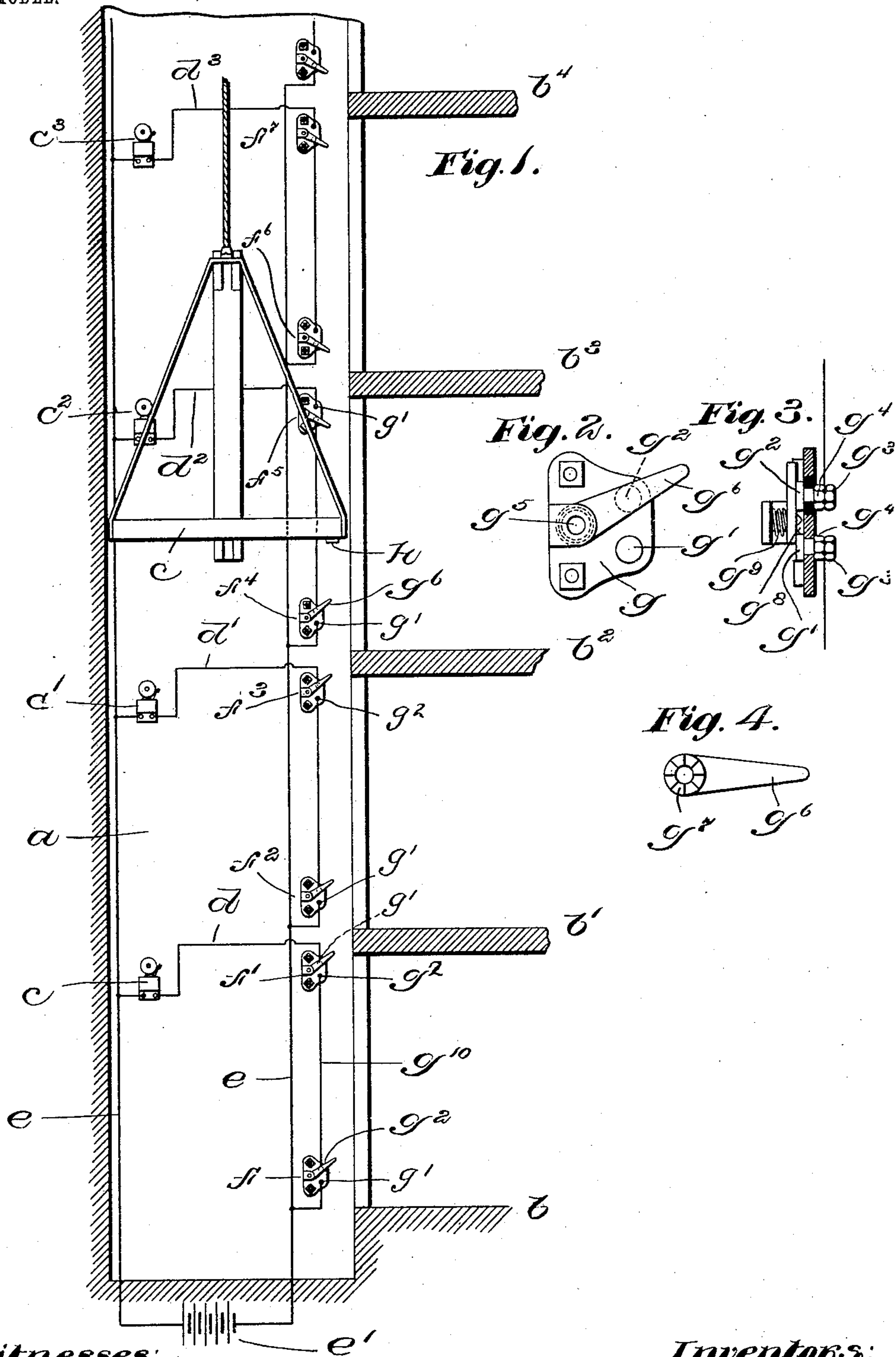


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ALARM SIGNAL FOR ELEVATORS.
APPLICATION FILED JULY 30, 1902.

NO MODEL.



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UNITED STATES PATENT OFFICE.

EDWARD L. HAIL AND GEORGE HAIL, OF PROVIDENCE RHODE ISLAND.

ALARM-SIGNAL FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 732,737, dated July 7, 1903.

Application filed July 30, 1902. Serial No. 117,718. (No model.)

To all whom it may concern:

Be it known that we, EDWARD L. HAIL and GEORGE HAIL, of Providence, in the county of Providence and State of Rhode Island, have
5 invented certain new and useful Improvements in Alarm-Signals for Elevators, of which the following is a specification.

This invention has relation to alarm-signals for elevators employed for the carrying of
10 freight, having for its object to provide certain improvements therein by means of which the mechanism is simplified and rendered more economic in maintenance than has heretofore been the case.

15 On the accompanying drawings, Figure 1 represents somewhat conventionally an elevator-well equipped with the invention. Fig. 2 represents one of the switches which we employ. Fig. 3 represents a section through the
20 same. Fig. 4 represents the movable member of the switch.

On the drawings the elevator-well is indicated at *a* and the floor of the landings at *b*, *b'*, *b²*, *b³*, and *b⁴*. At each landing there is the
25 usual door, through which access may be had to the elevator-well. The car is indicated at *c* and is controlled by the usual mechanism, which we have deemed unnecessary to illustrate. In the well there are located a series
30 of electromagnetic bells or signals *c*, *c'*, *c²*, and *c³*, each signal being located between the floors of two adjacent landings, so that it will be audible to a person at either of said landings. The alarms are arranged in branch circuits
35 *d*, *d'*, *d²*, and *d³* in multiple with a main circuit *e*, which includes an electric generator, such as a battery, (indicated conventionally at *e'*.) Each of the branch circuits includes in addition to the signal two switches, the
40 movable members of which are adapted to be actuated by the car, which is provided with a contact for this purpose. The two switches are located one immediately above the floor of one landing and the other immediately be-
45 low the ceiling of the landing thereabove, there being a space between the upper switch of one branch circuit and the lower switch of the adjacent circuit through which the car may travel before either of the switches is ac-
50 tuated. This space is provided so that when the car is at rest substantially at a level with the landing the branch circuits will all be

broken, so that no signal will sound. The switches are indicated at *f*, *f'*, *f²*, *f³*, *f⁴*, *f⁵*, *f⁶*, and *f⁷*, and each consists of a base-plate *g*,
55 which may be attached by suitable screws or bolts to the wall of the elevator-well. Said base-plate is provided with two contacts *g'* and *g²*, (the latter being insulated from the base-plate,) formed with suitable devices by means
60 of which the conductor-wires may be attached thereto. As illustrated, each contact consists of a headed bolt, on which the binding-nuts *g³* *g⁴* may be screwed. Fulcrumed on a stud *g⁵* there is a switch-lever or movable
65 member *g⁶*, having in its hub teeth *g⁷*, adapted to engage supplemental teeth *g⁸* on the base-plate. The lever is adapted to move axially of the stud to permit it to swing thereabout, being held yieldingly against the teeth *g⁸* by
70 a spring *g⁹*. The teeth are so formed as to automatically position the member *g⁶* with respect to the contacts and to return it into position to be engaged by a contact *h* on the car
75 after it has been thrust aside by said contact during the travel of the car. In each pair of switches—as, for instance, *f* *f'* or *f²* *f³* or *f⁴* *f⁵*—the insulated contacts are located in different positions, and therefore while in Fig.
80 3 the insulated contact *g²* is shown as above that at *g'*, yet in the other switch that is used in connection therewith in the same branch circuit the insulated contact *g²* must be below that at *g'*. In other words, their
85 positions are simply reversed. In Fig. 1 the arms *g⁶* of the switches *f⁴* *f⁵* are both in contact with the insulated contacts, so as to cause the closing of the branch circuit *d* through the alarm *c²*. The insulated contacts of each
90 pair of switches, as *g²* in switches *f* and *f'*, are connected by a conductor *g¹⁰*, the other contacts being electrically connected with the switch members. By reason of this construction and arrangement it is necessary
95 that the switch members should both be in engagement with the insulated contacts, as shown at *f⁴* and *f⁵*, in order to close the branch circuit in which they are located and cause the signal to sound.

The operation of the device is as follows: 100
Assuming that the car starts from the position shown in Fig. 1 and travels downward, at the position shown the signal *c²* is sounding; but as the car travels downward the contact *h* will

engage the switch member g^6 of the switch f^4 and force it downward, so as to break the branch circuit d^2 . Should the car be stopped at this point, its floor would be substantially
 5 at a level with the floor of the landing b^2 and no signal would be sounding. As the car continues downward, however, it moves the lever of the switch f^3 into position to close the branch circuit d' , the lever of the switch
 10 f^2 having been moved upwardly against the insulated contact when the car during the previous trip moved upward. Upon the closing of the circuit d' the alarm or signal c' immediately begins to sound and continues
 15 sounding during the time that the car moves from the landing b^2 until the lever of switch f^2 is operated to break the circuit. As the car travels downward all of the levers of the switches are moved downward, as in-
 20 dicated by the position of the levers above the car in Fig. 1, and as the car moves upward the levers are correspondingly moved upward, as shown by the switches below the car in the last-mentioned figure. It is
 25 obvious that the alarms cease sounding only when the floor of the car is substantially at a level with the floor of the landing and that should the car creep away from the landing-floor at any time a switch will be
 30 thrown and a signal will sound to indicate to persons working near the well that the car had moved. The action of the switches and the sounding of the signal is entirely independent of any action of the controlling
 35 mechanism and depends solely upon the travel and location of the car.

We do not herein claim "the construction with an elevator-car, and a plurality of landings, of an electric circuit having therein a
 40 sounding device, and automatic means independent of the landing-doors for breaking the circuit when the car is opposite each of the landings and for closing said circuit as the car travels between the landings to give warn-
 45 ing that the car is in motion," as it forms the subject-matter of our application, Serial No. 105,487, filed May 1, 1902.

Having thus explained the nature of the invention and described a way of constructing
 50 and using the same, although without attempting to set forth all of the modes of its use or

all of the ways in which it may be made, we now declare that what we claim is—

1. The combination of an elevator-car, a series of alarms at the landings, and means
 55 for sounding an alarm at the landings successively as the car moves up and down, said means including a series of independent or isolated branch circuits in the well, a contact on the car adapted to close said branch cir-
 60 cuits successively as the car travels, a source of electrical supply connected with all of said alarms and said branch circuits, said branch circuits and said contact on the car being rela-
 65 tively arranged whereby the branch circuits are open and the alarms are silent only when the floor of the car is substantially at a level with the floor at a landing.

2. The combination of an elevator-car, a series of alarms at the landings, and means
 70 for sounding an alarm at the landings successively as the car moves up and down, said means comprising a single main circuit including a source of electrical supply, and a branch circuit at each landing having a sin-
 75 gle alarm therein, and a contact on the car adapted to close said branch circuits and cause the sounding of said alarms as the car travels past said landings both up and down, all inde-
 80 pendently of the car-controlling mechanism.

3. The combination of an elevator-car, a series of alarms at the landings, and means
 85 for sounding an alarm at the landings successively as the car moves up and down, said means comprising a single main circuit including a source of electrical supply, and a branch circuit at each landing having a sin-
 90 gle alarm for said landing, and a contact on the car adapted to close said branch circuit and cause the sounding of said alarm as the car travels past said landing both up and
 95 down, and to continue sounding as long as the said contact remains within the limit of said branch circuit irrespective of whether or not the car is moving.

In testimony whereof we have affixed our signatures in presence of two witnesses.

EDWARD L. HAIL.
 GEORGE HAIL.

Witnesses:

HENRY A. GREENE,
 AUGUSTA ALLEN.