

J. N. McCUE.

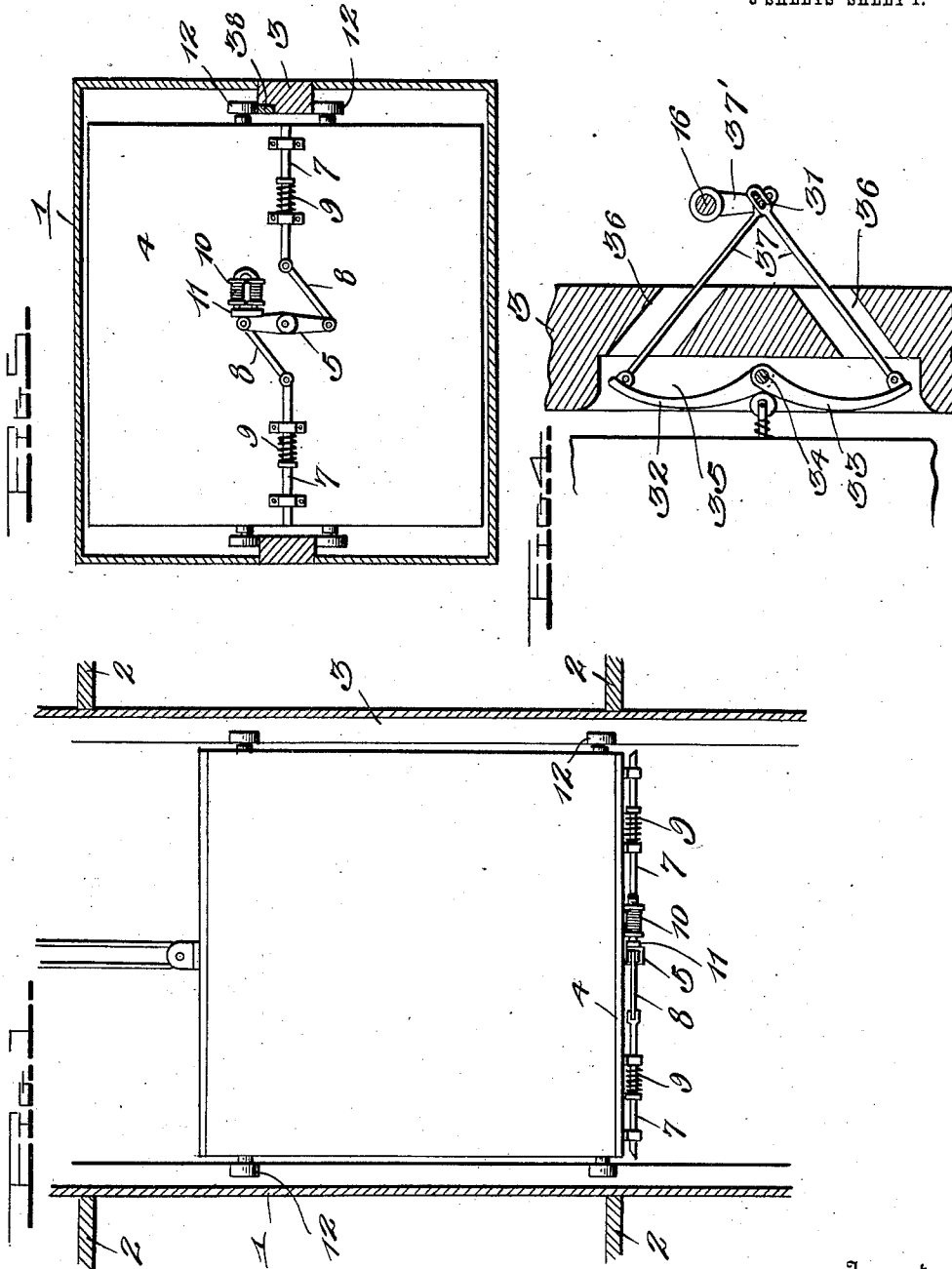
ELEVATOR.

APPLICATION FILED JULY 24, 1912.

1,065,956.

Patented July 1, 1913.

3 SHEETS—SHEET 1.



Inventor

J. N. McCue,

Witnesses

Chas. L. Griesbauer, Jr.
A. B. Norton.

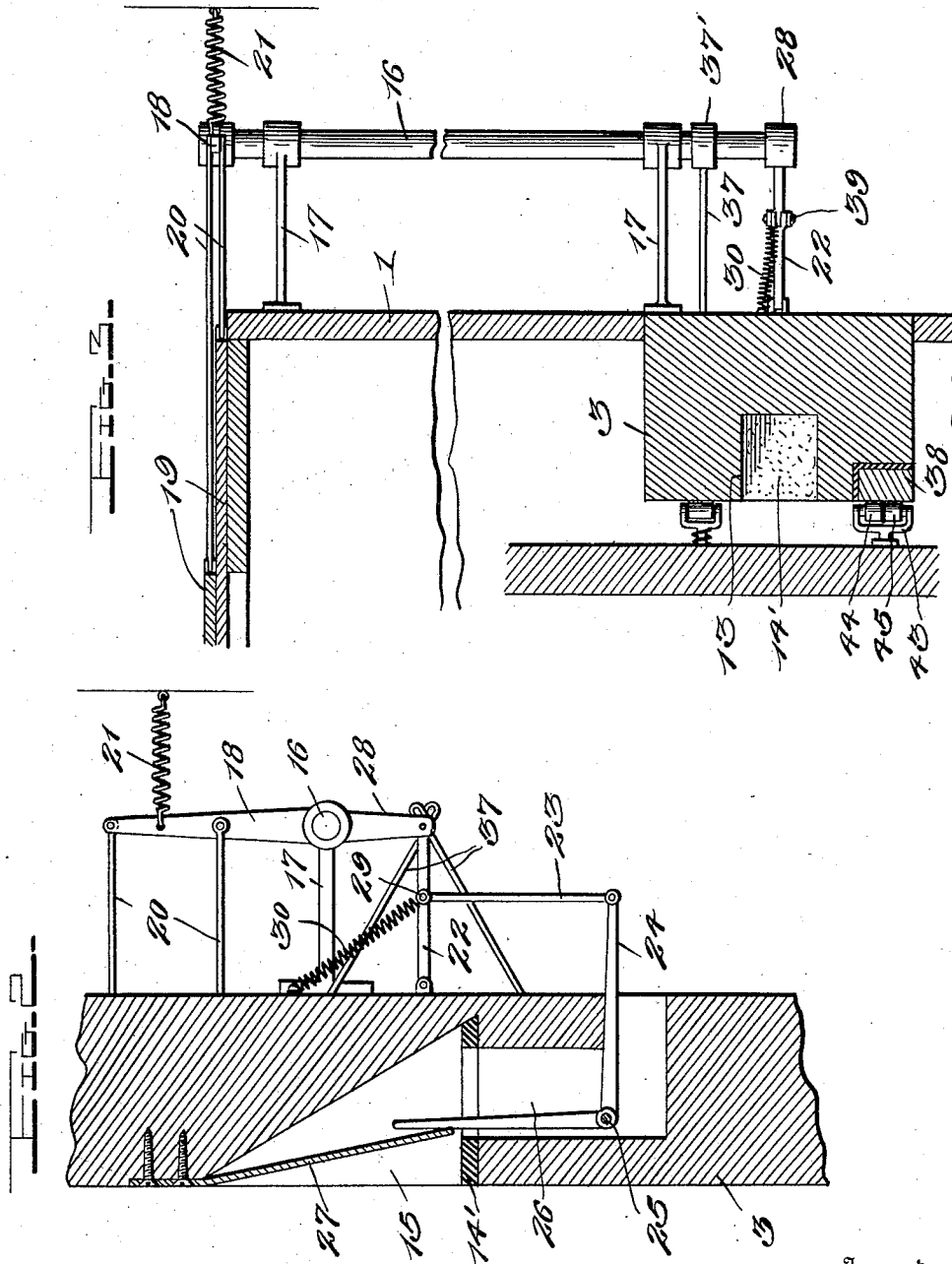
Watson E. Coleman,
Attorney

J. N. McCUE.
ELEVATOR.
APPLICATION FILED JULY 24, 1912.

1,065,956.

Patented July 1, 1913.

3 SHEETS—SHEET 2.



Inventor

J. N. McCue,

Witnesses

Chas. L. Griesbauer.
A. B. Norton.

By

Watson E. Coleman.
Attorney

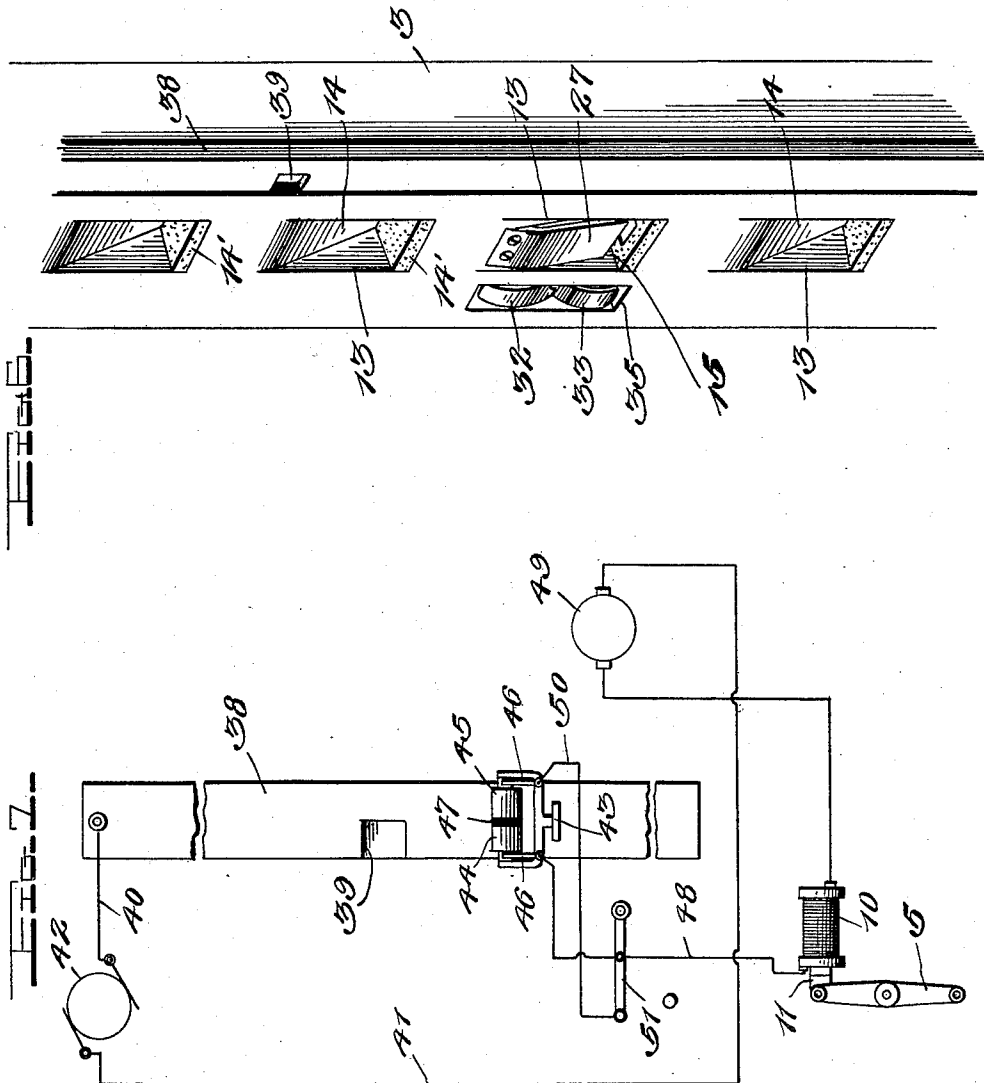
ELEVATOR.

APPLICATION FILED JULY 24, 1912.

1,065,956.

Patented July 1, 1913.

3 SHEETS—SHEET 3.



Inventor

J. N. McCue,

Witnesses

Chas. L. Griebauer.

A. B. Norton.

 $\mathbb{B}_Y$

Watson E. Coleman.
Attorney

Attorney

UNITED STATES PATENT OFFICE.

JOHN N. McCUE, OF AUXVASSE, MISSOURI.

ELEVATOR.

1,065,956.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed July 24, 1912. Serial No. 711,300.

To all whom it may concern:

Be it known that I, JOHN N. McCUE, a citizen of the United States, residing at Auxvasse, in the county of Callaway and State of Missouri, have invented certain new and useful Improvements in Elevators, of which the following is a specification, reference being had to the accompanying drawings.

The present invention relates to new and useful improvements in elevators and more particularly to a safety appliance which is adapted to be automatically operated when stopping on the level with the floor, and which will also automatically open and close the elevator gates.

The object of the present invention resides in providing an electrically operated safety mechanism upon the elevator which will automatically stop the car, and which may be also used for opening and closing the elevator gates when approaching the floor of the building.

A further object of the present invention is to provide a semi-automatically operated mechanism for opening and closing the elevator gates, which will be positive in action, strong and durable in construction, easily operated and controlled, simple in all its parts, easy of installation, and which can be manufactured and sold at a comparatively low cost.

Other objects will be apparent hereinafter as the description continues.

With the above and other objects in view, this invention consists of the novel details of construction, combination, formation and arrangement of parts as will be hereinafter more fully described, claimed and particularly pointed out in the accompanying drawings, in which—

Figure 1 is a front elevation illustrating the same as mounted within the shaft and illustrating my invention as applied thereto. Fig. 2 is a detail vertical section through the guard rail illustrating the door opening mechanism. Fig. 3 is a horizontal section through the same. Fig. 4 is a similar view illustrating the door closing mechanism. Fig. 5 is a bottom plan view of the elevator car. Fig. 6 is a detail perspective view of a portion of one of the guide rails, and Fig. 7 is a diagrammatical illustration of the elevator circuit used for operating the safety appliance.

Reference now being had to the accom-

panying drawings wherein I have designated like parts by like reference numerals throughout the several views, the numeral 1 indicates an ordinary elevator shaft of a building having the various floors thereof indicated by the numeral 2 and the elevator shaft being provided with the usual guide rails 3. The elevator car, indicated by the numeral 4, is adapted to be reciprocated up and down the shaft by an automatically operated motor in the usual manner.

The safety appliance, forming a part of the subject matter of the present invention, includes a pair of laterally extending bolts which are adapted to engage notches formed within the guide rails of the elevator shaft, so that, should any of the mechanism become broken, the bolts will be operated and engage the notches formed in the guide rail to stop the elevator car. This mechanism comprises a lever 5 which is fulcrumed on the bottom face of the elevator car and is connected to a pair of laterally extending bolts 7 by means of links 8. These bolts are provided with coil springs 9 which are adapted to hold the same in an outward position so that they will normally tend to engage the notches formed within the guide rails for supporting the elevator car. To normally hold the bolts at an inward position against the tension of the coil springs, I provide a magnet 10 which is included in an electrically operated circuit which also includes the motor for propelling the elevator car up and down the shaft. The lever 5 is provided with an armature 11 so that when the magnet 10 is energized, it will operate the lever 5, thereby normally holding the bolts at an inward position, but, should the circuit to which the magnet 10 is included become short-circuited or, should the operator desire to stop the car at a certain floor, the circuit will be broken and the magnet would release the lever 5, thereby allowing the bolts to engage the notches formed within the guide rails for stopping the car. The elevator car 4 is also provided with guide rollers, indicated by the numeral 12, which extend on each side of the guide rails, which apparently guide the elevator car as the same ascends or descends through the shaft.

Each of the guide rails is provided with a plurality of notches 13 which are substantially about one and one-half feet long and each has a gradually inclined face 14 which

the bolts 7 are adapted to engage when the same have been operated so that when the bolts are released the springs 9 will force the same against the inclined walls 14 thereby stopping the car before resting upon the lower portion of the notches.

The bolts 7 are adapted to be operated so as to engage the notches 14 formed within the guide rails should the cable or other mechanism for propelling the car become broken, thereby providing means for catching the car to prevent accidents. All of the notches formed within the guide rails are provided with rubber bumpers, indicated by the numeral 14', within the lower portion of the notches, thereby providing a cushioning device to prevent jars due to the sudden stop of the car. It is obvious from the foregoing description that these bolts are used for a safety device to prevent any accident to the elevator car, but the same may be used for opening and closing the elevator gates which guard the hatchway at the various floors of the building to the elevator shaft. To provide means for operating the elevator gates, I provide a mechanism within one of the notches, illustrated by the numerals 15, below the level of each floor within the building, so that as the bolts, mounted on the car, come in alinement with this notch 15 and the same have been released, they engage the notch adjacent the floor which the car is to stop, and thereby automatically open or close the elevator gates, as will be hereinafter described. The mechanism for opening these gates comprises a shaft, indicated by the numeral 16, which is mounted upon bearings 17 secured to the elevator shaft. This shaft 16 has provided at one end thereof, a crank arm 18 which is connected to a sectional elevator gate 19 by means of links 20. One of the links 20 is connected to the section of the gate adjacent the crank arm 18 and is connected to the crank arm adjacent its pivot point, whereas the other link is connected to the other section of the gate at one end and its opposite end is connected to the outer extremity of the crank arm 18 thereby providing means so that when the crank arm is operated the section of the gate farthest from the crank arm will move twice as far as the other section of the gate, thereby providing means for operating the gate so that the hatchway to the elevator shafts will be open and closed. A coil spring 21 is connected to this crank arm 18 and to the frame of the building, so that they will normally hold the elevator gates in an open position, but, to provide means to hold these gates in a closed position, I provide mechanism which is mounted within each of the notches 15. This mechanism comprises a hinged lever 22 which is pivotally mounted upon the outside of the guide rail and con-

nected by means of a link 23 to a bell crank 24. This bell crank 24 is pivotally mounted, as at 25, within an L-shaped slot 26, formed within the guide rail. The vertically extending arm of the bell crank projects within the notch 15 and rests upon a leaf spring 27, so that when one of the bolts mounted upon the bottom of the elevator car comes in contact with the spring 27, it will engage the crank lever 24, thereby forcing the vertically extending arm of the same inwardly and breaking the hinged lever 22. This lever 22 comprises two sections which are hingedly secured, as at 29, and at its hinged joint is connected the link 23 and a coil spring 30 which is secured at its opposite end to the guide rail. This coil spring 30 normally holds the sections of the link 22 in a substantially horizontal plane, as the horizontal arm of the bell crank 24 engages the upper wall of the horizontal plane of the L-shaped slot. The outer end of the lever 22 is pivotally connected to the lower end of the crank arm 28 whereby when the bell crank 24 lowers the link 23, the lever 22 will be broken at the joint 29 so as to allow the lower end of the crank arm 28 to swing inwardly and the coil spring 21 to open the elevator gates. When the pressure is released from the vertical arm of the bell crank 24, the coil spring 30 will return the lever 22 to its horizontal position.

To provide means for closing the elevator gates, I provide a pair of levers, indicated by the numerals 32 and 33, respectively, which are hingedly secured upon a shaft 34 within a slot 35 mounted within one of the side rails adjacent each of the notches 15. Communicating with the slot 35 is a pair of diagonally extending slots 36 in which are adapted to operate links 37. These links are each connected at their inner ends by means of a slot and pin connection 31 to the crank arm 37' of the shaft 16, whereas, their opposite ends are connected to the levers 32 and 33, respectively. It is obvious from this construction, as the bolts operate the door releasing mechanism so that the coil spring 21 may open the gates, the shaft 16 will be rotated, thereby causing the crank arm 37' to force the links 37 inwardly, which in turn project the levers 32 and 33, beyond the face of the guide rail. As the car descends or ascends, it will engage one of these levers 32 and 33, which will obviously force the crank arm 28 in an opposite direction to that which the coil spring 21 has a tendency to hold the same and as the car is moving, the bolt 7 will be brought out of engagement with the leaf spring 27, thereby allowing spring 30 to move the lever 22 to normal position thereby holding the lower end of the crank arm 28 outwardly to hold the gates in a closed position.

The circuit, which includes the magnet 10 130

for normally holding the bolts 7 in an inward position, comprises a track which is mounted upon one of the guide rails which supplies the proper amount of current to the magnet 10 to energize the same, and this circuit is also provided with a switch by which the operator may, at will, control the operation of the bolts 7. It is obvious that when the circuit in which the magnet 10 is located is broken, it will cause the bolts to engage the notches 14 mounted within the guide rails, thereby stopping the car and to also stop the motor which propels the car up and down the elevator shaft, I include the motor within the circuit for operating the bolts 7. A copper track 38 is mounted upon the inner face of one of the side rails and is provided with a plurality of gaps 39 formed in the tracks within one edge thereof adjacent each floor of the building, for a purpose which will be hereinafter described.

In the drawings, the numerals 40 and 41 denote the two service wires which lead from a suitable source of electric supply or generator, indicated by the numeral 42, and the former wire 40 being connected to the upper end of the track 38, whereas the other service wire 41 is connected with mechanism for operating the motor and bolts 7 in the circuit.

The car 4 is provided with a bracket 43 which has provided in its forked ends a pair of rollers, indicated by the numerals 44 and 45 respectively, which are adapted to contact the track 38. This bracket 43 is provided with a pair of brushes 46 which are adapted to engage the ends of each of the rollers 44 and 45, and the said rollers being spaced apart by suitable insulation, indicated by the numeral 47. A line wire, indicated by the numeral 48, is connected to one of the brushes 46 which is in contact with the roller 44 and the opposite end of this wire is connected to one pole of the magnet or solenoid 10, and the opposite pole of this solenoid is connected to one pole of the armature circuit of a motor 49, this motor being represented for propelling the elevator car up and down the elevator shaft. The opposite pole of the armature circuit of the motor 49 is connected to the other service wire 41, thereby completing the circuit.

It is obvious from the foregoing, that as the rollers 44 and 45 travel upon the track 38, they will complete the circuit, which includes the propelling motor 49 and the magnet 10, thereby allowing the elevator car to be propelled up and down the shaft and also to draw the safety locking bolts 7 out of engagement with the notches 14 but, when the roller 44 comes in contact with one of the gaps 39 formed within the track adjacent each floor of the building, it will short circuit the connection, thereby causing

the bolts 7 to project and engage the notches 14 and also stops the motor 49 which will obviously stop the elevator car. To provide means to prevent the car from being stopped at each floor and only stop at the will of the operator, I provide in the circuit, a wire 50 which is connected to one of the brushes 46 which is in contact with the roller 45 and having at its opposite end a switch 51 which is in engagement with the line wire 48. This switch 51 is adapted to be mounted within the elevator car and to be operated by the elevator operator, so that when coming to a floor, it is desired to stop the car at that floor, the switch 51 is turned, thereby cutting off the circuit between the line wire 48 and the roller 45 which is in constant contact with the track 38, but when the roller 44 comes in contact with the gap 39 adjacent the floor, the magnet 10 and the motor 49 will be short circuited, thereby stopping the car as before described.

It is to be noted from the foregoing, that I have not illustrated any means for controlling or reversing the movement of the motor 49 and also the various speeds of the motor, but it is to be understood that any suitable or well known means may be used in connection with the field circuit of this motor, whereby the same may be reversed and the various speeds thereof be governed.

Whereas I have shown a specific embodiment of the present invention, it is to be understood that other minor details of construction, formation and arrangement of parts may be resorted to that come within the scope of the present invention without departing from the spirit of the invention.

What I claim is:

1. In a device of the character described, the combination of a shaft, an elevator car mounted therein, means for propelling said elevator car, doors slidably mounted within said shaft, spring actuated bolts mounted upon said car, means for holding said bolts in an inward position, and means for releasing said bolts upon the level with the floors in the building whereby said gates will be opened substantially as described.

2. In a device of the character described, an elevator shaft, a car mounted therein, guide rails formed within said shaft, said guide rails having notches formed therein, spring actuated bolts mounted upon said car, sliding doors mounted within said shaft, means mounted within said notches operatively connected to said doors and means whereby said doors will be opened when said bolts have been released, substantially as described.

3. In a device of the character described, the combination of an elevator shaft and a car slidably mounted therein, guide rails mounted within said shaft, notches formed

within said guide rails, spring actuated bolts mounted upon said car, means for holding said bolts in an inward position, sliding doors mounted within said elevator shaft, means for normally holding said doors in an open position, means for holding said doors in a closed position, means for releasing said bolts whereby the said gates will be released, and means for closing said gates substantially as described.

4. In a device of the character described, the combination of an elevator shaft and guide rails mounted therein and a car slidably mounted thereupon, a track mounted upon said guide rails, rollers mounted upon said car and in contact with said track, spring actuated bolts mounted upon said car, a magnet mounted upon said car and adapted to hold said bolts in an inward position, a circuit including said magnet the track and rollers, a motor for propelling the elevator car, said motor being included in the circuit, and means for breaking the circuit when the car approaches the floor for stopping the same substantially as described.

5. In a device of the character described, the combination with an elevator shaft and guide rails mounted therein, a car slidably mounted within the elevator shaft, notches formed within said guide rails, spring actuated bolts carried by the car, means for holding the said bolts in an inward position, sliding doors mounted within the elevator shaft, means for normally holding said doors in an open position, means mounted within said notches and operatively connected to said doors for holding the doors

in a closed position, the said bolts adapted to engage the means mounted within said notches for releasing the doors, and means carried by the car for closing the doors, substantially as described.

6. In a device of the character described, the combination of an elevator shaft, a car slidably mounted therein, guide rails mounted within said shaft, notches formed within said guide rails, spring actuated bolts carried by the elevator car, means for holding the bolts in an inward position, sliding doors mounted within the elevator shaft, a horizontally extending shaft journaled upon the said elevator shaft, means connecting said horizontally extending shaft with the elevator gates, means connected to said shaft for holding the gates in an open position, means operatively connected to said horizontal shaft for holding the gates in a closed position, means mounted within said notches and operatively connected to the last mentioned means, means for releasing the spring actuated bolts, the said bolts when released adapted to engage the means mounted within the recesses to permit the gates to be opened, and means carried by the car for closing the gates when the same starts to ascend or descend, substantially as and for the purpose specified.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JNO. N. McCUE.

Witnesses:

STANLEY B. OLDHAM,
W. O. PORTER.