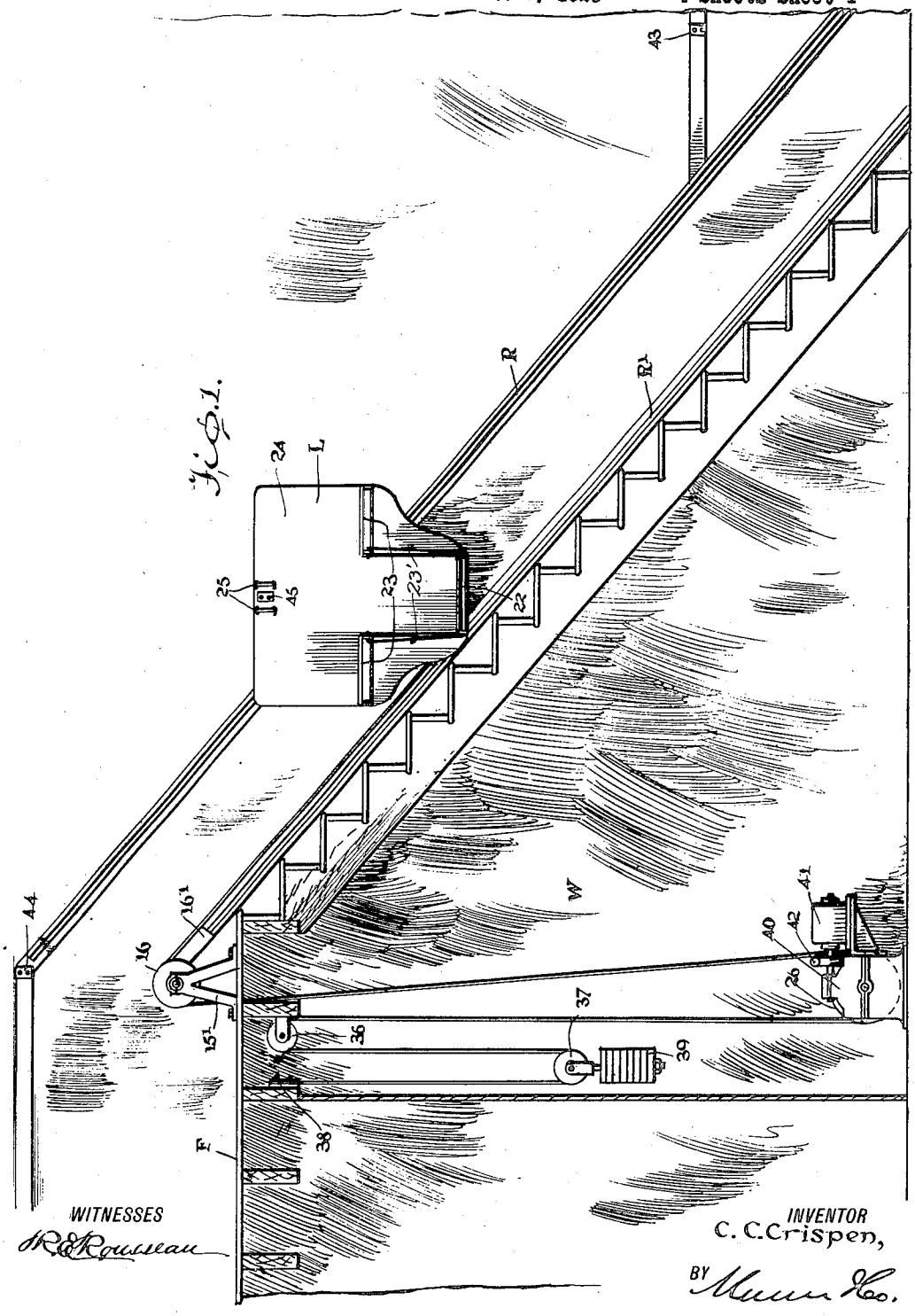
Nov. 13, 1923. 1,473,813

C. C. CRISPEN

ELEVATOR FOR STAIRWAYS

Filed Oct. 4, 1921 4 Sheets-Sheet 1




WITNESSES

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4 Sheets-Sheet 2

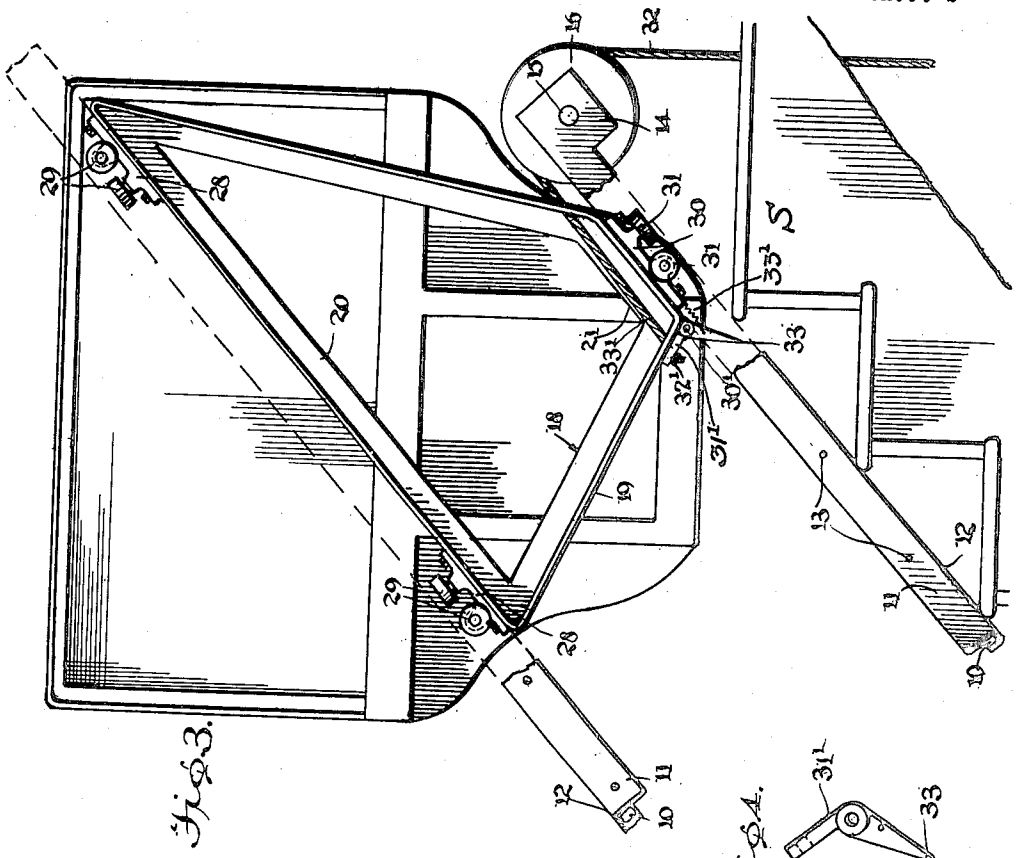


Fig. 3.



Fig. 4.

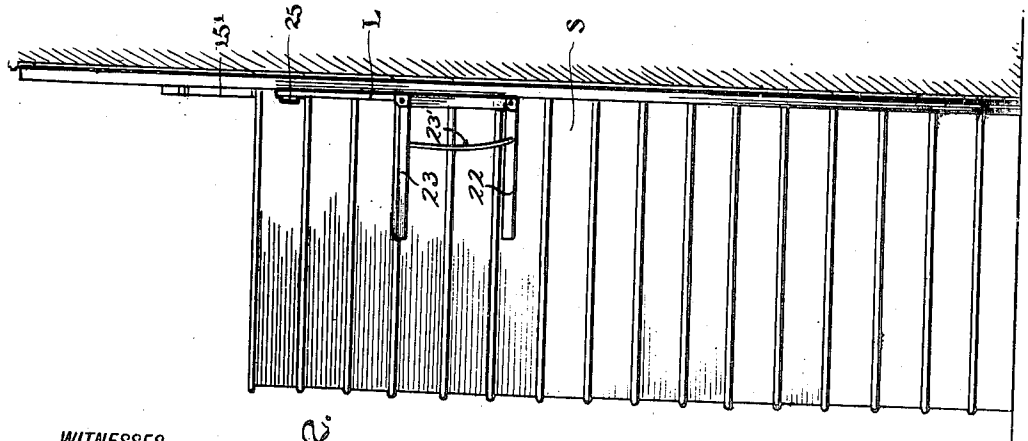


Fig. 2.

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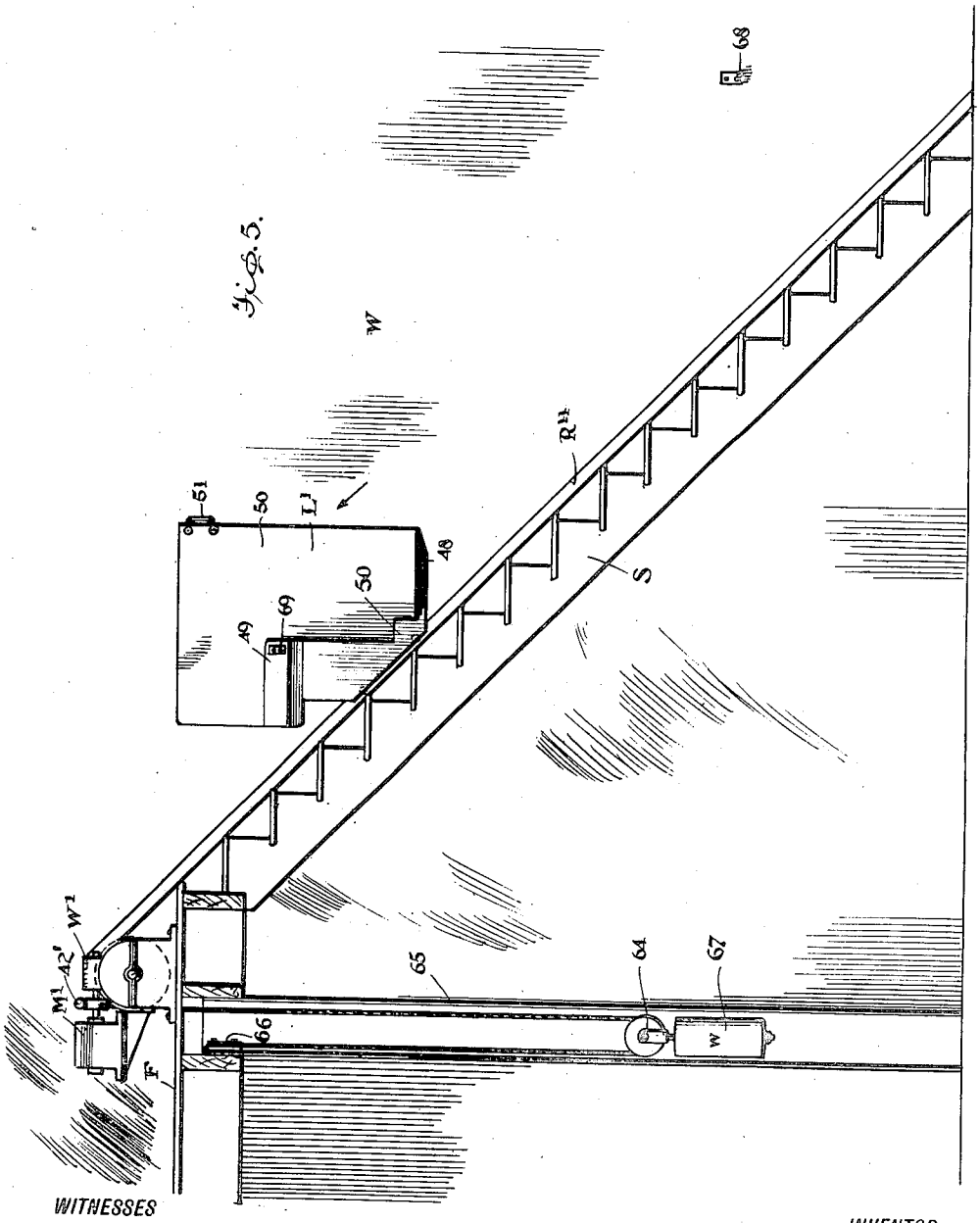
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WITNESSES

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4 Sheets-Sheet 4

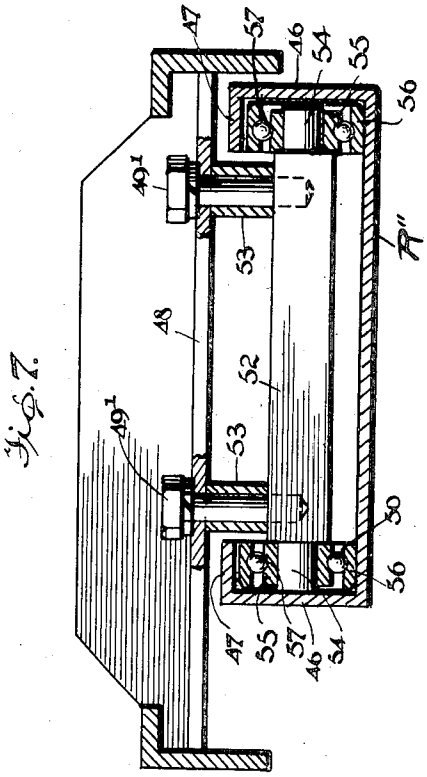



Fig. 7.

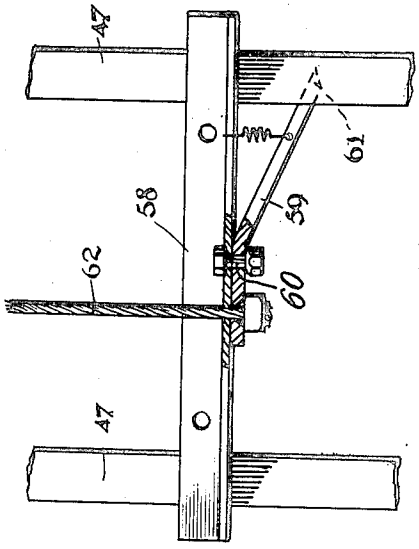
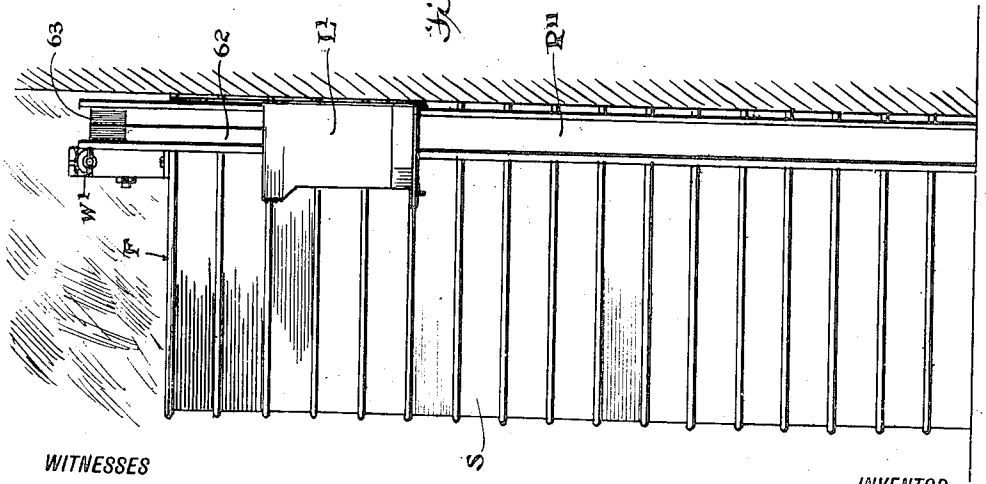



Fig. 8.

Fig. 6.




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Patented Nov. 13, 1923. 1,473,813

# UNITED STATES PATENT OFFICE.

CLARENCE CULLEN CRISPEN, OF HARRISBURG, PENNSYLVANIA.

## ELEVATOR FOR STAIRWAYS.

Application filed October 4, 1921. Serial No. 505,328.

*To all whom it may concern:*

Be it known that I, CLARENCE CULLEN CRISPEN, a citizen of the United States, and a resident of Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Elevators for Stairways, of which the following is a specification.

This invention relates to an elevator for stairways.

Among the objects of the invention is to provide an elevator adapted to be installed for operating upon a stairway in any dwelling or hotel for elevating or lowering people the distance of the stairway with which the same is associated in an expeditious and reliable manner.

It is also an important object of the invention that the elevator be simple in construction and adapted to be manufactured and installed at a low cost.

It is a further and important object of the invention that the elevator be adapted to be installed on an ordinary stairway and not interfere with the regular use thereof.

Other objects relating to details of construction, combination and arrangement of parts will hereinafter appear in the detailed description to follow.

The invention is illustrated by way of example in the accompanying drawings, in which,

Figure 1 is a sectional elevation illustrating the application of the invention,

Figure 2 is a front elevation of the same, the wall with which the stairway is immediately associated being shown in section,

Figure 3 is a rear elevation of the elevator car and showing fragmentary portions of the associated rails,

Figure 4 is a detail view of the emergency stop element,

Figure 5 is a view similar to Figure 1 but showing a modified application of the invention,

Figure 6 is a view similar to Figure 2 of the modified application shown in Figure 4,

Figure 7 is a transverse sectional view of the rail upon which the elevator car travels and particularly illustrating the manner in which the car is movably supported by the rail; and

Figure 8 is a detail view illustrating the emergency stop for the modified form of invention.

Similar reference characters refer to like parts or objects throughout the drawings.

Referring to the drawings in detail and particularly to Figures 1 to 3 inclusive, S indicates generally a stairway which in this instance is arranged adjacent the wall W and leading to an upper floor F.

R and R′ indicate an upper and lower rail, respectively, upon which there is mounted an elevator car for moving up and down the stairway S.

The rails R and R′ are channel shaped as shown in Figure 3. The side flanges 10 and 11 of each rail oppose each other and the bridge portion 12 of each rail is of the same width. The inner flange 11 of each rail adjacent the wall W is of greater width than its companion flange 10. Each rail is supported by bolts 13 which extend through the side flange 11 and into the wall W. Also the rail R′ may rest upon the stairway as shown to further support the same. At the upper end of the inner flange 11 of the rail R′ there is formed a lug 14 which journals the one end of a shaft 15, the other end of the shaft being formed in the bearing standard 15′. To the shaft 15 there is secured a winding drum 16, the bridge portion 12 of the channel rail and the side flange 11 being cut away as at 16′ sufficiently to permit the winding drum to freely rotate.

The elevator car L comprises an angular frame 18 with a bolting flange 19 extending thereabout, the top and bottom sides 20 and 21, respectively, being parallel to each other. From the frame 18 there extends laterally a platform 22 which has associated therewith a pair of opposing seats 23 and a side wall 24 which carries at its upper end a pair of hand grips 25, to which a passenger may hold. The platform and seats are hinged to the side wall 24 as indicated in Figure 2, the platform and seats being connected by the rods 23′ adapted to permit the seats and platform to be folded upward and against the wall or back 24 in unison. It is of course to be understood that the detail construction of the car L would comply with the judgment of the builder or manufacturer.

The upper side 20 of the frame 18 has secured adjacent each end a block 28, each block having journaled therein a pair of rollers 29 the peripheries of which are disposed in planes at right angles to each other, thus enabling one roller to engage the

bridge portion 12 of the rail R while the other roller engages either of the flanges 10 or 11 of the rail. The other side 21 of the frame 18 is also provided with a block 30 which has journaled therein a similar pair of rollers 31, one of which is adapted to engage with the bridge portion of the channel rail R' while the other may engage either of the associated side flanges 10 and 11.

A cable 32 has its one end attached to the one end of the emergency stop 31' as at 32'. The emergency stop is in the shape of a belt crank lever, being fulcrumed to the frame as at 30' and its free end pointed as at 33. Also a coil spring 33' extends between the stop and frame which upon the breaking of the cable 32 will swing the pointed end of lever into engagement with the bridge portion of the rail R' and hold the car against downward movement.

The cable 32 is otherwise wound about the drum 16 and then extended downwardly through a suitable opening in the floor F; then about a pulley 26 and about the sheaves 36 and 37 and its end secured to a floor sill as at 38. The sheave 36 may also be secured to a floor sill as shown and from the sheave 37 there is suitably suspended the adjustable weights 39.

The pulley 26 is suitably connected to be driven by a worm and gear unit generally indicated at 40 and said worm and gear being driven by an electric motor 41; and preferably between the motor and worm and gear unit there is interposed a magnetic brake 42.

The wiring diagram for operating the motor is not shown as the same may be done in any conventional manner with the object of starting the motor in either direction from the foot of the stairway as by a button switch at 43 and also starting the motor in either direction at the head of the stairway by a similar switch 44. Also a switch of similar character should be mounted upon the car L as at 45.

When it is desired to ascend the stairway by the car L, the proper switch button should be operated for bringing the car to the foot of the stairway and after the passengers are aboard the car, the proper switch button should be operated for starting the car upward upon the stairway. The magnetic brake 42 will of course operate to stop the car when the motor 41 is not operating in a manner well understood, and the emergency stop 31' will operate to stop the car should the cable break. It is thought that the manner in which the car is movably supported and the manner in which the motor operates to elevate the car is entirely clear from the foregoing description and consequently no further description will be here given.

Referring to Figures 5 to 8 inclusive, it will be observed that only one rail generally indicated by the reference character R'' supports the car L'. The rail in this instance is channel shaped and each flange portion 46 is formed with an inward extension 47. The rail rests upon the stairway and may be secured in any desirable manner. The car L' is constructed to provide the platforms 48 and 49, the platform 49 being elevated and to serve for baggage or the like while the platform 48 serves for the passengers to stand upon. Also the car has a back 50 with the handle 51 for passengers to grasp for steadying themselves. To the platform there is secured an axle 52 by the means of enlarged bolt screws as at 49', said axle being held in spaced relation with the platform 48 by the sleeves 53. The axle 52 is formed with a spindle 54 at each end and each spindle has fitted thereon a collar 55. About each collar there is disposed an annular member 56 to serve as a roller, and between each roller 56 and its associated collar 55 there is interposed the ball bearings 57. It is also to be understood that a second and similar axle 52 will be mounted beneath the car at the proper distance to maintain the car in proper position and against tilting movement.

Upon the bottom of the car L there is secured in any convenient manner a cross-member 58 which is preferably L-shaped in cross section. Upon the vertical portion of the L-shaped cross member 58 there is fulcrumed an emergency stop member 59 by a bolt 60, said member being of the shape shown and having its outer end pointed as at 61 while its inner end is connected to the cable 62. Also a spring 63 is secured between the outer end portion of the stop and the cross member 58 which will assure that the pointed end 61 of the stop member will be brought to engage with the associated side flanges 46 of the rail R'' in case the cable 62 should break.

The cable 62 is wound about a drum at the upper end of the rail as at 63 (Figure 6) and then passed about the sheave 64 which is vertically movable in a shaft 65, and the end of the cable secured to a floor sill as at 66. The sheave 64 has attached thereto a weight 67.

The winding drum in this instance is driven by the motor M' and gear and worm unit W'. Also a magnetic brake 42' is utilized to hold the car against movement when the motor is not operating. Also a switch 68 may be positioned at the foot of the stairway for starting the motor M' in either direction and a similar switch on the car L' as at 69.

The operation of the modified construction of the present invention described is

substantially that of the form shown in the Figures 1 to 4 inclusive and no detail description is deemed essential.

I claim:

1. A stairway elevator, comprising in combination, a channel rail adapted to be secured to extend the length of the stairway, a car movable upon said channel rail, roller means carried by the car adapted to move in said channel rail for supporting the car, means carried by the rail adapted to cooperate with the roller means to hold the car in an upright position.

2. In an apparatus of the character described, a track consisting in a channel shaped rail and each side of the channel rail terminating at its free edge in an inwardly extending flange, a plurality of rollers adapted to move between each inwardly extending flange and the bottom of said rail, and a car supported by said rollers.

3. In an apparatus of the character described, a track consisting in a channel shaped rail and each side of the channel rail terminating at its free edge in an inwardly extending flange, a plurality of rollers adapted to move between each inwardly extending flange and the bottom of said rail, an axle supported between said rollers, and a car supported by said axle.

4. In an apparatus of the character described, a track consisting in a channel shaped rail and each side of the channel rail terminating at its free edge in an inwardly extending flange, a plurality of rollers adapted to move between each inwardly extending flange and the bottom of said rail, a platform, and means whereby the platform may be directly secured to said axle and be supported to move above said rail with said rollers.

5. An elevator for stairways, comprising in combination a single rail adapted to be supported along one side of a stairway, an elevator car movable upon the rail comprising a back and a platform extending laterally therefrom and seats hinged to the back and adapted to be folded thereagainst.

6. In combination, an inclined rail, said rail being channel shaped and each side of the rail having its free edge formed with an inwardly extending flange, rollers between each inwardly extending flange and the bottom of said rail, axles supported by said rollers, a car body supported by said axle, means for drawing said car upwardly upon said rail, and means whereby upon the means for drawing said rail upwardly upon the track becoming disengaged the car will be held against downward movement upon said rail.

7. In combination, an inclined channel shaped rail having the free edge of each of its sides formed with an inwardly turned flange, a running gear movably supported within the channel rail, a car supported by said running gear and movable upon the channel rail, and said running gear being also adapted to prevent side tilting movement of the car.

8. In combination, an inclined channel shaped rail having the free end of each of its sides formed with an inwardly turned flange, a running gear movably supported within the channel rail, a car supported by said running gear and movable upon the channel rail, said running gear being also adapted to prevent side tilting movement of the car, cable means for drawing said car upwardly upon said rail, and connection means releasable upon the cable being released from said car whereby to engage said rail for holding the car against downward movement.

9. In combination, an inclined channel shaped rail, a roller supported truck movable longitudinally of the rail and between the side flanges thereof, a car supported by said truck, means adapted to prevent side tilting movement of said truck, a cable secured to said truck and adapted to be utilized for drawing the same upwardly upon said rail, and a catch member adapted to operate for holding the car against downward movement upon the rail when said cable is permitted to be slacked or non-tensioned.

10. In combination, an inclined channel shaped rail, a roller supported truck movable longitudinally of the rail and between the side flanges thereof, a car supported by said truck, means adapted to prevent side tilting movement of said truck, a cable secured to said truck and adapted to be utilized for drawing the same upwardly upon said rail, an elongated bar pivotally supported upon the truck at a point intermediate its ends, and its one end connected to said cable, while its other end is disposed out of engagement with said channel rail and spring means connected to said latch member adapted to draw the same into engagement with the channel rail for holding the car against downward movement upon the cable becoming slacked or non-tensioned.

11. In a device of the character described, a car body comprising a frame, a vertical wall supported by said frame, and a foldable platform extending from said wall.

12. In a device of the character described, a car body comprising a frame, a vertical wall supported by said frame, and a foldable platform and foldable seats extending from the one side of said wall.

CLARENCE CULLEN CRISPEN.