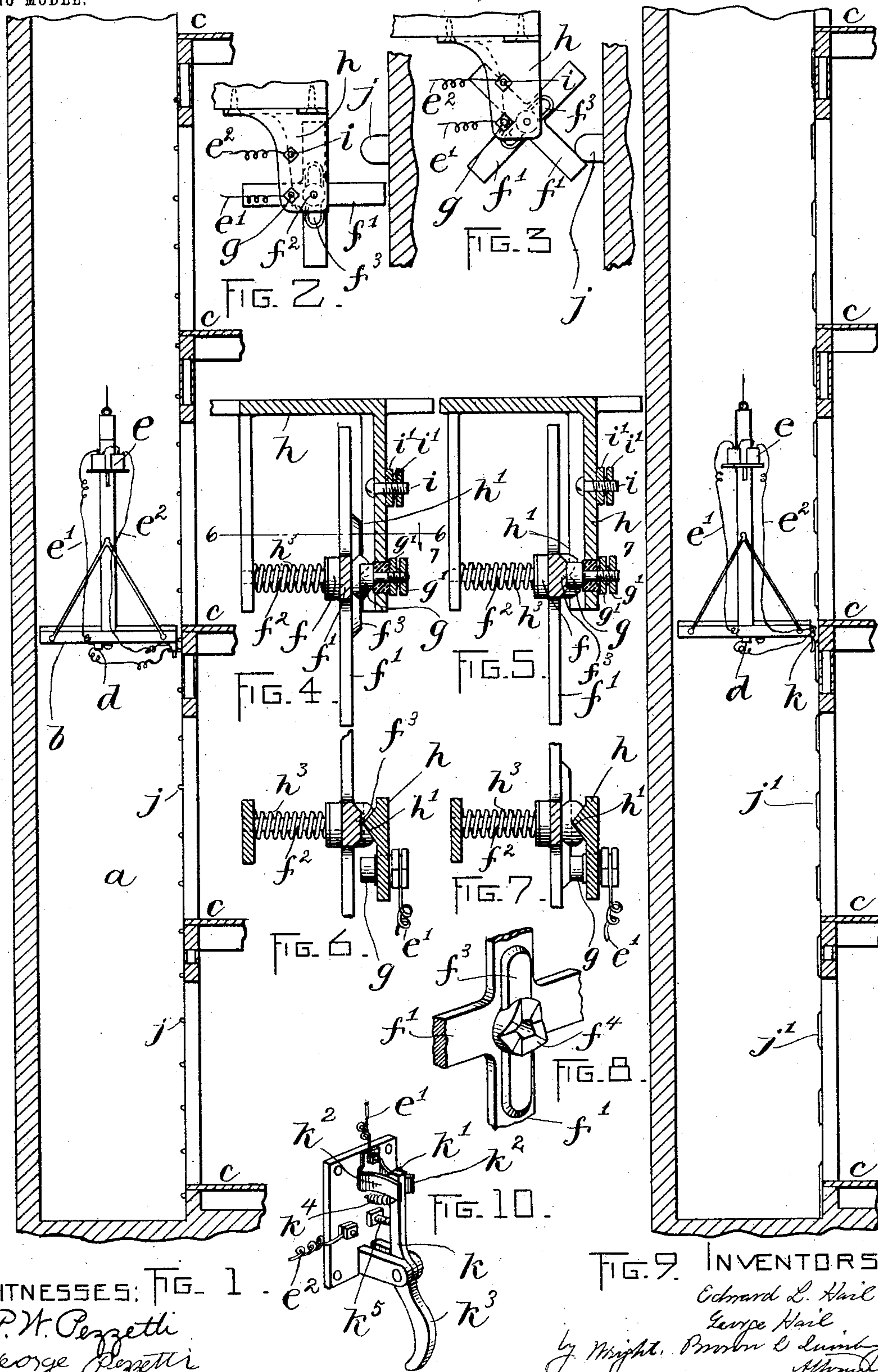


E. L. & G. HAIL.  
ALARM SIGNAL FOR ELEVATORS.

APPLICATION FILED MAY 1, 1902.

NO MODEL.



WITNESSES: FIG. 1.  
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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. 743,493, dated November 10, 1903.

Application filed May 1, 1902. Serial No. 105,487. (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 automatic alarm-signals for elevators, and has for its object to provide certain improvements therein  
 10 by means of which the alarm will be caused to sound at intervals as the car travels up and down the elevator-well.

Of the accompanying drawings, Figure 1  
 15 represents an elevator-well, a car therein, and the automatic alarm apparatus. Figs. 2 and 3 represent different positions of the automatic switch, the said switch being shown as in the act of moving in Fig. 3. Figs. 4 and 5 represent  
 20 enlarged sections through the switch to show it in the two positions which it assumes. Fig. 6 represents a section on the line 6 6 of Fig. 4. Fig. 7 represents a similar section through Fig. 5. Fig. 8 represents a perspective view  
 25 of the switch with the arms broken off, showing the alternate teeth and notches. Fig. 9 represents another embodiment of the invention in which a different form of switch is employed. Fig. 10 represents a perspective  
 30 view of a switch employed in the apparatus shown in the figure last referred to.

Referring to the drawings, there is shown thereon an elevator-well (indicated at *a*) and a traveling car, (indicated at *b*.) The mechanism for controlling the travel of the car and the car-hoisting mechanism are not illustrated, as they in no wise coact with the invention forming the subject-matter hereof. The various landings are indicated at *c c* and are  
 40 equipped with gates, doors, or other analogous movable obstructions.

The alarm apparatus includes an electric bell, (indicated somewhat conventionally at *d* both in Figs. 1 and 9,) the electric circuit including said bell and also including a battery  
 45 or generator *e*, conductor-wires *e'* *e''*, and a switch which is automatically actuated as the car moves up and down to open and close the circuit at intervals. The alarm, the generator, and the switch are all located upon the  
 50 car, and extending up the wall of the well are

devices which coact with the switch for effecting or controlling its operation.

The switch which is employed in the apparatus illustrated in Figs. 1 to 8 consists of a  
 55 star-wheel *f* with radial points, teeth, or arms *f'*. The hub of the star-wheel is journaled upon a shaft *f''*, mounted in a bracket *h*, attached to the car. The multiple-pointed switch is formed with a raised contacting  
 60 surface *f'''*, which extends on both sides of its center some little distance, as shown in Figs. 3, 4, and 7, so that when the switch is rotated the opposite ends of the contacting surfaces will alternately engage the stationary contact  
 65 *g*, consisting of a headed bolt secured to but insulated from the bracket *h*. The threaded end of the bolt receives the binding-nuts *g'*, between which the ends of the conductor-wire *e'* may be engaged, as shown in Figs. 6 and 7. 70  
 The conductor-wire *e''* is electrically connected with the bracket *h* by means of the bolt *i* and the binding-nuts *i'*. The hub of the multiple-pointed switch is provided with alternating teeth and notches *f''''*, as shown in Fig. 8, 75  
 coacting with teeth *h'*, formed on the bracket *h* and constituting a stationary lock. The switch is adapted to move longitudinally of the supporting-shaft *f''*; but it is held against the teeth *h'* by a spring *h''*. The function of 80  
 the coacting teeth *h'* and *f''''* is to insure the movement of the multiple-pointed switch one-fourth of its rotation and also to hold the said switch yieldingly against movement at the end of each quarter of a rotation. At 85  
 all times one of the points or arms of the switch projects sufficiently to engage one of a series of stops or projections *j*, arranged at intervals the length of the elevator-well. As the car moves the stops will be successively 90  
 engaged by the points of the star-wheel or switch, and the said switch will receive, therefore, a step-by-step rotation, whereby the movable contacting surfaces *f'''* of the switch will be successively engaged with and disen- 95  
 gaged from the stationary contact *g*, so as to successively make and break the circuit through the alarm *d*. Preferably these projections or stops are so arranged in the well that the bell or alarm will not sound when 100  
 the car is caused to stop at a level with any one of the landings *c*—that is, with the floor



of the car practically opposite the floor of the landing—whether the car has ascended or descended to the landing. In Figs. 9 and 10 the same object is secured by providing the wall of the well with a series of elongated projections  $j'$  and inserting in the electric circuit in lieu of the switch  $f$  a pivoted switch  $k$ , whose end  $k'$  is moved out of engagement with the spring stationary contacts  $k^2$  by the engagement of the cam-shaped or curved end  $k^3$  of the switch with the contacts  $j'$ . A spring  $k^4$  is employed for normally holding the end  $k'$  of the switch in engagement with the stationary contacts, and an adjustable stop  $k^5$  is employed to limit the movement of the switch toward operative position. The spring-contact  $k^2$  is insulated from the base of the switch and is provided with two arms or portions properly curved to receive the end of the switch  $k$  between them. According to this construction as the car moves up and down the elevator-well the switch  $k'$  is automatically at intervals caused to contact with and move away from the stationary contacts  $k^2$  by the automatic engagement of the end  $k^3$  with and its disengagement from the stops or projections  $j'$  in the elevator-well.

It will be observed that the alarm signal mechanism is operated independently of any car-controlling mechanism and of the doors at the landings. In this respect it differs from systems in which the actuation or non-actuation of the alarm depends upon the opening or closing of a door or any movement of the car-controlling mechanism.

Having thus explained the nature of the invention and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. The combination with an elevator-car and a plurality of landings, of an electric circuit, an electromagnetic alarm in said circuit, and automatic means other than said alarm for intermittently closing and breaking said circuit during the travel of the car in either direction from one landing to the next successive landing, to indicate by the alarm that the car is in motion.

2. The combination with an elevator-car and a plurality of landings, of an electric circuit including an electromagnetic alarm, and automatic means other than the alarm for intermittently closing and breaking said circuit when the car is in motion in either direction, whereby the alarm indicates the location of the car, said automatic means being constructed and arranged whereby said circuit is broken when the car is practically level with any one of said landings.

3. The combination with an elevator-car and a plurality of landings, of an electric circuit, an electric sounding device in said cir-

cuit, and automatic means independent of the landing-doors and the car-controlling mechanism for breaking the circuit when the car is opposite each of said landings, and for closing the circuit as the car travels in either direction between said landings.

4. The combination with an elevator-car and a plurality of landings, of an electric circuit, an electric sounding device in said circuit located on the car, and means independent of the landing-doors and the car-controlling mechanism for breaking the circuit when the car is opposite any one of the landings, and closing the circuit when the car is traveling in either direction between the landings to indicate the location of the car.

5. The combination with an elevator-car, of an electric circuit including an electromagnetic alarm on the car and automatic means to cause said alarm to sound during the travel of the car in either direction between the landings, and to be silent when the car is at a level with a landing.

6. The combination with an elevator-car and a plurality of landings, of an electric circuit including an alarm, a movable switch, a plurality of projections arranged on the wall of the well to engage and operate the switch as the car moves up or down the well, said projections being so arranged that the alarm is silent when the car is opposite one of the landings and that the switch is actuated to make and break the circuit alternately at intervals as the car moves from one landing to another.

7. The combination with an elevator-car and a plurality of landings, an electric circuit including an alarm on the car, and a movable switch mounted on the car, and a series of projections arranged on the wall of the well between the landings and adapted to be engaged by said movable switch to alternately make and break the circuit through the said alarm, while the car is traveling from landing to landing in either direction, to indicate that the car is in motion.

8. The combination with an elevator-car, of an electric circuit including an alarm on the car, a rotary switch on the car, and a series of projections arranged on the wall of the well and adapted to be engaged by said rotary switch to alternately make and break the circuit through the said alarm, said rotary switch having a plurality of projections adapted to be engaged by the said projections on the wall of the well.

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

EDWARD L. HAIL.  
GEORGE HAIL.

Witnesses:

HENRY A. GREENE,  
AUGUSTA ALLEN.