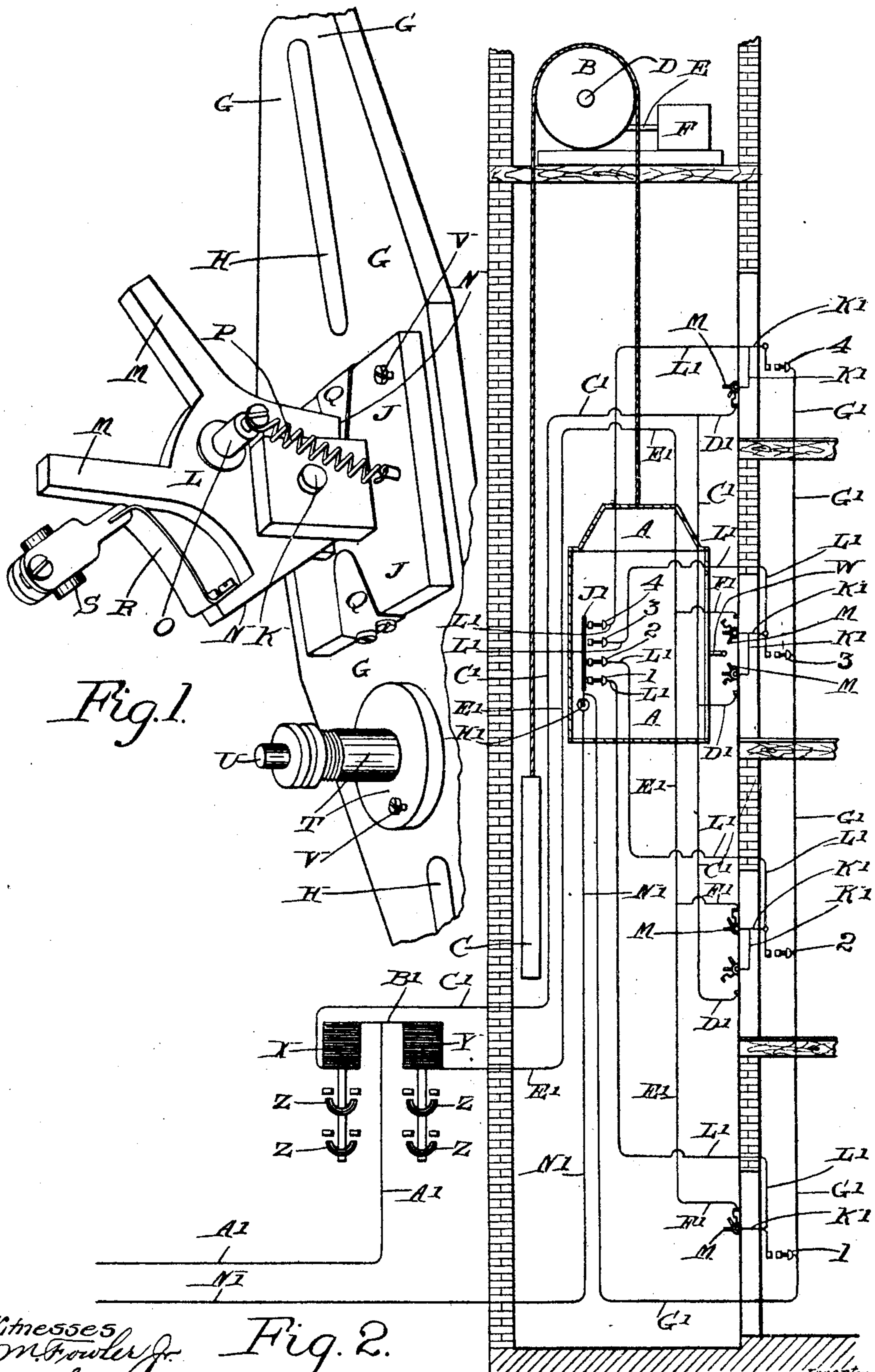


No. 803,378.

PATENTED OCT. 31, 1905.

G. A. P. WEYMOUTH.
CONTROL OF ELECTRIC ELEVATORS.

APPLICATION FILED APR. 3, 1905.



Witnesses
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Fig. 2.

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UNITED STATES PATENT OFFICE.

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CONTROL OF ELECTRIC ELEVATORS.

No. 803,378.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed April 3, 1905. Serial No. 253,536.

To all whom it may concern:

Be it known that I, GEORGE ANDREW PHILIP WEYMOUTH, a subject of the King of Great Britain and Ireland, residing at 234 Little Lonsdale street, in the city of Melbourne, county of Bourke, State of Victoria, Commonwealth of Australia, have invented new and useful Improvements in the Control of Electric Elevators, of which the following is a specification.

My invention relates to lifts or cages which are raised or lowered by an electric motor.

The object of my invention is to provide a cheap and simple system of push-buttons, switches, wires, and other parts whereby the lift may be controlled from its interior or from any landing. The switches before referred to are so arranged that the floor of the lift always stops in absolutely the same plane as the landing required; but in order that my invention may be better understood I will now refer to the accompanying sheet of drawings, which are to be taken as part of this specification and read herewith.

Figure 1 represents, on an enlarged scale, a perspective view of the landing-switch. It is open. Fig. 2 is an elevation of a lift and lift-shaft, partly in section.

To clearly disclose the striker and switches, a space wider than ordinary is shown between the landing and the lift. The lift is stationary at the third landing. The switches on the top and bottom floor and the upper one on the second floor are closed. The two switches on the third floor and the bottom one on the second floor are open. The object of these switches is to change the connections to the push-buttons on the landings that those below the lift are always set for bringing the lift down and those above the lift are always set for bringing the lift up, no matter what the position of the lift in the lift-well may be. By means not included in this invention the lift and landing push-buttons are so arranged and interlocked that when one button is pushed another cannot be moved until the lift stops. Arrangements are also made in any ordinary way that the lift-shaft door cannot be opened until the lift is opposite it, and until the door is closed the lift cannot be started. The motor-circuits and the accelerating mechanism being of any ordinary character are not

shown. The energizing-circuits do not occupy in practice the position illustrated; but they are so shown for convenience.

Similar letters of reference indicate similar or corresponding parts where they occur in both the views.

My invention includes a lift or cage A. This is supported by a rope passing over a drum B. At the other end of the rope is a balance-weight C. The said drum B is affixed to a drum-shaft D, upon which is a worm-wheel. (Unseen.) The said worm-wheel is driven by a worm on the motor-shaft E by the motor F, or the said lift may be operated in any other well-known way. Near each lift-floor and inside the shaft is attached a landing-switch. This, as seen in Fig. 1, has a base-board G, in which are vertical adjusting-slots H. To this base-board is attached a tumbler-bracket J. Between two cheeks outstanding from this and upon a pivot-pin K is pivoted the tumbler L. The said tumbler L has on its outer end two legs M, while on its inner end it has stop-faces N. Protruding on each side of the said tumbler is a stud O. To this stud is pivoted the outer end of the retaining-spring P. The inner end of the said spring is attached to the tumbler-bracket J. Upon the said tumbler-bracket J are cushioning-springs Q, upon which the stop-faces on the tumbler strike. Attached to the tumbler is the inner end of a carbon-holding spring R. To the outer end of the said spring is attached the outer carbon contact S. There is also attached to the base-board G a carbon-holder T. To the outer end of this is attached in any well-known way the inner carbon contact U. Upon the tumbler-bracket J and carbon-holder T are terminal screws V. The before-described landing-switches are attached at each landing inside the lift-shaft and the legs protrude into the shaft. At the top and bottom floors only one switch is used, whereas at the intermediate floors two of them are applied. Instead, however, of there being two switches at every intermediate floor a single reversing-switch can be used. Protruding from the lift, so as to engage with the legs M, is the striker W. The outer end of this may be provided with a roller or other attachment whereby a silent contact may be formed with the tumbler-legs. Instead of the lift operat-

ing the switches they may be moved by the balance-weight C. The said landing and lift push-buttons are so electrically arranged in relation to each other that after one is pushed
5 no other button can be pushed until the lift stops.

In combination with the foregoing I employ an up-solenoid X and a down-solenoid Y. When a current passes through either one of
10 these solenoids, contact is made through the motor-contacts Z with the motor-circuit, which causes the motor F to move in either direction. To the said solenoids is led the positive main A'. Between the solenoids is attached
15 the bridging-wire B'. From the up-solenoid X proceeds the up-circuit C'. To the up-circuit wire C' is attached one end of the up-landing circuit branches D'. The other end of each of the said up-landing circuit branches is con-
20 nected to a landing-switch, one of which is on all the landings but the bottom. From the down-solenoid Y proceeds the down-circuit wire E'. To this are attached one end of the down-landing circuit branches F'. The other
25 end of each of the said branches F' is connected to the landing-switch, one of which is situated on all the landings except the top.

At each landing is a landing push-button. These are marked "1 2 3 4." To these are con-
30 nected the return-main G'. This enters the lift A, in which is a contact-plate J' and an emergency-switch H'. The object of this switch is to break the circuit and stop the lift in case of pressing the wrong button. The
35 return-main G' from the lift proceeds to the negative main N'. Between the landing push-buttons and the landing-switches are coupling-wires K'.

In the lift are lift push-buttons 1 2 3 4. To
40 these are connected the inner ends of lift-circuit wires L'. The outer ends of these are connected to the landing-switches.

The cycle of operation with my invention is as follows: A person on the ground-floor, hereinafter called the "first" floor, discover-
45 ing the lift is absent or as shown in Fig. 2 presses a landing push-button. The down-circuit is thereby closed, and the motor-contact Z operates the lift-motor so that it lowers the lift. The lift continues lowering until it
50 reaches the bottom, for after the button is pushed the down-solenoid Y is acting. The passage of the current which energizes the motor-contact Z is through the positive main A', the down-solenoid Y, and the down-circuit wire E'. It then passes through the
55 landing-switch on the first floor, the coupling-wire K', the landing push-button 1 to the return-main G'. It then proceeds to the emergency-switch H' and from there to the negative main N'. When the lift reaches the first floor, the striker W engages with the lower leg M of the tumbler, and the circuit is
60 opened. The motor-contact Z recovers itself and the motor stops, or should the lift be re-

quired on the fourth floor on the landing-button being pushed the current passes through the up-solenoid X, the up-circuit C', the branch D', across the landing-switch, through the landing-button 4 to the negative
70 return G', into the lift, across the emergency-switch H', and away to the negative main N'. The up-solenoid regulates the motor-contacts so that the said motor raises the lift, and directly the striker W on the lift strikes and
75 moves the upper leg on the tumbler on the fourth floor the circuit is broken and the motor stops. The door on the fourth landing can then be opened. On entering the lift the person closes the door. If he wishes to reach the
80 second floor, he presses the lift push-button marked "2." The current then passes through the down-solenoid Y, the down-circuit wire E', the branch F' to the upper switch on the second floor, the coupling-wire K', the lift-
85 circuit wire L', through the car push-button 2 to the contact-plate J', through the emergency-switch H' to the negative main N'. Directly the lift strikes and moves the bottom leg of the tumbler on the upper switch on the
90 second floor the circuit is broken and the motor stops.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In the control of electric elevators, one switch on the upper and lower landing and two switches at each intermediate landing, and said switches being electrically connected to push-buttons in circuit with a return-main. 100

2. In the control of electric elevators, a lift having therein lift push-buttons, each of said buttons being connected by lift-circuit wires to landing-switches, a contact-plate in said lift in circuit with a return-main, and an
105 emergency-switch in said return-main, in connection with the negative main.

3. In an electric elevator, a circuit-controller supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a base-board, a tumbler-
110 bracket carried by said base-board, a tumbler carried by said bracket, and means for normally retaining said tumbler in adjusted positions.

4. In an electric elevator, a circuit-controller supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a pivotally-mounted tumbler, said tumbler provided with a plurality
115 of legs, and means for normally retaining said tumbler in an adjusted position.

5. In an electric elevator, a circuit-controller supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a body provided with outwardly-projecting extensions, and yielding
120 means for normally holding said controller in adjusted positions.

6. In an electric elevator, a circuit-controller 130

supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a base, a pivotally-mounted tumbler carried by said base, said tumbler comprising a body portion provided with legs and a terminal, said base provided with a terminal adapted to be engaged by the terminal carried by said tumbler for closing the circuit, and means for securing said tumbler in an adjusted position.

7. A circuit-controller, comprising a base-board, a bracket provided with parallel cheeks carried by said base-board, a tumbler carried by said cheeks, cushioning means carried by said bracket and adapted to be engaged by said tumbler, a terminal formed upon said tumbler, a terminal formed upon said base-board and adapted to be engaged by the terminal carried by said tumbler for closing the circuit.

8. A circuit-controller, comprising a support, a terminal formed upon said support, and a movable tumbler carried by said support, said tumbler provided with a spring-terminal and with substantially parallel legs, said spring-terminal adapted to engage the terminal carried by said support for closing the circuit.

9. In an electric elevator, a circuit-controller supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a movable body provided with substantially parallel legs adapted to be engaged by the lift for either opening or closing the circuit.

10. A circuit-controller, comprising a support, said support provided with a terminal, a tumbler carried by said support, cushioning means carried by said support contiguous to said tumbler, yielding means carried by said support and connected to said tumbler for retaining the same in an adjusted position, said tumbler provided with a terminal, and means extending from said tumbler adapted to be engaged for opening and closing a circuit.

11. A circuit-controller, comprising a support, a stationary terminal carried by said support, a tumbler carried by said support, a spring-terminal carried by said tumbler, cushioning means secured contiguous to said tumbler, and yielding means for securing said tumbler in an adjusted position.

12. In an electric elevator, a circuit-controller supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a base member, a stationary terminal secured to said base member, a tumbler-bracket carried by said base member, a tumbler movably mounted upon said bracket, cushioning-springs carried by said bracket contiguous to said tumbler, a spring-terminal carried by said tumbler and adapted to engage said stationary terminal carried by said base member for closing a circuit, and outwardly-diverging legs formed upon said tum-

bler and adapted to be engaged by said lift for opening or closing a circuit.

13. A circuit-controller, comprising a support, a stationary terminal carried by said support, a tumbler provided with a terminal carried by said support, and cushioning means arranged in diametrically opposite positions upon said support contiguous to said tumbler, said cushioning means adapted to be engaged by said tumbler when in adjusted positions.

14. A circuit-controller, comprising a support, a stationary terminal carried by said support, a tumbler carried by said support, a lateral projection formed upon said tumbler, yielding means connecting said lateral projection and said support, and a terminal formed upon said tumbler and adapted to engage the stationary terminal carried by said support for closing a circuit.

15. A circuit-controller, comprising a stationary terminal, a pivotally-mounted member provided with legs, and a terminal carried by said legs, the terminal of said member adapted to engage the stationary terminal for closing the circuit.

16. In an electric elevator, a circuit-controller supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a slotted base member, a stationary terminal carried by said base member, a tumbler-bracket carried by said base member, parallel cheeks carried by said bracket, a tumbler movably mounted between said cheeks, cushioning-springs secured to said bracket contiguous to said tumbler and adapted to be engaged thereby, said tumbler comprising a body portion provided with outwardly-diverging legs, a removable spring-terminal carried by said body, said spring-terminal adapted to engage the stationary terminal for closing the circuit, a lateral extension formed upon said body, and yielding means connecting said lateral extension and said bracket.

17. In the control of electric elevators, a single switch upon the upper and lower landings, switches upon each of the intermediate landings, each of said switches comprising a tumbler provided with a terminal and outwardly-diverging legs, and said switches being electrically connected to push-buttons in circuit with the return-main.

18. In the control of electric elevators, the combination with a lift, of a switch upon the upper and lower landings, switches upon the intermediate landing, means carried by said lift for operating said switches, each of said switches provided with a terminal and legs, and said switches being electrically connected to push-buttons in circuit with a return-main.

19. In an electric elevator, the combination with a lift, a switch on each of the landings, means carried by said lift for actuating said switches, each of said switches comprising a movable body provided with a terminal and outwardly-projecting legs, said switches being

electrically connected to a return-main by manually-operated means in circuit with said main and capable of closing the circuit.

20. In the control of electric elevators, a lift
5 provided with lift push-buttons, each of said buttons being connected by lift-circuit wires to landing-switches, a contact-plate in said lift in circuit with the return-main, and an emergency-switch carried by said lift in said re-
10 turn-main and in connection with negative main.

21. In an electric elevator, the combination with a lift, a switch upon the upper and lower landings, switches upon the intermediate land-
15 ing, each of said switches of the intermediate landing comprising a terminal carrying-tumbler, a stationary terminal coacting with each of said tumblers, each stationary terminal carried contiguous to its tumbler in diametrically
20 opposite positions to the terminal for operating with the other tumbler, and means carried by said lift for actuating said tumbler for opening and closing the circuit.

22. In an electric elevator, the combination
25 with a lift, of a circuit-controller upon each landing and supported in the path of the lift to be moved thereby in either direction, said circuit-controller comprising a stationary terminal, a pivotally-mounted tumbler secured
30 contiguous to said stationary terminal, said tumbler provided with a spring carrying-terminal and legs, and means carried by said lift adapted to actuate said tumblers for causing their terminal to engage the stationary ter-
35 minal or be moved from engagement therewith.

23. In an electric elevator, the combination with a lift, a circuit for controlling movement of said lift, said circuit provided with a switch,
40 said switch comprising a stationary terminal, a tumbler secured to said stationary terminal, a spring-terminal carried by said tumbler, outwardly-diverging legs secured to said tumbler, and a push-button upon said circuit be-

ing capable of closing the circuit for permit- 45
ting the current to energize the motor for actuating the lift.

24. In an electric elevator, the combination with a lift and a motor, of a circuit connected to a landing, said lift and motor, a push-but- 50
ton in said circuit, a switch in said circuit, said switch comprising a pivotally-mounted member carrying a terminal, a stationary terminal secured contiguous to said member, legs
55 extending from said member, and means carried by said lift and adapted to alternately engage said legs for opening and closing said switch.

25. In an electric elevator, a circuit-controller supported in the path of the lift to be 60
moved thereby in either direction, said circuit-controller, comprising a stationary terminal, a pivotally-mounted member secured contiguous to said stationary terminal, said pivotally-mounted member provided with a terminal 65
and extensions, means formed upon said lift and adapted to alternately engage said extensions for either opening or closing the circuit.

26. In an electric elevator, the combination with a lift, of a circuit-controller carried in 70
position to be actuated by said lift, said circuit-controller comprising a stationary terminal, a movable member secured contiguous to said stationary terminal, said movable member provided with a terminal adapted to en- 75
gage the stationary terminal for closing the circuit, and said movable member provided with means adapted to be alternately engaged by said lift for opening or closing the circuit for moving the first terminal into engage- 80
ment with or away from the stationary terminal.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

GEORGE ANDREW PHILIP WEYMOUTH.

Witnesses:

EDWIN PHILLIPS,

GEORGE A. U'REN.