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L. J. KINNARD

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ELEVATOR SIGNAL

Filed March 14, 1930

Fig. 1.

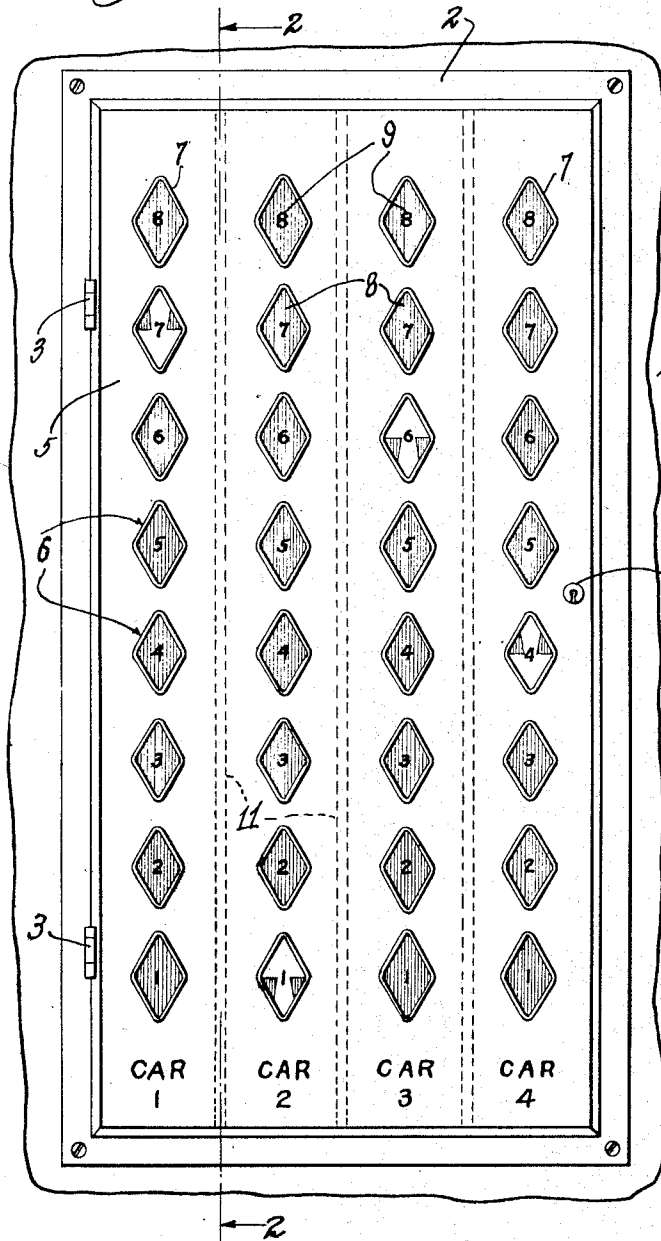


Fig. 2.

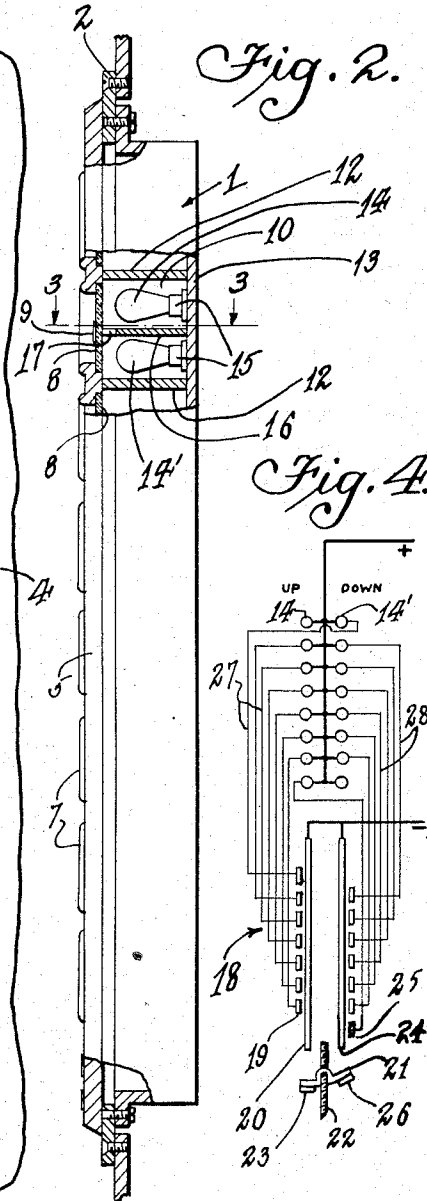


Fig. 4.

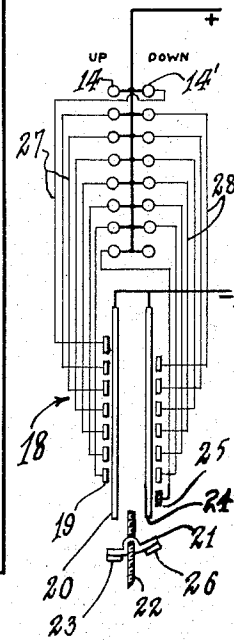
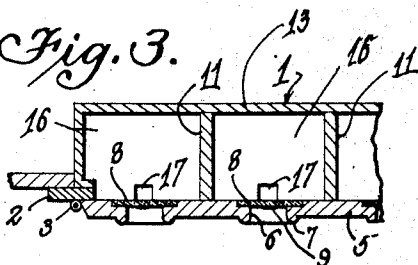


Fig. 3.



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ELEVATOR SIGNAL

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My invention relates to signal systems and has particular reference to signal systems utilized to indicate the position of an elevator car with respect to its floors.

5 In elevator operation it is desirable to indicate, either to persons within the car, or, to a dispatcher or attendant having charge of a group of elevator cars, the position of any one of the cars with respect to the floors which it serves.

10 Elevator car position indicators now used in the art usually comprise a plurality of illuminated elements, one for each of the floors served by the car, which are illuminated selectively in accordance with the position of the car adjacent the floor with which one of the signal elements is associated. These prior indicators, however, have the disadvantage that they do not indicate the direction in which the car is traveling, as well as the position of the car in its hatchway.

15 An object of my invention therefore is to provide a position indicator for elevators in which both the direction of motion of the car and the position of the car are communicated through the operation of a single device.

20 Another object of my invention is to provide a position indicator for an elevator car in which a translucent screen, one of which is provided for each of the floors, is illuminated in such manner as to indicate both the position of the car and the direction in which it is travelling.

25 Another object of my invention is to provide a position indicator of the character described in which the translucent screen, when not illuminated, presents the appearance of a diamond and when illuminated, presents the appearance of an arrow which points in the direction of travel of the car.

30 Another object of my invention is to provide a position indicator for elevators of the type described in which a single screen may be illuminated by either of two lamps, dependent upon the direction in which the car is travelling, the illumination of either of the lamps producing the effect of an arrow pointing in the direction of travel of the car.

35 My invention will best be understood from

the following description with reference to the accompanying drawings, wherein

Figure 1 is a front elevational view of a position indicator built in accordance with my invention for use with a bank of four elevator cars.

Figure 2 is a sectional view of my indicator taken along line II—II of Figure 1.

Figure 3 is a detail sectional view taken along line III—III of Figure 2.

Figure 4 is a diagrammatic view illustrating the manner in which the position indicating lights may be controlled in correspondence with the movements of the associated car.

Referring to the drawings, I have illustrated in Figures 1, 2 and 3 a position indicator comprising a box-like housing or casing 1 having a front plate 2 to which is secured, as by hinges 3 and lock 4, a movable cover plate 5.

The cover plate 5 is provided with a number of perforations or openings 6 therein, the openings preferably having the configuration of a diamond having its longer axis extending in the vertical direction. There are illustrated eight perforations in each of four lines, each perforation representing one of the eight floors served by a car and each of the lines or groups of perforations representing the indicators associated, respectively, with each of the four cars in the bank. Adjacent each line of perforations a suitable inscription may be secured to or embossed upon the cover plate to designate with which car in the bank the line of perforations is associated.

For example, the line of diamond shaped perforations on the extreme left hand side of Figure 1 has immediately beneath it the designation "Car 1", denoting the fact that this line of perforations is associated with car No. 1 of the bank. Similar inscriptions appear under each of the other lines to determine with which car each of these lines is associated.

A decorative border 7 may be provided around the boundary of each of the diamond shaped perforations 6 to enhance the appearance of the cover plate 5.

Each of the diamond shaped perforations 6 is provided with a translucent screen 8 to which may be attached a number inscription 9 indicating the floor with which the particular perforation and screen are associated. The screen is preferably so constructed that when not illuminated it is substantially opaque, but when illuminated will readily pass rays of light.

The casing or housing 1 is divided into a plurality of compartments 10 by means of vertical partitions 11 which divide the casing into four vertical sections, one for each of the line of diamond shaped openings, and a plurality of transverse partitions 12 which divide each section into a plurality of small compartments, one for each of the diamond shaped openings. The partitions 11 and 12 preferably extend from the rear 13 of the casing 1 to a position to close contact with the cover plate 5 so as to prevent passage of light from one of the compartments to the other.

In each of the compartments, I have illustrated a pair of lamps or other light sources 14 and 14', these lamps being secured in suitable receptacles or sockets 15, one of which is in the uppermost part of the compartment 10 and the other of which is in the lowermost portion of the compartment.

A light shield 16 is provided extending between the upper or "up" lamp 14 and the lower or "down" lamp 14' in each of the compartments, the shield 16 being arranged in substantial alignment with the smaller axis of the diamond shaped opening. Each of the light shields is arranged with its front edge in substantial contact with the screen 8 so as to prevent passage of light from one of the lamps to the other portion of the compartment in which it is mounted. Adjacent the central portion of the small axis of the diamond shaped opening the material of the shield 16 is cut away, providing a notch 17 in the shield so as to permit a limited passage of light from one of the lamps 14 or 14' to that part of the screen 8 which lies in the other portion of the compartment 10. The configuration of the notch 17 is such that when one of the lamps is lighted it produces a shadow on that part of the screen lying in the other section of the compartment 10, except for a relatively narrow band of light.

It will be observed that with a construction as described the position indicator will normally represent a plurality of unilluminated diamond shaped openings in the cover plate 5, but when one of the lamps 14 or 14' is lighted the particular diamond shaped opening with which it is associated will present the appearance of a well defined arrow, the head of which will be constituted by the illuminated half of the diamond lying on one side of the small axis thereof, and the shaft of the arrow comprising a connected narrow

illuminated band on the screen comprising that part of the diamond lying on the opposite side of the smaller axis thereof. In addition to the arrow-like configuration of the illuminated area of the screen, the number on the screen will become apparent and will indicate the number of the floor with which the opening is associated.

In order to properly control the lighting of lamps 14 and 14', I have illustrated in Figure 4 a diagrammatic representation of a floor selector 18 of the construction well known and used in the elevator art for controlling elevator signals. This floor selector comprises a base, not shown, upon which are mounted a plurality of segments 19, in alignment with each other, one segment for each of the floors served by the car. Adjacent the line of segments 19 is a current feed strip 20. A movable arm 21 mounted upon a screw 22, driven by some part of the moving mechanism of the elevator car, is caused to traverse the segments in line 19 as the car moves up and down in its hatchway. A contact brush 23 mounted upon and carried by the movable arm 21 will therefore be caused to pass over the segments in line 19 and bridge the gap between the segments and the current strip 20, the particular segment which is connected with strip 20 depending upon the position of the car adjacent the floor with which the segment is associated. It will be understood that the movements of the carriage 21 over the segments of line 19 will be so coordinated with the upward movements of the car past the floors which it serves, that the proper segment will be bridged when the car is adjacent to any selected floor.

On the right hand side of the screw 22 a second contact strip 24 and a second row of segments 25 is illustrated, similar in character to strip 20 and segments 19. It will be understood by those skilled in the art that when the car moves upwardly the frictional engagement between the carriage 21 and the screw 22 will be such that the carriage 21 will be rotated slightly to cause the brush 23 to be moved into a position of engagement with contact strip 20 while, when the car is moving downwardly, the carriage 21 will be rotated in the opposite direction to cause engagement of a contact brush 26 with strip 24 and segments 25 and will lift the brush 23 from its associated contacts.

I have illustrated in Figure 4 a plurality of lamps 14 representing the "up" lamps mounted in the upper portion of each of the compartments 10, each of which is connected by means of a conductor 27 to a corresponding segment in group of segments 19. I have also illustrated a plurality of lamps 14' representing the "down" lamps in the lower section of each of the compartments 10, also connected by means of suitable conductors 28 to corresponding segments in the group 25.

The operation of my position indicator will best be understood when considered with respect to an assumed operation. Assuming that car No. 1 is at the top floor, the car in moving to the top floor moved upwardly and hence engaged contact brush 23 of selector 18 with contact strip 20 and the uppermost segment of the group 19. Hence, while the car is standing at the top floor the lowermost lamp in the compartment 10 will be energized and will present the appearance illustrated in the upper right hand corner of Figure 1. That is, the illumination of lamp 14' will be such as to cause complete illumination of the lower part of the diamond shaped screen and also illumination of the narrow band on the upper part of the diamond shaped screen, thus indicating that car No. 1 is at the top floor and is prepared to travel downwardly.

It will be observed that the topmost segment in line 19 is connected with the "down" lamp in the uppermost compartment, while the lowermost segment in line 25 is connected with the "up" lamp in the lowermost compartment 10. This arrangement is made because while the car is standing at the terminal floor and before it starts in the new direction, the selector arm will be positioned for the direction opposite to that which the car will take when it starts.

As the car proceeds downwardly, contact between the uppermost segment of group 19 and current strip 20 will be broken and a new circuit including the uppermost contact of group 25 will be completed, since, as the car starts downwardly the brush 26 will be moved into engagement with contact strip 24 and as the car approaches the seventh floor, or the floor below the terminal, the brush 26 will bridge the gap between current strip 24 and the topmost segment in group 25. The extinguishing of the light 14' in the uppermost compartment 10 and the lighting of the lamp 14' in the next lower compartment will produce the arrow-like image on the screen associated with the seventh floor. Further movements of the car will illuminate the next succeeding compartment and the operation of the entire system creating the appearance of an arrow which travels downwardly as the car travels downwardly past the corresponding floors.

It will be observed therefore that I have provided a position indicator which has a pleasing appearance and at the same time conveys the double indication of the position of the car and the direction in which it is moving.

While I have illustrated a preferred embodiment of my invention, it is to be understood that the foregoing description is illustrative only and I do not desire to be limited to any of the details shown and described

herein, except as defined in the appended claim.

I claim:

In a position indicator for elevators, an opaque casing, means defining a diamond shaped opening in said casing, a translucent screen in said opening, a pair of light sources arranged behind the screen and on opposite sides of the axis of said diamond, a light shield extending from said screen across said axis of the diamond for confining the illumination from either light source to its respective half of the diamond, and a cutout portion in said shield extending over a portion only of the axis of said diamond permitting passage of a narrow defined band of light to pass to the other half of the diamond.

Signed at Los Angeles, Calif., this 7th day of March, 1930.

LUTHER J. KINNARD.