

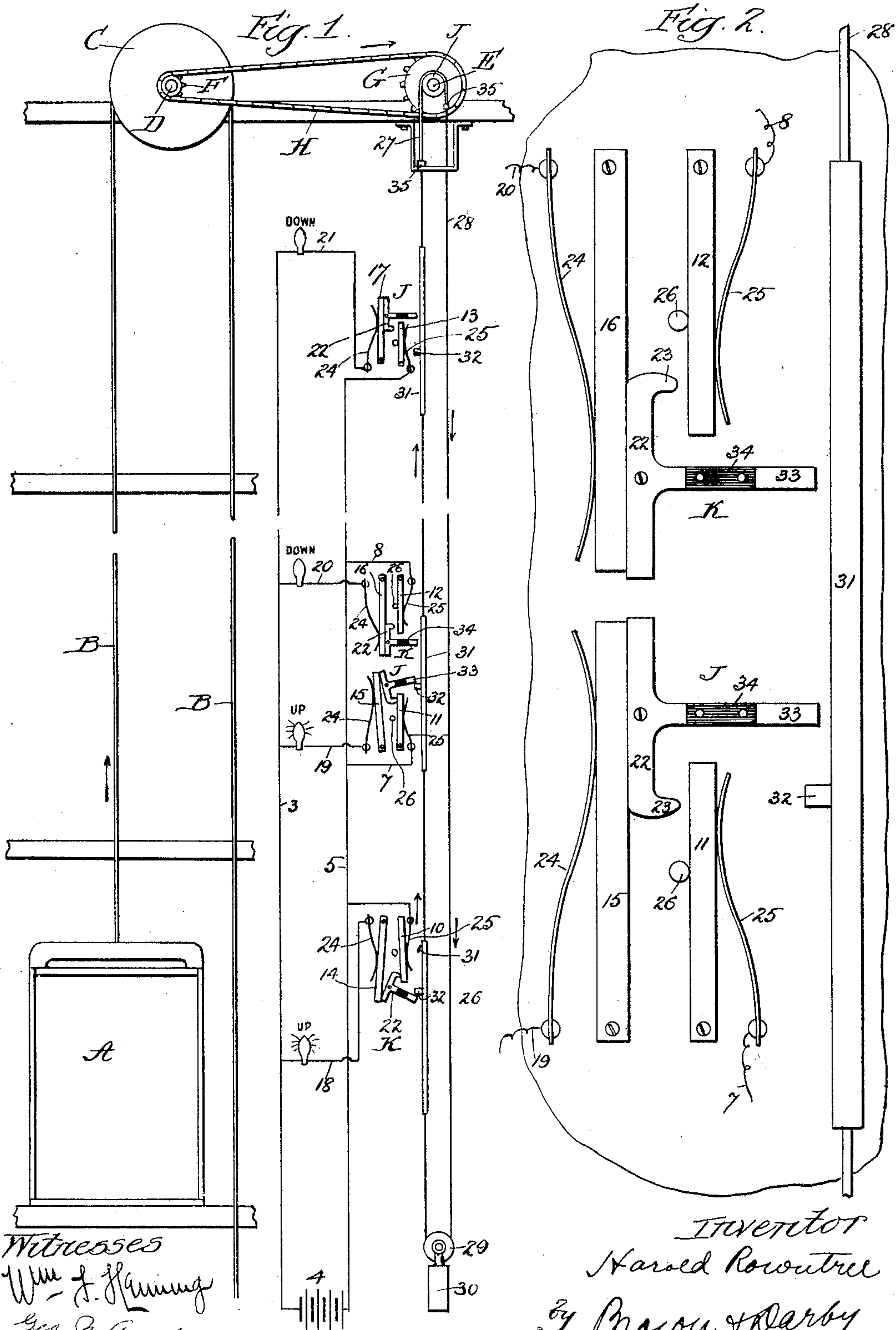
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H. ROWNTREE.
INDICATOR FOR ELEVATORS.

(Application filed Feb. 10, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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INDICATOR FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 638,992, dated December 12, 1899.

Application filed February 10, 1898. Serial No. 669,731. (No model.)

To all whom it may concern:

Be it known that I, HAROLD ROWNTREE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Indicator for Elevators, of which the following is a specification.

This invention relates to flash-light indicators for elevators.

10 The object of the invention is to provide simple, inexpensive, and efficient electric devices for indicating the approach of any particular car in a bank of elevators or the approach of the car where there is only one elevator-shaft at each of the floors or landings.

15 Other objects of the invention will appear more fully hereinafter.

20 The invention consists, substantially, in the construction, combination, location, and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically pointed out in the appended claims.

25 Referring to the accompanying drawings thereon, Figure 1 is a view illustrating the application of the invention to an elevator. Fig. 2 is a detached detail broken view, on an enlarged scale, showing an illustrative embodiment of practical means for completing the circuits of the indicators.

30 The same part is designated by the same reference-sign wherever it occurs.

35 In the practical operation of elevators it is a matter of importance that a passenger at any particular floor be notified in advance of the approach of the elevator-car to that floor, and it is desirable that the direction of travel of the car be also indicated to the passenger. 40 It is the special object of the present invention to provide an arrangement which is simple and efficient for accomplishing these purposes.

45 Referring to the accompanying drawings, illustrating an application of the invention to an elevator, reference-sign A designates an elevator-car; B, the hoisting-cable therefor; C, the sheave for the hoisting-cable at the top of the elevator shaft or well; D, the shaft of 50 said sheave. These parts may be of the usual

or any well-known type or form of construction and arrangement.

Arranged in suitable relation to shaft D, to be driven therefrom, is a shaft E. This shaft may be driven from shaft D in any 55 suitable manner and with any desired relative speed. In the particular form shown sprocket-gears F G are respectively mounted on shafts D and E, around which is arranged to pass a sprocket-chain H, the relative sizes 60 of sprocket-gears F and G being so arranged as to secure the desired relative speeds of rotation of shafts D and E. Upon shaft E is mounted a drum J, arranged to operate the devices for properly throwing into commis- 65 sion the indicators, as will presently be more specifically described.

Arranged at each landing or floor past which the elevator travels is a signal device. In the particular form shown an electric lamp 70 is employed, though the invention is not limited or restricted thereto. At each floor or landing intermediate the extreme top and bottom floors are arranged two indicators, one marked "up" and one marked "down." At 75 the bottom floor of the well or shaft is a similar signal device marked "up," and at the top floor or landing is a similar signal device marked "down." One of the terminals of each of these lamps or other electric signal- 80 ing devices is permanently connected to a conductor 3, connected to one pole or terminal of a battery 4 or other suitable source of electrical energy. From the other terminal of such battery or other source of electrical en- 85 ergy extends a conductor 5, to which is connected a branch conductor 6 7 8 9 for each lamp or other signal device. Each branch conductor 6 7 8 9 is in electrical connection with movable contacts 10 11 12 13 in any suitable 90 or convenient manner. Arranged to cooperate with each of the movable contacts 10 11 12 13 are similar movable contacts 14 15 16 17, each of which is in electrical connection through conductors 18, 19, 20, and 21 with the 95 other terminal of the lamps or other electrical signals throughout the system. In the particular form shown, to which, however, the invention is not limited or restricted, these movable contacts 10 11 12 13 14 15 16 17 com- 100

prise pivoted levers and are arranged in pairs, one pair being provided for each lamp or other signal device, and the members of each pair of said contacts are normally out of electrical connection with each other. It will be remembered that only one signal device is employed at the bottom and top landings of the elevator. Therefore at these landings only one pair of contacts 10 14 or 13 17 is employed. At the intermediate landings, however, two lamps or signals are employed, one marked "up" and the other marked "down." Therefore at each of such intermediate landings two pairs of such movable contacts are employed.

In the proper adaptation of the principles of my invention it is important to provide means whereby a signal is made at any particular floor only when the car is approaching that floor. It is also important that at any intermediate floor or landing only the "up" signal be given when the car is moving upwardly and only the "down" signal be given when the car is moving downwardly. Many specifically different constructions and arrangements for accomplishing this result may be employed without departure from the spirit or scope of the invention. In the particular form shown, to which, however, the invention is not limited, the two pairs of movable contact-levers—for instance, 11 15 and 12 16—are oppositely arranged with respect to each other—that is, said levers are each pivoted at one end thereof, the free ends of levers 11 15 being presented toward and arranged proximate to the free ends of levers 12 and 16, as clearly shown. Suitable means are provided, which are actuated coincident with the movement of the elevator, for completing the circuit between the corresponding pairs of movable contacts 10 14 11 15 12 16 13 17. In order that the signal may not remain in commission throughout the whole travel of the car from one limit of its travel to the other, means are provided whereby the circuit of a signal is completed only when the car is approaching any particular floor and which circuit is broken as soon as the car reaches or passes that floor, and means are also provided whereby only the pairs of movable contacts which control the signals marked "up" are actuated during the upward travel of the car, and only the pairs of contacts which control the signals marked "down" are actuated during the downward movement of the car. Many specifically different arrangements of apparatus for accomplishing this result may be employed without departure from the spirit of my invention. While, therefore, I have shown and will now describe a specific arrangement for accomplishing this result, I do not desire to be limited or restricted thereto. In the form shown I pivotally mount a three-armed lever in co-operative relation with respect to each pair of movable contacts. For instance, in the form shown a lever K is provided at each

landing to control the contacts and to bridge the space therebetween when suitably actuated for controlling the circuit of the "down" signal at that floor, while a lever J is arranged at each floor and similarly operated to control the circuit of the "up" signal at such floor. Each of said levers is so relatively arranged and pivoted that the arm 22 thereof projects into the space between the free ends of its cooperating pairs of levers 11 15 12 16, &c., and each of such arms 22 is provided with a bent end 23. Each of the movable contact-levers 14 15 16 17 is arranged to normally bear against the flat edge or end of its corresponding three-armed lever, being held in place yieldingly in any suitable manner—as, for instance, by means of spring 24—the action of which tends to return said contact-lever and also said three-armed lever J K to their normal positions. The bent end 23 of the three-armed lever J K is presented toward the cooperating movable contact-lever 10 11 12 13 of the same or cooperating pair. Each of said movable contacts or levers 10 11 12 13 is yieldingly pressed toward the bent end 23 in any suitable manner—as, for instance, by means of spring 25. The movement of said levers toward said bent end 23 is limited by a stop 26, which is arranged in position to normally hold contact 10 11 12 13 out of contact with the bent end 23 of its corresponding switch-lever J K. When, however, the three-armed lever J K is rocked in a direction to cause the bent end 23 thereof to engage and contact with its corresponding contact-lever 10 11 12 13, it will be seen that circuit is immediately established between contacts 10 14 11 15 or 12 16, as the case may be. The completion of circuit through these contacts completes the circuit through the lamp or other signal device controlled by the particular contacts thus brought into electrical connection with each other, thereby effecting the signal. It will be seen that the rocking movement of the three-armed lever is opposed initially by the spring 24 until the bent end 23 thereof engages the cooperating contact-lever, and thereafter the action of spring 25 also opposes the rocking movement of the three-armed lever. The action of these springs tends to return the operating-lever J K to its normal position, thereby breaking contact between the pairs of contact-levers.

The next step necessary to carrying my invention into practical operation is to provide means actuated by or coincident with the movements of the car for rocking levers J K. Many specifically different arrangements of mechanism actuated coincident with the travel of the car may be devised for effecting this purpose and still fall within the spirit and scope of the invention. In the particular form shown, to which, however, the invention is not limited, a suitable connection is mounted to be actuated by drum J on shaft E. In practice this connection may comprise a short belt or band 27, mounted around said

drum and connected at the ends thereof to the ends of a rope, band, wire, or belt 28, arranged to extend in a loop or bight throughout the length of the elevator shaft or well and pass around a suitable sheave or other guide 29 adjacent to the bottom of the shaft or well. If desired, and in order to maintain the belt or wire connection 28 taut, sheave 29 may be weighted, as shown at 30. Included in connection 28 is a series of bars 31, corresponding in number to the sets of signaling devices and each bar being provided with a projection or pin 32, arranged to move in a path such as to engage arm 33 of the three-armed levers J K. This portion 33 of said levers J K is insulated, as at 34, from the other arms of said levers.

It will be understood that the length of travel of the several bars 31 may be suitably regulated with reference to the distance through which the car travels from one limit of travel thereof to the other by employing suitable reduction-gears F G. In practice, however, each of the bars 31 travels only a distance such as to pass the set or sets of contacts at the same landing therewith while the car travels from one extreme limit to the other, and the position of the projection or pin 32 on each bar 31 is so regulated that such pin will strike the end or arm 33 of the contact-levers J K only when the car approaches that particular landing. It is evident that the parts may be so relatively arranged and timed as to their action that the circuit of an "up" signal, for instance, may be made one or two or more floors in advance of the approach of the car to that floor in order that timely signal of the approach of the car to such landing may be given to the waiting passenger at that landing. It will also be seen that the pin or projection 32 successively engages the projecting arms 33 of both contact operating-levers J K at each of the intermediate landings; but by reason of the relative arrangement of the pairs of contacts at such intermediate landing with the free ends of the contact-levers projecting toward each other and also by reason of the relative arrangement of the contact operating-levers J K themselves—that is, said levers being arranged with the arms 22 thereof projecting in opposite directions—it will be seen that while both of said levers J K will be rocked while the car is going up, for instance, the contacts controlled by only one of said levers will be so actuated as to throw into commission a signal. This operation will be clearly understood by reference to Fig. 2. Suppose the car be moved in a direction to cause bar 31 to move upwardly. Projection or pin 32 thereon will first engage arm 33 of lever J, thereby rocking the same, so as to cause the bent end 23 thereof to engage contact-lever 11, thereby completing circuit between contacts 11 and 15. This will complete the signaling-circuit from battery or other source of electric supply 4 through conductor 5, branch 7, lever 11, arm 22, lever

15, conductor 19, the lamp or other signal marked "up," conductor 3, back to battery. The parts are so arranged, as shown, for instance, in Fig. 1, that this circuit is completed before the car reaches the floor opposite the point where the signal is located, and the speed of travel of car A and of bar 31 is so relatively regulated that when the car has arrived at the landing referred to the pin or projection 32 will ride off or beyond the end 33 of lever J, thereby permitting springs 24 25 to return said lever J to its normal position, thereby breaking the circuit just described. Continued upward movement of bar 31 will cause pin 32 thereon to engage the end 33 of lever K at the same landing. The rocking of said lever K, however, will not be in a direction to complete circuit between contact-levers 12 and 16, and therefore, although lever K will be rocked, the contacts, and hence the signal controlled thereby, will not be thrown into commission during the movement of bar 31 in the direction above described. On the other hand in case the bar 31 travels in the opposite direction—that is, for instance, downwardly—the pin or projection 32 will engage lever K and rock the same, so as to complete the circuit between contacts 12 and 16, thereby completing the circuit of the lamp or signal device marked "down" in Fig. 1, and when said pin or projection 32 engages lever J said lever is rocked, but not in a direction to complete circuit between contacts 11 and 15. Thus it will be seen that on the upward movement of the car only the signals marked "up" will be made, and during the downward movement or travel of the car only those lamps or signals marked "down" will be thrown into commission.

By reference to Fig. 1 it will be seen that the pin or projection 32 on the lower bar 31 is arranged adjacent to the upper end of said bar, while the same part on the intermediate bar is arranged adjacent to the middle of said bar, and the same part on the upper bar is nearer the lower end of such bar. By reason of this arrangement it will be seen that the signal on each floor will be made only as the car approaches that floor, and such signal will be arrested when the car reaches or leaves such floor, and by suitably regulating the position of pin or projection 32 with reference to the time when it will engage and actuate a lever J or K the signal on the first, second, third, or any particular floor at any particular point in advance of the car will be made, and such signal will continue in commission until the car reaches that particular floor, thus giving ample and timely warning to the passenger.

Suitable stops 35 are provided on belt 27 in order to arrest properly the travel thereof.

While I have shown and described the signal apparatus for only one intermediate landing, it will of course be readily seen that the same construction may be duplicated throughout the entire length of a well or elevator

shaft with any number of intermediate floors. It will also be seen that the principles of the invention above described may be applied to one elevator or to a bank of elevators.

5 The signals marked "up" and "down" at each floor may be distinguished from each other in any suitable manner—such, for instance, as by arranging such signals in connection with suitable transparencies, or by
10 employing electric lamps with different-colored globes or glasses or bulbs, or in any other suitable or desirable manner.

Many changes and variations in the details of construction and arrangement of gearing
15 for suitably actuating the signaling-controlling contacts may be made without departure from the spirit or scope of my invention; but,

Having now set forth the object and nature of my invention and a form of apparatus embodying the same, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent of the United States, is—

1. In an indicator for elevators, an electric
25 signal arranged at each landing, a circuit for each signal, pivoted levers normally out of electrical connection with each other and arranged in the circuit of each signal, means for establishing electrical connection between
30 each pair of levers, and means actuated coincidentally with the travel of the car for actuating such circuit-establishing means, as and for the purpose set forth.

2. In an indicator for elevators, an electric
35 lamp located at each landing, a circuit for each lamp, said circuit being normally broken, a pivot-lever also arranged at each landing and arranged when rocked in one direction to complete the circuit of the lamp at that
40 landing, a bar having a projection arranged to engage and rock said lever, and means actuated coincidentally with the travel of the car for moving said bar, whereby when the car moves in one direction the circuit of said lamp
45 is completed but when moved in the opposite direction said circuit remains broken, as and for the purpose set forth.

3. In an indicator for elevators, a pair of lamps located at each intermediate landing,
50 separate circuits for each of said lamps, a circuit-controlling lever for each lamp, said levers being pivotally mounted, a movable bar

having a projection arranged to successively engage said levers, means whereby when said levers are rocked in one direction the lamp-
55 circuit controlled thereby is completed, but when rocked in the opposite direction said circuit remains broken, and means actuated coincidentally with the travel of the car for moving said bar whereby as the car moves
60 upwardly the circuit of only one of said lamps is completed and when said car moves downwardly the circuit of the other of said lamps is completed, as and for the purpose set forth.

4. In an indicator for elevators, a pair of
65 electric lamps located at each landing, an independent circuit for each lamp, a pair of normally-separated levers arranged in the circuit of each lamp, said levers being pivoted at one end and the free ends of one pair of
70 levers at each landing being presented toward the free ends of the other pair of levers at the same landing, oppositely-arranged pivotally-mounted levers arranged to bridge the space
75 between the respective pairs of levers, a movable projection arranged to successively engage and rock said levers whereby when the car travels upwardly the circuit of only one of said lamps is completed and when the car
80 moves downwardly the circuit of the other of said lamps is completed, as and for the purpose set forth.

5. In an indicator for elevators, an electric signal device arranged at each landing, an independent circuit for each of said signals,
85 normally-separated movable contacts arranged in each circuit whereby said circuits are normally broken, a rocking lever arranged to complete circuit between each pair of movable contacts, means actuated coincidentally
90 with the travel of the car and operating in advance of the arrival of the car at each floor to rock said lever whereby the signal at such floor is made, said means adapted to break
95 such signal-circuit when the car reaches such floor, as and for the purpose set forth.

In witness whereof I have hereunto set my hand, this 8th day of February, 1898, in the presence of the subscribing witnesses.

HAROLD ROWNTREE.

Witnesses:

S. E. DARBY,
CHAS. H. SEEM.