S. F. GLIMM.

SAFETY DEVICE FOR ELEVATORS.

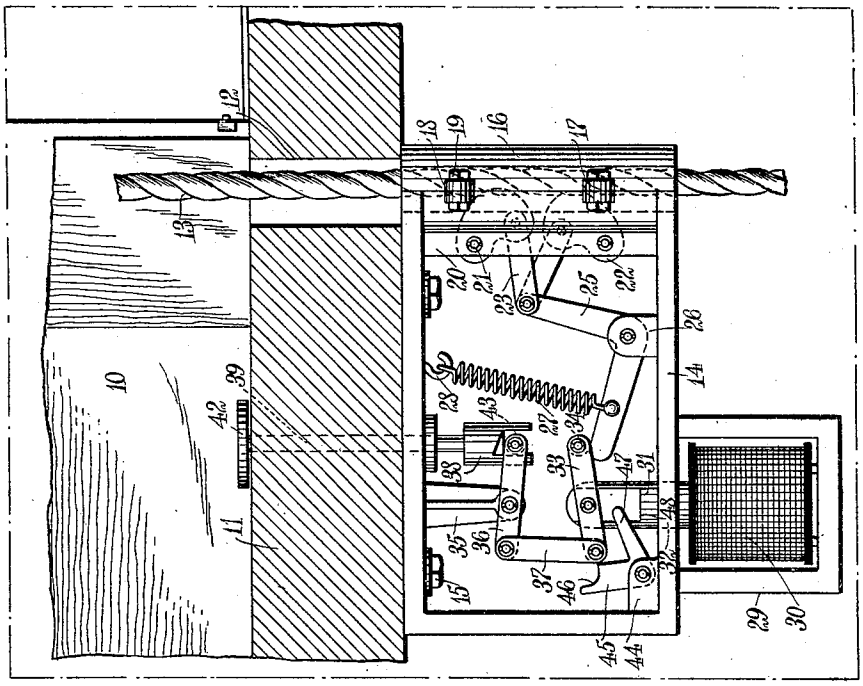
APPLICATION FILED SEPT. 28, 1910.

1,008,255.

Patented Nov. 7, 1911.

2 SHEETS—SHEET 1.

Fig. 2



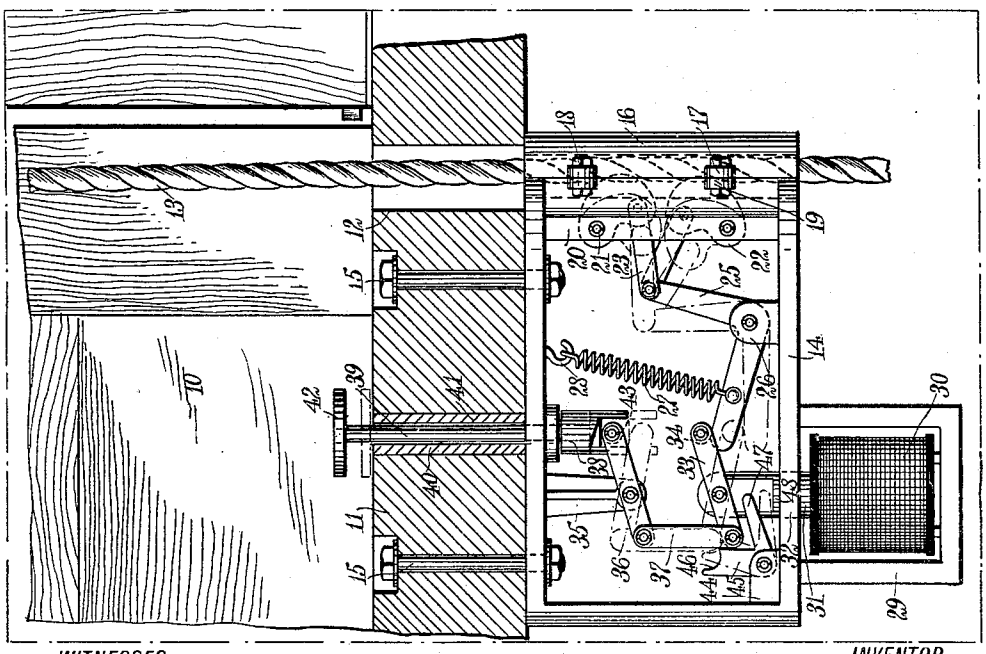


Fig. 1

WITNESSES:

J. A. Brophy

John K. Brachog

INVENTOR

Stephen F. Glimm

BY Munn & Co

ATTORNEYS

S. F. GLIMM.

SAFETY DEVICE FOR ELEVATORS.

APPLICATION FILED SEPT. 28, 1910.

1,008,255.

Patented Nov. 7, 1911.

2 SHEETS—SHEET 2.

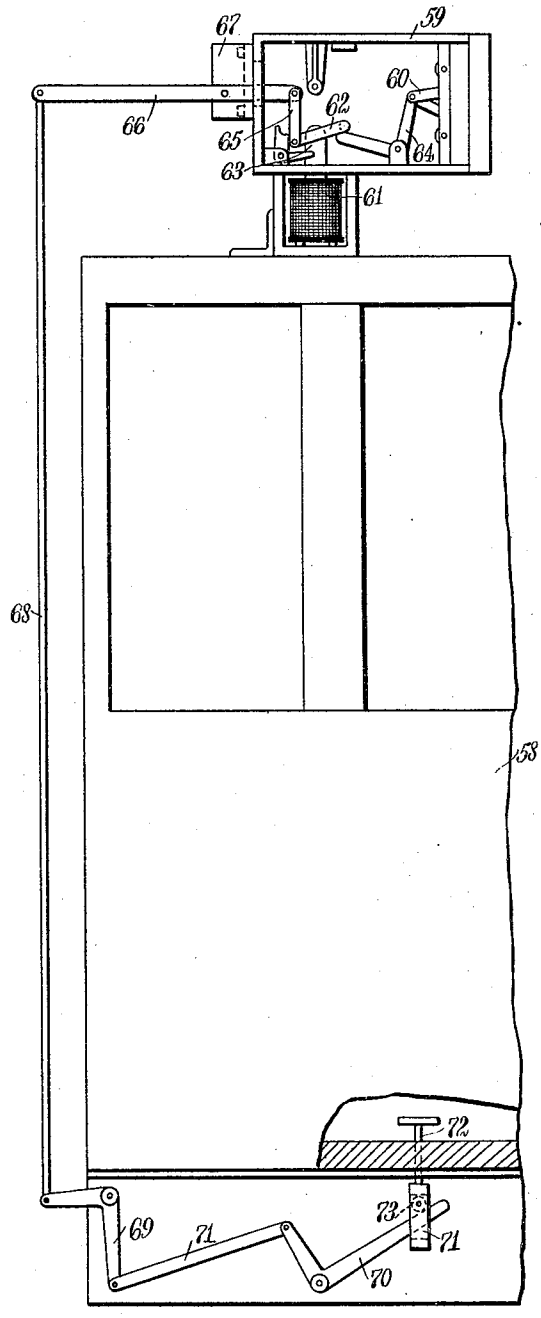


Fig. 4

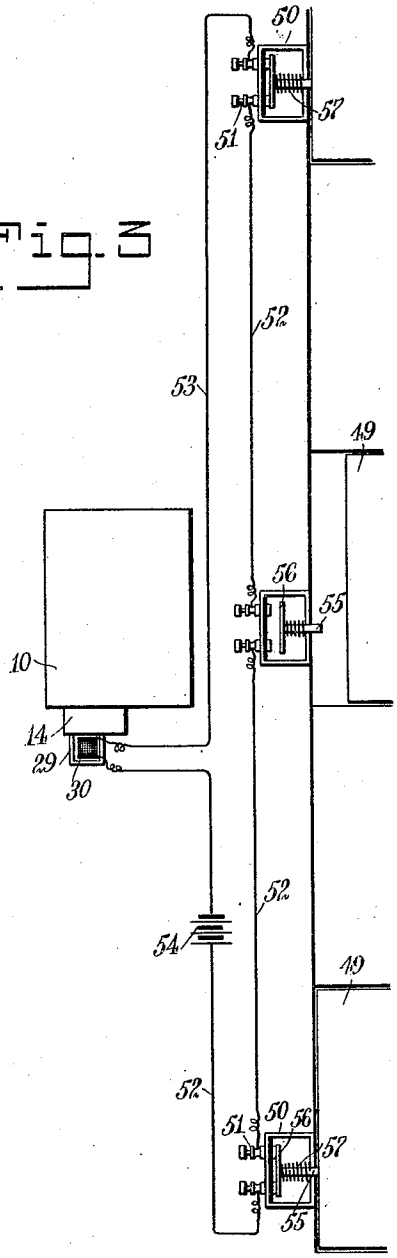


Fig. 5

WITNESSES:

J. A. Brophy

John K. Brachorst

INVENTOR

Stephen F. Glimm

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

STEPHEN F. GLIMM, OF NEW YORK, N. Y.

SAFETY DEVICE FOR ELEVATORS.

1,008,255. Specification of Letters Patent. Patented Nov. 7, 1911.

Application filed September 28, 1910. Serial No. 584,343.

To all whom it may concern:

Be it known that I, STEPHEN F. GLIMM, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Safety Device for Elevators, of which the following is a full, clear, and exact description.

This invention relates to safety devices for passenger and other elevators, and has reference more particularly to a device of this class comprising in combination a lock for preventing the movement of the elevator car, means whereby the operator of the elevator can control the lock, and means controlled by the elevator door or other closure for controlling the first-mentioned means.

The object of the invention is to provide a simple and efficient safety device for elevators, which can be used in connection with elevators of different kinds, which is controlled by the operator of the elevator himself and is also controlled by the doors of the elevator system so that the elevator car cannot move when one of the doors is open, which provides means for instantly bringing the elevator car to a stop in case it should fall or descend at too high a rate of speed, which can be operated instantly, and which is at all times under the control of the operator of the car.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a fragmentary vertical section of part of an elevator having an embodiment of my invention, certain positions of the parts being shown in dotted outline; Fig. 2 is a similar view showing certain of the parts in different positions; Fig. 3 is a diagrammatic view of an elevator system having my invention applied thereto; and Fig. 4 is a fragmentary elevation of an elevator car having a modified form of my invention applied thereto.

Before proceeding with a more detailed explanation of the invention, it should be understood that the present form of the device constitutes an improvement upon that shown in the United States Patent No. 920,820, issued on May 4, 1909, to E. J. Brown. This patent discloses a locking device for preventing the movement of the elevator car except at the will of the operator. The locking device employed in the present form of the invention is similar to that shown in the patent referred to, but in addition I provide means whereby the locking device is controlled by the doors of the elevator system so that as long as a door is open, the elevator cannot be operated. Furthermore, I provide means by which the operator can set the locking device to render it inoperative while the elevator car is traveling.

Certain of the details of construction shown for example herewith form no part of the invention and can be varied in accordance with individual preference and special conditions without departing from the underlying spirit of the invention.

Referring more particularly to the drawings, I have shown, for example, part of an elevator car 10 having a floor or bottom 11 provided with an opening 12 through which the controlling cable 13 passes, by means of which the operator starts and stops the car. Underneath the floor of the car is located an open frame 14 preferably of rectangular form and secured in place by means of bolts 15 which pass through the bottom of the car. The cable 13 passes through the end of the frame and between the frame and a keeper part 16, having flanges 17 secured by means of bolts 18 to flanges 19 of the frame. The frame has spaced sides 20 at the end through which the cable passes, and has pivotally mounted by means of suitable pins 21, between the sides, rounded cams 22. Each cam has pivotally secured thereto a link 23, the end of which is secured to one of the arms of the bell crank lever 25. The latter is pivotally mounted between lugs 26 attached to the frame and has a spring 27 secured to the free arm, and to the frame by means of a hook 28. The spring tends to hold the bell crank lever in position so that the cams are forced against the cable 13 and grip it securely. Consequently, in this position of the parts, the downward movement of the elevator car will pull upon the cable to stop the car instantly and prevent the movement of the same downward. This is also true

of the upward movement of the car so that when the cams are operative, it cannot be caused to descend or ascend.

Under the frame 14 is secured a second frame 29 in which is mounted an electro-magnet 30 having a movable core or armature 31 which extends through an opening 32 into the frame. A lever 33 is pivotally connected intermediate the ends with the upper extremity of the armature and has at one end a roller 34 in engagement with the free arm of the bell crank lever 25. A bracket 35 depends from the upper part of the frame and has pivotally secured thereto a lever 36 mounted upon the bracket intermediate its ends. A link 37 connects the levers 33 and 36. The free end of the lever 36 is engaged by the forked and enlarged lower end 38 of a pin 39 which extends through a sleeve 40 in an opening 41 of the car floor. The pin 41 has a head 42 which limits its downward movement. The end of the lever 36 in engagement with the end 38 of the pin has a roller 43.

The frame 14 has, adjacent to the magnet 30, extensions 44 between which is pivotally mounted a stop 45 having the upper end provided with a rounded recess 46. The stop has rigidly secured thereto a laterally extended finger 47 adapted to be engaged by a shoulder 48 of the armature. The stop is so formed that the upper end thereof can be positioned to engage the end of the link 37 to lock the parts in predetermined positions.

In Fig. 3 I have shown an elevator system having a plurality of doors 49. Associated with each door is a rectangular frame 50 having electrical contacts 51 connected by means of conductors 52 and 53 with each other and with a suitable source of electric current 54. The conductors 52 and 53 are also connected with the electro-magnet 30 of the safety device. Each frame 50 has a movable member 55 having a head 56 adapted to connect electrically the contacts 51. A spring 57 tends to hold each member in position such that the circuit is open. The arrangement is such that when the doors are closed, they engage the members 55 to close the circuit.

By depressing the pin 39 by stepping upon the head thereof, or in any other suitable manner, the levers 33 and 36 and the link 37 are operated so that the roller 34 is brought into engagement with the free arm of the bell crank lever to release the cams so that the elevator car can move. The downward movement of the pin causes the link 37 to move upward so that the stop can fall into position under the lower end of the link whereby it becomes operative to hold the parts in this position. It will be understood that the lever 33 holds the bell crank lever 25 against the tension of the spring 27 as long as the free end of the lever 33 is depressed. The opening of a door any where in the elevator system would break the circuit and release the armature of the magnet. The spring could then raise the lever 33 and the locking device would at once become operative. The upward movement of the armature would also displace the stop member 45 through the engagement of the shoulder 48 with the finger 47. It will be understood that the locking device is normally operative. As soon as the door is opened, the elevator car is brought to a stop. Furthermore, it is impossible to start the car without first depressing the pin 39. It will thus be seen that the safety device is always under the control of the operator before the car starts.

In Fig. 4 I have shown a modified form of the device in which the car 58 has a frame 59, corresponding to the frame 14, mounted on the top thereof. The locking device 60 mounted in the frame is similar to that shown in the preferred form of the invention. The magnet 61 has a lever 62 associated with the armature 63 thereof and adapted to operate a bell crank lever of the locking device. A link 65 is connected with the lever 62, and in turn has connected therewith a lever 66 pivotally mounted upon an extension 67 of the frame and extending laterally beyond the car. It is connected by means of a link 68 with a bell crank lever 69 mounted on the bottom of the car. A second bell crank lever 70 under the bottom of the car is pivotally connected by means of a link 71 with the first lever 69. One arm of the lever 70 is received in a yoke bracket 71, carried by a pin 72. The bracket has a roller 73 in engagement with the bell crank lever. The pin 72 corresponds to the like element 39 in the preferred form of the invention.

It will be understood that the operation of the last described safety device is similar to the other form.

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

1. The combination, with an elevator having a car and a door, of a normally operative lock for preventing the movement of the elevator car, means whereby the operator of the elevator can render said lock inoperative, and means controlled by said elevator door for rendering said lock operative when said door is opened, independently of said first means.

2. The combination with an elevator having a car and a door, of a normally operative lock for preventing the movement of the elevator car, means whereby the operator of said elevator can render said lock inoperative, means controlled by said elevator door for rendering said lock operative when

said door is opened, and an automatically operable stop for holding said first-mentioned means in position such that said lock is inoperative.

3. In combination, an elevator car and a door, a normally operative lock for preventing the movement of said car, a device controllable by the operator of the elevator, for rendering said lock inoperative and electro-magnetic means controlled by said door, for maintaining said first-mentioned device inoperative when said door is opened.

4. The combination, with an elevator having a car and a door, of a lock for preventing the movement of the elevator car, a spring tending to maintain said lock operative, an electro-magnet, means associated with said magnet, whereby the operator of said elevator can render said lock inoperative, said electro-magnet controlling said means, and an electric circuit controlled by said door, said circuit including said electro-magnet.

5. The combination, with an elevator having a car and a door, of a lock for preventing the movement of the elevator car, said lock being normally operative, an electro-magnet, pivotally operable means whereby the operator of said elevator can control said lock, said means being associated with said magnet, said magnet having a core constituting a fulcrum for said means, and an electric circuit including said electro-magnet and controlled by said door whereby said circuit is broken when said door is open.

6. The combination, with an elevator having a car and a door, of a lock for preventing the movement of the elevator car, a bell crank lever controlling said lock, a spring tending to hold said lever in position such that said lock is operative, an electro-magnet having a movable core, a lever pivotally mounted upon said core and in operative relation with said bell crank lever, means whereby the operator of said elevator can operate said lever to release said lock when said core is in a predetermined position, and an electric circuit controlled by said door and including said magnet, said core when said circuit is broken being in position such that said lever is inoperative with respect to said bell crank lever.

7. The combination, with an elevator having a car and a door, of a lock for preventing the movement of the elevator car, a bell crank lever controlling said lock, a spring tending to hold said lever in position such that said lock is operative, an electro-magnet having a movable core, a lever pivotally mounted upon said core and in operative relation with said bell crank lever, means whereby the operator of said elevator can operate said lever to release said lock when said core is in a predetermined position, a stop for holding said lever in position such that said lock is released, and means whereby said core when said circuit is broken can displace said stop into an inoperative position.

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

STEPHEN F. GLIMM.

Witnesses:
JAMES J. YOUNG,
EDWARD E. SAPHORE.