U. E. CROFUT, Jr.

EXTENSION CAR STEP.

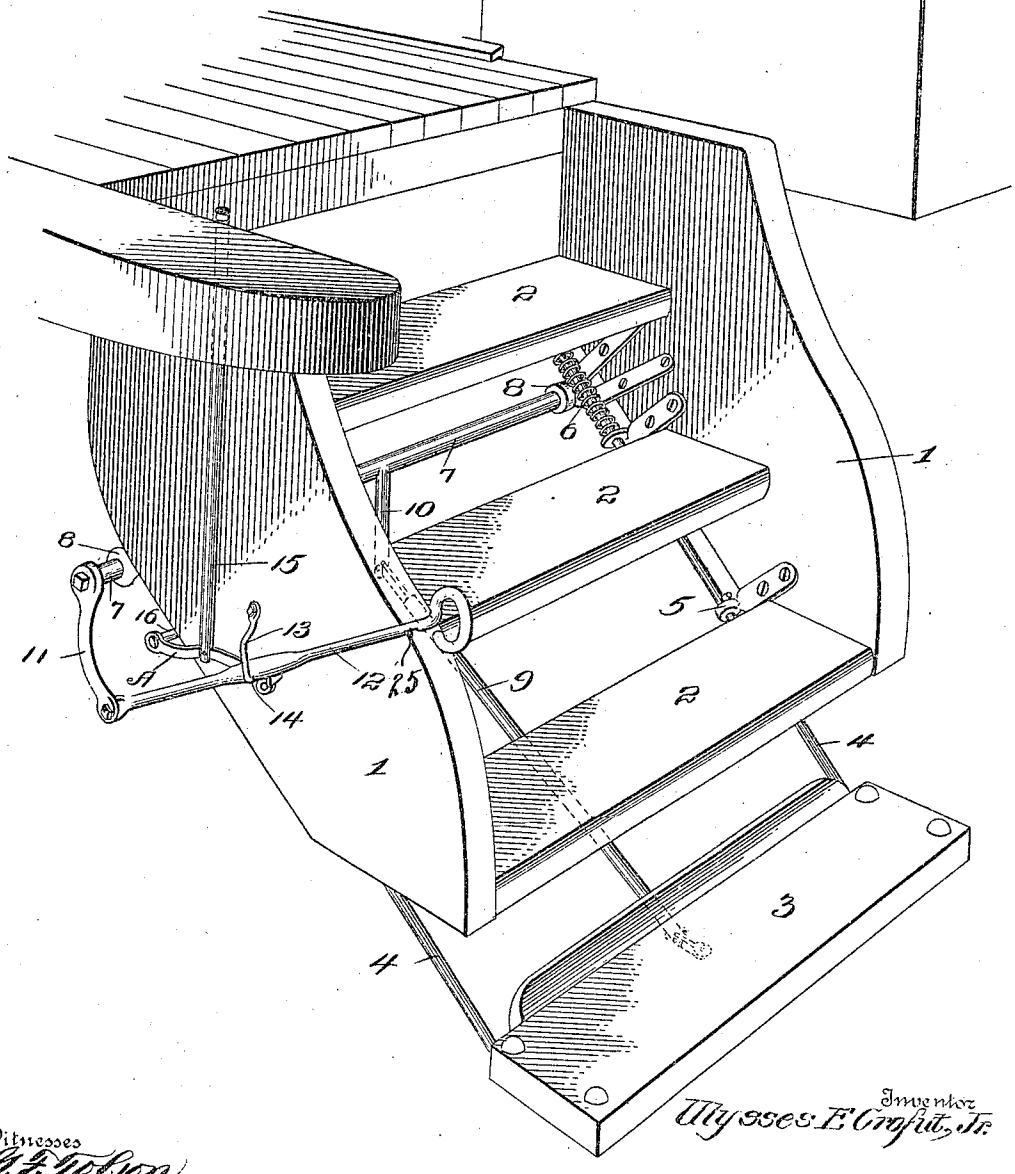
APPLICATION FILED MAY 14, 1909.

948,874.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
G. F. Tolson.
U. B. Tillyard.

Inventor
Ulysses E. Crofut, Jr.

By Victor J. Evans
Attorney

ANDREW B. GRAHAM CO. PHOTO-LITHOGRAPHERS WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 2.

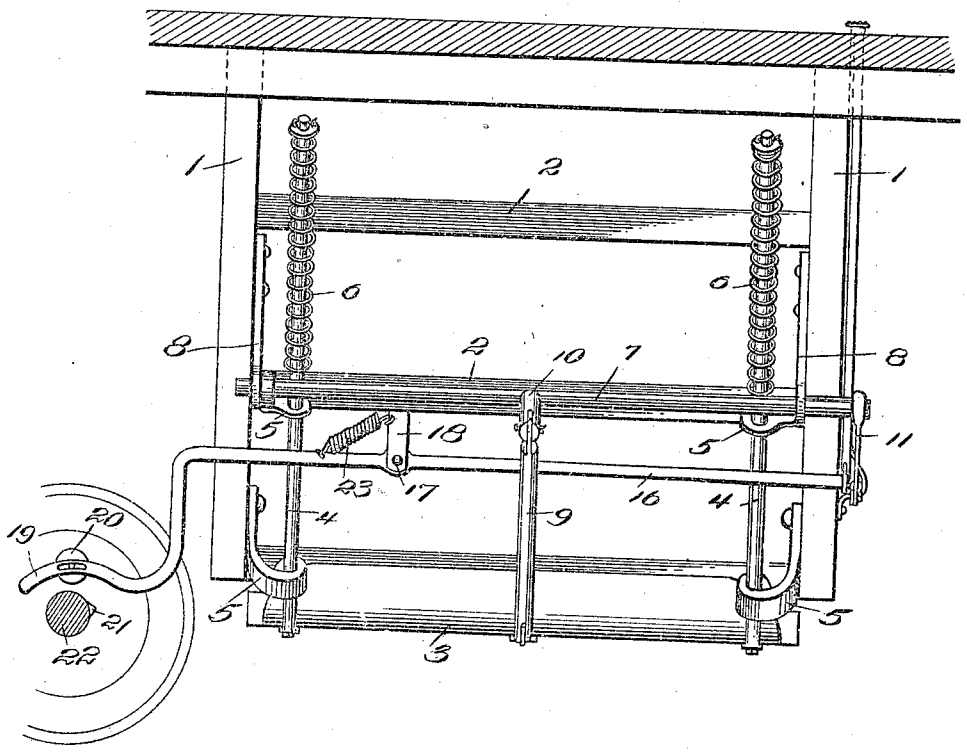


Fig. 4.

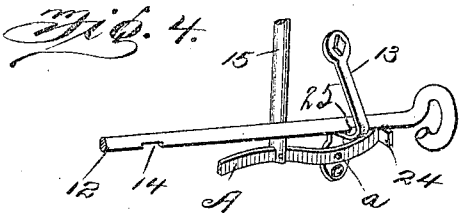
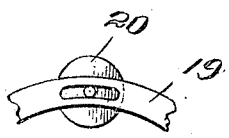


Fig. 3.



Witnesses

R. F. Tolson.

U. B. Hillyard.

Inventor

Ulysses E. Crofut, Jr.

By Victor J. Evans

Attorney

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ULYSSES E. CROFUT, JR., OF SCRANTON, PENNSYLVANIA.

EXTENSION CAR-STEP.

948,874. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed May 14, 1909. Serial No. 495,929.

To all whom it may concern:

Be it known that I, ULYSSES E. CROFUT, Jr., a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented new and useful Improvements in Extension Car-Steps, of which the following is a specification.

The present invention appertains to extension steps particularly designed for public carriers such as street railway and steam cars, the purpose being to devise novel operating means whereby the lowermost step may be projected into operative position and automatically returned to normal position or out of the way when not required for immediate service.

The invention provides novel and peculiar trip mechanism for releasing the latch mechanism whereby the step is held in operative position against the automatic returning means, said trip mechanism being actuated by movement of the car in either direction whereby return of the extension step to the given position is assured.

A further purpose of the invention is to provide lock means whereby the extension step is held elevated even though the returning means should become inoperative and under usual conditions admit of the step lowering, said lock means automatically engaging with a part of the step operating mechanism to hold the step in normal or elevated position under abnormal conditions.

A further purpose of the invention is the construction and arrangement of the latch, trip and lock mechanisms to insure a coöperation between them to the attainment of the results herein stated and to render positive and certain the carrying out of the different functions for which the respective parts are devised.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and the drawings hereto attached in which corresponding and like parts are indicated in all the views of the drawings and are referred to in the description by the same reference characters.

Referring to the drawings forming a part of the specifications: Figure 1 is a perspective view of a pair of steps provided with an extension step and operating devices constructed in accordance with and embodying the essential features of the invention. Fig. 2 is a rear view of the steps showing the axle provided with the trip in section. Fig. 3 is a detail view showing more clearly the manner of movably mounting the roller coöperating with the cam whereby the latch mechanism is tripped. Fig. 4 is a detail view showing more clearly the relation between the latch and lock mechanisms.

The steps may be of any construction and arrangement such as commonly provided in connection with public carriers such as street and steam railway cars to admit of passengers entering and leaving such carriers. As illustrated, the steps comprise hangers or side pieces 1 and treads 2. The lowermost tread or step 3 is adjustable, that is, mounted to be lowered into operative position or elevated to be out of the way so as not to project and strike objects along the route. The step 3, designated as the extension step, may be mounted in any manner and as shown is connected to rods 4 which are mounted in guides 5 attached to the hangers or side pieces 1. Springs 6 mounted upon the rods 4 normally exert a force to hold the step 3 elevated. The extension step has a limited movement and when at its lowest position is properly spaced from the lowermost fixed tread 2 to admit of passengers readily mounting or leaving the steps.

The means for operating the extension step consist of a rock shaft 7 which extends transversely of the steps in the rear thereof and mounted in bearing brackets 8 secured to the hangers 1, and a link 9 pivotally connected at its lower end to the extension step and at its upper end to an arm 10 projected from the rock shaft 7. Upon turning the rock shaft in one direction, the extension step is lowered being moved downward by the combined action of the link 9 and arm 10. A crank arm 11 at one end of the rock shaft has an operating bar or rod 12 connected thereto and extended within convenient reach to admit of ready manipulation when it is required to lower the extension step into operative position.

Suitable means are provided for holding the extension step when lowered against the tension of the return springs 6. For convenience, said means coöperate with the operating bar or rod 12 and are mounted upon the outer side of one of the hangers 1 and comprise a latch 13 and a notch 14 or like part provided upon the bar or rod 12. When the operating bar or rod 12 is drawn forwardly, the rock shaft 7 is moved to

effect a lowering of the step 3 and when said step reaches the lowermost position, the latch 13 enters the notch 14 thereby holding the step in operative position. As the step is lowered the springs 6 have their tension increased and when the latch 13 is released, the springs 6 serve to automatically return the extension step to normal position. A trip rod 15 coöperates with the releaser A and projects vertically and terminates at its upper end with a button or pressure piece to be engaged by the foot of the operator when required, so as to effect disengagement of the rod 12 from the latch 13. It is to be understood that the trip rod 15 may be operated in any manner.

A lever 16 pivoted at 17 to a bracket arm 18 extended rearwardly from the steps is connected at one end to an extension of a latch releaser A and its opposite end is provided with a laterally extending arm 19 which is provided with a roller 20 arranged to be engaged by a cam 21 on an axle 22 forming a part of the truck upon which the body of the car or other form of carrier is mounted. A spring 23 coöperates with the lever 16 to normally hold the roller 20 in contact with the axle 22 and the latch releaser A in position to engage with the notch or like part 14 of the operating bar or rod 12 with the latch 13. The roller 20 is mounted so as to have a limited play thereby preventing the same stopping upon the crest of the cam 21 which would be objectionable and prevent operation of the locking means for holding the extension step in lowered position.

The latch 13 is in the form of a keeper through which the outer portion of the operating rod or bar 12 passes, the lower portion serving to engage either one of the notches 14 or 25. The latch releaser A is pivoted at *a* and has a portion 24 arranged to extend across the path of the rod or bar 12 to effect disengagement thereof from the latch when it is required to admit of the extension step rising so as to be out of the way. The trip rod 15 is pivoted to the latch-releaser and the outer end of the lever 16 is likewise connected thereto.

From the foregoing it will be understood that the step 3 is held in elevated position or out of the way by means of the springs 6 and should said springs become disarranged, that is, the upper securing means become detached the step 3 would drop. To prevent and guard against such contingency, lock means are employed independently of the springs 6 for holding the step 3 after it has been elevated. These lock means consist of the latch 13 and a notch 25, the latter being provided in the operating bar or rod 12. When the step 3 is elevated, the latch enters the notch 25 of the operating bar or rod 12 and prevents forward movement of the same, hence, holds said step in normal position. To lower the step, the outer end of the bar or rod 12 is grasped and moved so as to disengage the notch 25 from the latch 13 after which said bar or rod 12 is drawn outward thereby causing the step 3 to lower and when said step reaches its lowest position, the notch 14 of the operating bar 12 receives the latch 13. It will be observed that the latch 13 serves both to hold the step elevated and lowered. When it is required to elevate the step, the trip rod 15 may be pressed upon or when the car has been set in motion, the cam 21 will engage with the roller 20 and move the lever 16 and in either event the bar 12 is disengaged from the latch 13 thereby permitting the springs 6 to come into play for returning the step to normal position so as to be out of the way.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what is claimed is—

1. In steps of the character specified, a carrier provided with an extension step and means for returning said extension step to normal position, a latch mechanism for holding said extension step lowered, a lever arranged to effect release of the latch mechanism, and a cam provided upon a rotating part of the carrier provided with the steps to automatically operate said lever to insure a return of the extension step to normal position.

2. In steps for railway cars or like carriers provided with an extension step and means for automatically returning said extension step to normal position, a latch mechanism for holding the extension step when lowered in operative position, a lever arranged to operate the latch mechanism, a roller adjustably mounted upon said lever, and a cam mounted upon the axle of the carrier for coöperation with said roller to automatically effect release of the latch mechanism to admit of the extension step automatically returning to normal position.

3. In combination with steps comprising an extension step and means for automatically returning said extension step to normal position, means for actuating the extension step embodying an operating rod, a

latch for engaging said operating rod, a latch releaser for disengaging the operating rod from the latch, means for automatically operating the latch releaser, and other means for operating the latch releaser at will.

4. In combination with a carrier, a rotating part, steps comprising an extension step and means for automatically returning said extension step to normal position, means for actuating the extension step embodying an operating rod, a latch for engaging said operating rod, a latch releaser for disengaging the operating rod from the latch, means for automatically operating the latch releaser, a lever connected with said latch releaser, means for automatically moving said lever from the rotating part of the carrier provided with the steps, and a trip rod adapted to actuate the latch releaser, to effect disengagement of the operating rod from the latch at will.

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

ULYSSES E. CROFUT, JR.

Witnesses:
JOHN L. FLETCHER,
V. B. HILLYARD.