

No. 837,323.

PATENTED DEC. 4, 1906.

W. G. MILLER.
SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED MAY 14, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

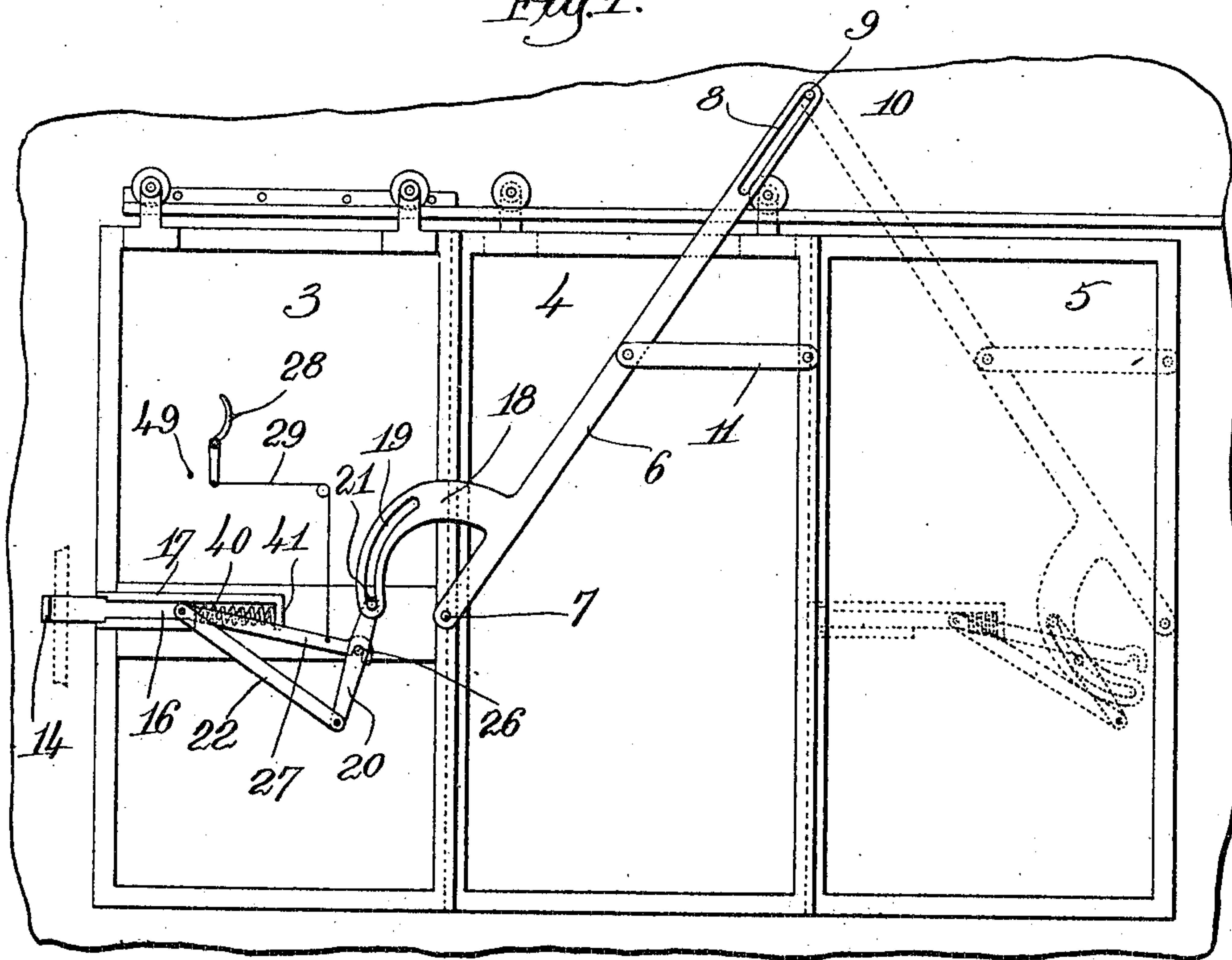


Fig. 2.

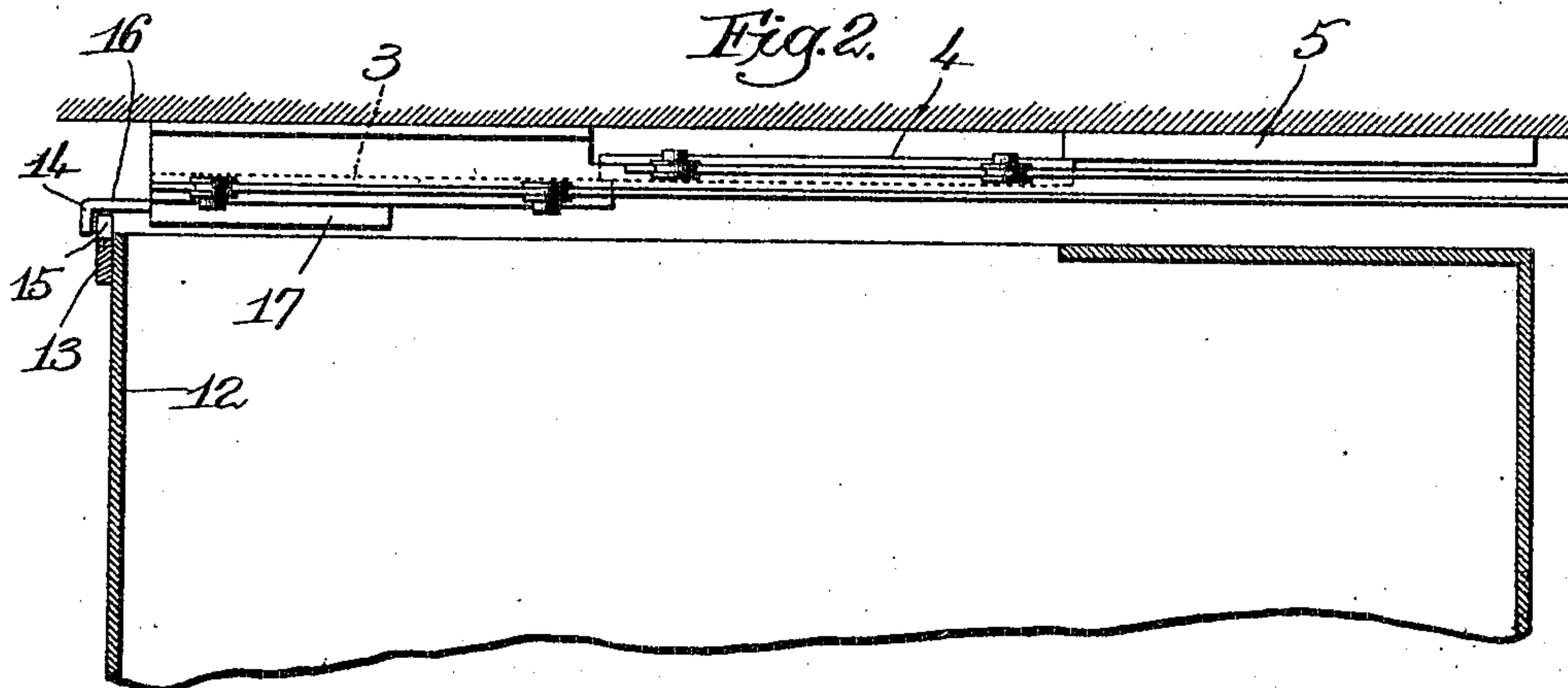
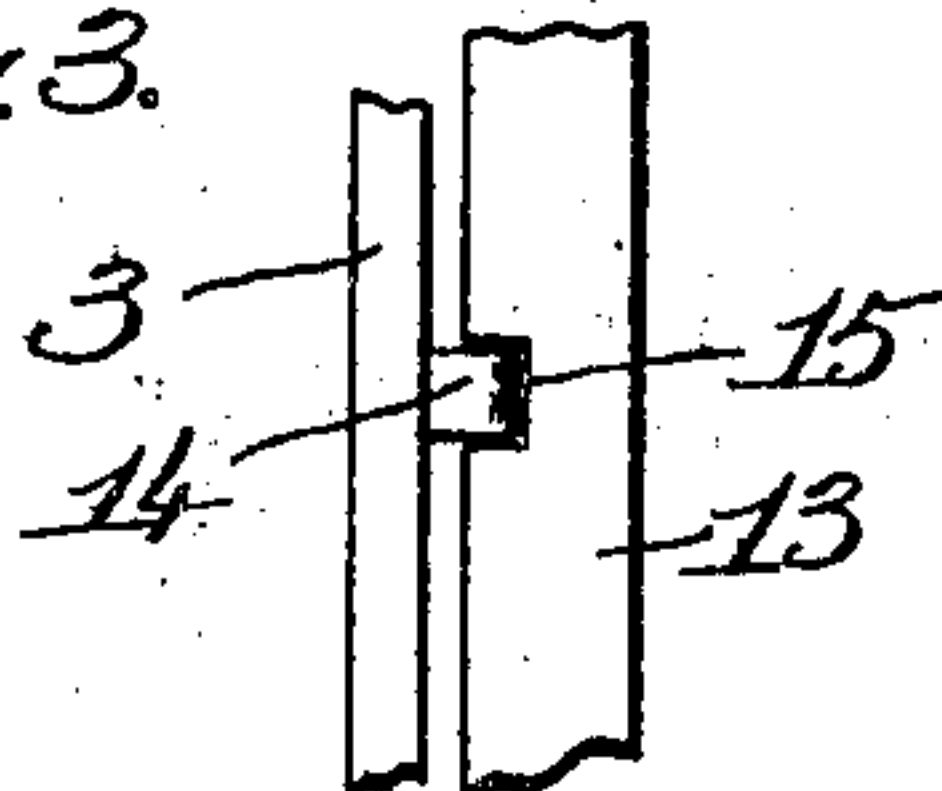


Fig. 3.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 4.

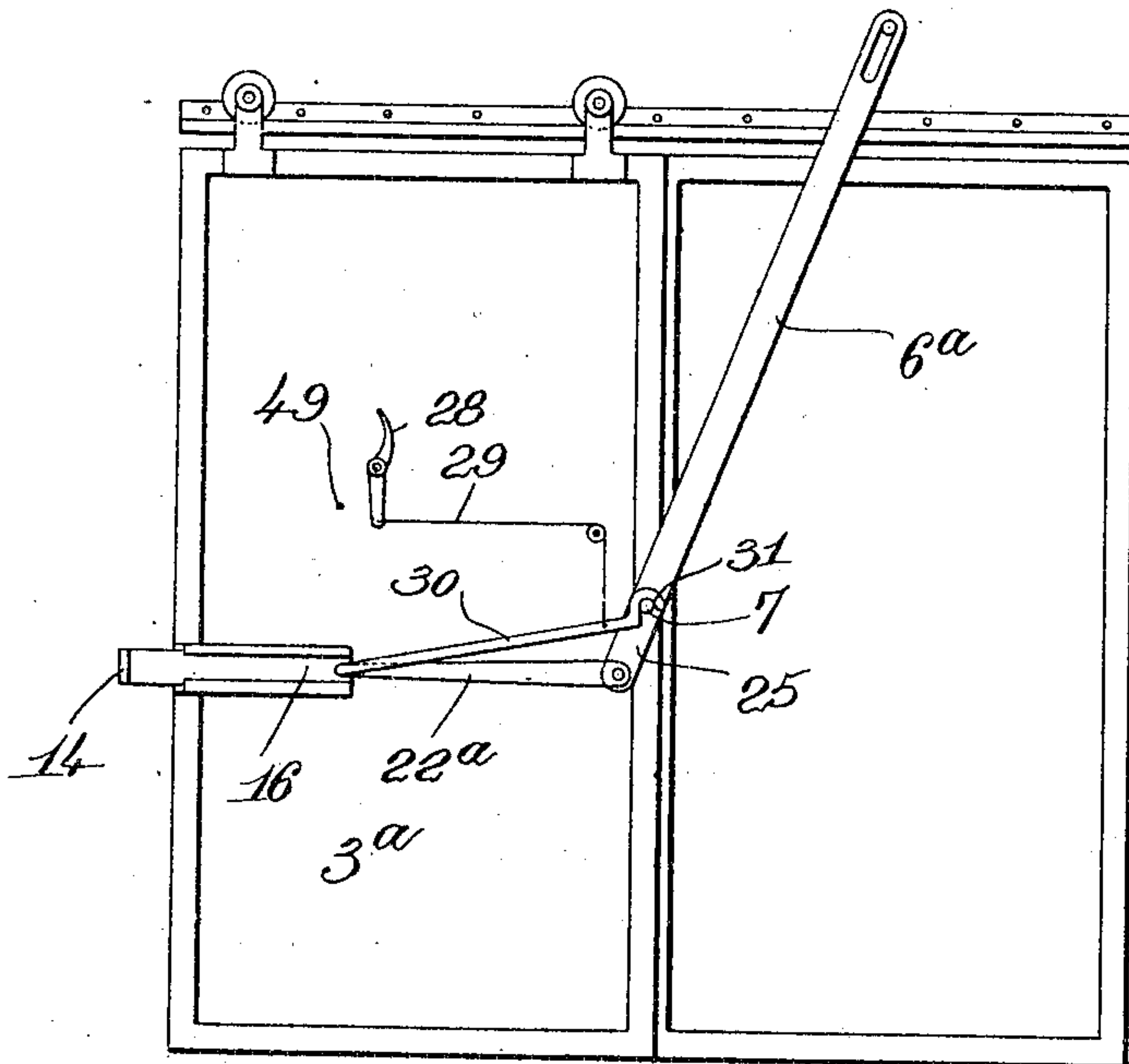
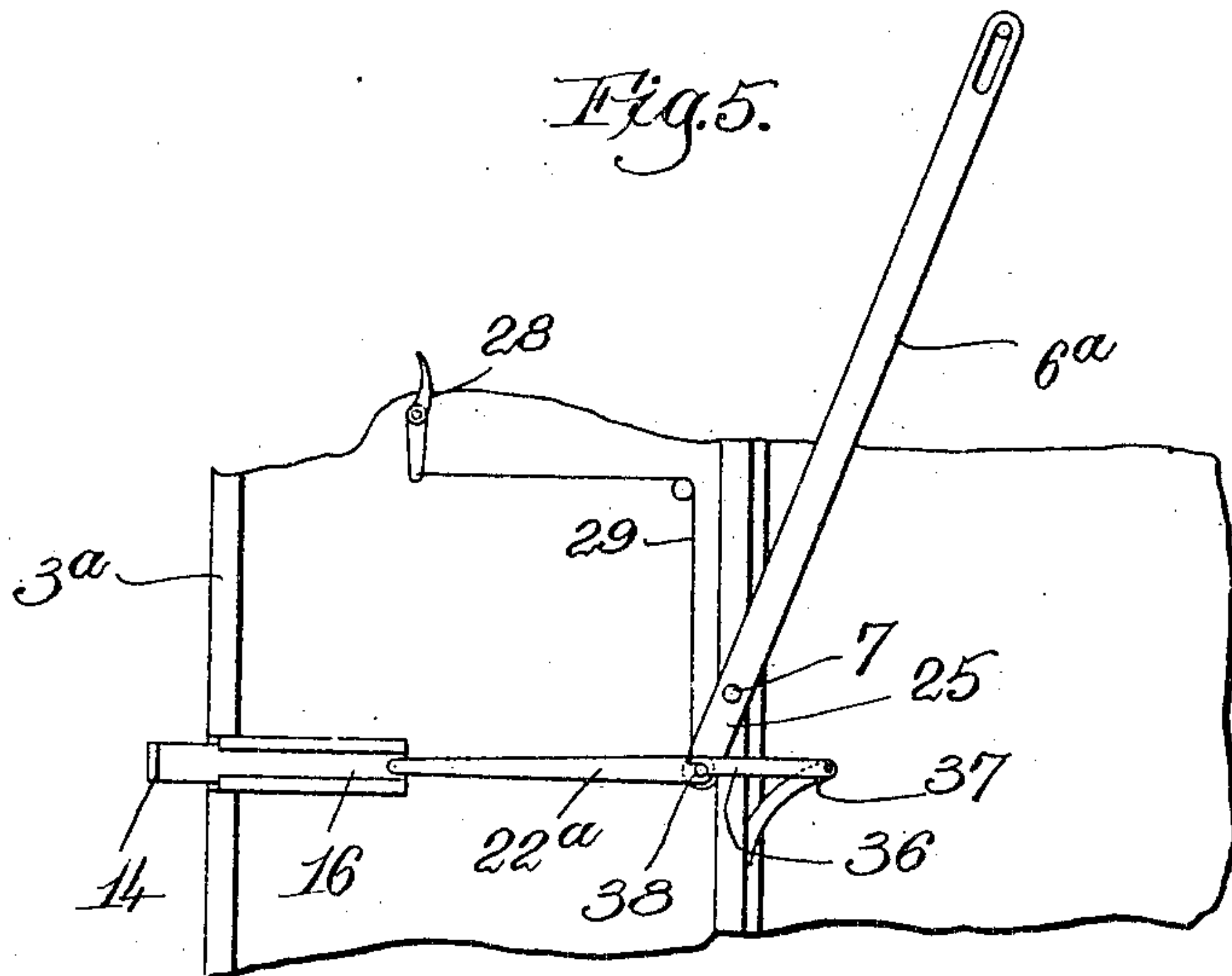


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM G. MILLER, OF CAMBRIDGE, MASSACHUSETTS.

SAFETY DEVICE FOR ELEVATORS.

No. 837,323.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed May 14, 1906. Serial No. 316,681.

To all whom it may concern:

Be it known that I, WILLIAM G. MILLER, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Safety Devices for Elevators, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to elevators, and has for its object to provide a novel safety device which will prevent the elevator operator from opening the door of the elevator-well except when the cage is properly positioned at the landing.

In my Patent No. 737,440, dated August 25, 1903, I have shown and described a safety device which comprises a projection extending inwardly from the door of the elevator-well and a cooperating projection extending outwardly from the cage, said two projections extending toward each other sufficiently so that they overlap and having such a disposition relative to each other that the projection on the elevator-cage is in the path of movement of that on the door except when the cage is properly positioned at the landing. With this arrangement it is impossible to open the door of the well except when the cage is stationary at the landing. In said patent the projection on the cage is shown at some point between the corners thereof, and the projection on the door is shown as situated near its inner edge. In some elevators it is necessary for various reasons to place the projection on the car or cage at one corner, and in such cases it is necessary to place the projection on the door at the free edge of the latter. Where this construction is necessary, the projection on the door, if it is rigidly secured to the door, is apt to project into the door-opening slightly when the door is opened, and thus form an obstruction which is liable to catch in the garments of persons entering the door.

According to my present invention I make the projection on the door capable of movement relative to the door and provide suitable means whereby said projection is withdrawn from its projecting position as the door is opened, whereby when the door is fully opened said projection is entirely out of the way of persons entering or leaving the elevator-cage.

In the drawings, Figure 1 is a side view of

an elevator-door well having my invention applied thereto. Fig. 2 is a top plan view of the door, said view showing the elevator-cage in horizontal section. Fig. 3 is a detail of the stops on the door and the elevator-cage. Figs. 4 and 5 show different ways in which the invention may be embodied.

In Figs. 1 and 2 I have shown my invention as applied to that type of door in which the door is made in two or more movable sections, and in Figs. 4 and 5 the invention is applied to the type of elevator wherein the door is made in one section.

Fig. 1 represents a view of that side of the door adjacent the elevator-cage, and in said figure, 3 and 4 designate the two door-sections, which are slidably mounted in any suitable way and which when opened overlies the portion 5 of the elevator-well.

The doors are shown as connected together to operate simultaneously, and while any suitable means for thus connecting the doors may be employed I have illustrated a construction which is now commonly used on elevators and which forms no part of my present invention.

6 designates a lever pivoted to the outer door-section, as at 7, and having a slot 8 in its upper end which is slidably mounted on a pin or projection 9, extending from the wall 10 of the elevator-well. This lever 6 is connected at substantially its central point with the door-section 4 by means of a link 11. With this construction it will be seen that when the door-section 3 is moved toward the right, Fig. 1, the door-section 4 will be moved thereby, but will move at one-half the speed of the door-section 3, and the two sections will finally move back and overlie the fixed portion 5, as shown best by dotted lines. This manner of operating the doors forms no part of my present invention.

The elevator-cage is designated generally by 12, and it has projecting outwardly therefrom a projection 13, which is adapted to cooperate with a projection 14 projecting from the door to prevent the door from being opened except when the elevator is at the proper position opposite the landing. The projections 13 and 14 extend toward each other sufficiently so that they overlap, as will be best seen in Fig. 2.

In the present form of my invention the projection 13 on the elevator-cage is in the form of a flange extending outwardly from said cage and provided with a notch or recess

15, which is so positioned that when the elevator is opposite the landing the notch stands in line with the projection 14. When the projection is thus in line with the notch, the door 3 can be opened, as will be obvious, but if the cage is above or below its proper position the door cannot be opened because the projection 14 will strike the flange 13, all as more fully described in my above-mentioned patent.

It will be noted that the projection 13 is so situated at the corner of the car that in order to overlap it the projection 14 extends beyond the free edge of the door 3. If said projection 14 were rigid with the door, it would project into the door-opening when the door was fully opened. To prevent this, I provide the projection 14 with a shank 16, which is movably mounted in a suitable guide 17, carried by the door 3, and which is connected to the door-operating mechanism in such a way that the projection 14 is moved to the right relative to the door, thus withdrawing from the door-opening as the door is opened.

Various ways of accomplishing this may be adopted without departing from the invention.

In Fig. 1 the lever 6 is shown as having secured thereto a curved arm or plate 18, provided with a slot 19, which is preferably eccentric to the center of motion 7.

20 designates a lever pivoted to the door and having at one end a projection 21, which enters the slot 19, the other end of said lever 20 being connected to the shank of the projection 14 by means of a suitable link 22. The shape of the slot 19 is such that as the door 3 is moved to the right, Fig. 1, the lever 20 is swung from its full to its dotted line position, thereby withdrawing the bolt or projection 14 from its projected position and removing it entirely from the door-opening.

Instead of providing the swinging lever 6 with the cam-slot 19 and having the intermediate lever 20 I may connect the bolt or projection 14 directly to the projecting end of the lever 6, as shown in Figs. 4 and 5. In this embodiment of my invention the swinging arm is designated by 6^a, and it is pivoted to the door 3^a, as at 7, and extends below the pivot-point a short distance as at 25. This projecting end 25 of the swinging arm 6^a is connected with the shank 16 of the projection by means of a suitable link 22^a. It will be obvious that with this construction whenever the door 3^a is moved to the right the bolt or projection 14^a will be simultaneously moved to the right relative to the door and thus withdrawn from its projecting position. Substantially the same construction is shown in Fig. 5.

In addition to the means above described for withdrawing the projecting bolt or projection on the door I have provided suitable means for locking the door. In Fig. 1, 27

designates a locking-latch which is pivoted to the shank 16 of the projection 14 and which is adapted to engage a projection 26, carried either by the door 3 or by the lever 20.

When the locking-latch is in engagement with the projection, the doors 3 and 4 are locked against movement, as will be obvious. In order to unlock the door to permit it to be opened, I have provided the handle 28, which is pivoted to the door and connected by a suitable connection 29 with the latch, so that when the operator turns the handle toward the right the latch will be released. This handle serves two purposes. It first serves as a means for releasing the latch and then as a means for giving movement to the door.

It is customary for the elevator operator to handle the controlling device for the elevator with his right hand and to open the doors with his left hand.

The handle 28 is preferably given the shape shown in the drawings, so as to make it more convenient for the operator to manipulate it with his left hand. When the elevator reaches the landing, the operator presses the handle 28 to the right, thereby releasing the locking latch 27. Continued pressure on said handle brings the lower end thereof against the stop 49, when said handle may be used to open the door. 49 designates a stop to limit.

In Fig. 4 the locking-latch is designated by 30, and it is shown as being pivoted to the link 22^a and as adapted to engage a projection 31, mounted either on the door 3^a or on the lever 6^a. 28 is the handle for releasing the latch and opening the door.

In Fig. 5 the locking-latch is designated by 36, and it is pivoted to a fixed support, as at 37, and is adapted to engage a projection 38 either on the link 22^a or on the lever 6^a. 28 designates the handle for releasing the latch, which handle is pivoted to the door and is connected to the latch by a suitable connection 29.

In all forms of the invention the handle 28 is used first to release the locking-latch and then to open the door.

If desired, a suitable spring attachment or its equivalent may be employed for automatically closing the door when it is fully opened.

In Fig. 1, 40 designates a spring, one end of which engages the end of the bolt 16 and the other end of which engages a projection or abutment 41, carried by the door 3. When the door is fully opened, this spring is compressed, as will be obvious, and the resiliency of the spring will obviously tend to close the door.

The main feature of my invention is making the projection on the door a movable one and providing suitable mechanism, so that as the door is opened the projection is withdrawn from its projecting position.

I have illustrated herein various ways in

which this could be accomplished; but my invention is not limited to the particular devices illustrated and described.

Another feature of my invention is the provision of a locking device for the door which coöperates with the movable projection on the door.

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

1. In an elevator, a door having a projection movably mounted thereon, an elevator-car having a coöperating projection extended therefrom, said projections having such relation to each other that the projection on the car stands in the path of movement of that on the door, except when the car is properly positioned at the landing, and means to give the projection on the door a movement relative to the door when the latter opens or closes.

2. In an elevator, a door provided with a projection extending from one edge thereof, an elevator-car having a coöperating projection, said projections being so disposed that the one on the car stands in the path of movement of the one on the door, except when the car is properly positioned at the landing, and means to move the projection on the door relative to the door as the door is opened.

3. In an elevator, a door having a projection movably mounted thereon, an elevator-car having a coöperating projection extended therefrom, said projections having such relation to each other that the projection on the car stands in the path of movement of that on the door, except when the car is properly positioned at the landing, and means operated by the opening movement of the door to give the projection thereon a movement relative thereto.

4. In an elevator, an elevator-car having a projection extending therefrom, a door leading to the elevator-car, said door also having a projection extending therefrom and situated beyond the edge of the door, said projections having such relation to each other that the one on the car stands in the path of movement of the one on the door, except when the car is positioned at the landing, and means operated by the opening movement of the door to move the projection on the door in a direction parallel to the movement of the latter.

5. In an elevator, the combination with a car having a projection, of a door, a sliding projection mounted on the door and coöperating with the projection on the car to prevent opening movement of the door except when the car is in a predetermined position, and a locking-latch also coöperating with said sliding projection to prevent the opening movement of the door except when said latch is released.

6. In an elevator, an elevator-car having a projection, a door having a coöperating projection, said projections being so disposed relative to each other that the one on the car stands in the path of movement of the one on the door, except when the car is in a predetermined position, means operated by the opening movement of the door to give the projection on the door a movement relative thereto, and a locking-latch coöperating with said means.

7. In an elevator, a door having a projection movably mounted thereon, an elevator-car having a coöperating projection extended therefrom, said projections having such relation to each other that the projection on the car stands in the path of movement of that on the door, except when the car is properly positioned at the landing, and means to give the projection on the door a movement relative to the door when the latter opens or closes, and a spring tending normally to close the door.

8. In an elevator, a door having a projection movably mounted thereon, an elevator-car having a coöperating projection extended therefrom, said projections having such relation to each other that the projection on the car stands in the path of movement of that on the door, except when the car is properly positioned at the landing, means to give the projection on the door a movement relative to the door when the latter opens or closes, and a spring acting against the projection on the door and tending normally to close the latter.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM G. MILLER.

Witnesses:

GEO. W. GREGORY,
BERTHA F. HEUSER.