

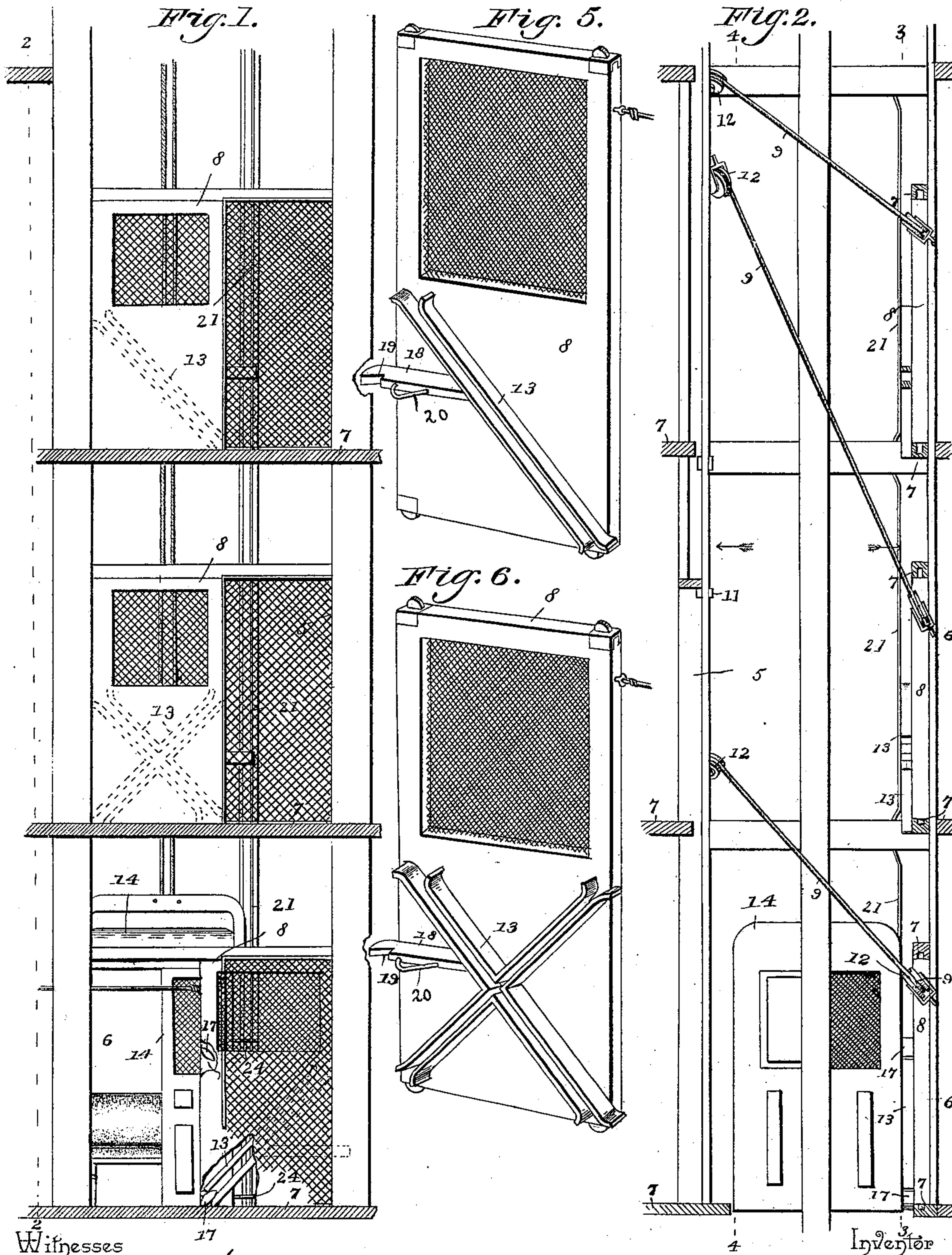
(No Model.)

2 Sheets—Sheet 1.

J. McLAUGHLIN.
AUTOMATIC GATE FOR ELEVATORS.

No. 518,374.

Patented Apr. 17, 1894.



Witnesses

J. McKel
O. E. Ray

By his Attorneys,

James McLaughlin,
C. Snow & Co.

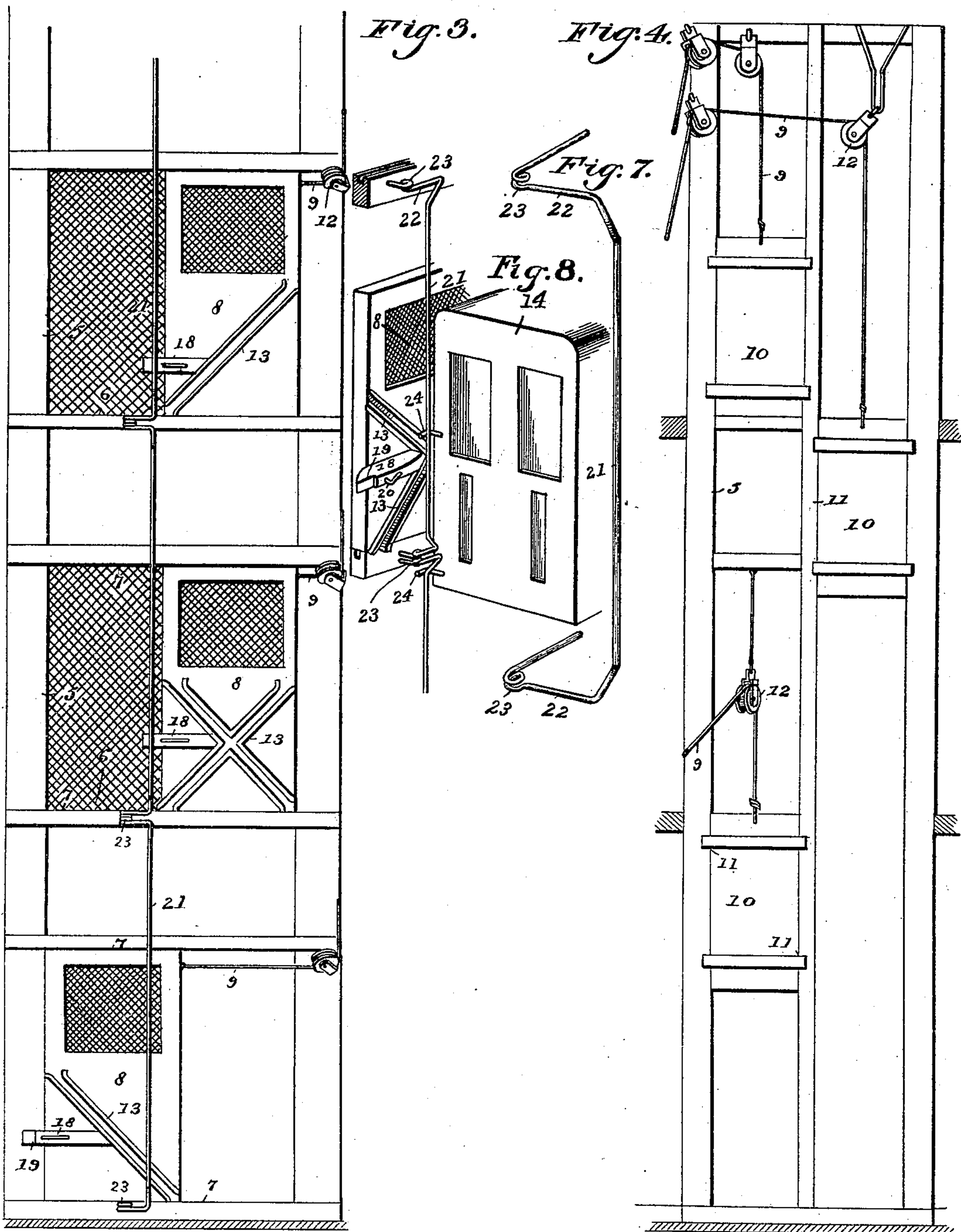
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J. M. Ke,
O. E. Dwyer.

Inventor

James McLaughlin,

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C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JAMES McLAUGHLIN, OF MICHIGAN CITY, INDIANA, ASSIGNOR OF ONE-HALF
TO ROBERT G. FRANKLIN, OF SAME PLACE.

AUTOMATIC GATE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 518,374, dated April 17, 1894.

Application filed February 24, 1893. Serial No. 463,579. (No model.)

To all whom it may concern:

Be it known that I, JAMES McLAUGHLIN, a citizen of the United States, residing at Michigan City, in the county of La Porte and State of Indiana, have invented a new and useful Automatic Gate for Elevators, of which the following is a specification.

My invention relates to improvements in elevator gates and means for operating the same, and has special reference to that class in which the gates are successively opened and closed by the elevator car without attention upon the part of the operator.

The objects of my invention are to provide simple, direct and effective means for automatically opening and closing the gates, and also to provide means for automatically locking and unlocking the same.

Further objects and advantages of my invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings: Figure 1 is a front view of an elevator shaft provided with gates and operating mechanism therefor embodying my invention, a portion of such mechanism being indicated in dotted lines and one of the gates being partly broken away to illustrate one of the shoes which travel in the inclined guides. Fig. 2 is a vertical sectional view upon the line 2—2 of Fig. 1. Fig. 3 is a vertical sectional view upon the line 3—3 of Fig. 2, looking forward, or in the direction indicated by the darts upon Fig. 2. Fig. 4 is a similar view upon line 4—4 of Fig. 2, looking rearward, or in the direction indicated by the darts in said Fig. 2. Fig. 5 is a perspective view of the bottom gate showing the rear side thereof. Fig. 6 is a similar view of an intermediate gate, showing its rear side. Fig. 7 is a detail view, in perspective, of one of the locking devices. Fig. 8 is a detail view in perspective of a locking-bar and connections.

The frame-work 5 of the elevator shaft, as shown in the drawings is essentially of the ordinary construction.

6 represents the gate openings whose bottoms are on the planes of the several floors.

7 represents the horizontal guides and 8 the slidable gates which are fitted at their upper and lower edges in the guides 7 and are adapted

to move laterally in the usual manner. Connected severally to these gates, by means of cords or flexible connections 9, are counter-balancing weights 10. These weights slide in vertical ways 11 at the rear side of the frame 5, and the flexible connections 9 pass over and are guided by the pulleys 12.

Fixed to the rear sides of the gates are inclined guides 13, those upon the top and bottom gates being inclined respectively in opposite directions, and those upon the intermediate gates being inclined in both directions, for a reason which will hereinafter be fully understood.

14 represents the elevator car, provided with shoes or shuttles 17, which are inclined, respectively, in opposite directions, the inclination thereof corresponding with that of the inclined guides which are carried by the gates. Each gate is provided near one side edge with a lateral arm 18, provided with a notch 19, as shown in the drawings. Adjacent to said notch upon each arm 18 is arranged a guide 20, whose function will be hereinafter explained. A locking bar 21 is arranged adjacent to one side edge of each gate, the same being provided at its upper and lower ends with parallel arms 22 in which are formed coiled pressure springs 23, which press the locking-bars toward the rear surfaces of the gates in position to engage the notches 19. The pressure of the locking bars being constant, the guides 20 are provided to press said bars laterally and furnish an additional locking projection in the event of the gates not being tightly closed. The elevator car is provided with lateral disengaging fingers, 24, which are adapted, as the car approaches a gate, to engage said locking bars and disengage them from their respective notches or studs.

It will be understood that the peculiar form of the notches and the means for guiding the locking-bar thereto may be varied according to the style of the elevator and the taste of the builder, and therefore for convenience I will term such features catches.

The locking bars are held in engaging positions by their actuating springs, as described, and are adapted to engage such catches when the gates reach their closed positions.

Assuming the parts to be in the positions

shown in Fig. 1, with the elevator car down, its platform being in the plane of the lowermost floor and the lower gate being open, it will be seen that the lower shoe or shuttle is arranged in the lower end of the inclined guide upon the lower gate, and the upper shoe or shuttle is arranged above the upper end of such guide. As the car ascends its lower shoe or shuttle operating in the inclined guide of the lower gate closes the latter, and at the proper time, (governed by the distance between the floors and the heights of the car and doors,) the upper shoe engages the inclined guide of the intermediate gate and opens the same. After the lower gate reaches its closed position the locking-bar engages the catch 19.

It will be understood that as illustrated in the drawings, the locking bars will not engage the catches 19 until the finger 24 by which said locking bar has been previously disengaged, releases such locking bar, and owing to the fact that the bends of the locking bars are arranged at the extremities thereof of the gates will not be positively locked until after the succeeding finger 24, (which, if the car is ascending will be the lower finger) has passed the upper end of the bar, but it is obvious that if said bends were made adjacent to the planes of the catches, the release of the bars would occur earlier and the gates would be locked immediately upon being closed. Modifications of this character, which do not depart from the spirit of the invention, as described and shown, may be made to suit the requirements.

As above mentioned, the intermediate gate was opened by the upper shoe or shuttle, but when said gate reaches its open position the lower shoe or shuttle is in alignment with the other inclined guide of said gate, being a different guide from that in which the upper shoe operated in opening the same. Therefore, as the car continues to ascend the upper shoe will open the next higher gate and the lower shoe will engage the lower ends of the guide upon said intermediate door and close the latter. As the car rises from floor to floor the locking-bar is disengaged from its catch by the disengaging finger 24. When the car reaches the top of the shaft the uppermost gate will be engaged only by the upper shoe or shuttle, being opened by the same during the ascent of the car and being closed by the same upon the descent of the car. And also, the lowermost gate is engaged only by the lower shoe, being closed by the latter upon the ascent of the car and opened thereby upon the descent of the same. Hence the top and bottom doors, as shown in the drawings are provided, respectively, with but one inclined guide, such guides being, however, inclined in opposite directions as described. The intermediate gates are, upon the ascent of the car, opened by the upper shoe and closed by the lower shoe, and upon the descent of the car are opened by the lower shoe

and closed by the upper shoe, and therefore they must be provided with duplicate inclined guides. The counterbalancing weights assist in the operation of closing the gates, render their movement easy, and prevent the operation of closing and opening the gates from interfering with the movement of the car. A further and important function of these weights is to hold the gates in their closed positions while the locking bars are out of engagement with the catches. The locking bars form the permanent locks for the gates when the car is entirely above or below the floor, upon which such gate is arranged, and the weights form temporary securing devices to hold the gates closed while the car is passing from that floor to the one above or below.

Changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an elevator, the combination with sliding gates, an elevator car, means whereby the gates are opened and closed successively as the car ascends or descends, and means to lock the gates in their closed positions, of counterbalancing weights flexibly connected to the gates to assist the closing action and hold them closed until locked, and means carried by the car to disengage said locking means, substantially as specified.

2. The combination with the gates, and means for operating the same, of locking-bars having parallel upper and lower arms provided with spring coils, to normally hold the bars in their operative positions, notched catches carried by the gates, and means to disengage the locking-bars from the catches, substantially as specified.

3. The combination with slidable gates, and automatic operating connections, of spring-pressed, vertically-disposed locking-bars equal in length to the height of the gates, notched arms carried by the gates to be engaged by said locking bars, and a finger carried by the car to disengage the locking-bars from the said arms, substantially as specified.

4. The combination with gates and automatic operating mechanism therefor, of locking-bars provided with spring-actuated terminal arms, notched arms carried by the gates to be engaged by the locking-bars, guides fixed to said notched arms to guide the locking-bars, and means for disengaging the locking-bars from the said arms, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES McLAUGHLIN.

Witnesses:

J. F. SPIRO,

ROBERT G. FRANKLIN.