

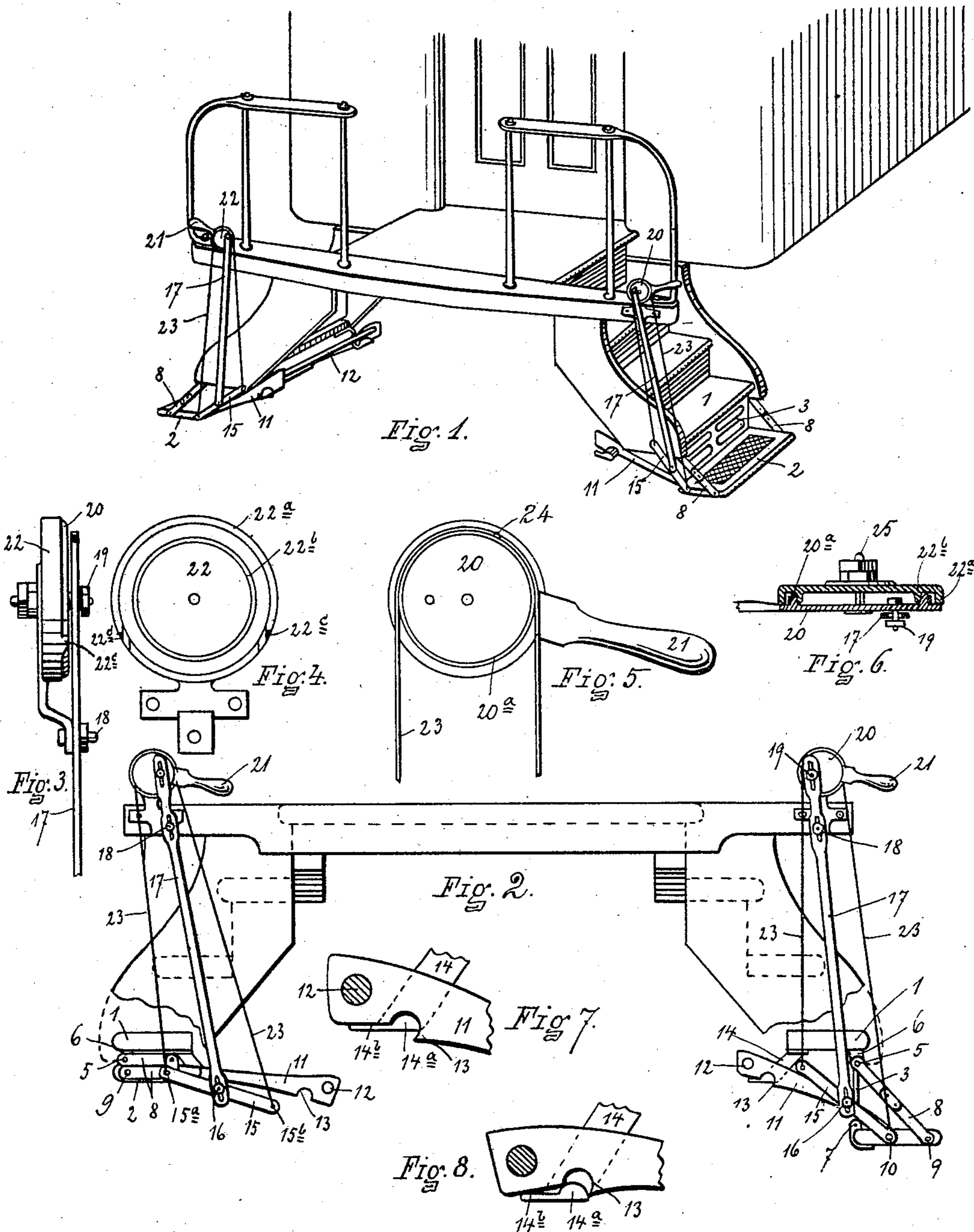
(No Model.)

2 Sheets—Sheet 1.

G. LANGKANS.  
EXTENSION CAR STEP.

No. 574,916.

Patented Jan. 12, 1897.



WITNESSES.

Rich. A. George.  
Carl A. Babbist

INVENTOR  
GUSTAV LANGKANS

BY Risley Robinson Love  
ATTORNEY'S.

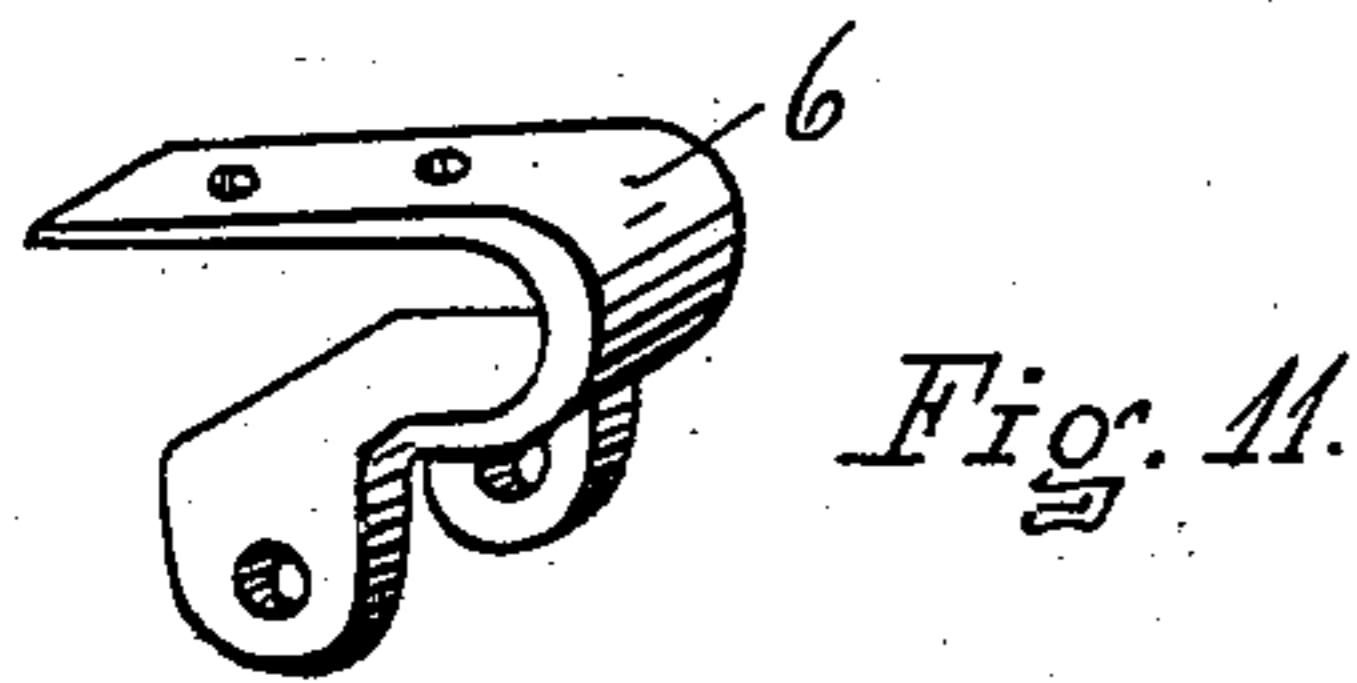
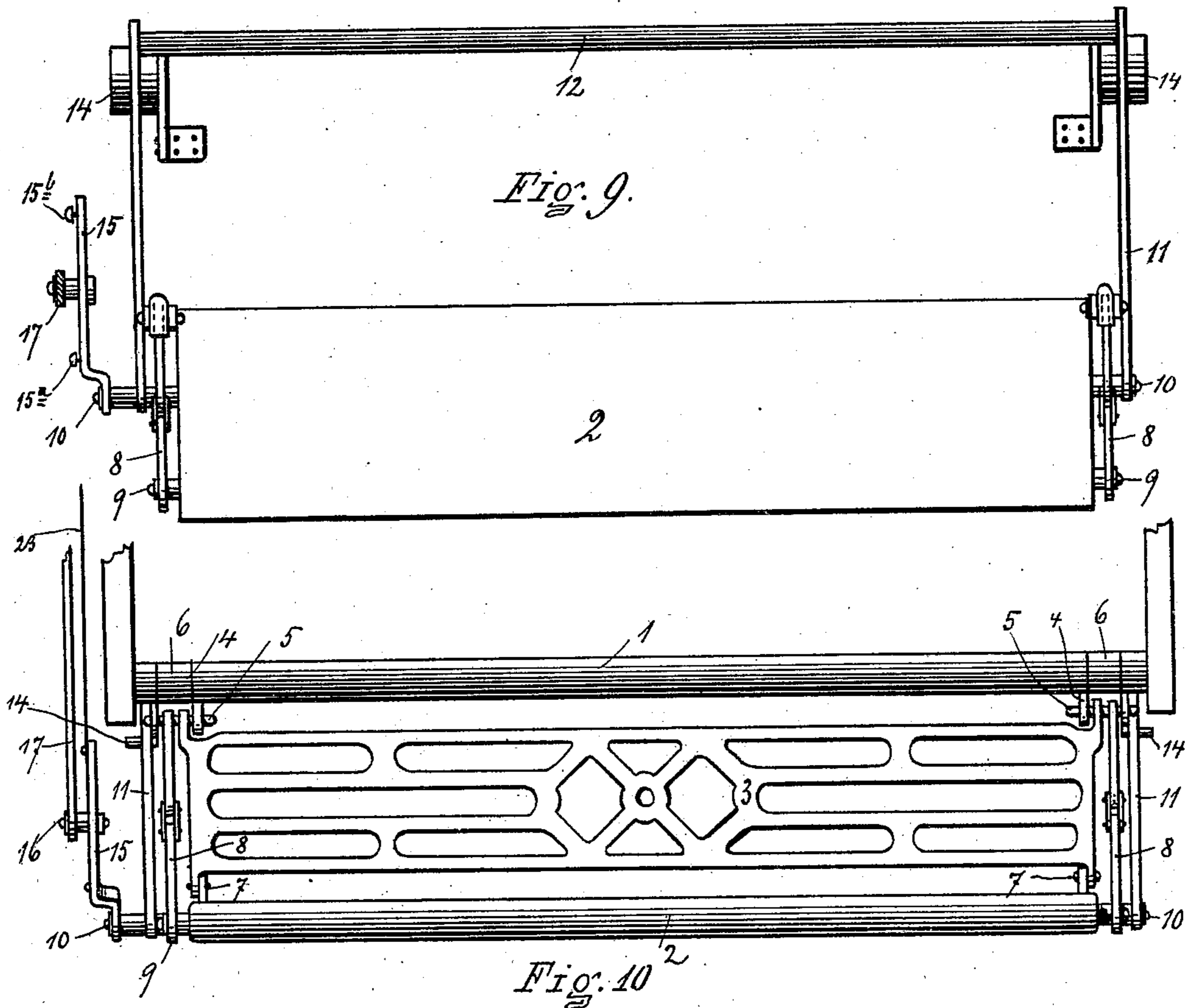
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# UNITED STATES PATENT OFFICE.

GUSTAV LANGKANS, OF UTICA, NEW YORK.

## EXTENSION CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 574,916, dated January 12, 1897.

Application filed August 21, 1896. Serial No. 603,502. (No model.)

*To all whom it may concern:*

Be it known that I, GUSTAV LANGKANS, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Extension 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, and to the figures of reference marked thereon, which form part of this specification.

In the drawings, Figure 1 shows a perspective view of an end of a car having my extension car-step applied. Fig. 2 shows an end view showing two of the steps applied to the end of the car, one of them in folded position and one in extended position, the parts being broken out to better exhibit the construction. Fig. 3 shows an edge view of the step-operating mechanism. Fig. 4 shows a face view of the fixed or stationary portion of this step-operating mechanism. Fig. 5 shows an inner face view of the movable portion of the same device. Fig. 6 shows a cross-section of the same. Fig. 7 shows an end view of a movable brace employed in the construction in connection with a fixed support on which it engages. Fig. 8 shows the same as Fig. 7 with the brace in the position which it assumes in disengaging itself from its support. Fig. 9 shows a plan view of the step and its mechanism in extended position. Fig. 10 shows a front view of the same. Fig. 11 shows a perspective view of a hinged part or hanger by means of which the folding step is attached to the permanent step of the car.

Referring to the reference-figures in a more particular description of the device, 1 indicates the low permanent car-step, to which the extension-step 2 is attached by the riser 3, hinged to the permanent step at 4 by pins 5, extending through ears of hanger or hinge part 6, secured on the edge of the permanent step 1. At the lower side the riser is hinged to the extension-step at 7. For supporting the outer edge of the extension-step in open position are provided double-jointed braces 8 at either end of the step, secured at their upper ends on the pin 5 and pivoted at their lower ends at 9 to the outer side

of the step. At either end of the step and pivoted to the same at about the middle of the end of the step are provided braces 11. These braces are connected at their inner ends by a bar 12, which is made heavy in proportion to the rest of the mechanism to act as a counterweight. The inner ends of the braces 11 are provided with a peculiar-shaped hooked shoulder 13, which is adapted to engage on the horizontal portion of the fixed supports 14, secured on the under side of the rear portion of the permanent step 1. These supports 14 have the rounded portion 14<sup>a</sup> and the inner or rear shoulder portion 14<sup>b</sup>, substantially as shown. For operating the step there is also provided, secured at one end on the pivot 10, a rocking lever 15. This lever at its middle portion is provided with a pivotal pin 16, which engages in a slotted opening in the lower end of the lever 17. The lever 17 is pivoted to a fixed support at 18, and is also provided with a slotted opening in its upper end, in which the pin 19, secured in the disk 20 of the operating mechanism, engages. The disk 20 is provided with a handle 21, by means of which it is operated, and is supported by a fixture 22, secured on the end of the car. This fixture 22 has a disk-like portion, and on its face are exterior and interior circular ribs or rims 22<sup>a</sup> and 22<sup>b</sup>. The rib 22<sup>a</sup> serves to inclose the working parts of the device, while the rib 22<sup>b</sup> acts as a support for the disk-plate 20 by reason of the circular rib 20<sup>a</sup> on the plate 20 surrounding the same. The rib 20<sup>a</sup> on its outer side forms a kind of pulley for the metal strap or flexible connection 23, which is secured to the disk-plate 20 by a pin 24, projecting from the rib through an opening in the strap. The disk 20 is secured to the fixture 22 by a central bolt 25. For limiting the movement of the parts there are provided on the fixture 22 two stops 22<sup>c</sup>, against which the handle 21 is adapted to strike at the end of its movement in either direction. The flexible connection or strap 23 extends from the disk 20 down to the lever 15, and each end is secured to each end of the lever at 15<sup>a</sup> and 15<sup>b</sup>, respectively.

The operation of the device is as follows: The step being in folded position, as shown on the left of Fig. 2, it is brought into open or extended position, as shown on the right of

Fig. 2, by turning the handle 21 of the step-operating device from the position shown on the left of Fig. 2 to the position shown on the right of Fig. 2. In this movement the arm 15 is thrown from the position shown on the left of Fig. 2 to that shown on the right by the flexible connection 23 drawing on one end of the arm and relieving the other end. At the same time the lever 17 is given a swinging movement which forces the step outward from its position under the permanent step 1 as it swings downwardly. As the extension-step opens the braces 11 slide over the supports 14 until they reach the fully-extended position, in which position the hooked shoulders 13 drop into engagement with the rounded side of the support 14. This locks the step rigidly in extended position, while the outer edge of the step is supported by the double-jointed brace 8. To fold the step, the handle 21 of the operating device is moved in the opposite direction from that described, when the strap 23, drawing on the arm 15 and through it the pivot 10, elevates the front side of the step and particularly the end of the braces 11. When the outer end of the brace 11 is elevated, the inner end of the same is disengaged from the support 14 by being cammed or thrown off by reason of the end of the brace engaging on the shoulder 14<sup>b</sup> of the support 14, as shown in Fig. 8. When the shoulder 13 has been disengaged, the braces slide backwardly over the supports 14 into the position shown on the left of Fig. 2. The counterweight-bar 12 assists in closing the step after the braces 11 begin to slide backward over the supports 14, and also to assist in maintaining the step in folded position after it has been closed.

It is evident that the step-operating devices for this step may be dispensed with and the step operated by hand, in which case in folding the step the raising of the outer edge of the extension-step by hand would operate to disengage the inner ends of the braces 11 the

same as though operated by the mechanism shown and described for that purpose.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a permanent car-step of the extension-step, the riser hinged to the permanent step and to the rear of the extension-step, the double-jointed brace for supporting the outer edge of the extension-step and the braces detachable from fixed supports, substantially as set forth.

2. The combination in a folding car-step of the permanent step 1, the folding step 2, the riser 3 hinged to each, the double-jointed brace 8, the braces 11 and fixed supports with which they are detachably engaged, substantially as set forth.

3. The combination with a folding car-step of the levers 15 and 17, the rocking hand disk and the flexible connections attached to the lever 15, substantially as set forth.

4. The combination with an extension car-step of the brace 11 having the shoulder 13 and a support 14 having the head portion 14<sup>a</sup> and the shoulder portion 14<sup>b</sup>, substantially as set forth.

5. The combination in a car-step and operating mechanism of the folding step 2, the riser 3 hinged to the rear of the step and to the fixed step, the double-jointed braces 8, the rigid braces 11, the supports 14 with which the braces 11 are detachably engaged, the counterweight connection between the ends of the braces 11, the levers 15 and 17 connected with each other and to the step as described, the hand-disk, having a crank-pin engaging with the lever 17 and the connections extending to the ends of the lever 15, substantially as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

GUSTAV LANGKANS.

Witnesses:

PETER P. SMITH,  
E. WILLARD JONES.