

A. V. WINEGARDEN.
FOLDING CAR STEP AND DOOR.
APPLICATION FILED OCT. 28, 1912.

1,052,636.

Patented Feb. 11, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

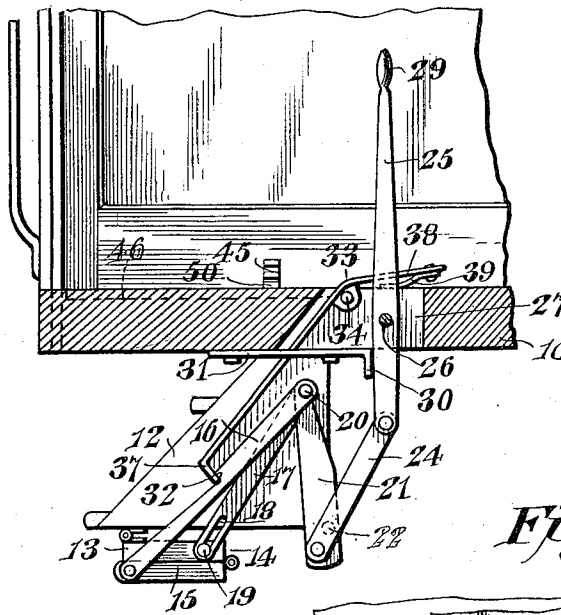


Fig. 2.

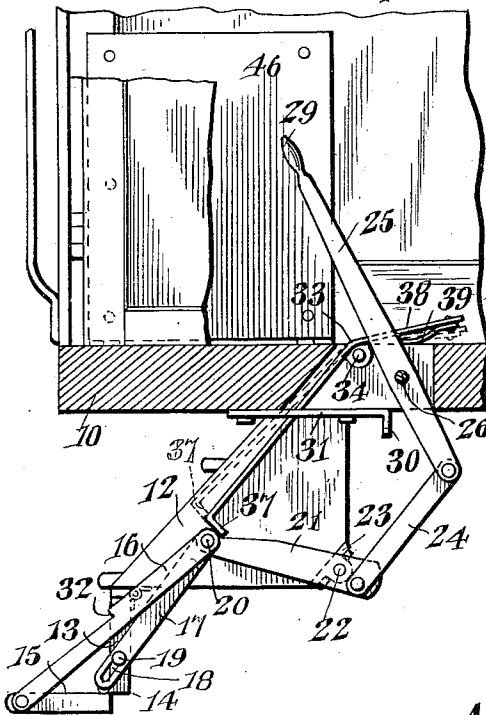
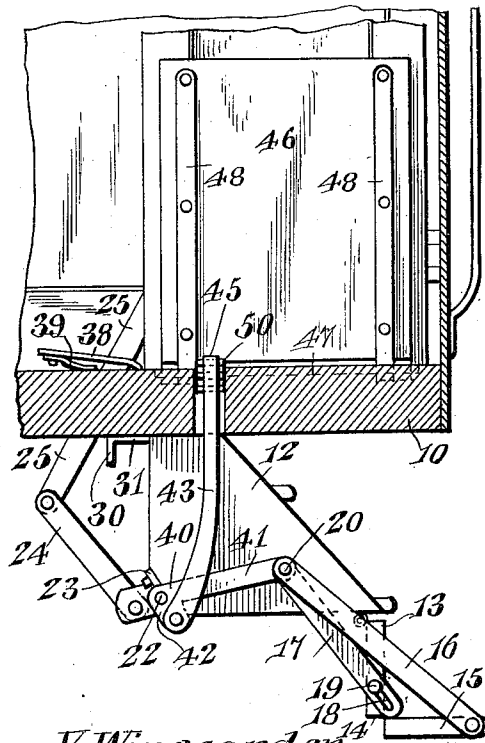


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

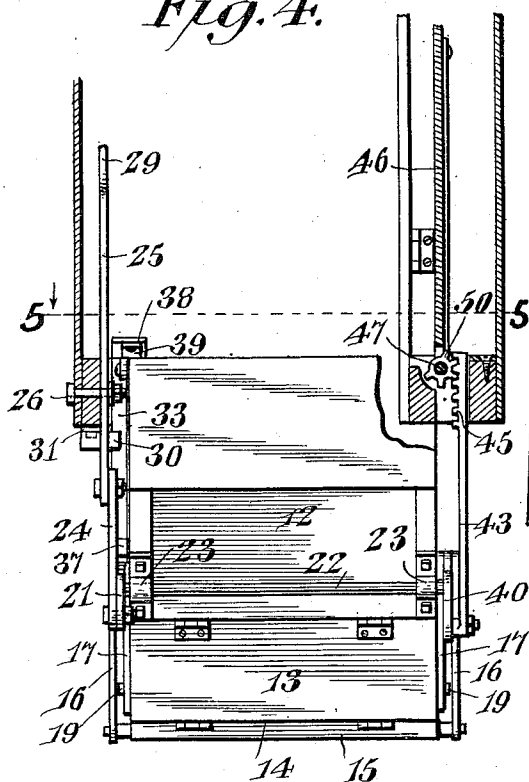


Fig. 5.

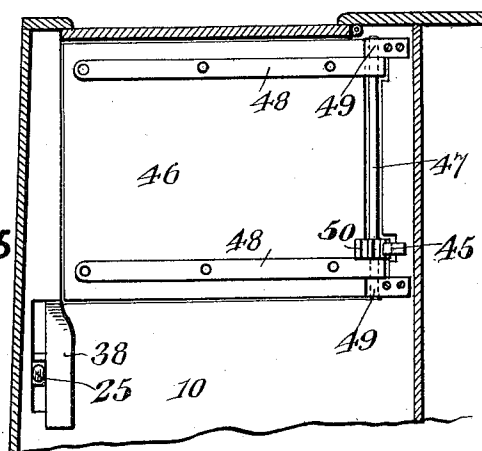


Fig. 6.

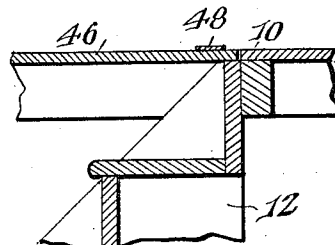


Fig. 7.

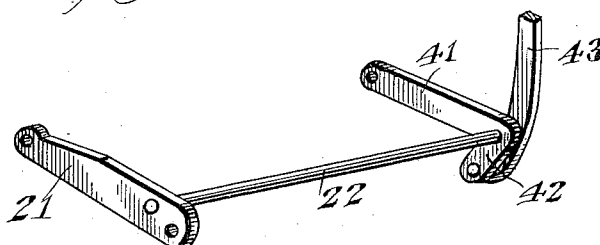
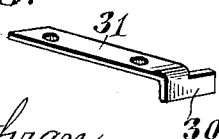


Fig. 8.



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FOLDING CAR STEP AND DOOR.

1,052,636.

Specification of Letters Patent.

Patented Feb. 11, 1913.

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To all whom it may concern:

Be it known that I, AREY V. WINEGARDEN, a citizen of the United States, residing at Eldorado, in the county of Butler and State of Kansas, have invented a new and useful Folding Car Step and Door, of which the following is a specification.

My invention relates to improvements in railway car steps, and has for its object to provide the fixed steps of the car with a folding step, in combination with a door leading to the steps, and operating means for simultaneously lowering or opening the folding step and opening the door or closing the folding step and shutting the door, means being provided for positively locking the folding step and door in a closed position and also for holding them both in an open position.

The invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of construction may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a transverse sectional view taken through the end sill of the platform of a railroad coach showing the outer side of the fixed steps with my invention applied thereto, the parts being in a closed position. Fig. 2 is a similar view with the parts shown in the open position. Fig. 3 is a transverse sectional view taken through the platform close to the end of the body of the car showing the inner side of the fixed steps with the invention applied thereto and the parts in an open position. Fig. 4 is a longitudinal sectional view through the platform showing the back of the fixed steps with the invention applied thereto, the parts being shown in an open position. Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 4 but showing the parts in a closed position. Fig. 6 is a fragmentary view of a portion of the fixed steps and platform showing the trap door in a closed position. Fig. 7 is a perspective view of the operating lever, rock shaft and associated parts. Fig.

8 is a perspective view of the member which serves as an abutment for the hand lever.

Referring to the drawings, which illustrate the preferred embodiment of my invention, 10 designates the platform of a railroad coach provided with the usual passageway or exit leading to the fixed steps 12. Near the front or outer edge of the bottom of the lower step of the fixed flight of steps is hinged the riser 13 of a folding step 14. The riser 13 and the tread 15 of the folding step are hinged together at their meeting edges so as to fold flat one against the other beneath the lower fixed step. Pivotaly connected to the tread 15, near its outer or front edge, is a link 16, and to the rear or lower end of the riser 13, is connected the end of a second link 17 having a slot 18 in its lower end which has a sliding engagement with a fixed headed pin 19 carried by the riser at the outer side. The upper or other ends of the links 16 and 17 are brought together and connected by a common pivot 20. Connected to the pivot 20 between the ends of the links is the free end of a lever 21. This lever is fixed to one end of a transversely-arranged rock shaft 22, which is arranged in rear of and extends entirely across and slightly beyond the sides of the fixed step and is journaled in bearings formed by strap irons 23 secured to the underside of the fixed steps. Connected to the other end of the lever 21 is the lower end of a diagonally-disposed link 24. The upper or other end of the link is connected to the lower end of a normally vertically-disposed hand lever 25. The lever 25 is pivoted at 26 in a slot 27 formed in the inner face of the transverse end sill of the platform 10, so that its lower end projects below the platform. The hand lever extends up some distance above the platform and terminates at its upper end in a suitable grip or handle 29. The stroke of the hand lever is limited in its forward movement by the depending stop 30 formed on a plate 31 attached to the underside of the car sill.

The link 16 connected to the end of the tread 15 is provided at an intermediate point with a shoulder 32. Adapted to cooperate with the shoulder 32 is an angular latch lever 33, which extends up through the slot 27 of the platform and is pivoted at 34 within said slot, and has its lower end provided

with a downwardly-extending lip 37, adapted to engage the shoulder 32 of the link 16. The short arm 38 of the latch lever extends over the platform constituting a treadle, and has secured to its free end one end of a flat spring 39, which bears against the platform and forces said arm up. In the position shown in Fig. 1 with the steps folded or closed, the lip 37 of the latch lever engages with the shoulder 32, while in the other position shown in Fig. 2, the lip 37 is brought in rear of and above the pivot 20 which connects the lever 21 with the links 16 and 17, thereby holding the steps locked in both positions.

The rockshaft 22 has secured to its end at the inner side of the steps a bell crank lever 40. The long or upper arm 41 of the bell crank lever is connected to the pivot 20 connecting the upper ends of another set of links 16 and 17, which are exactly similar to the corresponding links at the outer side of the steps, except that the shoulder 32 is omitted from the link 16. Connected to the free end of the lower or short arm 42 of the bell crank lever is the lower end of a vertically-disposed arm 43, the upper end of which extends up through a hole in the platform 10 close to the passageway leading to the steps. The upper end of the arm 43 is provided with teeth constituting a rack 45.

Adapted to normally close the passageway in the platform is a trap door 46, which is hinged at the inner side of the passageway and is designed when closed to have its upper face flush with the top of the platform. The trap door is provided along its inner edge with a pintle rod 47 secured by means of strap irons 48, the ends of the pintle rod passing through eyes 49 connected to the platform. Secured to the pintle rod 47 is a segment 50 which meshes with the rack 45 carried by the arm 43.

When it is desired to lower the folding step 14 and open the door 46 leading to the steps, the trainman places his foot upon the treadle 38 of the latch lever 33, thus raising the lip 37 out of engagement with shoulder 32 on the link, and then pushes the lever 25 from the vertical position to the inclined position shown in Figs. 2 and 3, whereupon the link 24 lifts the inner end of the lever 21, and forces the links 16 and 17 downwardly thereby unfolding the folding step by forcing the riser 13 to a vertical position and the tread 15 to a horizontal position. Through the rock shaft 22 the bell crank lever 40 is simultaneously operated, and the long arm 41 thereof connected to the second set of links 16 and 17 forces them down, while the other arm 42 of the bell crank lever is raised, thereby moving the arm 43 upwardly, and its rack 45 in engagement with the segment 50 will raise the trap door 46. When the trainman removes his foot from the treadle

38 the lip 37 will descend assuming the position shown in Fig. 2, thus locking the folding step and trap door in an open position. Then the vestibule door is opened swinging in front of the trap door, so that it is out of the way. When it is desired to raise the folding step and lower or close the trap door, the vestibule door is first closed and the trainman again presses his foot on the treadle raising the lip 37 to the position shown in dotted lines in Fig. 2, when the lever and the attached parts can be pulled back to the vertical position shown in Fig. 1.

From the foregoing it will be apparent that I have produced an exceedingly simple and effective device which can be easily and quickly operated to open and close the folding step and trap door simultaneously. It is also evident that the folding step can be used without the door and its operating connections, and that if desired the folding step could be operated by employing one set of links 16 and 17, though the duplicate set is the best construction.

I claim:

1. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, links connected to said folding step, means for actuating said links to move said folding step to an open or closed position, and a latch for engaging said links to lock said folding step in either position.

2. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, links connected to said folding step, means for actuating said links to move the folding step to an open or closed position, a shoulder formed on one of said links, and a latch provided with a lip adapted to engage said shoulder to hold said folding step in a closed position.

3. In a device of the class described, a platform having a fixed step, a folding step comprising a tread and a riser hinged to said fixed step and also to each other, a link connected to said tread, a second link having a slotted connection with said riser, and means connected to said links for simultaneously operating the same to open and close said folding step.

4. In a device of the class described, a platform having a fixed step, a folding step comprising a tread and a riser hinged to said fixed step and also to each other, a pair of links having a common pivot and spaced apart at their lower ends and connected at said ends independently to said tread and riser, a lever connected to the pivot of said links, and a hand lever connected to said lever.

5. In a device of the class described, a platform having a fixed step, a folding step hinged to the fixed step and comprising a tread and a riser hinged to each other, sepa-

rate links connected independently to the tread and riser and pivoted together at their upper ends, a shoulder on one of said links, a lever connected to the pivot of said links, a hand lever connected to the said lever for actuating the same, and a latch lever adapted in one position to engage the said shoulder for locking the folding step in a closed position and in another position to engage in rear of or above the pivot connecting the links with the lever for holding the step in its open position.

6. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, a hand lever pivoted to the platform, link connections between the hand lever and the folding step for folding and unfolding the step, and a latch lever pivoted to the platform and engaging the link connections when the step is in its closed or open position, said latch being provided with a treadle extension located above the platform for releasing the latch lever from its engaged positions.

7. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step and comprising a tread and a riser hinged to each other, a pair of links connected respectively to the tread and riser and pivoted together at their upper ends, a lever connected to the pivot of said links, a hand lever connected to said lever for actuating the same, and a latch lever adapted to engage one of the links when the step is folded to retain the step in its folded position and in another position to engage the said links and lever in rear of the said pivot for holding the step in its open position, said latch lever having a treadle extension located above the platform to permit its actuation by the foot of a trainman.

8. In a device of the class described, a platform having a fixed step arranged below the same, a folding step hinged to said fixed step, links connected to said folding step, a lever connected to said links, a hand lever connected to said lever, a latch lever pivoted to said platform contiguous to said hand lever, said latch lever comprising a latch carrying arm which extends below said platform, and a treadle arm extending over said platform, and a spring arranged to force said latch carrying arm into engagement with said links to lock said step in either a closed or open position.

9. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, links connected to said folding step, a lever connected to said links, a rock shaft on one end of which said operating lever is secured, a ball crank lever secured to the other end of said rock shaft and actuated thereby, a trap door to close the entrance to said folding steps, door con-

trolling means actuated by the movement of said bell crank lever, and a hand lever for actuating the first mentioned lever to open and close the folding step and move the door to open and close the entrance to said steps.

10. In a device of the class described, a platform provided with an opening, a hinged door adapted to normally close said opening and provided with a fixed gear, a fixed step located below said opening, a folding step hinged to said fixed step, a lever connected by links to said folding step, a rock shaft actuated by said lever, a rack arm actuated by said rock-shaft and engaging said fixed gear for opening and closing said door, and a hand lever for operating said lever to simultaneously open and close said folding step and said door.

11. In a device of the class described, a platform provided with an opening, a door adapted to normally close said opening, a fixed step located below said opening, a folding step hinged to said fixed step, a lever having link connections with said folding step, a rock shaft actuated by said lever, a bell crank lever fixed to said rock shaft, link connections between one of the arms of said bell crank lever and said folding step, means connected to the other arm of said bell crank lever for controlling the opening and closing of said door, and a hand lever for actuating the first mentioned lever to move said bell crank lever to effect the simultaneous opening and closing of said folding step and said door.

12. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, a passageway leading to said steps, a hinged trap door for closing said passageway, a hand-operated lever, link connections between said lever and said folding step for operating the same, said link connections being duplicated on both sides of the step, and separate connecting devices between the link connections and the trap door whereby the opening and closing of the folding step effects the opening and closing of the trap door.

13. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, said platform having a passageway leading to said steps, a trap door hinged to said platform for closing said passageway, link and lever connections with said hinged step on both sides thereof, an operating arm connected to one set of the link and lever connections for actuating the trap door, and a hand lever connected to the opposite set of the link and lever connections for actuating the same and folding and unfolding the step.

14. In a device of the class described, a platform having a fixed step, a folding step hinged to said fixed step, said platform hav-

ing a passageway leading to said steps, a trap door hinged to said platform for closing said passageway, a vertically disposed hand lever provided on the platform, connections between the hand lever and the outer side of the folding step for actuating the same directly by the movement of said hand lever, separate connections on the inner side of the folding step between the same and the trap door for raising and lowering the latter by the movement of the said step, and a latch lever operated from above

the platform for locking the step in either its open or its closed position, said latch lever effecting the corresponding locking of the hand lever and the trap door through the connections described. 15

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

AREY V. WINEGARDEN.

Witnesses:

W. F. BENSON,

N. F. FRAZIER, Jr.

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