J. STEPHENSON.

Street-Car.

No. 162,964. Patented May 4, 1875.

Fig. 1.

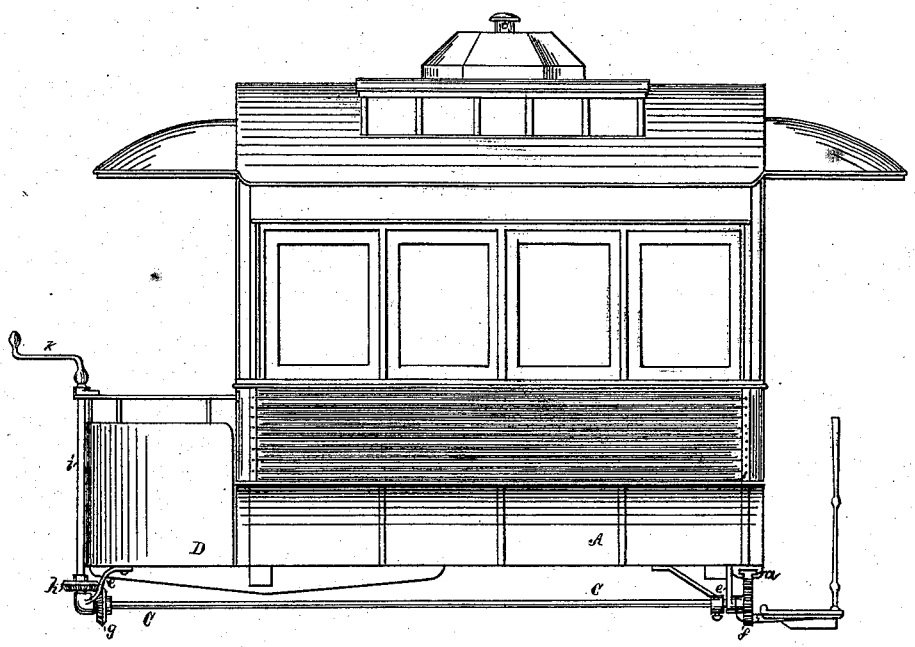


Fig. 2.

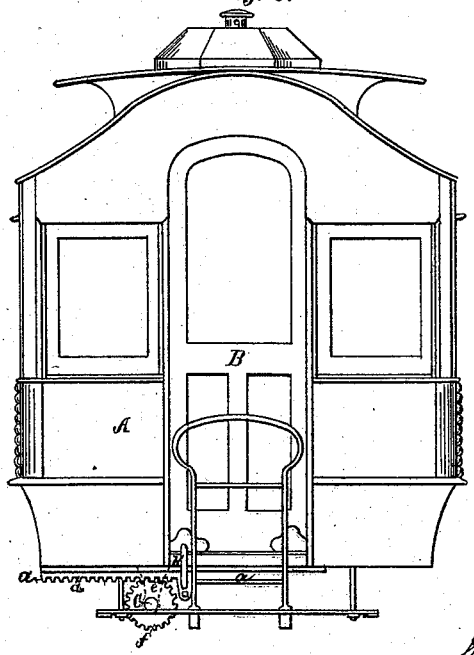


Fig. 3.

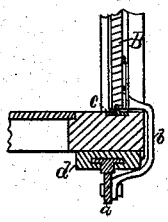
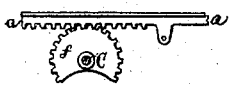


Fig. 4.



Witnesses.
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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. **162,964**, dated May 4, 1875; application filed April 27, 1875.

CASE G^{3a}.

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 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.

Figure 1 represents a side elevation of a street-car having my improvement applied thereto, the running-gear being removed. Fig. 2 represents an end elevation of the same, and Fig. 3 a detail section of the lower end of the door and its adjuncts. Fig. 4 represents a modification of the device for operating the rack-bar that operates the door.

My invention relates to an improved mode of operating the entrance-door of street-cars; and consists in a new and improved combination of operating devices with the entrance-door of a car provided with a rack-bar, whereby the driver can more readily and surely open and close the door in the rear, while at his post in front.

In this application the broad idea of operating the entrance-door of a car by means of a rack and an operating gear, and suitable mechanism to operate the latter is not claimed, as such forms the subject-matter of original application, marked Case G^3, and from which the subject-matter of this application is hereby withdrawn, and called Case G^{3a}.

To enable others skilled in the art to make, construct, and use my improvement, I will now describe its parts in detail, omitting a description of such parts of a car as are unnecessary to a full understanding of my present improvement.

The forward end of the car-body, so far as this invention is concerned, may be made in any suitable way; but the rear end and its entrance-door should be so constructed that the latter can be made to slide back and forth in opening or closing the entrance to the car.

A represents a car-body adapted to my purpose, it being provided with a sliding door, B, to the lower end of which is secured a rack-bar, *a*, by means of a bracket or brackets, *b*, (see Fig. 3,) to which it is firmly bolted. The lower end of the door is made to rest and slide on a rail or way, *c*, arranged on and secured to the rear end and upper side of the car-floor.

If desired, the door may be provided with grooved rollers for its support on the rail *c*, and to facilitate its operation.

The rack *a* may or may not be made to slide in a guide-groove; but it is preferred to do so. This plan is shown in Fig. 3, the rack-bar for this purpose being shown as of a T-shape in its cross-section, and so arranged as to slide in a correspondingly-grooved block, *d*, secured to the under side of the car-body at its rear end. By so making it, the door is made to move more evenly and steadily than it might otherwise do. For many reasons I prefer to locate the rack-bar below the end sill of the car, yet it might be arranged above the door, and at various other points, without in any way altering the principle of its application to the door, or of its mode of operation.

To the under side of the floor or bottom of the car is suspended a shaft, C, by means of hangers *e*, having suitable bearings for the mounting of the shaft. At the rear end of this shaft is secured a pinion-wheel, *f*, the teeth of which are made to mesh with those of the rack-bar *a*, while at its front end is secured a beveled pinion, *g*, which meshes with the teeth of a corresponding bevel-wheel, *h*, which, in turn, is mounted on the lower end of a crank-shaft, *i*, located at the front end of the driver's platform D, and through the crank-handle *k* of which the driver is enabled to impart motion to the door B in the rear, by means of the said shaft *i*, bevel-gears *h* and *g*, shaft C, pinion *f*, and rack-bar *a*. This arrangement of the shaft C, pinion *f*, and gears *g* and *h*, below the body of the car is to adapt it to the operation of the rack *a*, as arranged below the rear sill of the car.

In the event of a different arrangement of the rack, a corresponding arrangement of the shaft C and *e* may be required to be made in order to operate it, but which would in no way

involve a change of principle in the operating devices, but simply such change as could be effected by any competent mechanic skilled in car-building.

Instead of using a full pinion, *f*, a segmental pinion of suitable size and number of teeth may be used for the purpose. Such a pinion is shown in Fig. 4. In such case shaft C would act simply as a rock-shaft, the pinion and rack-bar being relatively so constructed that a partial revolution of the shaft would suffice fully to open or close the entrance to the car. As a rule, however, pinion *f* is preferred.

Having described my invention, what I claim in this application, and desire to secure by Letters Patent, is—

The combination of a rack-bar, *a*, and the rear or entrance door of a street-car with an operating gear, shaft C, bevel-gears *g* and *h*, and crank-lever *i*, substantially as and for the purpose set forth.

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

JOHN STEPHENSON.

Witnesses:
AUGUST RIPPERGER,
STUART A. STEPHENSON.