No. 794,141. PATENTED JULY 4, 1905.

J. S. COXEY.

FOLDING EXTENSION STEP.

APPLICATION FILED OCT. 26, 1904.

Fig. 1

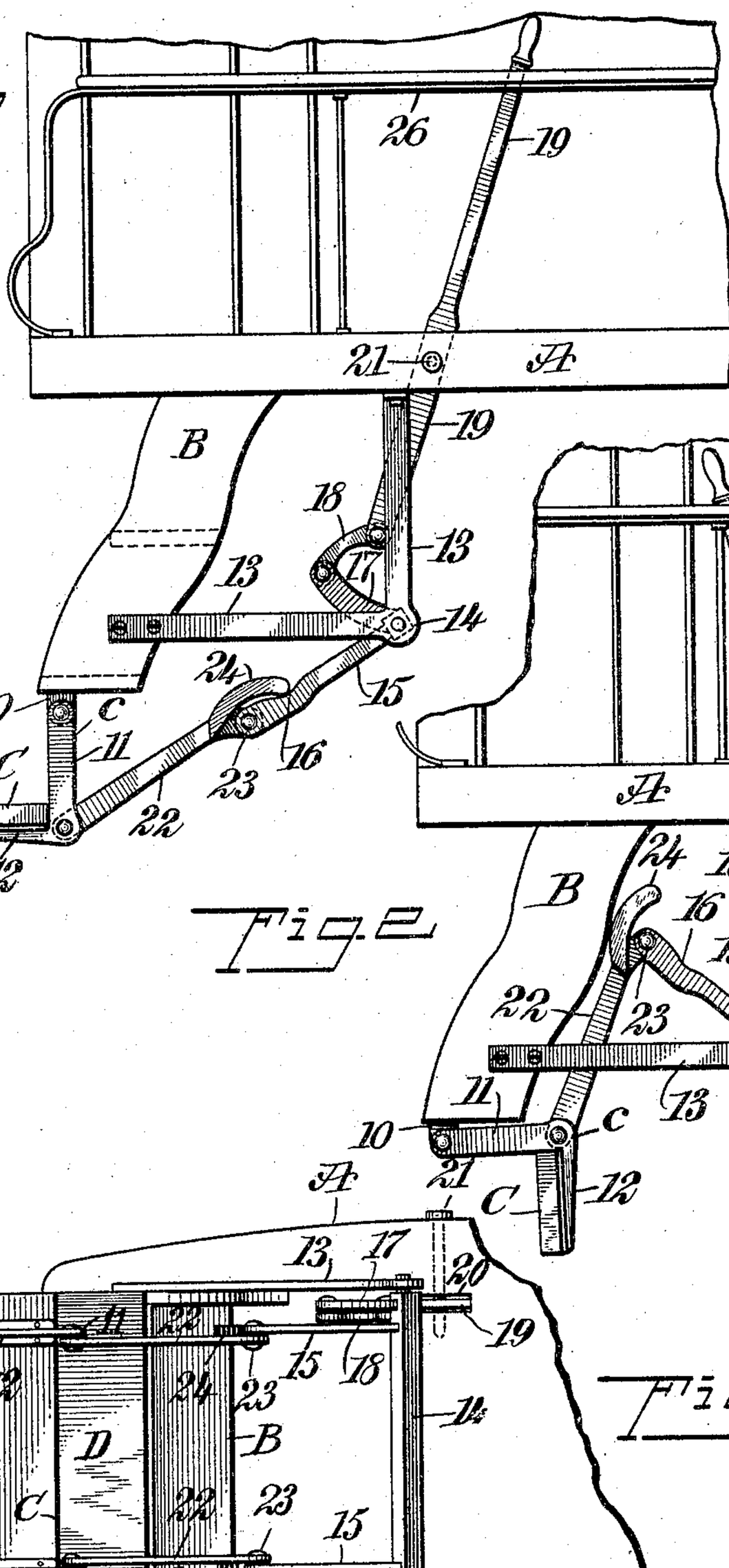
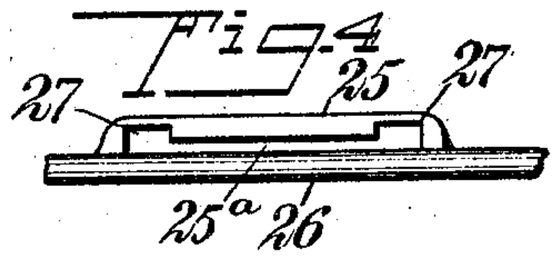


Fig. 2

Fig. 3

Fig. 4



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No. 794,141. Patented July 4, 1905

UNITED STATES PATENT OFFICE.

JASPER SHOEMAKER COXEY, OF ABERDEEN, WASHINGTON.

FOLDING EXTENSION-STEP.

SPECIFICATION forming part of Letters Patent No. 794,141, dated July 4, 1905.

Application filed October 26, 1904. Serial No. 230,091.

To all whom it may concern:

Be it known that I, JASPER SHOEMAKER COXEY, a citizen of the United States, and a resident of Aberdeen, in the county of Chehalis and State of Washington, have invented a new and Improved Folding Extension-Step, of which the following is a full, clear, and exact description.

My invention relates to swing or folding extension-steps, particularly adapted for use in connection with railway-cars and like vehicles.

The purpose of the invention is to do away with the small stool or box usually employed to facilitate the landing of passengers from railway-coaches at depots or stations where there is no convenient platform and to accomplish such result by providing an auxiliary bottom step having folding or swing connection with the lower step of the usual series fixed to the platform of a coach and to control the movements of the auxiliary steps by means of a series of levers conveniently operated through a handle member located at the platform of the coach.

Another purpose of the invention is to render the entire attachment exceedingly light, yet strong and readily applied, and to so shape and connect the levers employed that at one movement of the said handle member the auxiliary step will be swung from a folded position beneath and at the rear of the main stairs to a horizontal tread position below and in advance of the main stairs, while at a reverse movement of the handle member the auxiliary step is folded beneath the main stairs and back of the same, being then entirely out of the way when the coach is drawn up at a platform, for example, said levers acting to automatically lock the auxiliary step in either of the positions mentioned.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a partial end view of the platform of a railway-coach and its attached steps and a side elevation of the auxiliary step and its actuating mechanism, illustrating the auxiliary step in position for use. Fig. 2 is a view similar to that shown in Fig. 1, the auxiliary step, however, being shown folded out of the way and the actuating mechanism in position to accomplish such movement. Fig. 3 is a bottom plan view, the parts being in the position shown in Fig. 1; and Fig. 4 is a plan view of a portion of the guard-rail of the platform and of a keeper for the handle member of the step-actuating mechanism, which keeper is carried by the said guard-rail.

A represents the platform of a railway-coach, B the steps usually fixed to the platform and which I denominate the "main" stairs, and C represents an auxiliary step which has folding or swinging connection with the bottom portion of the main stairs B. The folding or swinging attachment is preferably made as illustrated, wherein ears 10 extend downward from the bottom of the lowermost steps of the main stairs nearer the front than the back and adjacent to the ends, and the link members 11 of angle or L shaped hangers *c* are pivoted to said ears, while the other or stirrup members 12 of the hangers are usually widened and flattened at their outer faces and constitute supports for the auxiliary step C, to which attachment is made by rivets, screws, clips, or the like.

Opposing angular brackets 13 are employed as chief supports for the actuating mechanism used in connection with the swinging step C, which brackets are angular, being of the elbow pattern, and are located one at each side of the main stairs B, being secured to the side boards of the main stairs and the platform A at the rear of the said stairs. With reference to the said mechanism it is as follows: A shaft 14, preferably polygonal between its ends, is journaled at its ends, which are cylindrical, in the brackets 13, where their

members connect, and the said shaft is provided with two forwardly-extending shifting arms 15, one near each end, and a depression or recess 16 is made in the upper edge of each shifting arm near its forward end. Near one end of the shaft 14 an upwardly and rearwardly curved crank-arm 17 is secured, pivoted at its upper extremity to a similarly-curved link 18, pivoted in its turn to the lower end of a hand-lever 19. This lever 19 is passed out through an opening 20 in the platform, being fulcrumed upon a suitable pin 21, which crosses the said opening. The handle end of the hand-lever 19 is passed up through the space 25[a] between a horizontal keeper 25 and the inner face of the upper member of the guard-rail 26 for the platform. This keeper is provided with recesses 27 at its end portions, communicating with the said space 25[a]. The handle of the lever 19 is under side tension while in the space 25[a], and therefore as soon as a recess 27 is reached the handle portion of the hand-lever enters the same, locking the lever at one or the other end of its throw.

Links 22 are pivoted to the hangers 11 at the intersection of their members, and the opposite or rear ends of the links are downwardly or rearwardly curved to a greater or less extent, the curved ends being pivoted by suitable pins 23 to the forward ends of the shifting arms 15. When the hand-lever 19 is in the right-hand recess 27 of the keeper 25, occupying the position shown in Fig. 1, the crank-arm 17 will have been carried downward and forward or toward the steps, rocking the shaft 14 in the same direction. Consequently the shifting arms 15 and the links 22 will have a forward and downward inclination, corresponding members 15 and 22 being nearly in end alinement, and the link members 11 of the hangers *c* will be vertical, and the stirrup members 12 will have a horizontal position below and in front of the lower step of the main stairs, supporting the auxiliary step C in the same position, thus adding an additional step to those of the main stairs.

The auxiliary step will be securely held in its tread position, first, by means of the locked position of the hand-lever, and, second, by the pivotal elbow connection between the links 22 and the shifting arms 15; but in order to add additional sustaining power to the actuating mechanism I secure one end of a locking-arm 24 to one side of each link 22 forward of the pivots 23. These locking-arms are upwardly arched and are of sufficient length to extend beyond or to the rear of the pivots 23, and when the auxiliary step C is held in its forward or tread position the free ends of the locking-arms enter the recessed portions of the shifting arms 15 and bearing downwardly thereon not only lock but strengthen the pivotal connection between the arms 15 and 22 against any force except that exerted in an upward direction. When the anxiliary step C is not needed, the hand-lever 19 is carried to the other end of the keeper 25, entering the recess 27 at such end, whereupon the shaft 14 will be rocked rearwardly, the pivotally-connected ends of the shifting arms 15 and the links 22 will be carried upward to the position shown in Fig. 2, and the auxiliary step C will be drawn and held well back of the main stairway out of the way, and as the step C will at such time be behind a wheel of the coach the step will be perfectly safe. Furthermore, when the said auxiliary step C is swung to its rear folded position the main stairway may be utilized in connection with the platform in the same manner as if the auxiliary step were not present.

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

1. In a vehicle provided with a platform and main steps leading therefrom, an auxiliary step having swinging relation to the bottom portion of the main steps, a lever at the said platform, and an actuating mechanism connecting the said lever with the said auxiliary step, which mechanism consists of a shaft, arms carried by the shaft, a connection between one of the arms and the lever, links pivoted to the other arms of the shaft and to the auxiliary step, and locking-arms carried by the links and engaging the arms to which the links are pivoted.

2. In combination with the platform of a vehicle, steps connected with the said platform, a lever carried by the platform and a locking device for the lever, of an auxiliary step having swinging connection with the bottom portion of the steps connected with the platform, a shaft at the rear of the fixed steps, a support for the shaft, forwardly-extending shifting arms carried from the shaft, links pivotally connected with the swinging auxiliary step and having pivotal elbow connections with the said shifting arms, and upwardly and rearwardly curved crank-arm extending likewise from the said shaft, and a correspondingly-curved link pivoted to the said crank-arm and to the said lever.

3. The combination with the platform of a vehicle, stairs fixed thereto, a lever fulcrumed at the platform, a locking device for the lever, and brackets attached to the platform at the rear of the stairs, of a shaft journaled in the said brackets, a rearwardly-curved crank-arm attached to the shaft, a rearwardly-curved link pivotally connecting the crank-arm with the said lever, shifting arms extending outward from the said shaft, having depressions in their upper edges near their outer ends, an angular hanger pivotally connected with the bottom portion of the stairs, an auxiliary step supported by the said hangers, links pivoted to the said hangers, having their rear ends up-

wardly and rearwardly curved and pivotally connected with the outer ends of the shifting arms, and upwardly-arched locking-bars secured to the said links forward of their pivotal connection with the shifting arms, the said arched locking-bars being of sufficient length to extend over the said pivotal connection and to enter the depressions in the shifting arms.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JASPER SHOEMAKER COXEY.

Witnesses:
PHIL. S. LOCKE,
S. K. BONUS.