

No. 697,208.

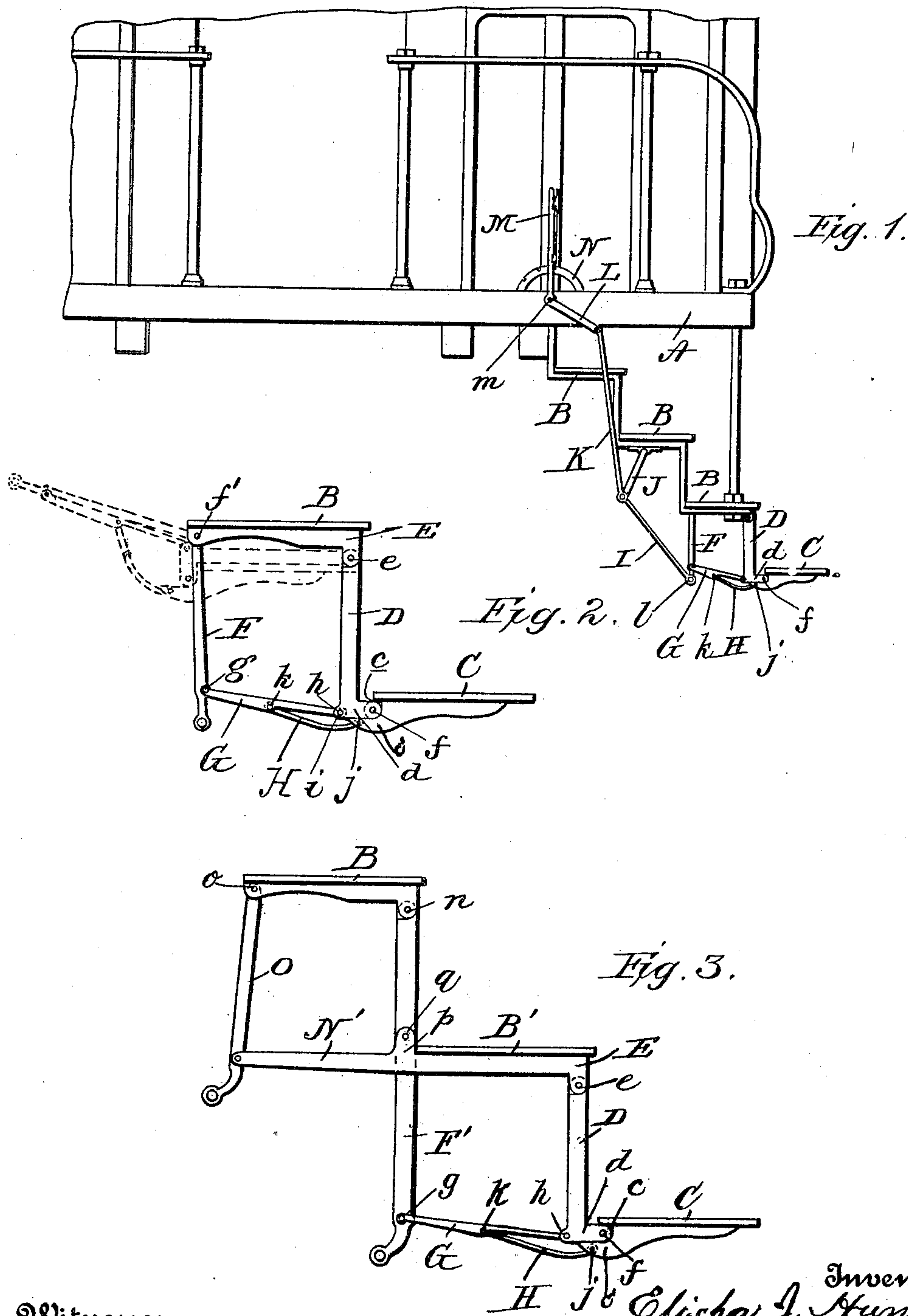
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E. J. HUNT.

FOLDING STEP FOR CARS OR OTHER CONVEYANCES.

(Application filed June 26, 1900.)

(No Model.)



Witnesses  
F. L. Ouraud.  
George J. Weber.

Inventor  
Elisha J. Hunt  
by George C. Boulton  
His Attorney

# UNITED STATES PATENT OFFICE.

ELISHA J. HUNT, OF NEW YORK, N. Y.

## FOLDING STEP FOR CARS OR OTHER CONVEYANCES.

SPECIFICATION forming part of Letters Patent No. 697,208, dated April 8, 1902.

Application filed June 26, 1900. Serial No. 21,702. (No model.)

*To all whom it may concern:*

Be it known that I, ELISHA J. HUNT, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Folding Steps for Cars or other Conveyances; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in folding steps for cars or other conveyances; and it has for its objects, among others, to provide a simple and cheap yet efficient and reliable folding step and mechanism for operating the same. The folding step is so mounted and connected with the actuating means as to be folded up beneath the next adjacent step, where it is out of the way and not liable to become damaged in any way, yet readily thrown down into operative position and firmly held so that there will be no danger of its accidentally folding under the weight of a person thereon.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention in its preferable form is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is an elevation showing the application of the invention to a car. Fig. 2 is an enlarged detail of the folding step and its pivotal connections, the same being shown in its operative position by full lines and by dotted lines showing the position the parts assume when folded. Fig. 3 is an enlarged detail similar to Fig. 2, but showing a modified form in which two of the steps are movable.

Like letters of reference indicate like parts throughout the several views.

Although in the present instance I have

chosen to show my invention as applied to a railway-car, it is evident that it is in no wise restricted to such use, as it may be applied to other conveyances as well as to stationary objects, such as porches or any other place where it may be desirable to provide a step or steps that may be folded up out of the way when desired.

Referring now to the details of the drawings by letter, A designates a platform or other like part, and B a series of steps, which may be supported in any suitable manner and which may be of any desired number, as these features in no wise affect the essential of the present invention.

C in Figs. 1 and 2 is a step designed to be extended as shown in Fig. 1 and by full lines in Fig. 2 when it is desired to use the same, and in this instance it is shown as provided at its inner end with a recess or cut-away portion *c* to receive the forward end of the projecting lug *d* of the vertical hanger D, which latter is pivotally suspended from the under side of the fixed step B, in this instance being pivoted, as at *e*, to the depending lug E at the front bottom edge of the said step B. The step C is pivoted, as at *f*, to the said projection *d*, as shown clearly in Fig. 2. The portion of the step C rearward of its pivot is provided with a recessed extension *c'* at its inner end, which forms a lock-joint by its engagement with the under side of the projection *d* when the step is in its distended position, as seen in Fig. 2, to not only limit the downward movement of the said step, but to form a brace and prevent its being forced downward beyond a predetermined point by the weight of a person on the step, as will be readily understood upon reference to said Fig. 2.

F is a hanger pivoted at its upper end, as at *f'*, to the under side of the rear of the step B, and near its lower end it has pivotally connected therewith, as at *g*, the link G, the other end of which is pivotally connected, as at *h*, with the ear *i* at the rear of the lower end of the hanger D, as seen in Fig. 2.

H is a guide-arm pivotally connected at one end, as at *j*, to the rearmost portion of the



step C beyond its pivot and its other end connected pivotally with the link G at a point about midway between its ends.

The guide-arm H, having a pivot-joint connection to the rear portion to the step C and to the enlarged portion of the link G, as shown at *k*, serves, when the step C has an upward movement, to keep the same in a straight line during the operation of folding said step and connected hanger together.

I is a rod pivotally connected, as at *l*, with the lower end of the hanger F and its other end connected with one end of a crank or rockshaft J, mounted in bearings on the under side of one of the stationary steps B, as seen in Fig. 1, and to this rock-shaft is also pivotally connected the lower end of the rod K, the other end of which is pivotally connected with one arm L of the operating-lever M, pivotally mounted at its angle, as at *m*, to the platform or some other relatively fixed support and provided with a pawl adapted to engage in the notches of the segmental rack-bar N, all as clearly shown in Fig. 1.

The operation will be apparent. When the lever is in the position in which it is shown in Fig. 1, the step C is down in position for use, the hanger F is vertical, the link or arm H is in its distended position, and the step is horizontal, with its shoulder at the rear engaged beneath the projection *d* at the front of the hanger D at its lower end. When it is desired to fold the step, all that it is necessary to do is to move the lever M, when the parts will be thrown into the position in which they are seen in dotted lines in Fig. 2. The hanger D is thrown up against the under side of the next adjacent step B and the step C folded up against the under side of the said hanger, the arm or link H assuming the position indicated by dotted lines and the whole mechanism thus thrown up out of the way, where it cannot be injured or become deranged.

In Fig. 3 I have shown a modification of the construction above described. In this form two of the steps are movable. The lower step C and its connections remain as before. The hanger F', however, is extended to the second step above, where it is pivoted, as at *n*, its lower end being designed to have pivotally attached thereto a rod similar to the rod I, which is not illustrated in Fig. 3, and the second step B' has a transversely-arranged cross-bar N', the rear end of which is pivotally connected with the hanger O, pivotally suspended, as at *o*, from the under side of the rear of the step B next adjacent, and to the lower end of this hanger O is designed to be attached the operating-rod connected with the lever. (Not shown.) The cross-bar N' of the step B' has an upwardly-extending lug *p*, which is pivotally connected, as at *q*, with the hanger F', as shown. The operation of this form will be apparent. It is substantially the same as that of the form shown in

Figs. 1 and 2, except that the second step B' is also folded up, it being folded beneath the step B, and then the hanger D and step C and connections are folded against the step B' in substantially the same manner that they are folded against the step B in said Fig. 2.

It will be observed that I have produced a novel form of folding step and operating devices therefor, and while the structural embodiment of the invention herein disclosed is at the present time believed to be the preferable one, still I do not wish to be restricted to the details of construction herein illustrated, but reserve the right to make such variations, changes, and modifications as come properly within the scope of the protection prayed.

What is claimed as new is—

1. The combination with a vertically-vibrating and endwise-movable hanger, of a step pivotally connected therewith, a transverse link pivotally connected to said hanger, and an arm pivotally connected with said link and said step, as and for the purpose specified.

2. The combination with a pair of vertically-pivoted hangers, of a step pivotally connected to the front hanger, a link pivotally connected with both hangers, and an arm pivotally connecting the link and said step, as shown and described.

3. The combination with a vertical pivoted hanger, having a lug, of a step provided with a recessed portion whereby to pivot the same to the lug, the step being also provided with an extension whereby to adapt the same to abut against the under side of said lug, a link pivoted to an ear of said hanger, and an arm pivoted to the extension of said step, and to said link, substantially as specified.

4. The combination with a series of vertically-vibrating and endwise-movable hangers, a transverse cross-bar pivoted to the hangers, a step mounted on the cross-bar, and a step pivoted to the lower end of the outer hanger, and means connected to said hangers whereby to fold the steps, as and for the purpose set forth.

5. The combination with a vertically-pivoted hanger, of a step pivotally connected therewith, a link pivotally connected to the rear portion of the hanger, a guide-arm pivoted to the link and step, and means for folding the hanger and step together, as shown and described.

6. The combination with a pivotally-suspended hanger, of a step pivotally connected therewith, a link pivotally connected with the hanger, a guide-arm pivotally connecting the link and step, a rear hanger pivotally connected with said link, and means for actuating the last-mentioned hanger, to fold the first-mentioned hanger and step together, as shown and described.

7. In folding steps for cars and other conveyances, the combination with a cross-bar



having central and end hangers vertically pivoted thereto, and steps pivoted to the cross-bar and hangers, and means connected to the hangers whereby to fold said steps and  
5 hangers, as shown and described.

8. In folding steps for cars and other conveyances, the combination with a central vertical hanger, a cross-bar pivoted midway thereof, and vertical hangers pivoted to the

ends of the cross-bar, and steps pivoted to said cross-bar and said hangers, substantially as specified.

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

ELISHA J. HUNT.

Witnesses:

GEO. C. POULTON,

E. A. PAUL.