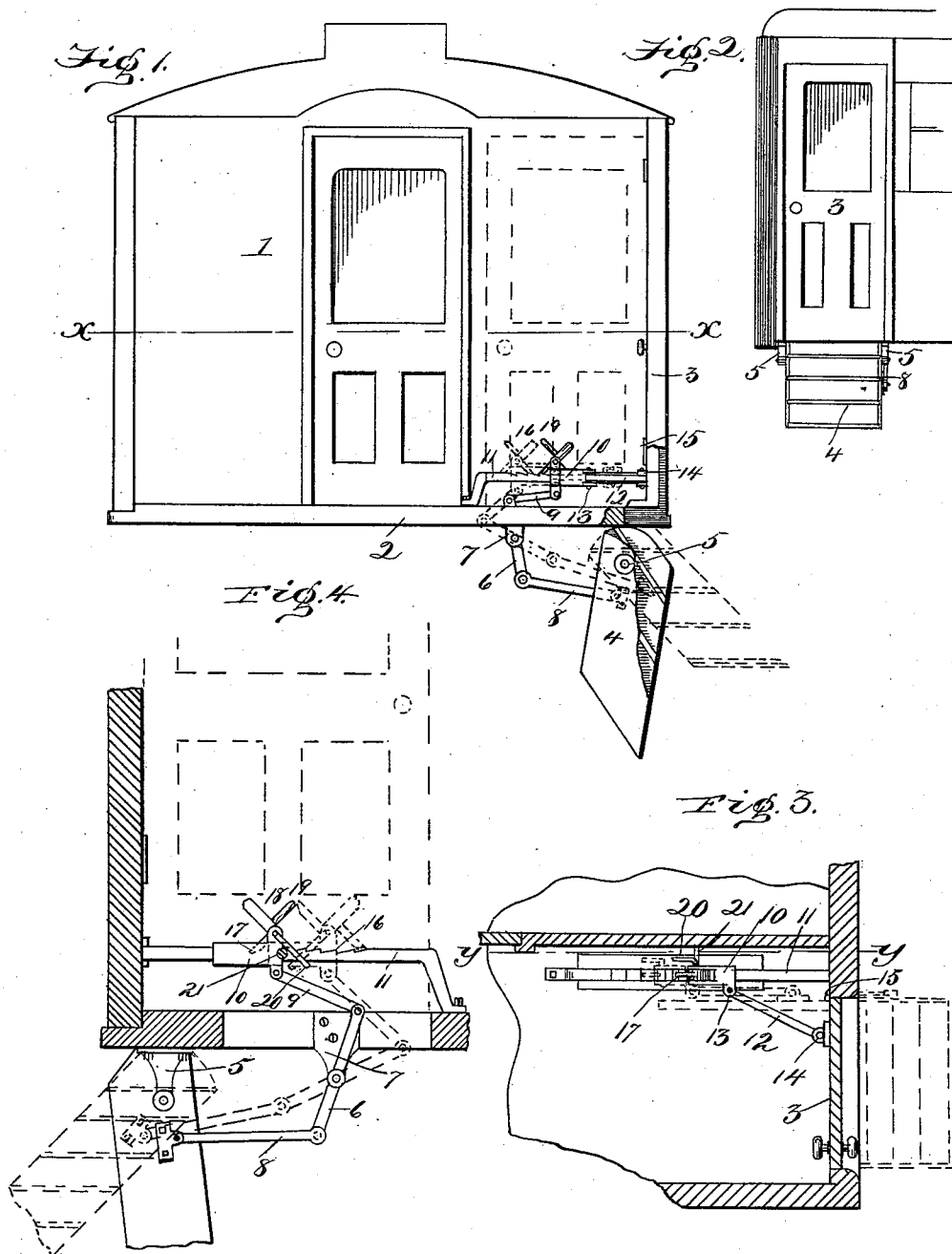


(No Model.)

F. MUTSCHLER.
VEHICLE STEP.

No. 540,797.

Patented June 11, 1895.



Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERICK MUTSCHLER, OF ROCHESTER, NEW YORK.

VEHICLE-STEP.

SPECIFICATION forming part of Letters Patent No. 540,797, dated June 11, 1895.

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To all whom it may concern:

Be it known that I, FREDERICK MUTSCHLER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Vehicle-Steps; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention has for its object to provide an improved step for railway-cars, or other vehicles, adapted to be moved out of the way and preferably within the line of the car when the latter is in motion, so as not only to decrease the wind resistance of the car and prevent persons from getting on or off the car while in motion, but render it less liable to engage obstructions or platforms at stations and which, when desired, can be moved so as to allow passengers to alight or enter, and to these ends it consists in certain improvements, all as will be hereinafter described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is an end view of a portion of a vestibuled car, showing the application of my invention, a portion of the platform and steps being broken away to show the construction and the steps shown elevated in dotted lines; Fig. 2, a side elevation of the same; Fig. 3, a horizontal sectional view on the line *xx* of Fig. 1; Fig. 4, a vertical sectional view on the line *yy* of Fig. 3.

Similar reference-numerals in the several figures indicate similar parts.

The car or vehicle to which my invention is applied is indicated by 1 and is provided with the usual platform 2, preferably extending nearly the width of the car, and forming a vestibule, 3 indicating the usual door, and 4 the flight of steps, consisting of four or more, as desired. The steps are pivoted at their upper portion upon brackets 5 attached to the under side of the platform and are arranged to be turned down to the position shown in full lines Fig. 1, when the car is in motion being then preferably entirely within the line of the car-body, or they may be turned out to the position shown in dotted lines to allow passengers to alight or enter the car. The position of

these steps is controlled from the vestibule-door 3 so that when the door is closed and the car is in motion the steps are down in the position shown in full lines, and when open they are moved upward and outward and are locked in position until the door is again closed, and the means for accomplishing this consists, in the present embodiment, of a lever 6 pivoted to a bracket or support 7, the lower end being connected by a link 8 pivoted to the steps, while the upper end is connected to a link 9 pivoted to a slide 10, operating on a guide or way 11 on the car, and to this slide is pivoted on a vertical pivot 13 one end of a link 12, the other end of which is pivoted at 14 to the inner side of the door 3. When the door is opened the steps will be raised, as shown, and passengers may alight, and it will be noted that in this position the toggle formed by the link 9 and lever 8 is nearly straight, thereby requiring but little power to hold the steps from moving down, and that the door also forms one member of a toggle, the other member being formed by the link 12 and the pivot or point of connection forming the knuckle between the link 12 and the door is slightly in rear of or may be in line with the hinges 15 of the latter, so that the tendency of a weight on the steps would be to hold the door open more firmly. In order, however, that there may be no possibility of the steps moving down when a passenger is upon them, I provide the way 11 on which the slide 10 operates with ratchet teeth 16 pointing inward, and arrange upon said slide 10 a co-operating pawl or detent 17, which engages said rack and prevents the movement of said slide in an outward direction to allow the steps to move down until the pawl is lifted out of engagement by pressure upon an operating portion or treadle 18. The pawl is held in or out of engagement with the rack by a device such as a weight 19 connected to it above its pivot and adapted to be moved across the center of motion though a spring could be employed for the same purpose, but in order to insure the proper engagement of the pawl, I provide it below its pivot with an arm 20 adapted to strike a projection or stud 21 when the slide is moved outward and the door is closed, operating to turn the pawl positively down upon the rack, as shown in full lines Fig. 4, the weight holding it in this po-

sition so that when the door is opened and the steps raised the pawl will slide over the teeth, holding the steps at all points and even if the door should not be moved back far enough to be retained by pressure back of its hinges, as in dotted lines Fig. 3, nevertheless the parts would be held.

It will be understood that the steps are held down when the door is closed and locked and that when the door is open the pawl is in engagement with the rack so that it is necessary for the operator to disengage the pawl, using the treadle 18 for the purpose, when the door is to be closed, the weight 19 holding the pawl disengaged until the door is closed again when it is engaged with the rack, as described.

The herein described construction not only enables wide platforms or vestibules to be employed on cars, but also the steps are folded out of the way of station platforms, or other obstructions likely to be encountered, and also as the treads of the steps are inclined, the accumulation of ice or snow upon them is prevented.

The connections between the door and steps are so positioned and constructed that very little power is required to operate them, the pivotal center of said steps being above their plane of movement.

I claim as my invention—

1. The combination with a car or vehicle, the steps pivoted thereon and arranged to swing below their normal plane of use, of the swinging door, and connections between it and the steps, whereby, when the door is opened, the steps will be swung up, substantially as described.

2. The combination with a car or vehicle and the steps pivoted thereon and arranged to swing below their normal plane of use, of the hinged and swinging door arranged above the steps, and connections between said door and the steps for operating the latter by the movement of the former embodying a toggle, one member of which is formed by the door, the knuckle of said toggle being movable in line with or beyond the hinge of the door, substantially as described.

3. The combination with a car or vehicle and the steps pivoted thereon and arranged to swing below their normal plane of use, of a guide, a slide operating thereon and connected to said steps, a pawl and rack for arresting the movement of the slide in one direction, an entrance door for the car arranged above the steps, and connections between it

and the slide, whereby the steps will be elevated to operative position when the door is opened, substantially as described.

4. The combination with the car or vehicle having the hinged entrance door, of the steps pivoted on the car and arranged to swing below their normal position of use, connections between the door and steps for swinging the latter upward by the opening of the door, embodying a toggle, one member of which is formed by the door, and pawl and rack devices for preventing the operation of the door in a direction to swing said steps downward, substantially as described.

5. The combination with the car or vehicle having the hinged entrance door, of the steps pivoted on the car and arranged to swing below their normal position of use, connections between the door and steps for swinging the latter upward by the opening of the door, embodying a toggle, one member of which is formed by the door, a pawl and rack retaining device for preventing the operation of the door in a direction to swing the steps downward, a holding device (as a weight) for the pawl, and a stop engaged by the pawl for throwing it into positive engagement with the rack, substantially as described.

6. The combination with a car or vehicle having the hinged entrance door, and the steps pivoted on the car, of the guide, the slide operating thereon, the lever 6 and links 9 and 8 connecting it with the slide and steps, and the link 12 pivoted to the door and to the slide, substantially as described.

7. The combination with a car or vehicle having the hinged entrance door, and the steps pivoted on the car, of the guide having the teeth, the slide operating on said guide and having the pawl, the lever, the link for connecting the slide with the lever, the link connecting the steps with the lever, and the link pivoted to the door and to the slide, substantially as described.

8. The combination with a car or vehicle having the hinged entrance door, and the steps pivoted on the car, of the slide, and a guide therefor, connections between the slide and the steps for moving the latter, the pawl on the slide, and a cooperating rack, and a link pivoted at one end to the door and at the other end to the slide, substantially as described.

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Witnesses:

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