(No Model.) 2 Sheets—Sheet 1.

W. N. CANDEE.

EXTENSION STEP FOR CARS.

No. 464,491. Patented Dec. 8, 1891.

Fig. 1.

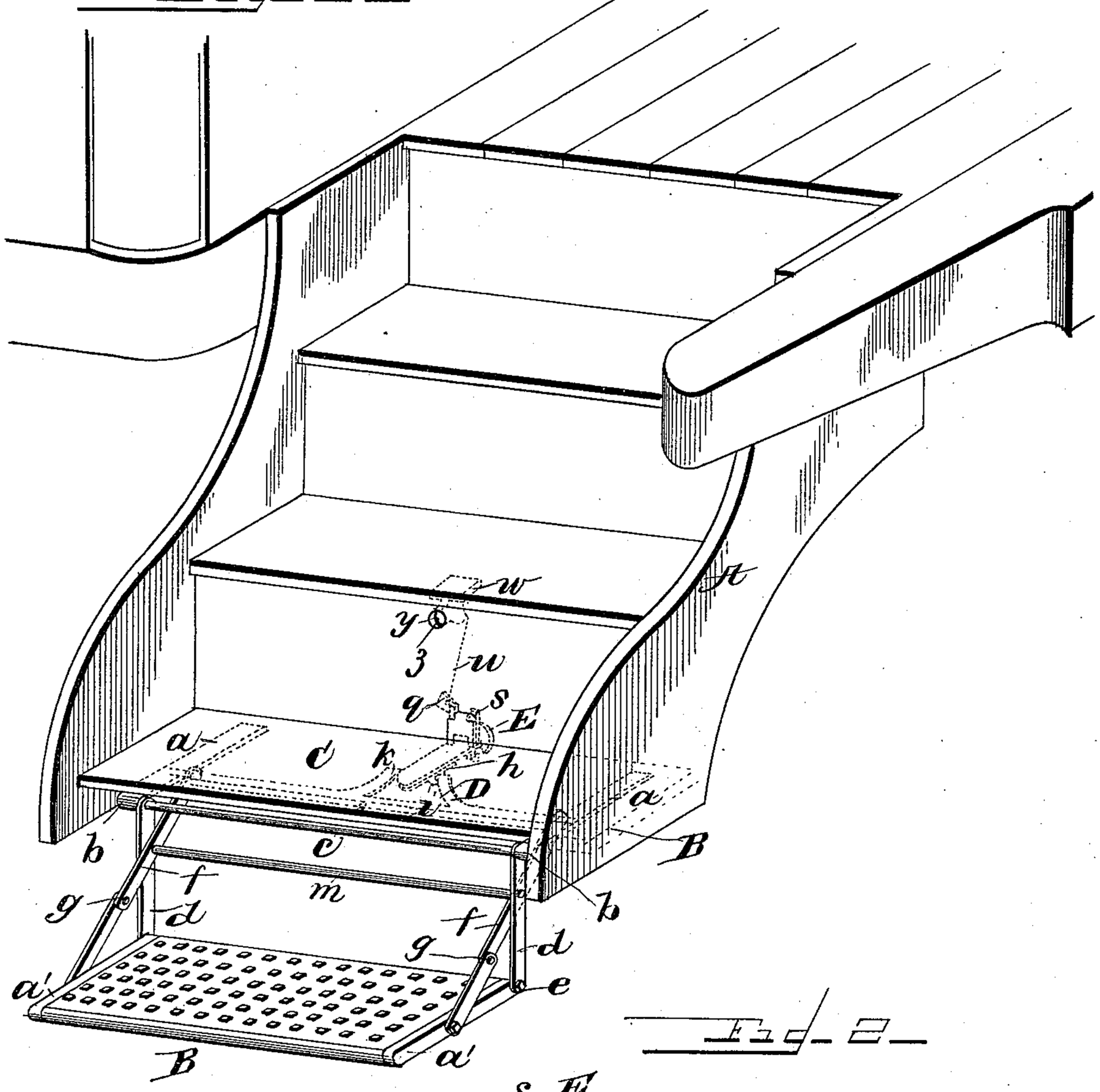
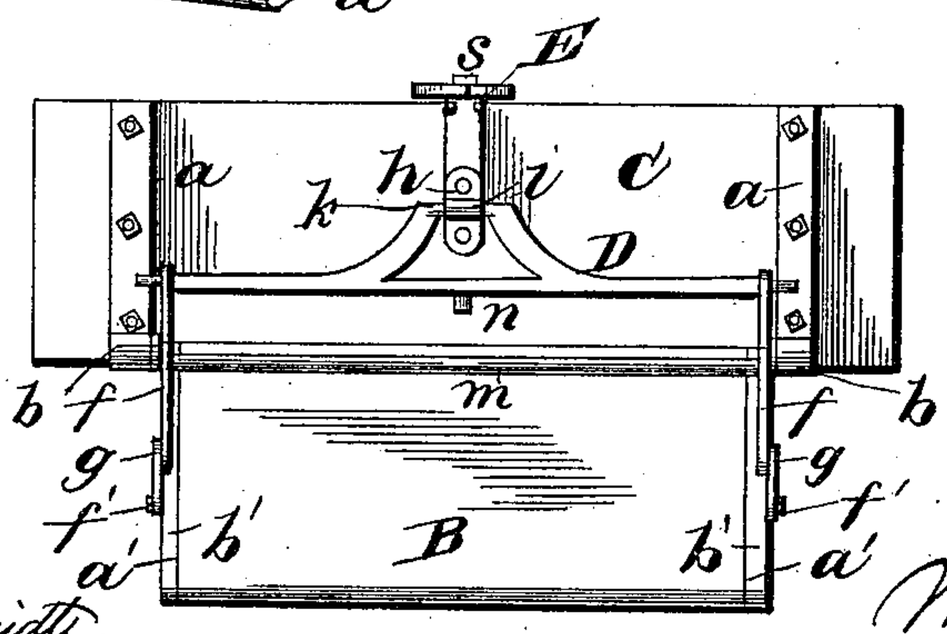


Fig. 2.



Witnesses

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

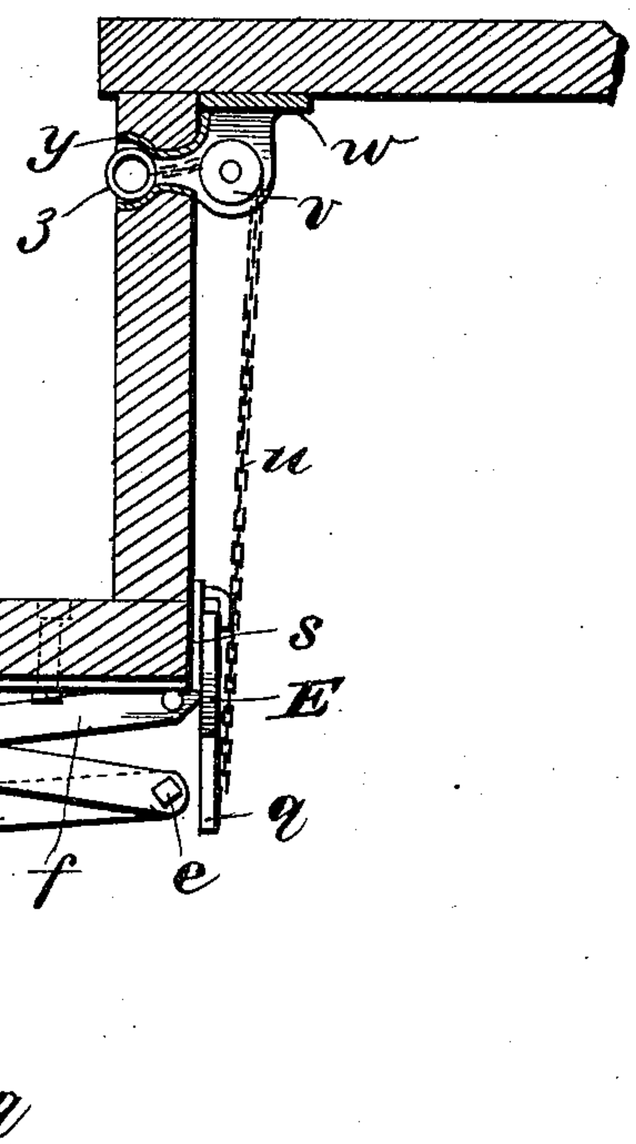

Fig. 4.

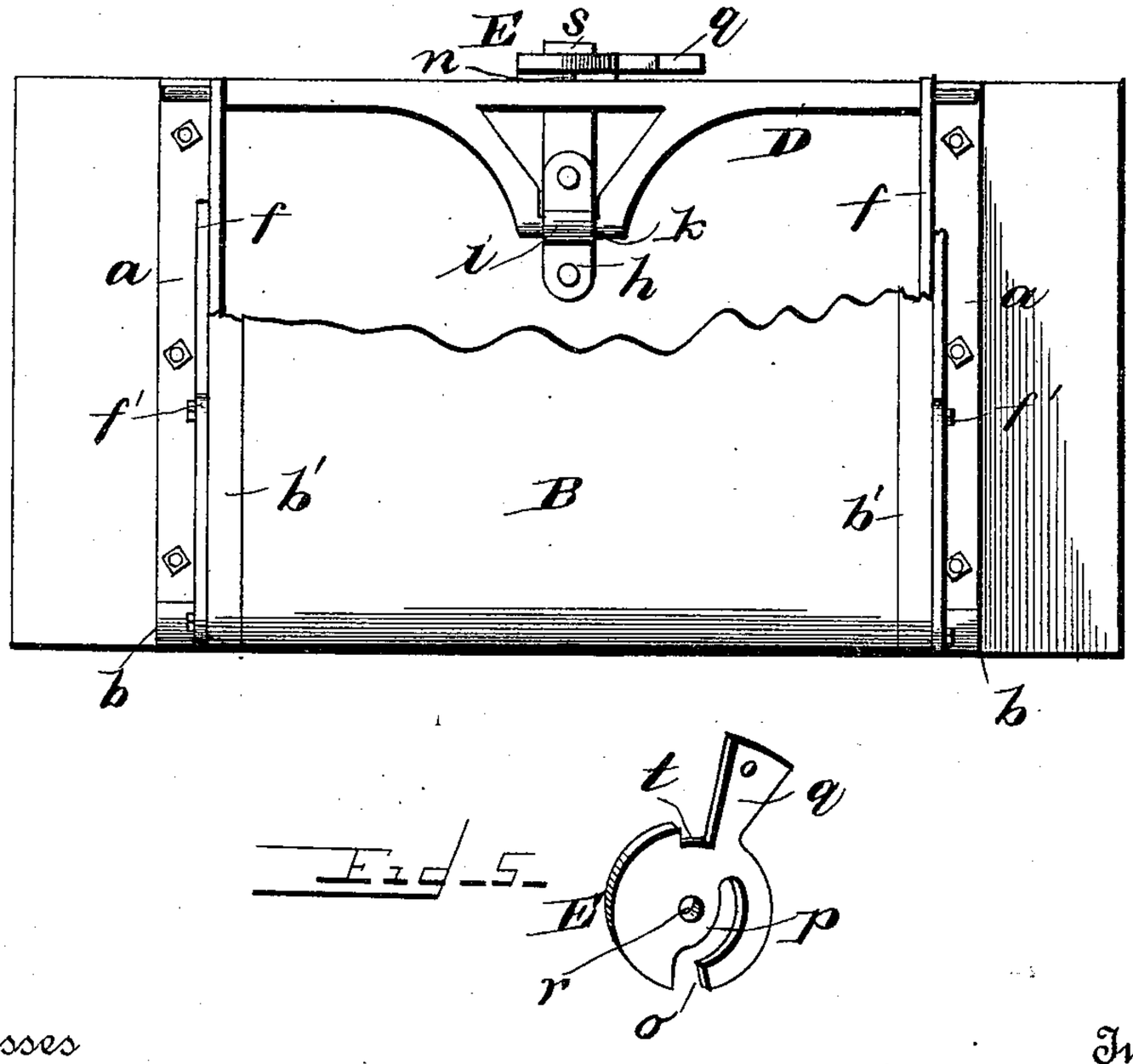

Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM N. CANDEE, OF BUFFALO, NEW YORK.

EXTENSION-STEP FOR CARS.

SPECIFICATION forming part of Letters Patent No. 464,491, dated December 8, 1891.

Application filed April 14, 1891. Serial No. 388,944. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. CANDEE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Extension-Steps for Coaches; and I do hereby 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.

My invention relates to passenger-coaches, such as railway-cars or other coaches, and has for its object certain improvements in extension-steps to be attached to the permanent steps of such coaches in a manner that they can be readily extended for use and folded underneath the lowest permanent step when not required.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a perspective view of a set of steps with my improved extension-step attached; Fig. 2, an inverted plan of the lowest permanent step and my extension-step; Fig. 3, a side view of the same on an enlarged scale, showing the extension-step folded; Fig. 4, an inverted plan of the lowest permanent step and the extension-step folded thereon, the latter step being broken away to show the position of the vibrating bar; and Fig. 5, a perspective of the automatic latch securing the extension-step in folded position.

Reference being had to the drawings and the letters thereon, A indicates the permanent steps of a railway passenger-coach of ordinary construction.

B is an extension-step, which is attached to the under side or bottom of the lowest permanent step C by means of transverse metallic steps *a a*, having an eye *b* in one end of each and in which the step B is suspended upon a rod *c* and bars *d d*. The rod *c* is passed through the eyes *b b* and the holes in the upper end of the bars *d d* and secured in the straps *a a* in any approved manner, such as by a nut or by upsetting and riveting. The lower end of each supporting-bar *d* is pivotally secured to one end of the step B near the rear edge by screw-bolts *e e*. To each end of the step B is also secured an angular brace-rod *f* by means of screw-bolts *f'*, and is jointed at *g* to fold readily, as shown in Fig. 3. The opposite and upper end of each rod *f* is pivotally secured to the ends of a vibrating bar D. The bar D is secured to the under side of the permanent step C by a strap *h*, having a seat or depression *i*, in which a journal *k* on said bar rests and vibrates freely as the step is moved into or out of position for use.

At the point of intersection of the bar *d* and the brace-rod *f* at each end of the structure the two are pivotally connected by a rod *m*, which may extend the entire length of the structure, as shown, or they may, as is obvious, be secured by short rods or bolts extending through the intersecting rods at each end only, the points forming fulcra for the brace-rods when the step B is extended.

On the rear edge of the vibrating bar D is a pin *n*, which engages with a latch E, secured on the rear edge of the step C to lock and secure the step B in its folded position. The latch E is provided with a radial slot *o*, which terminates in a curved slot *p*, with which the pin *n* engages when the parts are locked, the locking being effected automatically by the gravity of the arm *q*, which causes the latch to turn on its axis *r* when released by the dog *s*, which engages a recess *t* in the periphery of the latch and is raised out of engagement with the recess *t* by the bar D.

To the arm *q* is attached a chain or cord *u*, which passes over a sheave *v* in a casting *w*, secured under the front edge of the step above that to which the extension-step is attached. The front end of the casting *w* is provided with a bell-shaped extension *y* to receive a ring *z* on the end of the chain *u*. By drawing upon the chain *u* the latch is turned upon its axis and the pin *n* released from the slot *p*, when the step B will descend into position for use, and when it is desired to fold the step B under the step C, the step B is first drawn forward sufficiently to permit the bar D to descend rearward from the step C and the brace-rods *f* to bend forward at their joints *g*, when the bars *d* and the rods *f* will fold into the position shown in Fig. 3, and the latch E will automatically lock the parts in said folded position. It will be observed that when the step B is extended the bar D is thrown forward

against the under side of the step C and braces the step B by virtue of the fulcra at the points of intersection of the bars *d* and rods *f*, and thereby relieve the rod *c* of a portion of the weight brought to bear upon the step B, and at the same time this position of the several bars and rods effectually locks the step B in its extended position until released by driving the step forward and changing the position of the fulcra of the several levers.

On the ends of the step B are metal strips *a' a'* to strengthen the step and prevent warping by exposure to the elements. The strips *a' a'* are provided with horizontal flanges *b' b'*, which rest in rabbets formed in the ends of the step.

Having thus fully described my invention, what I claim is—

1. In an extension-step, the combination of a step, suspension-bars pivotally secured to the step, angular brace-rods also pivotally secured to said step, and a vibrating bar secured to a permanent step, and to which bar said brace-rods are pivotally attached.

2. In an extension-step, the combination of a step, suspension-bars pivotally secured to the ends of the step, angular and jointed brace-rods, and a vibrating bar secured to a permanent step and pivotally connected to said brace-rods.

3. In an extension-step, the combination of a step, suspension-bars, angular brace-rods, and a vibrating bar secured to and bearing against a permanent step constructed to fold, substantially as described.

4. In an extension-step, the combination of a step, suspension-bars pivotally secured to the step, angular brace-rods pivotally secured to the step and intersecting the suspension-rods, and a vibrating bar secured to a permanent step and connected to the brace-rods.

5. In an extension-step, the combination of a step, suspension-bars pivotally connected to said step, angular brace-rods secured to the step and to a vibrating bar secured to a permanent step and arranged to swing in the arc of a circle in extending and folding the device.

6. In an extension-step, the combination of a permanent step, a movable step, intersected suspension-bars, and brace-rods pivotally connected at their points of intersection, and a vibrating bar secured to and bearing against a permanent step and connected to said brace-rods.

7. In an extension-step, the combination of a step, suspension-bars, brace-rods, and a vibrating bar pivotally connected to fold, a latch for locking said parts in folded position, and means for releasing the same.

8. In an extension-step, the combination of a permanent step, a movable step, pivoted and folding connections between the two steps, an automatic latch for locking said parts in folded position, and positive means for releasing the same.

9. In an extension-step, the combination of a step, suspension-bars constructed to be folded, a latch, and releasing mechanism consisting of a chain, and a casting supporting a sheave and provided with a bell-shaped projection.

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

WILLIAM N. CANDEE.

Witnesses:
D. C. REINOHL,
WM. E. DYRE.