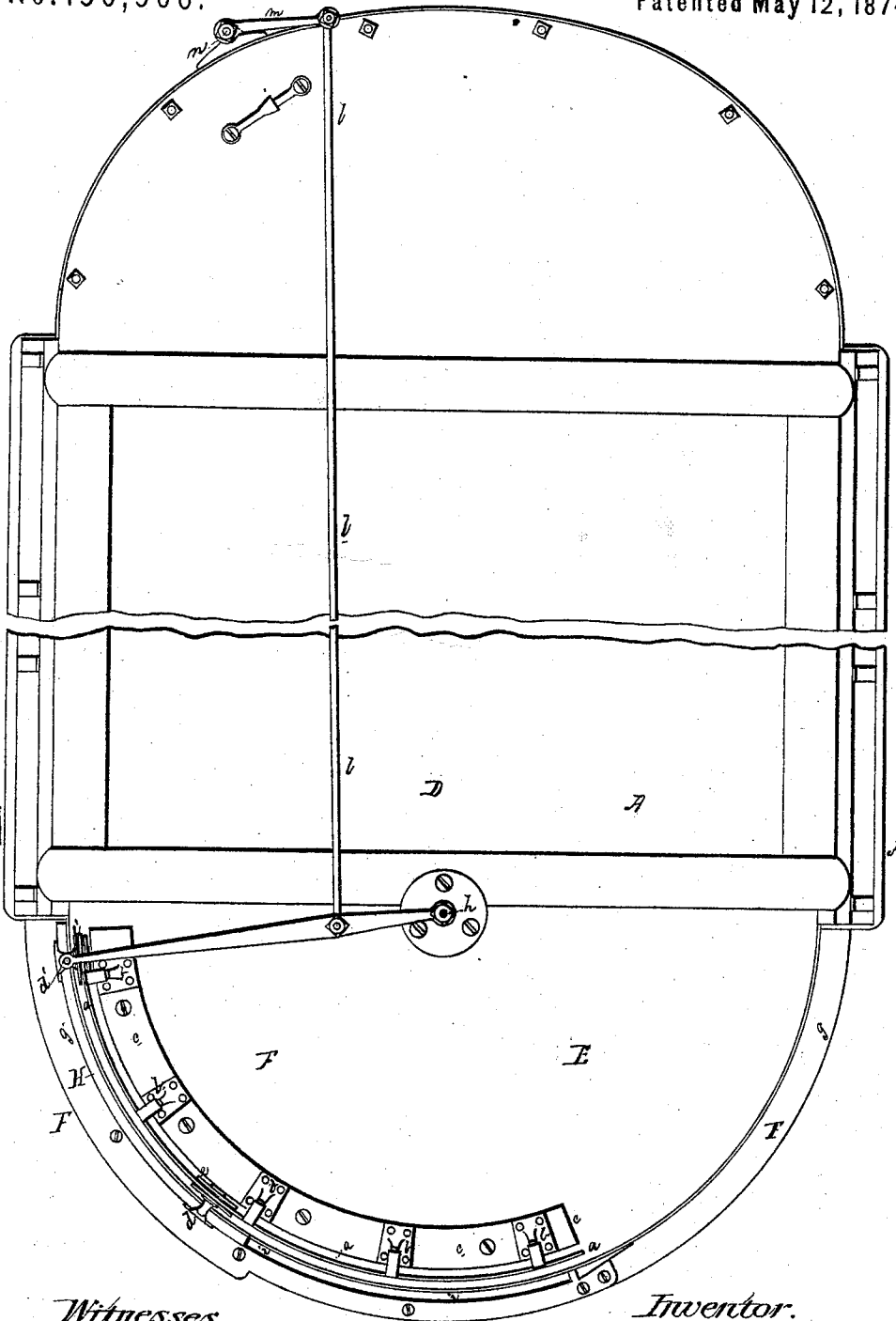


J. STEPHENSON.
Street-Cars.

No. 150,906.

Patented May 12, 1874.

Fig. 1.



Witnesses.

D. G. Stuart
A. McCallum

Inventor.

John Stephenson
per P. Hannay
Atty.

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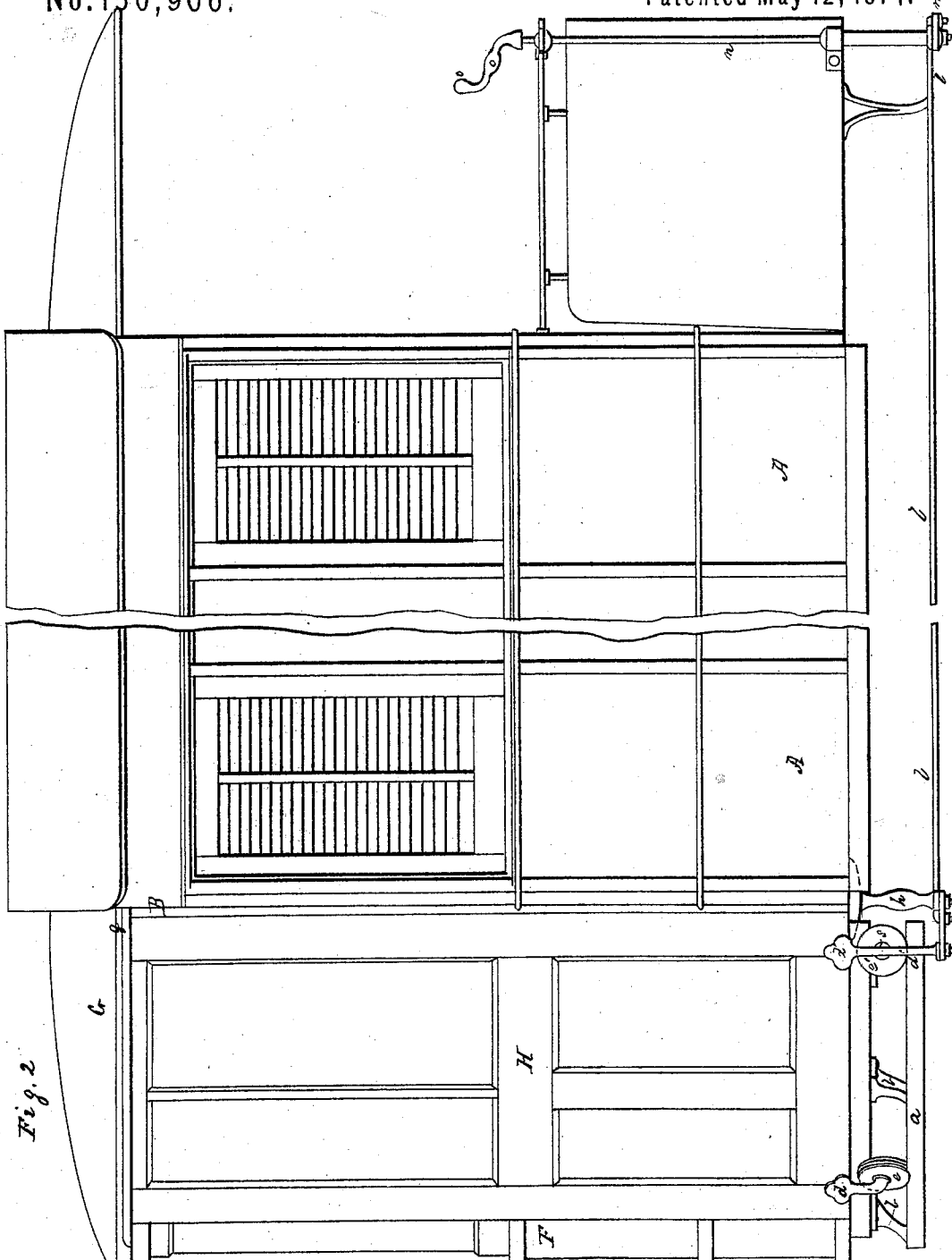


Fig. 2

Witnesses.

D. L. Stuart
A. McCallum

Inventor.

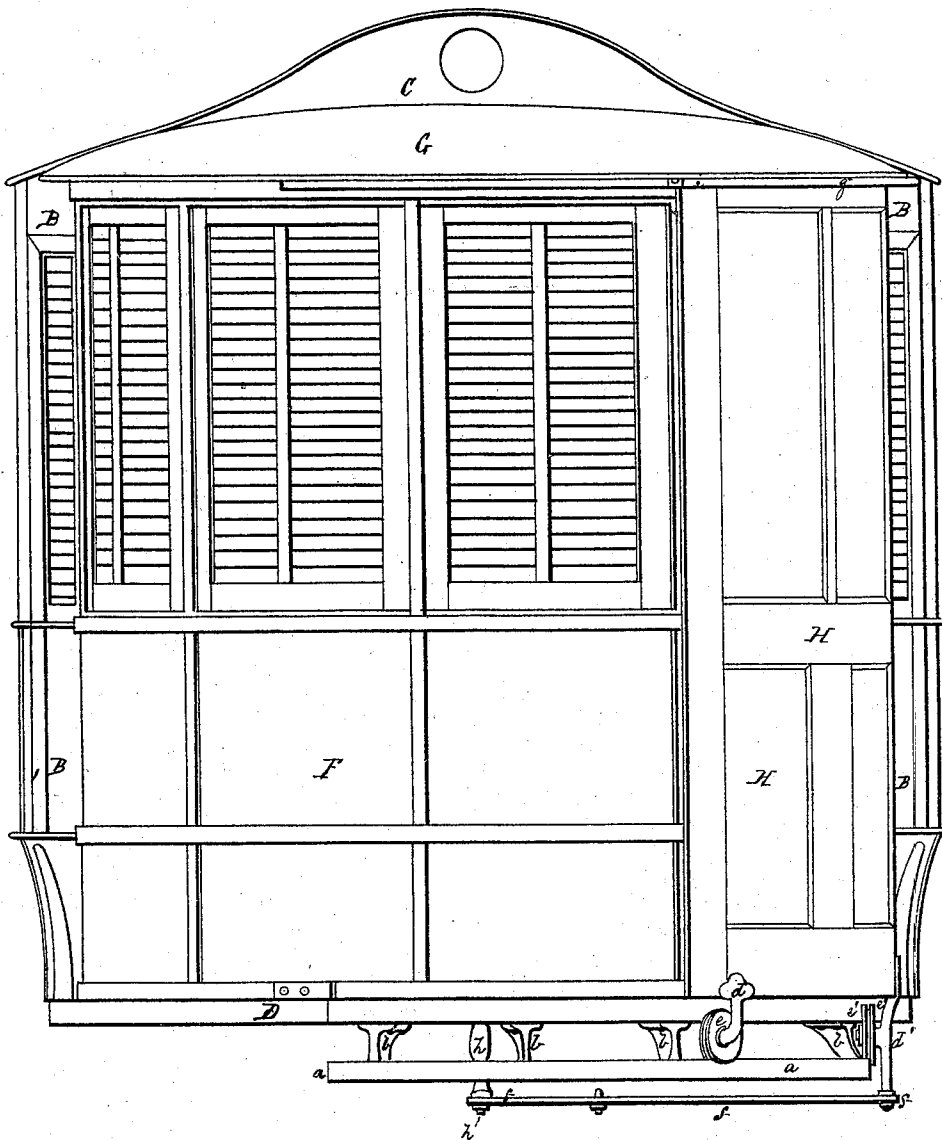
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Patented May 12, 1874.

Fig. 3



Witnesses:

D. Stuart
A. M. Callum

Inventor:

John Stephenson
per S. Hannay atty.

UNITED STATES PATENT OFFICE.

JOHN STEPHENSON, OF NEW YORK, N. Y.

IMPROVEMENT IN STREET-CARS.

Specification forming part of Letters Patent No. **150,906**, dated May 12, 1874; application filed March 16, 1874.

CASE A' A'.

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 Improvements in Street-Cars having a curved extension in the rear, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan of the under side of a street-car having my improvements applied thereto, the running-gear being attached and the car itself represented as broken in two. Fig. 2 represents a side elevation of the same, and Fig. 3 an end view of the rear of the car.

My invention relates to that improved class of street-cars provided with an extension in the rear and with a sliding door, for which I made application for Letters Patent of the United States, marked Case A A, the present application being a subdivision of that application, and marked Case A' A'. The first branch of my present improvement consists in combining with the rear extension or appendage of a street-car, which incloses the space usually occupied by the rear platform and its entrance door or doors, certain devices, to be hereinafter described, by means of which the driver, while on his stand in front, is enabled to operate the door as easily and perfectly as in the ordinary square-ended car, thereby dispensing with the services of the conductor usually employed on cars having an extension in the rear.

To enable others skilled in the art to make, construct, and use my improvement, I will now proceed to describe its parts in detail, omitting a particular description of such parts of a street-car as are common to others and not pertinent to my present improvement.

The main body A of the car may be of the usual length and construction, with the exception of its rear end, from which the usual door pillars, panels, and other frame-work are or may be removed, and a couple of plain side pillars, B, substituted in their place, and which are connected together at their top by a plain or arched frame-piece, C. Thus constructed, the car is then provided at its rear end with

an independent extension or appendage, F, 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, the inner ends of which diverge from each other, so as to be suitably and firmly connected to the sills of the main body A of the car at the rear end of the latter. This frame may be braced and supported in any known or suitable manner and made of any suitable form, but the curved form is preferred. On this frame-work is erected the wall or walls of the extension F, as also its floor E, and which may either be laid above, below, or in a line with the plane of the floor D of the main body A of the car, as may be deemed most advisable. The wall edges of the appendage are then suitably and firmly connected to the rear end of the car, and provided with an independent or supplementary roof, G, and with an opening or openings for the door or doors H. When two doors are used, they are arranged as shown in Fig. 4—that is to say, one on each side of the extension; but when only one is used, as shown in Figs. 1 and 3, then it may be arranged at any convenient place in the extension, although a single door arranged at the right-hand side has proved effective and desirable. The door or doors I may either be hinged to the extension, or, what is deemed better, and, as such, so represented in the drawings, may be arranged to move in a guideway, i, formed 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 of the extension, in which event the door may be made to slide either on the inside or outside of the rear end of the extension, as may be desired; or the doors may be supported on rollers *e e'*, each of which may be mounted on an axis properly secured to the door in the ordinary way, or on an axis secured to or formed on suitable legs *d d'*, which are firmly secured to the foot of the door, and

these rollers then made to rest on a rail or way on the floor, in which case the door would slide within the extension; or the door may be similarly supported from below, so as to slide on the outside of the extension, in which event I prefer to arrange the rail or way *a*, on which the door is made to move, at the rear end of the extension, but beneath the floor, and to support the latter by brackets *b*, suitably secured to the bottom of the floor of the extension; or the rail *a* may be secured to the floor in any other well-known or suitable manner. In applying the rail to the extension it 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 *b* directly to it, a block or timber, *c*, of suitable shape may be interposed between them, the block being first secured to the car-floor, and then the brackets to the block. In the latter cases 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 *e*, and the foot of the other, *d'*, rest in the end of the lever *f*, which operates the door, while a spur from the same leg may form an axis for the other sheave-wheel, *e'*. The two wheels *e e'*, as before stated, rest upon the rail, and thus support the door. These wheels *e e'* are grooved or flanged, so as to embrace, as it were, the sides of the rail *a*, in order to prevent their displacement. The upper end of the door takes into and travels in a groove or guideway, *i*, cut in or otherwise formed on the under side of the frame-work *g* of the roof *G* of the extension, as in Fig. 1, 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, *f*—that is to say, is pivoted to the lever *f*, and the latter, in turn, pivoted to a stud-pin or pivot, *h*. The pivot-pin *h* 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 *F* is a segment, so that as the lever *f* 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 *f* itself is operated by means of a rod or lever, *l*, the one end of which is pivotally connected to the lever *f*, and the other to a crank, *m*, made fast to a rock-shaft, *n*, arranged at the front of the car, and which carries at its upper end a crank handle or lever, *o*, 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 *f* 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.

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; nor is their application to the door of a car having an extension in the rear considered as being unprotected by this patent, whether said door is hinged or made to slide in a groove, and that irrespective of the particular mode of forming the connection between the operating mechanism and the door or doors.

This car is intended to be used in connection with a fare-box, and without the use of a conductor, the fare-box being so arranged and secured at the front end of the car, with relation to the driver and to the passengers, that both may inspect the fare after it has been deposited therein, thereby enabling the driver to open and close the door, and to collect and inspect the fare, without moving from his position in the front of the car, or withdrawing his attention from his horse. Moreover, a car thus made is more convenient for the passengers getting in and out, and much less liable to accident, besides being more roomy.

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

1. The combination of an appendage, *F*, having an entrance-door, with the main body *A* of a street-car, and mechanism, substantially as described, so connected with said door that it may be opened and closed from the front of the car, as set forth.

2. The combination of a car-body, *A*, with an extension, *F*, in the rear, carrying a sliding entrance-door of conformable shape, and with mechanism, substantially as described, by which the door can be opened and closed from the front of the car, as set forth.

3. The combination of a car-body, *A*, and an extension, *F*, in the rear, with a sliding entrance-door of conformable shape, provided with an arm or leg, *d'*, for the attachment of the operative mechanism of the door, for the purpose set forth.

4. The combination of a car-body, *A*, and an extension, *F*, in the rear, with a sliding entrance-door of conformable shape, having two or more arms or legs, *d d'*, one or both of which form a point of attachment for the operative mechanism of the door, substantially as set forth.

5. The combination of a car-body, *A*, having an extension, *F*, in the rear, with a sliding entrance-door of conformable shape, provided

with arms or legs $d\ d'$ and sheave-wheels $e\ e'$, substantially as and for the purpose set forth.

6. The combination of a car-body, A, having an extension, F, in the rear, with a sliding entrance-door of conformable shape, carrying one or more arms or legs, $d\ d'$, and sheave-wheels $e\ e'$, with a rail, a , correspondingly shaped and suitably supported, for the purpose set forth.

7. The combination of a car-body, A, extension F, sliding entrance-door H, legs $d\ d'$, and rollers $e\ e'$, with a rail, a , and two or more brackets, b , suitably placed beneath the car, for the purpose described.

8. In combination with a car-body, A, and extension F, a door, H, provided with two or more legs or arms, $d\ d'$, each carrying a sheave-wheel for the support of the door, and one of them, d' , connected to the mechanism by which the door is operated at the rear from the front of the car, as set forth.

In testimony whereof I hereunto set my hand to this specification.

JOHN STEPHENSON.

Witnesses:

P. HANNAY,
D. G. STUART.