

(No Model.)

H. A. MERRITT.
EXTENSIBLE CAR STEP.

No. 395,660.

Patented Jan. 1, 1889.

Fig. 1.

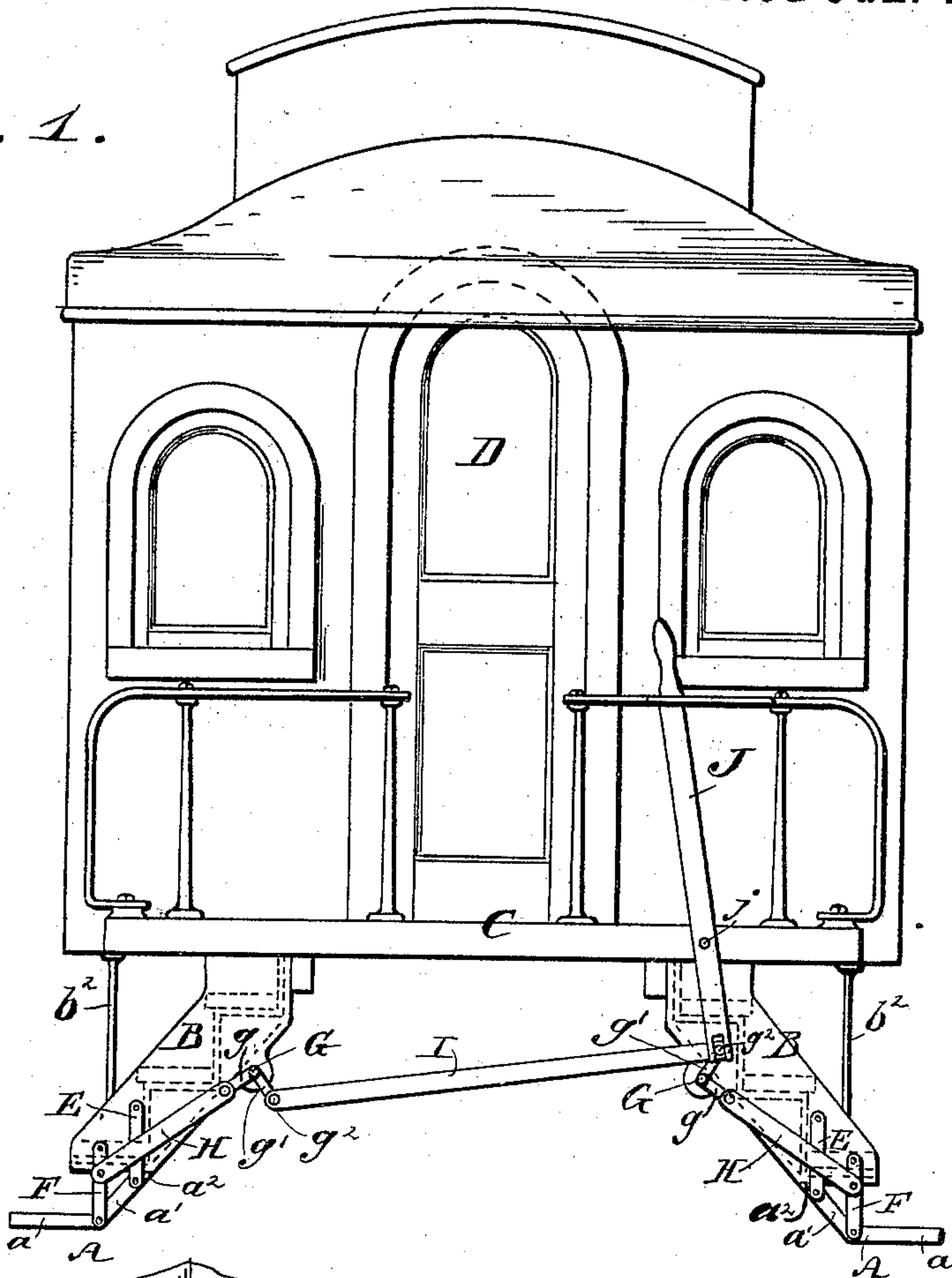
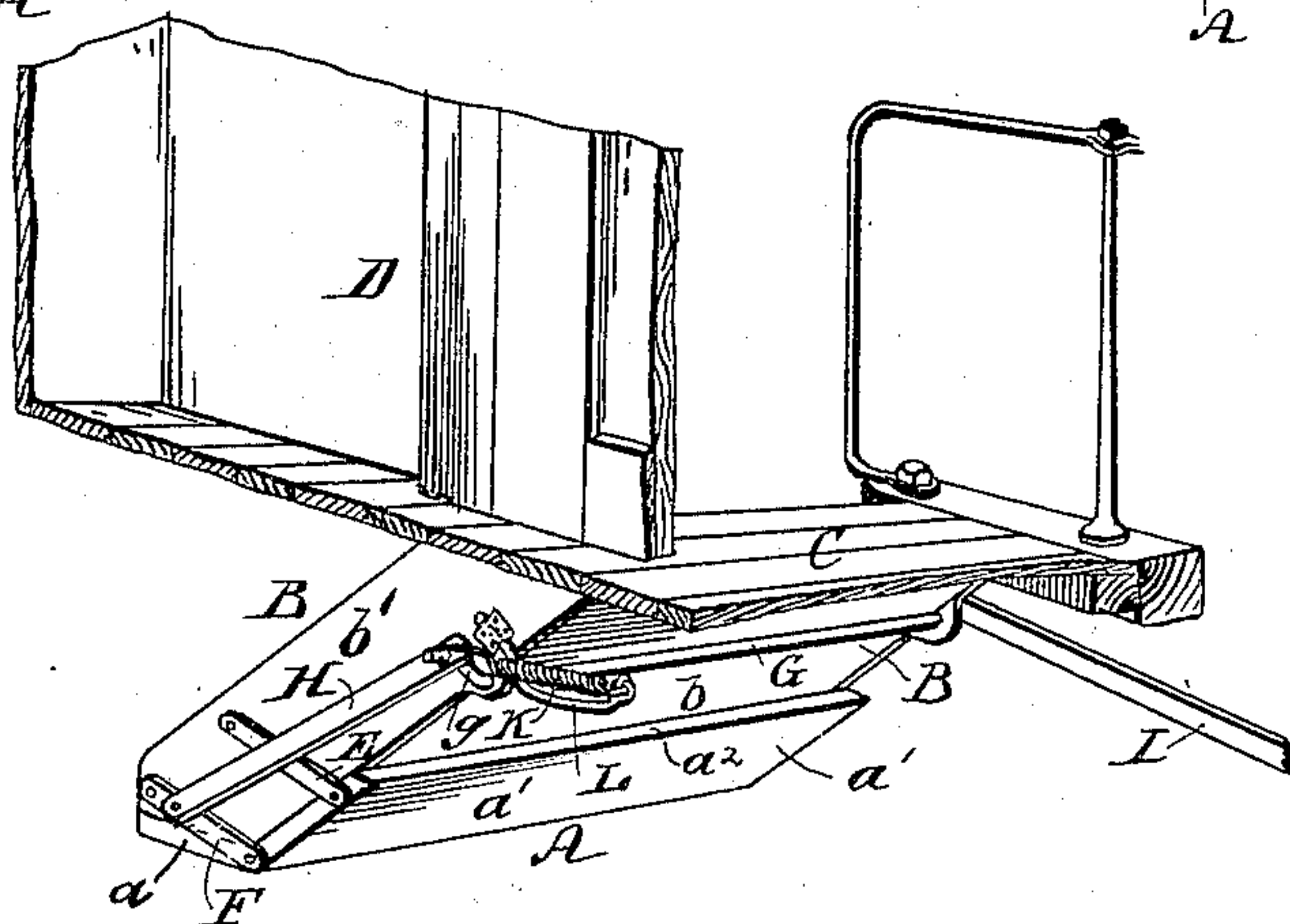


Fig. 2.



WITNESSES:
John H. Deemer
E. M. Clark

INVENTOR:
H. A. Merritt
BY *Munn & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY A. MERRITT, OF BROOKLYN, NEW YORK.

EXTENSIBLE CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 395,660, dated January 1, 1889.

Application filed July 28, 1888. Serial No. 281,266. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. MERRITT, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Extensible Car-Step, of which the following is a full, clear, and exact description.

My invention relates to extensible steps for railway-cars, which may be held folded to the permanent car-steps while the car is moving, and may be almost instantly lowered or extended when the car stops to promote convenient exit of passengers from the car.

The invention has for its object to provide a simple, inexpensive, easily-operative, and self-locking car-step of this character; and it consists in certain novel features of construction and combinations of parts of the extensible step structure with relation to the permanent car-steps, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is an end view of a railway passenger-car with my improved extensible steps applied thereto and shown in lowered or extended position, and Fig. 2 is a detail perspective view of a portion of the car-body and the inner side of the ordinary steps at one side of the car-platform and with the extension-step folded up closely thereto as when out of use.

My improved extensible step A is applied and operated by mechanism, presently explained, at the lower step, B, of the series of ordinary permanent steps, usually three or four in number, which are provided at each side of the platform C of a passenger-car, D, which may have the usual or any approved construction.

The step A is made with a horizontal portion or step proper, *a*, and an inclined riser, *a'*, which, when the extensible step is folded, lies closely to the inclined back board, *b*, of the series of steps B of the car. The step A is hung at each end to the steps B by means of two links, E F, which are pivoted at their upper ends to the stringer or side piece, *b'*, of the steps B and at their lower ends are pivoted to the step A, the links E being pivoted to the upper parts of the inclined riser *a'*, and

the links F being pivoted at the junction of said riser with the step proper, *a*, the pair of links E F at each end of the step A remaining parallel with each other.

A shaft, G, which is journaled transversely to and at the back or inner face of the steps B, carries at each end a crank-arm, *g*, both of these crank-arms extending from the shaft in like radial planes, and to wrist-pins at the ends of these crank-arms *g g* are pivoted or hung the upper inner ends of bars or rods H H, which range downward and outward alongside of the step-stringers *b' b'* of the car-steps B and are pivotally connected at their lower outer ends with the two outer links, F F, above mentioned, and as shown in the drawings. The outer ends of the shafts G G of the opposite series of side steps, B B, of the car are provided with other crank-arms, *g'*, which range about at right angles with the crank-arms *g* at these ends of the shafts, one of the crank-arms *g'* extending upward and the other downward. These crank-arms *g' g'* are provided with wrist-pins *g² g²*, with which the opposite ends of a transversely-ranging operating-bar, I, are pivotally connected, and the wrist-pin *g²* of one of the crank-arms *g'* is engaged by the lower slotted or forked end of a lever, J, which is fulcrumed at *j* to the car-platform C and projects upward in convenient reach of a person on the platform, who by operating the lever may simultaneously extend or fold up the steps A A at opposite sides of the platform.

To the extremity or wrist of the inner crank-arm *g'* of each shaft G, or that crank-arm next the main body of the car, is attached one end of a normally contracting or pulling spring, preferably a spiral spring, K, the other end of which is connected to the outer end of a rod, L, which is fixed at its inner end to the stringer *b'* of the steps B. The bar shown at *b²* in Fig. 1 of the drawings is the ordinary hanger-bar which supports the steps B from the car platform or body.

The operation of my improved extensible car-steps is as follows: When the lever J is thrown back to the position shown in Fig. 1 of the drawings, the lever, by direct action on the wrists *g²* of one of the crank-arms *g'* of one shaft G and through the bar I, connected to the wrist *g²* of the crank-arm *g'* of the other

shaft G, will, by means of the crank-arms *g g* of said shafts G G and the bars H, push the links F F at each end of both extensible steps A A downward, and thereby also swing the step-links E E downward and carry the steps downward and outward until the upper edges, a^2 , of their inclined risers a' pass beneath the lower permanent steps B at each side of the car-platform. It will be noticed that when the extensible steps A are adjusted for use in this manner the bars H and the crank-arms *g* of the shafts G, with which they connect, are brought about in alignment, whereby the steps are securely locked in lowered or extended positions, and the engagement or contact of the upper edges, a^2 , of the step-risers a' with the under sides of the lower permanent steps also serves as an additional lock to the extended steps. By shifting the lever J in the other direction the shafts G and bars H will be operated to cause the steps A A to rise and move inward until they fold snugly against the bottom permanent step B and the back piece or plate, *b*, thereof, and as will be understood from Fig. 2 of the drawings.

The springs K are arranged relatively to the crank-arms *g* of the shafts G, with which they connect, so as to exert a pulling strain on the arms whether the steps A A be extended or folded; hence the spring forms a safety-lock to hold the steps in either position to which they may be adjusted and independently of the locking tendency of the bars H and crank-arms *g*, and also of any locking tendency the lever J may have.

It is manifest that the steps at both sides of the car may be provided with an operating-lever, J; but I prefer to use the construction with the coupling-bar I and employ but one lever J at each car-platform.

It is obvious that when the steps A A are extended their risers a' are about in the same plane with the back piece, *b*, of the steps B and effectually close the space between the extended step *a* and the lower permanent step above it, thus making the steps B A practically one series and preventing annoyance to lady passengers by ogling bystanders and avoiding accidents which might occur were the riser a' not used.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described extensible car-step, comprising a foot-plate hung by parallel end pairs of links from the permanent car-steps, a transverse shaft journaled on the permanent steps and having crank-arms, and bars connecting said crank-arms with the suspension-links of the extensible step or foot-plate, substantially as herein set forth.

2. The herein-described extensible car-step, comprising a foot-plate hung by end pairs of

links from the permanent car-steps, a transverse shaft journaled on the permanent steps and having crank-arms, bars connecting said crank-arms with the suspension-links of the extensible step or foot-plate and holding it extended, and a spring connected to the car-body or permanent steps and to a crank-arm on the shaft and locking the steps in either folded or extended positions, substantially as herein set forth.

3. The combination, with the permanent car-steps B, of an extensible step, A, formed with a foot-plate, *a*, and riser a' , pairs of links E F, pivoting each end of the step A to the steps B, a shaft, G, journaled on the steps B and having crank-arms *g g* at each end, a bar, H, connecting the arms *g* and links F, and a spring, as K, connected to one crank-arm *g* and to the car steps or body or a rod thereon, substantially as described, for the purposes set forth.

4. The combination, with permanent car-steps B, of an extensible step, A, links E F, connecting the steps A B, a shaft, G, having crank-arms *g g*, bars H, connecting said arms with the links F, a crank-arm, g' , on the shaft G, and a lever, J, fulcrumed on the car and engaging the crank-arm g' , substantially as herein set forth.

5. The combination, with permanent car-steps B, of an extensible step, A, links E F connecting the steps A B, a shaft, G, having crank-arms *g g*, bars H, connecting said arms with the links F, a crank-arm, g' , on the shaft G, a lever, J, fulcrumed on the car and engaging the crank-arm g' , and a spring, K, connecting one crank-arm *g* of the shaft G with the car steps or body or a rod thereon, substantially as herein set forth.

6. The combination, with permanent car-steps B at each side of a car-platform, of extensible steps arranged therewith, links connecting the extensible steps with the permanent ones, a shaft, G, journaled at each series of steps B and provided with crank-arms *g g'*, bars H, connecting the crank-arms *g* with the extensible-step suspension-links, and a bar, I, connecting the crank-arms $g' g'$ of both shafts G G, substantially as described, whereby the extensible steps at each side of the car-platform will be operated simultaneously, as set forth.

7. An extensible car-step hung to the permanent steps and formed with a foot-plate, *a*, and with a riser, a' , which closes the space between the plate *a* and the permanent steps above it when the step is extended, substantially as herein set forth.

HENRY A. MERRITT.

Witnesses:

G. W. PHELON,
JAMES A. LOGAN.