

A. C. GOODELL, Jr.
 Devices for Operating Car-Doors.

No. 154,241.

Patented Aug. 18, 1874.

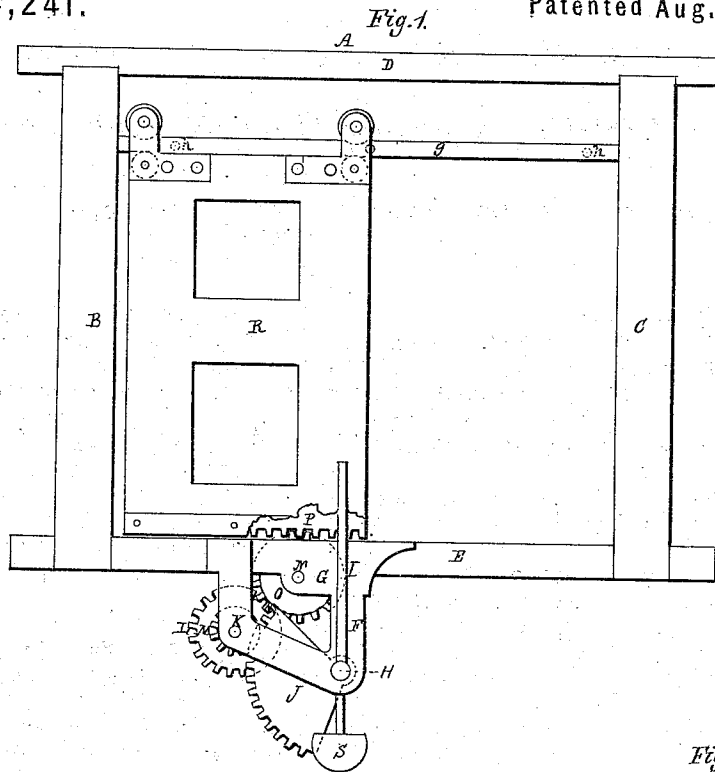


Fig. 2.

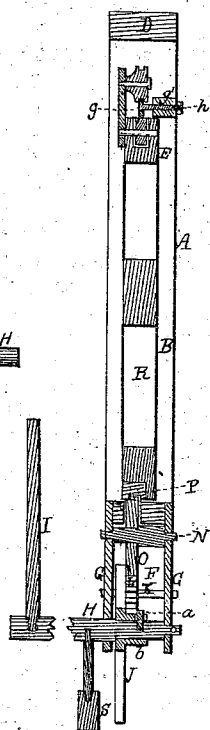


Fig. 4.



Fig. 5.

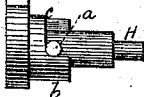
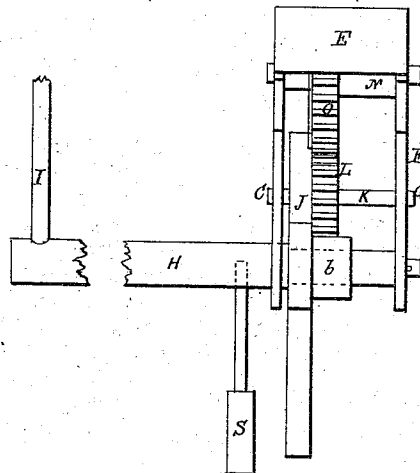


Fig. 3.
Enlarged.



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WITNESSES.
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IMPROVEMENT IN DEVICES FOR OPERATING CAR-DOORS.

Specification forming part of Letters Patent No. **154,241**, dated August 18, 1874; application filed May 4, 1874.

To all whom it may concern:

Be it known that I, ABNER C. GOODELL, Jr., of Salem, Essex county, Massachusetts, have invented certain Improvements in Mechanism for Operating Doors of Railway-Cars or other vehicles, of which the following is a specification:

The purpose of my present invention is to provide a simple, effective, and durable mechanism for enabling the driver of a car or other vehicle to control the movements of the rear door, the mechanism herein explained being positive in its movements, and not dependent upon springs or other mechanical devices, which are subject to disarrangement or failure.

In my present improvements I not only enable the driver to open or close the door, but to lock it or retain it in an open or closed state, as he may see fit; and these improvements consist, in part, in pivoting upon a horizontal rock shaft or rod, and within a suitable hanger, a sectoral toothed rack below the bottom of the car and in line with the door, which rack engages a pinion fixed upon a hub of a toothed wheel or spur-gear, which latter is also pivoted within the hanger before named, the spur-gear, in turn, meshing into and driving a third spur-gear disposed above the sectoral rack, and also pivoted within the hanger, and immediately below the door, the latter gear meshing into a toothed rack affixed to the lower edge of the door, the whole being so arranged that when the sectoral rack is turned in one or the other direction from one extreme position, the door is forced in the same direction, the connection between the sectoral rack and its shaft being such that after the opening or closing of the door has been completed the shaft returns, by its own volition, to a point opposite that last assumed in opening or closing the door, in order not only to be in readiness to effect a reverse movement of the door, but to permit of the opening or closing of the door by hand without effect upon the rock-shaft, one object I have had in view being to produce a device which may be brought to act upon the door or not, as occasion may require, and whether in use or not presents no unsightly or unusual appearance.

The drawings accompanying this specification represent, in Figure 1, an inside view of a portion of the end frame of a street-railway car with my improvements applied thereto; Fig. 2 being a vertical section of the same, and Fig. 3 an edge view of the mechanism for operating the car-door.

In these drawings, A represents a portion of the end frame of a street-railway car, whereof one corner-post is shown at B, a door-post at C, a roof-beam at D, and a floor-timber at E.

In carrying my invention into practice, I apply to the under side of the floor of the car or the timber E a hanger-frame, F, composed of two housings, G G, applied to opposite sides of such beam; and within or between these housings, and at the extreme lower part thereof, I mount a long rod or rock-shaft, H, which extends forward to the front or driver's platform, and terminates thereat in an upright arm or lever, I, which is under the immediate control of the driver and readily accessible to his foot or hand, as occasion may require. To the rock-shaft H, and between the housings, I affix an upright sectoral rack, J, while alongside this rack I pivot within the housings G G, by a horizontal shaft, K, a spur-gear, L, and upon one side of this gear I affix a pinion, M, into which the sectoral rack meshes. Within the upper part of the hanger or frame F I pivot, upon a horizontal shaft, N, a second spur-gear, O, which engages upon the one hand with the gear L, and at top with a horizontal rack, P, affixed to the under side of the door R, such door being suspended at top from a horizontal rail by rollers, in the usual manner of trundling doors, and provided with additional rollers *a*⁴ *a*⁴, to trundle or travel against the lower edge of such rail.

The union between the rock-shaft H and sectoral rack J is not a rigid one, as I desire to obtain a slip on the reverse movement of the shaft, in order not to act upon the mechanism, and to this end I affix to such shaft a radial stud or pin, *a*, and I cut away a portion of the hub *b* of the rack, as shown at *c*, to receive this pin, and permit of a short movement of the hub upon the shaft in either direction without effect upon the sector J; or

the same effect may be produced by affixing upon the rock-shaft a rigid arm to operate in connection with pins affixed to such sector J.

To the under side of the shaft H I suspend an equipoise-weight, S, to overbalance the gravity of the shipper-arm I and maintain the latter in an upright position, except at such times as the driver may be opening or closing the door, or forcibly hold it out of such position when he desires to lock the door in an open or closed state.

When the door is fully open or closed the stud *a* abuts against one or the other side of the notch *c*, in readiness to act upon the sector and open or close the door, as the case may be, when the shaft H is rocked in the right direction.

The operation of the mechanism herein explained is as follows, presupposing the door to be open, as represented in the drawings, and the sector J to the extreme of its movement to the left, at which point it was left upon opening the door, the stud *a* being against the side of the notch *c*, opposite that which it abutted against in effecting the opening of said door, or as shown in Fig. 4 of the drawings, which is a rear view of the shaft H, hub *b*, stud *a*, and notch *c*. If the driver desires to close the door, he pushes the shipper in such direction as to force the shaft H and stud *a* in the direction of the arrow in Fig. 4, and this stud acts upon the hub *b*, to rock the sector J in the same direction, and, through the agency of the pinion M, gears L and O, and rack J, move the door in a like direction until it is closed, and the stud *a*, by the gravity of the weight S, leaves the side of the notch with which it was last in contact, and abuts against the opposite side, in readiness to open the door, which is effected in the same manner as the closing. Owing to the arrangement of the stud *a* and notch *c*, the door may be opened by hand without effect upon the shaft H and shipper-arm I. If the driver desires to lock the door in an open or closed state, he maintains his pressure upon the shipper in the position in which it was last left in effecting such opening or closing, the result of which is that the stud *a*, in lieu of leaving the first side of the notch *c*, as before stated, remains in contact with it, and by preventing any return movement of the sector prevents also any movement of the door.

Upon each side of the rack P I affix a plate or guard, these two guards together consti-

tuting a channel to receive the rack and prevent misplacement of the door and one of these plates or guards bears at bottom upon a concentric ledge formed upon the adjacent face (the outer in the present instance) of the gear O, by which means the easy trundling of the door is facilitated, the noise of the gears lessened, and the concussions or thrusts upon the door lightened.

The details of the mechanism herein explained may be departed from to some extent without losing sight of the gist of my invention, which consists in the adaptation of devices substantially as herein shown, whereby I obtain a positive mechanical movement to operate the door.

It will be seen, by referring to the accompanying drawings, that I attach the rail *g*, which supports the door, to the backing or supporting bar *g'* in a peculiar manner—that is, by securing it by several horizontal starts, *h h*, &c., in lieu of screwing or bolting it directly to the face of the bar, as now generally practiced. By this means I provide a means of escape for dust, dirt, or other particles which otherwise might in time find lodgment between the upper parts of the two and choke or clog the channel in which the edges of the rollers travel.

I claim—

1. The combination of the weighted rock-shaft H and shipper-arm I with the door and intervening mechanism, so that a movement of the shipper to either side of its mean position shall act upon the door to open or close it, substantially as set forth.

2. The weighted shipper-lever and system of gearing for communicating movement from the shipper to the door, combined to open or close the door, and also to permit free movement of the door by hand independently of and without moving the shipper, as set forth.

3. The combination of the shaft H, overbalanced shaft N, and the shipper-arm I, substantially as and for purposes set forth.

4. The rail *g*, attached to the bar *g'*, substantially as herein described, by means of the starts *h h*, &c., whereby interstices are provided for escape of dust, lint, or other substances, essentially as and for purposes stated.

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Witnesses:

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