W. D. LUTZ.

ELEVATOR GATE CONTACT DEVICE.

APPLICATION FILED SEPT. 25, 1911.

1,182,283. Patented May 9, 1916.

Fig. 1.

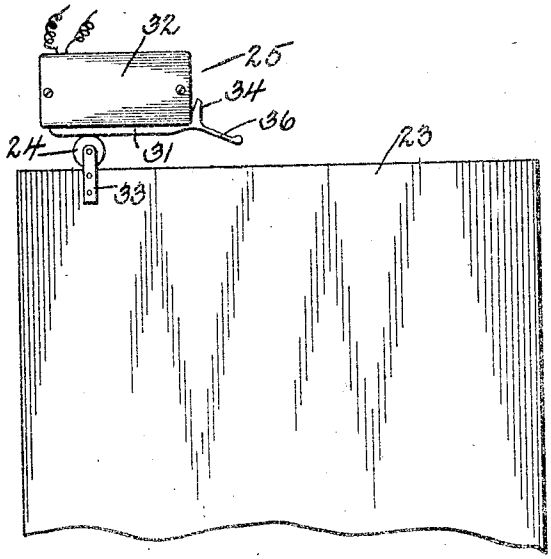


Fig. 2.

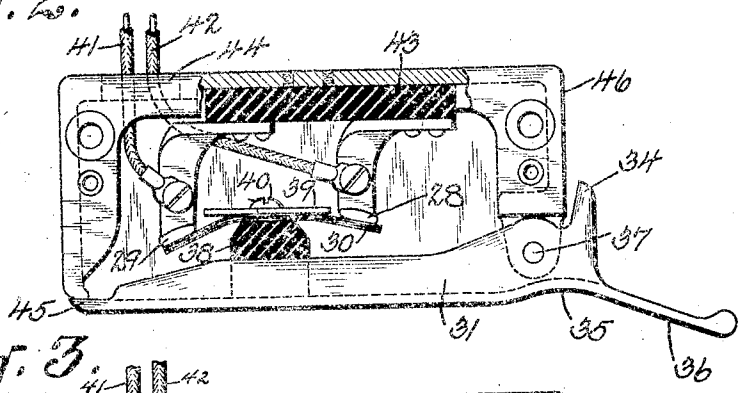
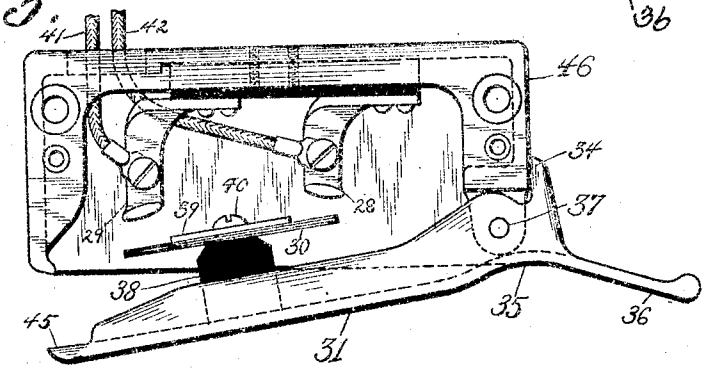


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM D. LUTZ, OF ALLENDALE BOROUGH, NEW JERSEY, ASSIGNOR TO OTIS ELEVATOR COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ELEVATOR-GATE CONTACT DEVICE.

1,182,283. Specification of Letters Patent. Patented May 9, 1916.

Application filed September 25, 1911. Serial No. 651,109.

To all whom it may concern:

Be it known that I, WILLIAM D. LUTZ, a citizen of the United States, residing in the borough of Allendale, in the county of Bergen and State of New Jersey, have invented a new and useful Improvement in Elevator-Gate Contact Devices, of which the following is a specification.

My invention relates to improvements in contact devices such as are used in connection with the gates or doors of elevators for the purpose of rendering the elevator inoperative unless the gate be in closed position.

An object of the invention is the provision of a contact device which is absolutely certain in its action under all conditions.

Other objects will appear hereinafter, the novel combinations of parts being pointed out in the appended claims.

In elevator installations it is the usual practice to employ safety devices in connection with the landing doors or car gates or both, so that the car cannot be operated until and unless these closures are in closed position. This is particularly true in the case of automatic elevators where some such device is not only very essential, but in some localities is required by law.

While the usual contact device gives more or less satisfaction, under favorable conditions it is not reliable, and frequently is the source of much trouble owing to its failure to act at the proper time, and this introduces an element of danger, thereby defeating the very object for which it was intended. Furthermore the usual contact device often employs a spring to open the contacts as the gate or door is opened at a landing and the spring frequently fails to work since any arcing at the contacts is liable to cause them to weld or stick together.

Since the gate contacts and the door contacts are generally connected in series with each other and include the car operating circuit, it is readily seen that if anyone of these contacts becomes disabled the whole system becomes inoperative and in order to determine which one of the contacts is at fault it is necessary to inspect each one in turn, a job which takes considerable time and causes an unnecessary delay particularly where the elevator is in constant use. Then again an elevator attendant will often start and stop the car by opening and closing the gate or landing doors rather than use the car switch or other operating device. This of course causes arcing at the door contacts and as before pointed out tends to destroy their usefulness.

My invention overcomes all of these objectionable features found in other contact devices and in order to understand the invention reference is had to the accompanying drawings in which—

Figure 1 is a diagrammatic representation of a typical electric elevator system embodying my invention; Fig. 2 is an enlarged view of the contact device and car gate; while Figs. 3 and 4 show the contact device in closed and open position, respectively, with the cover removed so as to show the working parts.

Referring to Figs. 1, 2 and 3, it will be seen that the contact device comprises a cast metal casing 46 provided with a cover 32 which has been removed in Figs. 2 and 3, so as better to show the interior parts. The bottom of the casing is open and contains a contact lever 31 which is pivoted at 37. This lever carries a block of insulation 38 to which is fastened a flexible contact or bridging piece 30 made up of a number of thin strips of copper or bronze. These strips are secured together and to the block 38 by a screw 40, a washer 39 being placed on top of the strips so as to stiffen them and prevent vibration.

29 and 28 are a pair of fixed contacts which coöperate with the bridging contact 30 and are secured to a block of insulation 43 which is fastened to the top of the casing by screws or otherwise. Conductors 41 and 42 lead out of the casing through a hole 44 and are secured by cable terminals to each of the fixed contacts 29 and 28. The lever 31 due to its own weight tends to move downwardly and assume the position shown in Fig. 3 being limited in its downward movement by the stop 34 engaging the side

of the casing. The lever is limited in its upward movement by reason of the lip 45 as shown in Fig. 2. The lower side of the lever 31 is substantially a plain surface for a portion of its length and toward one end 36 it extends at an angle, an intermediate portion being recessed at 35.

When the door or gate is in open position the lever 31 is always down and the contacts 29 and 28 are separated. As the door is closed the roller 24 thereon strikes against the plain surface of this lever and forces it upwardly, carrying the contact member 30 into engagement with the fixed contacts, the spring tension of the member 30 insuring a good electrical contact. It will be noted that the member 30 not only forms an abutting contact but a sliding contact as well, for after the member 30 first engages the fixed contacts a further upward movement of the same produces a rubbing contact, thereby keeping the contact surfaces bright and clean and insuring a firm electrical connection therebetween. In opening the door or gate the roller thereon is moved off of the plane surface of the lever and beneath the recess 35 thereby permitting the lever to drop by its own weight and separate the contacts. If for any reason the lever refuses to drop and open the contacts at this time, a further movement of the door to open position carries the roller 24 against the angular portion 36 of the lever and the latter is positively moved so as to open the contacts. This positive opening feature is of great value since it insures that the door cannot be moved to open position without first effecting an opening of the contacts, also the door cannot be closed without forcing the lever upwardly and closing the contacts.

While I have shown my improved contact device as being applied to the gate or door in the elevator car, it is to be understood that it may equally well be applied to the landing doors or any other closure whether the same be swinging or sliding. Where two or more contact devices are used, I prefer to connect the contacts in series relation in a controlling circuit of the elevator.

The contact device may be so proportioned and located with respect to the roller carried on the door that a very slight movement of the latter toward open position will operate to open the contacts but this is not absolutely necessary since it is feasible to permit the door or gate to open a short distance before operating the contacts providing the amount of opening is not sufficient to permit the passage of a person therethrough.

I have shown and described a preferred form of my invention, but it will be understood that various changes in details could readily be made by those skilled in the art without departing from the spirit and scope of the invention.

What I claim as new and desire to have protected by Letters Patent of the United States is:—

1. In a door contact device, the combination of a casing, contacts mounted within said casing, a pivoted lever carrying a contact member adapted to coöperate with said contacts, a door, and a member carried by the said door and movable therewith for positively operating said contact member into and out of engagement with said contacts.

2. In a door contact device, the combination of a casing, contacts mounted on the casing, a contact member adapted to open and close a circuit through said contacts, a door, a lever carrying said contact member and adapted by reason of its weight to move said contact member in open-circuit position, a member carried by the door, adapted to engage and positively to move said lever into closed circuit position and also to move out of engagement with the lever whereby the latter will automatically move to open circuit position, and a projection on said lever adapted to be engaged by said door member positively to move the lever into open circuit position.

3. In a door contact device, the combination with a door, of a member carried by the door and movable therewith, a casing, contacts mounted therein and a lever pivoted to the casing and carrying a contact adapted electrically to engage said contacts, said member being adapted positively to rock the lever about its pivot in both directions to effect the engagement and disengagement of said contacts upon the opening and closing of the door.

4. In a door contact device, the combination with a door, of a contact casing having fixed contacts mounted therein, a lever pivoted to the casing, a contact member carried by said lever and co-acting with said fixed contacts, and a member carried by the said door adapted when moved in one direction positively to move the said lever in circuit closing position and when moved in another direction positively to move said lever in circuit opening position.

5. In a door contact device, the combination with a door, of a contact casing, fixed contacts mounted within the casing, a lever pivoted to the casing and carrying a contact adapted to co-act with said fixed contacts when the said lever is rocked upon its pivot, and a member secured to the door adapted positively to rock said lever in both directions to effect a positive opening and closing of the said contacts.

6. In a door contact device, the combination with a door, of a contact casing, fixed contacts mounted within the casing, a lever pivoted to the casing and carrying a contact adapted to co-act with said fixed contacts when the said lever is rocked upon its pivot,

angular portions of said lever on each side of the pivot, and a member carried by the door adapted to engage each of said angular portions of the lever and thereby positively force said lever-contact into and out of electrical engagement with said fixed contacts.

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

WILLIAM D. LUTZ.

Witnesses:
SCHUYLER PHILLIPS,
GEORGE E. BOECKLIN.