

961,260.

2 SHEETS—SHEET 1.



R. Hamilton.
M. Cox

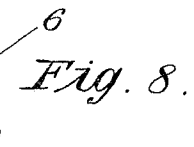
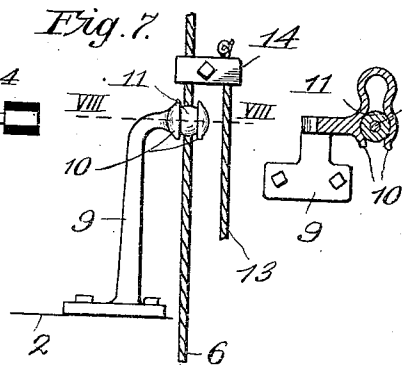
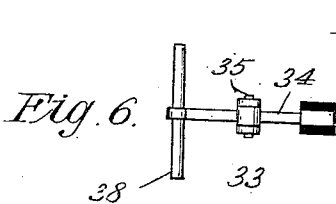
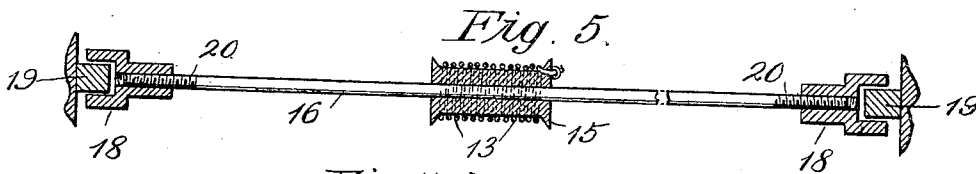
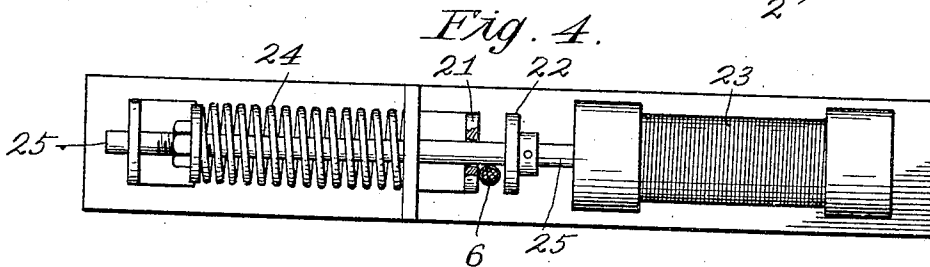
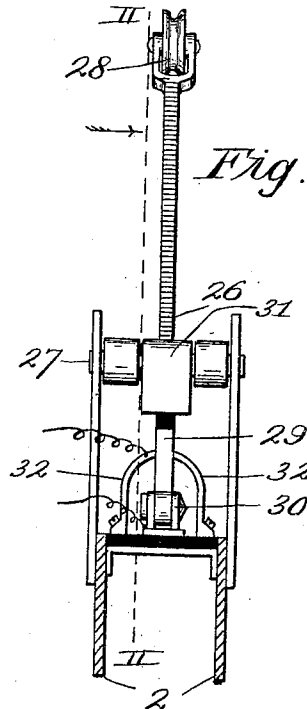
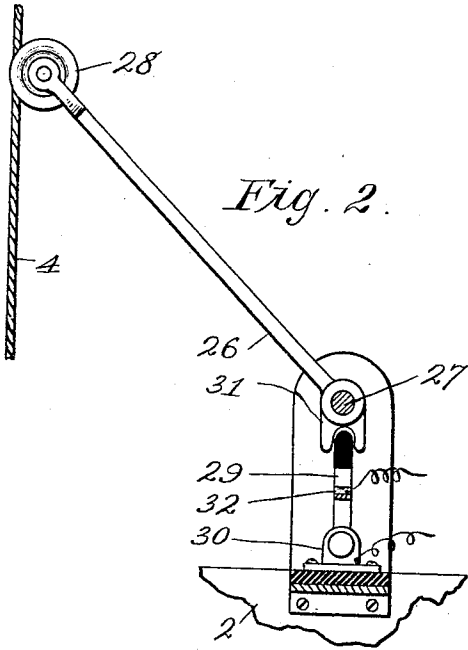
Inventor,
George B. Rice
By F. G. Fischer, atty.

G. B. RICE.
 MEANS FOR OPERATING ELEVATOR SAFETY DEVICES.
 APPLICATION FILED NOV. 26, 1907.

961,260.

Patented June 14, 1910.

2 SHEETS—SHEET 2.



Witnesses:

R. Hamilton
 M. Cox

Inventor,
 George B. Rice

By F. G. Fischer, atty.

UNITED STATES PATENT OFFICE.

GEORGE B. RICE, OF OCEAN SPRINGS, MISSISSIPPI.

MEANS FOR OPERATING ELEVATOR SAFETY DEVICES.

961,260.

Specification of Letters Patent. Patented June 14, 1910.

Application filed November 26, 1907. Serial No. 403,944.

To all whom it may concern:

Be it known that I, GEORGE B. RICE, a citizen of the United States, residing at Ocean Springs, in the county of Jackson and State of Mississippi, have invented certain new and useful Improvements in Means for Operating Elevator Safety Devices, of which the following is a specification.

My invention relates to improvements in safety apparatus for elevator cars; and my object is to provide a simple and reliable apparatus of this character which will effectually check the descent of the car should the hoisting-cable therefor break or slacken sufficiently to create a source of danger to the car and its occupants.

The apparatus includes an electric circuit which must be closed before the car can be used, as the apparatus is actuated to hold the car on failure of the current. Hence neglect on the part of the attendant to keep the apparatus in good working order will result in disuse of the car until the apparatus is restored to order.

One important feature of the apparatus is that it stops the car immediately on the breaking of the hoisting-cable, so that the car will not have time to attain dangerous speed before the apparatus acts.

Other features of the invention will hereinafter appear, and in order that it may be fully understood, reference will now be made to the accompanying drawings, in which—

Figure 1 represents an elevator provided with my improved safety apparatus. Fig. 2 is a vertical section of a gravity circuit-breaker on line II—II of Fig. 3. Fig. 3 is a front elevation of the same. Fig. 4 is a detail of a spring-actuated clutch employed in carrying out the invention. Fig. 5 is a detail of a mechanically-controlled clutch for engaging the car guides. Fig. 6 is a plan view of another form of circuit-breaker. Fig. 7 is an enlarged elevation of means for normally securing the governor-cable to the car. Fig. 8 is a cross section of same on line VIII—VIII of Fig. 7.

1 designates an elevator shaft; 2, the car; 3, the hoisting-drum; 4, the hoisting-cable which travels upon overhead guide pulleys 5 and is attached at its ends to the hoisting-drum and the top of the car; 6, the governor-cable, and 7 and 8, the weighted sheave and overhead governor-wheel, respectively, around which the governor-cable

travels. All of the above parts are old and form no part of the present invention.

9 designates a stand secured to the top of the car and provided with a resilient socket 10 which firmly grasps a ball 11 fixed to the governor-cable so that when the car travels up and down it will actuate said governor-cable, which will in turn actuate the governor 12 whereby the car is ordinarily checked upon attaining excessive speed.

13 designates a safety-cable attached at one end to cable 6 by a clip 14, and at its opposite end to the mechanically-controlled clutch, carried preferably at the bottom of the car. Said clutch consists of a winding-drum 15 to which the safety-cable is attached, a shaft 16 which carries the drum and is journaled in bearings 17, and a pair of bifurcated shoes 18 adapted to engage the guides 19 of the elevator shaft.

Shaft 16 has right and left screw-threads 20 at its ends which engage similar threads in the shoes 18 so that when said shaft is rotated in one direction by the winding-drum, it will force the shoes into frictional contact with the guides and check the car, and when said shaft is rotated in the opposite direction it will disengage the shoes from the guides.

The spring-actuated clutch, above referred to, is preferably arranged at the head of the shaft and consists of a stationary jaw 21, a movable jaw 22, a solenoid 23, and an expansion spring 24 which is normally held compressed by the solenoid so that jaw 22, carried by the solenoid plunger 25, will be held away from the governor-cable and permit the same to travel with the car.

The gravity circuit-breaker is preferably carried at the top of the car and consists of a bell-crank lever 26 fulcrumed upon a pin 27, a trolley-wheel 28 carried by the long arm of the bell-crank lever and engaging the hoisting-cable, an arm 29 pivotally mounted at its lower end in a bracket 30 and engaging the bifurcated short arm 31 of the bell-crank lever, and a pair of resilient contacts 32, which normally engage the opposite sides of arm 29.

33 designates a circuit-breaker located, preferably, beneath the hoisting-drum and consisting of a lever 34 fulcrumed at 35, a contact 36 carried at one end of the lever, a fixed contact 37 normally engaged by contact 36, and a cross-piece 38 carried at one

end of the lever and arranged beneath the hoisting-cable, as shown in Fig. 1. The solenoid of the spring-actuated clutch, the gravity circuit-breaker, and the circuit-breaker 33 are connected in series by an electric circuit 39, which receives its current from any suitable source of supply.

Should the hoisting-cable break at a point between the car and the overhead guide pulleys 5, the gravity circuit-breaker will be the first to act by reason of said cable permitting the trolley-wheel 28 to drop and thus cause bell-crank lever 26 to throw arm 29 out of engagement with contacts 32 and interrupt the circuit. The interruption of the circuit will deenergize the solenoid 23 and permit spring 24 to expand and draw the movable jaw 22 toward jaw 21, so that the governor-cable 6 will be firmly gripped and held stationary by said jaws. Then as the car descends ball 11 will be released from socket 10 and the winding-drum 15 will be rotated by the safety-cable 13 and force the shoes into frictional contact with guides 19 to check the descent of the car.

Should the cable break between the overhead guide pulleys and the hoisting-drum, circuit-breaker 33 will be actuated first by the hoisting-cable dropping down upon cross-piece 38 and raising contact 36 out of engagement with contact 37. This separation of the contacts 36 37 will interrupt the circuit and deenergize the solenoid 23 so that the descent of the car will be checked as above described.

Should the car become jammed between the guides 19 while the drum was paying out the hoisting-cable 4, the latter would become slack and permit both of the circuit-breakers to act, so that the car could not be started until the slack cable was taken up.

Having thus described my invention, what I claim is:—

1. A safety apparatus for elevator cars comprising a clutch on the car adapted to engage the car guides, means detachably

connected to the car adapted to actuate said clutch, an electrically-controlled spring-actuated clutch adapted to detach said means from the car, and a circuit-breaker in circuit with the last-mentioned clutch adapted to be actuated by the hoisting-cable of the car.

2. A safety apparatus for elevator cars comprising a clutch on the car adapted to engage the car guides, means detachably connected to the car adapted to actuate said clutch, an electrically-controlled spring-actuated clutch adapted to detach said means from the car, a pivotally-mounted bell-crank lever carried by the car, a trolley-wheel journaled on said lever and engaging the hoisting-cable of the car, a pivotally-mounted arm on the car adapted to be actuated by the bell-crank lever, a circuit communicating with the electrically-controlled spring-actuated clutch and having one terminal connected with said arm, and a resilient contact normally engaging said arm and connected with another terminal of the circuit.

3. The combination with the hoisting and governor-cables of an elevator, of means for detachably connecting the governor-cable to the elevator car, a clutch carried by the car adapted to engage the elevator guides, means connecting the governor-cable and the clutch whereby the latter is actuated, an electric circuit, a circuit-breaker which is actuated to interrupt said circuit by the breaking or slackening of the hoisting-cable, and a spring-actuated clutch which grips the governor-cable when the circuit is interrupted, said spring-actuated clutch embodying a solenoid in circuit with the circuit-breaker and whereby said clutch is normally held inoperative.

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

GEORGE B. RICE.

Witnesses:

F. G. FISCHER,
M. Cox.