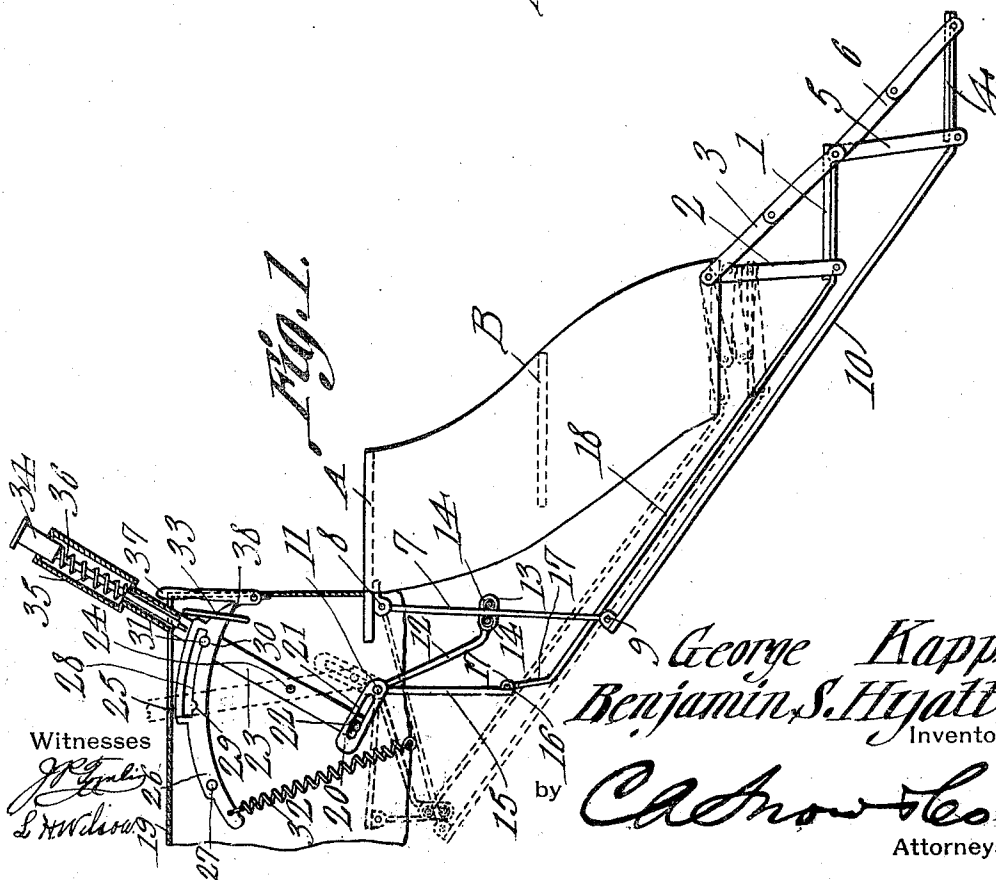
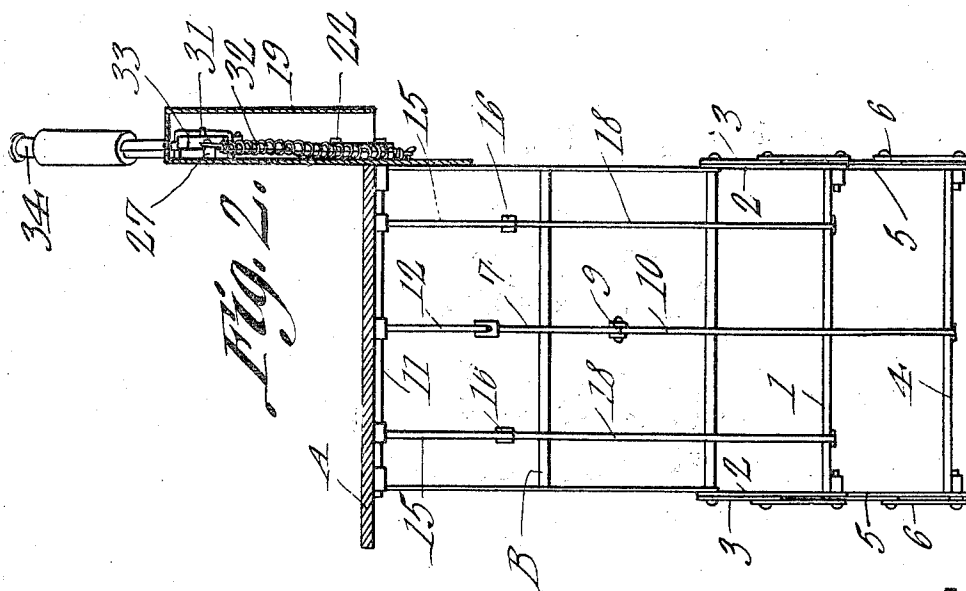


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UNITED STATES PATENT OFFICE.

GEORGE KAPP AND BENJAMIN S. HYATT, OF VINITA, OKLAHOMA.

FOLDING CAR-STEP.

1,030,409.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, GEORGE KAPP and BENJAMIN S. HYATT, citizens of the United States, residing at Vinita, in the county of Craig, State of Oklahoma, have invented a new and useful Folding Car-Step, of which the following is a specification.

This invention relates to folding car steps particularly designed for use in connection with railway cars.

One of the objects of the invention is to provide a foldable attachment for the steps ordinarily used and whereby stools such as commonly employed may be dispensed with.

Another object is to provide improved means for shifting the steps of the attachment to extended or to folded positions, said mechanism including means whereby the parts are locked in either of the positions to which they may be shifted.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a side elevation of the mechanism constituting the present invention, a portion of the fixed steps and of the housing provided for the operating mechanism being shown. Fig. 2 is a rear elevation of the parts shown in Fig. 1, the platform and the housing being shown in section.

Referring to the figures by characters of reference A designates a portion of the platform of a car to which are connected the usual fixed steps B. The mechanism constituting the present invention is designed as an attachment to be employed in connection with the steps. Said mechanism includes an upper movable step 1 the inner corner portions of which are connected to the front corner portions of the lower fixed step B, by means of links 2, said outer corner portions of the lower fixed step B being also connected to the outer corner portions of the step 1 by links 3, these links being arranged in pairs, one pair being located at each side

of the steps. The lower movable step 4 has its inner corners connected to the outer corners of the step 1 by links 5 similar to the links 2 and additional links 6 connect said outer corners of the step 1 to the outer corners of the step 4, these links 6 being arranged in pairs, one pair being located at each side of the steps. Thus it will be seen that when the steps are extended, each of the movable steps is supported from the step thereabove by links forming upwardly converging connections. A hanger 7 is hingedly connected, as at 8, to the structure A and extends downwardly and is pivotally connected, as at 9, to the upper end of a rod 10, the lower end of which extends under and is fixedly secured to the middle portion of the lower step 4. A rock shaft 11 is journaled on the bottom of the structure A and has an arm 12 extending downwardly therefrom and terminating in a yoke 13 which straddles the hanger 7 and has spaced rollers 14 engaging opposed portions of the hanger. Additional arms 15 are fixedly connected to and extend down from the shaft 11 and each of these arms 15 is pivotally connected, as at 16, to the upturned end portions 17 of rods 18. These rods extend downwardly and are secured to the lower face of the step 1 close to the sides of the step. A housing 19 extends upwardly from the structure A preferably beyond the steps and one end of the shaft 11 projects into this housing and is provided with a longitudinally slotted arm 20 preferably extended upwardly within the housing. The slot 21 within this arm receives a stud or roller 22 extending laterally from the lower end of a lever 23 which is fulcrumed, as at 24, within the housing and extends upwardly through a slot 25 in the top of the housing. A holding strip 26 is fulcrumed, as at 27, within the upper portion of the housing 19 and extends across one side of the lever 23, this strip being formed with an arcuate slot 28, the lower wall of which is provided, adjacent its ends, with notches 29 and 30 respectively either of which is adapted to receive a stud 31 extending laterally from the lever 23. A spring 32 is connected to one end of the strip 26 and also to the bottom portion of the housing 19 and serves to hold the slotted portion of the strip 26 normally elevated so that the lower wall of the slot 28 will constantly press upwardly against the stud 31 which projects into the slot. The free end

of the slotted portion of strip 26 is mounted within a guide 33 located in the housing. A button 34 or its equivalent is movably mounted within the upper end portion of lever 33 and is preferably supported by a spring 35. A stem 36 projects from and moves with this button and terminates at a point above the slotted portion of strip 26 and in alignment with the stud 31. A locking member 37 is pivotally mounted within the housing and has a projection 38 thereon adapted to extend under the free end of the slotted portion of strip 26 and thus prevent said end from being pressed downwardly. One end of this locking member projects through the housing 19 so that it can be conveniently reached when it is desired to release the mechanism used in actuating the steps.

It is to be understood that under normal conditions the stud 31 is seated in either the notch 29 or the notch 30 and when thus located, it is impossible for the strip 26 to be swung downwardly so as to become disengaged from the stud 31 unless the projection 38 is first swung outwardly from under strip 26. When the stud 31 is seated in notch 30 the steps are extended, as shown in Fig. 1 and can thus be used in lieu of the stool commonly employed. When it is desired to fold the steps, the locking member 37 is swung outwardly so as to withdraw the projection 38 from under strip 26. Button 34 is then depressed and stem 36 is caused to push against the strip 26 and swing it downwardly, thereby placing the spring 32 under greater stress. This downward movement of strip 26 will be sufficient to disengage the notched portion 30 from the stud 31 and it will therefore be possible to swing the lever 23 about its fulcrum 24 until the stud 31 is brought into register with notch 29 whereupon the spring 32 will move the notched portion 29 upwardly into engagement with the stud and thereby prevent further movement of the lever. During this movement of the lever the stud 22 will cause the arm 20 to swing and the shaft 11 to rotate and the two arms 15 will thus pull upwardly on the rods 18 while, at the same time, the rollers 14 carried by yoke 13 will travel along hanger 7 and cause said hanger to pull upwardly on rod 10. Thus the steps 1 and 4 will be swung backwardly and upwardly and the links 3 and 6 will be caused to fold and to assume positions beside the links 2 while the steps 1 and 4 are held close to the lower step B. After the steps have thus been folded the locking member 37 can be swung back into engagement with the strip 26 and the parts will thus be locked so that the steps cannot be lowered until the foregoing operation has been reversed.

It will be noted that when lever 23 is at either limit of its movement, it is arranged

at right angles to the arm 20. Thus, should any pressure be exerted downwardly or upwardly upon the steps 1 or 4, the arm 20 would push against stud 22 on a line extending through the fulcrum 24 and there would thus be no danger of the lever breaking under pressure.

What is claimed is:—

1. The combination with a car structure including a fixed step, of movable steps suspended below the fixed step and foldable relative thereto, an actuating lever, means operated thereby for shifting the movable steps into or out of active position, yieldable means engaging the lever for holding it at either limit of its movement, and means carried by the lever for shifting said yielding means out of engagement with the lever.

2. The combination with a car structure including a fixed step, of movable steps suspended below the fixed step and foldable relative thereto, an actuating lever, means operated thereby for shifting the movable steps into or out of active position, yieldable means engaging the lever for holding it at either limit of its movement, means carried by the lever for shifting said yielding means out of engagement with the lever, and means engaging said yielding means for holding it against movement out of engaging position.

3. The combination with a car structure and a step fixedly connected thereto, of movable steps foldable against said fixed step, a rock shaft, separate means actuated by the shaft for moving the respective movable steps into or out of active position, an arm extending from the shaft, a lever slidably engaging the arm, yieldable means for engaging the lever to hold it at either limit of its movement, and means carried by the lever for depressing said means to release the lever, said slotted arm and lever cooperating to direct pressure against the fulcrum of the lever when the movable steps are subjected to weight.

4. The combination with a car structure and a step fixedly connected thereto, of movable steps foldable against said fixed step, a rock shaft, separate means actuated by the shaft for moving the respective movable steps into or out of active position, an arm extending from the shaft, a lever slidably engaging the arm, yieldable means for engaging the lever to hold it at either limit of its movement, and means carried by the lever for depressing said means to release the lever.

5. The combination with a car structure having a fixed step, of steps movably connected to and foldable against the fixed step, members fixedly connected to the respective movable steps and extending upwardly from the back portions thereof, a hanger suspended from the structure and connected to one

of said members, said hanger being mounted to swing, a rock shaft, means movable with the rock shaft and movably engaging the hanger for swinging said hanger during the actuation of the rock shaft, to move one of said members and its step, arms extending from the rock shaft and engaging the other members to move them and the other step, and means for actuating the rock shaft.

6. The combination with a car structure including a fixed step, of a movable step suspended below the fixed step and shiftable relative thereto, an actuating lever, means operated thereby for shifting the movable step into or out of active position, yieldable means for holding the lever at either limit of its movement, and means controlled by the lever for shifting said holding means out of active position.

7. The combination with a car structure including a fixed step, of a movable step suspended below and shiftable relative to the fixed step, an actuating lever, means operated thereby for shifting the movable step into or out of active position, yieldable means engaging the lever for holding it at either limit of its movement, and means carried by the lever for shifting said yielding means out of engaging position.

8. The combination with a car structure having a fixed step, and steps movably connected to the fixed step and adapted to fold thereagainst, of a rock shaft, means operated by said shaft for shifting the steps into or out of active positions, a slotted arm movable with the rock shaft, an actuating lever slidably engaging said arm and adapted to rock the shaft, a slotted holding member pivotally mounted adjacent the lever, there being recesses in one wall of the slot in said member, means on the lever and slidable in the slot and adapted to be seated within either of said recesses, means yieldingly connected to said member for holding either of said recessed portions in engagement with said projecting means on the lever, and means carried by the lever for disengaging said holding member from said projecting portion to release the lever.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

GEORGE KAPP.
BENJAMIN S. HYATT.

Witnesses:

J. S. MORTON,
H. E. BAGBY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."