

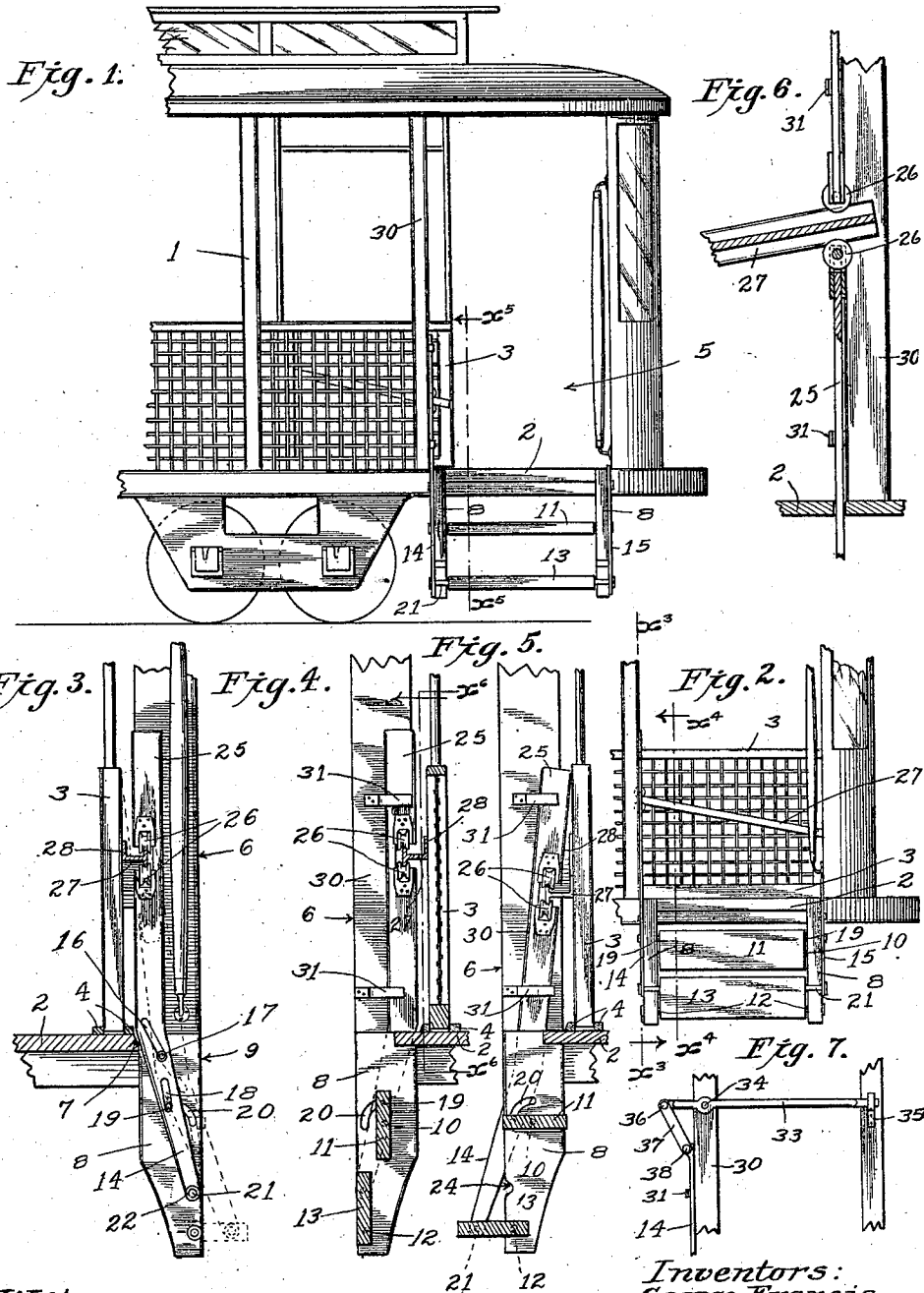
E. W. LEWIS, G. W. WRIGHT & G. FRANCIS.

FOLDING CAR STEPS.

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UNITED STATES PATENT OFFICE.

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FOLDING CAR-STEPS.

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To all whom it may concern:

Be it known that we, EDWARD W. LEWIS and GEORGE W. WRIGHT, both citizens of the United States, and GEORGE FRANCIS, a subject of the King of Great Britain, who has declared his intention of becoming a citizen of the United States, all residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Folding Car-Steps, of which the following is a specification.

This invention relates to car steps of that particular type in which the tread of the step may be moved into folded position when not in use, and one of the main objects of the invention is to so construct the car steps that they may be folded within the line of the side of the car, thereby doing away with the objectionable feature of having projections extending outwardly from the side of the car, and at the same time providing a greater clearance between cars when passing on curves or where double tracks are in close proximity.

Another object of the invention is to provide means whereby the folding steps are operated in conjunction with the closing of a gate and the raising and lowering of the steps operated simultaneously therewith.

Another object of the invention is to provide a device of the character described of simple operation and economical construction.

Other objects and advantages will appear hereinafter from the following description.

Referring to the drawings which are for illustrative purposes only: Figure 1 is a side elevation of a portion of a car equipped with folding steps, showing an embodiment of our invention, with the steps in lowered position, and the gate shown in open position. Fig. 2 is a view similar to Fig. 1, showing the gate in closed position and the steps in upper or folded position. Fig. 3 is a vertical sectional view, on line x^3-x^3 Fig. 2, looking in the direction indicated by the arrow. Fig. 4 is a vertical sectional view on line x^4-x^4 Fig. 2, looking in the direction of the arrow, showing the steps in folded position, and the gate closed. Fig. 5 is a vertical sectional view, on line x^5-x^5

Fig. 1, showing the steps in lowered position, and the gate open. Fig. 6 is a sectional view on line x^6-x^6 Fig. 4, looking in the direction of the arrow. Fig. 7 is a fragmental view, showing a modified form of operating means for the step.

1 designates a car, 2 the platform of the car, and 3 a gate adapted to move between guide rails 4 on the car platform across the entrance 5 of the car. The platform 2 at the entrance 5 of the car is cut away a distance back from the side line or side of the car 6, as indicated at 7. At each side of the cut away portion 7 of the platform 2, are secured, in any suitable manner, side hangers or step supports 8, the outer line 9 or front of each hanger 8 forms a continuation of the side line of the car. Pivotaly mounted at 10 to each side hanger 8 is an upper step or tread 11, and pivotally mounted at 12 to each side hanger 8, is a lower step or tread 13. On the outer side of one step support 8 is an operating bar 14 and a guiding-bar 15 is placed on the outer side of the other step support 8, each bar 14 and 15 is provided with a slot 16 which engages a pin 17 on the adjacent step support 8. Each bar 14 and 15 is also provided with a slot 18 which engages a pin 19 on the upper step 11, which pin 19 extends through a curved slot 20 in the adjacent step support 8. At each end of the lower step 13, near the front edge thereof, is a pin 21 which extends laterally therefrom, and is engaged in a perforation 22 in the lower end of the adjacent bars 14 and 15 respectively.

The operating bar 14 is provided with an upward extension 25 having mounted thereon a pair of grooved rollers or pulleys 26 which engage therebetween a T-rail or cam track 27, provided with a flange 28 secured in any suitable manner to the outside of the gate 3. The cam track 27 is secured to the gate 3 in a diagonal position, the lowest portion of the cam track 27 being at the forward end of the gate, and the upper or highest portion of the cam track 27 being at the inner end of the gate. Secured to the upper right 30 of the car is a pair of guide plates 31 which extend over the operating bar 14, preventing displacement of the operating bar.

The device above described is operated in the following manner: In the position shown in Fig. 1, the steps are shown in lowered or operative position, and the gate 3 shown in open position. As the gate 3 is pushed forward to close the entrance of the car, the grooved pulleys 26 ride upward along the cam track 27, thereby raising the operating bar 14, which being in engagement with the pin 21 on the lower step 13 swings the step or tread 13 on its pivot 12 into upper or folded position shown in Fig. 4. At the same time, the pin 19 on the upper step 11 being seated in the lower end of the slot 18 of the operating bar 14, is raised upwardly causing the step 11 to move about the pivot 10 thereof into the upper or folded position shown in Fig. 4, the action of the gate in closing, and the folding of the steps into the upper or closed position, taking place simultaneously. The guiding bar 15 is secured to the lower step by pin 21 and is also engaged by a pin 19 on the upper step 11, so that upon the operation of the steps in either direction by the operating bar 14, the bar 15 operates with the same movement as the bar 14 and insures that the ends of the steps connected thereto rise and lower in unison with the ends of the steps attached to the bar 14. When the steps are in lowered position, the pins 19 on the step 11 are resting on the lower end of the slots 20 in the step supports 8 and against the upper end of the slots 18 in the operating bar 14 and guiding bar 15, thereby preventing lower movement of the bars 14 and 15 and steps 11 and 13.

As shown in Fig. 5 of the drawing, the front of the upper step 11 when in lowered position, is substantially flush with the side line of the car and the front edge of the step support 8. The lower step when in lowered position, as illustrated in the same figure, extends outwardly beyond the side line of the car as clearly illustrated. Upon the steps being raised to folded or inoperative position, the bottom of the lower step is substantially flush with the side line of the car and the step support 8, a portion of the step supports 8 being cut away at 24 to clear the pins 21, and the upper step is wholly within the front lines of the step supports 8, as clearly illustrated in Fig. 4 of the drawing.

In the form shown in Fig. 7, an entrance closure is used, consisting of a single bar 33 pivoted at 34 to the upright 30 and supported at its outer end by means of a stop 35. In this form the inner end of the bar is pivoted at 36 to the upper end of a link 37 pivoted at 38 to the upper end of the operating bar 14. In the form illustrated in Fig. 7, the upward movement of the outer end of the bar 33, opening the passageway to the

car, causes the inner end of the bar 33, link 37, and operating bar 14 to move downwardly, thereby lowering the steps into the position shown in Fig. 5. When it is desired to close the entrance to the car and the outer end of the bar 33 is moved downwardly into position shown in Fig. 7, the link 37 and bar 14 are caused to move upwardly, thereby folding the steps into inoperative position shown in Fig. 4 of the drawing.

What we claim is:

1. Folding car steps comprising a pair of downwardly depending step supports, each having a slot therein, an upper and lower step between said supports pivoted thereto, an operating bar on one of said step supports having a slot therein, a pin at the forward edge of the upper step extending through said slot in the step support into the slot in the operating bar, a pin at the forward edge of the lower step engaged by the operating bar, and means for raising and lowering the operating bar.

2. In combination with a car platform, a pair of step supports, an upper and lower step between said supports pivoted thereto, an operating bar for raising and lowering the steps, a gate on the platform at the top of said steps, and means on the gate for raising and lowering said operating bar.

3. In combination with a car platform, a pair of step supports, an upper and lower step pivoted to the step supports, an operating bar for raising and lowering the steps, grooved rollers on said operating bar, a gate on the platform at the top of said steps, and a cam track on said gate engaging said rollers on the operating bar to raise and lower the operating bar by closing and shutting the gate respectively.

4. In combination with a car platform, a pair of step supports each having a slot therein, an upper and lower step pivoted to the step supports, an operating bar at the side of one of the step supports, a guiding bar at the side of the other step support, said operating bar and guiding bar each having an upper and lower slot therein, a pin on each step support engaging the upper slot in its associated bar, pins at the forward edge of each step at each end thereof engaging its associated bar, the pins on the upper step extending through the slots in the step supports into the lower slots in the bars, grooved rollers on said operating bar, a gate on the platform at the top of said steps, and a cam track on said gate engaging said rollers to raise and lower the operating bar by closing and opening the gate respectively.

5. In combination with a car platform, a pair of step supports extending downwardly from said platform and having their outer

faces flush with the side of the car, a plurality of steps between said step supports pivoted thereto, one of said steps extending outwardly beyond said step supports, an operating bar on one of said step supports connected to the forward edge of each step, and means for raising said operating bar to fold said steps within the outer face of the step supports.

In testimony whereof, we have hereunto set our hands at Los Angeles, California, this 1st day of December, 1910.

EDWARD W. LEWIS.
GEORGE W. WRIGHT.
GEORGE FRANCIS.

In presence of—

FRANK L. A. GRAHAM,
P. H. SHELTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
