W. A. HOENEMAN.

CIRCUIT MAKER AND BREAKER.

APPLICATION FILED NOV. 23, 1915.

1,205,348.

Patented Nov. 21, 1916.

2 SHEETS—SHEET 1.

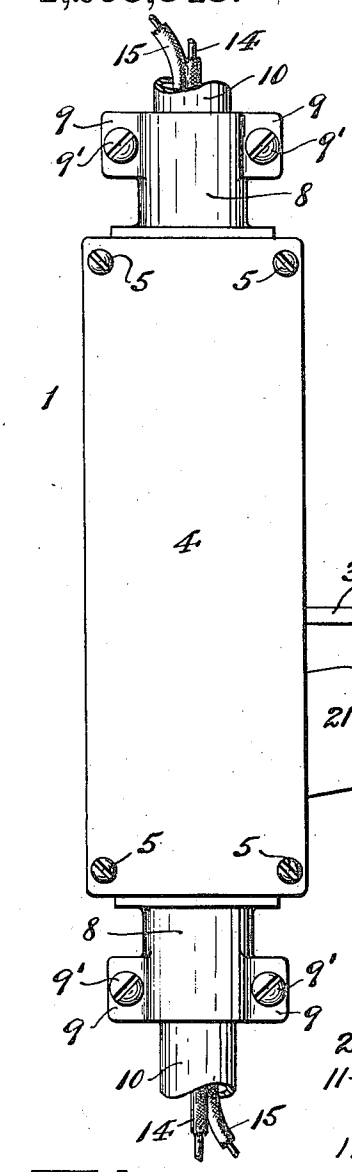


Fig. 1

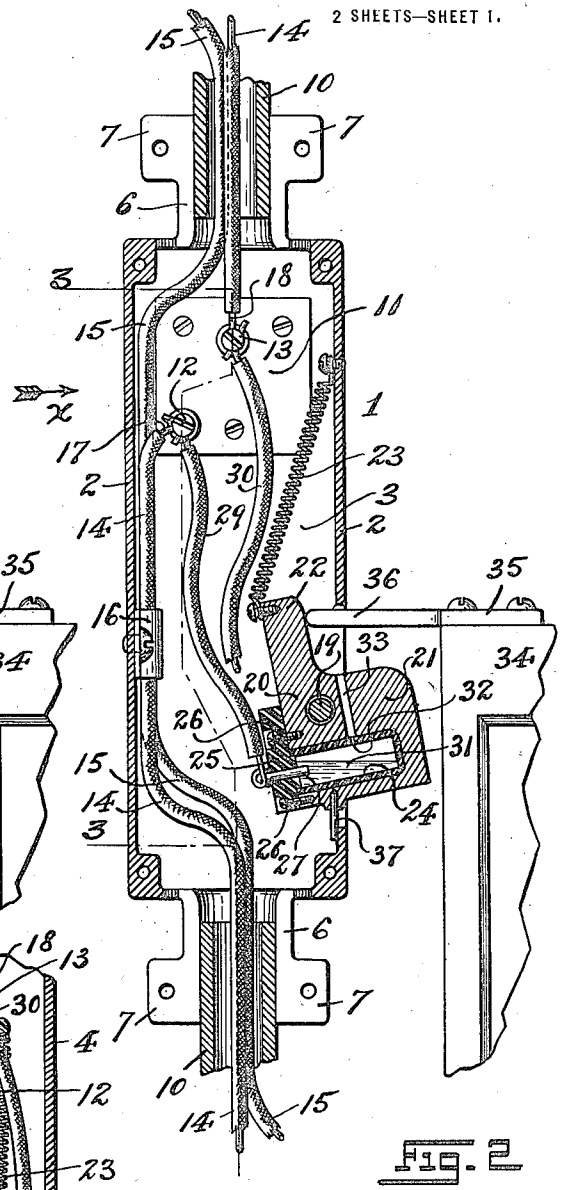


Fig. 2

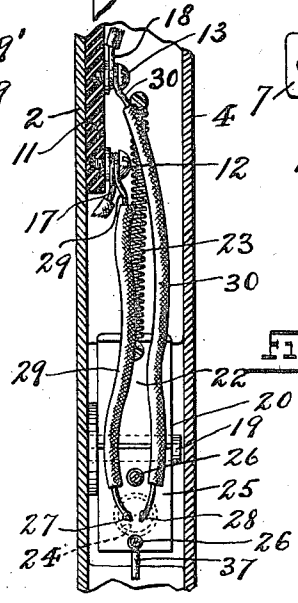


Fig. 3

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Eva E. Desch.

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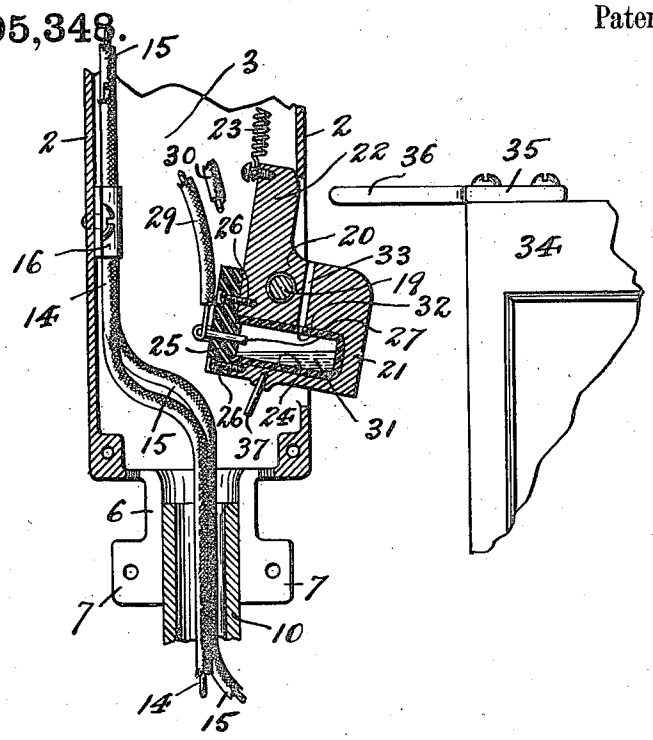


Fig. 4

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UNITED STATES PATENT OFFICE.

WILLIAM A. HOENEMAN, OF BROOKLYN, NEW YORK.

CIRCUIT MAKER AND BREAKER.

1,205,348. Specification of Letters Patent. Patented Nov. 21, 1916.

Application filed November 23, 1915. Serial No. 63,047.

To all whom it may concern:

Be it known that I, WILLIAM A. HOENEMAN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Circuit Makers and Breakers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention has reference, generally, to improvements in safety devices for elevators; and, the invention relates, more particularly, to a novel construction of electric circuit closing devices adapted to be operated by the floor-level doors located at the elevator shafts, whereby the closing of the door automatically completes an electric circuit either to supply current to the moving mechanism of an electric elevator or to actuate the releasing movement of a locking mechanism engaging the hand ropes or levers of a steam, belt or hydraulic elevator, and the opening of the door automatically interrupts said electric circuit either to cut off the supply of current to the moving mechanism of an electric elevator, or to actuate a locking mechanism engaging the hand ropes or levers of a steam, belt or hydraulic elevator, all for the purpose of preventing the movement of the elevator car until the floor-level doors of the elevator shaft are closed, thus minimizing danger of accidents and making for the personal safety of the operators and passengers using the elevator.

Other objects of the present invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the same.

With the various objects of the present invention in view, the same consists, primarily, in the novel circuit controlling safety device for electric and other elevators hereinafter set forth; and the invention consists, furthermore, in the novel arrangements and combinations of the various devices and parts, as well as in the details of the construction of the said parts, all of which will be more fully described in the following specification, and then finally embodied in the claims which are appended to and which form an essential part of the said specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of the novel circuit controlling safety device made according to and embodying the principles of the present invention, the same being arranged to be operated by a sliding elevator door; Fig. 2 is a transverse longitudinal section of the same; Fig. 3 is a detail longitudinal section of the same taken on line 3—3 in said Fig. 2, looking in the direction of the arrow *x*; and Fig. 4 is a transverse longitudinal section of the same, similar to that shown in Fig. 2, but indicating the elevator door in opening position and the operation of the device to interrupt the circuit of an electric current.

Similar characters of reference are employed in all of the hereinabove described views, to indicate corresponding parts.

Referring now more particularly to Figs. 1 to 4 inclusive of said drawings, the reference character 1 indicates the complete circuit controlling safety device made according to and embodying the principles of my present invention, the same comprising a casing 2, preferably of rectangular form, and providing an interior chamber 3 in which the mechanism of the device is contained, said chamber 3 being normally closed by the cover-plate 4, retained in connection with said casing 2 by means of screws 5, or any other desirable form of fastening or retaining devices. Located at each end of said casing 2, and integrally formed therewith, are the fixed portions of a clamp-like receiving means comprising a semi-cylindrical neck-portion 6 at the end of which are located a pair of oppositely and laterally extending perforated and internally screw-threaded ears 7. Adapted to complete said clamp-like receiving means is a removable or detachable semi-cylindrical neck-portion 8 also provided at its outer end with a pair of oppositely and laterally extending perforated ears 9. Said semi-cylindrical neck-portion 8 is adapted to be registered with said fixed semi-cylindrical neck-portion 6, and form in conjunction with the latter a tubular receiving opening in which is arranged the end of a metallic tubular con-

duit 10, the same being clamped in secured relation to said casing 2 by means of screws 9′, or other suitable fastening devices, which pass through said registered perforated ears 7 and 9, whereby said tubular conduit 10 is clamped securely between said respective semi-cylindrical neck-portions 6 and 8.

The reference character 11 indicates a terminal-base, the same being suitably secured within said casing 2 at a suitable location upon the back-wall thereof. Said terminal-base 11 is made of any suitable non-conductor of electricity or insulation material. Adapted to screw into said terminal-base 11 are suitable electric terminals or binding-post devices 12 and 13 to which circuit wires or conductors can be anchored. Carried in the tubular conduits 10 are electric circuit wires 14 and 15. These wires pass through the interior of the casing 2, and are retained in a proper position against one side wall of said casing by a suitable retaining clip 16. The said circuit wire 14 is broken within the casing 2 and one end 17 is secured to the terminal 12 and the other end 18 is secured to the terminal 13, whereas the return circuit wire 15 passes directly through the casing 2. Fixed within said casing 2 so as to extend laterally therein from the back wall, and adjacent to one side wall of said casing, is a pivot post 19. Pivoted upon this pivot post 19 is an oscillating member 20, the same being so arranged that a portion 21 thereof extends outwardly through an opening provided in said adjacent side wall of said casing. Said outwardly projecting portion 21 of said oscillating member 20 provides the major part of the latter, so that the body of the same is balanced upon the pivot post 19 in a manner to permit the force of gravity to normally cause said oscillating member to swing or tip downwardly and outwardly. Connected integrally with the inner end of said oscillating member 20 is an upwardly extending arm 22 which contacting with the side wall of said casing 2 acts as a stop to limit the said outward oscillation of said oscillating member 20. While the force of gravity is sufficient to cause the outward oscillation of said oscillating member to swing the same to normal position, if it is desired a pull-spring 23 may be employed to cause or aid in such movement. Located within the lower end of said oscillating member 20, so as to extend inwardly from the inner face thereof is a tubular socket or cavity in which is secured a mercury-pot 24, made of any suitable material, such as fiber or the like, and open at its outer end. Secured to the inner face of said oscillating member 20 by means of screws 26, or other suitable fastening means, so as to extend over and close said open outer end of said mercury-pot 24, is a supporting cover-plate 25, made of any suitable insulating material or non-conductor of electricity. Fixed in said cover-plate 25, so as to extend laterally therethrough and into the outer end of said mercury-pot 24, are a pair of contact-points 27 and 28, the same being electrically separated from each other by the insulating material of which said cover-plate 25 is made. Secured to the outer end of said contact-point 27 is one end of a wire conductor 29, the opposite end of which is secured to said terminal 12, and thus in electrical connection with the incoming end 17 of said circuit wire 14. Secured to the outer end of said contact point 28 is one end of a wire conductor 30, the opposite end of which is secured to said terminal 13, and thus in electrical connection with the outgoing portion 18 of said circuit wire 14. The said mercury-pot is adapted to contain a quantity of mercury or quick-silver 31. Said mercury-pot is further provided in its upper wall with a vent 32 which registers with a suitable outlet passage 33 formed in the body of said oscillating-member 20 and which communicates with the air exterior of said oscillating-member.

The reference character 34 indicates a sliding door such as is usually located at the entrance of the elevator shaft at each floor level. Secured to said door, at any convenient point, is trip-member 35 having a forwardly projecting tongue or trip-finger 36. When the elevator door is in normal closed position, as indicated in Figs. 1 and 2 of the accompanying drawings, said trip-finger 36 has been forced into engagement with the arm 22 of said oscillating member 20 so as to press said arm 22 to tip or tilt the same upwardly and inwardly until stopped by the contact of its stop-pin 37 with a portion of the side wall of said casing 2. When forced to such position the said oscillating member 20 has lifted at its outer end so as to tilt its mercury-pot 24 in such a manner as to cause the mercury 31 contained therein to flow inward toward and over the electrically separated contact-points 27 and 28, thereby bridging the electrical break therebetween with the electric conductor afforded by the said mercury. Such operation closes the electric circuit permitting the electric current to operatively circulate therethrough either to supply current to the motors for moving the elevator cars, or to actuate the release movement of any suitable locking or holding device adapted to normally hold against operation the hand-rope or levers of elevators operated by steam, water or the like, thus permitting the operator to control the movement of the elevator car up and down the elevator shaft. When however, (as shown in Fig. 4) the door 34 is opened, said trip-finger 36 is moved outwardly and away from its restraining engagement with said arm 22 of the oscillating member 20,

which thereupon, under the force of gravity or by the pull of the spring 23, drops or tilts downwardly and outwardly, with the result that the level of its mercury-pot 24 is shifted to an opposite inclination so as to cause the mercury 31 contained therein to flow outward and away from the electrically separated contact-points 27 and 28, thereby removing the bridge of electrical conductor therebetween. Such operation breaks or opens the electric circuit thus preventing the flow of electric current therethrough and stopping the operation of the elevator car, or permitting automatic locking or holding devices to again grip or lock the hand-rope or levers of cars operated other than by direct electrical means. It will thus be seen that so long as a door in the elevator shaft is open a car therein cannot be moved, and the operation of the car can only be effected when the doors are closed, thus making for the safety of passengers entering and leaving the cars, as well as the safety of the operator of the car.

While I have specifically mentioned the mercury or quicksilver as the movable medium carried in the oscillatable member 20, it must be understood that I do not limit myself to such material, since the circuit closing effect or engagement with the contact-points 27 and 28 may be accomplished by other means, such for example as a metal ball or sliding bolt arranged within the so called mercury-pot 24.

I am aware that the construction of the different parts of my novel apparatus above described may be varied, as well as the combinations and arrangements of such parts, hence, I intend to claim the device generically, and do not limit myself to the precise construction of the details thereof, nor do I limit myself to the exact arrangements and combinations of the various parts, or to the exact details of said parts, as described in the foregoing specification, or as illustrated in the accompanying drawings.

I claim:—

1. In a device of the kind described a casing, clamp-devices connected with the ends of said casing for securing thereto conduits carrying the electric circuit wires to be passed through said casing, an oscillating member pivoted within said casing, said casing having an opening in its walls giving access to said oscillating member, said oscillating member having a closed interior chamber, a pair of electrically separated contact-points supported in connection with said oscillating member so as to enter one end of said chamber, a movable medium in said chamber which is a conductor of electricity, said oscillating member being balanced on its pivot so as to normally tilt said chamber to maintain said movable medium normally out of contact with said contact-points, means for connecting said contact points electrically with the wires of an electric circuit passing through said casing, and means adapted to be moved into engagement with said oscillating member to so tilt its chamber as to move said movable medium into bridging contact with said contact-points.

2. In a device of the kind described a casing, a pivot post in said casing, an oscillatable member pivoted on said pivot post, said casing having an opening in its walls giving access to said oscillatable member, said oscillatable member having an inner chamber, means for closing said chamber, a pair of electrically separated contact-points adapted to enter one end of said chamber, fluid mercury adapted to be inclosed in said chamber, means for normally tilting said oscillatable member and its chamber to flow said mercury away from said contact-points, means adapted to be carried into engagement with said oscillatable member to tilt the same in an opposite direction to flow said mercury over said contact-points, stop means for limiting the tilting movements of said oscillatable member, an insulating base secured within said casing, a pair of binding-post devices mounted on said insulating base, electric conductors extending respectively from said contact-points to said respective binding posts, electric circuit wires passing through said casing, one of said circuit wires being broken and its separated ends respectively secured to said respective binding-post devices, a semi-circular neck-portion integrally formed at each end of said casing, a separable semi-circular neck-portion adapted to be registered with each integral neck-portion, means for securing said neck-portions together, said neck-portions providing clamp-devices within which tubular conduits carrying said circuit wires may be clamped in operative connection with said casing.

3. In a device of the kind described a casing, a pivot post in said casing, an oscillatable member pivoted on said pivot post, said casing having an opening in its walls giving access to said oscillatable member, said oscillatable member having an inner chamber, means for closing said chamber, a pair of electrically separated contact-points adapted to enter one end of said chamber, fluid mercury adapted to be inclosed in said chamber, means for normally tilting said oscillatable member and its chamber to flow said mercury away from said contact-points, means adapted to be carried into engagement with said oscillatable member to tilt the same in an opposite direction to flow said mercury over said contact-points, stop means for limiting the tilting movements of said oscillatable member, an insulating base secured within said casing, a pair of binding-post devices mounted on said insulating base,

electric conductors extending respectively from said contact-points to said respective binding posts, electric circuit wires passing through said casing, one of said circuit wires being broken and its separated ends respectively secured to said respective binding-post devices, and means within said casing for retaining said circuit wires adjacent to one side wall of said casing.

In testimony that I claim the invention set forth above I have hereunto set my hand this 19th day of November, 1915.

WILLIAM A. HOENEMAN.

Witnesses:
GEORGE D. RICHARDS,
ADOLPH HANSEN.