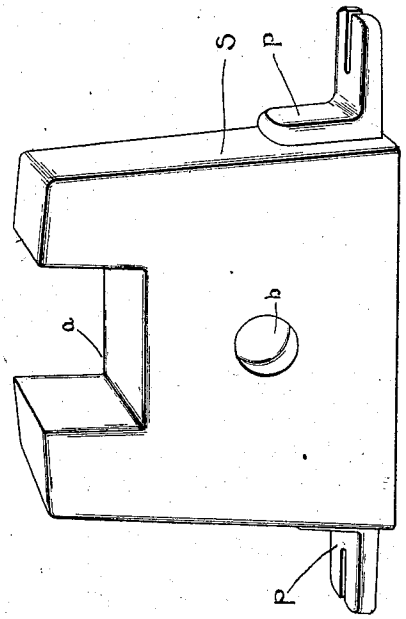


Fig. 1.

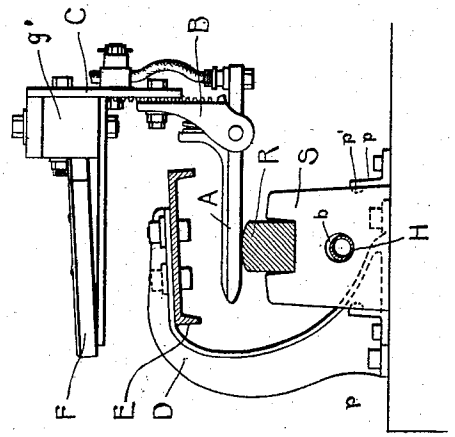
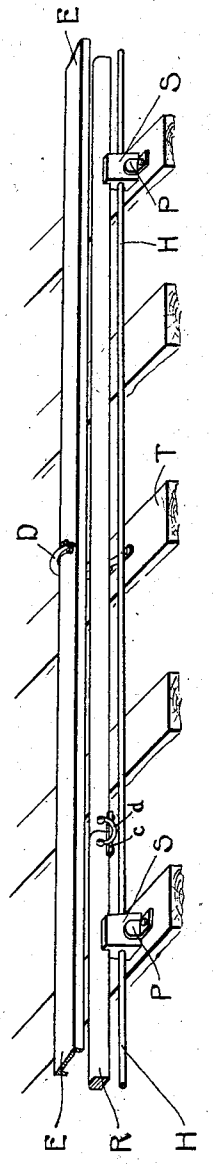


Fig. 3.



Witnesses.
J. Ellis Glenn.
Helen Orford

Inventor.
Samuel B. Stewart, Jr.
by Allen A. Davis
Atty.

No. 728,324. Patented May 19, 1903.

UNITED STATES PATENT OFFICE.

SAMUEL B. STEWART, JR., OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

THIRD-RAIL ELECTRIC RAILWAY..

SPECIFICATION forming part of Letters Patent No. 728,324, dated May 19, 1903.

Application filed July 5, 1902. Serial No. 114,343. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL B. STEWART, Jr., a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Third-Rail Electric Railways, of which the following is a specification.

My invention relates to improvements in electric railways of the type employing a third-rail conductor arranged parallel to the track or service rails and with the upper surface of which a collector-shoe carried by the car is adapted to engage.

The object of my invention is to provide an efficient guard for the third rail in addition to the guard above the rail which will effectively prevent accidental contact with the side or under surface of the third rail and which at the same time will not act as a barrier against which snow or rubbish will collect.

In the accompanying drawings, Figure 1 is a vertical sectional view of the third rail and guard therefor, also showing in elevation the insulating-support for the third rail and the collector-shoe carried by the car. Fig. 2 represents one of the insulating-supports for the third rail in perspective on a larger scale; and Fig. 3 is a perspective view of the third rail and insulating-supports therefor, showing the relative position of the protecting-strip above the rail and the foot-guard beneath the same.

The third rail R is represented in the figure as having substantially a rectangular cross-section and is supported by a series of insulating-blocks S, which are fastened to the cross-ties in any suitable manner—such, for instance, as by means of the angle-irons *p*, one side of each of which is bolted to the cross-tie and the other side of which carries a projection which engages in recess *p'* in the insulating-block. The supporting-blocks S are provided in their top surfaces with slots *a*, which are adapted to receive and hold the third rail R in such a manner as to allow it to have a movement vertically in said slots, but to prevent any sidewise or lateral movement of the said rail.

By the use of a third rail of substantially rectangular cross-section I am enabled to obtain for a given conductivity of third rail one which will have a small height relative to its cross-section and which will at the same time maintain the strength necessarily required of such a rail in practical daily use. The ends of two adjacent lengths of the third rail are fastened together by means of the strip *c*, fastened to the under side of the rail, and are electrically connected by means of the bond *d*. The upper surface of the third rail is curved to allow the collector-shoe carried by the car to make a more perfect contact while moving over said rail than would be possible with a rail having a flat upper surface.

Since in my invention no cap or connecting-piece of conducting material is used between the top of the insulating-support and the third rail and since the support is constructed to rest directly upon the cross-ties, a simple and inexpensive third-rail-supporting block is obtained which will have a very great creepage insulating-surface for a given height of the third rail above the road-bed or cross-ties.

The protecting-strip E is supported from the cross-ties by means of a series of bracket-arms D in such a manner as to leave a small clearance between the top of the third rail and the under side of the protecting-strip, but sufficiently great to allow a thin flat collector-shoe A, carried by the car, to engage the upper surface of the third rail. This collector-shoe A is pivotally supported in a frame B, which in turn is adjustably mounted on a hanger C, carried on the cross-beam *g*. The beam *g* is rigidly fastened to the journal-boxes of the motor-car truck. A projecting shelf F, which acts as a guard to prevent injury to the collector-shoe and also to prevent persons or animals from coming in contact therewith, is also supported by the beam *g*.

The specific forms of collector-shoe and third-rail protecting strip or guard herein shown and described form no part of my present invention and are not claimed herein, since they form the subject-matter of two applications filed contemporaneously herewith—Stewart, Serial No. 114,342, and Potter, Serial No. 114,328.

In order to provide a more perfect protection to persons and animals against injury

from contact with the third rail, I have provided what I term a "foot-guard," which is supported parallel to the third rail and preferably below the upper surface thereof by means of the insulating-supports for the third rail or in any other suitable manner. The foot-guard shown in the figures of the drawings consists of sections of a pipe or rod H, the ends of which are supported in recesses *b*, formed in adjacent third-rail-supporting blocks S. The recesses *b* for supporting the guard-rod are preferably made quite shallow, but may extend entirely through the block in such a manner as to allow the guard-rod to be made continuous.

The use of a rod or pipe in place of a side wall of a protecting-housing or a strip of material built up under the third rail obviates the difficulties which have been experienced with such last-mentioned constructions due to the collection of snow or dust or dirt within the third-rail housing or between the third rail and the ground. In my present construction no appreciable barrier is formed which will allow snow or sleet to collect in case of storms, and a substantially clean sweep is allowed the snow or sleet between the third rail and the road-bed. One of the great advantages of the foot-guard is in preventing a person who is standing close to the third-rail-protecting strip from moving his foot into contact with the side or under surface of the third rail. Therefore the protecting-strip E and the foot-guard H can be considered as cooperating to form a most efficient and effective guard for the third rail.

The position of the foot-guard relative to the third rail is not necessarily limited to that shown in the figures of the drawings, as without departing from the spirit and scope of my invention the foot-guard might be supported upon lugs projecting from one side or the other of the third-rail insulator, or it might be carried by the bracket-arms D. Two or more rods might be used in place of the single rod herein shown.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric-railway system, a third rail, insulating-supports for said third rail, and a foot-guard for said rail supported parallel to the rail and between the under surface of said rail and the ground.

2. In an electric railway, a third rail, insulating-supports therefor, and a foot-guard for said rail carried by said insulating-supports and arranged parallel to said rail between the under surface of the rail and the ground.

3. In a third-rail electric railway, a foot-guard for the third rail comprising an insulated pipe or rod supported parallel to the third rail below the upper surface thereof.

4. In a third-rail electric railway, a foot-guard for the third rail consisting of a pipe or pipes carried parallel to the third rail by the insulating supporting-blocks for said third rail.

5. In an electric railway, a third rail, a protecting-strip above said rail, and a foot-guard consisting of a pipe or pipes supported by the third-rail insulators parallel to the said rail.

6. In an electric railway, a third rail, a protecting-strip above said rail, and a foot-guard consisting of an insulated pipe or pipes supported parallel to the third rail and below the upper surface thereof.

7. In an electric railway, a third-rail conductor, a guard therefor, and a foot-guard consisting of a pipe or rod supported parallel to said third rail below the upper surface thereof.

8. In an electric-railway system, a block of insulating material having a slot in its upper surface adapted to receive and hold a third rail, and also having a recess or recesses for receiving the ends of rods or pipes which act as a foot-guard for the third rail to prevent injury from contact therewith.

In witness whereof I have hereunto set my hand this 1st day of July, 1902.

SAMUEL B. STEWART, JR.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.