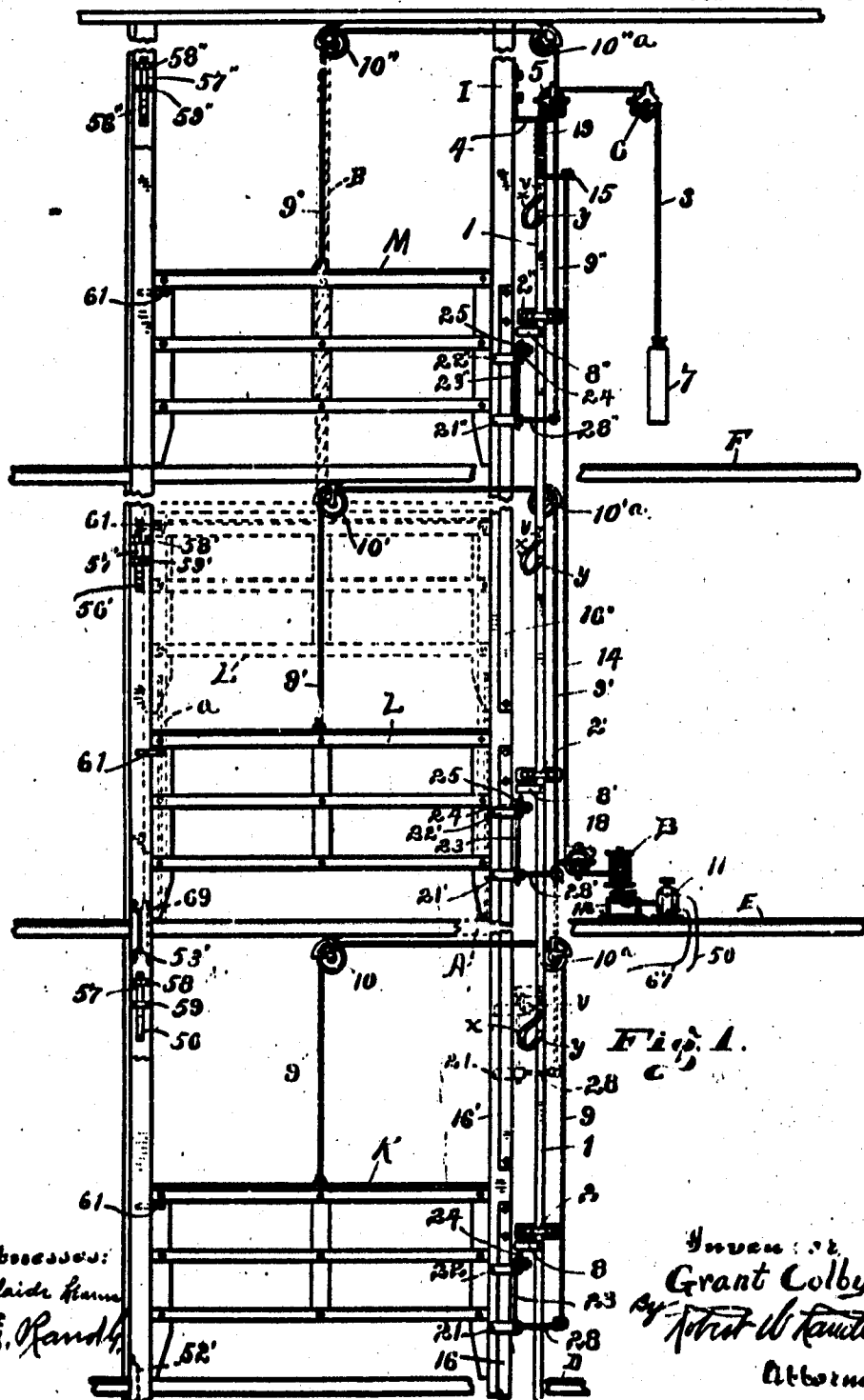


G. COLBY.
ELECTRICALLY OPERATED ELEVATOR GATE MECHANISM.
APPLICATION FILED OCT. 13, 1910.

1,010,863.

Patented Dec. 5, 1911.

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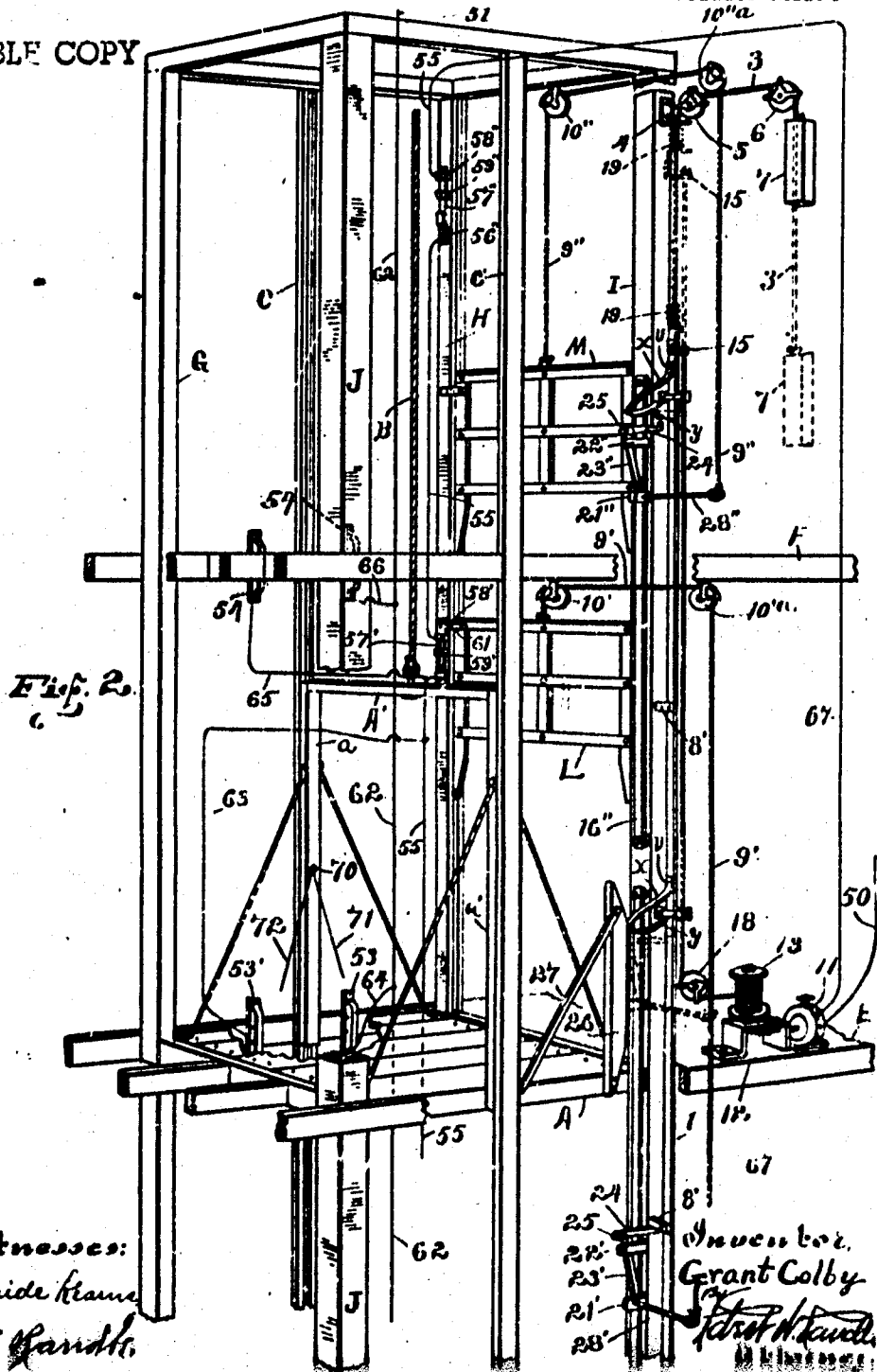
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4 SHEETS-SHEET 3.

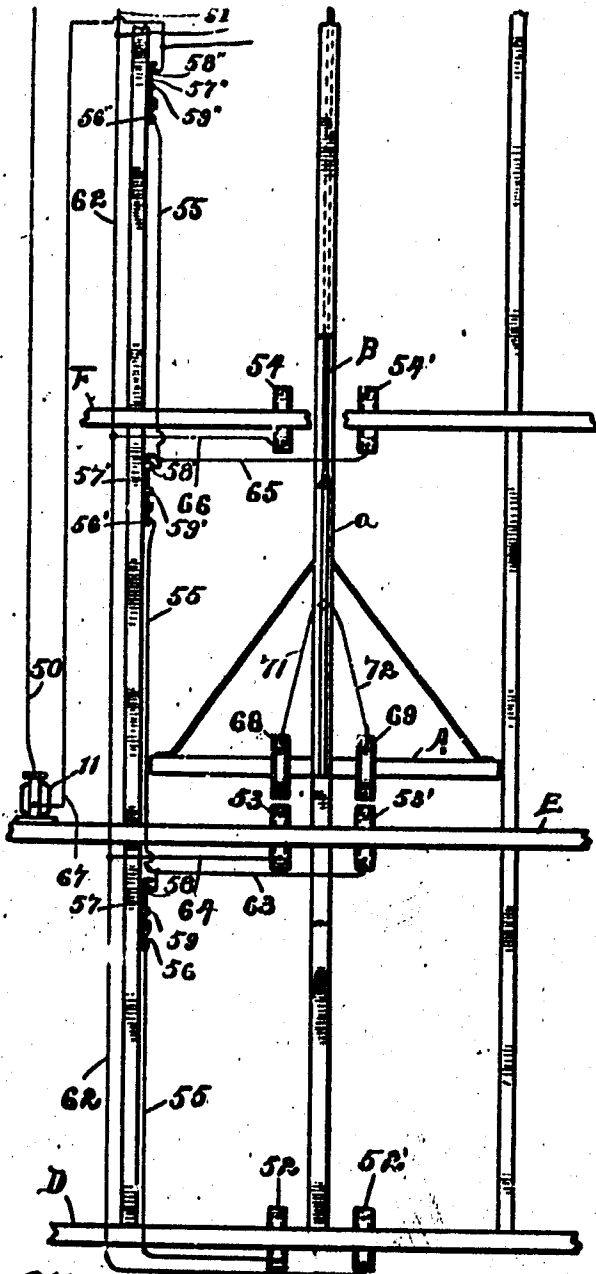


Fig. 3.

Witnesses:
Oselaide Leary.
R. G. Handley.

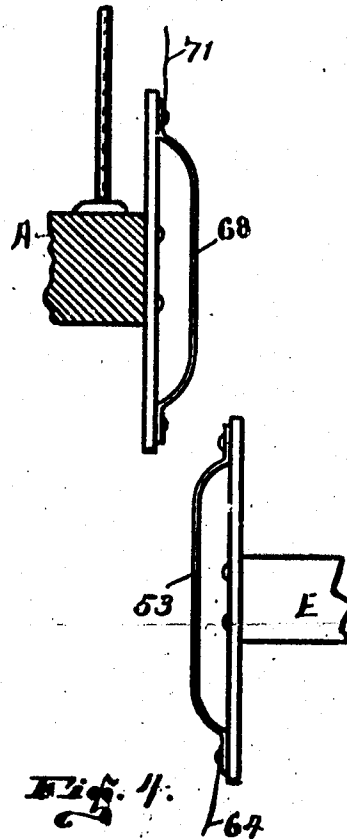


Fig. 4.

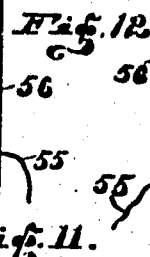
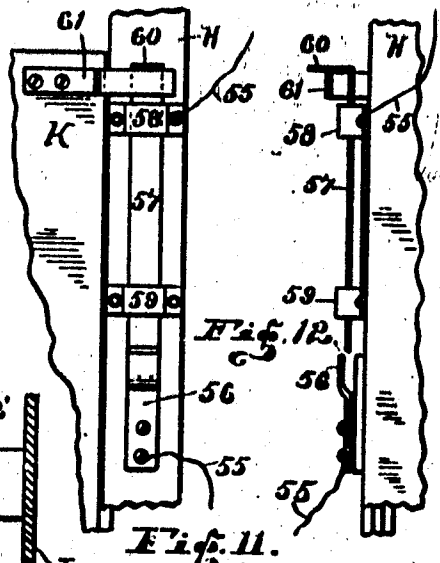
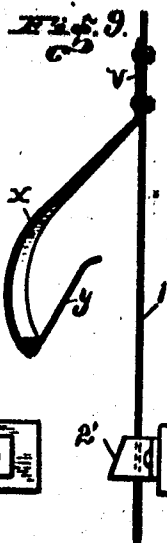
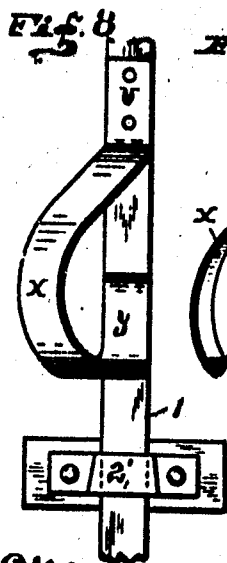
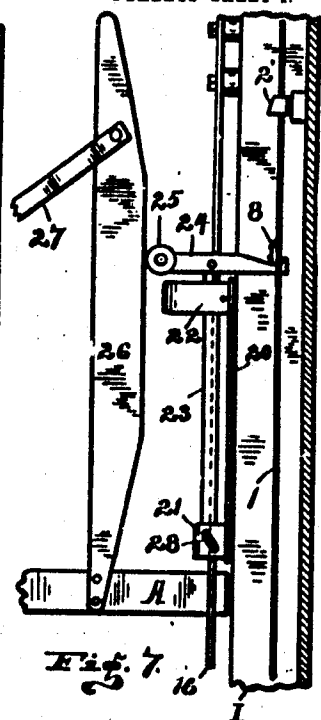
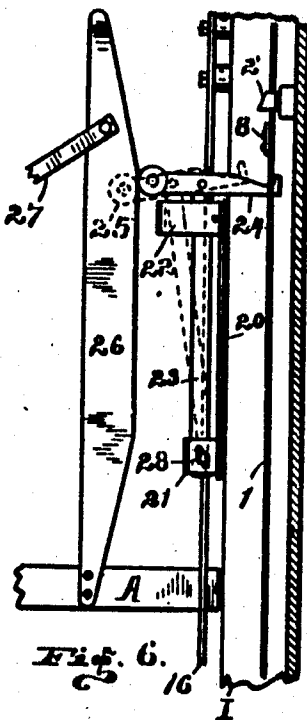
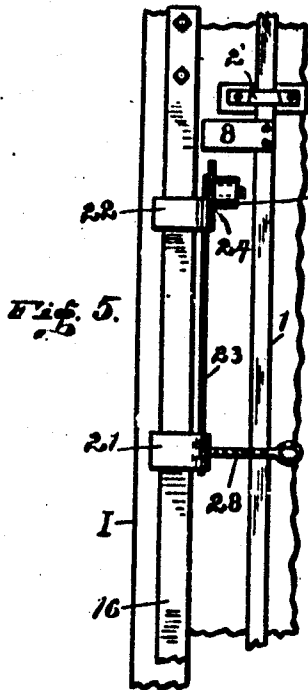
Inventor:
Grant Colby:
By Robert W. Handley,
Attorney

G. COLBY.
ELECTRICALLY OPERATED ELEVATOR GATE MECHANISM
APPLICATION FILED OCT. 19, 1910.

1,010,863.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 4.



Witnesses:
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R. G. Bond.

Inventor,
Grant Colby,
By Robert W. Randall,
Attorney.

UNITED STATES PATENT OFFICE.

GRANT COLBY, OF NEW PARIS, OHIO.

ELECTRICALLY-OPERATED ELEVATOR-GATE MECHANISM.

1,010,863.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed October 13, 1910. Serial No. 586,835.

To all whom it may concern:

Be it known that I, GRANT COLBY, a citizen of the United States, and a resident of New Paris, in the county of Preble and State of Ohio, have invented certain new and useful Improvements in an Electrically-Operated Elevator-Gate Mechanism, of which the following is a full, clear, and accurate specification.

The object of my present invention, broadly speaking, is to provide an electrically operable, open at will, elevator-gate mechanism which will be positive in action, strong and durable in construction, easily operated and controlled, simple in all of its parts and easy of installation, and which can be manufactured and sold at a comparatively low price.

More specifically stated my object is to provide a mechanism of the nature above set forth whereby the elevator gates which guard the various hatchways of an elevator shaft will remain closed, regardless of the number of times the elevator car passes up and down, until such time as shall be desired by the operator of the elevator car, and then only providing the floor of the elevator car is even, or nearly so, with one of the floors of the building.

Another object is to provide a mechanism of the character designated whereby the various elevator-gates which guard the hatchways through the various floors will remain closed until such time as designated by the operator when the floor of the elevator car is near one of the floors of the building, such designation being accomplished by the pressure of a button or the like, making an electrical connection, which will cause the gate at that floor to be opened electrically.

Other objects and particular advantages of my invention will be brought out and made apparent in the course of the following description when taken in connection with the accompanying drawings forming a part of this specification.

One manner for carrying out the objects of my invention in a practical manner and that which in practice I have found to be the most desirable and satisfactory is shown in the accompanying drawings, in which—

Figure 1 is a front elevation of certain parts of my invention, showing same in connection with various floors of a building, the elevator shaft, and the gates for the various floors. Fig. 2 is a perspective view of sub-

stantially the same parts as shown in Fig. 1 with the addition of the elevator car to operate between the various floors. Fig. 3 shows a side elevation of certain features of the invention, but more particularly showing the electrical connections. Fig. 4 is an enlarged detail side elevation of two of the electrical contacts, showing their relative positions with relation to each other. Fig. 5 is an enlarged detail showing a front elevation of the latch for controlling the elevator gates; Fig. 6 is a side elevation of the latch in connection with the cam carried by the elevator car; Fig. 7 is a view of the same parts shown in Fig. 6 but in this instance showing the latch engaged. Fig. 8 is a perspective view of one of the catches for holding the gates open. Fig. 9 is a side elevation of the catch shown in Fig. 8 and showing same disengaged. Fig. 10 shows a side elevation of the same catch engaged. Fig. 11 shows a front elevation of one of the circuit breakers connected; and Fig. 12 is a side elevation of one of the circuit breakers disengaged.

Similar indices denote like parts throughout the several views.

In order to clearly explain the construction and the operation of my invention I have shown it in connection with an elevator-car having a floor or body A, the two sides, or vertical bars, *a* and *a'* extending from the center of the sides, and the cross-bar A'. Extending up from the center of cross-bar A' is the cable B, by which the car is raised and lowered in any well known manner.

C and C' denote the two side posts having guides by which the elevator car is guided directly up and down through the shaft formed through the various floors D, E and F of a building. Suitable corner posts may also be provided, as for instance posts G, H, I and J, although these are not essential to my invention, except that they provide means for mounting the various gates hereinafter mentioned. Slidable up and down in suitable guideways, between posts H and I (or between posts G and J) are the various gates K, L and M, one for each floor, which are adapted to rest on the floors and close the hatchways of the respective floors D, E and F.

The several parts above enumerated are old in the art and they may be variously changed as desired to meet various conditions.

It has been customary heretofore to open the various gates manually, or to have them open automatically, or semi-automatically, each time the elevator car passed any particular floor. I will now describe the construction by which the several gates may be opened electrically, but only when the elevator car is near a particular floor and then only when desired by the operator.

Numeral 1 denotes a bar which extends up and down through the building, reaching all of the floors, and it is carried by suitable guides 2, 2' and 2'' which may be secured to post I or to other parts of the building as found most convenient. Secured to the upper end of bar 1 is a chain or cable 3 which projects up through guide 4, then over sheaves 5 and 6, and then downward, with the weight 7 secured to its other end, as indicated, said weight being such as to normally raise the bar 1 to its highest position, there being a cushion spring 19 contacting with guide 4 which prevents the bar 1 from stopping too abruptly when it moves upward. Between each floor a finger is secured to the bar 1, these being indicated in this instance by indices 8, 8' and 8'' for the respective floors.

Numerals 9, 9' and 9'' denote the respective ropes, cords or cables which are secured to the gates K, L and M. Said ropes or the like extend upward, to one side, and then downward, each passing over two sheaves 10-10'; 10'-10'' and 10''-10''', respectively, all of said sheaves being located near their respective ceilings as shown.

Numeral 11 denotes an electric motor which is operative upon the gearing device 12. Mounted on the frame of the gearing is the vertically disposed spool 13 which is adapted to be revolved by the motor 11 but, by reason of said gearing, at a greatly reduced rate of speed.

Numeral 14 denotes a cable, or the like, having one end secured to the upper end of the bar 1 by means of the bracket 15. From said bracket the cable 14 extends down under sheave 18 and then out and around spool 13 where it is secured, being of such length as to allow the proper amount of endwise movement to the bar 1.

Secured parallel with post I but disposed a slight distance therefrom are the permanent bars 16, 16' and 16'', that is one for each gate K, L and M, respectively. Each of said bars extends from some distance above its respective floor to a considerable distance below that floor. Slidably mounted on each of the last mentioned bars is a latch mechanism, the same being identical with each other, which I will now describe, referring more particularly to the latch mechanism of the lower gate, and indicating like parts for the other gates by similar numerals with exponents, corresponding

with the exponents used on said permanent bars: The parts which I will now describe are shown in detail in Figs. 5, 6 and 7.

Numeral 20 denotes a stem. Secured to the lower end of said stem is the shoe 21 which operates up and down on the bar 16. Secured on the upper end of stem 20 is the shoe 22 which has an outwardly extending loop which is for the purpose hereinafter appearing. Pivoted at its lower end to guide 21 is the arm 23 which extends up through said loop of the guide 22. Secured on the upper end of arm 23 is the latch 24 which is disposed at right-angles to the arm 23. One end of said latch extends out to the side of the bar 1 and it is provided with a hooked-end which is adapted to engage the under edge of the finger 8, as indicated in Fig. 7, that is when the arm 23 is parallel with said bar 1. By reason of said loop in the guide 22 the arm 23 may be disposed at an angle as indicated by the dotted lines in Fig. 6, thereby withdrawing the hook portion of the latch 24 from alinement with the finger 8 so that it may not be engaged thereby. Mounted on the other end of the latch 24 is a roller 25, which provides a roller contact for engagement with the cam 26 hereinafter referred to. Said latch is operable by said cam 26, there being but one cam 26 and that is secured to and is continuously carried by the elevator car. The lower end of cam 26 is secured to the side of the floor or base A of the elevator car, and the upper end thereof is secured by brace 27 which extends therefrom downward at an angle to the floor or base A, as indicated in Fig. 2. Extending out from guides 21, 21' and 21'' are the arms 28, 28' and 28'', respectively, each having an eye in its outer end in which is secured one end of the respective ropes or cords 9, 9' and 9''.

A catch is provided for retaining the gates open at their highest elevation after the motor has been cut out, there being one of said catches for each gate, substantially as that shown in Figs. 8, 9 and 10. The guides 2, 2' and 2'' form each a part of each of said catches, the faces of said guides being beveled as in Fig. 9, for the purpose hereinafter made apparent. Each of said catches includes a flat member formed of spring material comprising a fixed portion *x* which is rigidly secured to bar 1, from which extends downwardly the curved portion *y* of considerable length, then the upwardly extending portion *z* which may be parallel at times with bar 1, and then the short portion which is bent out from the upper end of part *z* to engage the face of the bar 1. Normally said upper portion of the part *z* stands away from bar 1 so as not to engage the guide 2, but it is adapted to be pressed back against said bar by means of the cam 26.

The electrical arrangements are shown most clearly in Fig. 3, the motor 11 being shown as located on the second floor, but it may as well be placed on either of the other floors, or it may be placed at any other point as will be found most convenient.

In the drawings numerals 50 and 51 denote the two service wires which lead in from the source of electrical supply, the former being connected directly to the motor while the latter has other connections which will be fully set forth.

Extending above and below each floor and secured on each side of the center of the hatchway are the respective pairs of fixed contacts 52—52', 53—53' and 54—54', for the respective floors D, E and F.

Numerals 55 denotes a main wire extending from contact 52 upward to the top of the building, there being a circuit-breaker interposed therein near the ceiling above each floor, said circuit-breakers being shown most clearly in detail views in Figs. 11 and 12, each comprising a fixed member 56, and the sliding member 57, the latter being carried in the hangers 58 and 59. The upper end of the member 57 is turned out at right angles forming the horizontal finger 60. Secured to the upper part of each gate, for instance gate K, is the arm 61, same having an offset whereby it extends out beyond the gate, clearing the hangers 58 and 59 and adapted to engage the underside of finger 60 for the purpose of lifting the member 57 out of contact with member 56, as in Fig. 12. Wire 55 is of course broken at each of said circuit-breakers, one end thereof being secured to member 56 and the other end being secured to hanger 58 (or 59). Now when member 57 is lifted up the circuit will be broken at that point, and when it is down the circuit may pass there-through. A second wire, 62, extends from contact 52' to the top of the building same being connected to service wire 51. At floor E a branch wire 63 extends off from wire 55 to contact 53', and also from wire 62 a branch wire 64 extends off connecting with contact 53.

At floor F a branch 65 extends off from wire 55 to contact 54', and from wire 62 a branch wire 66 extends off connecting with contact 54. As above intimated the service wire 51 is connected to the main wire 62, and wire 67 extends from wire 55 to the motor, that is to the opposite pole of the motor from that of wire 50.

Numerals 68 and 69 denote the two movable contacts which are of like construction but they are oppositely disposed to the aforementioned or permanent contacts, and said contacts 68 and 69 are carried on one edge of the floor A of the car in such position that as the car moves up and down the contact 68 may impinge contact 52,

53 or 54, and at same time that contact 69 impinges contacts 52', 53' or 54', as is indicated in Fig. 4. Said contacts 68 and 69 are located some distance apart, as indicated in Fig. 3.

Located on some part of the elevator car, within reach of the operator, is a push-button, or switch, 70. Connected with the two poles of the button or switch are the wires 71 and 72 which connect with contacts 68 and 69, respectively. Said push-button is of ordinary construction so made that when the button is pressed an electric current may pass therethrough, while normally the circuit will be broken therein, that is when the button is released.

The operation of my invention is as follows: It is apparent that the weight of the various gates, K, L and M, will within themselves normally retain them lowered or closed, as shown in Fig. 1, and in the upper part of Fig. 2. Also it is apparent that the elevator car may be operated up and down from the top to the bottom of the building, or vice versa, without operating any of said gates and without any attention on the part of the operator. And it will be impossible for the operator of the car to cause either of the gates to be raised, electrically, unless the floor of the car is near to or even with one of the floors of the building, and it will also be observed that only one of said gates may be so raised at one time, regardless of the number of gates there may be. With the above clearly in mind suppose, now for instance, that as the car approaches floor E then contacts 68 and 69 will connect with contacts 53 and 53', and with said contacts made then suppose that the car be stopped, that is with floor A of the car even with or near the level of the surface of floor E, yet even then the gate will remain closed, but if the operator at this time press the button or switch 70 then the electric circuit will be established which will operate the motor 11, that is to say the motor will then be connected with both of the service wires 50 and 51,—the former directly, and the latter through wire 62 and wire 64 to contact 53, then through contact 68 and wire 71 to the button 70, then through wire 72 to contact 69, then from the latter to contact 53' to wire 63, and from the latter to wire 55 and then to the motor 11 through wire 67, thereby completing the circuit, and of course causing the motor to operate and turning the spool 13, thereby causing the cable 14 to wind therearound and resulting in drawing the bar 1 downward endwise, thereby raising weight 7, as in Fig. 2. Now as the bar 1 is being lowered while the elevator car is at floor E it is evident that the cam 26 will, previously, have pressed the latch 24 to such position that as bar 1 moves downward the finger 8', carried 13

thereby, will engage said latch 24, as in Fig. 7, thereby carrying the latch mechanism downward therewith, which of course will result in pulling the rope or cord 9' and causing the gate L to rise as the bar 1 descends. As the gate rises to the height desired then the arm 61 will engage the finger 60 thereby lifting the member 57 out of contact with member 56 thereby resulting in breaking the current at that point and of course stopping the operation of the motor, and thereby stopping the upward movement of the gate. Now if no catching means were provided it is evident that as soon as the power was cut off from the motor that the gate would immediately drop back to its closed position, but the catching device is so placed that it comes into action as soon as the current is broken by the said circuit breaker. Now as the bar 1 descends then the curved portion α of the catch will impinge the cam 26 which manifestly will spring the part y toward the bar 1 causing the upper portion of part y to engage said bar 1 and then slide down over the bevel of guide 2' and finally spring off of the lower edge of guide 2' simultaneously with the breaking of the current, therefore as the gate starts to drop then the upper portion of part y of the catch will engage under guide 2' and hold all of said parts in position as shown between floors E and F in Fig. 2. Now as the car leaves either of the floors or landings, for instance floor E, going in either direction up or down, it is evident that the contacts 68 and 69 will be separated from the stationary contacts 53 and 53', respectively, for instance. Simultaneous with the above the cam 26 will release the flat spring member v , α , y , and allow it to spring back releasing it from the guide 2', thereby allowing the bar 1 to be lifted up to its limit by the weight 7, and allowing the gate then open to drop back to closed position. As the gate starts back to closed position it will release member 57 and allow it to drop down in contact with member 56, again connecting the electric circuit at that point. In fact as the car leaves floor E (or any other floor) all of the devices will automatically assume their normal positions, substantially as indicated in Fig. 1. It is also evident that the same thing may occur at each floor as that just stated as occurring at floor E.

I desire that it be fully understood that various changes may be made in the several details of construction herein shown and described, and that modifications and substitutions may be incorporated within the limits of the invention without departing from the spirit of my invention or sacrificing any of the advantages thereof.

Having now fully shown the best exemplification of my invention to me known at this time, what I claim and desire to se-

cure by Letters Patent of the United States, is—

1. An electrically operated elevator gate mechanism comprising the combination with a plurality of gates each normally closing an entrance to an elevator shaft; and an elevator-car movable in said shaft; of a bar extending from the top to the bottom of said shaft regardless of the number of gates, a weight normally retaining said bar in its highest position, a motor adapted to lower said bar, an independent stationary bar for each floor located parallel with the first named bar and extending above and below its floor, a latch mechanism slidable on each of said independent bars and comprising a stem, a shoe carried on the lower end of the stem, a guide having an outwardly extending loop, an arm 23 pivoted at the lower end to said shoe and extending up through said loop of the guide, a latch member secured near its center to the upper end of said arm 23 and having a hooked end located near the first named bar, a finger secured to the first named bar which is adapted, under certain conditions, to be engaged by said latch member, a roller mounted on the other end of said latch member, a cam carried by the elevator-car and adapted to press against said roller to move the latch member into position to be engaged by said finger, means carried by the elevator-car for starting the motor at the will of the operator whereby the latch mechanism then pressed by said cam will be engaged by said finger as the first named bar is lowered by the motor and thereby raising the gate at that floor, substantially as set forth.

2. An electrically operated elevator gate mechanism comprising the combination with a plurality of gates each normally closing an entrance to an elevator-shaft, and an elevator-car movable in said shaft; of a single bar extending the full length of the elevator-shaft and adapted to be operated vertically, a weight normally retaining said bar in its highest position, a motor adapted to lower said bar, an independent stationary bar for each gate each extending above and below the floor at which it is located, a latch mechanism mounted on each of said stationary bars, means carried at each floor by the first named bar for engaging said latch mechanism, a system of electric wiring which is normally broken, means carried by the car for completing the electric circuit if desired by the operator of the car but only when the car is near one of the floor landings, a drum adapted to be revolved by the motor, a cable adapted to be wound on the drum, the other end of said cable being attached to the first named bar whereby said bar will be lowered when the motor is operated, a flexible connection be-

tween each of said latch mechanisms and its gate whereby as a latch mechanism is engaged by the first named bar the gate located at the same floor as is the elevator-car will be raised, and means for breaking the electric circuit when the gate has reached the height desired, all substantially as set forth.

3. An electrically operated elevator gate mechanism comprising the combination with a plurality of gates each normally closing an entrance to an elevator-shaft, and an elevator-car movable in said shaft, of a bar extending from the top to the bottom of said shaft regardless of the number of gates, a weight normally retaining said bar in its highest position, a motor adapted to lower said bar, a latch for each gate, an independent bar for each gate, each latch

being slidable on one of said independent bars parallel with the first named bar, a cam carried by the elevator-car and adapted to press said latches into position to be engaged by said movable bar, and means carried by the elevator-car for starting the motor whereby the latch then pressed by said cam will be engaged and the gate at that floor will be raised, and means for retaining the gate open until the elevator-car leaves that floor.

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

GRANT COLBY.

Witnesses:

ROBERT W. RANDLE,
R. E. RANDLE.