

J. M. CORDRAY.
EXTENSIBLE CAR STEP.
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1,056,152.

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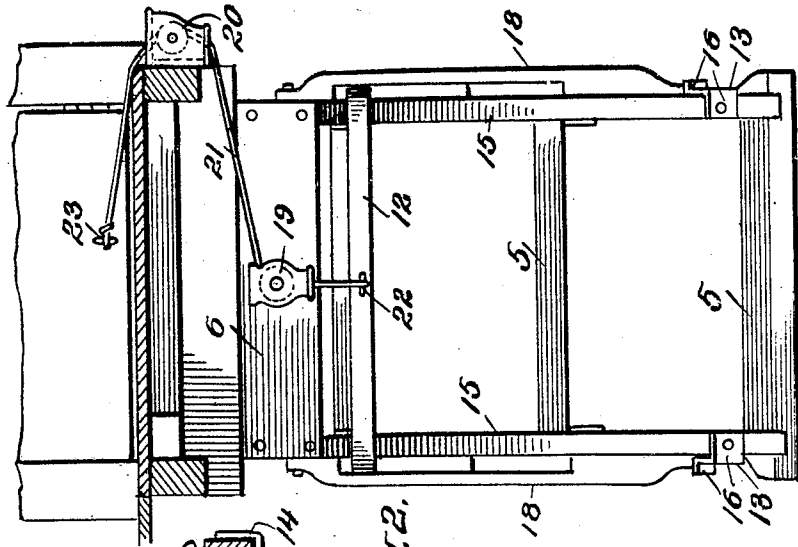


Fig. 1.

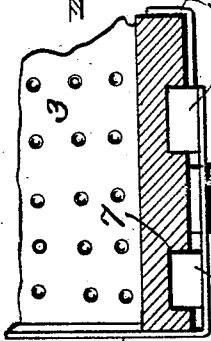


Fig. 2.

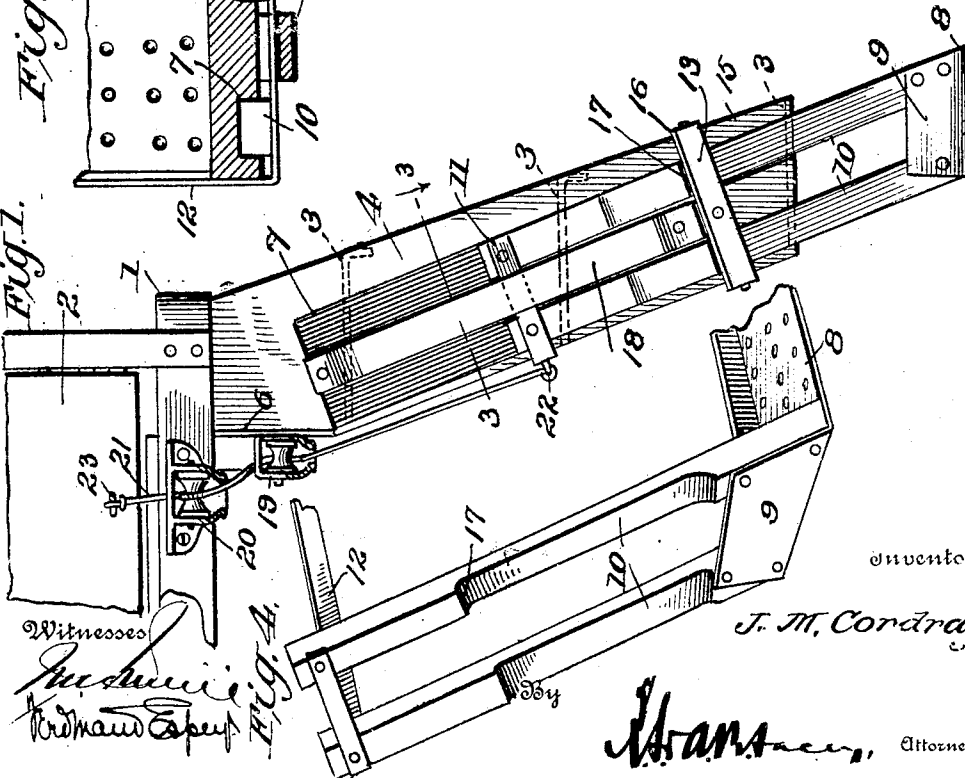


Fig. 3.

Witnesses

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EXTENSIBLE CAR-STEP.

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To all whom it may concern:

Be it known that I, JAMES M. CORDRAY, citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Extensible Car-Steps, of which the following is a specification.

This invention relates to extension steps for railway passenger coaches, street railway cars, etc.

One aim of the invention is to provide a structure of the class mentioned in which the extensible step will be automatically lowered or extended upon opening of the door of the car and raised or retracted upon closing of the door, the use of manually operated levers or other actuating devices for the step being in this manner obviated.

Another aim of the invention is to so mount the extensible step that when in extended position it will be firmly braced and when retracted will be supported in position out of the way of obstructions along the track.

The invention further aims to so arrange the raising and lowering mechanism for the step that it will be concealed from view and not be liable to be disarranged by persons ascending or descending the step.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawing, in which:

Figure 1 is a side elevation of the step structure embodying the invention. Fig. 2 is a rear elevation thereof, the extensible step being shown raised. Fig. 3 is a sectional view on the line 3—3 of Fig. 1. Fig. 4 is a fragmentary perspective view of the extensible step and hanger.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawing by the same reference characters.

In the drawing, the vestibule platform of the car is indicated in general by the numeral 1 and the door is indicated by the numeral 2 and in the drawing is illustrated as hinged, although it may be slidably mounted without departing from the spirit of the invention, as will be presently explained. A relatively fixed flight of steps of the ordinary type is located at the side of the platform and the treads of this flight of steps are indicated by the numeral 3 and the stringers

between which the treads are mounted are indicated by the numeral 4. Each of the steps is provided at its rear with a relatively short riser 5 and a riser-plate 6 is secured at its ends to the rear edges of the stringers 4 and extends between the said stringers and between the under side of the platform 1 and the tread of the upper step 3. Each stringer 4 is formed in its outer face with parallel grooves or channels 7 which slidably receive the hanger arms of the extension step, as will now be explained.

The extension step above mentioned is indicated by the numeral 8 and is provided at its ends with upstanding flanges 9. A pair of hanger arms 10 are secured at their lower ends to each of the flanges 9 and extend upwardly therefrom in inclined position and in parallel relation. These arms 10 are slidably received in the channels 7 as above stated and at their upper ends are connected by means of a brace-bar, the end-ports of which are bent at right angles as at 11 and secured in any suitable manner to the said upper ends of the hanger arms. The intermediate portion of the brace-bar indicated by the numeral 12 extends transversely in rear of the stringers 4, as clearly shown in Fig. 2 of the drawing. Thus, not only does the brace bar serve to connect and properly space the upper ends of the hanger arms of each pair but it also serves to prevent the upper ends of these hanger arms spreading away from the respective stringers 4. The hanger arms are also confined for sliding movement in the channels 7 by means of a yoke 13 having angular ends 14 secured to the front and rear edges of the stringers 4 and secured at its intermediate portion as at 15 to the respective stringer between the channels 7. This yoke is provided with an outwardly projecting flange 16 and the arms 10 are formed or provided upon their outer sides with stop-shoulders 17 which are designed to rest upon the flange 16 when the step 8 is in extended position, the movement of the step to this position being limited by the engagement of the shoulders against the flange and the step being braced in its extended position by such engagement. As an additional means for bracing the upper ends of the hanger arms against movement out of the channels 7, there is secured upon the outer side of each stringer 4 a bracket 18 which extends between the channels 7 and parallel thereto.

and has the intermediate portion spaced from the rear stringers as clearly shown in Figs. 2 and 3 of the drawings. That portion of the bar 11 which connects the upper ends of each pair of hanger arms is slidably received between the intermediate portion of the bracket 18 and the outer side of the adjacent stringer 4.

A pulley 19 is mounted upon the rear side of the riser plate 6 and a pulley 20 is mounted at the rear side of the platform 1, and a cable or other suitable flexible connection 21 is connected at one end as at 22 to the intermediate portion 12 of the brace-bar which connects the upper ends of the hanger arm and is trained over these pulleys and connected as at 23 to the door 2. In Fig. 1 of the drawing the door is illustrated in open position and in Fig. 2 is shown closed, and by referring to Fig. 2 it will be readily understood that as the door is swung to open position the cable or other flexible connection 21 will become slack and the step 8 and its hanger arms 10 will lower by gravity to extended position, as shown in Fig. 1 of the drawing. It will also be understood that as the door is swung to closed position, the pull exerted upon the cable 21 will serve to raise or retract the step 8 until it assumes a position beneath the lowermost one of the steps 3.

It will be apparent that the cable 21 might be connected to a sliding door equally as well as to the hinged door shown in the drawing, and in fact, if desired, it may have no connection whatsoever with the door but may be operated through the medium of an air cylinder and piston controlled by the conductor, motorman or engineer.

Having thus described the invention what is claimed as new is:—

1. In a structure of the class described, a relatively fixed step, stringers supporting the step, an extension step, hangers slidably mounted upon the stringers and supporting the extension step, cooperating stops upon the stringers and hangers arranged to limit

the movement of the extension step to extended position, means connecting the upper ends of the hangers at each side of the structure, a flexible element attached to the connecting means, and means connected with the said flexible element for raising and lowering the extension step.

2. In a structure of the class described, a relatively fixed step, stringers supporting the step, an extension step, the stringers being provided with channels, hangers slidably mounted within the channels and supporting the extension step, means confining the hangers for sliding movement in the channels, a stop upon each of the hangers arranged to engage with the confining means whereby to limit the movement of the hangers to extend the extension step, means connecting the upper ends of the hangers at each side of the structure and bracing the same against movement from each other, and means operatively connected with the connecting means for raising and lowering the extension step.

3. In a structure of the class described, a relatively fixed step, stringers supporting the step and provided with spaced apart longitudinally extending channels, an extension step, hangers slidably mounted within the channels and supporting the extension step, the intermediate portions of the hangers being reduced in thickness, yokes extending transversely of the stringers and bearing against the outer faces of the reduced portions of the hangers and adapted to be engaged by the unreduced portions thereof to limit their upward and downward movement, and means operatively connected with the hangers for raising and lowering the extension step.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES M. CORDRAY. [L. S.]

Witnesses:

ALVIN GALLAHER,
Mrs. M. A. CORDRAY.