H. P. MAY.

AUTOMATIC SAFETY DEVICE FOR ELEVATORS.

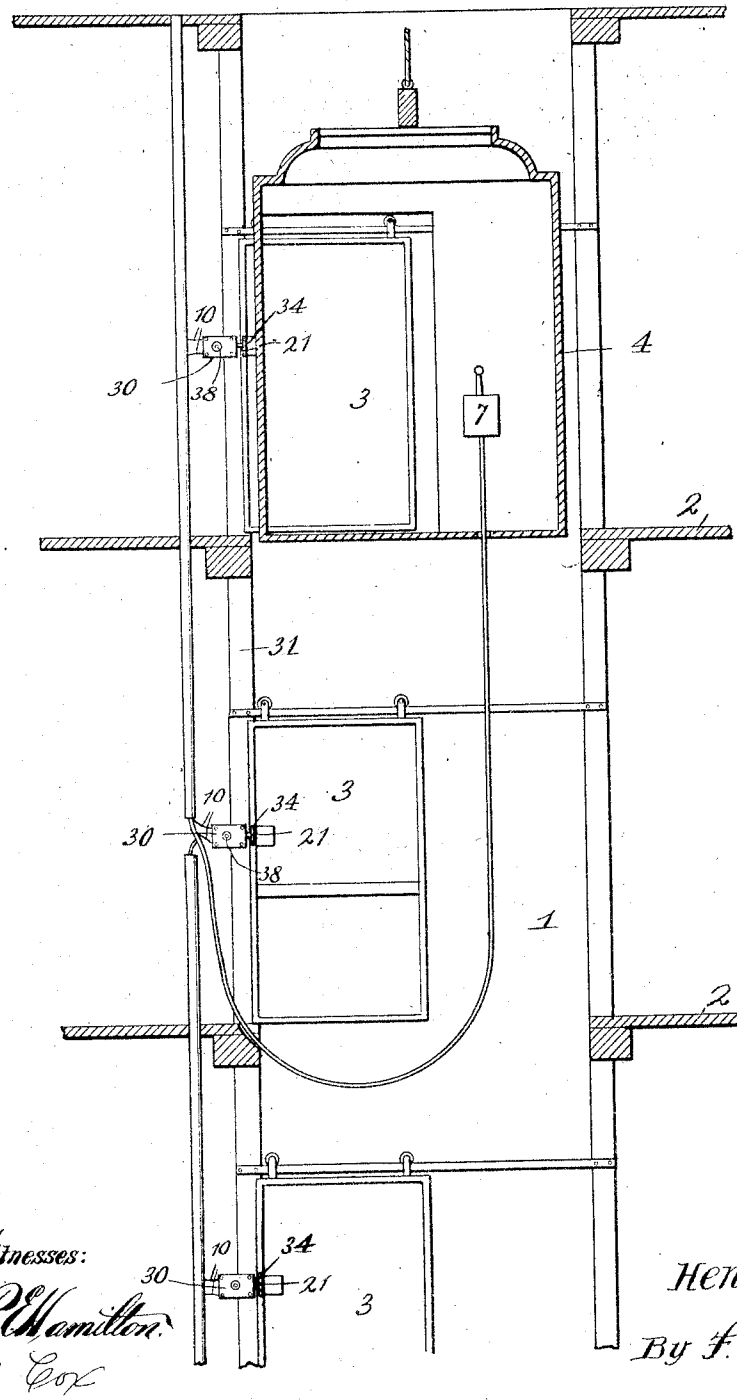
APPLICATION FILED DEC. 26, 1908.

982,519.

Patented Jan. 24, 1911

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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2 SHEETS—SHEET 2.

Fig. 2

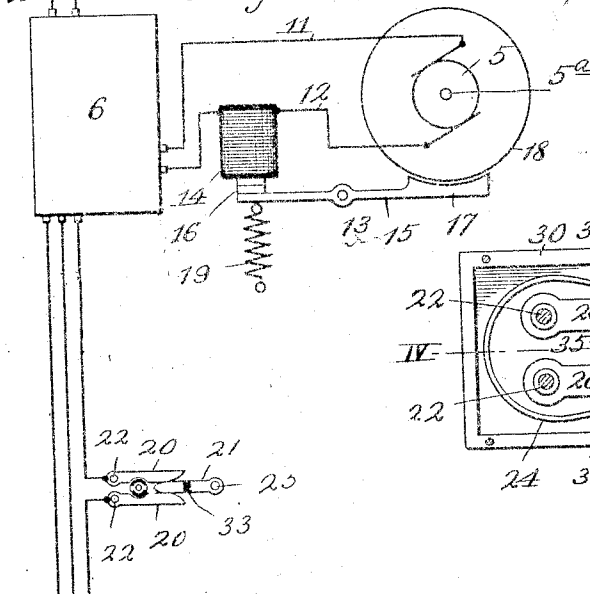
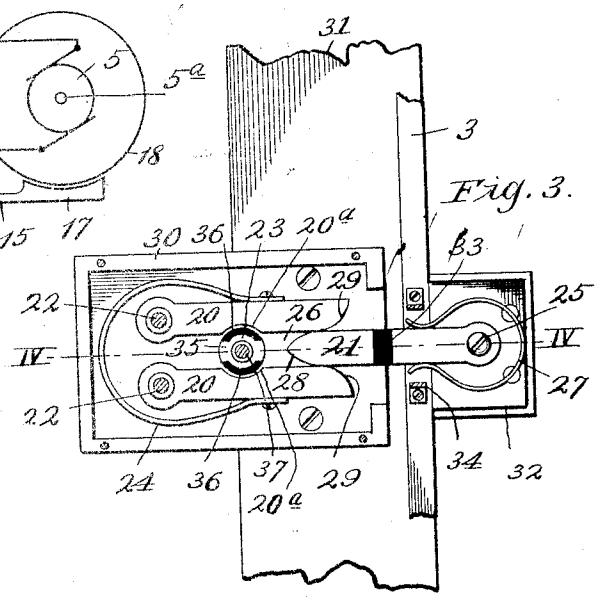


Fig. 3.



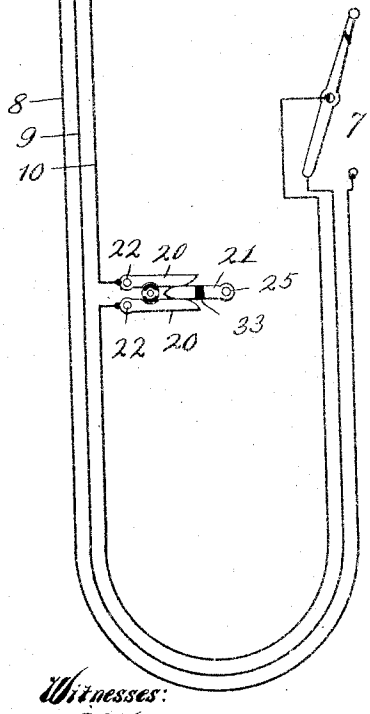


Fig. 4.

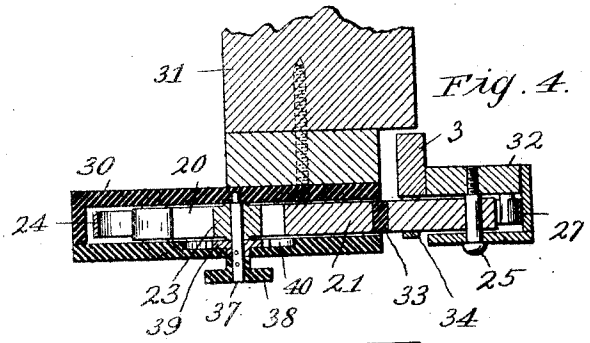
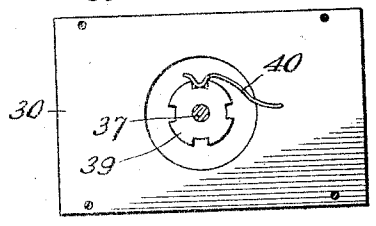


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY P. MAY, OF KANSAS CITY, MISSOURI, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO H. A. STEVENS, J. W. STEPHENS, AND H. S. JULIAN, ALL OF KANSAS CITY, MISSOURI.

AUTOMATIC SAFETY DEVICE FOR ELEVATORS.

982,519. Specification of Letters Patent. Patented Jan. 24, 1911.

Application filed December 26, 1908. Serial No. 469,254.

To all whom it may concern:

Be it known that I, HENRY P. MAY, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Automatic Safety Devices for Elevators, of which the following is a specification.

My invention relates to automatic safety devices for passenger and freight elevators, and my object is to provide electrically-controlled means whereby the opening of the doors at each landing of the elevator, will bring into operation certain brake mechanism whereby the motor for operating the car will be locked and any movement of the car prevented until the door has been closed at each floor or landing; thus preventing persons from attempting to enter or get out of an ascending or descending car, through a partly closed door, while the car is in motion.

In the drawings, which illustrate the invention: Figure 1 shows a vertical section of an elevator shaft and a car equipped with my invention. Fig. 2 is a diagram of the circuit and electrical appliances employed in carrying out the invention. Fig. 3 is an enlarged elevation of a novel circuit-breaker employed in carrying out the invention. Fig. 4 is a longitudinal section on line IV—IV of Fig. 3. Fig. 5 is a detail of a latch employed in carrying out the invention.

1 designates the elevator shaft; 2, the various landings with which said shaft communicates; 3, the gates for closing the openings leading from the shaft to the landings; 4, the elevator car; 5, the motor for operating the car; 6, the magnetic controlling-board; 7, the controller for starting, stopping, and reversing the direction of travel of the car; 8, 9, and 10, conductors leading from the magnetic controlling-board 6 to the controller 7; 11 and 12, conductors leading from the magnetic controlling-board 6 to motor 5; 13, a brake for locking the motor, consisting of an electromagnet 14 in circuit with conductor 12, a lever 15 provided at one end with an armature 16 and at its opposite end with a shoe 17, a friction-wheel 18 fixed or geared to the motor shaft 5^a, and a retractile spring 19 for throwing the brake-shoe 17 into engagement with the friction-wheel 18 when the current through the electromagnet 14 is interrupted, and A and B designate two conductors communicating with the magnetic controlling-board 6 and a source of electrical energy, not shown. All of the above parts are of ordinary construction and hence a detailed description thereof is deemed unnecessary.

The current to the motor may either be interrupted in the usual manner through the intermediacy of the controller 7, or it may be automatically interrupted when a gate at any of the landings is thrown open by means of novel circuit-breakers, which I place at said landings. Each of said circuit-breakers consists of a pair of jaws 20 and an arm 21, which latter is adapted to slidingly engage the adjacent sides of the former, and thus close the circuit between the controller 7 and the motor 5. Jaws 20 are pivotally-mounted at their rear ends upon pins 22 and are normally pressed into engagement with a manually-operable rotary member 23 by a U-shaped spring 24. Arm 21 is pivotally secured to a gate 3 by a screw 25, and held in line with the space 26 between jaws 20, by a spring 27, and in order that it may readily enter said space and engage the adjacent sides of the jaws, I point its forward end 28 and flare the free ends 29 of said jaws. Hence should the gate sag and cause the pointed terminal 28 to engage one of the flaring ends 29, it will guide arm 21 into its proper position between the jaws 20.

Cable 10 is cut at a point opposite each circuit-breaker, and the terminals thus formed are connected to jaws 20, which latter are mounted in a box 30, secured to frame 31 beside the gate-opening in said frame. Box 30 is either insulated or constructed of insulating material to prevent frame 31 from becoming charged from the jaws 20. It also extends beyond the flaring ends of the jaws to protect the hand of the elevator operator from any sparks which might occur when arm 21 is withdrawn in the act of opening a gate. Arm 21, which is carried by the gate, is insulated therefrom by a casing 32, to prevent said gate from becoming charged from the arm. Said arm is also divided by an insulator 33, as an extra precaution against charging the gate.

34 designates a strap for preventing the

free end of arm 21 from dropping down below the flaring end of the lowermost jaw 20 in case spring 27 should become broken.

The rotary member 23 is interposed between jaws 20 to hold the same apart, and it consists of a conductor 35 and two oppositely-disposed insulators 36, which latter are normally in contact with the jaws to prevent the current from flowing from one jaw 20 to the other when arm 21 is withdrawn by throwing open the gate. However, when it is desired to repair a gate without stopping the car, member 23 is rotated a quarter of a revolution to bring the conductor 35 into engagement with jaws 20, and thus provide a path from one jaw to the other when the arm 21 is withdrawn. Member 23 is circular in form and mounted upon a pin 37, provided with a knob 38 and a notched wheel 39, which latter is engaged by a spring-detent 40, for reliably holding member 23 in either of its positions. Jaws 20 are recessed at 20^a to give them broad bearings on the rotary member 23.

The operation, briefly stated, is as follows: The circuit between the controller 7 and motor 5 is normally closed, so that the car 4 is free to traverse the shaft 1. When a gate at one of the landings is thrown partly or completely open, its arm 21 is withdrawn from between its respective jaws 20. This interrupts the circuit to the motor and de-energizes magnet 14, so that spring 19 will actuate the brake which locks the motor until the gate is closed, and again completes the circuit by forcing its arm 21 into contact with the jaws 20. Should the gate get out of order and it is desirable to repair it without shutting down the car, this can be accomplished by turning its respective rotary member 23 a quarter of a revolution to bring its conductor in contact with its respective jaws 20. The gate can then be opened without interrupting the motor circuit.

While I have shown and described the preferred form of my invention, I, of course, do not limit myself to the exact details of construction and arrangement of parts shown in the drawings, but reserve the right to make such changes as properly fall within the spirit and scope of the invention.

Having thus described my invention, what I claim is:

1. A safety device for elevators, comprising, in combination with an elevator gate, a fixed contact device adapted to be located in an elevator operating circuit and a movable element carried by said gate to contact with said contact device, said fixed contact device comprising a pair of parallel spaced, and independently pivoted jaws, and means to exert uniform pressure on the outer side of each jaw to press them equally together, and said movable element comprising a tongue pivotally mounted to be directed between said jaws, and spring means bearing uniformly on each side of said tongue, whereby the latter is directed centrally between said jaws and is permitted to adjust itself to the latter.

2. A safety device for elevators, comprising, in combination with an elevator gate, a fixed contact device adapted to be located in an elevator operating circuit and a movable element carried by said gate to contact with said contact device, said fixed contact device comprising a pair of parallel, spaced and pivoted jaws, a rotatable element between said jaws adapted to direct the current constantly through the said jaws, said rotatable element consisting of alternate oppositely disposed insulating and conducting materials and a spring element bearing on the outer sides of said jaws to press them together, and said movable element comprising a tongue adapted to enter between said spring pressed jaws to close the elevator circuit.

3. A safety device for elevators, comprising, in combination with an elevator gate, a fixed contact device adapted to be located in an elevator operating circuit and a movable element carried by said gate to contact with said contact device, said fixed contact device comprising a pair of parallel, spaced and pivoted jaws, and a spring element bearing on the outer sides of said jaws to press them together, an element rotatable between said jaws and comprising alternate oppositely disposed segments of insulating and conducting material, whereby said element is adapted to direct the current constantly through said jaws or to insulate said jaws from one another and said movable element comprising a spring-centered tongue directed to project between the free ends of said spring-pressed jaws to close the elevator circuit.

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

HENRY P. MAY.

Witnesses:
F. G. FISCHER,
M. COX.