

No. 632,369.

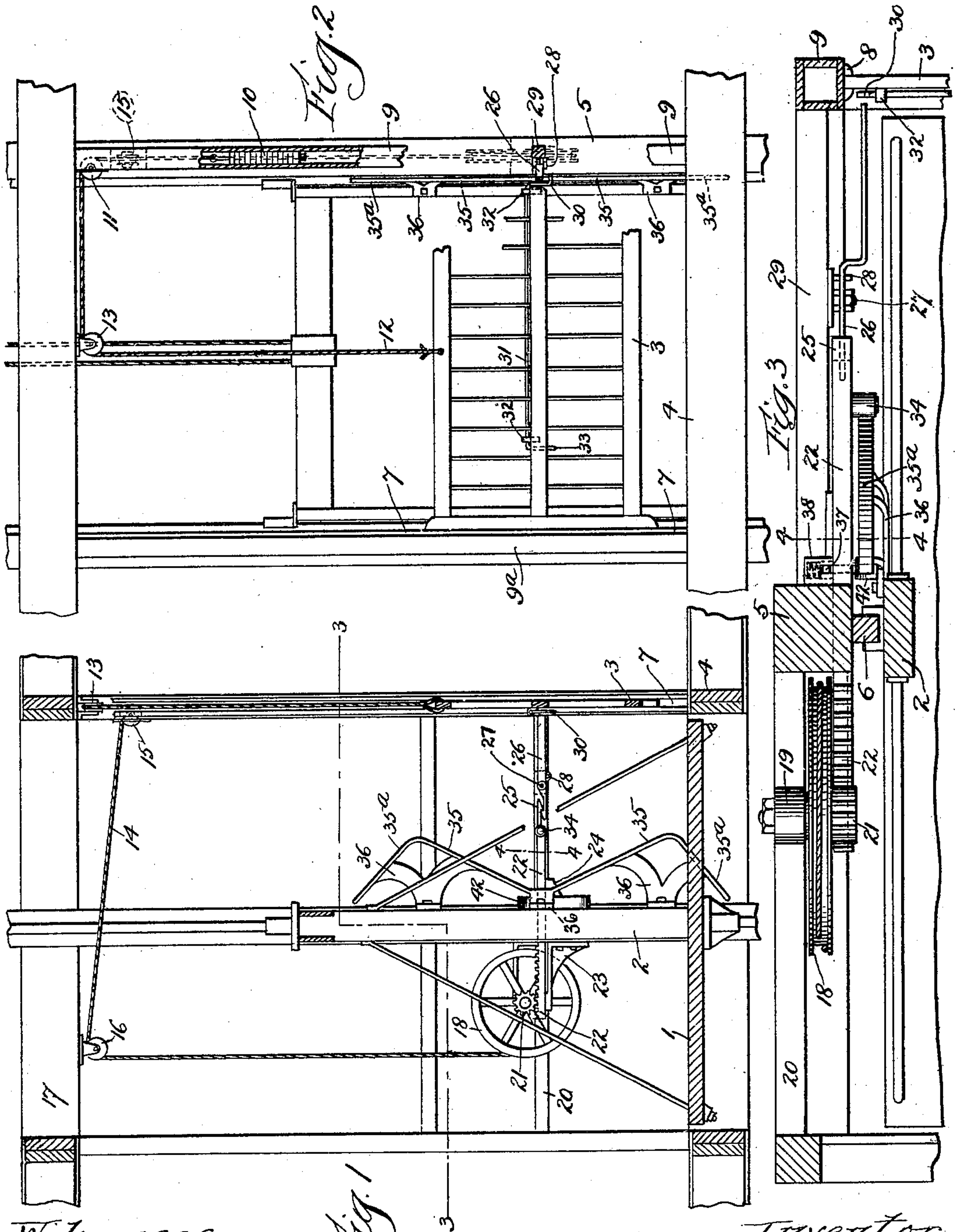
Patented Sept. 5, 1899.

E. S. ROBISON.
MEANS FOR OPERATING ELEVATOR DOORS.

(Application filed Apr. 12, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
Wm. F. Hemming
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Fig. 1

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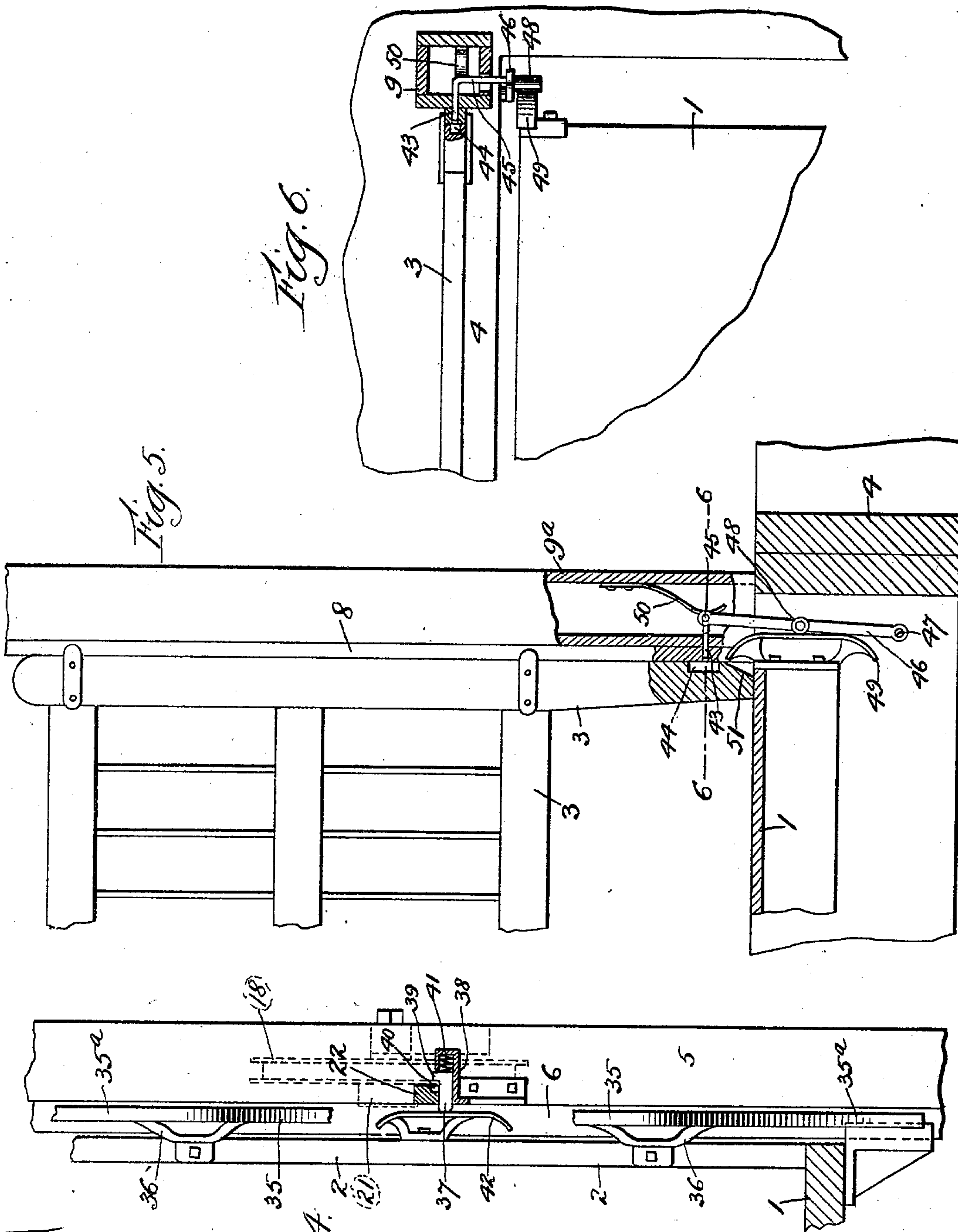
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Fig. 4.

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UNITED STATES PATENT OFFICE.

ELLIOTT S. ROBISON, OF CHICAGO, ILLINOIS.

MEANS FOR OPERATING ELEVATOR-DOORS.

SPECIFICATION forming part of Letters Patent No. 632,369, dated September 5, 1899.

Application filed April 12, 1897. Serial No. 631,753. (No model.)

To all whom it may concern:

Be it known that I, ELLIOTT S. ROBISON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Means for Operating Elevator-Doors, of which the following is a full, clear, and exact specification.

My invention relates to means for operating elevator-doors, and more particularly to means for closing the door by the motion of the car after it has been opened by other means; and it has for its object to provide an improved and simple mechanism whereby the movement of the car in either direction may close and lock the door.

It also has for its object to prevent the opening of the door excepting when the car is at the proper elevation and to then open it automatically.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a vertical section of an elevator car and shaft equipped with my improvements, looking from the side. Fig. 2 is a front view, partly broken away, of an elevator provided with my improvements. Fig. 3 is an enlarged plan sectional view taken on the line 3 3, Fig. 1. Fig. 4 is an enlarged detail section, partly broken away, taken on the line 4 4, Figs. 1 and 3. Fig. 5 is a front elevation of the lower portion of the gate or door and the car, showing certain portions broken away and others in section on different vertical planes, as will hereinafter appear; and Fig. 6 is a detail plan section taken on the line 6 6, Fig. 5.

My invention is shown as applied to a freight-elevator, this being an example of the form for which my improvements are more especially designed.

1 represents the floor of the car; 2, the standards; 3, the gate or door; 4, one of the floors of the building; 5, one of the side standards of the shaft, and 6 the guide-strips secured thereto and with which the guides on the standards 2 engage. In the example of elevator shown in the drawings the door 3 is

arranged to slide vertically between guides or ways 7 8 and is adapted to close by its own gravity, so as to be self-closing when permitted by other mechanism by which it is controlled.

In one corner of the elevator-shaft is arranged a vertical weight-box 9, in which is arranged a weight 10, and at the upper end of which box is located a pulley 11. Secured to the door 3 at one end is a cable or cord 12, which passes upwardly over a pulley 13, secured to the upper side of the door-frame, and then passes over the pulley 11 and has its other end attached to the weight 10. By this means it will be seen that the weight will automatically elevate the door 3 as soon as it is released. This weight 10 is also connected to one end of a cable 14, which passes upwardly over another pulley 15, arranged near the upper end of the weight-box 9, and thence passes over a pulley 16, secured to the under side of the beam 17. From here the cord or cable 14 passes downwardly around and is attached to a drum 18, journaled in a box or bearing 19, mounted upon a suitable support or beam 20. On the inner side of the drum 18 is secured a pinion 21, which meshes with a horizontally-sliding rack-bar 22, the latter being supported by brackets 23 24, secured to the stanchion 5 of the elevator-shaft. The rack-bar 22 passes through a suitable passage formed in the stanchion 5 and rests against the inner side of the guide-strip 6, which serves to hold the bar 22 in place. One end of the bar 22 is provided with a hook 25, under which engages a latch 26, having a pivotal support 27 and stop 28 on the bar or beam 29, one end of the latch 26 being arranged in such a position that it may be engaged by a cranked arm 30, formed on a shaft 31, mounted in suitable bearings 32 on the door 3 and having an operating-handle 33, thus enabling the conductor on the car to release the latch 26 from its engagement with the hook 25. When the hook 25 is so released, it will be seen that the weight 10 will elevate the door and in so doing unwind the cable 14 from the drum 28 and cause the rack-bar 22 to recede from the door, and the door will remain open until such rack-bar has been again forced forward, causing the cable 14 to wind upon the drum and elevate the weight 10. In order now that this forward movement of the rack-bar 22 may be effected by the movement of the car in either

direction and the door thus automatically closed and latched, I provide the side of the rack-bar with a lug, which may be in the form of a pivoted roller 34 and which is arranged to be struck by either of twin cams 35, carried by the car. These cams 35 are arranged in a vertical position and secured by brackets 36 to one of the standards 2 of the car, and they are so formed that the rack-bar 22 may recede to the full extremity of its movement away from the door before the lug 34 strikes either of the cams when the car is substantially level with the landing. To this end the cams 35 project toward the door from their meeting ends, and hence if the lug 34 should be in the path of the cams when the car moves in either direction it will be forced toward the door until the hook 25 engages over the latch 26, and thus locks the door from being opened by the weight 10. In order that the lug 34 may not engage behind the cams 35 in the event the door should be opened before the car reaches the landing, the upper end of one and the lower end of the other is provided with an inwardly-inclining portion 35^a, which would strike under or over the lug 34, according to the direction in which the car might be moving, and force the lug outwardly until the hook 25 engaged over the latch 26. The door might then be opened after the car reached the landing. By thus permitting the door to close by gravity and to be opened by the gravity of the weight 10 it will be seen that the force of the movement of the door in one direction will be limited by the force of gravity exerted upon it and in the other direction by the force of gravity exerted on the weight 10 regardless of the speed of the elevator-car, and hence all danger of injury to persons being caught in the door, which exists where the door is opened and closed by positive means, is absolutely avoided.

As a safeguard against mischievous persons operating the door-opening mechanism before the car reaches the landing, I provide a lock which prevents the rack-bar 22 from being pulled inwardly or away from the door. This is best shown in Fig. 4 of the drawings, and it consists simply of a sliding bolt 37, mounted in a bracket or box 38 under the bar 22, and has a tooth 39, adapted to engage in a recess 40, formed in the under side of the bar 22, the bolt 37 being forced normally outward with the tooth 39 in engagement with the recess 40 by a spring 41, located in the box 38. This lock is automatically released and the bar 22 permitted to slide by a shoe 42, secured to the side of one of the standards 2 of the car, so that by the time the car reaches the level of the floor or landing the bolt 37 will have been engaged and forced back by the shoe 42, permitting the weight 10 to open the door as soon as the latch 26 is released by the conductor. Another form of this lock mechanism, which accomplishes substantially the same end, is shown in Figs. 5 and 6, and

consists of a sliding bolt 43, located in the lower end of the weight-box 9 and passing through such box and engaging in a recess 44, formed in the side of the gate or door 3, the recess 44 being vertically elongated, so that it may not be necessary to place the door in an exact position before it will lock. This bolt 43 is provided with a laterally outwardly-projecting arm 45, which is swiveled or pivoted in the upper end of a lever 46, the latter being pivoted at 47 to the side of the elevator-shaft and carrying a lug 48, with which a shoe 49 on the side of the elevator-car engages when the car reaches the landing, thus crowding the lever 46 to one side and pulling the bolt 43 out of engagement with the recess 44. The bolt 43 is automatically returned to its engaging position when the car moves away by a spring 50. The lower corner of the door 3 may be beveled off, as shown at 51, whereby the door in descending will automatically force the bolt 43 back until the recess 44 comes opposite it.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the car and a self-closing door, of a weight or its equivalent for opening said door, a winding mechanism, a flexible connection between said winding mechanism and weight, means for actuating said winding mechanism and elevating said weight having a portion carried by the car, and means for holding said weight elevated, substantially as set forth.

2. The combination with the car and a self-closing door, of a weight or its equivalent connected with said door for opening it, a winding-drum having flexible connection with said weight, a sliding bar having a stud, geared to said drum, a device carried by the car for moving said bar lengthwise and elevating said weight and means for holding said weight elevated, substantially as set forth.

3. The combination with the car and a self-closing door, of a weight or its equivalent for opening said door, a winding-drum having a flexible connection with said weight for elevating it, a sliding rack-bar geared to said drum and having a stud and a catch at one end, a latch for engaging said catch and means carried by the car for engaging said stud and forcing said bar lengthwise, substantially as set forth.

4. The combination with the car and the door, of means for opening the said door, means for causing the door to close, an actuating device for said latter means carried by the car, a lock for holding said means inactive and preventing the door-opening means from being operated and a device carried by the car for disengaging said lock, substantially as set forth.

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Witnesses:

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