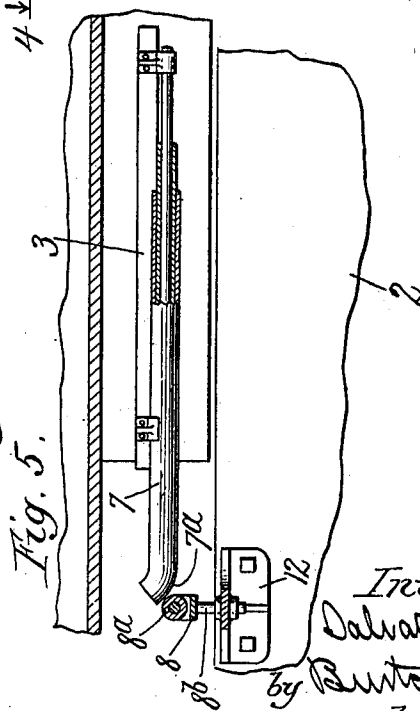
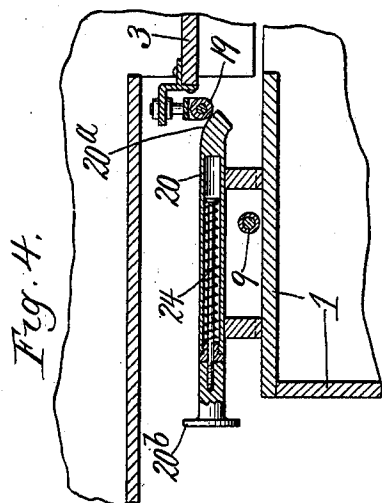
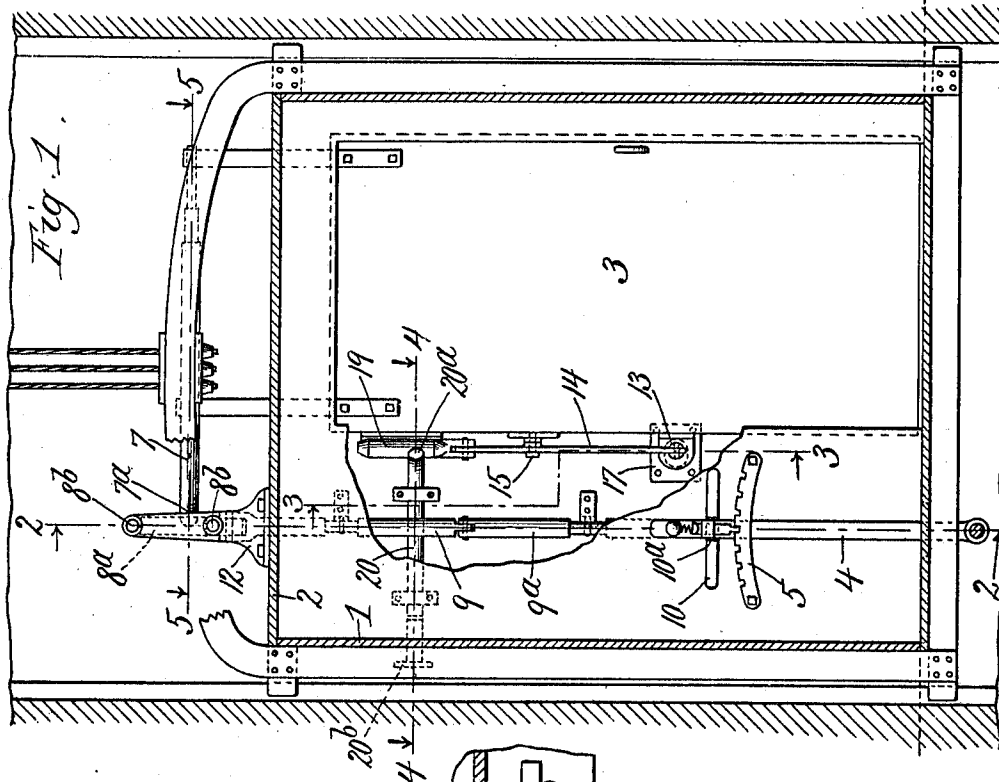


992,153.

2 SHEETS—SHEET 1.



Witnesses.
Edward T. Wray.
C. J. Christoffel

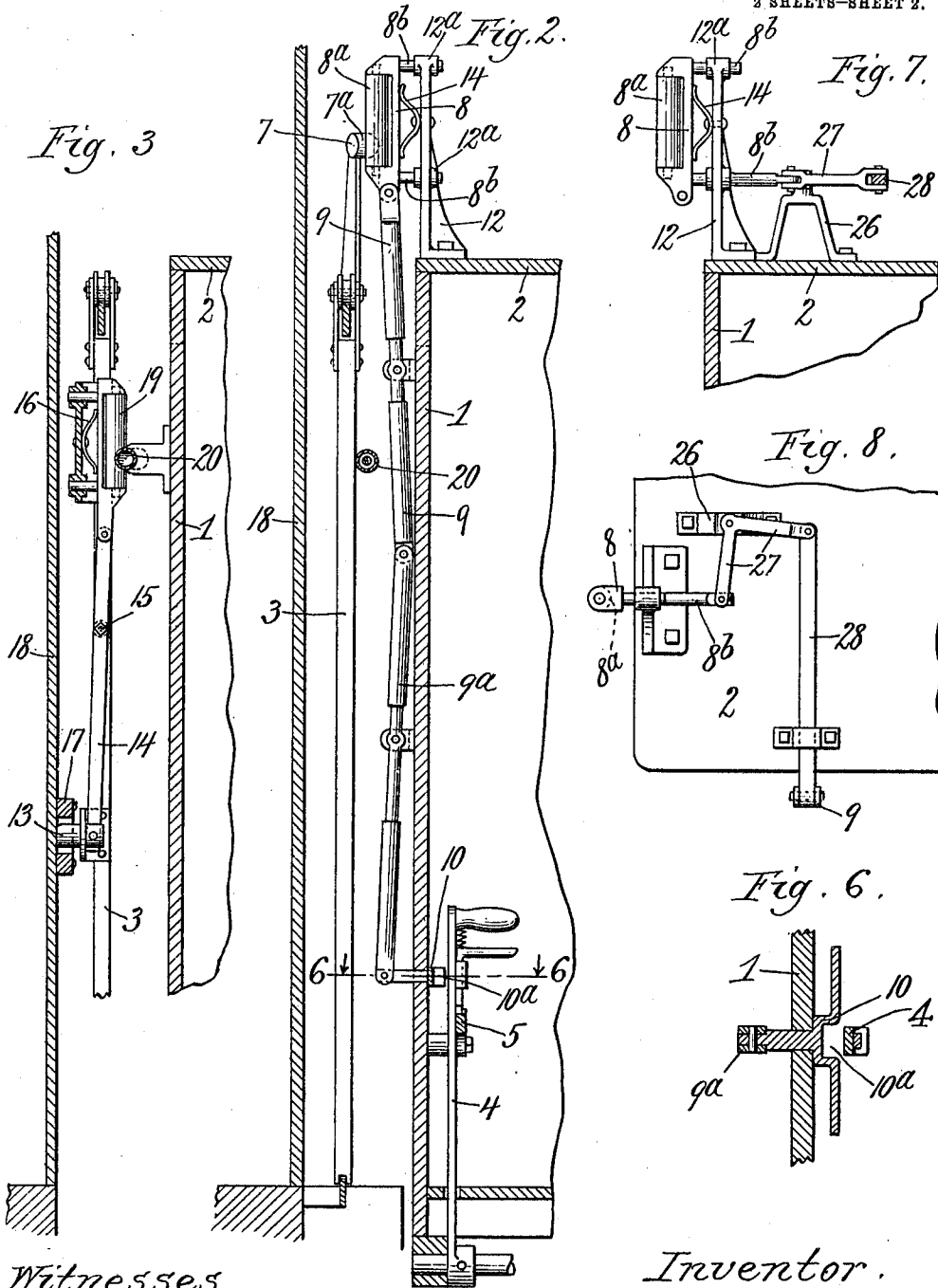
Inventor.
Salvatore Bisuglia
by Burton Burton
his Attys.

S. BISCEGLIA.
ELEVATOR CAR DOOR SAFETY DEVICE.
APPLICATION FILED MAY 9, 1910.

992,153.

Patented May 16, 1911.

2 SHEETS—SHEET 2.



Witnesses,
Edward T. Wray
C. J. Christoffel

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UNITED STATES PATENT OFFICE.

SALVATORE BISCEGLIA, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO LEE N. ELKAN, OF CHICAGO, ILLINOIS.

ELEVATOR-CAR-DOOR SAFETY DEVICE.

992,153.

Specification of Letters Patent.

Patented May 16, 1911.

Application filed May 9, 1910. Serial No. 560,331.

To all whom it may concern:

Be it known that I, SALVATORE BISCEGLIA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Elevator-Car-Door Safety Devices, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved apparatus adapted to prevent the opening of elevator car doors except when the car is within safe proximity to a floor, and also preventing the car from being started away from the floor except when the door is safely closed.

It consists in the elements and features of construction shown and described as indicated in the claims.

In the drawings: Figure 1 is a vertical section of an elevator car equipped with this device looking toward the side of the car in which the door is situated. Fig. 2 is a section at the line 2—2 on Fig. 1, upon a larger scale than said Fig. 1. Fig. 3 is a section at the line 3—3 on Fig. 1, upon the same scale as Fig. 2. Fig. 4 is a section at the line 4—4 on Fig. 1. Fig. 5 is a section at the line 5—5 on Fig. 1. Fig. 6 is a section at the line 6—6 on Fig. 2. Fig. 7 is a side elevation of a device for transmitting the lever-locking movement when the operating lever is at a different side of the car from that at which the door is situated. Fig. 8 is a plan view of the parts shown in Fig. 7.

In the drawings, 1, represents the wall of the car, 2, the ceiling; 3, one of the doors of the elevator shaft of which one is provided at each floor or landing, 4, the controlling lever, 5, the segment past which the controlling lever swings and at the middle notch of which it is engaged for holding the car at the position of rest. The expedient for preventing the car from being started away from the position of rest except when the door is safely closed, or nearly so, consists in the provision of a device for engaging the controlling lever, 4, to lock it at its neutral position, that is the position of rest, by the first and very short movement of the door in opening, and holding it so locked throughout the remainder of the opening movement of the door and until the same is closed past the point of safety. The de-

vices for this purpose comprise a cam bar, 7, which is mounted on the top of the door, having a cam terminal, 7^a, which at closed position, stands close to an abutment, which is preferably a roll, 8^a, a few inches in length, journaled in a carrier, 8, mounted upon the top of the car with capacity for short movement toward and from the plane of the door and connected to the upper end of a lever, 9, which by means of a second lever, 9^a, (both levers being fulcrumed upon the center side of the car,) operates a guard, 10, mounted in the side of the car, having a recess or notch, 10^a, positioned for engaging the controlling lever, 4, when said guard is thrust inward, the inward thrust being caused by the encounter of the said cam end, 7^a, of the bar, 7, with the abutment, 8^a. The parts may be proportioned and positioned so that upon such encounter sufficient travel of the cam end on to the abutment, to move the guard then into lever locking position shall occur in the first two or three inches of opening movement of the door. Such encounter having occurred, the cam bar, 7, which beyond said cam end is parallel with the plane of the door and its path of movement, remains bearing against said abutment roll, 8^a, and so holds the operating lever locked until the door is returned past the nearly closed position at which the lever-locking encounter of the cam end of the abutment occurs.

For adapting the device to be applied to elevator cars of different heights, having doors of different widths, involving a different amount of movement in opening and closing, the bar, 7, is preferably made of two telescoping members, as seen in Fig. 5, and the levers, 9, and 9^a, are similarly made of telescoping members, as seen in Fig. 2. For positioning and guiding the carrier, 8, and the abutment, 8^a, thereon, accurately for the proper encounter therewith of the cam end, 7^a, of the bar, 7, there is mounted at the top of the elevator car a bracket, 12, having guide bearings, 12^a, into which studs, 8^b, which project from the side of the carrier, 8, above and below the abutment roll, 8^a, extend and are thrust by the movement which is communicated to said abutment by encounter of the cam end, 7^a, therewith, a spring, 14, being interposed between the bracket, 12, and the lever, 8, which operates to hold the abutment, 8^a, outward into the

path of the cam end, 7^a, of the bar, 7, and to thrust it out after it has been pushed back by said cam end, and thereby withdraw the guard, 10, away from lever locking position.

5 When the controlling lever, 4, is at the side of the car instead of the front, that is upon the side of the car at right angles to that at which the door is located, there may be mounted at the top of the car, on a standard,

10 26, a bell crank lever, 27, one arm of which may be engaged by an elongated guide stud, 8^b, which is in that case provided for extending through the lower bearing in the bracket 12, the other arm of the bell crank lever

15 being connected by a thrust bar, 28, with the upper end of the lever, 9, which in that case is positioned on the side of the car at right angles from that at which the door is located.

20 For the purpose of preventing the elevator car door from being opened except when the car is at or in safe proximity to a floor, there is provided a bolt, 13, carried upon the lever, 14, fulcrumed at 15, upon the

25 edge of the car door, and provided with a spring, 16, tending to throw the bolt into a housing, 17, mounted on an upright, 18, of the elevator shaft. The lever, 14, carries an abutment preferably in the form of a some-

30 what elongated roll, 19, which is positioned for encounter with the cam end, 20^a, of a bar, 20, mounted upon the outer side of the elevator cage, when the car is at a floor or within a short distance therefrom, deter-

35 mined by half the length of the abutment, 19. If for example it is desired to prevent the car door from being opened when the car is more than 3 inches away from the floor, the abutment roll, 19, being 6 inches

40 long and positioned so that the cam end, 20^a, of the bar, 20, will strike at the middle of the length of the roll when the car is exactly at the floor, a travel of the car more than 3 inches away from the floor in either direc-

45 tion will carry the bar, 20, above or below the abutment roll so that it will not encounter the bar upon movement of the door for opening. The aperture 17^a in the hous-

50 ing, 17, for the bolt, 13, is horizontally elongated enough to permit the amount of movement of the door necessary for the abutment, 19, to ride onto the cam end, 20^a, of the bar, 20, for which purpose a very short movement not exceeding 2 inches is suffi-

55 cient; and the cam end, 20^a, of the bar, 20, is sufficiently abrupt to cause the bolt, 13, to be withdrawn from the housing during opening movement of the door not greater than the elongation of said aperture. From

60 this construction it will be seen that if the car has traveled up or down past the floor far enough to take the bar, 20, out of the path of the abutment roll, 19, the movement of the door for opening to the distance to

65 which it can move, that is the length of the

aperture, 17^a, in excess of the diameter of the bolt is not sufficient for opening it, and the bolt will prevent further opening movement to lock by its said bolt.

It will be observed that the means for 70 locking the controlling lever at neutral position when the door is opened, coöperates with the means for preventing the door from being opened, except at or near a floor; in that, since the only condition under which 75 the controlling lever can be moved from neutral position, is that the door is closed, and the only condition under which the door can be opened, is that it is at or safely near a floor, it follows that the door can not be 80 opened while the elevator is moving between floors and that the elevator can not move from floor to floor while the door is open. When the controlling lever is provided with the customary guard shown at 5, in front of 85 said lever, preventing it from being swung outward or forced away from the car wall, the extension of the guard, 10, back of the entire path of swing of the controlling lever and close thereto, yields another result, 90 namely, that the door can not be opened even while the car without being stopped is moving past the floor; because however quickly the sliding movement of the door might be attempted to be made, so as to be 95 effected while the car is passing the floor and the abutment roll, 19, is in position to encounter the cam end, 20^a, for unlocking the door, such opening movement could not be 100 made because the cam end, 7^a, of the bar, 7, encountering the abutment, 8^a, would effectually lock the door against further opening because said abutment, 8^a, would be pre- 105 vented from allowing the encounter of the cam by the guard, 10, which would be stopped against the controlling lever because of the latter not being at neutral position. The two devices therefore while each per- 110 forming these specific functions, for which they are primarily designed, coöperate with each other to prevent any but safe opening of the door. 115

The bar, 20, is preferably provided with a stop, 20^b, at its outer end, to check the open- 115 ing movement of the door at proper position; and since it may often happen that the dimension of the elevator cage in the direction to which the door slides is less than 120 twice the full opening movement of the door so that in opening fully the door must slide beyond and protrude at one side past the shaft, the bar, 20, is preferably not only tele- 125 scoped, but constructed so that it may be extended in such opening movement of the door while still affording the stop to limit 130 said opening movement; this being effected as seen in Fig. 4, by connecting the two telescoping members by a coiled spring, 24, coiled within one and around the other of said members, the inner member being the

one which carries the stop, 20^b, so that the door in encountering the stop will extend the bar as far as the door should slide, but can not escape, the stop being returned to a point within the dimension of the shaft by the reaction of the spring when the door is closed.

I claim:

1. An elevator car door safety device comprising in combination with a power controlling lever on the car, a device for locking such lever at neutral position, means mounted on the car door for actuating the lever-locking device by the initial opening movement of the door, such means being positioned and extended for encounter for such actuation only when the car is at a predetermined distance from the floor; cooperating means carried by the door and the elevator shaft for locking the door at closed position adapted to permit a slight initial opening movement of the door without unlocking and means carried by the car positioned for encounter with the door-carried door locking means in such short initial opening movement of the door, the said door-carried means being extended vertically for such encounter a distance corresponding to the predetermined distance from a floor within which the power-controlling lever may be moved from neutral position.

2. An elevator car door safety appliance comprising in combination with the shaft and door provided with cooperating devices for locking the door at closed position adapted to permit slight initial opening movement without unlocking, a member carried by the car positioned and extended for encounter with the door-carried member of the door-locking means for releasing the same when the car is within a predetermined distance from a floor.

3. A structure for the purpose indicated comprising in combination the elevator shaft and car door, door locking means comprising cooperating members on the door and shaft respectively, and means on the door consisting of a lever which carries an abutment, and a cam bar mounted on the car positioned for encounter with the abutment by a short initial opening movement of the door while the car is opposite the latter, said cam bar being adapted upon such encounter during such short initial opening movement

of the door to disengage the door locking device.

4. A structure for the purpose indicated comprising in combination the elevator shaft and car door, door locking means comprising cooperating members on the door and shaft respectively, and means on the door consisting of a lever which carries an abutment and a cam-bar mounted on the car positioned for encounter with the abutment by a short initial opening movement of the door while the car is opposite the latter; said cam bar being adapted upon such encounter during such short initial opening movement of the door to disengage the door locking device, and a spring for holding the said locking devices normally engaged.

5. In a structure for the purpose indicated, in combination with the shaft, the car, the car door, a lever fulcrumed on the edge of the door; a bolt carried by one end of the lever; a housing for the bolt mounted on the shaft having the bolt engaging aperture horizontally elongated to permit short opening movement of the door while the bolt is engaged; a spring operating to hold the bolt in the housing; an abutment on the end of the lever opposite that at which the bolt is mounted, and a cam carried by the car mounted thereon in position to be in the path of the abutment; said abutment being elongated vertically for collision with the cam when the car is within a predetermined distance either way from a floor.

6. In combination with a car, car door, elevator shaft and a power controlling lever mounted in the car, means on the car door and car cooperating for locking the controlling lever in neutral position upon the opening of the car door, means on the door and shaft cooperating for locking the car door with a short range of movement from closed position, and means on the car positioned for encounter of the door locking element on the door in the said short range of opening movement when the car is at or within a predetermined distance of the floor.

In witness whereof, I have hereunto set my hand in the presence of two witnesses, at Chicago, Illinois, this 5th day of May, 1910.

SALVATORE BISCEGLIA.

Witnesses:

CHAS. S. BURTON,

C. J. CHRISTOFFEL.