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2 SHEETS—SHEET 1.

Fig. 1.

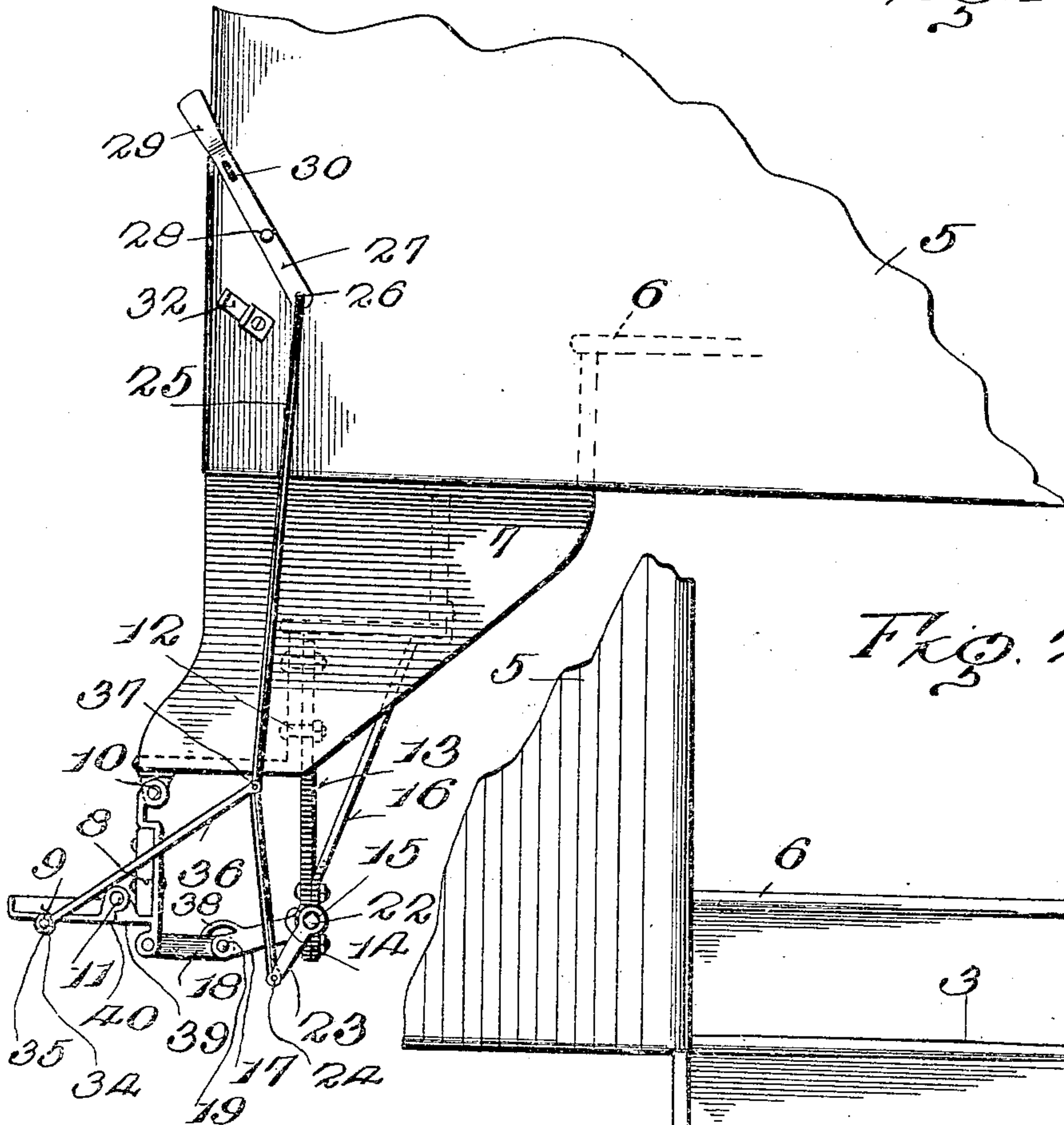
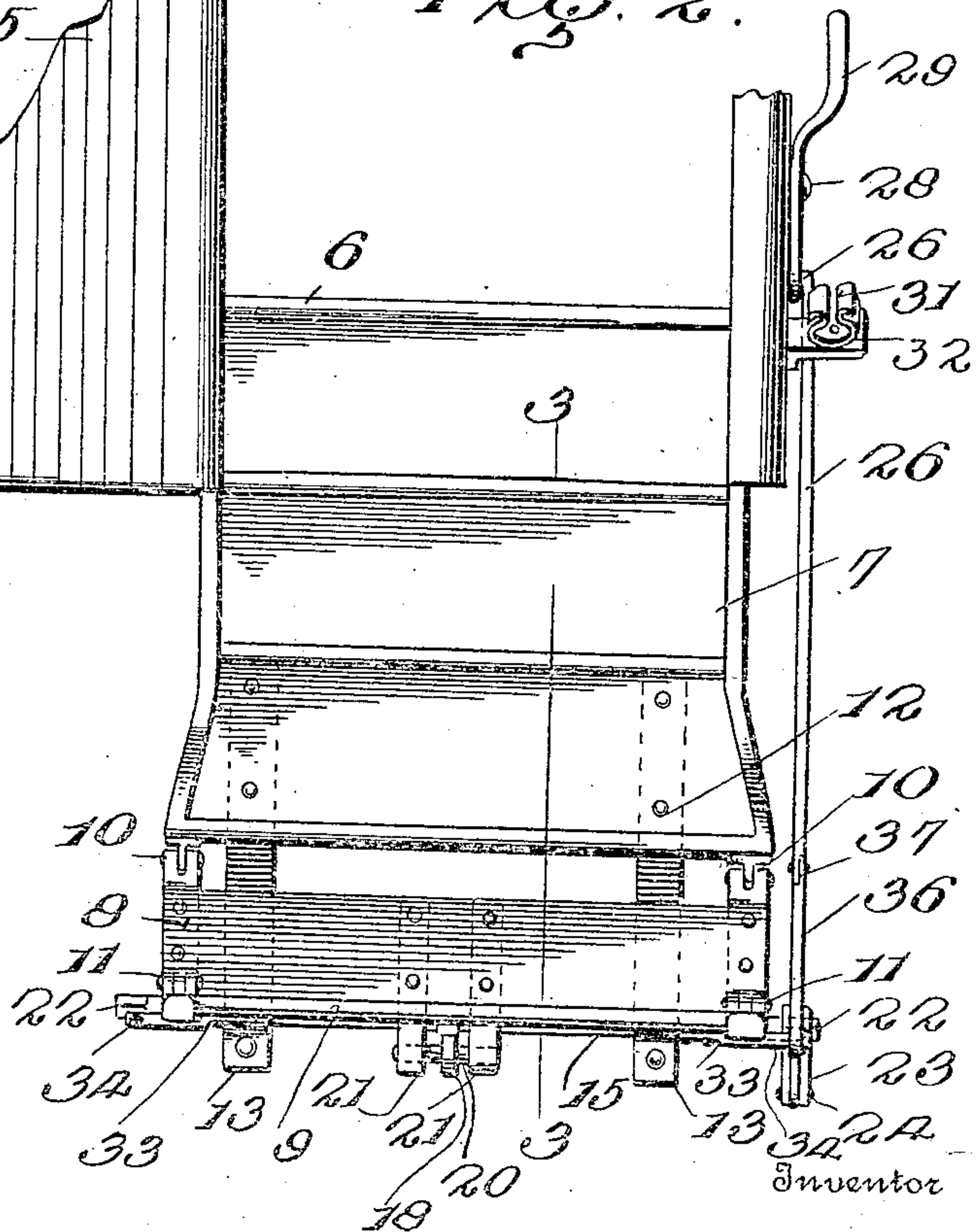


Fig. 2.



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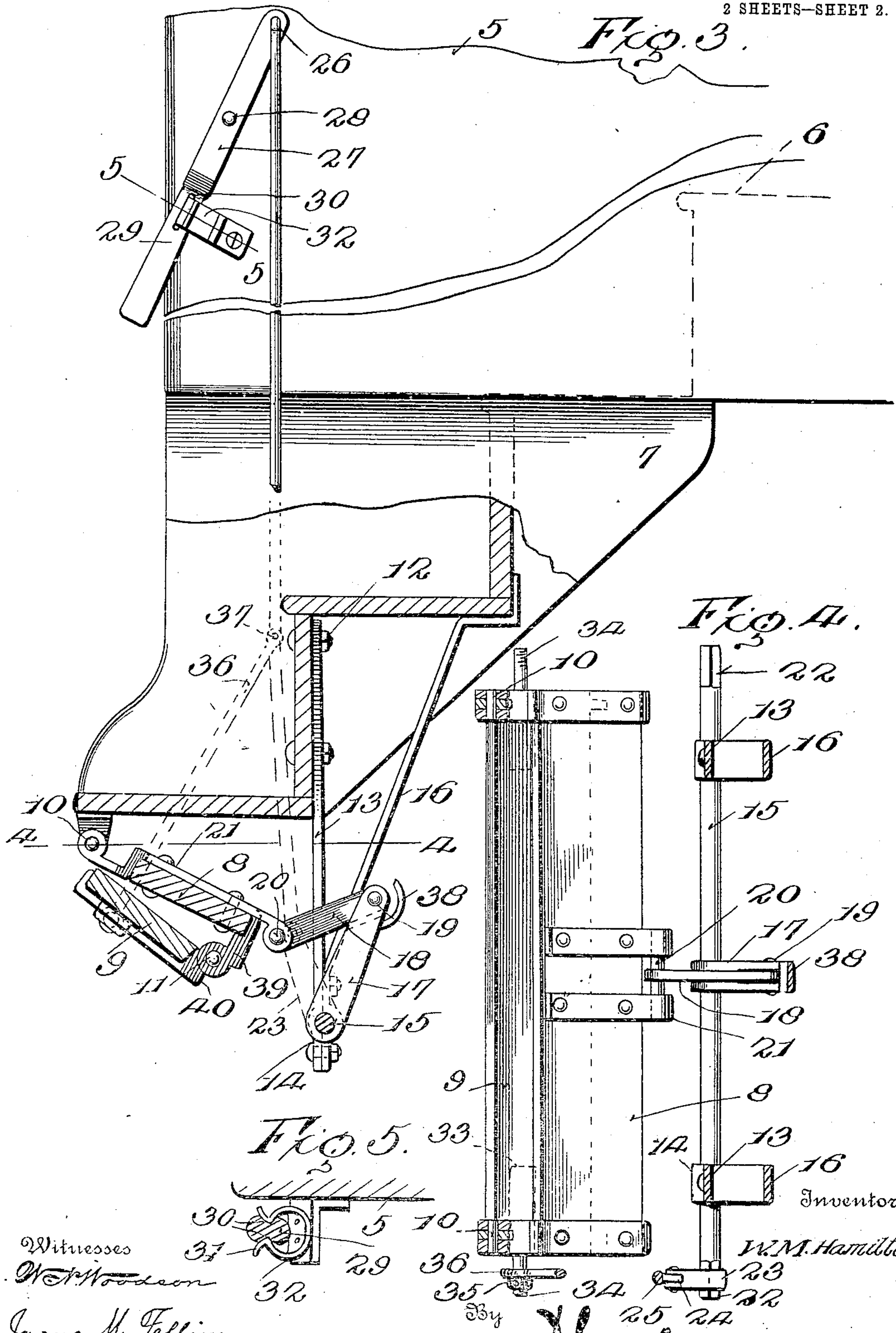
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AUTOMATIC CAR STEP.
APPLICATION FILED NOV. 24, 1909.

962,832.

Patented June 28, 1910.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CAR-STEP.

962,832.

Specification of Letters Patent. Patented June 28, 1910.

Application filed November 24, 1909. Serial No. 529,793.

To all whom it may concern:

Be it known that I, WILLIAM MILLARD HAMILTON, citizen of the United States, residing at Westplains, in the county of Howell and State of Missouri, have invented certain new and useful Improvements in Automatic Car-Steps, of which the following is a specification.

This invention relates to car steps and has for its object to provide an auxiliary step adapted to be attached to the stationary or permanent steps of a car for the convenience of passengers entering or leaving the car, and designed to take the place of the ordinary porter's stool usually employed for this purpose.

A further object of the invention is to provide means for raising and lowering the auxiliary step, and means for supporting said auxiliary step in elevated position.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is an end view of a portion of a car provided with an auxiliary step constructed in accordance with my invention; Fig. 2 is a front elevation of the same; Fig. 3 is a vertical sectional view showing the auxiliary step in elevated or inoperative position; Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 3 and looking in the direction of the arrow; Fig. 5 is a detail transverse sectional view taken on the line 5—5 of Fig. 3.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The improved device forming the subject matter of the present invention may be applied to either open or closed vestibule cars and by way of illustration is shown in con-

nection with an open vestibule car of the ordinary construction in which 5 designates the body of the car, 6 the platform, and 7 the permanent steps leading to the platform.

Depending from the lowermost permanent or stationary step 7 is an auxiliary step, preferably formed in two sections 8 and 9, one of which constitutes a riser and is pivotally connected at 10 to the bottom of the adjacent permanent step, while the other forms a tread piece and is pivotally connected at 11 with the riser 8.

Depending from and rigidly secured to the permanent steps 7 by bolts or similar fastening devices 12, are spaced hangers 13 provided with terminal bearings 14 in which is journaled a longitudinally disposed shaft 15, there being a brace 16 forming a rigid connection between the shaft 15 and one of the steps 7 in order to assist in supporting said shaft.

Keyed or otherwise rigidly secured to the intermediate portion of the rock shaft 15, is an arm 17 having its free end bifurcated to form a seat for a link 18. One end of the link 18 is pivotally connected at 19 with the bifurcated end of the arm 17, while the other end of said link is pivotally connected with a short rod section or pin 20 carried by a pair of strap irons 21 fastened to the rear face of the riser 8. The opposite ends of the rock shaft 15 are provided with square portions 22, one of which extends within a correspondingly squared socket formed in the crank arm 23.

Pivotally mounted at 24 on the free end of the crank arm 23, is a rod 25, the upper end of which is pivotally connected at 26 with an operating lever 27. The operating lever 27 is pivotally mounted at 28 on the adjacent end of the car and is provided with a handle 29 having its opposite sides formed with grooves or depressions 30 adapted to receive the spring clamping jaws 31 of a locking member or clip 32, the latter being fastened to the adjacent end of the car, as best shown in Figs. 3 and 5 of the drawings.

The operating lever, instead of being pivotally mounted on the end of the car may be fastened to the side of the car, in which event, the locking member or clip 32 will also be fastened to the side of the car in position to engage said operating lever.

Extending laterally from one end of the

tread piece 9 of the auxiliary step, is a bar 33 having one end thereof reduced to form a cylindrical portion 34 provided with terminal threads for engagement with a clamping nut 35.

Pivotally mounted on the cylindrical portion 34 of the bar 33, is one end of a short rod section or link 36, the other end of which is pivotally connected at 37 with the intermediate portion of the operating rod 25.

A lug 38 is secured to or formed integral with the arm 17 and adapted to bear against the upper face of the link 18 when the auxiliary step is moved to lowered or operative position.

It will here be noted that the hinges 39 connecting the riser and tread of the auxiliary step, are formed with square shoulders 40 adapted to contact with each other when the tread is in horizontal position, thus to assist in sustaining the weight of the passengers when entering or leaving the car.

Thus it will be seen that by grasping the handle 29 of the operating lever and moving the latter in the direction indicated by the arrow in Fig. 3 of the drawings, the rod 25 will cause the crank arm 23 to oscillate the rock shaft 15, and through the medium of the arm 17 and link 18, move the riser 8 of the auxiliary step to vertical position. It will also be noted that when a downward pull is imparted to the operating rod 25, the short rod section 36 will force the tread 9 outwardly until the shoulders 40 engage each other, thus supporting the auxiliary step beneath the permanent steps of the car and in convenient position for the passengers to step upon when entering or leaving the car. When the operating lever 27 is moved in the opposite direction, that is to say to the position shown in Fig. 3 of the drawings, the rod 25 will exert an upward pull on the crank arm 23 and cause the arm 17 and rod 36 to exert an upward and rearward pull on the auxiliary step and thus move the latter to elevated or inoperative position beneath the permanent steps.

It will of course be understood that the auxiliary step may be used in connection with either open or closed railway coaches or in connection with street railway cars if found desirable or applicable, without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new is:

1. The combination with a car having stationary steps, of an auxiliary step including a tread and riser, one of which is pivotally connected with the stationary steps, a rock shaft having connection with the riser of the auxiliary step and provided with a crank arm, an operating lever, a rod forming a connection between the operating lever and crank arm, a rod forming a connection between the first mentioned rod and the tread

of the auxiliary step, and means for supporting the auxiliary step in elevated position beneath the stationary steps of the car.

2. The combination with a car having stationary steps, hangers depending from one of the stationary steps and provided with bearings, a rock shaft journaled in said bearings, an auxiliary step including a tread and riser, one of which is connected with the adjacent stationary step, a pin and link connection between the rock shaft and riser of the auxiliary step, an operating lever, a rod forming a connection between the operating lever and crank arm of the rock shaft, and a link forming a connection between the intermediate portion of the rod and the tread of said auxiliary step.

3. The combination with a car having stationary steps, of an auxiliary step including a tread and riser, one of which is pivotally connected with one of the stationary steps, a rock shaft having connection with the riser of the auxiliary step and provided with a crank arm, an operating lever, a rod forming a connection between the operating lever and crank arm, a connection between the rod and tread of the auxiliary step, said operating lever being provided with oppositely disposed seating grooves, and a socket secured to the car and provided with spring arms adapted to enter the grooves in the operating lever when the latter is actuated to elevate the auxiliary step.

4. The combination with a car having stationary steps, of an auxiliary step pivotally mounted for swinging movement on one of the stationary steps and including pivotally connected tread and riser sections, a rock shaft having connection with the riser of the auxiliary step and provided with a crank arm, an operating lever pivotally mounted on the car and operatively connected with the crank arm, said operating lever being provided with oppositely disposed longitudinal seating grooves, a connection between the lever connecting means and the tread of the auxiliary step and a socket also secured to the car and provided with spring pressed arms adapted to enter the grooves in the operating lever when the latter is actuated to move the auxiliary step to elevated position.

5. The combination with a car having stationary steps, hangers secured to one of the stationary steps and provided with terminal bearings, a rock shaft journaled in said bearings, a brace forming a connection between the rock shaft and another of said stationary steps, a crank arm secured to one end of the rock shaft, an auxiliary step depending from the stationary steps and comprising pivotally connected tread and riser sections, a pin and link connection between the intermediate portion of the rock shaft and the riser section of the auxiliary step, an oper-

ating lever pivotally mounted on the body of the car, a rod forming a connection between one end of the operating lever and the crank arm, a rod forming a connection between the intermediate portion of the last mentioned rod and the tread portion of the auxiliary step, and a spring clip secured to the car and adapted to engage the operating lever when the latter is operated to elevate the auxiliary step.

6. The combination with a car having stationary steps, of an auxiliary step including pivotally connected riser and tread sections, one of which is pivotally connected with the adjacent stationary step, hangers depending from said stationary steps and provided with bearings, a rock shaft journaled in said bearings and provided with spaced crank arms, a pin and link connection between one of said arms and the riser of the auxiliary step, an operating lever pivotally mounted on the car, a rod forming a connection between the operating lever and the other crank arm of the rock shaft, a bar extending laterally from one end of the tread section of the auxiliary step, a rod forming a connec-

tion between said bar and the intermediate portion of the first mentioned rod, a projection on one of the crank arms of the rock shaft and adapted to engage the link when the auxiliary step is in operative position, and means engaging the operating lever for retaining said auxiliary step in elevated position.

7. The combination with a car having stationary steps, of an auxiliary step including a tread and riser, one of which is pivotally connected with the stationary steps, a rock shaft having connection with the riser of the auxiliary step and provided with a crank arm, an operating lever, a connection between the operating lever and crank arm, a connection between the lever connecting means and the tread of the auxiliary step, and means for supporting the auxiliary step in elevated position.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM MILLARD HAMILTON. [L. s.]

Witnesses:

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