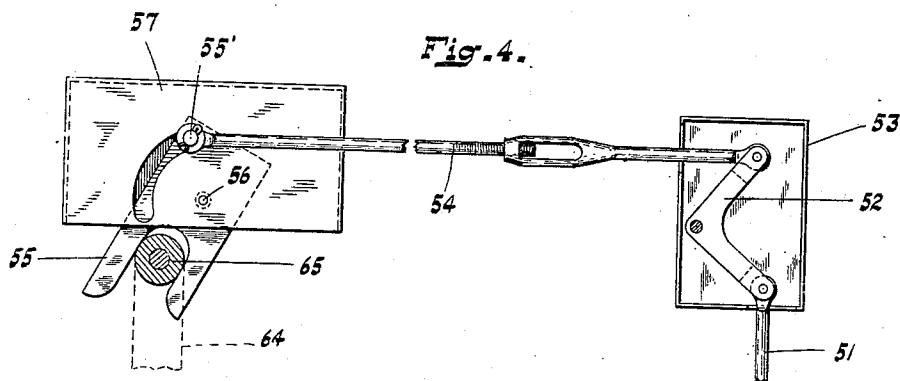
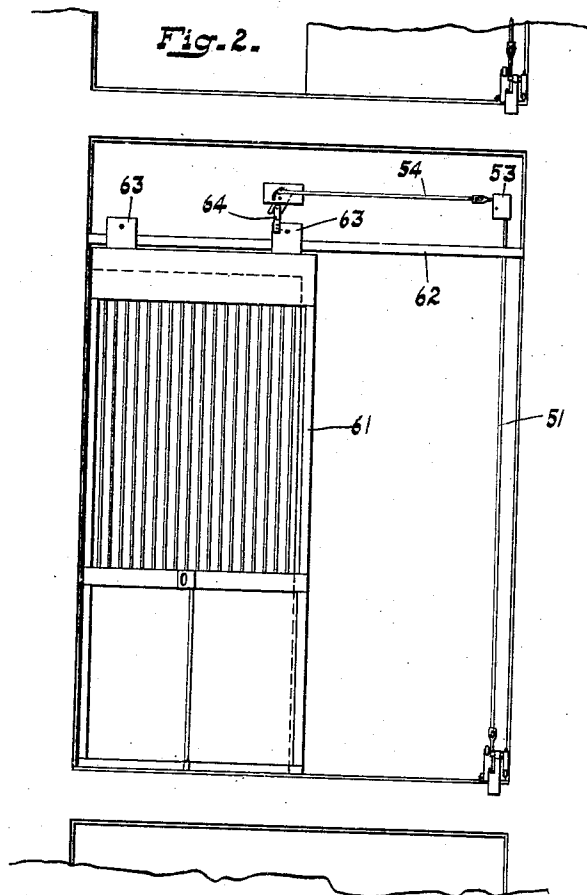
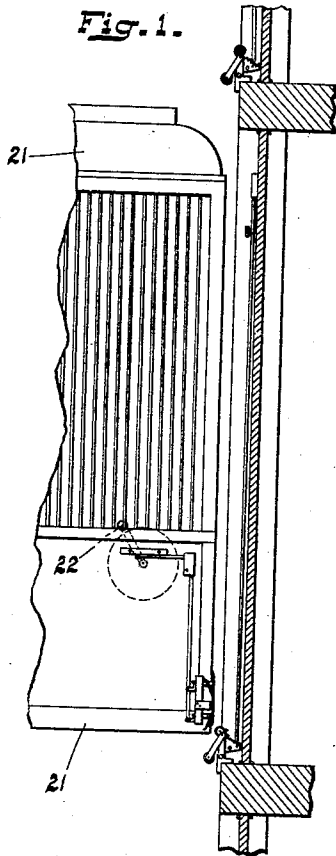


H. W. McNAUGHT.
ELEVATOR SAFETY DEVICE.
APPLICATION FILED JAN. 17, 1910.

969,296.

Patented Sept. 6, 1910.

3 SHEETS—SHEET 1.



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Fig. 3.

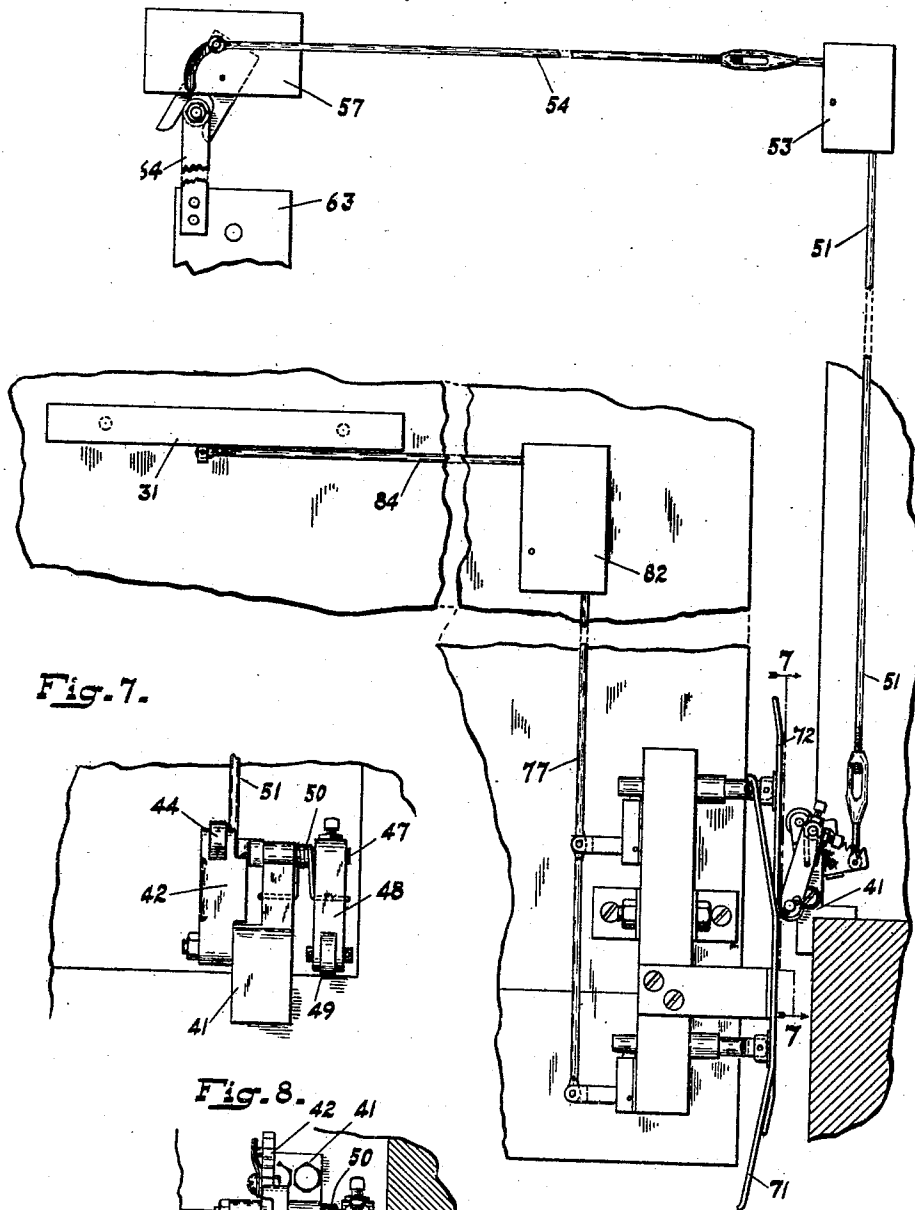


Fig. 7.

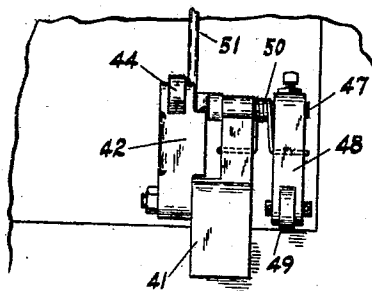
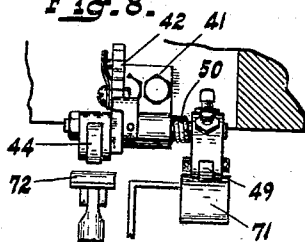


Fig. 8.



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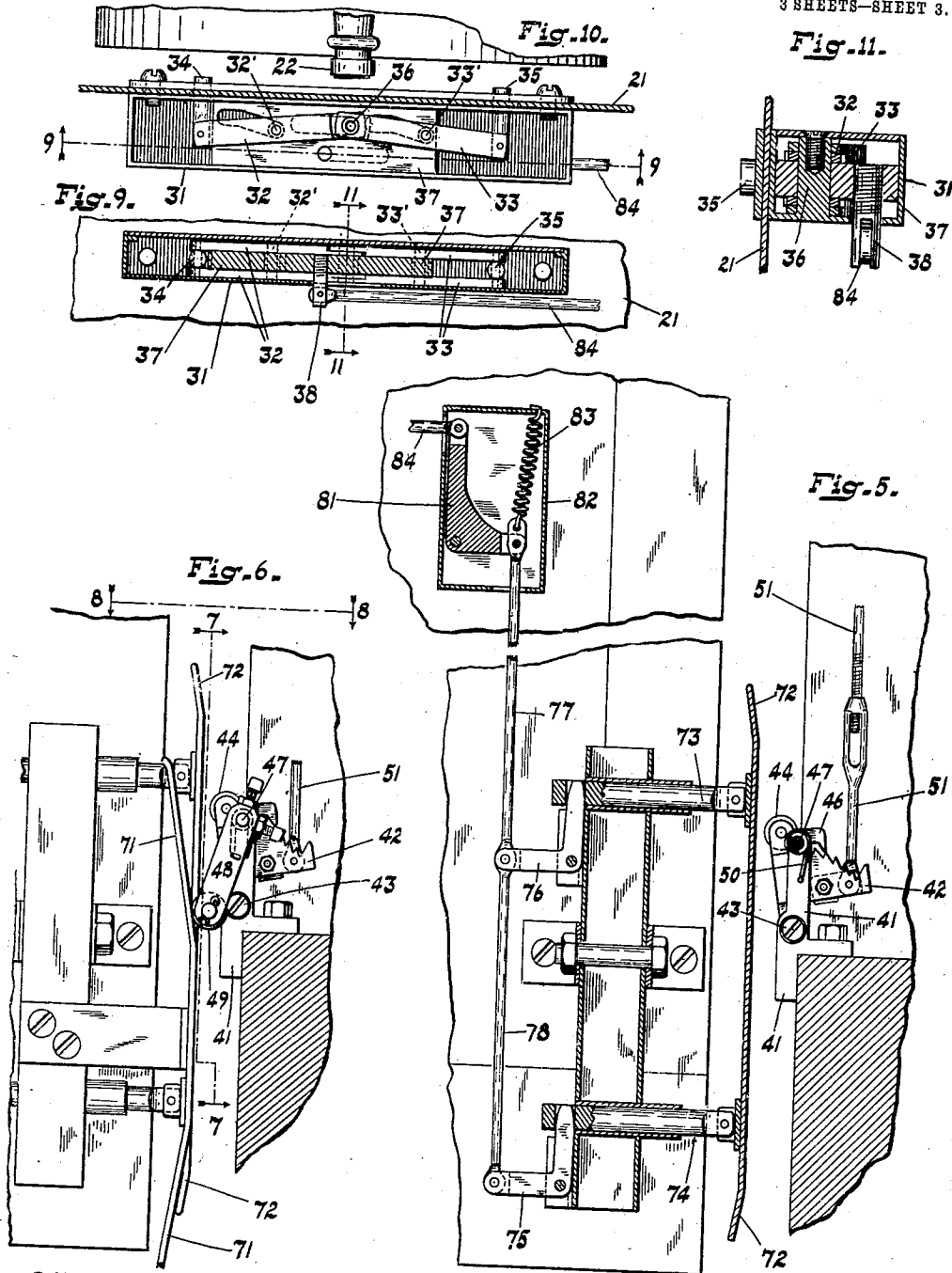
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HARRY W. McNAUGHT, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO ELEVATOR SAFETY EQUIPMENT COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

ELEVATOR SAFETY DEVICE.

969,296.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed January 17, 1910. Serial No. 538,387.

To all whom it may concern:

Be it known that I, HARRY W. McNAUGHT, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a certain new and useful Elevator Safety Device, of which the following is a specification.

The object of my present invention is to produce an apparatus by means of which the gates of an elevator shall be prevented from being opened except when the elevator car is at the level of a floor, and also by which so long as the door is open the elevator car shall be prevented from being operated to ascend or descend.

The apparatus in question will be first fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a view of a fragment of an elevator car together with a fragmentary section of the adjacent portion of the building, illustrating the arrangement of my improved apparatus when used therewith; Fig. 2 an elevation of an elevator gate as seen from the interior of the elevator shaft, together with fragments of adjacent portions of the building; Fig. 3 a view, on an enlarged scale in part like Fig. 2, but including also fragments of the elevator car carrying the mechanism relating to my invention; Fig. 4 a detail view on a still further enlarged scale of the mechanism above the door of the elevator; Fig. 5 a detail view of the mechanism at the bottom of an elevator-door opening and the mechanism on the elevator car adapted to operate in connection therewith, some portions being broken away and other portions being shown in section to illustrate the construction more clearly; Fig. 6 a side elevation of the two strikes at the lower corner of the elevator car, and of the locking levers at a door opening; Fig. 7 a detail elevation as seen when looking in the direction indicated by the arrows from the broken line 7 7 in Figs. 3 and 6; Fig. 8 a top or plan view as seen

when looking downwardly from the broken line 8 8 above Fig. 6; Fig. 9 a sectional elevation of the mechanism within the elevator car which operates in connection with the ordinary elevator control lever; as seen when looking in the direction indicated by the arrows from the broken line 9 9 in Fig. 10; Fig. 10 a plan view of the parts shown in Fig. 9 with the cover of the casing which contains the mechanism removed so as to show the working parts, and Fig. 11 a transverse sectional view on an enlarged scale at the point indicated by the broken line 11 11 in Fig. 9.

The elevator car 21 is or may be of any ordinary construction and arrangement, and is designed to be placed in an elevator shaft, where it is caused to ascend and descend by any ordinary or desired means. Within said elevator car, convenient to the hand of the operator, is the ordinary control lever 22 by means of which the driving mechanism of the elevator is caused to operate, and which is designed to be shifted from time to time, according to the service desired, to "ascending", "descending" and "neutral" positions, respectively. As the parts so far mentioned are or may be of any ordinary or desired form or character, and form no part of my present invention, they will not be further described herein, except incidentally in describing the said invention.

Within the car, secured to its wall, just behind the control lever 22, is a casing 31 containing two levers 32 and 33 carrying movable detents or pins 34 and 35, one on either side of the control lever 22, and which are adapted to be projected into the path of said control lever and thus prevent the latter from moving beyond them when so projected; but which, when withdrawn, are out of the path of the control lever so that it is permitted to move freely in the ordinary manner. These levers 32 and 33 are pivotally mounted on a stud 36 in casing 31, and have pins 32' and 33' passing through cam slots in a sliding block 37. Said block 37 is arranged to be moved back and forth in casing 31, and thus to project

and withdraw detents 34 and 35. The means for moving the block 37 consists of a pin 38 extending down through the bottom of the casing to which the other mechanism 5 is connected as will be presently described.

Secured to the frame of the building within the elevator well, and near each floor level, is a locking and releasing device controlled in part by the operation of the doors 10 to the elevator wells, at the several floors respectively. This device embodies a frame portion 41 and a notched sector 42 attached thereto by pivot bolt 43, said sector having at its upper end a contact point 44, which 15 is preferably in the form of an anti-friction roller, and which is adapted to engage with a strike (presently to be described) on the elevator car, as said elevator car passes up and down. The sector 42 constitutes also a bell-crank lever, the contact 20 point 44 being one extremity thereof and a pull rod 51 being attached to the other extremity, as will be presently described. When the combined bell-crank lever and 25 notched sector 42 is held upwardly by the pull rod 51, the contact point 44 projects into the path of a yieldingly-mounted strike on the elevator car. Said part 42 is, however, adapted to be held out of contact with 30 said strike, and the parts controlled thereby thus held from operation, by means of a pawl 46 carried by rock-shaft 47. Said rock shaft is adapted to be operated by a swinging arm 48 having a contact point 49 arranged to come in contact with a second 35 rigidly-mounted strike carried by the elevator car, as will be presently described. Contact point 49, like contact point 44, is preferably in the form of an anti-friction 40 roller.

Pull rod 51 runs upwardly to a bell-crank lever 52, preferably contained within a casing 53, at a point just above the level of the top of the elevator door. Another pull rod 45 54 attached to the other arm of bell-crank lever 52 runs at right angles with pull rod 51, and is attached at the other end to a forked member 55 pivoted at 56 in a box-like casing 57. The connection between pull 50 rod 54 and member 55 is by means of a stud 55' extending out through an arc-shaped slot in one side of casing 57, concentric with pivot 56.

The doors 61 to the elevator are mounted 55 to move back and forth in any ordinary and well known manner. In the drawing such a door is shown as hung on a track 62 by means of hangers 63. Extending up from the top of the door is an arm 64 (preferably bifurcated at its upper end) carrying an anti-friction roller 65 which engages 60 with the forked end of member 55. As

will be readily seen, therefore, the moving of the door back and forth will swing member 55 on its pivot 56, and, through pull 65 rod 54 bell-crank lever 52 and pull rod 51, will move the combined bell-crank-lever and notched sector 42 on pivot 43, except that the movement of pull rod 51 cannot be upward when pawl 46 is in engagement with 70 the teeth of said part 42, as it is then locked against movement in that direction, as already explained.

Secured to the lower portion of the elevator cage are two strikes, one of which, 75 71, is rigidly mounted, and the other of which, 72, is yieldingly mounted on reciprocating rods 73 and 74, as is best shown in Fig. 5. These rods 73 and 74 are connected at their inner ends by means of bell-crank 80 levers 75 and 76 with a pull rod 77, the two bell-crank levers being connected together by a link 78 by means of which they are caused to operate together, and by means of which, also, the strike 72 is 85 caused to move substantially uniformly as a whole when the corresponding part comes in contact with it at one end, instead of one end swinging ahead of the other, as would otherwise be the case. That is, the strike 90 72 and the link 78 maintain a substantially parallel relation at all times.

At its upper end rod 77 is connected to a bell-crank lever 81 mounted preferably in an inclosing casing 82, and normally held 95 upwardly by a spring 83. From the other arm of the bell-crank lever 81 a rod 84 runs to and connects with the stud 38. The operation is, therefore, when the strike 72 is pressed inward by the piece with which it 100 comes in contact, that the block 37 is moved longitudinally of casing 31, operating levers 32 and 33, and, through said levers projecting detents 34 and 35 out into the path of control lever 22, thus limiting the movement 105 of said control lever to the distance between the said two detents. This distance being shorter than the effective movement of the control lever, the lever is thereby held to neutral position, and the throwing of it to 110 a position which will cause the elevator car to move is thereby rendered impossible so long as the strike 72 is held in to its inner position, which it always is so long as the elevator door remains open. When the door 115 to the door-opening opposite which the elevator car is at the time is closed, the contact piece which holds the strike 72 inwardly is released, and the action of spring 83 will restore the parts to their normal position, 120 withdrawing the detents 34 and 35 from the path of the control lever 22, thus enabling the operator to manipulate said lever and run the car in the ordinary manner. The

movement in question cannot, however, be given to these parts so long as the elevator door remains open, because, in such case, the bell-crank lever and sector 42 have been swung upwardly and inwardly by the action of forked member 55 operating through the pull rods and bell-crank levers as described. It should be here remarked that the lower end of the segment shaped slot in casing 57 is below the center of pivot 56, so that the parts when they reach the position in question are securely locked against the effect of any direct pull. The shutting of the door, however, of course operates through forked member 55 to throw the member 42 to the position which permits the disengagement of contact point 44 with strike 72, and the consequent withdrawal of detents 34 and 35 by the pull of spring 83.

The features so far described, constitute the means by which it is rendered impossible for the elevator car to be operated to ascend or descend so long as the elevator door is open. The same means, in conjunction with strike 71, constitute the means by which the opening of the door is rendered impossible except when the elevator car is at a floor level.

As heretofore described lever arm 48 on rock shaft 47 carries a pawl 46 which is adapted to engage with the teeth on sector 42, and which is for this purpose a ratchet. A spring 50 operates to hold the pawl into engagement with the ratchet except when forcibly disengaged. The spring 50 is shown as coiled about the rock shaft 47, and having one arm attached to frame 41 and the other to lever arm 48, so that the pawl is held thereby into engagement with the ratchet. When, however, strike 71 on the elevator car comes against contact point 49 on arm 48, the force of the spring is overcome, rock shaft 47 is rocked in its bearings, and pawl 46 is raised out of engagement with the ratchet-faced sector 42, leaving the same free to swing on its pivot as may be desired. It is then, and only then, that the operator, by applying force to the door 61 can move it to the open position, as at all other times sector 42 being locked against movement, pull rod 51 and the parts attached thereto are prevented from upward movement. As the strike 71 only comes in contact with contact point 49 at the time when the elevator car is at a floor level, the result is that the door cannot possibly be opened when the elevator car is in any other position.

It will therefore be seen my apparatus constitutes a complete safety attachment for elevators, insuring both that the doors shall remain closed and locked at all times except

when the elevator car is at the floor level, and that the elevator car shall remain at the floor level, without possibility of being caused to ascend or descend, until the door to the elevator opening on the floor in question is closed.

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

1. The combination with an elevator car, the shaft within which said car operates having door openings at the respective floors of the building which the car passes and doors to said door openings, of two strikes on said elevator car, one fixed and the other yielding, a device secured to the building within the elevator shaft near each floor past which the strikes on the elevator car will travel as it ascends and descends, one member of said device having connections extending to alongside the path of the elevator door in opening and closing, said connections, an arm on the elevator door adapted to engage with said connections as the door is opened and closed and thus pull upon a member of the first mentioned device, a locking member in said first mentioned device adapted in the absence of operating means to lock said device against the movement which results when the door is opened, an arm controlling said locking device which extends into the path of one of the strikes on the elevator car, the first named member having a contact point which extends into the path of the yieldable strike extending to the vicinity of the control lever in the elevator car, said control lever, and movable detents arranged alongside of said control lever and adapted to be projected into and withdrawn from the path of said control lever.

2. The combination, with an elevator car, the controller in said car, the shaft within which the car operates, and the doors to said elevator shaft, of a strike yieldingly mounted on the car, a lock projectable into the path of movement of the car controller to limit the movement thereof, connections between said lock and said strike, a lever mounted adjacent the shaft doorway and adapted to engage said strike to move the same, intermediate connections between the door of said doorway and said lever whereby movement of the door from and to its closed position will move said lever, a lock movably engaging said lever to restrain the movement of the lever and thereby restrain the opening movement of the door, an operating member for said lock projected into the shaft, and a strike carried by the car in position to engage said operating lever and retract the lock only when the first mentioned

strike is in position to be actuated by the lever.

3. In a safety attachment for elevators, a locking device comprising a frame, a pivoted
5 ratchet-faced sector, a rock-shaft mounted adjacent to said sector carrying a pawl which engages with said ratchet-face at one end and an arm at the other end, a spring
10 adapted to normally hold the pawl into engagement with the ratchet-faced sector, connections operated by the elevator door arranged to move said sector-shaped rack when

the pawl is disengaged, and means carried by the elevator car for disengaging said pawl.

In witness whereof, I, have hereunto set
my hand and seal at Indianapolis, Indiana,
this twenty-ninth day of December, A. D.
one thousand nine hundred and nine. 15

HARRY W. McNAUGHT. [L. s.]

Witnesses:

CHESTER BRADFORD,
THOMAS W. McMEANS.