

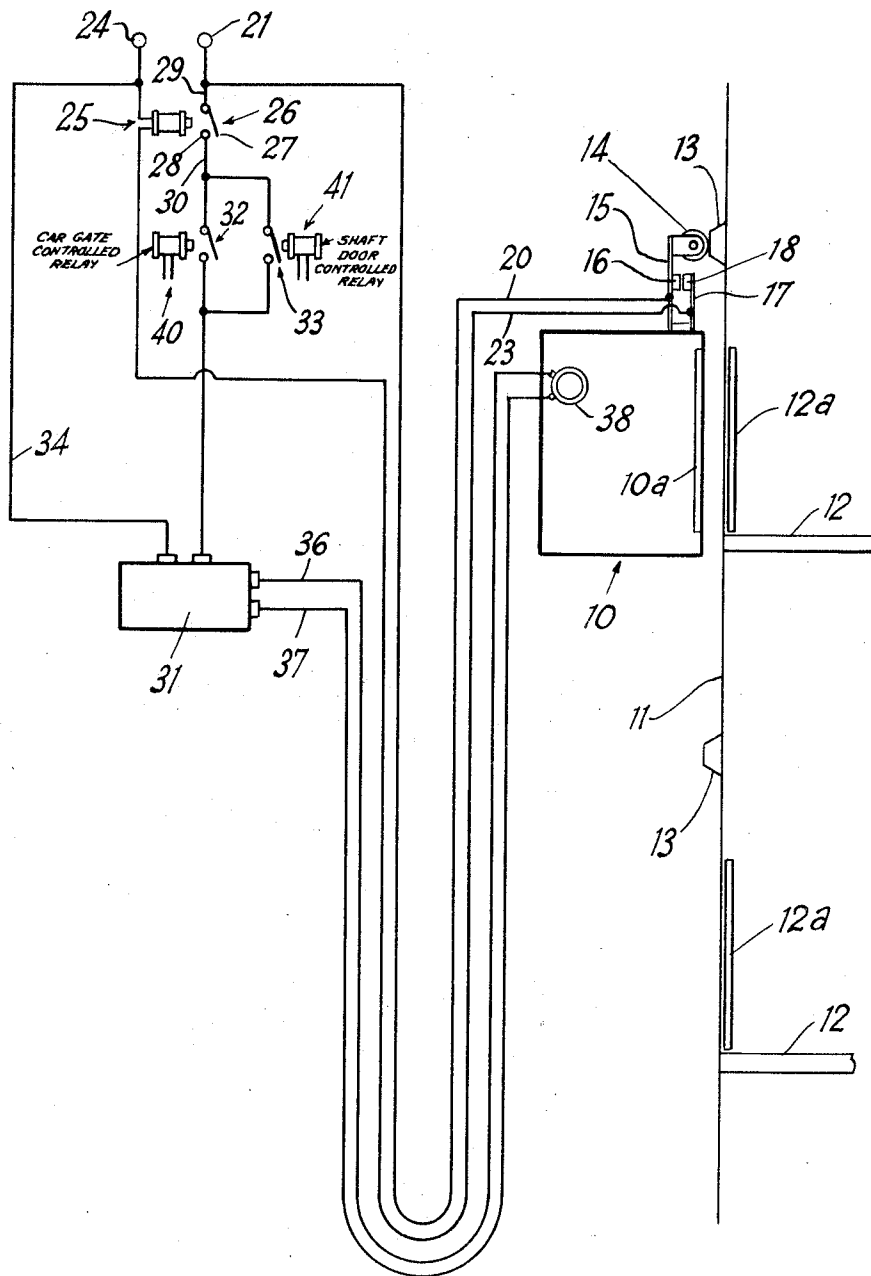
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ELEVATOR CONTROL SIGNAL SYSTEM

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ELEVATOR CONTROL SIGNAL SYSTEM

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This invention relates to elevator control signal systems.

An object of this invention is to provide a system of the character described having means to produce a signal should an elevator car stop more than a predetermined distance from the nearest floor stop or landing, and the door of the elevator is opening, or the elevator shaft door is open.

A further object of this invention is to provide a system of the character described comprising an audible warning signal in an elevator car, and means to operate the signal should the elevator stop more than a predetermined distance away from the nearest floor stop, the construction being such that said warning will automatically operate either while the elevator gate is being opened, or when the door of the elevator shaft is open.

In elevator systems as now constructed there is provided a gate relay which is energized only during the period that the elevator car gate or door is opening, and when the gate is fully opened the relay is deenergized. Also in present elevator systems there is sometimes provided a shaft door relay which is energized when all the doors of the elevator shaft are closed. When any of the elevator shaft doors are opened, such relay is deenergized. In accordance with the present invention, should the elevator be more than a predetermined distance away from a floor level, a relay is caused to close a contact in an amplifier circuit. In series with such contact is another contact controlled by the gate relay so that when the gate relay is energized upon opening of the inside gate of the elevator, the circuit to the amplifier is completed. When the gate is fully opened, the gate relay is deenergized and the contact controlled thereby opens again, but this time the door of the shaft may be opened. The door relay (which is energized when all the elevator shaft doors are closed) keeps another contact in parallel with the gate contact, in open condition when said relay is energized. When the door relay is deenergized by opening of the shaft door, the door contact is permitted to close to again complete the circuit to the amplifier. In accordance with the present invention, the amplifier is connected to a loud speaker in the elevator car and the loud speaker produces an audible warning signal when the amplifier is energized.

Another object of this invention is to provide an economical and durable system of the character described, which shall be sure and positive

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in operation, and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious, and in part hereinafter pointed out.

5 The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

10 In the accompanying drawing, in which is shown an illustrative embodiment of this invention, the single figure of the drawing is a diagrammatic sketch illustrating the invention.

15 Referring now in detail to the drawing, 10 designates an elevator car provided with a gate or sliding door 10a, and 11 designates the elevator shaft. In the drawing 12 designates the floor landings and 12a designates the shaft doors.

20 Fixed within the elevator shaft is a cam 13 for each landing so constituted as to be engaged by a roller 14 on the elevator car if the car stops at the level of the floor associated with said cam. Should the car stop more than a predetermined distance above or below the nearest floor landing 12, the roller 14 will not contact the cam. The term gate will be used to designate any car gate or sliding or car door.

30 The roller 14 is on a switch arm 15 suitably attached to the elevator car. On the switch arm 15 is a contact 16. On said elevator car is a switch arm 17 provided with a contact 18 adapted to be engaged by the contact 16 when the roller 14 is not in engagement with the cam 13. The arms 15 and 17 are preferably at the top or above the car. Contact 16 is connected by a flexible wire or conductor 20 to a feed line terminal 21. The wire or conductor 20 extends through the elevator shaft and has sufficient slack so that the elevator can move up or down in the shaft. Contact 18 is connected by another flexible wire or conductor 23 within the elevator shaft 11, to a second feed line terminal 24.

45 Interposed in conductor 23 is a relay 25. It will now be understood that should the elevator stop more than a predetermined distance from a floor level, contacts 16 and 18 will close to complete the circuit through the relay 25 which hence becomes energized.

50 Said relay 25 when energized is adapted to close a normally open switch 26. The switch 26 may comprise a contact arm 27, which when closed engages the fixed contact 28. Contact arm 27 is connected by wire 29 to feed line terminal 21.

Contact 28 is connected by wire or conductor 30 to one terminal of an amplifier 31. Interposed in wire 30 are a pair of switches 32 and 33. The switches 32 and 33 are each in series with switch 26, but in parallel with each other.

The second terminal of the amplifier is connected by wire 34 to the feed line terminal 24. Thus to energize the amplifier 31, switch 26 must be closed and in addition either one of the switches 32 or 33 must be closed. The amplifier 31 is connected by flexible wires 36 and 37 to a loud speaker 38 disposed within the elevator car 10. The wires or conductors 36, 37 are flexible and hang within the elevator shaft 11 to permit the elevator car to move up and down in the shaft. The amplifier 31 may be of any suitable type. It may be film operated like a moving picture radio amplifier, or it could have a steel tape or a record instead of film, or it may be of any suitable construction.

When the circuit to the amplifier is completed, the amplifier will cause the audible warning signal at the loud speaker 38. The warning signal may be the words "watch your step" audibly sounded and such warning may be repeated continuously as long as the circuit to the amplifier is closed.

The switch 32 is normally opened. It may be called a gate contact. This gate contact is closed by a relay 40. The relay 40 may be energized only during the period that the gate on the car is opening. When the gate is fully opened, the relay 40 is deenergized. The switch 33 is controlled by a relay 41. When the relay 41 is energized, it opens switch 33. The relay 41 is energized if all the doors in the elevator shaft are closed. When the relay 41 becomes deenergized, switch 33 closes. When the gate on the elevator door is fully opened, the relay 40 is deenergized permitting switch 32 to open and at this time or soon thereafter the shaft door at the floor level near the elevator car will open, and when any shaft door opens, the relay 41 is deenergized to permit closing of contact 33. Thus should the car stop at a point more than a predetermined distance from the nearest floor level, contacts 16, 18 close to energize relay 25 for closing switch 26. Then when the operator causes the elevator car gate 10a to open, switch 32 closes and the warning signal sounds. At the time the gate of the elevator car is fully opened, the outer or elevator shaft door 12a may be opened for causing closing of switch 33 so as to continue closure of the amplifier circuit and the warning signal continues operation. When the car gate 10a is not in opening motion and the elevator shaft doors 12a are all closed the amplifier is deenergized.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In combination, an elevator shaft, an elevator car in said shaft, said shaft being provided with a door on each landing, a gate on said elevator car, a signal in said car, and means to actuate

said signal upon stopping the car more than a predetermined distance from the nearest landing in said shaft, and the elevator car gate is being opened or the door at said landing is open, said means comprising a switch on the elevator car in normal condition when the car is more than a predetermined distance from the nearest landing, and means in the elevator shaft to actuate said switch to abnormal condition when the elevator car is less than a predetermined distance from a landing.

2. In combination, an elevator shaft, a shaft door at each landing, an elevator car, said elevator car being provided with a gate, a relay adapted to be energized during the initial opening movement of the gate and deenergized when the gate is fully open, a switch controlled by said relay, a second relay adapted to be energized when all the doors in the elevator shaft for said elevator are closed and deenergized when any door in the elevator shaft opens, a switch adapted to be opened when said second relay is energized and adapted to be closed when said second relay is deenergized, said switches being connected in parallel, a third switch in series with said first two switches, a relay controlling said third switch, means controlled by the car to energize said last relay, an amplifier in series with all of said switches, and a loud speaker within said elevator car controlled by said amplifier.

3. In combination, an elevator shaft, a shaft door at each floor level, an elevator car having a gate, in said shaft, a sound reproducing unit in the car, means to actuate said unit upon opening the elevator car gate, or upon opening a shaft door or upon opening both, when the car is more than a predetermined distance from a floor level.

4. In combination, an elevator shaft, a shaft door at each floor level, an elevator car having a gate, in said shaft, a sound reproducing unit in the car, means to actuate said unit upon opening the elevator car gate, or upon opening a shaft door or upon opening both when the car is more than a predetermined distance from a floor level, said means comprising an electrical circuit for said sound reproducing unit, a switch actuated by the opening of said gate, in said circuit in series with said unit, and a switch actuated by the opening of a shaft door in said circuit in series with said unit, said switches being in parallel, a switch actuated by the movement of said car, said last mentioned switch in series with said unit.

5. In combination, a door in said shaft, an elevator shaft, an elevator car movable in said shaft, a door on said car, an electrically actuated loud speaker in said car, an amplifier outside of said car, a circuit connecting said signal and said amplifier, and means responsive to the relative position of the car in the shaft to actuate said amplifier, and means controlled by the movement of the car door and shaft door to control said amplifier.

6. In combination, an elevator shaft, an elevator car in said shaft, said shaft being provided with a door on each landing, a gate on said elevator car, a signal in said car, and means to actuate said signal when the car is more than a predetermined distance from the nearest landing in said shaft, means dependent upon the opening of the elevator car gate to control said signal, and means controlled by opening of the door at said landing to control said signal.

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7. In combination, an elevator car, a gate on said car, an elevator shaft, shaft doors in said shaft, a switch, a relay, means controlled by the switch to energize said relay, an amplifier, a second switch in series with said amplifier, said relay being adapted to control said second switch, a pair of switches in parallel with one another and in series with said second switch and said amplifier, a car gate controlled relay and an elevator shaft door controlled relay controlling said pair of switches respectively, and a loud speaker controlled by said amplifier, means on said elevator car to actuate said first switch, and said loud speaker being disposed in said elevator car.

8. In combination, a switch, a relay, means controlled by the switch to energize said relay, an amplifier, a second switch in series with said amplifier, said relay being adapted to control said second switch, a pair of switches in parallel with one another and in series with said second switch and said amplifier, a car gate controlled relay and a shaft door controlled relay controlling said pair of switches, respectively, and a loud speaker, and means controlled by the amplifier to actuate the loud speaker, an elevator car, an elevator car door on said car, means on said elevator car to actuate said first switch, and said loud speaker being disposed in said elevator car, an elevator shaft for said car provided with a shaft door at each landing, means in the elevator shaft to control the means on the elevator car which actuates

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the first switch when the elevator car is more than a predetermined distance from a landing.

9. In combination, an elevator shaft, an elevator car movable relative to said shaft, a switch on said car, a relay controlled by said switch, means on the shaft for controlling said switch, an amplifier, a second switch in series with said amplifier, said relay controlling said second switch, a third switch in series with said second switch and with said amplifier, a car gate controlled relay controlling said third switch, a fourth switch in series with the second switch and said amplifier and in parallel with said third switch, a shaft door controlled relay controlling said fourth switch and a loud speaker on the elevator car controlled by said amplifier.

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