No. 880,152. PATENTED FEB. 25, 1908.

C. E. MOORE.

ELECTRIC SIGNAL FOR ELEVATORS.

APPLICATION FILED MAR. 7, 1906.

Fig. 1

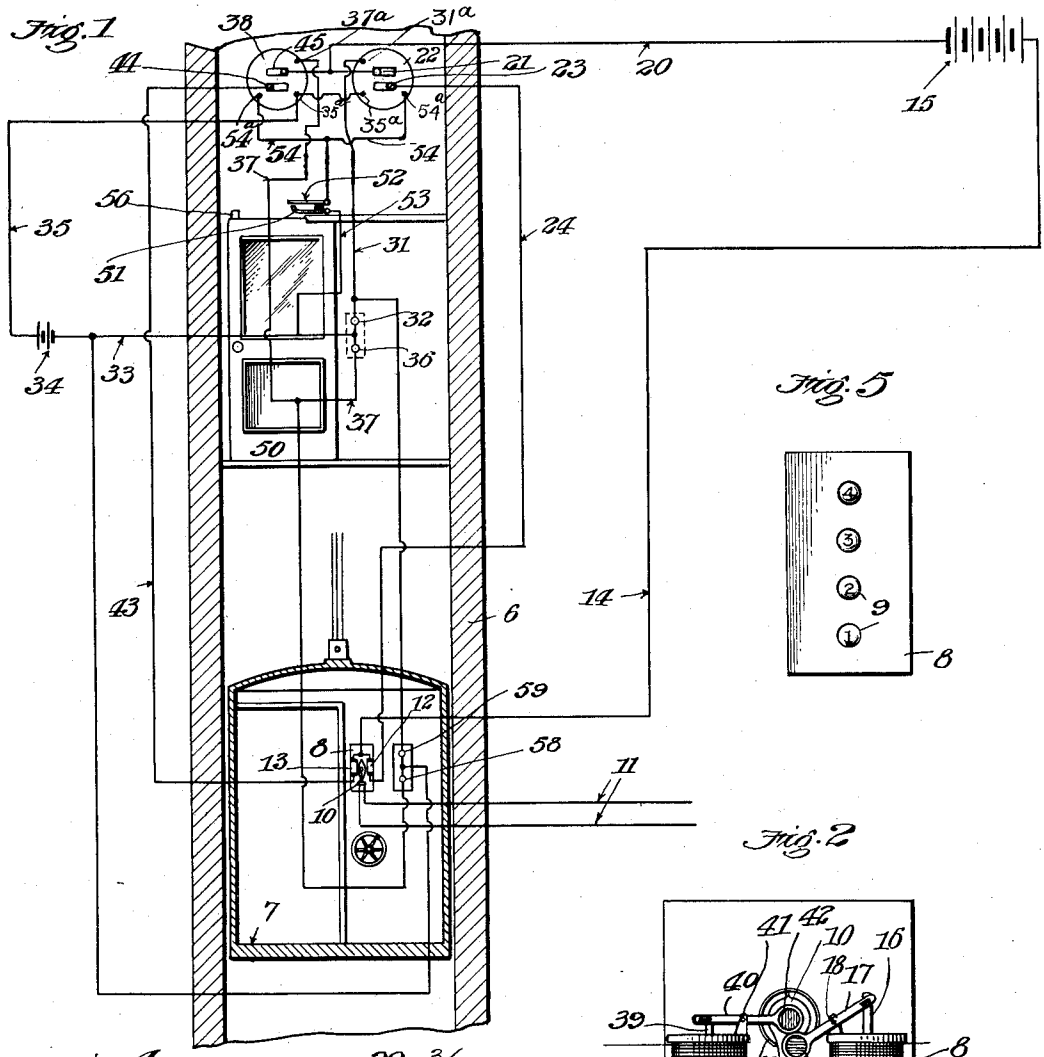


Fig. 5

Fig. 2

Fig. 4

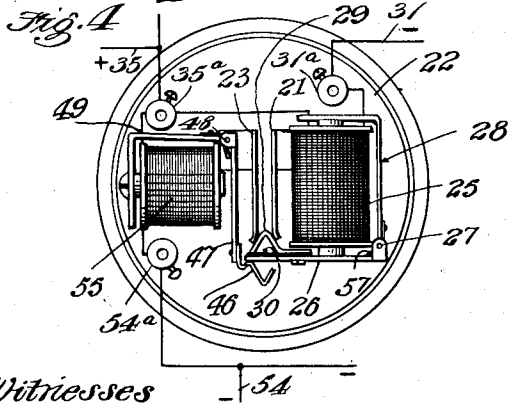
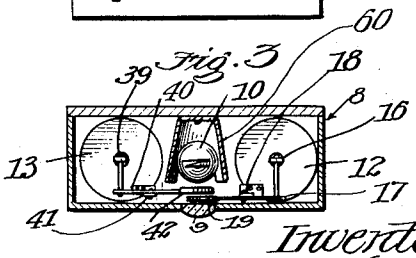


Fig. 3



Witnesses

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ELECTRIC SIGNAL FOR ELEVATORS.

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To all whom it may concern:

Be it known that I, CHARLES E. MOORE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Electric Signals for Elevators, of which the following is a specification.

My invention relates to signals displayed in an elevator cage; and the object thereof is to provide an efficient signal which will disclose to the operator in charge of the cage as soon as a passenger on a floor desires to go up or down from such floor and operates the signal button at that floor the direction the passenger desires to travel and the floor on which he is located. I accomplish this object by the mechanism described herein and illustrated in the accompanying drawings in which:—

Figure 1.—is a diagrammatic view of my signaling apparatus. Figs. 2 and 3.—are details of a portion of the color changing mechanism. Fig. 4.—is an enlarged detail of a switch used in my apparatus. Fig. 5.—is a front view of the signal box in the elevator cage.

In the drawings 6 is the elevator shaft of usual construction and 7 is the elevator cage which is moved therein in the usual manner by any appropriate mechanism. In the elevator cage and in plain view of the operator who has control of the cage is the signal box 8 which is provided with as many sight apertures 9 as there are floors in the building at which the elevator is required to stop. These sight apertures are numbered to correspond to the floors of the building.

In Fig. 5 I have shown the box as applied to a building containing four floors with the sight apertures numbered from one to four. These sight apertures are protected by uncolored glass, preferably ground or frosted glass. Behind these apertures and clearly visible therethrough is a source of artificial light, preferably an electric light 10 which is supplied by wires 11 with electrical energy from a source of supply, not shown.

At each side of the sight apertures are magnets, preferably solenoid magnets 12 and 13. One pole of magnet 12 is connected by line 14 to a source of electrical energy, which I have shown as battery 15, but where there is an electrical plant to supply electrical energy I prefer to obtain my electrical energy from such plant. Plunger 16 is connected to lever 17 which lever is pivoted at 18 to the casing of the solenoid. The free end of this lever carries a transparent colored disk 19, which when the magnet 12 is inert lies below and is not visible through the sight aperture. The other side of the battery 15 is connected by line 20 to contact 21 of switch 22. Switch 22 is provided with a contact 23 which is connected by line 24 with the other pole of solenoid 12. Switch 22 is provided with an electro-magnet 25 which is provided with an armature 26 that is pivoted at 27 to bar 28 secured to the base of the switch. The free end of the armature 26 is provided with a V-shaped contact strip 29 which is insulated from the armature by insulation 30. Contact strip 29 is adapted to engage the contacts 21 and 23, as shown in Fig. 4, whenever magnet 25 is energized and draws armature 26 within its magnetic field. One pole of electromagnet 25 is connected by line 31 from contact 31^a to the push button switch 32. The other side of this switch is connected by line 33 to one side of battery 34, the other side of battery 34 is connected by line 35 with the other pole of magnet 25. Push button switch 32 we will say is for the purpose of signaling when a passenger desires to go up in the elevator cage. Just below switch 32 is a similar switch 36, one side of which is connected by line 37 to one pole of an electro-magnet similar in construction to electro-magnet 25, carried by switch 38. The other side of switch 36 is connected to line 33, and line 35 is also electrically connected to the other side of the electro-magnet carried by switch 38.

Plunger 39 of the solenoid magnet 13 is operatively connected to lever 40 which is pivoted at 41 to the casing of the magnet. The free end of this lever carries a transparent colored disk 42, which when the magnet is inert lies below and is not visible through the sight aperture, but when the magnet 13 is energized is brought before the sight aperture as shown in Fig. 2 and thereby produces a colored light at the sight aperture in the signal box. One side of the solenoid 13 is connected to line 14 and the other side is connected by line 43 to contact 44

of switch 38. Contact 45 of switch 38 is connected to line 20. Switch 38 is complementary to switch 22 and is provided with like parts, which with the exception of contacts 37[a], 44, and 45 will be referred to by the use of the same numerals as are indicated on switch 22. Wire 35 runs to binding post 35[a] of switch 38 from which it branches running to magnet 55 and to the corresponding parts of switch 22. Wire 37 runs to binding post 37[a] from which it runs to magnet 25. Binding post 35[a] is also connected to magnet 25. Magnet 55 is also connected to binding post 54[a] from which wire 54 runs to a like binding post connected to a like magnet as in switch 22. Now assuming that these push buttons are on the third floor and a passenger desires to descend. He pushes button 36 thereby closing the circuit and energizing the electro-magnet carried by switch 38 which causes the armature of the electro-magnet carried thereby to connect contacts 44 and 45 in the same manner that contacts 21 and 23 are connected in Fig. 4. As soon as contact is made the free end of the armature passes below a hook 46 which is carried on the end of armature 47 which is pivoted at 48 to a bar 49 secured to the base of the switch. This hook prevents the disengagement of the contact strip carried by the armature from the contacts when the electro-magnet becomes inert, which will occur as soon as the person removes pressure from switch 36, thereby breaking the circuit through the magnet. As soon as these contacts are connected the circuit through the solenoid magnet 13 is established and the colored disk 42 is thrown before the sight aperture. Now if a passenger on the same floor should desire to go in the other direction he would push switch 32 which would close the circuit through the electro-magnet carried by switch 22 which would close the circuit through solenoid 12, thereby energizing it and causing it to bring the colored disk 19 before the sight aperture in the signal box for that floor. Colored disks 19 and 42 are of different colors. We will say that disk 42 is blue and disk 19 is red. Now when a red disk appears before the sight aperture it will indicate to the operator in the elevator cage that a person on the third floor desires to ascend. If a blue disk is brought before the sight aperture it will indicate that a person on that floor desires to decend As one is red and the other is blue when both disks are brought before the sight aperture at the same time the color will be purple which will indicate to the operator that there are persons on that floor some of whom desire to ascend and some to descend. When the operator gets to the third floor he opens the door 50. Secured to the top of the door is a spring contact 51 and just above contact 51 is a contact 52 which is insulated from contact 51. Contact 51 is connected by line 53 to line 33, and contact 52 is connected by line 54 to one pole of the electro-magnet 55 of switches 22 and 38. As the door is being opened spring contact 51 is brought into engagement with a bar 56 which causes contact 51 to engage contact 52 thereby closing the circuit and energizing magnets 55, of switches 22 and 38. Each magnet then attracts its armature 47 and causes the disengagement of hook 46 from armature 26, if at that time engaged, which last armature is then thrown downwardly by spring 57 and contact strip 29 is withdrawn from engagement with contacts 21 and 23 or 44 and 45 thereby breaking the circuit through the solenoid magnet which then becomes inert and the colored disks fall from in front of the sight apertures. If the operator cannot carry all the passengers which are on that floor, or if there are passengers to go up and down, and he is going down he operates a push switch 59 in the cage to notify the operators in the other cages that there are passengers to go up on that floor. Push switch 58 is connected up the same as push switch 36. A push switch 59 also located in the cage is connected up the same as push switch 32 so that the operator when going up and taking passengers from the floor can notify operators in other cages that there are more passengers on that floor desiring to go up. There are a pair of such switches for each floor. Where there are a number of elevators in a building it will be understood that the signal boxes in each elevator cage has the same connection to switches 22 and 38 that are herein described, and that each elevator cage has a signal box of the same character as that described herein and that in each case there are push buttons similar to push buttons 58 and 59 for each floor and connected up in the same manner.

By this construction it will be seen that where there are a number of elevators, the operators in each cage are immediately notified of the desire of passengers on the different floors to go up or down at the same time, and that they can therefore regulate the speed of their cars to stop at a floor or pass it, depending upon whether a colored or a clear light is shown in the signal box for the floor which the cage is about to reach, and that no matter how tall the building may be nor at what part of the same the elevator cage may be, the operator in each cage knows at what floors passengers desire to be moved from and what floors are clear from passengers. It will be seen that by using different colors to indicate the desire of passengers to go up and down that when there are passengers on the same floor that desire to go up and down that the throwing of the different

disks before the sight aperture at the same time a different color is produced at the sight aperture than is produced when a single colored disk is used, thus red and blue produce a purple, yellow and blue produce a green, and the combination of other colors produce still different effects.

A reflector 60 may be used to concentrate the light on the sight apertures.

Having described my invention what I claim is:—

1. A signal device for elevators comprising a signal box in the elevator cage having sight apertures therein, there being a sight aperture for each floor of the building; an artificial light in said signal box back of said apertures; two colored transparent disks adjacent to each of said apertures, said disks being of different colors and normally not in view through said apertures; magnets adjacent to said disks; a connection from said magnets to said disks, whereby both disks at any aperture may both appear before said aperture at the same time when the magnets are energized; a switch; a source of electrical energy; a connection from one pole of one of said magnets to said switch; a connection from said switch to said source of energy; and a connection from said source of energy to the other pole of said magnet; mechanism to hold said disks when brought before the apertures; and mechanism to release said holding mechanism.

2. A signal device for elevators comprising a signal box in the elevator cage having sight apertures therein, there being a sight aperture for each floor of the building; an artificial light in said signal box back of said apertures; two colored transparent disks adjacent to each of said apertures, said disks being of different colors and normally not in view through said apertures; electrical mechanism operatively connected to said disks for separately moving said disks before said sight apertures when energized, whereby both disks at any aperture may both appear before said aperture at the same time; mechanism at each floor for closing circuits whereby said electrical mechanism is energized; and mechanism for deënergizing said electrical mechanism upon the opening of the elevator door.

3. A signal device for elevators comprising a signal box in the elevator cage having sight apertures therein, there being a sight aperture for each floor of the building; an artificial light in said signal box back of said apertures; two colored transparent disks adjacent to each of said apertures, said disks being of different colors and normally not in view through said apertures; electrical mechanism for separately moving said disks before said sight apertures when energized, whereby both disks at any aperture may both appear before said aperture at the same time; means for rendering and holding said electrical mechanism energized; and means for releasing said holding means.

4. A signaling system for elevators comprising a plurality of sets of electrically operated chromatic signal devices, each set comprising signal devices of different color arranged to display their distinctive colors when operated separately and to display a blended color when operated conjointly; and corresponding sets of circuit controlling devices at different landings and circuit connections for controlling the respective signal devices of each set from the corresponding circuit controlling devices.

5. In an electric signal system for elevator cars, illuminating means; a plurality of sets of signal devices in the elevator car, each set comprising two transparent color screens means movable separately into position in front of the illuminating means, the color screen means of the two signal devices of each set being of different color; electromagnetic means for operating the said signal devices of each set, separately or conjointly, to display the distinctive color of each screen or the blended color of both screens; and a corresponding plurality of sets of switch devices at different landings of the elevator shaft, each set comprising two switch devices connected to operate the respective electromagnetic signal operating means of the corresponding set of signal devices.

6. A signal system for elevators comprising a plurality of sets of electrically operated signal devices in the elevator car, each set comprising two signal devices of different colors for up and down signals; illuminating means for illuminating said signaling devices when operated to display the color of each singly or to display a blended color when both are operated simultaneously; a corresponding plurality of sets of push buttons at the different landings connected to the electric operating means for the respective signal devices, one push button of each set being connected to operate one of the signal devices in the corresponding set and the other push button of each set being connected to operate the other signal device in the corresponding set; means for retaining the operated signal device circuits in operative condition; and means for restoring the said circuits to normal condition.

7. A signal system for elevators comprising a plurality of sets of electrically operated signal devices in the elevator car, each set comprising two signal devices of different colors for up and down signals, illuminating means for illuminating said signal devices when operated to display the color of each singly or to display a blended color when both are operated simultaneously; a corre-

sponding plurality of sets of push buttons at the different landings connected to the electric operating means for the respective signal devices, one push button in each set being connected to operate one of the signal devices in the corresponding set and the other push button of each set being connected to operate the other signal device in the corresponding set; and means for maintaining the operated circuit in closed condition; and means for opening said circuit.

In witness that I claim the foregoing I have hereunto subscribed my name this 1st day of March, 1906.

CHARLES E. MOORE.

Witnesses:
G. E. HARPHAM,
EDMUND A. STRAUSE.