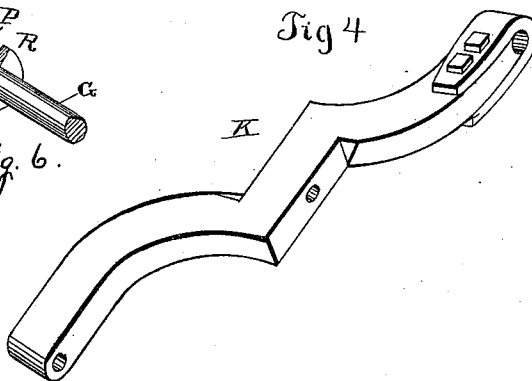
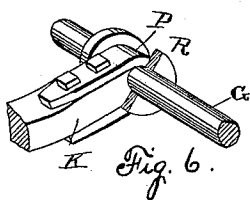
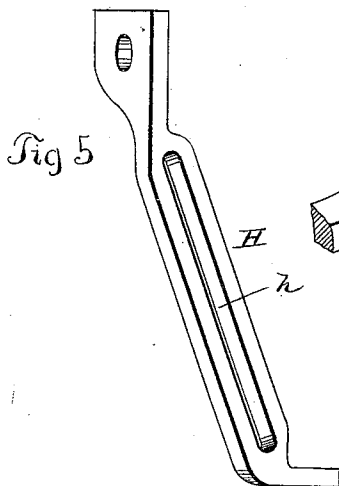
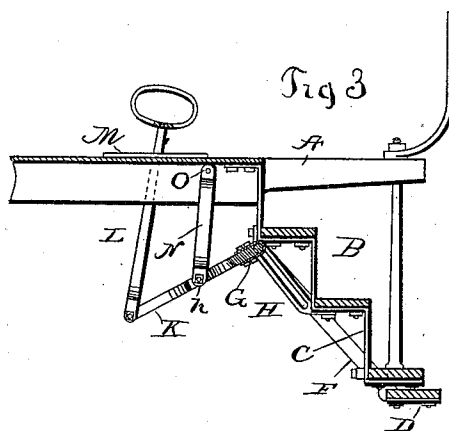
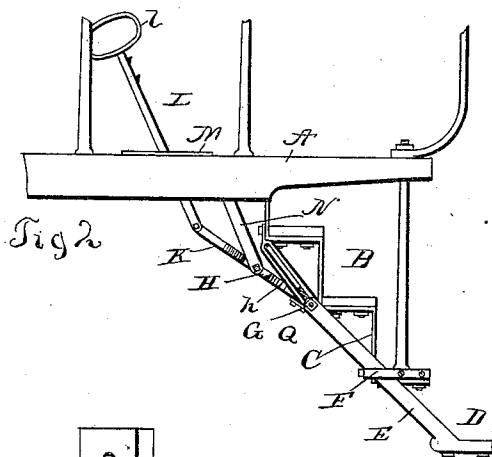
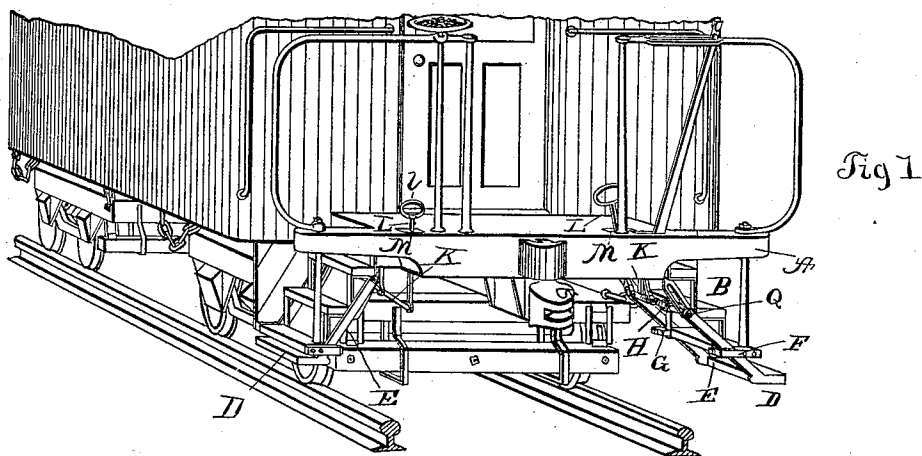


(No Model.)

D. W. CLARK.
ADJUSTABLE CAR STEP.

No. 463,481.

Patented Nov. 17, 1891.



WITNESSES:

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DANIEL W. CLARK, OF TIONESTA, PENNSYLVANIA.

ADJUSTABLE CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 463,481, dated November 17, 1891.

Application filed May 1, 1891. Serial No. 391,236. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. CLARK, a citizen of the United States, residing at Tionesta, county of Forest, State of Pennsylvania, have invented certain new and useful Improvements in Adjustable Car-Steps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in folding or adjustable car-steps, and has for its object to provide an attachment for the ordinary stationary car-steps which will enable an additional step to be extended into an operative position and withdrawn or folded close to the stationary step when not in use.

Various devices have been made heretofore with the object of facilitating the ascent and descent of passengers to and from the platform of the car, said devices being designed as substitutes for the independent stool which is ordinarily used to assist passengers in reaching and leaving the car-steps. In some cases these devices consist of folding steps to take the place of the ordinary stationary or fixed steps and are intended to be substituted therefor; but this construction necessitates the manipulation of the devices whenever the step is to be used, whereas in many cases the ordinary steps are sufficient.

It is therefore my object to provide a device which may be applied to the car-steps now in use, which can be used when required, and which will not interfere with the use of the fixed steps when not required, thereby adapting it to be attached to cars heretofore constructed.

A further object of my invention is to provide an adjustable step and means for operating the same from the platform of the car, in which the simplicity of construction enables them to be cheaply manufactured and applied to the car without altering the present construction of the latter and at small cost.

My invention consists in a certain novel construction and combination of parts, which

will be fully described hereinafter in connection with the drawings, wherein—

Figure 1 is a perspective view of a car-platform, showing my invention applied in the operative position to the steps at opposite ends thereof. Fig. 2 is a side view showing the adjustable step in its extended position. Fig. 3 is a central vertical sectional view showing the step in its folded position. Fig. 4 is a detached detail view of the lever. Fig. 5 is a similar view of one of the slotted guide-bars. Fig. 6 is a detail view.

Referring by letter to the drawings, A represents the platform, and B the stationary steps at the opposite ends of said platform, the steps being secured to the usual horses C, which are supported from the platform.

The adjustable step D is provided at its ends with the rearwardly-inclined side arms E E, which pass, respectively, through stirrups or keepers F on opposite ends of the bottom step B, and are connected at their upper ends by means of a transverse rod G.

To the rear side of the fixed steps, or to the horses C, to which said steps are secured, are attached guide-bars H H, provided with longitudinal guide-slots *h h* to receive the transverse connecting-rod G, whereby as the side arms are extended to lower the adjustable step their upper ends are guided by the movement of said connecting-rod in the slots.

K represents a lever, which connects an intermediate portion of the rod G to the lower end of an operating-arm L, which passes through an elongated opening *m* in a plate M, which is secured to the car-platform, and is provided at its upper end with a suitable handle *l*. The lever K is fulcrumed at an intermediate point to the lower end of a swinging link N, which is suspended from and pivoted upon a transverse rod O, which connects the timbers of the car-platform. This rod is preferably the ordinary tie-rod which is found in the majority of car-platforms.

From the above description it will be understood that when the adjustable step is in its folded or elevated position in contact with the under surface of the lower fixed step B, as shown in Fig. 3, the operating-arm is depressed, and when it is desired to extend the adjustable step said arm is elevated, thereby

elevating the adjacent end of the lever and lowering the opposite end thereof, and thus forcing the connecting-rod toward the lower ends of the guide-slots. When the step is in its folded position the operating-arm is inclined forward or outward toward its upper end, thereby causing it to bear normally against the corresponding end of the opening *m*, and the arm is provided on its front or outer side with a small shoulder or catch, or a series of said shoulders or catches, two being shown in the drawings, to engage the front side of the opening *m*. When it is desired to extend the step, this shoulder or catch must first be disengaged by moving the upper end of the operating-arm backward, or away from that side of the opening with which the shoulder or catch is engaged when it is free to be elevated. By means of this locking device the step is held in its folded position, whereby it cannot be jarred loose or extended by the motion of the car. When the step is in its extended position no locking device is required, the weight of the person standing thereupon being carried by the connecting-rod, which bears against the lower ends of the guide-slots.

It will be seen that by the use of the swinging link, to the lower end of which is fulcrumed the operating-lever, said lever being curved or angular in shape, I am enabled to connect one end of the latter to an intermediate point of the transverse connecting-rod, while the operating-arm (which is connected to the other end of the lever) is arranged at the side of the platform, and passes, as shown in the drawings, through one of the side beams. The operating-arm is placed at the side of the platform so as to be out of the way of passengers and at the same time accessible to the train-hands, and the opposite end of the lever is pivoted to an intermediate point (preferably about the center) of the connecting-rod, so as to prevent cramping or binding in the slots, and enable an equal strain to be exerted upon both side arms in raising and lowering the step.

The slotted guide-bars, above described, may be formed integral with the horses of the fixed steps; but in order to adapt my device to be applied to cars now in use I have shown said bars provided at opposite ends with perforated ears to be engaged by bolts, which also engage corresponding apertures in the horses, whereby it is only necessary to drill said apertures in the horses in order to adapt them for the reception of the slotted arms. The keepers, through which pass the inclined side arms, may also be cast integral with the lower ends of the horses; but for the same reason as above I have shown them constructed in such a manner as to enable them to be bolted in place. The lower end of the operating-arm is bifurcated, and the lower end of the swinging link is similarly formed for the reception of the lever, the front end of the latter being provided with an adjust-

able loop *P*, the arms of which are bolted to the upper and lower sides of the lever, and the connecting-rod is provided with fixed collars *p p*, between which said loop encircles the rod. The ends of the connecting-rod are engaged by nuts *Q Q*, which bear against the outer surfaces of the said arms. The handle is secured to the upper end of the operating-arm by a screw-joint, whereby it may be removed to introduce the arm or remove it from the opening *m*.

The inclination of the side arms corresponds approximately with the inclination of the fixed steps, and in order to enable the adjustable step to be drawn more effectively under the lower fixed step when folded and enable it to be projected sufficiently beyond the front edge of said fixed step when extended I have found it of advantage to arrange the slotted guide-bars at a slightly-different inclination from the side arms. The upper ends of said guide-bars are inclined slightly outward from the plane of the side arms, or the lower ends of said bars are inclined slightly inward from the plane of the arms in order to draw the upper ends of the latter outward as the step is folded and carry the same inward as the step is extended.

I do not desire to limit myself strictly to the precise details of construction above described, as it is evident that in the adaptation of my improved adjustable step to the various kinds of cars now in use and which may be hereafter constructed slight modifications of detail—such as the manner of attaching the essential members of my invention to the fixed parts of the car, the disposition of the operating-arm to accommodate special constructions to enable it to be arranged out of the way and at the same time render it accessible to the train-hands, &c.—will be necessary, and I reserve the right to make such changes without departing from the spirit of the invention.

From the above description it will be seen that when the extension-step is extended to its operative position the side arms are each firmly held or supported at two points—namely, in the stirrups or keepers at the bottom of the stationary car-steps upon the lowermost step and at the lower ends of the guide-slots—thereby preventing looseness or vibration and insuring a firm support for the foot of the passenger.

I am aware of various devices for the same purpose as my improved step, which are operated by means of levers which are connected to one side or one arm of the extension-step; but I have avoided this construction for the reason that the parts are liable to cramp and especially after considerable use when the joints become somewhat loose.

The operation of my improved extension-step will be the same at all times when the joints are new and properly adjusted and also when they become worn and loose.

Having thus described my invention, what I

claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of the extension-step provided with side arms, fitting in stirrups or keepers on the permanent car-steps, the guide-rod connecting the upper ends of the side arms, and a curved or bent lever connected at one end to an intermediate point of the guide-rod and pivoted at its opposite end to the lower end of an operating-arm, which is arranged at one side of the car-platform, substantially as specified.

2. The combination of the extension car-step provided with sliding side arms, a guide-rod connecting the upper ends of the side arms and operating in guide-slots, and a lever connected to an intermediate point of the guide-rod, fulcrumed at an intermediate point to a swinging link and provided at its free end with an operating-arm, substantially as specified.

3. The combination of the extension-step provided with sliding side arms which fit in stirrups or keepers upon the permanent car-steps, the inclined slotted guide-bars, the guide-rod connecting the upper ends of the side arms and engaging the slots in the guide-bars, and a lever connected to the guide-rod, substantially as specified.

4. The combination of the extension-step provided with side arms fitting in stirrups or keepers upon the permanent car-steps, the slotted guide-bars arranged at an inclination to the pitch of the car-steps, the guide-rod connecting the upper ends of the side arms and engaging the slots in the guide-bars, and a lever having a movable fulcrum and connected at one end to the guide-rod, substantially as specified.

5. The herein-described extension-step, provided with side arms which fit in guiding stirrups or keepers, the inclined guide-bars provided with guide-slots, the guide-rod connecting the extremities of the side arms and en-

gaging the guide-slots, the curved or bent lever fulcrumed at an intermediate point upon the free end of a swinging link, and connected at one end to an intermediate point of the guide-rod, and an operating-arm connected to the opposite end of said lever and provided with a shoulder or notch to engage a catch upon the car-platform, substantially as specified.

6. An extension car-step provided with side arms fitting in stirrups or keepers upon the lowermost permanent car-step, the slotted guide-bars inclined to the pitch of the permanent steps, the guide-rod connecting the upper ends of the side arms and engaging the slots in the guide-bars, the downward movement of the extension-step being limited by the guide-rod engaging the lower ends of the slots in the guide-bars, and a lever connected to an intermediate point of the guide-rod and mounted upon the free end of a swinging link, substantially as specified.

7. An extension car-step provided with side arms fitting in stirrups or keepers on the lowermost permanent car-step, the slotted guide-bars, the guide-rods connecting the upper ends of the side arms and engaging the slots in the guide-bars, the lever connected to an intermediate point of the guide-rod and fulcrumed to the free end of a swinging link, and an operating-arm connected at its lower end to the free end of the lever and provided on its front or outer side with a shoulder to engage a permanent catch upon the car-platform, said arm being adapted to incline forwardly or outwardly toward its upper end to normally engage the catch when the extension-step is folded, substantially as specified.

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

DANIEL W. CLARK.

Witnesses:

A. G. BOYS-SMITH.

WILLIAM F. ROBB.