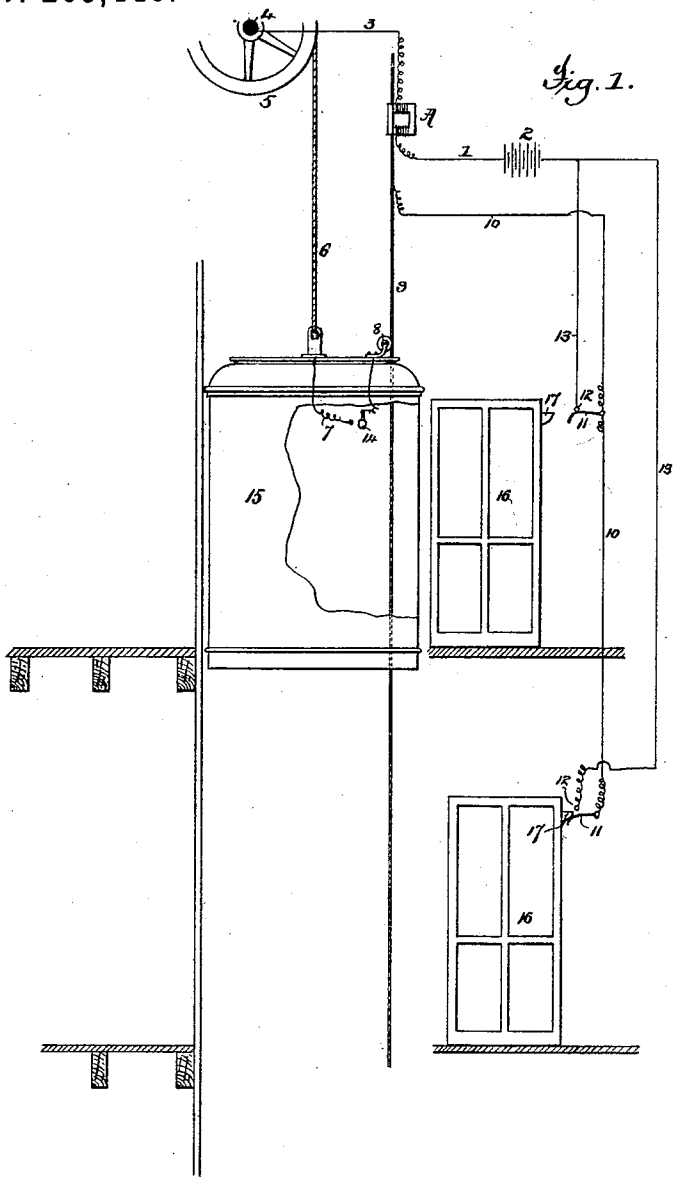
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W. E. SAWYER.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 265,448. Patented Oct. 3, 1882.

Fig. 1.



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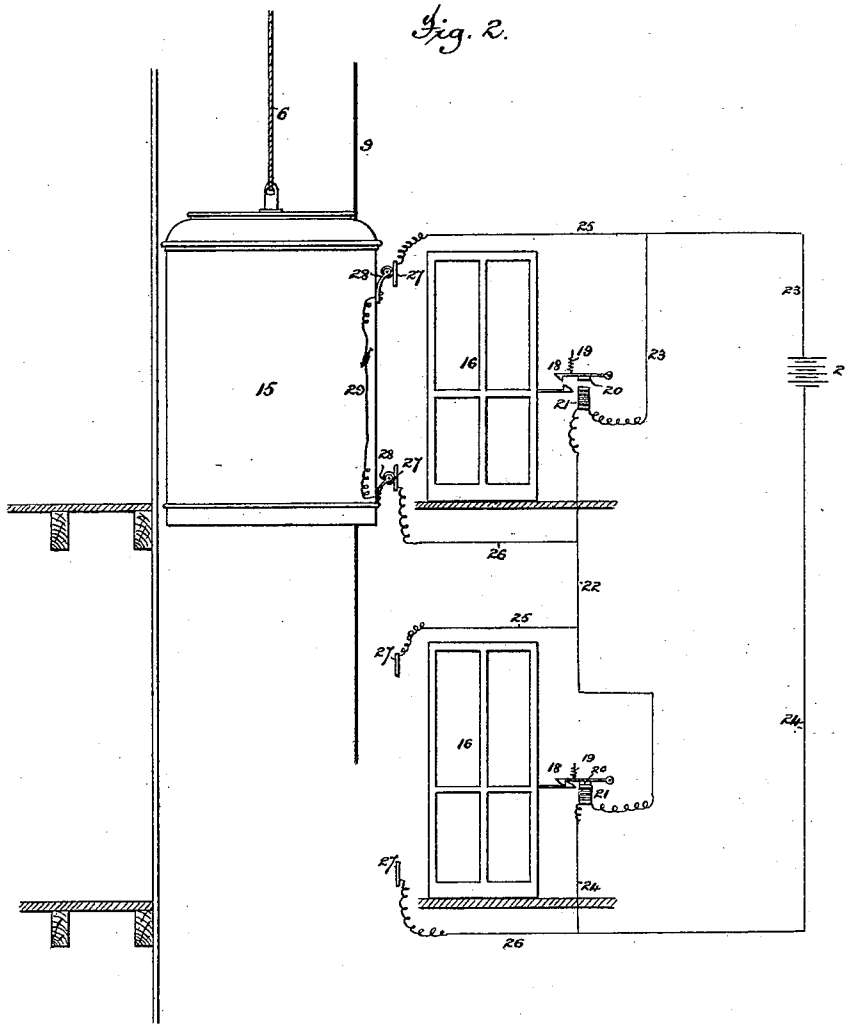
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Fig. 2.



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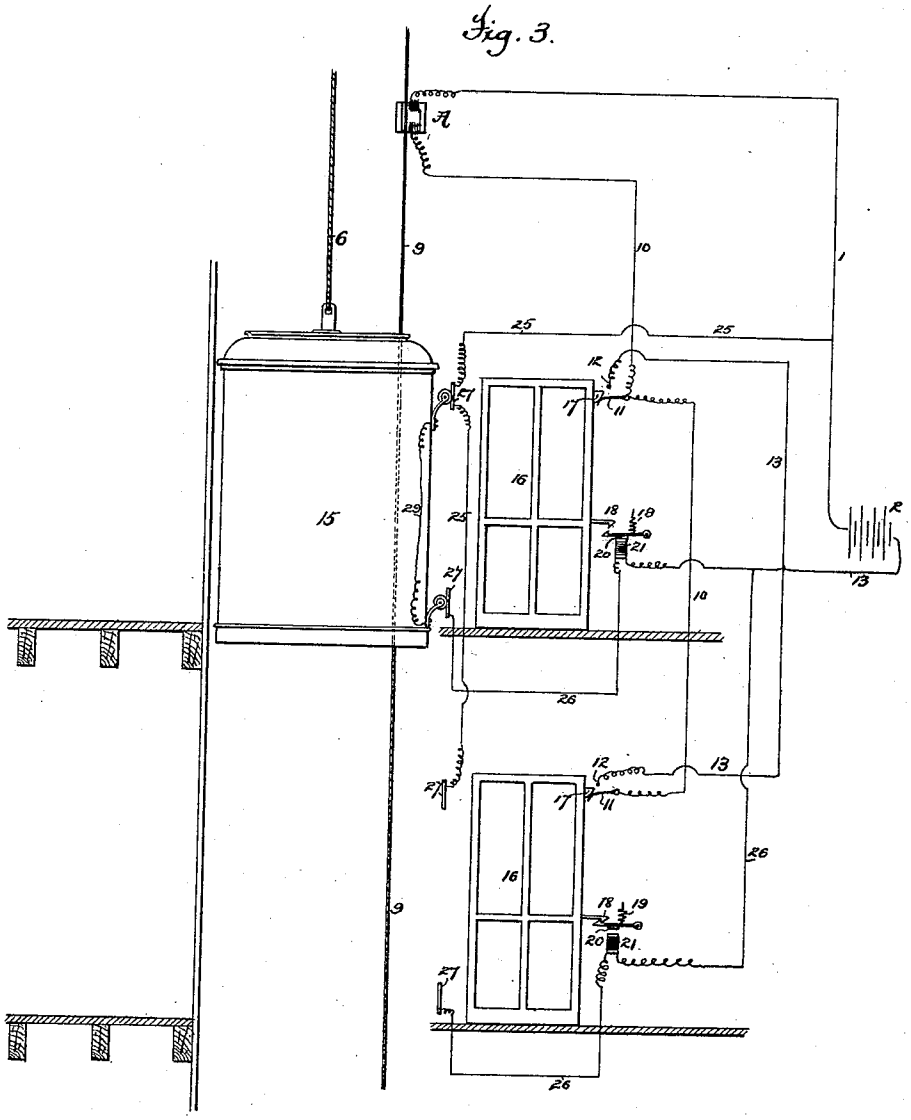
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Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM E. SAWYER, OF NEW YORK, ASSIGNOR TO HORACE G. H. TARR, OF YONKERS, N. Y.

SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 265,448, dated October 3, 1882.

Application filed July 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. SAWYER, a citizen of the United States, residing in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Safety Attachments for Elevators, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to that class of elevators that are used in hotels, stores, mines, and like places to convey passengers and freight from one floor or gallery to another, the object of the invention being to provide means whereby it is made impossible to open the elevator-door when the car is out of proper position, or to start the car until the door is closed and fastened, thereby removing the liability of accidents occurring from persons attempting to enter or get out of an ascending or descending car through a partially-closed door.

To this end the invention consists in locating a clutching mechanism at some convenient point, either above or below the highest or lowest point to which the car ascends or descends, in such position as to operate upon the starting-rope, said clutching mechanism being controlled by an electrical current, the circuit of which is closed and broken so as to operate the clutch by the opening and closing of the doors at the various landings.

It further consists in providing the doors at the various landings with catches or locks which are controlled by electro-magnets located in a circuit, which is broken or closed, so as to operate the catches to unlock and lock the doors by the arrival and departure of the car at and from the different landings.

It also consists in a combination of these two sets of devices, whereby both the foregoing results are automatically accomplished.

In the drawings, Figure 1 is a diagrammatic view illustrating the arrangement of the apparatus for accomplishing the automatic clutching and unclutching of the starting-rope by the opening and closing of the door. Fig. 2 is a like view illustrating the arrangement of the apparatus for automatically locking and unlocking the door upon the arrival and departure of the car from any landing, and Fig. 3 is a like view illustrating an arrangement of the apparatus for accomplishing both these results.

It will be observed that in the various figures the door of the elevator is not shown in its proper position, the views having been distorted in this respect to more clearly illustrate the systems of electrical connections.

Referring, now, particularly to Fig. 1, A represents an electro-magnetic clutch of the structure shown and described in my companion application. One pole of the magnet of this clutch is connected by the wire 1 with the battery 2, while the other pole is connected by the wire 3 with the shaft 4 of the metal pulley 5, over which passes the wire hoisting-cable 6, this cable being connected by a wire, 7, with a pulley, 8, which runs in contact with the starting-rope 9, which is also, as is usual, of wire. Connected with the starting-rope at a point near the clutch is a wire, 10, which passes downward along the elevator-shaft, and is connected at each landing with a spring circuit-breaker, 11, said circuit-breakers resting normally against contact-plates 12, which are connected by wires 13 with the opposite pole of the battery 2. The doors, as 16, at the various landings along the shaft are provided with lugs 17, which, when the doors are closed and fastened, rest against the circuit-breakers 11 and hold the latter out of contact with plates 12. The wire 7, which connects the small pulley 8 with the hoisting-cable 6, is provided with a switch, 14, the purpose of which will hereinafter appear. This switch being moved so as to complete the connection between the cable 6 and the starting-rope 9, the operation of the devices illustrated in this figure will be as follows: The car 15, arriving in the position shown in the figure, will be stopped in the usual manner by operating the starting-rope 9. In opening the door 16 its lug 17 will be moved away from the circuit-breaker 11, so as to permit it to come against contact-plate 12, thereby closing the circuit formed by wire 10, starting-rope 9, wire 7, cable 6, wheel and shaft 5 4, wire 3, and wire 1, so that the current passing through this circuit will operate the magnet of the clutch A to close said clutch upon the starting-rope and prevent the same being moved to

start the car until the circuit is broken, which will only occur when the door is closed. Immediately upon closing the door the lug 17 will move the circuit-breaker 11 away from the contact-plate 12, thereby breaking the circuit and releasing the starting-rope 9, so that the car can be moved downward to the next landing. From this it will be seen that so long as the door at any one of the landings is open the circuit will be closed, and the clutch A will operate to hold the starting-rope, so that it will be impossible for the car to be started in either direction.

To avoid the necessity of delay and of going up or down stairs in case the door at any one of the landings, either above or below the landing at which the car is stopped, should by any means become opened, so as to close the circuit and clutch the rope, the switch 14 may be opened so as to break the circuit thus formed and release the starting-rope, so that the car can be moved up or down to the door which has been left open.

It will of course be understood in this case that the jaws of the clutch A, or the portion of the starting-rope *g* coming in contact with the clutch, will be properly insulated, so as to prevent the current from passing directly from the clutch to the rope.

The apparatus for automatically unlocking and locking the doors at the various landings along the elevator-shaft upon the arrival and departure of the car, as illustrated in Fig. 2, consists of catches 18, one member of which is secured to the door, the other member being pivoted in the frame-work in position to engage with the member upon the door when the door is closed, but normally held out of locking contact therewith by means of a spring, as 19. These swinging members are provided with armatures 20, situated just above electro-magnets 21, located in an electric circuit formed of the wires 22 23 24 and the battery 2. When the electric current is allowed to pass through the circuit thus formed it will be readily seen that the action of the magnets 21 will draw the armatures 20 downward, so as to bring the two members of the catches 18 into locking contact and secure the doors in their closed position. The wires 22 23 24 are, however, provided with branches 25 26, connected to contact-plates 27 at the side of the shaft, which, when the car 15 arrives in proper position at any landing, are brought in contact with spring-rollers 28, connected by a wire, 29, in the car, so that a short circuit is at once formed through wires 25 26 29, whereby the current of electricity passes around instead of through the magnet 21, thereby releasing the armature 20 and permitting the spring 19 to raise one member of the catch and release the door, so that it can be freely opened for the ingress or egress of passengers. The door being again closed and the car started, the short circuit thus formed will at once be broken by the springs 28 passing out of contact with the plates 27, when the current will again pass through the magnet and operate the catch to secure the door.

By the two sets of apparatus thus far described it will be seen that two results are effected: First, the arrival of the car in proper position at any landing automatically unlocks the door to permit of its being opened, and that the opening of the door thus unlocked automatically operates the clutch A to secure the starting-rope and prevent the car from being moved until the door is closed; and that the closing of the door automatically releases the starting-rope, when the starting of the car will again automatically lock the door and prevent its being opened until the car is again in proper position. These two sets of devices, which have been separately illustrated in Figs. 1 and 2 for the sake of avoiding confusion and to simplify the description, are shown in Fig. 3 as combined. In the latter figure, however, the switch 14 and the connections by which it is possible to break the circuit passing through the clutch, so as to start the car in case one or more of the doors are open, has been omitted, as it is fully illustrated in Fig. 1. In Fig. 3, also, the door-locking mechanisms are illustrated as operated to unlock the doors by closing the circuit and causing the current to pass through the magnet instead of causing the current to pass around the magnet, as in Fig. 2. This, however, is an immaterial variation, as it will be readily understood by those familiar with the art that an open or a closed circuit can be applied equally well for operating either the clutching or the locking devices.

What I claim is—

1. The combination, with the elevator-car and its door and starting-rope, of the clutch, as A, and electrical connections through which the opening and closing of the door operates the clutch to grasp and release the rope, substantially as described.

2. The combination, with the elevator-car and its door and starting-rope, of the clutch, as A, electrical connections through which the opening and closing of the door operates the clutch to grasp and release the rope, and the switch, as 14, whereby the clutch can be made inoperative when desired, substantially as described.

3. The combination, with the elevator-car and the doors at the several landings, of locking mechanisms, as 18, for said doors, and electrical connections whereby the car, upon arriving at and departing from a landing, operates said locking mechanism to release and to lock the door, substantially as described.

4. The combination, with the elevator-car and the doors at the several landings, of locking mechanisms, as 18, for said doors, and electrical connections whereby all of the doors are locked when the car is in motion and only one released when the car comes to rest at a landing, substantially as described.

5. The combination, with the elevator-car, its starting-rope, and the doors at the various landings, of a clutch, as A, and locking mechanisms, as 18, for the doors, and electrical connections operated by the car to unlock and lock the door, and by the door to clutch and release the starting-rope, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. E. SAWYER.

Witnesses:
T. H. PALMER,
GEO. H. GRAHAM.