

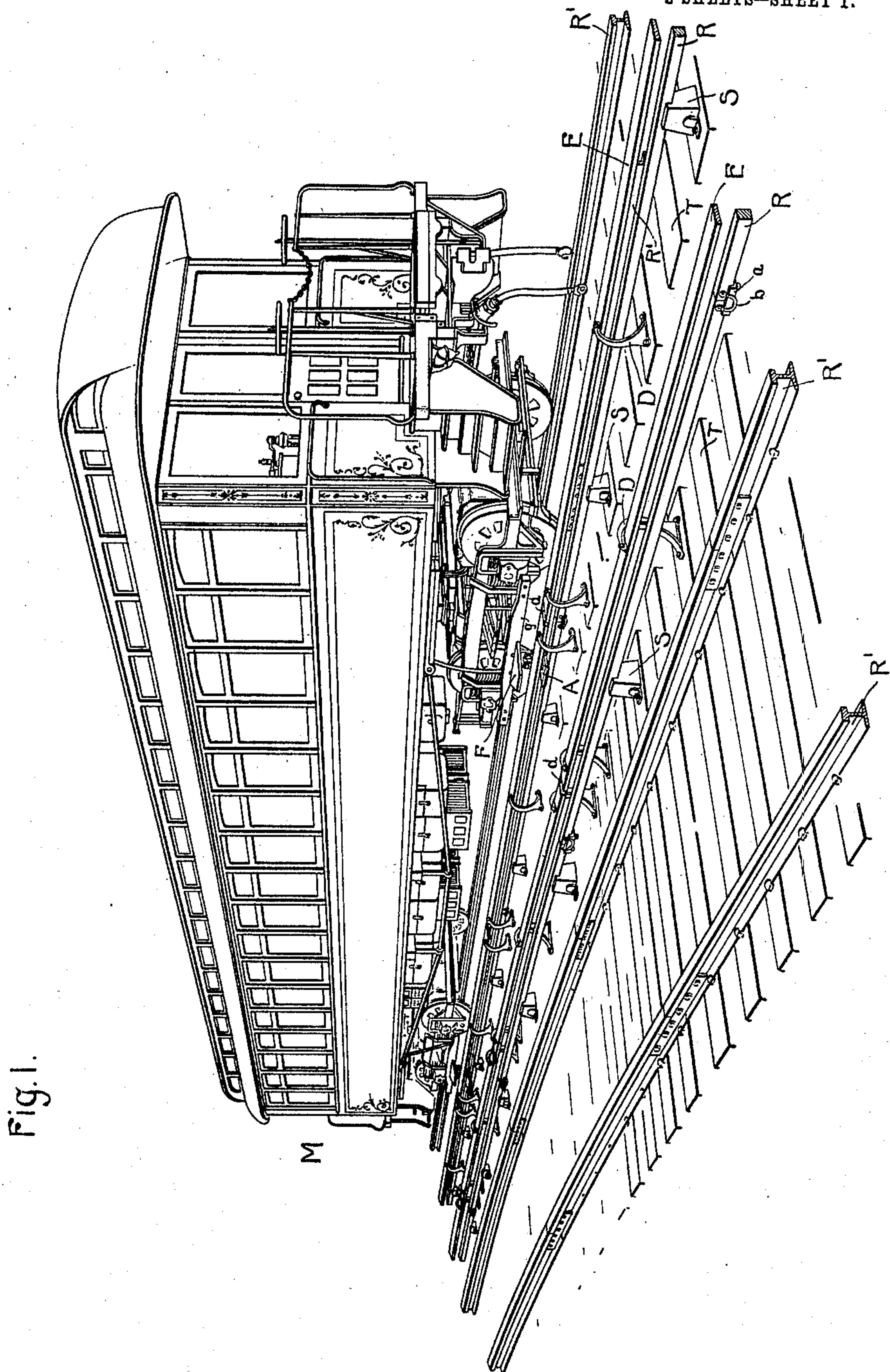
No. 756,980.

PATENTED APR. 12, 1904.

W. B. POTTER.
ELECTRIC RAILWAY.
APPLICATION FILED JULY 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses.

J. Ellis Glenn.

Helen O'ford

Inventor.

William B. Potter.

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2 SHEETS—SHEET 2.

Fig. 3.

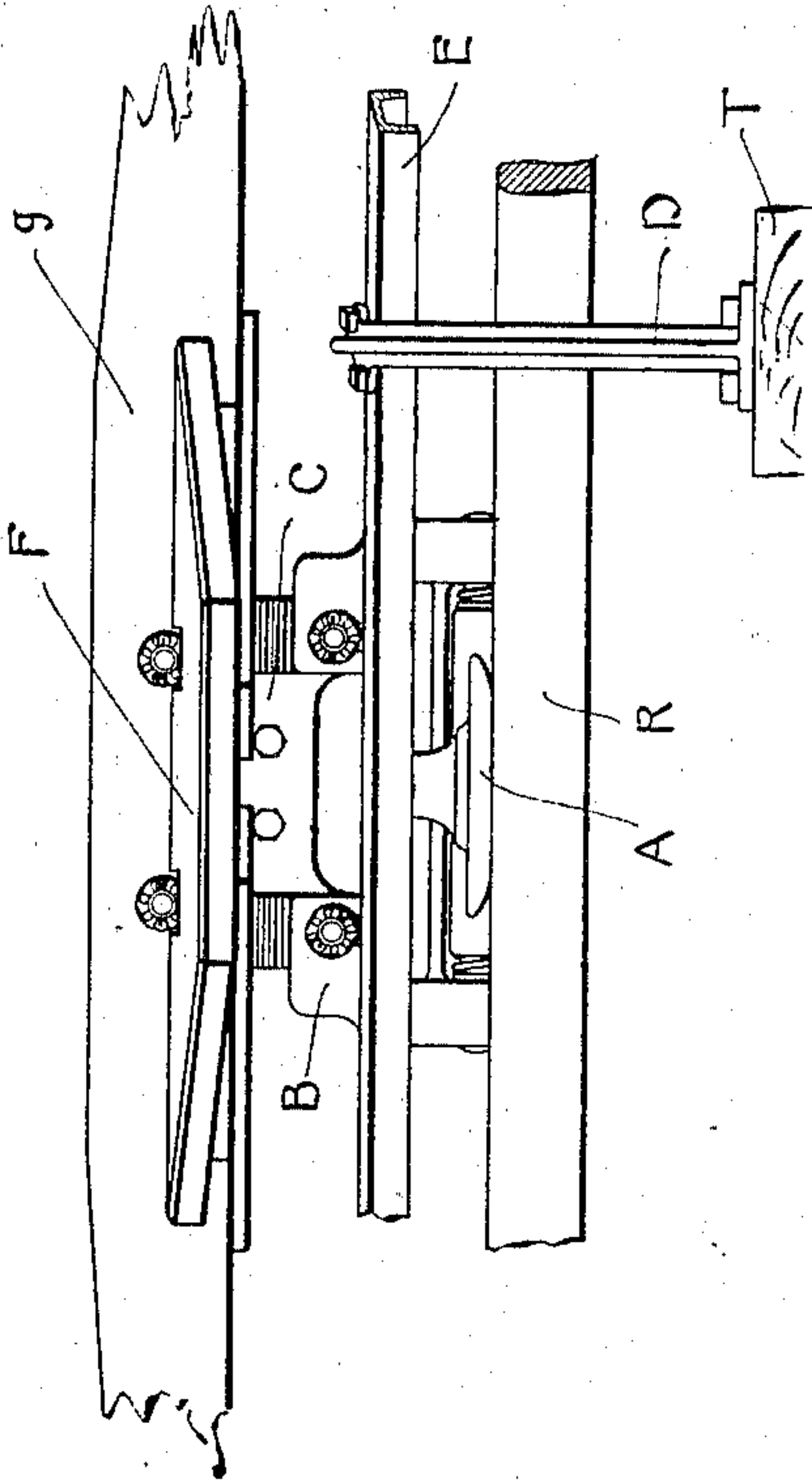


Fig. 2.

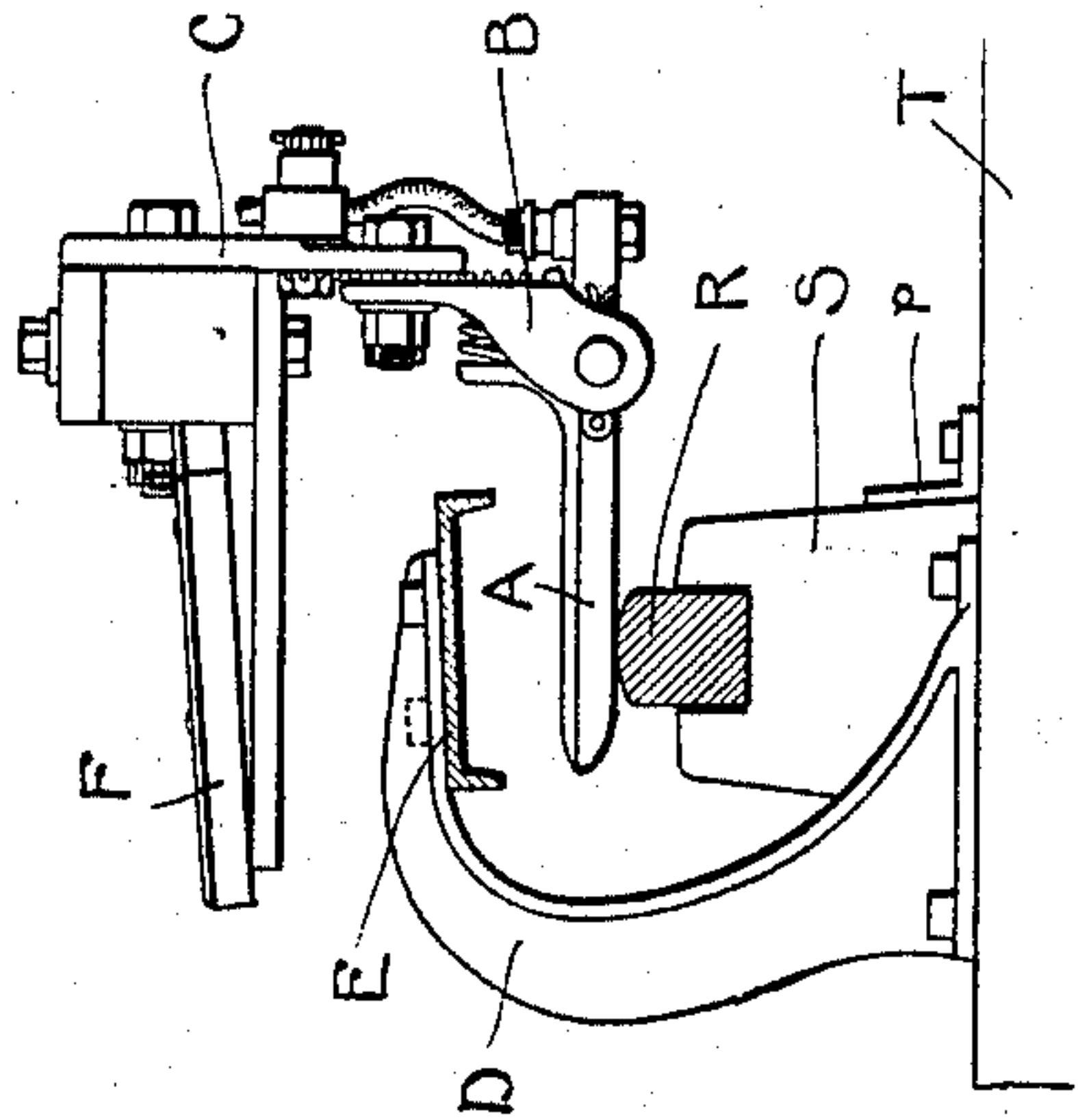
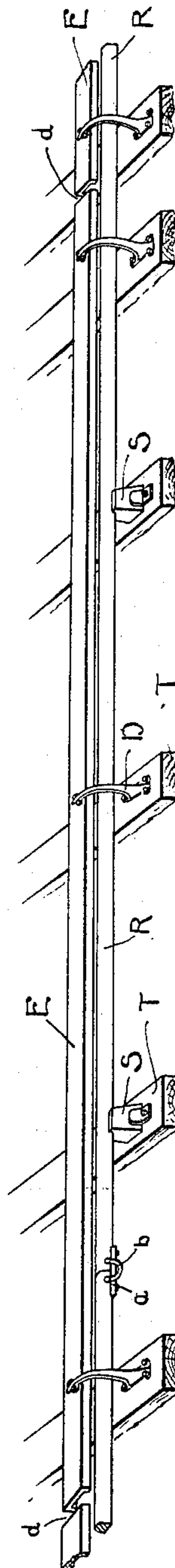


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM B. POTTER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC RAILWAY.

SPECIFICATION forming part of Letters Patent No. 756,980, dated April 12, 1904.

Application filed July 5, 1902. Serial No. 114,328. (No model.)

To all whom it may concern:

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

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

It is the object of my invention to provide a protected third rail that will be simple, durable, and compact in construction and at the same time efficient in protecting the rail against storms and other damaging influences and in protecting persons or animals from contact therewith.

A further object of my invention is to localize the effect in case the guard or protector for the rail becomes charged either by arcing at the collector-shoe or by any electrical connection with the third rail at any point along the way.

In railways of the type above referred to it has heretofore been deemed advisable to inclose the third-rail conductor in a continuous protecting-housing entirely covering and surrounding the rail except for a small opening or slot in the top or on one side of the housing, through which a collector-shoe carried by the car may project to engage or contact with the rail. Such a construction is open to numerous objections. A housing which incloses the rail is expensive to install. When made of wood, it is not durable, and when made of metal it must in any of the constructions heretofore proposed be thoroughly insulated from the third rail, or else it is liable to become charged to a dangerous potential throughout its whole length either by leakage from the third rail or by arcing at any one of the collector-shoes engaging the same. Moreover, in case of driving storms of snow and sleet such a housing will virtually act as a receptacle to receive and hold all the snow and sleet

which may be driven into it through the open slot, and after snow or sleet has collected on the surface of the rail to any considerable extent the passing of the collector-shoe will tend to pack and partially melt it, so as to form a coating of ice on the rail. Such a coating when once formed is productive of excessive arcing at the collector-shoe, and it may become thick enough in spots to actually open the circuit and stall the car. A construction of the character above described also facilitates the accumulation of dust and dirt around the third rail, causing grounds which are difficult to locate and which of course reduce the efficiency of the system so long as they exist.

A further objection to the use of any of the protected third-rail constructions heretofore proposed lies in the fact that the protected third rail is likely to be largely employed in electrically equipping roads that are now operated by steam. A third rail having the contour of the standard railway-rail when inclosed in a housing of the type above referred to makes a structure which rises to a considerable height above the road-bed, and to avoid the low-hanging cylinders of the modern steam-locomotive it is necessary to place the third rail and housing far to one side of the track-rails and to use collector-shoes which project a considerable distance from the car. It will be readily seen that such a construction is objectionable.

According to my invention the third rail instead of having the contour of the standard railway-rail heretofore employed is made of small depth as compared with its cross-section, and in place of the housing entirely inclosing the rail a single metallic strip is mounted above the rail in close proximity thereto. The protecting-strip or guard is made thick enough and of such a contour that it will be mechanically strong and wide enough to overhang the rail to a considerable extent on both sides, so that it will serve to prevent any considerable amount of snow or sleet from collecting on the surface of the rail even in driving storms. The third rail is suitably supported on insulators, and the protecting-strip

or guard is similarly supported by means of metal brackets mounted on the wood ties to which the traffic-rails are secured. The protecting-strip is thus partially insulated from ground, so that even though there may be considerable arcing at the collector-shoe in stormy weather there will be no tendency for any considerable current to pass to ground through the protecting-strip and its supports. With the construction thus far described, however, excessive arcing at the collector-shoe or any electrical connection between the protecting-strip and the third rail or the collector-shoe bearing thereon would render the said strip alive throughout its length, so that a person coming in contact with the same at any point might receive a serious shock. Moreover, in case a good electrical connection should exist between the protecting-strip and ground at one or more points along the way any arcing from the third rail and contact-shoe to the strip would have a greater tendency to continue after it had been once started.

In order to avoid the troubles above specified and to make the protection absolutely secure against injury to persons or animals, I have divided the metallic protection for the rail into a series of short sections. With the protecting-strip thus sectionalized any arching that may occur will operate only to charge the particular section under which the shoe is running, and, moreover, the danger of any considerable leakage of current to ground will be reduced by reason of the reduced liability of any one section being thoroughly grounded. The guard extends beyond the rail on either side far enough to prevent a person from making contact with the rail unless he actually tries to do so, and it is so close to the rail that contact can be made intentionally only with some difficulty. The arrangement which I have devised provides, therefore, a simple and effective protection for the rail against injury to persons or animals by coming in contact therewith and prevents any considerable collection of snow or sleet on the surface of the rail, while at the same time leaving the construction free and open. Moreover, by thus simplifying the construction and reducing the height of the third rail itself with respect to its cross-section I am enabled to reduce the height of the protection to such an extent that the third rail can be placed in close proximity to the track-rails without interfering with the running of steam-locomotives having low-hanging cylinders along the track. It therefore becomes possible to use collector-shoes projecting only a short distance from the car.

My invention will be better understood by reference to the following description, taken in connection with the accompanying drawings, while its scope will be pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a portion of a double-track railway equipped with my improved protected third rail, showing a motor-car in operative position on one of the tracks. Fig. 2 is a vertical sectional view of the third rail and the guard therefor, showing also in end elevation a collector-shoe in contact with the rail. Fig. 3 is a side elevation of the same, and Fig. 4 is a perspective view of the third rail and sectional guard.

Referring now to the figures of the drawings, R represents a third-rail conductor which is constructed in such a manner as to have a small depth with respect to its cross-section. The rail is supported on a series of insulating-blocks S, which are fastened to the cross-ties T in any suitable manner—such, for instance, as by means of the angle-irons *p*. (Shown clearly in Fig. 2.) The guard for the third rail R is shown in Fig. 1 as a flat metal strip and in Fig. 2 as an inverted channel-bar. This guard or protecting-strip E is formed in short sections and is supported from the cross-ties T in substantially a horizontal plane by means of a series of bracket-arms D, as clearly shown in Figs. 1 and 4. The space *d* between the sections of the protecting-strip is sufficient to prevent arcing across from one section of the protecting-strip to the adjoining section in case the first-mentioned section should become electrically connected with the third rail at any point. The sections are thus insulated from each other.

Since the brackets for supporting the guard are mounted on the cross-ties, the latter act to partially insulate the same from the ground. The protecting-strip or guard is supported so as to overhang the third rail on both sides thereof and is mounted as low as possible, so that there is a very small clearance between the top of the third rail and the under side of the protecting-strip. The extent of the overhang of the protecting-strip may be varied to suit the conditions required in practice, but should at least be sufficient to protect the upper surface of the third rail from sleet and snow which is liable to collect thereon in case of driving storms when the overhang is insufficient. The clearance between the third rail and guard should be sufficient to allow the passage of a thin flat collector-shoe carried by the car. The guard is preferably slightly pitched, so as to prevent the accumulation of rain-water, &c., on the top thereof. The sections of the third rail are connected together by supporting-strips *a*, bolted to the under side of the adjacent sections of the rail, and they are further connected electrically by means of the bonds *b*.

The collector-shoe A, which is supported from a beam *g*, rigidly fastened to the journal-boxes of the truck of the motor-car M, is formed of a thin flat metal piece having a

small moment of inertia and is pivotally mounted in a frame B, which in turn is adjustably supported on a hanger C, carried by the said beam *g*. A shelf or guard F is used for the purpose of protecting said shoe from injury and also to prevent injury to persons or animals from accidental contact with said shoe.

The collector-shoe herein shown forms no part of the present invention and is not claimed herein, since it forms the subject-matter of the application of S. B. Stewart, Jr., Serial No. 114,342, filed concurrently herewith. I have merely shown this specific form of collector-shoe to more clearly illustrate my invention.

It will be evident that many changes and modifications may be made in the construction herein disclosed and that the different features of invention herein specified may be used separately or in other combinations without departing from the spirit and scope of my invention, and in the claims hereto appended I aim to cover the said features of invention in whatever connection they may be employed.

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 in combination with a sectionalized metallic protecting-strip therefor, the sections of said protecting-strip being insulated from each other.

2. In an electric-railway system, a third rail in combination with a sectionalized metallic protecting-strip secured above the same and overhanging the said rail on both sides thereof, the adjacent sections of said protecting-strip being out of contact with each other.

3. In an electric-railway system, a third rail in combination with a sectionalized metallic protecting-strip secured above the same with a small clearance between the said strip and the top of the rail, the sections of said pro-

tecting-strip being electrically insulated from each other.

4. In an electric-railway system, a third rail the upper surface of which is adapted to be engaged by a current-collector, said rail having a small depth with respect to its cross-section, insulating-supports therefor, and a metallic protecting-strip supported entirely above the upper surface of said rail but in close proximity thereto.

5. In an electric-railway system, a third rail the upper surface of which is adapted to be engaged by a current-collector in combination with a sectionalized metallic strip mounted above the same in close proximity thereto and overhanging the said rail on both sides thereof, the overhanging part of said strip not extending below the upper surface of said rail on either side of the same.

6. In an electric railway, a third rail, a series of insulating-supports therefor, a guard for said rail composed merely of a shallow channel-bar, and a series of brackets for supporting said channel-bar in substantially a horizontal plane so that no part of said channel-bar extends below the upper surface of said third rail.

7. The combination with a third-rail conductor, of a guard therefor consisting merely of a thin metal strip supported in substantially a horizontal plane by means of brackets fastened to the cross-ties in such a manner as to allow a small clearance between the guard and the top of the third-rail conductor and to allow ready access to the upper surface of the rail from either side of said rail.

In witness whereof I have hereunto set my hand this 2d day of July, 1902.

WILLIAM B. POTTER.

Witnesses:

ANNE HARWARD,
LEWIS R. POMEROY.