No. 756,275. PATENTED APR. 5, 1904.

F. S. PAYNE.

ELECTRIC SIGNALING DEVICE FOR ELEVATORS.

APPLICATION FILED AUG. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

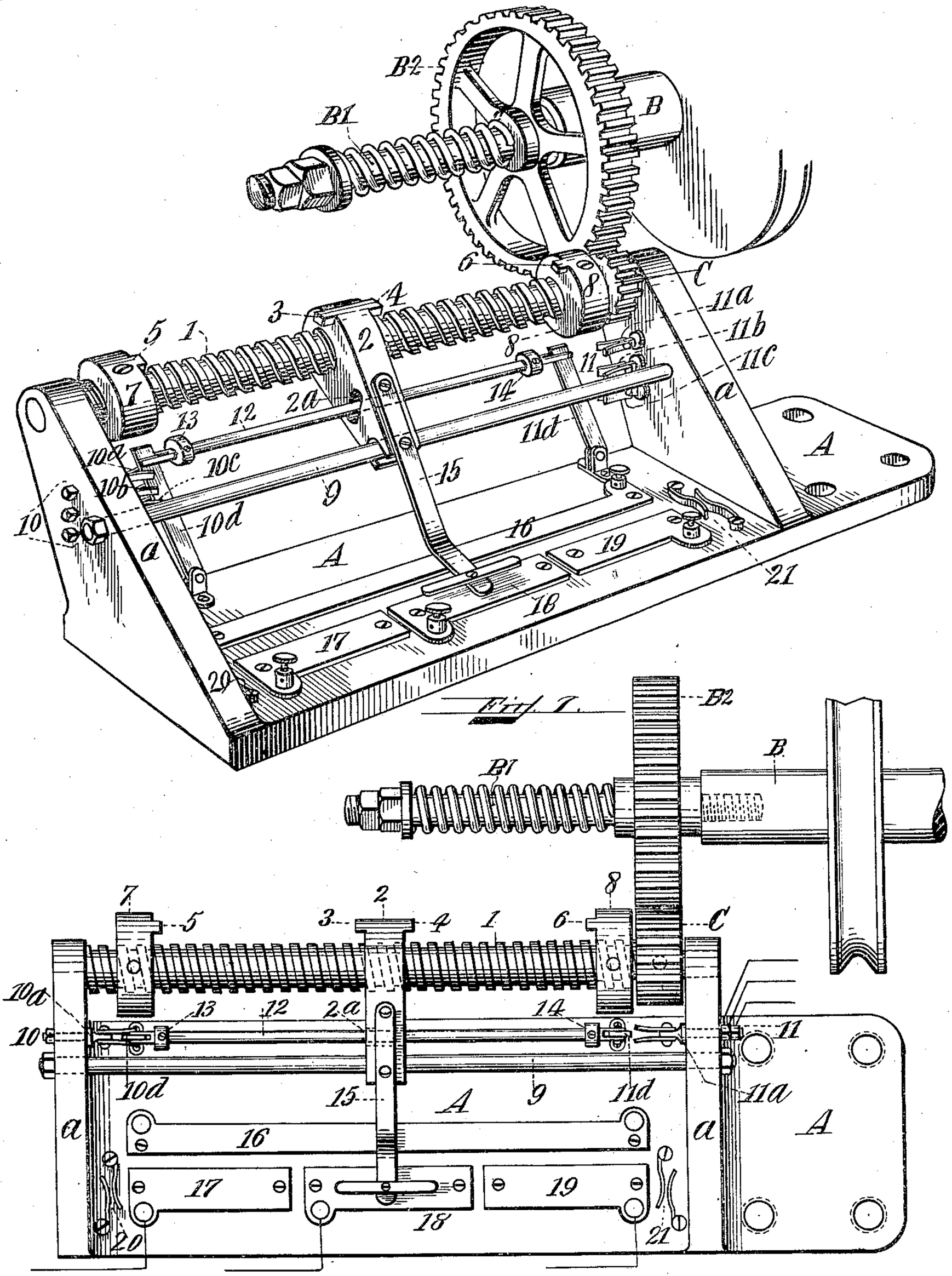

Fig. 1.

Fig. 2.

Witnesses:
W. Clooney.
F. J. V. Dalcin

Inventor:
Fred S. Payne.
By Arthur P. Hardy
his Atty.

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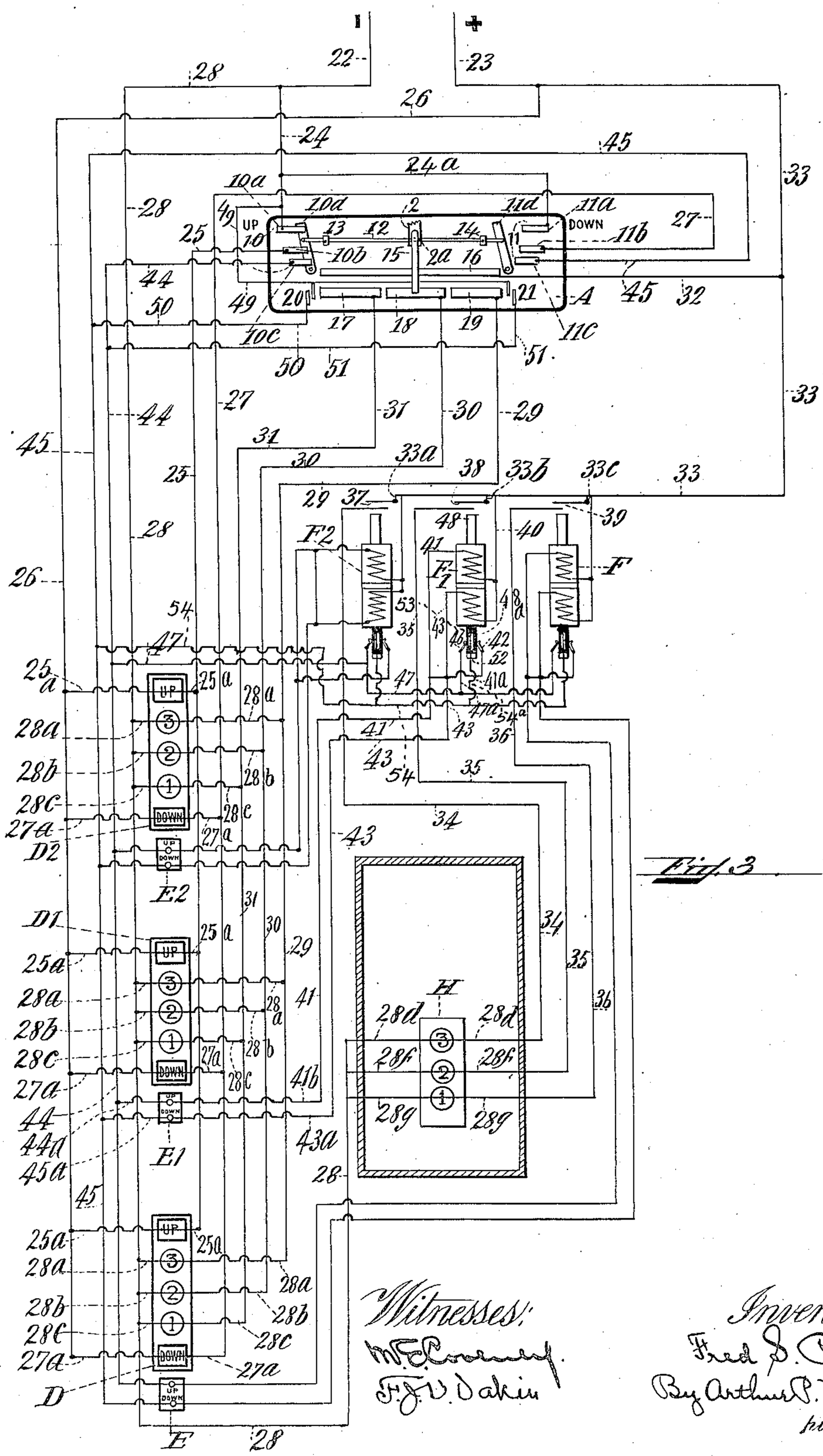

Fig. 3.

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No. 756,275. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

FRED S. PAYNE, OF BOSTON, MASSACHUSETTS.

ELECTRIC SIGNALING DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 756,275, dated April 5, 1904.

Application filed August 11, 1903. Serial No. 169,138. (No model.)

To all whom it may concern:

Be it known that I, FRED S. PAYNE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Electric Signaling Devices for Elevators, of which the following is a specification, reference being had to the accompanying drawings.

The present invention relates to that class of elevator signaling apparatus by means of which an electric signal is operated within the elevator-car through the medium of push-buttons located upon the various floors of the building through which the elevator travels and adjacent to the elevator-shaft and in which the movement of the elevator in ascending or descending actuates electric signals also placed adjacent to the elevator-shaft, one set of signals being placed upon each floor of said building and arranged to indicate whether that particular elevator is going up or down and at all times its position within the elevator-shaft.

The objects of my invention are to provide an elevator signaling device which shall, first, provide means for indicating upon each floor before the starting of the elevator-car from either its upper or lower terminal and during the entire trip of the elevator in either direction the direction in which the car is proceeding or is about to proceed; second, provide means for indicating upon each floor at all times the position of the elevator-car; third, provide means for signaling the operator of the elevator-car from any floor and the continuance of said signal until the arrival of the elevator-car at the terminal toward which it is proceeding when the signal is given, the "up" signal operating only when the car is ascending or standing at either terminal, and the "down" signal operating only when the car is descending or standing at either terminal. I accomplish these objects by the means hereinafter specified and as illustrated in the accompanying drawings.

I preferably use my present invention in connection with a part of my mechanical indicator mechanism described and shown in my United States Patent No. 734,744 of July 28, 1903. In the accompanying drawings the present invention is so shown.

Figure 1 represents a perspective view of the switches and their operating means. Fig. 2 is a plan view of the same. Fig. 3 is a diagrammatic view showing the present invention as applied to one elevator and its proper connections for three floors.

In the drawings, A represents the bed-plate of the operating mechanism, having on either end fixed arms *a a*, preferably cast integral therewith and adapted for the purposes hereinafter described.

B represents the main elevator sheave-shaft.

B′ represents a stud rigidly attached to shaft B.

B^2 is a gear frictionally mounted on stud B′.

C represents a pinion in mesh with gear B and rigidly attached to threaded rod 1, said rod 1 being supported at either end by arms *a a*.

2 represents a traveling nut on rod 1, having lugs 3 and 4 on opposite sides thereof, which respectively engage lugs 5 and 6 on collars 7 and 8 upon the arrival of nut 2 at either end of rod 1. Nut 2 also has an aperture 2^a, through which passes rod 12, said aperture being so constructed as to allow the free longitudinal movement of nut 2 and the reciprocating motion of rod 12. Collars 7 and 8 are adjustably fastened to rod 1 on either side of nut 2 and rotate with said rod 1 when it is in motion.

9 is a stationary rod fastened at either end to arms *a a* and engages nut 2 in such manner as to prevent the rotation of nut 2 and to cause it to move only in a longitudinal direction when rod 1 is revolving.

10 and 11 are terminal switches.

12 is a rod connecting knives 10^d and 11^d, which are suitably fastened to and insulated from bed-plate A. Knife 10^d engages clips 10^a, 10^b, and 10^c, and knife 11^d engages clips 11^a, 11^b, and 11^c when actuated by rod 12. Said rod, knives, and clips are so arranged that when one set of switches is closed the opposite set will be open.

13 and 14 are collars adjustably mounted on rod 12 and so arranged that nut 2 will engage them, respectively, during the course of its longitudinal movement.

15 is a brush attached to nut 2 and in continuous contact with plate 16 on bed-plate A.

16 is a contact-plate on bed-plate A, having electrical connections, as hereinafter described.

17, 18, and 19 are contact-plates also attached to bed-plate A, one contact being provided for each floor of the building through which it is intended for the elevator-car to travel. 20 and 21 are switches attached to bed-plate A and operated by brush 15. Switches 10, 11, 20, and 21 and contact-plates 16, 17, 18, and 19 are all suitably electrically connected for operation, as shown in Fig. 3, and, together with brush 15, are properly insulated.

The operation of the above-described reducing mechanism and switches is as follows: The rotation of shaft B causes gear B^2 to revolve in mesh with pinion C, thereby actuating threaded rod 1 and causing traveling nut 2 to move longitudinally until it arrives at either end of rod 1, when lugs 3 or 4 engage lugs 5 or 6 and stop the motion of rod 1, pinion C, and gear B^2. Gear B^2 being frictionally mounted on stud B', as hereinbefore described, permits the rotation of shaft B and stud B' to continue after the motion of rod 1 has ceased, and thus allows for the slipping of the elevator-cables over sheaves mounted on shaft B. The longitudinal movement of nut 2 necessarily brings brush 15 successively into contact with contact-plates 17, 18, and 19 and switches 20 and 21 and by means of the constant contact 16 successively makes and breaks the circuits through the lamps behind the numerals upon the signal-boxes on the various floors of the building, as set forth in Fig. 3. The longitudinal movement of nut 2 also necessarily causes nut 2 to engage adjustable collars 13 and 14, and to thus operate switches 10 and 11—that is to say, if switch 10 be closed and nut 2 be traveling toward switch 11 when nut 2 arrives at a point where it engages collar 14 the continuance of the longitudinal movement of nut 2 will draw rod 12 away from switch 10 and force it toward switch 11. When nut 2 has reached the limit of its movement toward switch 11, switch 10, by reason of the operation of rod 12, will have been opened and switch 11 closed. The movement of nut 2 in the opposite direction will cause the operation of switches 10 and 11 to be the reverse of that hereinbefore described. The movement of nut 2 along threaded rod 1 is so regulated as to be proportional to the movement of the elevator-car.

In Fig. 3, 22 and 23 represent the main supply and return wires, which are respectively connected to the positive and negative poles of any suitable electric generator and furnish current for all of the circuits shown in Fig. 3.

D, D', and D^2 represent signal-boxes upon the various floors of the building, one being provided for each floor. In the construction herein shown and as these boxes are preferably constructed each has an opaque front with the words "Going up" and "Going down" thereon. Between these words appear numerals corresponding to the various floors of the building. These words and numerals are illuminated by means contained within the signal-boxes and electrically connected, as shown in Fig. 3. As herein illustrated and as preferably constructed, I use one or more incandescent electric lamps placed directly behind each set of words and one or more incandescent electric lamps placed directly behind each numeral.

The lamps behind the words "Going up" are connected with supply-wire 22 by means of wire 24, switch 10, wire 25, and branch wires 25^a 25^a and with return-wire 23 by branch wires 25^a 25^a and wire 26. The lamps behind the words "Going down" are connected with supply-wire 22 by means of wire 24, branch wire 24^a, switch 11, wire 27, and branch wires 27^a 27^a and with return-wire 23 by branch wires 27^a 27^a and wire 26.

It is obvious from an inspection of Fig. 3 and the above description that when traveling nut 2 has in the due course of its movement toward switch 10 caused switch 11 to open and switch 10 to close the circuit will then be completed through switch 10 and the lamps behind the words "Going up" by means of the connections hereinbefore described; that said lamps will thereby become lighted and the words "Going up" illuminated; that these lamps behind the words "Going up" will continue lighted until the elevator-car has reached its upper terminal; that when the elevator-car has reached this point nut 2 will have in the due course of its longitudinal movement toward switch 11 during the ascent of the elevator-car come into contact with collar 14, thereby actuating rod 12, breaking the circuit through switch 10, and closing the circuit through switch 11, the lamps behind the words "Going down" and the connections hereinbefore described, thus in turn illuminating the words "Going down." By these means the words "Going up" will be illuminated while the elevator-car is stationary at its lower terminal and continuously during its ascent until its arrival at its upper terminal, when the words "Going up" will cease to be illuminated and the words "Going down" will become illuminated, and so constantly continue until the arrival of the elevator-car at its lower terminal.

The lamps behind the numerals in the signal-boxes D D' D^2 are connected with supply-wire 22 by means of wire 28 and branch wires 28^a 28^a 28^b 28^b 28^c 28^c. The lamps behind the numeral in each signal-box corresponding to the top or third floor of the building are connected by branch wires 28^a 28^a and wire 29 with contact-plate 19. The lamps behind the numeral corresponding to the middle or second floor are connected by branch wires 28^b

and wire 30 to contact-plate 18, and the lamps behind the numeral corresponding to the lower or first floor are connected by branch wires 28^c 28^c and wire 31 with contact-plate 17. The operation of this part of my invention is as follows: The movement of nut 2 in either direction will necessarily carry with it brush 15, which is in constant contact with plate 16, as hereinbefore described. Plate 16 is connected by wires 32 and 33 with return-wire 23. The movement of brush 15 will bring it successively into contact with plates 17, 18, and 19, and by means of constant contact 16 and the connections hereinbefore described will successively make and break the circuits through the lamps behind the numerals in the signal-boxes. For instance, when brush 15 comes simultaneously into contact with constant contact 16 and plate 18 the circuit will be completed through wires 22 and 28, branch wires 28^b 28^b, lamps behind numeral 2, branch wires 28^b 28^b, wire 30, contact-plate 18, brush 15, constant contact 16, and wires 32, 33, and 23. This circuit will remain closed and lamps behind numeral "2" lighted until the movement of nut 2 has carried brush 15 beyond contact with plate 18. It is obvious that when the elevator-car is ascending the words "Going up" only will be constantly illuminated during the entire upward trip, while the numerals will be successively illuminated and darkened in the order "1," "2," "3," and that when the elevator-car is descending the words "Going down" only will be constantly illuminated during the entire downward trip, while the numerals will be successively illuminated and darkened in the order "3" "2" "1."

E, E′, and E^2 represent push-button boxes, one being on each floor of the building.

F, F′, and F^2 represent small magnets, there being one for each floor of the building. These magnets each have a compound winding, one winding being used when the "up-button" is pressed and the other for the "down-circuit."

H represents a signal-box in the elevator-car. This signal-box, like the signal-boxes on the various floors of the building, is preferably constructed with an opaque front having numerals thereon corresponding to the various floors of the building. Behind each of these numerals, as shown in the construction herein described, is placed one or more incandescent electric lamps. The words "Going up" and "Going down" and the lamps for illuminating the same are omitted from this signal-box for the reasons hereinafter explained.

The several lamps behind the numerals in box H are connected to supply-wire 22 by wire 28 and branches 28^d 28^f 28^g. The lamps behind the numeral corresponding to the top or third floor are connected with the switch 37, operated by corresponding magnet F^2, by branch wire 28^d and wire 34, said switch being connected with return-wire 23 by branch wire 33^a and wire 33. The lamps behind the numeral "2" are connected with switch 38, operated by magnet F′, by branch wire 28^f and wire 35, said switch being connected with return-wire 23 by branch wire 33^b and wire 33. The lamps behind the numeral "1" are connected with switch 39, operated by magnet F, by branch wire 28^g and wire 36, said switch being connected with return-wire 23 by branch wire 33^c and wire 33. As all of the push-buttons and magnets are similarly connected and operate in the same manner, I will describe the connection and operation of the push-buttons in box E′ on the second or middle floor and their corresponding magnet F′.

One end of the winding for the "up-circuit" on magnet F′ is connected with return-wire 23 by wires 40 and 33. The other end of said winding is connected with one terminal of the "up" push-button in box E′ by wire 41 and branch wire 41^b and is also connected by branch wire 41^a with contact-spring 42. One end of the winding for the "down-circuit" on magnet F′ is connected by wires 40 and 33 with return-wire 23, the other end of said winding being connected with one terminal of the "down" push-button in box E′ by wire 43 and branch wire 43^a and also with branch wire 41^a. The other terminal of the up push-button in box E′ is connected with terminal clip 10^c of switch 10 by branch wire 44^a and wire 44. The other terminal of the down push-button in box E′ is connected with terminal clip 11^c of switch 11 by branch wire 45^a and wire 45. Contact-spring 46 of magnet F′ is connected by branch wire 47^a and common wire 47 with wire 44. Contact-spring 53 of magnet F′ is connected by branch wire 54^a and common wire 54 with wire 45. Magnet F′ has a movable armature 48, which has an insulated portion 48^a. One terminal of switches 20 and 21 on bed-plate A is connected with wire 24 by wire 49. The other terminal of switch 20 is connected with wire 45 by wire 50. The other terminal of switch 21 is connected with wire 44 by wire 51. By this arrangement when the elevator-car is ascending switch 10 is necessarily closed, and a person on any floor who desires to ascend and presses the up-button thereby completes the circuit through the corresponding magnet and the corresponding lamps in box H and indicates to the operator of the elevator-car the floor upon which such person is standing and the fact that such person desires to take passage in the ascending car. The operation of the armature of the magnet short-circuits the push-button, and thereby insures a continuance of the signal in box H until the arrival of the car at its upper terminal. For instance, if the up-button in box E′ be pressed when the elevator-car is stationary at its lower terminal or is ascending the circuit will there-

by be completed through supply-wire 22, wire 24, switch 10, wire 44, branch wire 44ª, the up push-button in box E′, branch wire 41ᵇ, wire 41, the up-winding on magnet F′, wire 40, wire 33, and return-wire 23. If the car be standing at its upper terminal and the up push-button in box E′ be pressed, the circuit will thereby be completed through supply-wire 22, wires 24 and 49, switch 21, wires 51 and 44, branch wire 44ª, the up push-button in box E′, and thence to wire 23, as above described. The closing of either of these circuits necessarily energizes magnet F′ and actuates armature 48, causing the same to close switch 38 and to thus complete the circuit through supply-wire 22, wire 28, branch wire 28ᶠ, lamp behind numeral "2" in box H, branch wire 28ᶠ, wire 35, switch 38, branch wire 33ᵇ, wire 33, and return-wire 23. Before the closing of these last-described circuits armature 48 normally comes in contact through its insulated part 48ª with contact-springs 42, 46, and 53, and when the circuits are closed, magnet F′ energized, and armature 48 drawn into contact with switch 38 the uninsulated portion 52 of armature 48 is thereby brought into contact with the springs 46, 42, and 53 and short-circuits the push-button by closing the circuit through wires 22 24, switch 10, wires 44 and 47, branch wire 47ª, contact 46, the uninsulated part 52 of armature 48, contact-spring 42, branch wire 41ª, wire 41, the "up" winding on magnet F′, wire 40, and wires 33 and 23. This short-circuiting of the push-button keeps magnet F′ energized and lamps behind numeral "2" in box H lighted until the arrival of the elevator-car at the top floor, when the movement of nut 2 breaks the circuits passing through switch 10 and causes the armatures of the several magnets to resume their normal positions and all of the lights in box H to become extinguished. If the down push-button in box E′ be pressed when the car is stationary at its lower terminal, the circuit will be thereby completed through supply-wire 22, wires 24 49, switch 20, wires 50 45, branch wire 45ª, the down push-button in box E′, branch wire 43ª, wire 43, the down circuit-winding of magnet F′, wire 40, wire 33, and return-wire 23. If the car be stationary at its upper terminal or descending and the down push-button in box E′ be pressed, the circuit will thereby be completed through supply-wire 22, wire 24, branch wire 24ª, switch 11, wire 45, branch wire 45ª, the down push-button in box E′, and thence to wire 23, as above described. The closing of the circuit through the down push-button necessarily energizes its corresponding magnets, short-circuits the push-button, and lights the lamps behind the numeral in box H, corresponding to the floor upon which the push-button is located in exactly the same manner as has been hereinbefore described as regards the circuit through the up push-button. As it is the custom in many large buildings to have the elevators when not running remain either at the upper or lower terminal, I provide switches 20 and 21 in order that the car may be signaled when so stationed.

By the arrangement hereinbefore described switches 20 and 21 are normally open. Switch 20 is closed by brush 15 when it reaches the limit of its movement toward switch 10 and the elevator-car is at its lower terminal. Switch 21 is closed by brush 15 when it reaches the limit of its movement toward switch 11 and the elevator-car is at its upper terminal.

When the elevator-car has left its lower terminal, switch 20 resumes its normal position. The circuit through the same is broken, and thereafter the circuit through the up-buttons only is operative until the car reaches its upper terminal, when by the breaking of the circuit through switch 10 and the closing of circuits through switches 11 and 21 the circuits through all the buttons again become operative. These continue until the elevator has left its upper terminal and switch 21 resumes its normal position, whereupon the circuit through the down-button only is operative until the arrival of the car at its lower terminal.

It is obvious that by the means I have adopted and herein described I have produced an electric signaling device for elevators which has many advantages over others now in use. By reason of the visual signals located adjacent to the elevator-shaft upon each floor there is little or no possibility of confusion arising in the mind of the person desiring to take passage in the elevator. A glance at the several signal-boxes, if there be more than one elevator, will at once enable such person to determine which elevator is going or ready to go in the direction in which he wishes to ride and whether the elevator-car is above or below him.

While there are devices in use which indicate when a car is approaching a floor, my apparatus indicates at all times, regardless of whether the car be stationary or moving, the direction in which it is proceeding or about to proceed.

If the intending passenger presses the button marked to correspond to the direction in which he wishes to ride, the signal will be communicated to the elevator-car and continue, although pressure upon the button be discontinued, until the arrival of the car at the terminal opposite to that at which it is standing or from which it has moved, and thus insures the observation of such signal by the operator of the car. If the elevator-car be between the upper and lower terminals and the intending passenger press the wrong button, there will be no resulting signal in the car; but when the car is stationary at either terminal all the buttons are in circuit to call it.

It is obvious that various parts of the device herein described may be varied or altered

and yet achieve the same result, and I do not limit myself strictly to the construction herein shown, but desire to claim in the broadest possible manner the results of my invention.

What I claim is—

1. An electric signaling device for elevators, consisting of a plurality of electric switches operated by a movable brush; signals upon each floor of the building, operated by certain of said switches and indicating at all times the direction in which the elevator-car is moving, or will next move; push-buttons upon each floor; magnets electrically connected with said push-buttons; switches, operated by said push-buttons and magnets; signals within the elevator-car; all being electrically connected as hereinbefore described, and for the purposes set forth.

2. An electric signaling device for elevators, consisting of a plurality of electric switches operated by a movable brush; signals upon each floor of the building, operated by certain of said switches, and indicating at all times the position of the elevator-car within the elevator-shaft; push-buttons upon each floor; magnets operated by said push-buttons; switches operated by said push-buttons and magnets; signals within the elevator-car; all being electrically connected, as hereinbefore described and for the purposes set forth.

3. An electric signaling device for elevators, consisting of a plurality of electric switches operated by a movable brush; signals upon each floor of the building, operated by certain of said switches, and indicating at all times the direction in which the elevator-car is moving or about to move, and its position within the elevator-shaft; push-buttons upon each floor; magnets electrically connected with said push-buttons; switches operated by said push-buttons and magnets; signals within the elevator-car; all being electrically connected as hereinbefore described and for the purposes set forth.

4. An electric signaling device for elevators, consisting of a plurality of electric switches operated by a movable brush; signals upon each floor of the building, electrically connected with and operated by certain of said switches, and indicating at all times the direction in which the elevator-car is moving or will next move; push-buttons upon each floor; magnets electrically connected with said push-buttons; switches operated by said push-buttons and magnets; and signals within the elevator-car, electrically connected with the last-mentioned switches, and operated by said push-buttons, magnets and switches.

5. An electric signaling device for elevators, consisting of a plurality of electric switches operated by a movable brush; signals upon each floor of the building, electrically connected with and operated by certain of said switches, and indicating at all times the position of the elevator-car within the elevator-shaft; push-buttons upon each floor; magnets electrically connected with said push-buttons; switches operated by said push-buttons and magnets; and signals within the elevator-car, electrically connected with the last-mentioned switches, and operated by said push-buttons, magnets and switches.

6. An electric signaling device for elevators, consisting of a plurality of electric switches operated by a movable brush; signals upon each floor of the building, electrically connected with and operated by certain of said switches, and indicating at all times the direction in which the elevator-car is moving, or will next move, and its position; push-buttons upon each floor; magnets electrically connected with said push-buttons; switches operated by said push-buttons and magnets; signals within the elevator-car electrically connected with the last-mentioned switches and operated by said push-buttons, magnets and switches.

7. An electric signaling apparatus for elevators, comprising a plurality of electric switches operated by a traveling nut, and means for operating the nut; a plurality of signals upon each floor of the building, operated through certain of said switches, and indicating at all times the direction in which the elevator-car is moving or will next move; push-buttons upon each floor; magnets corresponding to and electrically connected with, said push-buttons; electric switches operated by said push-buttons and magnets; a plurality of signals within the elevator-car, electrically connected with said last-mentioned switches and operated by the push-buttons, magnets and switches aforesaid.

8. An electric signaling apparatus for elevators, comprising a plurality of electric switches operated by a traveling nut, and means for operating the nut; a plurality of signals upon each floor of the building, operated through certain of said switches, and indicating at all times the position of the elevator within the elevator-shaft; push-buttons upon each floor; magnets corresponding to and electrically connected with, said push-buttons; electric switches operated by said push-buttons and magnets; a plurality of signals within the elevator-car, electrically connected with said last-mentioned switches and operated by the push-buttons, magnets and switches aforesaid.

9. An electric signaling apparatus for elevators, comprising a plurality of electric switches operated by a traveling nut, and means for operating the nut; a plurality of signals, upon each floor of the building, operated through certain of said switches and adapted to indicate the direction in which the elevator-car is moving, or will next move, and at all times its position; push-buttons upon each floor; magnets corresponding to, and electrically connected with, said push-buttons; electric switches operated by said push-buttons and magnets; a plurality of signals within

the elevator-car, electrically connected with said last-mentioned switches, and operated by the push-buttons, magnets and switches aforesaid.

10. An electric signaling device for elevators comprising a plurality of electric switches operated by the movement of a traveling nut and means for operating the nut; a signal-box upon each floor of the building; means within each signal-box electrically connected with and operated by certain of said switches for the purpose of indicating the direction in which the elevator-car is proceeding, or about to proceed, and at all times its position within the elevator-shaft; push-buttons upon each floor of the building; electromagnets corresponding to and electrically connected with said push-buttons; electric switches operated by said push-buttons and magnets; a signal-box within the elevator-car and means within said elevator signal-box electrically connected with said last-mentioned switches and operated by said push-buttons, magnets and switches.

11. An electric signaling device for elevators comprising a plurality of electric switches operated by a brush attached to a traveling nut and means for operating said nut; a signal-box upon each floor of the building and electrically connected with and operated by certain of said switches; means within said signal-boxes for indicating the direction in which the elevator-car is proceeding, or about to proceed, and at all times its position within the elevator-shaft; a plurality of push-buttons upon each floor; electromagnets corresponding to and electrically connected with said push-buttons; electric switches operated by said magnets and electrically connected with a signal-box within the elevator-car; means within the last-mentioned signal-box for indicating the floor upon which the push-button pressed is located.

12. An electric signaling device for elevators comprising a plurality of electric switches operated by a brush attached to a traveling nut and means for operating said nut; a signal-box upon each floor of the building and electrically connected with and operated by certain of said switches; means within said signal-boxes for indicating the direction in which the elevator-car is proceeding, or about to proceed, and at all times its position within the elevator-shaft; a plurality of push-buttons upon each floor; electromagnets corresponding to and electrically connected with said push-buttons; electric switches operated by said magnets and electrically connected with a signal-box within the elevator-car; means within the last-mentioned signal-box for indicating the floor upon which the push-button pressed is located; means for short-circuiting said push-buttons and causing the continuance of the signal within the signal-box in the elevator-car until the arrival of said car at the terminal toward which it is proceeding or is about to proceed.

13. In an electric signaling device for elevators, the combination of a traveling nut and means for operating the same; a brush attached to said nut; a plurality of electric switches operated by said brush and traveling nut; a signal-box upon each floor of the building electrically connected with certain of said switches; means within said signal-boxes and operated by certain of said switches for indicating the direction in which the elevator-car is moving, or is about to move, and at all times its position within the elevator-shaft; a plurality of push-buttons upon each floor; the circuit through one push-button being operative only when the elevator-car is stationary at either terminal or ascending; the circuit through the other push-button being operative only when the elevator-car is stationary at either terminal or descending; electromagnets electrically connected with and corresponding to said push-buttons; each magnet having a plurality of windings, and a movable armature; means for actuating said armature; electric switches operated by the movement of said armatures; a signal-box within the elevator-car and electrically connected with said last-mentioned switches; means within the elevator signal-box and operated by said switches, magnets and push-buttons for indicating the floor upon which the push-button pressed is located; means for short-circuiting said push-buttons and for continuing the signal in said last-mentioned signal-box until the arrival of the elevator-car at the terminal toward which it is proceeding, or is about to proceed.

14. In an electric signaling device for elevators, the combination of a traveling nut and means for operating the same; a brush attached to said nut; a plurality of electric switches operated by said brush and nut; a signal-box and a plurality of signals upon each floor of the building electrically connected with certain of said switches; means within said signal-boxes and operated by certain of said switches for indicating the direction in which the elevator-car is moving, or will next move; means for causing said signals to be continuous until the arrival of the elevator-car at the terminal toward which it is moving, or will next move; means for automatically discontinuing said signals upon the arrival of the car at the terminal toward which it was moving, or about to move when the signal was given; other means within the signal-boxes and operated by certain other of said switches for indicating at all times the position of said car; a plurality of push-buttons upon each floor; electromagnets, corresponding to and electrically connected with said push-buttons; each magnet having a plurality of windings and a movable armature;

means for actuating said armature; means for causing the circuit through one push-button upon each floor and one winding upon each magnet to be operative only when the elevator-car is stationary at either terminal or is ascending; other means for causing the circuit through the other push-button upon each floor and the other winding upon each magnet to be operative only when the elevator-car is stationary at either terminal, or is descending; electric switches operated by the movement of said armatures; a signal-box within the elevator-car; and a plurality of signals within said last-mentioned signal-box electrically connected with said last-mentioned switches; means within said elevator signal-box and operated by said switches, magnets, and push-buttons for indicating the floor upon which the push-button pressed is located; means for short-circuiting said push-buttons and for insuring the continuance of the signal within the elevator signal-box until the arrival of the elevator-car at the terminal toward which it is proceeding, or is about to proceed.

15. In an electric signaling device for elevators, the combination of a traveling nut and means for operating the same; a brush attached to said nut; a plurality of electric switches operated by said brush and nut; a signal-box upon each floor of the building electrically connected with certain of said switches; means within said signal-boxes operated by means of certain of the switches connected therewith for indicating when the elevator-car is ascending, or that its next trip will be upward; means within said signal-boxes operated by certain of the switches connected therewith for indicating when said car is descending; means for causing said signals to be continuous until the arrival of said car at the terminal opposite to that from which it had started, or at which it was standing when the signal was given; means for automatically discontinuing said signals upon the arrival of said car at the terminal toward which it was moving when said signal was given, or toward which it next moved after said signal was given; means within each signal-box and operated by certain of the switches connected therewith for indicating at all times the position of the elevator-car; a signal-box within the elevator-car and means upon each floor of the building and connected with said elevator signal-box for signaling the elevator-car only when the car is stationary at either terminal or has started to make an ascent or is ascending; other means upon each floor and connected with said elevator signal-box for signaling, the elevator-car only when it is stationary at either terminal, or has started to make a descent or is descending; means for continuing the signal within the elevator signal-box until the arrival of the elevator-car at the terminal toward which it has started or is moving when said signal is given.

16. In an electric signaling device for elevators, the combination of a traveling nut and means for operating the same; an electric brush attached to said nut; a plurality of electric switches operated by said brush; a plurality of electric switches operated by the traveling nut; said last-mentioned switches being so connected that when the circuit through one set of switches is made, the circuit through the other set will be broken; a signal-box upon each floor of the building; means within said signal-boxes and in circuit with and operated by said connected switches for indicating the direction in which the elevator-car is moving, or will next move; other means within said signal-boxes in circuit with and actuated by the switches operated by the electric brush for indicating at all times the position of the elevator-car within the elevator-shaft; a plurality of push-buttons upon each floor; electromagnets corresponding to the various floors and in circuit with said push-buttons; each magnet having a plurality of windings and a movable armature; one winding of each magnet being in circuit with one of the push-buttons upon the floor corresponding to the magnet, the other winding being in circuit with the other push-button; electric switches corresponding to said magnets and operated by the armatures of the same when said magnets are energized; a signal-box within the elevator-car and in circuit with the switches operated by the magnets; means within said last-mentioned signal-box and operated by said push-buttons, magnets and switches for indicating the floor upon which the push-button pressed is located; means for short-circuiting each push-button after the circuit through the same has been made and for continuing the signal in the elevator signal-box until the arrival of the elevator-car at the terminal opposite to that at which the car is standing, or last stood.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRED S. PAYNE.

Witnesses:
M. E. COVENEY,
ARTHUR P. HARDY.