

(No Model.)

2 Sheets—Sheet 1.

H. LUTZ.
CAR STEP.

No. 462,496.

Patented Nov. 3, 1891.

Fig. 1

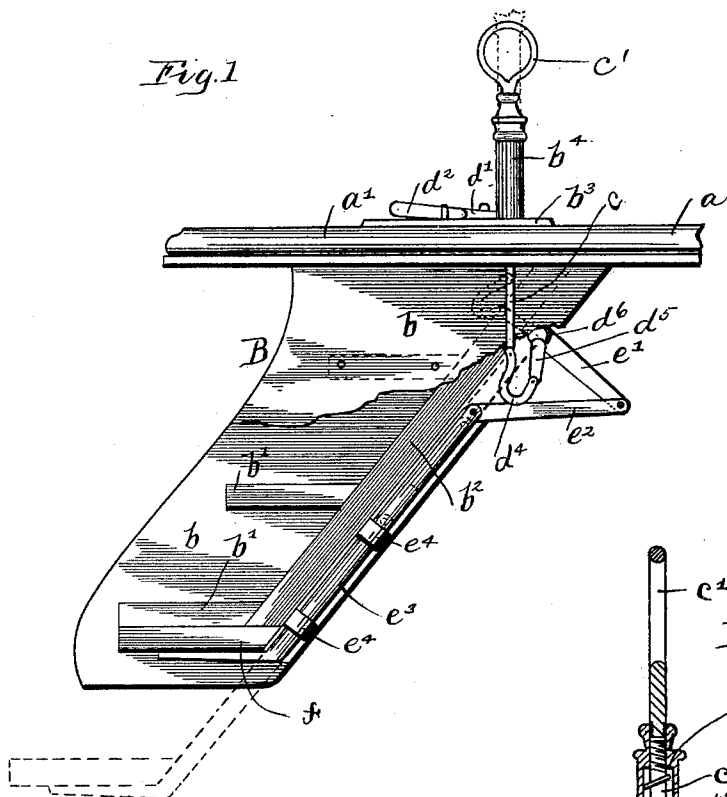


Fig. 2

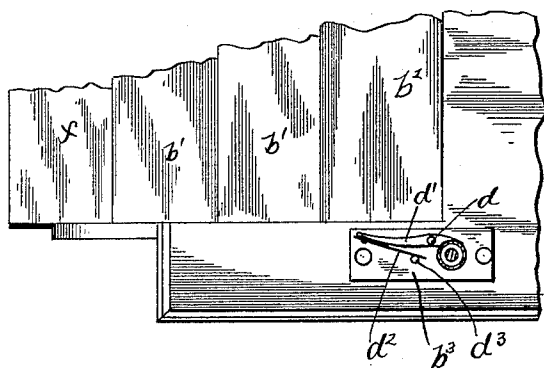
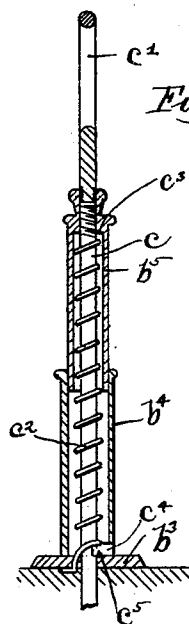


Fig. 3



Witnesses

J. A. Travel
E. E. Bragg

Inventor

Henry Lutz
By his Attorneys.
Staley and Shepherd

(No Model.)

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Fig. 4

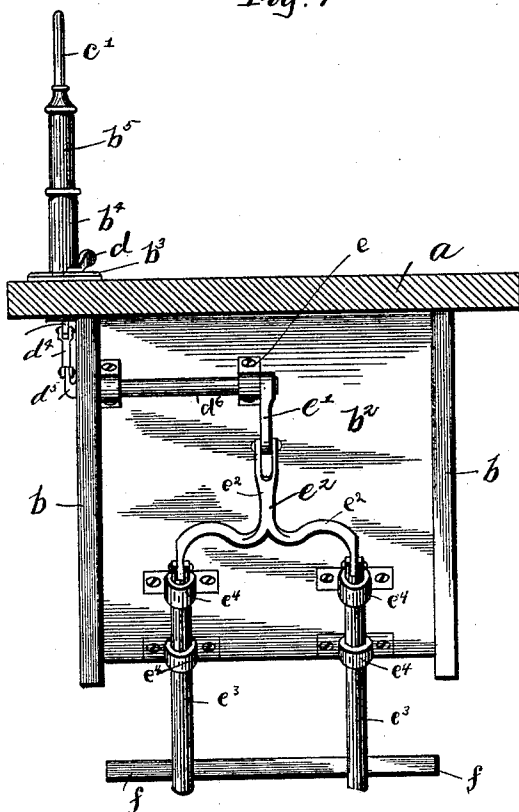


Fig. 5

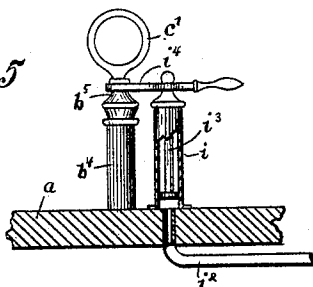
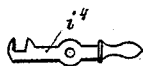


Fig. 6



WITNESSES:

E. E. Bragg
H. B. Bradshaw

INVENTOR

Henry Lutz
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UNITED STATES PATENT OFFICE.

HENRY LUTZ, OF LOGAN, OHIO.

CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 462,496, dated November 3, 1891.

Application filed May 15, 1891. Serial No. 392,806. (No model.)

To all whom it may concern:

Be it known that I, HENRY LUTZ, a citizen of the United States, residing at Logan, in the county of Hocking and State of Ohio, have
5 invented a certain new and useful Improvement in Railway-Car Steps, of which the following is a specification.

My invention relates to the improvement of extension-steps for railway-cars; and the
10 objects of my invention are to provide simple and improved means for extending the lower step of a series of car-steps, to provide in connection therewith means for quickly and conveniently elevating said lower step against
15 the under side of the step-frame when not in use, and to produce other improvements in the details of construction, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the
20 accompanying drawings, in which—

Figure 1 is a side elevation of a set of car-steps, showing, for the sake of clearness, a portion of the siding broken away therefrom, showing in full lines the position of my extension mechanism when the lower step is elevated and in dotted lines the position thereof when the same is lowered or extended. Fig.
25 2 is a plan view of that side of the stairway upon which is mounted my hand-operating device, showing the latter in cross-section. Fig. 3 is a central vertical section enlarged from Fig. 1 of said hand-operating device. Fig. 4 is a rear view of the stairway provided with my improvements and showing the lower
35 step extended. Fig. 5 is a view showing a modification in the manner of operating my device, and Fig. 6 is a detail view of one of the parts employed in said modification.

Similar letters refer to similar parts throughout the several views.

a represents a portion of one of the end platforms of a car, and *a'* the outward extensions thereof, which extend on opposite sides of the usual stairway-recesses.

45 *B* represents the ordinary form of stairway, which is inclined outwardly and downwardly from the platform *a* in the usual manner. Of this stairway *b* represents the side pieces, *b'* the fixed steps, which are arranged at intervals between said side pieces, and *b²* the step backing-pieces, which ordinarily cover the
50 rear sides of the steps. Upon the upper side

of the platform *a*, on one side of the stairway and near the rear side of the latter, is fixed a metallic plate *b³*, from which rises a vertical
55 and fixed tube *b⁴*. This tube *b⁴* has telescoped therein a tube *b⁵*, the upper and smaller end portion of which is internally screw-threaded, as shown.

c represents a lever-operating or plunger
60 rod, which passes loosely through the tubes *b⁴* and *b⁵*. This rod *c* has its upper end screwed within the upper end portion of the tube *b⁵*, and the latter is provided with an upward extension and finger-piece *c'*. The lower
65 portion of the rod passes, as shown, through the lower open end of the tube *b⁴* and through an opening in the plate *b³* and platform *a* beneath said tube. That portion of the rod *c* which is within the tubes *b⁴* and *b⁵* is, as
70 shown, provided with a coiled spring *c²*, which surrounds the same, the upper end of said spring being fixed to the rod *c* or made to bear against the internal shoulders *c³*, formed by the production of the smaller neck or up-
75 per end portion of the upper tube *b⁵*. The lower end of this spring is preferably caught, as shown, beneath the plate *b³* and platform *a*. As shown in the drawings, the tube *b⁴* is
80 provided on one side adjoining its base-plate *b³* with an opening *c⁴*.

A notch or recess *c⁵*, designed to communicate with the case-opening *c⁴*, is formed in the rod *c*, said notch being so located that when said rod is drawn upward to its high-
85 est point, as hereinafter described, its notch will form an inward termination of the case-opening *c⁴*. Upon the plate *b³* is fulcrumed at *d* a pawl or dog *d'*, against one side of the outer portion of which is secured the end
90 of a spring-strip *d²*, the free end of which bears against a pin *d³*, which projects upwardly from said plate *b³*. The pawl *d'* is so located with relation to the spring stop-pin *d³* as to cause through the tension of said
95 spring-strip an inward pressure on the outer portion of the pawl *d'*, which will result in the inner end of the head of said pawl being held by spring-pressure within the opening
100 *c⁴* of the tube *b⁴* and against the rod *c* on the inner side of said tube. The lower end of the rod *c*, which extends through and beneath the platform *a*, is pivotally connected with the upper end of an approximately hook-

shaped lever-coupling d^4 , the lower hook end of the latter being pivoted or fulcrumed to one end of a downwardly-extending arm d^5 , the remaining end of which is rigidly connected with the outer end of a horizontal shaft d^6 , which extends inwardly at right angles with the arm d^5 through a rearward extension of one of the side pieces b , in which the outer end of said shaft bears. The inner termination of the shaft d^6 is at the center of the width of the backing-piece b^2 , near which it is provided with a suitable bearing-box e , which projects from said backing-piece. Fixed on the inner end of the shaft d^6 is an arm e' , to the outer or lower end of which is fulcrumed the upper end or stem of a bifurcated arm e^2 . The lower outwardly and thence downwardly extending forks of this arm e^2 are each pivotally connected with the upper end of a downwardly-extending rod e^3 , said rods e^3 being supported loosely in suitable bearings or keepers e^4 , which project from the rear side of the step backing-piece. The rods e^3 are of such length that when forced downward, as hereinafter described and as shown in Fig. 4 of the drawings, their lower forwardly-bent ends will be supported at a point beneath and in front of the lower fixed step of the stairway. Upon this forwardly-bent lower end portion of the rods e^3 is rigidly supported a lower or extension step f , which is of such length as to fit loosely when so supported between the lower end portions of the stairway side pieces and beneath the lower fixed step.

The operation of my device is as follows: When the tube b^5 is down or inclosed by the tube b^4 , it will be observed that the spring-actuated rod c will have been forced downward to such an extent beneath the platform a as to result, through the connection of said rod and arm d^5 and the connection of the latter with the shaft d^6 , in the shaft-arm e' being made to extend outwardly from the step-backing. This position of the arm e' , owing to its connection with the arm e^2 , results in the outward projection of the latter. This position of the arm e' results in the step-supporting rods e^3 being supported at such height as to bring the step f into contact with the under side of the lowest fixed step b' .

The parts above described, and shown in Fig. 1 of the drawings, are normally supported in the positions described by the tension of the coiled spring which is within the tubular portions b^5 b^4 . With the extension-step support in the elevated position described it is obvious that said step will be free from contact of platforms or other obstacles which may be built adjacent to the railway. When the train has reached a station and it is desired to increase the length of the stairway for the accommodation of parties entering the train, the tube b^5 is pulled upwardly by grasping the finger-piece c' and elevating the same until the notch c^5 of the rod c is opposite the recess c^4 in the tube b^4 , when the head

of the pawl d will, by pressure of the spring-strip d^2 , be caused to enter and engage with said notch c^5 , thus providing a support for said rod and inner tube in their elevated positions. This upward movement of the rod c will result through the connection therewith of the arm d^5 in the outer end of the latter moving in the arc of a circle to the position shown in dotted lines in Fig. 1, and the consequent inward straightening movement of the arms e' e^2 will result in a downward movement of the step-supporting rods e^3 and a consequent downward movement of the step f . Owing to the fact that the rods e^3 travel in the direction of the incline of the stairway, it is obvious that the lower step f will be thus supported in proper alignment with the remaining fixed steps b' . In this manner the stairway is extended the desired distance by a direct downward movement thereof. As the train is again started the brakeman or other employé may cause the extension-step to resume its elevated position by such pressure against the outer end portion of the pawl d' as will result in the disengagement of the pawl-head with the notch c^5 of the rod c .

As shown in Figs. 5 and 6 of the drawings, I may elevate the tube b^5 through the pressure of the air from the air-brake pipes. This means of operation is accomplished by supporting adjacent to the tube b^4 a tube i , which communicates at its lower end with an air-pipe i^2 , and within which is adapted to slide a piston or plunger i^3 . The upper outwardly-projecting end of the piston i^3 may be connected with the upper end portion of the tube b^5 by means of a suitable arm i^4 , which couples said parts together. It will be readily understood that in this method of operation the air from the air-brake pipes enters the tube i through the pipe i^2 and forces upward the piston i^3 , which in turn elevates the tube b^5 through the connecting-arm i^4 .

From the construction herein shown and described it will be seen that a simple and positive construction and arrangement of parts is produced, by means of which the extension-step may readily be returned from its lowered position, and by means of which a convenient railway-stairway is produced.

Owing to the fact that the extension-step when not lowered is covered by the lower fixed step of the stairway, it will be seen that said extension-step will be free from the action of snow or rain, and that its operating parts are protected from the weather by the platform and stairway backing.

I am aware that railway-car stairways or steps have been produced heretofore with an extension-step; but my invention differs from these both in the manner of construction and operation.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

In steps for railway-cars, the combination, with the fixed steps and their supporting

frame-work, of the upwardly-extending tube
b⁴, supported from the car-platform, telescop-
ing tube b⁵, internal spring-actuated rod c²
within said tubes and connected with tube b⁵,
5 recess c⁴, and notch c⁵, formed, respectively,
in the rod, tube b⁴, and rod c, as described,
shaft d⁶, journaled at the back of the fixed
steps, pivoted coupling-piece d⁴, connecting,
as described, said shaft and rod c, shaft-arm
10 e', arm e², jointedly connected therewith, step-

supporting rods e³, movably supported at the
back of the steps b', and a step supported on
the lower ends thereof, said rods e³ being
jointedly connected with arm e², substantially
as described.

HENRY LUTZ.

In presence of—

I. C. WRIGHT,

WM. F. EISELE.