

J. STEPHENSON.
Street-Cars.

No. 152,701.

Patented June 30, 1874.

FIG. I.

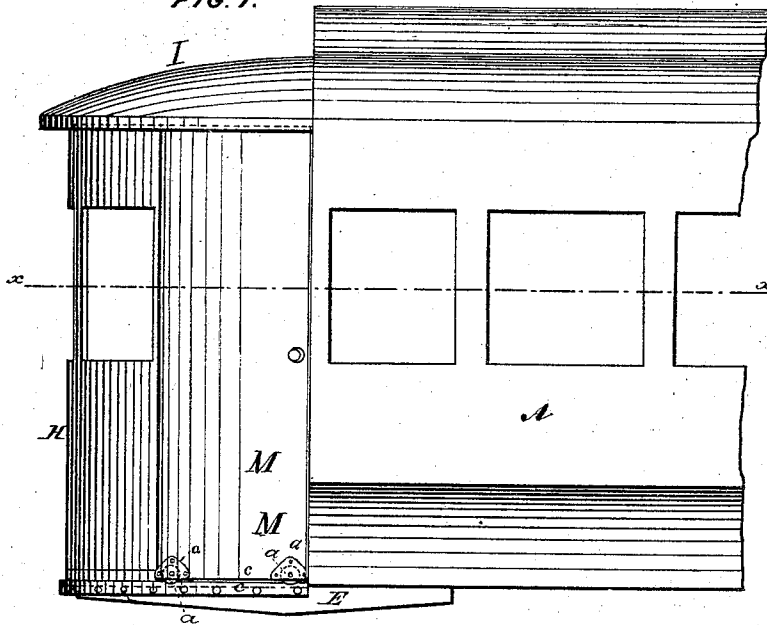
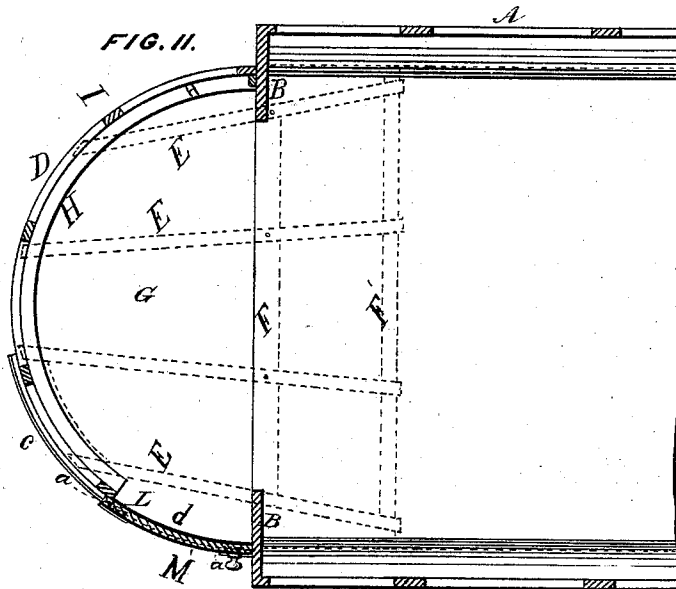


FIG. II.



WITNESSES:

Leon R. Riebeck
D. B. Stuart

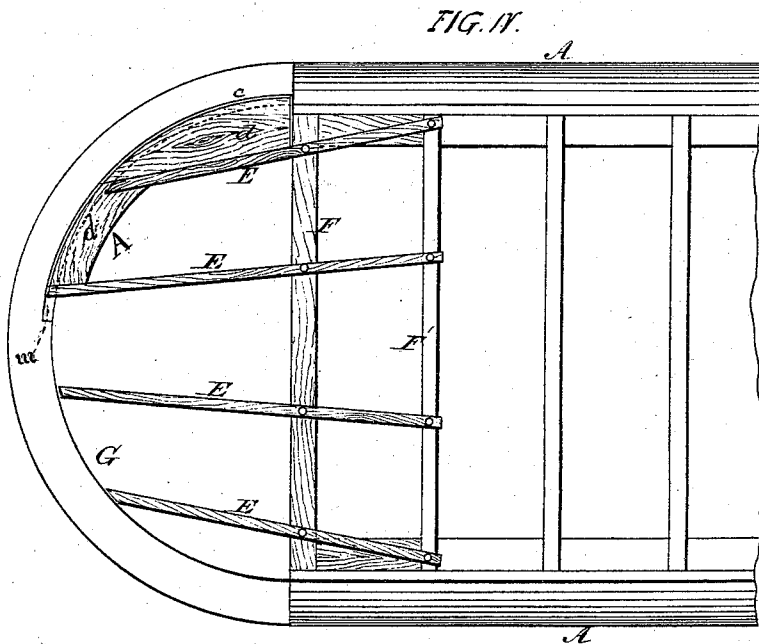
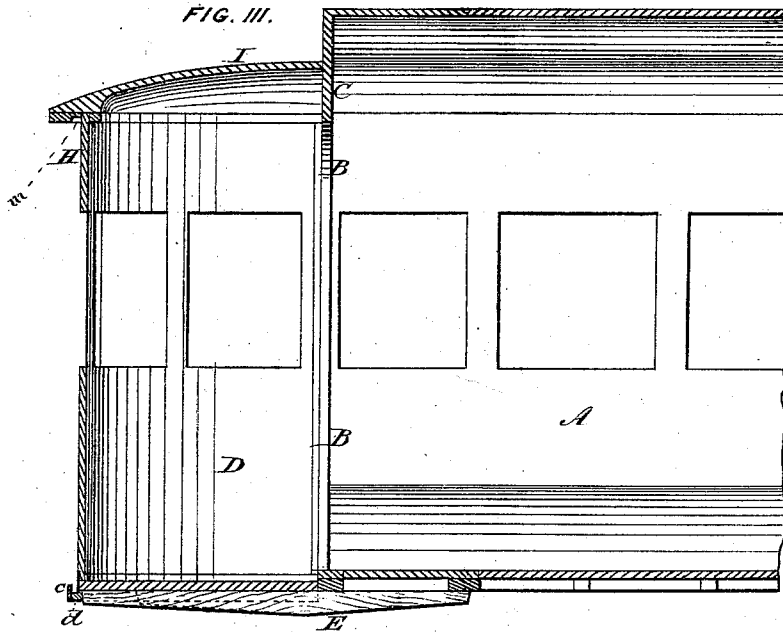
INVENTOR:

John Stephenson
per P. H. H. H.

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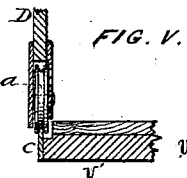
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INVENTOR:

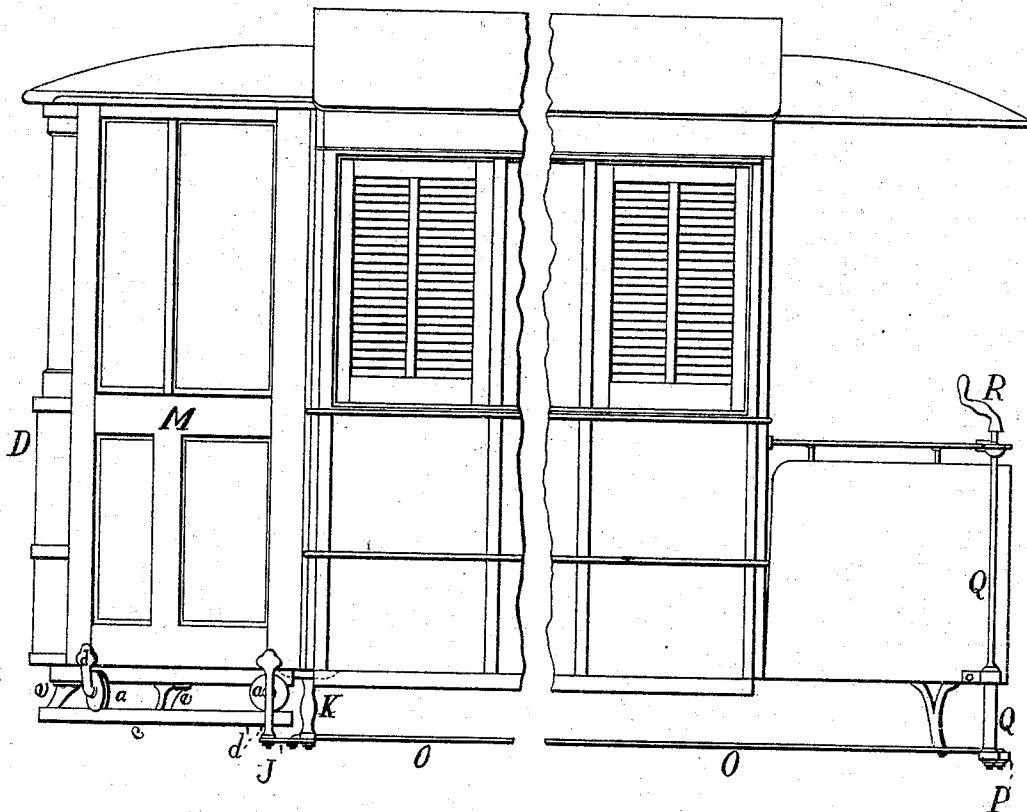
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Fig 6.



WITNESSES

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By

INVENTOR

John Stephenson
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UNITED STATES PATENT OFFICE.

JOHN STEPHENSON, OF NEW YORK, N. Y.

IMPROVEMENT IN STREET-CARS.

Specification forming part of Letters Patent No. **152,701**, dated June 30, 1874; application filed June 8, 1874.

To all whom it may concern:

Be it known that I, JOHN STEPHENSON, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in the Method of Constructing Street-Cars; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 represents a side elevation of the rear end of a car having my improvement applied thereto, the forward end of the car being broken off and the running-gear removed. Fig. 2 represents a horizontal section of the same, and Fig. 3 a vertical longitudinal section. Fig. 4 represents a plan of the under side of Fig. 1, showing the manner of supporting the appendage in the rear of the car. Fig. 5 represents a detail section, showing one mode of supporting the lower end of the sliding door upon the rail. Fig. 6 represents a side elevation of a car having my improvement applied thereto, showing the manner of operating the door by the driver in front of the car, a portion of the car being broken out of the middle.

My invention relates to a new and improved mode of constructing the body of street-cars, with a view of increasing their convenience and safety, and is especially adapted to cars in which the door for the entrance and exit of the passengers is operated by the driver, and the cars run without the aid of a conductor.

My improvement for this purpose consists in combining, with the main body of a street-car, an appendage or extension at the rear, in which is arranged a sliding entrance door or doors, when such appendage is so made as to inclose the space usually occupied by the rear platform, and so constructed in all its details and parts as to form a separate and independent portion of the car—that is to say, constructed with independent and detachable walls, roof, or hood, frame-work, and floor—and the whole as thus made suitably secured to the rear end of the main body of the car, and upheld by independent splayed or

diverging supporting-beams suitably but detachably secured to the frame-work of the main body.

To enable others skilled in the art to make, construct, and use my improvement, I will now proceed to describe its parts in detail.

The main body A of the car may be made of the usual length and construction, with the exception of its rear end, from which the usual door, pillars, panels, and frame-work are removed, and a couple of plain side pillars, B, substituted in their place, and which are connected together at their top by a frame-piece, C, of suitable shape and construction. Thus constructed, the car is then provided at its rear end with an independent extension or appendage, D, so as to inclose the space usually occupied by the rear platform. This appendage is erected on a separate and distinct frame-work or support, consisting of rails or timbers E, bolted or otherwise suitably secured at their rear end to the sills F F of the main body of the car. These beams are made to diverge from each other as they recede from the rear toward the front of the car, and may be braced or stayed, if desired, in any suitable manner, in order to give greater strength and rigidity to them. Upon the upper side of that portion of the timbers E which project beyond the rear end of the main body of the car is secured the floor G of the appendage, and which will be made of such form as it is desired to give to the appendage D; but the curved form is preferred. On this floor is erected the wall or walls H of the extension D, which are then suitably and firmly connected to the rear end of the main body of the car, and provided with an independent hood or supplementary roof, I, and with an opening or openings, L, for the door or doors M. When two doors are used they will be arranged one on each side of the car, in the manner of the one shown at M, Figs. 1 and 2; but when only one is used it may then be arranged at any convenient place in the extension, although a door arranged at the right-hand side, as shown in Fig. 1, has proved both effective and desirable. The door or doors thus arranged are made to move on a guideway, either on the inside or outside of the rear end of the extension.

This mode may be effected in various ways—as, for instance, by suspending the door from the top by attaching it to the arms of two or more pivotal pins, each of which carries a friction-roll, and these then made to rest and move on a rail secured to and depending from the roof or upper end of the rear wall of the extension, or to both. When so supported the door may be made to slide either on the inside or outside of the extension, as may be desired; or the doors may be supported on rollers *a a*, each of which may be mounted on an axis properly secured to the foot of the door, in the manner shown in Fig. 1, or on an axis secured to or formed on suitable legs which are firmly secured to the bottom of the door, in the manner shown in Fig. 6. In either case they may be made to rest on a rail or way on the floor, in which event the door would slide within the extension, or on a rail, *c*, supported on or secured to the outer edge of a supporting-beam, *v*, which is bolted or otherwise secured to the bottom of the floor of the extension of the car, in the manner shown in Figs. 3 and 4. In this case the door will move on the outside of the extension. Or the door may be similarly supported from below, so as to move on the outside of the extension, by arranging the rail or way *c*, on which it is to move, at the rear end of the extension, but beneath the floor, as shown in Fig. 6. In this case the rail is supported by brackets *e*, suitably secured to the under side of the floor.

In applying the rail to the extension it, in each case, is so formed and secured as to conform to the shape of the latter, and when located beneath the floor, is so arranged as to lie within the outer edge of the floor of the extension. To prevent undue strain on the floor by attaching the brackets directly to it, thick flat blocks of wood may be interposed between them, the blocks being first secured to the floor, and then the brackets to them.

As a rule, I prefer to support the door on rollers mounted on an axis formed on or otherwise secured to the legs *d d'*, in the manner shown in Fig. 6, as it presents an easy and simple mode of attaching the mechanism by which the driver operates the door where the car is intended to be operated in that way; otherwise, where the passengers are to open and close the entrance-door, the method shown in Figs. 1 and 2 is preferred. In the former case the legs *d d'* are secured to the door at or near its lower corners, and so as to extend downward below the level of the car-body, that the foot of the one, say *d*, may form an axis for the door-roller or sheave-wheel, and the foot of the other, *d'*, rest in the end of the lever which operates the door, while a spur from the same leg forms an axis for the other sheave-wheel. The two wheels, as before stated, rest upon the rail, and thus support the door. These wheels are grooved or flanged, so as to embrace, as it were, the sides or the rail, in order to prevent their displacement. The upper end of the door takes into and

travels in a groove or guideway, *n*, cut in or otherwise formed on the under side of the frame-work of the roof of the extension, as in Figs. 3 and 4, and may be arranged on the inside or outside of the extension, according as the door is made to move within or without. The lower end of the leg *d'*, as before stated, is made to rest in a bearing formed in the end of a lever, *J*—that is to say, is pivoted to the lever *J*, and the latter in turn pivoted to the stud-pin or pivot *K*. The pivot-pin *K* is firmly secured to the bottom of the car at such point as will make the lever thus pivoted a radius of the circle of which the extension is a segment, so that as the lever *J* is turned on its pivotal center, it will, through the leg *d'*, or other equivalent device or connection, open or close the door, according to the direction in which the lever is moved by the driver. The lever *J* itself is operated by means of a rod or lever, *O*, the one end of which is pivotally connected to one end of the lever *J*, and the other to a crank, *P*, made fast to a rock-shaft, *Q*, arranged at the front of the car, and which carries at its upper end a crank handle or lever, *R*, by which the driver is enabled to open or close the door, as circumstances may require. The same devices slightly modified—as, for instance, by connecting the leg *d'* to the lever by a slot instead of a pivotal hole, or by the interposition of a link-lever between them—may be applied to the operating of the door of an extension where it has to be moved in a straight line, as, for instance, in an extension where its sides are set at an angle to each other; or, in other words, where a horizontal section of the extension would present the main features of a longitudinal section of the frustum of a cone, and which constitutes a modified form of my improved appendage or extension.

Various other modes of operating the door of a car having an extension in the rear might be described, such as those described in my pending application, marked Case B B, filed January 9, 1874; but such, for that reason, are not here deemed necessary to be described.

A car thus made is more convenient for the passengers getting in and out, and much less liable to accident, besides being much more roomy.

In this patent I do not claim a street-car provided with the curved extension in the rear, which forms a continuous part of said car; but

What I do claim is—

1. A street-car having an independent or detachable appendage or extension, *D*, in the rear, substantially as described.

2. The combination of a car-body with an independent or detachable appendage, *D*, in the rear, provided with a sliding entrance door or doors of conformable shape, substantially as set forth.

3. The combination of a car-body with an independent or detachable appendage or ex-

tension, D, in the rear, provided with a sliding entrance door or doors, M, and a rail or way, c, of conformable shape, substantially as set forth.

4. The combination of a car-body with an independent or detachable appendage or extension, D, in the rear, provided with a sliding entrance door or doors, M, supported on rollers or sheaves a, and with a rail or way, c,

said doors and way being of conformable shape, substantially as set forth.

In testimony that I claim the foregoing as of my own invention, I hereunto affix my signature in presence of two witnesses.

JOHN STEPHENSON.

Witnesses:

WILLIAM J. WALKER,
JOHN SMITH.