

(No Model.)

2 Sheets—Sheet 1.

A. PUTNAM.  
EXTENSION CAR STEP.

No. 539,593.

Patented May 21, 1895.

Fig. 1.

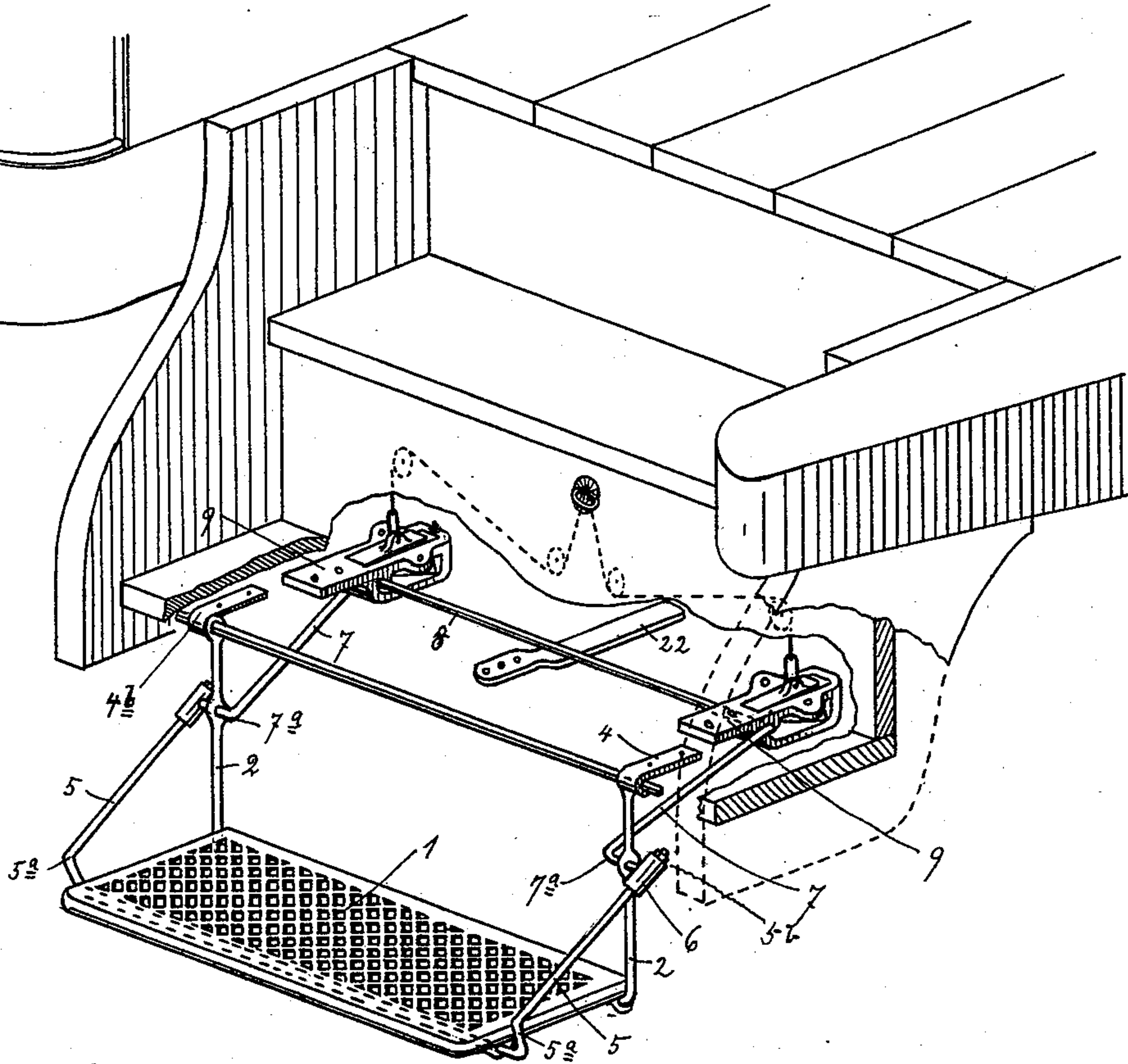
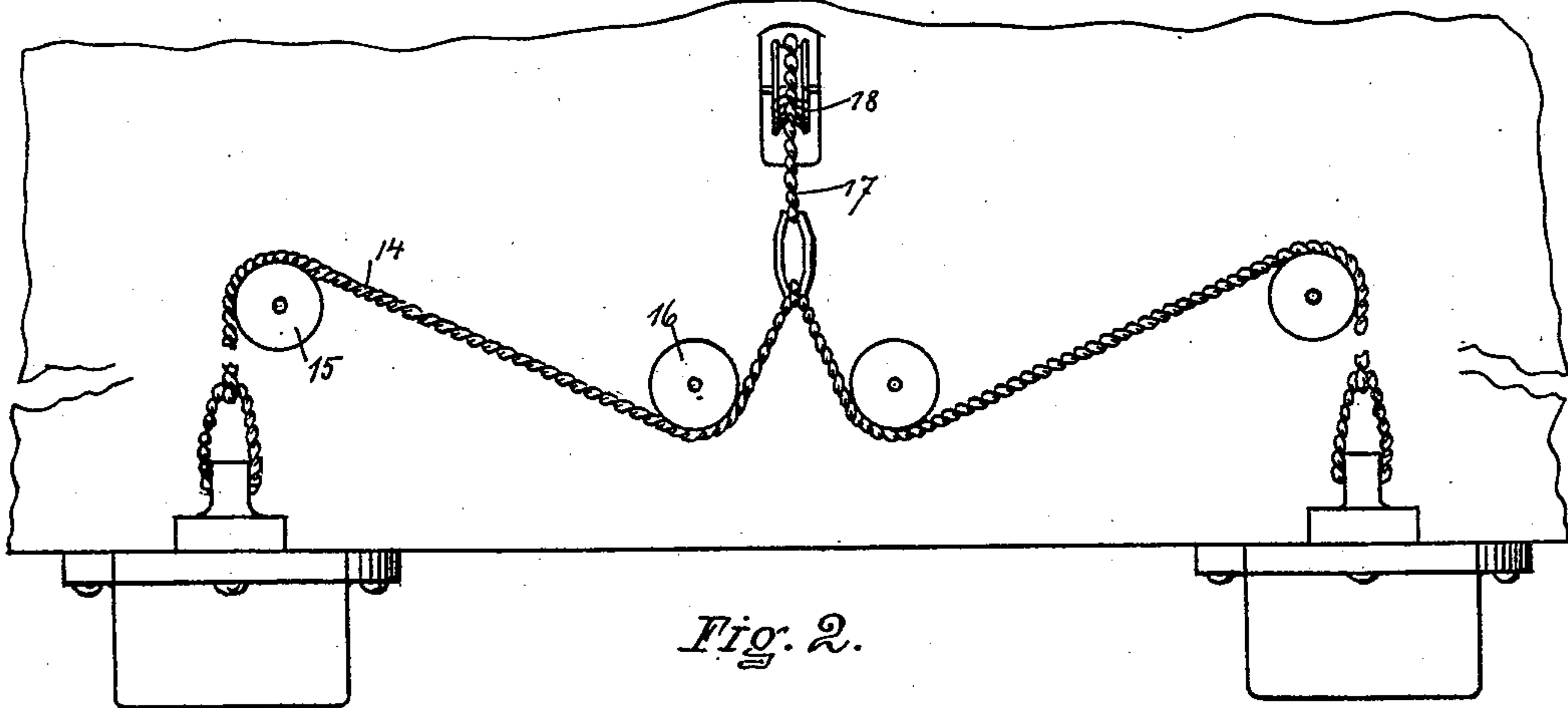


Fig. 2.



WITNESSES.

Rich. A. George.  
C. F. Munson

INVENTOR.

ALFRED PUTNAM.  
BY Risley Robinson  
ATTORNEY'S

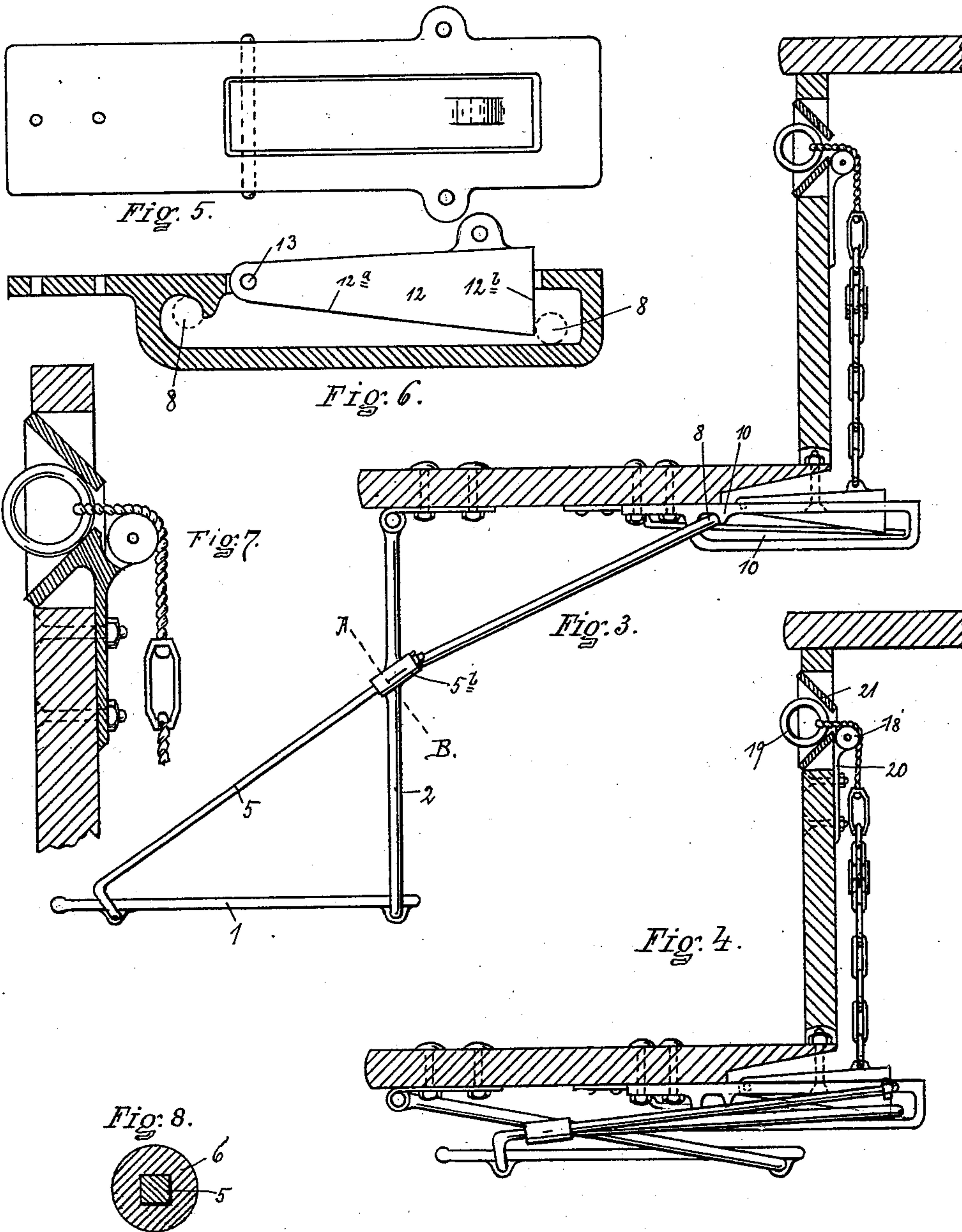
(No Model.)

2 Sheets—Sheet 2.

A. PUTNAM.  
EXTENSION CAR STEP.

No. 539,593.

Patented May 21, 1895.



WITNESSES.  
Rich. A. George.  
E. G. Munson

INVENTOR.  
ALFRED PUTNAM.  
By Kisley & Robinson  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

ALFRED PUTNAM, OF HOLLAND PATENT, ASSIGNOR TO THE EXTENSION  
CAR STEP COMPANY, OF UTICA, NEW YORK.

## EXTENSION CAR-STEP.

SPECIFICATION forming part of Letters Patent No. 539,593, dated May 21, 1895.

Application filed June 30, 1893. Serial No. 479,279. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED PUTNAM, of Holland Patent, in the county of Oneida and State of New York, have invented certain  
5 new and useful Improvements in Extension-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  
10 the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to extension steps for  
15 cars, although it is obvious that they are equally applicable to other conveyances.

In the drawings which accompany and form a part of this specification, and in which similar figures of reference refer to corresponding  
20 parts in the several views, Figure 1 shows in general perspective my improved car-step extended. Fig. 2 shows details of the mechanism for operating the step. Fig. 3 shows a side elevation of the step and operating mechanism in extended position. Fig. 4 shows in a  
25 similar manner the step in folded position. Fig. 5 shows a plan view of a keeper and catch. Fig. 6 shows the same parts shown in Fig. 5 partially on a vertical section. Fig. 7 shows  
30 details relating to mechanism for operating the catches which secure the step in closed position. Fig. 8 shows a cross-section of a sleeve and extension-rod, taken on line A B of Fig. 3.

Referring more particularly to the reference numerals marked on the drawings in a more specific description of the device, 1 indicates the extension step which has mounted  
40 on its rear portion an arm or arms 2, 2 which are connected under the rear portion of the step by a rod shown in dotted lines, and are pivoted or hinged at their upper ends upon a rod secured on the under side of the permanent car step by means of hanger irons 4,  
45 4. The forward portion of the step is supported by a pair of hanger rods 5, 5 which are provided with angular bends as shown at 5<sup>a</sup>, 5<sup>a</sup> and the two hanger rods are connected by a rod which extends through under the forward portion of the step as shown in dotted  
50 lines in Fig. 1.

The upper or free ends of the hanger rods 5 slide in sleeves 6, 6 provided about or above the middle of the arms 2, 2 and mounted on the outer ends of the bracing rods or bars 7, 7,  
55 which are provided with a right angular bend as shown at 7<sup>a</sup>, which extend through a bearing provided in the arms 2, 2. The bracing arms 7, 7 are connected by a connecting bar or rod 8 and the whole is preferably made  
60 integral as it extends from one of the sleeves 6 to the other. Adjacent to the rear upper end of the bracing rod 7 secured on the under side of the permanent step, are provided combined keepers and catches 9, 9. In the  
65 keeper 9 is provided a slot-like opening 10 through which the rod 8 passes, and in the upper side of the slot 10 is provided a projection 10<sup>a</sup> against which the rod 8 will engage when the step is in extended position  
70 and act as a shoulder against which the rear upper end of the bracing rod 7 finds bearing. The slot 10 is large enough around the projection 10<sup>a</sup> to allow the rod 8 to be disengaged from the front side of the projection and  
75 passed around under it into the rear side. Hinged in the rear portion of the slotted opening 10 is provided a gravity catch 12 pivoted to the keeper body at 13 and having an inclined face 12<sup>a</sup> extending from the rear por-  
80 tion so that as the rod 8 is caused to pass to the rear of the keeper the gravity catch 12 will be raised thereby, and when the rod has passed beyond the rear end 12<sup>b</sup> of the keeper it will drop in behind and secure the rod, as  
85 shown in dotted lines in Fig. 6.

The keepers 9 on each end of the permanent car step are preferably identical, although I have found, and it is obvious, that one of the  
90 keepers might have the gravity catch omitted. From each of the gravity catches on each end of the car step, I provide a connecting chain or cord, as shown at 14, which passes around a pulley as 15 pivoted on the back portion of the riser between the permanent car steps  
95 thence around a pulley 16 to cord 17 which passes over a pulley 18 also secured on the rear portion of the riser and after passing through an opening in the front of the riser, is provided with a ring 19 by which the  
100 catches can be operated. The pulley 18 is on a bracket-like casting 20 provided with a fun-



nel-like portion 21 which is passed through a bit-hole in the front of the riser and secured by screws or bolts.

The hanger rod 5 is preferably square in cross-section, and the opening in the sleeve 6 for receiving it is also preferably made square, which assists in resisting lateral movement in the adjustable step.

On the end of the rod 5 is provided an adjustable nut 5<sup>b</sup> or other similar contrivance for taking up wear and adjusting the pitch of the step. Secured on the under side of the permanent step I also provide a spring 22 engaging on the under side of the rod 8 and adapted to hold it up behind the projections 11 when the step is in extended position.

The operation of the step is substantially as follows: When the step is folded as shown in Fig. 4, and it being desired to extend the same into position for use, the attendant simply places his finger through the ring 19 and pulls on the connections extending to the catches 12 thus raising the catches and releasing the bar 8 from the position in which it had been previously secured as shown in dotted lines at the right of Fig. 6. When the bar 8 is released the step automatically and by its own gravity, swings from the folded position shown in Fig. 4, to the extended position shown in Figs. 1 and 3. The rod 8 passing along the slotted opening 10 and by the momentum which the parts obtain, the rod is passed under the projection 11 and becomes automatically engaged in front of the projection as shown in Fig. 3. As the step assumes its extended position from its folded position, as shown in Fig. 4, the hanger rod 5 slides through the bearing sleeve 6, as will readily be understood by referring to the figures. To fold the step, the attendant simply takes hold of the front edge of the step and after giving it a slight raise which disengages the rod 8 from behind the projections 11, the step is gradually pushed backward and upward until it assumes its complete folded position, and the rod 8 becomes engaged behind the catches 12, which secure the step in folded position. As the step folds, the rear end of the brace 7 being supported by the keeper 9, the step portion 1 gradually folds toward the supporting arms 2 and the supporting arm 2 at substantially the same rate of speed folds toward the under side of the permanent step. If it were not for the keeper 9 always retaining the rod 8, or what is more important, the rear end of the brace 7, the step portion could be folded against the arms 2 while they hung in their vertical position; but by reason of the keeper 9 all the parts have to simultaneously fold. By reason of the rigid connection extending between the arms 2, 2 and between the hangers 5, 5 and between the braces 7, 7, the step is held very stiffly against lateral movement, either in its extended or folded positions, and is not at all liable to become stuck.

It is evident that the catches could be dispensed with and other catches provided which

engage directly on the step, or some other part and secure it in folded position; although I much prefer the construction herein shown. The offset or bends 5<sup>a</sup> in the hanger rods 5 allow the step to fold much more neatly than could be done if the offsets or bends were not provided, although it is quite obvious that the construction could be varied to dispense with these; and it is also obvious that numerous changes and modifications in and from the construction herein shown, may be made without departing from the equivalents of my invention.

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

1. An extension step, in combination with suspending arms on which it is supported, and a brace connected at one end with the suspending arm and movable in a fixed keeper at the other end, and a catch for engaging the end of the brace at the keeper, substantially as set forth.

2. The combination of an extension step, swinging arms supporting the rear end of the step, a fixed keeper above and to the rear of the step, and a brace extending from the forward edge of the step to the keeper, and movably secured therein, and a catch for securing the brace and thereby the step in folded position, substantially as set forth.

3. The combination of an extension step, swinging arms supporting the rear portion of the step, hanger rods supporting the forward portion of the step and constructed to slide in bearings or sleeves secured on the arms, a brace connected with the supporting rods and a fixed keeper above and to the rear of the step within which the brace is undetachably held, substantially as set forth.

4. The combination of an extension step, pivoted hanger arms supporting the rear side of the step, a fixed keeper and an extendible brace connected with the forward portion of the step at one end and engaging movably with the keeper at the other end and engaging with the hanger arms substantially as set forth.

5. The combination of an extension step, pivoted arms supporting the step, a jointed brace engaging with the arms and connected with the front of the step at one end, a fixed keeper at the other end of the brace in which the end of the brace is retained and is laterally movable, and a catch for securing the step in folded position, substantially as set forth.

6. The combination of an extension step, an arm pivoted to a support and engaging and supporting the step, a fixed keeper and a brace engaged at one end with the step-supporting arms and at the other movable within the keeper, and a catch engaging the keeper end of the arm, substantially as set forth.

7. The combination of an extension step, arms connecting the rear portion of the step with a support and pivoted to each, hanger rods engaging the front edge of the step, sleeves or bearings on the arms in which the



hanger rods slide, a fixed keeper, a brace engaged with the arms at one end and movably engaged within the keeper at the other, a fixed projection or shoulder against which the keeper end of the brace is adapted to engage, and a catch for engaging the keeper end of the brace, substantially as set forth.

8. The combination of an extension step, arms connecting the rear portion of the step with a support, and pivoted to each, hanger rods supporting the front edge of the step in bearings mounted on the arms, in which the hanger rods are held and through which they

slide, a fixed keeper, a brace engaging at one end with the arms and connected to the bearings of the hanger rods and movably engaged at the other end with the keeper, and a catch engaging the keeper end of the brace, substantially as set forth.

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

ALFRED PUTNAM.

Witnesses:

J. G. GIBSON,  
GEORGE A. GAYMONDS.