(No Model.) 2 Sheets—Sheet 1.

A. G. LEONARD.

PLATFORM STEP.

No. 517,282. Patented Mar. 27, 1894.

Fig. 1.

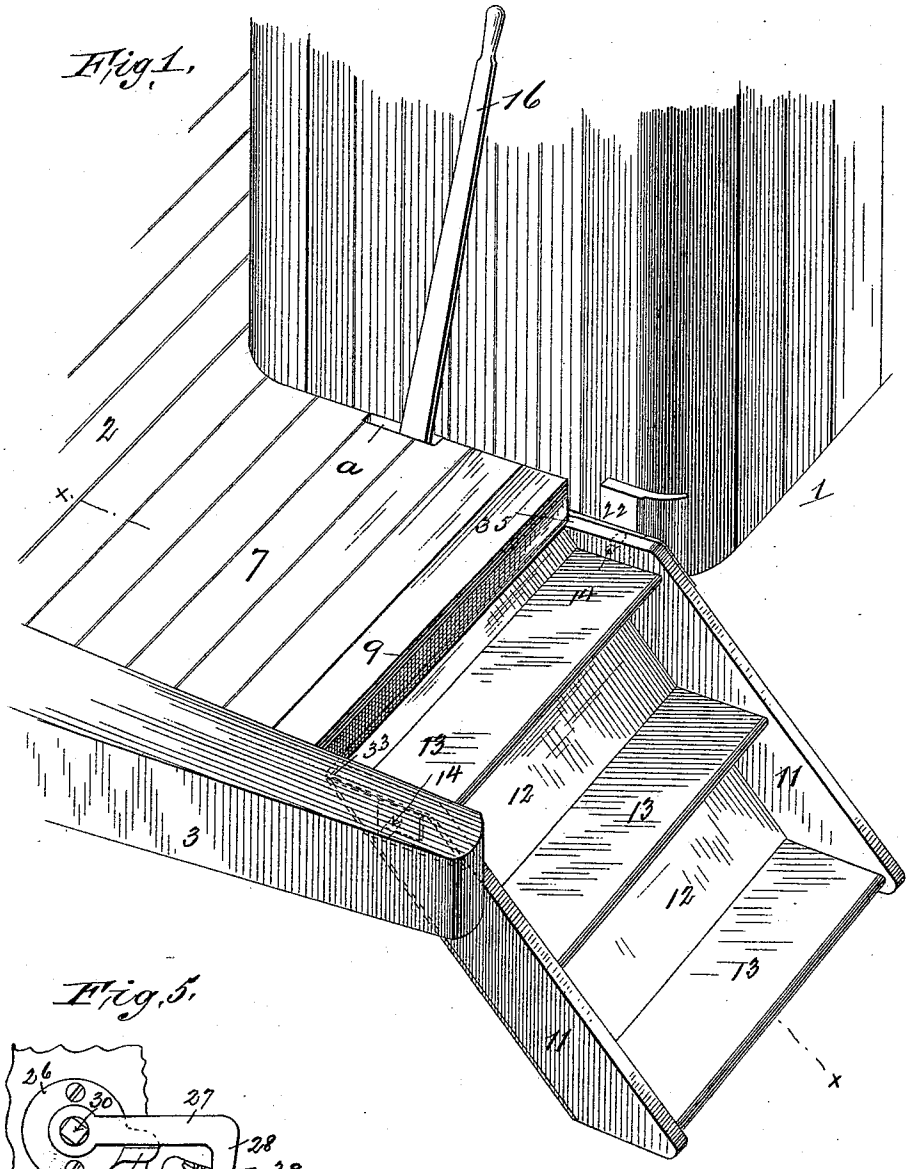
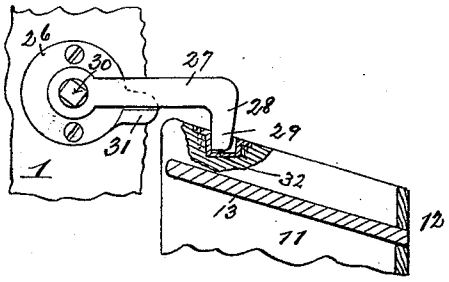


Fig. 5.



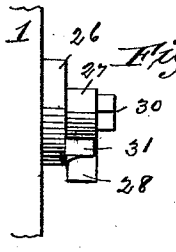


Fig 6.

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WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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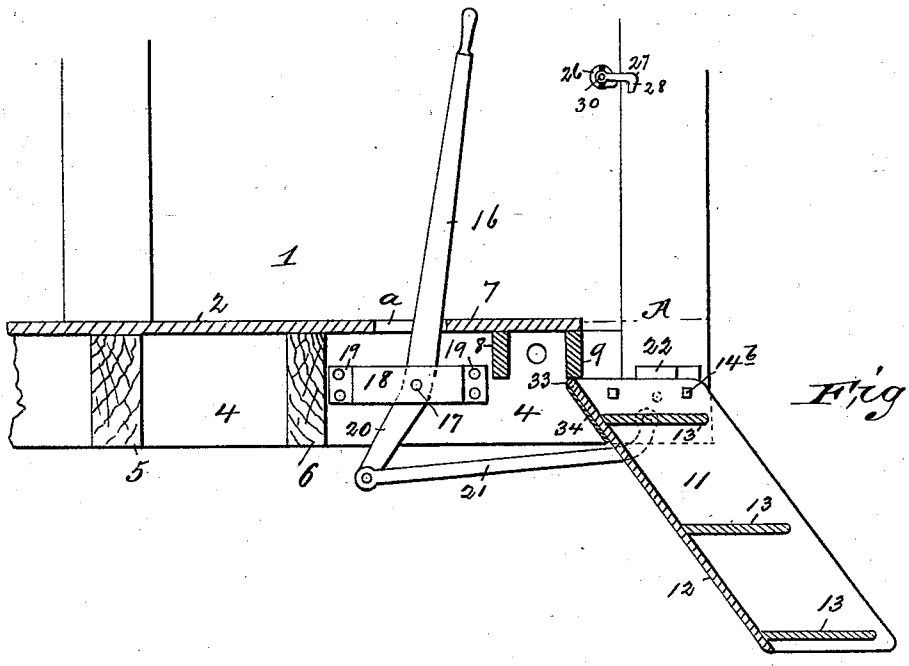

Fig. 2.

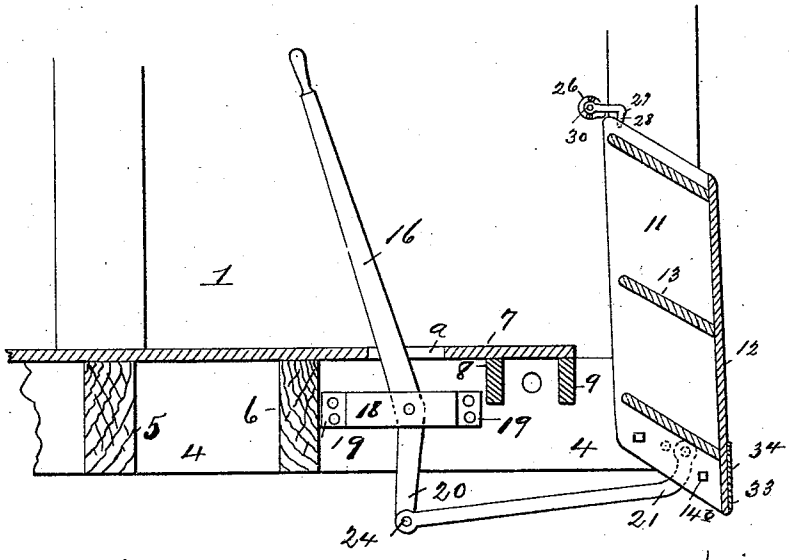

Fig. 3.

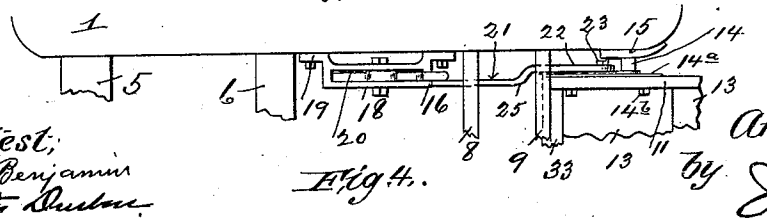

Fig 4.

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UNITED STATES PATENT OFFICE.

ARTHUR G. LEONARD, OF NEW YORK, N. Y.

PLATFORM-STEP.

SPECIFICATION forming part of Letters Patent No. 517,282, dated March 27, 1894.

Application filed July 22, 1893. Serial No. 481,199. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR G. LEONARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made certain new and useful Improvements in Platform-Steps, of which the following is a specification.

My invention has for its object first to provide car platforms with a pivoted step of simple construction so that when the step is not in use the step may be vibrated upwardly and held in an elevated position at the side of the platform, and to do away with the usual form of articulated step now in use and the complicated apparatus for operating it; and secondarily to provide a construction of platform whereby I am enabled to get an increase in the width thereof and increased resistance against compact.

My invention therefore consists in taking a step of the ordinary construction with side plates and tread immovably secured together, and pivotally securing its rigid side plates near or in line with its upper part or tread to the car framing in such a way that the step can be swung bodily up and down by a single operating lever and connecting rod, the step when up forming a guard or gate of the entire step to prevent passengers leaving the platform at an improper time, and when down will form means for egress from the platform, the point of pivotal support of the step being so placed that when the step is lowered the sill restrains its further movement.

My invention in this regard therefore consists in but three elements, to wit: a platform; a step, the parts of which are immovable one in relation to the other, and which has the co-relation to the platform just before set forth, and means for pivotally supporting the step so that it can be swung bodily, its pivot forming the real point about which it moves. The means for swinging the step is secured thereto closely adjacent to its pivotal support so that the weight of the pivoted end of the step will accelerate the swing, and, after it has been started, help the operator in elevating it.

My invention, as to the platform, consists in flooring over almost all of the usual space allotted for the steps, which according to the present practice extends some distance inward toward the center of the car, and increase the floor space of the platform. In doing this I extend between the main front cross sill, sometimes called the "door sill" and the buffer beam at each side of the longitudinal center, and beyond the place where the usual "step sill" (in steam railway cars) is located and preferably closely adjacent to the outer longitudinal sills, additional sills longitudinally disposed, which in addition to forming a support for the step when lowered, as hereinafter described, tend to brace the car structure against injury by end compact as well as to form a support for the added platform sections.

I am aware that the platforms of street cars have been made as wide, or almost as wide, as the total distance between the outer longitudinal sills and to which a step has been pivoted, so I do not intend to claim these features broadly.

My invention further consists in the details of construction hereinafter described and more fully pointed out in the claims.

In the drawings—Figure 1 is a perspective view, showing a portion of the end of the car, its platform, the step lowered, and the operating lever in position at the end of its outer movement; Fig. 2, a sectional elevation, reduced, on the line $x x$ Fig. 1, the parts being in the same position; Fig. 3, a like view with the step raised; Fig. 4, a plan view of Fig. 2 showing certain parts broken away; Fig. 5, an enlarged side elevation of a portion of the step and car showing the device for maintaining the step in its closed or upright position; and Fig. 6, a side elevation of the detaining latch and its support on the car.

Similar letters and numerals of reference refer to like parts throughout the several views.

In the drawings 1 indicates a portion of the car; 2 the platform flooring thereof, and 3 the buffer beam in front of the platform.

In Figs. 2 and 3 the door sill is shown at 4, the central longitudinal platform sills at 5, and the usual step sill at 6.

I mean by the words "usual step sills" that according to the standard adopted by all car builders and railroads, the step sill, which has heretofore defined the width of the platform between the steps, and which are located

at a certain predetermined point at both sides of the longitudinal center of the car, should be understood to bear that same relation in the present structure that it does in all other like structures, which relation is a fixed one and determined by the gage and the width of the car.

By reference to Figs. 2, 3 and 4 it will be seen that the inner ends of the platform sills abut directly against the cross sill 4, and are preferably in line with the corresponding longitudinal car body sills (or the platform sills may be continuations of the body sills), so that, when, as in the case of a collision, end on, the impact will be received directly by the ends of the longitudinal car sills, and this must be distinguished from the street car practice in which the "outlook" or platform sills do not abut, end on, against the body sills, but are carried below them and are secured by straps and bolts. I therefore secure by my invention, as further described, an extended platform, the extensions of which are stationary, and which are supported by sills having their ends in line (that is end on) with both the body sills and the buffer beam, by which the capacity of the car to resist shock by end impact and the strength of the platform itself is greatly increased. This, however, I do not claim herein except as such novel features are combined with my step, the novel features of the platform forming the subject matter of an application filed by me on the 27th day of September, 1893, and serially numbered 486,594.

It will be seen by reference to Figs. 1, 2 and 3 that the platform 2 does not end at the step sill 6, but is continued beyond the same by what I call platform extensions 7 which are supported at their outer ends by supplemental sills 8, 9, extending between the door sill and the buffer beam and abutting end to end. Thus additional area is secured for the platform, the desirability of which is well known. The step is shown at 10, which is of the usual structure, the present one having the side plates 11, back plate 12 united to the side plates, and the treads 13, all secured together so as not to have any movement in relation to each other. To the side plates 11 at their upper portion are secured trunnions 14 formed on the plate 14^a rigidly secured to the side plates 11 by the bolts 14^b and which find bearings in a plate 15 secured in a proper place on the side of the car; or the plate 15 may have the trunnions thereon which will then find bearings in the plate 14^a.

By reference to Fig. 2 it will be seen that a space A is left between the end of the platform and the side of the car which is as wide at least as the width of the step, so that when the step is down, as in Fig. 2, the top tread will lie directly within that space and its outer edge extend to or out from the "skin" of the car, so that the first step the alighting passenger takes from the platform will bring him out of the car. Also, that the location of the pivotal point (the trunnions 14) in the position shown brings the top tread within easy stepping distance (or a "step") from the platform flooring. The additional sills 8, 9 are not made as high as the sills 5, 6 as it is thought that they will serve their purpose as supports for the added platform sections and form efficient means for co-operating with the step, as hereinafter set forth, without having the same depth, but for the purpose of getting from them the resistance to compact, as before stated, I prefer to make them deeper (as in my application before referred to), in which case the top tread could be brought nearer to the top of the step, and thus preserve the regular "step" distance between the platform flooring and the top tread. Other results of this arrangement are that when down the step will lie over the platform or walk adjacent to the track, and be closer thereto than the usual step, and as the same extends, when down, some distance out from the car, it can even rest on the adjacent station platform, and increase the facility in leaving the car. The increase in the width of the platform is very valuable in vestibuled cars, as it permits of the vestibule side door being located directly over the outer sill 9, and in the space between the sills 6 and 9 a removable seat or stool can be placed for the convenience of the passengers.

When raised, as in Fig. 3, the step can be so pivoted as to lie within the body of the car.

The means for raising the step are as follows: An operating lever 16 extends up through a slot *a* in the platform extensions 7, and is pivotally secured by the pin 17 within a bracket 18, which bracket is fixed by its ears 19 to the door sill. The lever 16 has a bent arm 20, and this arm is connected to the top of the step by a link 21 having a gooseneck 22 and an eye thereon, through which passes a bolt 23 for pivotally securing the gooseneck to the plate 14^a, the other end of the link 21 being secured to the arm 20 of the lever 16 by a pin 24. The link 21 has a bend 25 which enables it to pass the outside of the step as shown in Fig. 4. The union of the link 21 to the step is had closely adjacent to its pivotal support, so that the lever 16 will move through a very small arc in raising or lowering the step, and the arrangement of the arm 20 and bent link 21 is such that no dead points are created, the effect of the entire leverage being that the step is moved up with great rapidity and ease when compared with the very small extent of movement of the lever 16.

It is desirable that a device for retaining the step in its elevated position be used, a form of such device being shown in Figs. 5 and 6, and which consists of a plate 26 secured to the side of the car having a latch 27 with a downwardly extending finger 28 rounded at 29 for working easily over the top of the step side plate, which latch is pivotally secured upon the stud 30 forming part of the

plate 26, the plate also having a lug 31 extending therefrom and which prevents the latch from dropping too far down. The finger 28 is adapted to engage with a mortise-plate 32 recessed into the under edge of one of the side plates 11. If desired a spring may be provided to act upon the latch to keep it in contact with the mortise-plate, the engagement of the plate and the latch preventing the door vibrating outwardly, except when properly freed.

Instead of securing the latch to the side of the car it can be secured to a post rising from the buffer beam which would define the outer angle of the vestibule. I have shown it in the present way for simplicity of illustration and do not limit myself to such location; and, further I do not limit myself to the use in this connection of a restraining latch as the lever 16 may be engaged by such a device as is used for holding the levers for uncoupling cars, so that the means for retaining the step in the upright position may be applied either to the step itself or to any other portion of its operating mechanism.

The means for retaining the step, when lowered, in its proper position for permitting exit from the car will now be described, and incidentally the co-operation of the step with one of the novel features of the platform set forth. The side plates of the step are pivoted, as before set forth, with such a relation to the additional sill or sills 9 (that is, such sill can be unitary or multiple) that the points or corners 33 of the side plates 11 are adapted to bear against the outer supplemental sill 9 when the step is in its lowered position, as shown in Figs. 2 and 4, which holds the step rigid to support the weight of a person moving upon it. If the sill 9 is made deeper the pivotal point can be lowered, and the top tread raised, as before set forth; or the top of the step can be cut away without necessitating a change of location of the trunnions. I prefer to reinforce this portion of the step by an additional plate 34 which strengthens it in the desired direction. By disposing the arm 20 out of the central axis of the lever 16, and by using the gooseneck link 21 and connecting it to the step at one side of the pivotal point thereof, the step is held to a certain degree in a locked condition, and the arrangement of the levers is such that both the step and the operating lever 16 move in the same direction when raising or lowering the step.

By reference to Fig. 3 it will be seen that the step, when raised, lies practically within the outer line of the car and extends some distance above the platform extensions 7, so that when in its elevated position the step is out of the way, and at the same time serves as a means for preventing passengers from alighting from the car too soon, and the brakeman or car attendant can control the exit of the passengers and prevent them from leaving the car until the same has come to a stop.

The form of device shown here can be modified as to details of construction without departing from the spirit of my invention. I therefore do not limit myself to the exact construction shown.

Having described my invention, I claim—

1. The combination, in a car and its platform, of the platform extension extending out beyond the usual step sill, and a swinging step pivotally supported at the edge of the extension, and means connected with the step at its pivotal end close to its pivot for swinging the step in an arc around its pivotal support, the step when lowered forming means for egress from the car, and when elevated extending upwardly above the platform, substantially as described.

2. The combination of a platform, and a unitary step, whose parts are immovable with relation to each other the platform having a recess, non-articulated means for pivotally supporting the step within the recess, and means for bodily moving said step, whereby the full length of the step can be caused to extend above or below its pivotal support, substantially as described.

3. The combination with the step pivoted at or near one of its ends, of an operating lever independent of the step and having a short arm, the pivots of said step and lever extending in the same direction, and a link directly connecting the short arm of the lever with the step beneath the pivot of said step, whereby the lever and step move in parallel lines, substantially as described.

4. The combination of the platform, with a step having treads and sustaining plates therefor united into a unitary structure, whose parts are immovable with relation to each other and means for pivotally sustaining the step on the platform adjacent the platform edge whereby the step can be vibrated bodily about a fixed point, and means connected to the step at a point close to its pivot for so vibrating the step, substantially as described.

5. The combination of a platform, with a step having treads and sustaining plates therefor united into a unitary device, whose parts are immovable with relation to each other means for pivotally supporting the said step adjacent the platform edge, and operating devices therefor, connected to the step at a point close to its pivot whereby the step can be vibrated so as to cause it to extend bodily above and below such pivotal point without reducing the length of the step, substantially as described.

6. The combination with the car and its platform, of the step pivotally secured adjacent thereto, the operating lever 16 pivotally supported, and arranged independent of said step and a link 21 movably secured to the lower arm of the operating lever and to the step adjacent to the pivotal point of the said step, substantially as described.

7. The combination with the platform, of the step pivotally supported adjacent thereto,

the operating lever 16 having the inwardly extending lower arm 20 below its pivot, and arranged independent of said step and the link 21 secured to the arm 20 and to the step adjacent its pivot, substantially as described.

8. The combination with the platform, of the step pivoted adjacent thereto, and operating lever fulcrumed to the platform, and made in a separate structure from said step and a link connecting the lower end of said lever with the step adjacent its pivotal point, the distance between the swivel points of the link being greater than the distance between the fulcra of the step and operating lever, substantially as and for the purpose herein set forth.

9. The combination with the platform, of the lever 16 having the bent arm 20 pivotally supported, the step pivotally supported near its top to the car at the edge of the platform, and a link 21 having a gooseneck pivotally connected at one end to the bent arm 20, the gooseneck being pivotally connected to the step adjacent to the pivotal point thereof, substantially as described.

10. The combination of the platform, the sill or sills 9, the step pivoted adjacent said sill, which sill is arranged to engage the upper part of the step to limit its downward movement, the fulcrumed lever 16 and link 21 secured to the lever and to the step adjacent its pivot, substantially as described.

11. The combination with the car, its platform, and a step pivotally supported adjacent thereto, of devices secured to the car or platform and arranged to engage the outer edge of the step to hold it in an elevated position and thus relieve its operating devices of strain, substantially as described.

Signed at the city, county, and State of New York this 18th day of July, 1893.

ARTHUR G. LEONARD.

Witnesses:
H. H. JACKSON,
CALEB M. HILLMAN.