

**No. 677,783.**

**Patented July 2, 1901.**

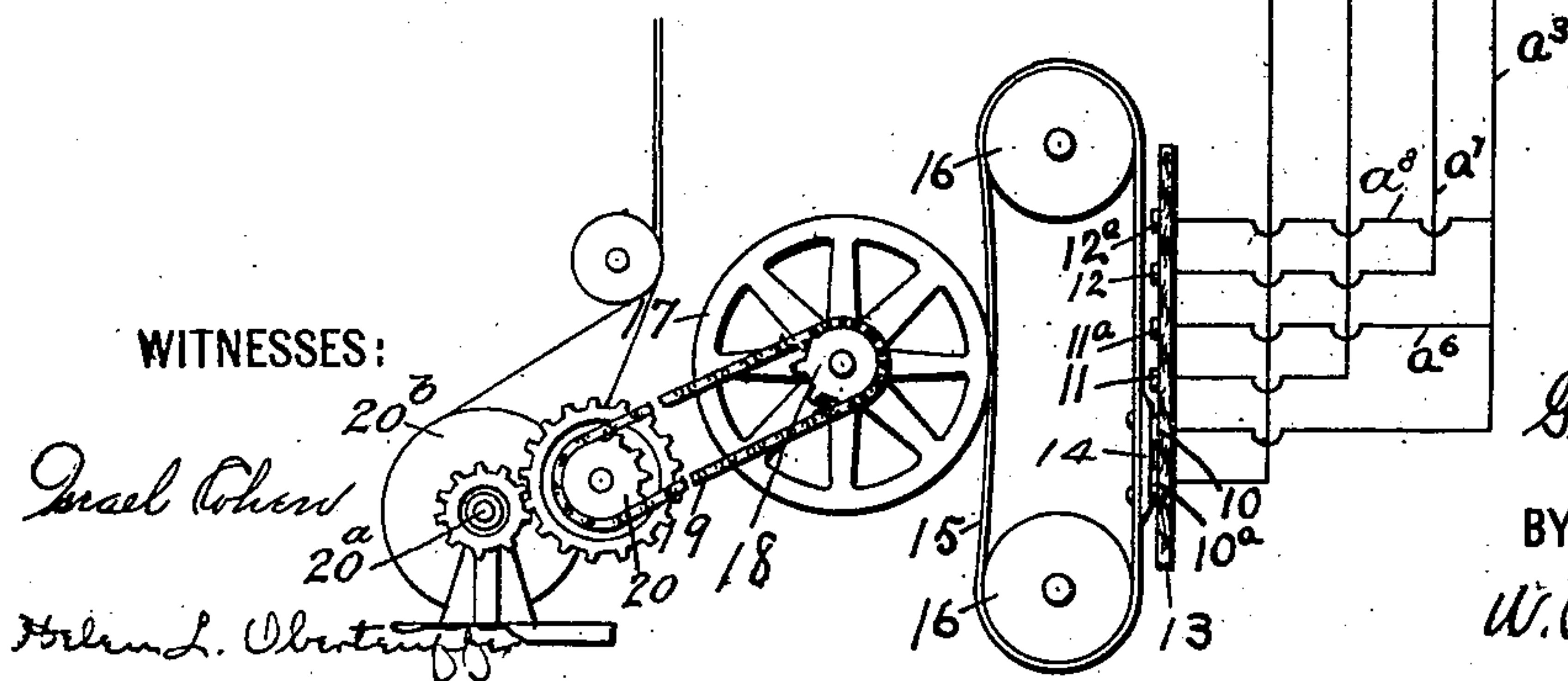
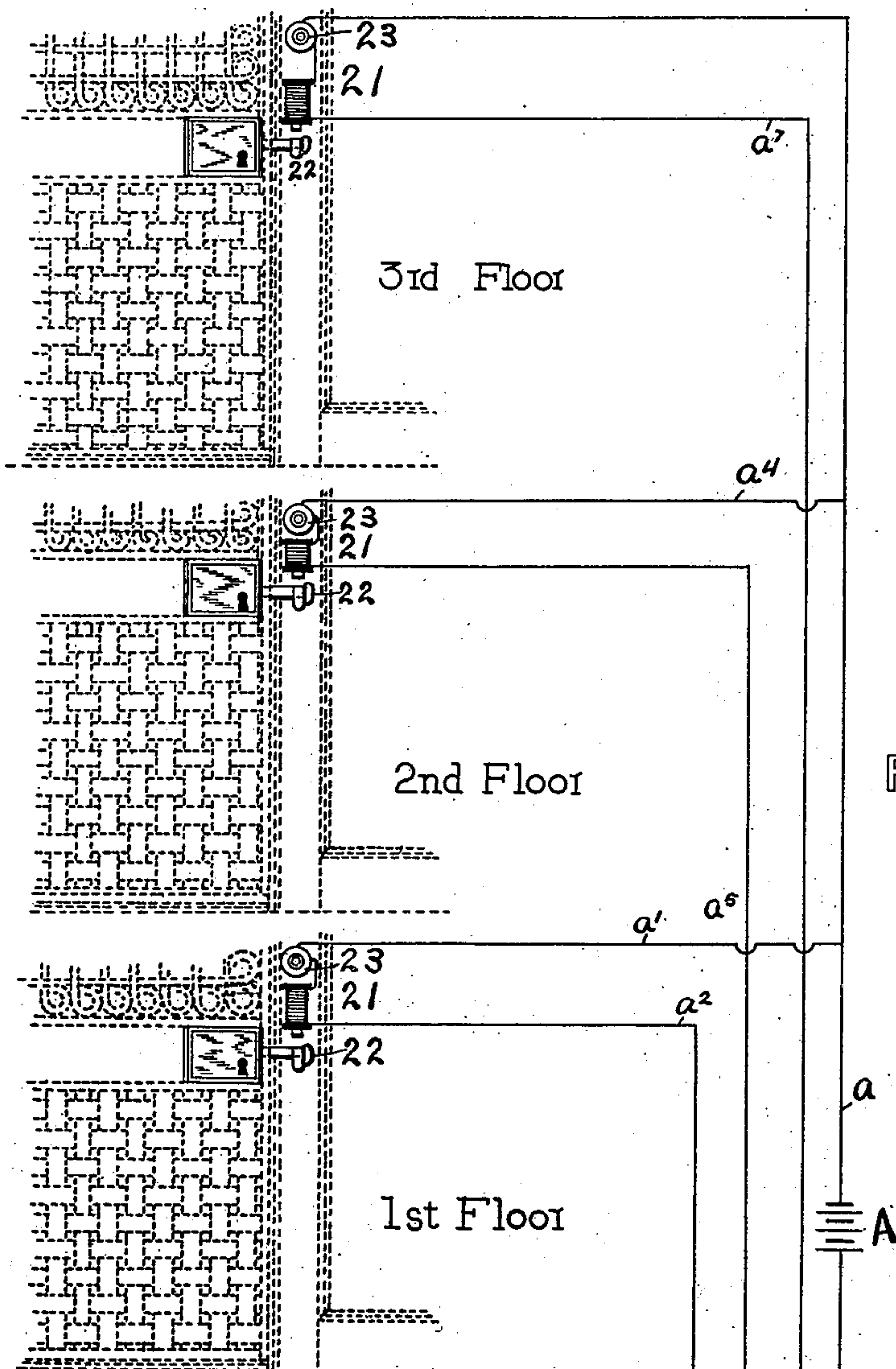
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## CONTROLLING DEVICE FOR ELECTRICAL DOOR OPENERS.

(Application filed July 30, 1900.)

(No Model.)

**2 Sheets—Sheet 1.**



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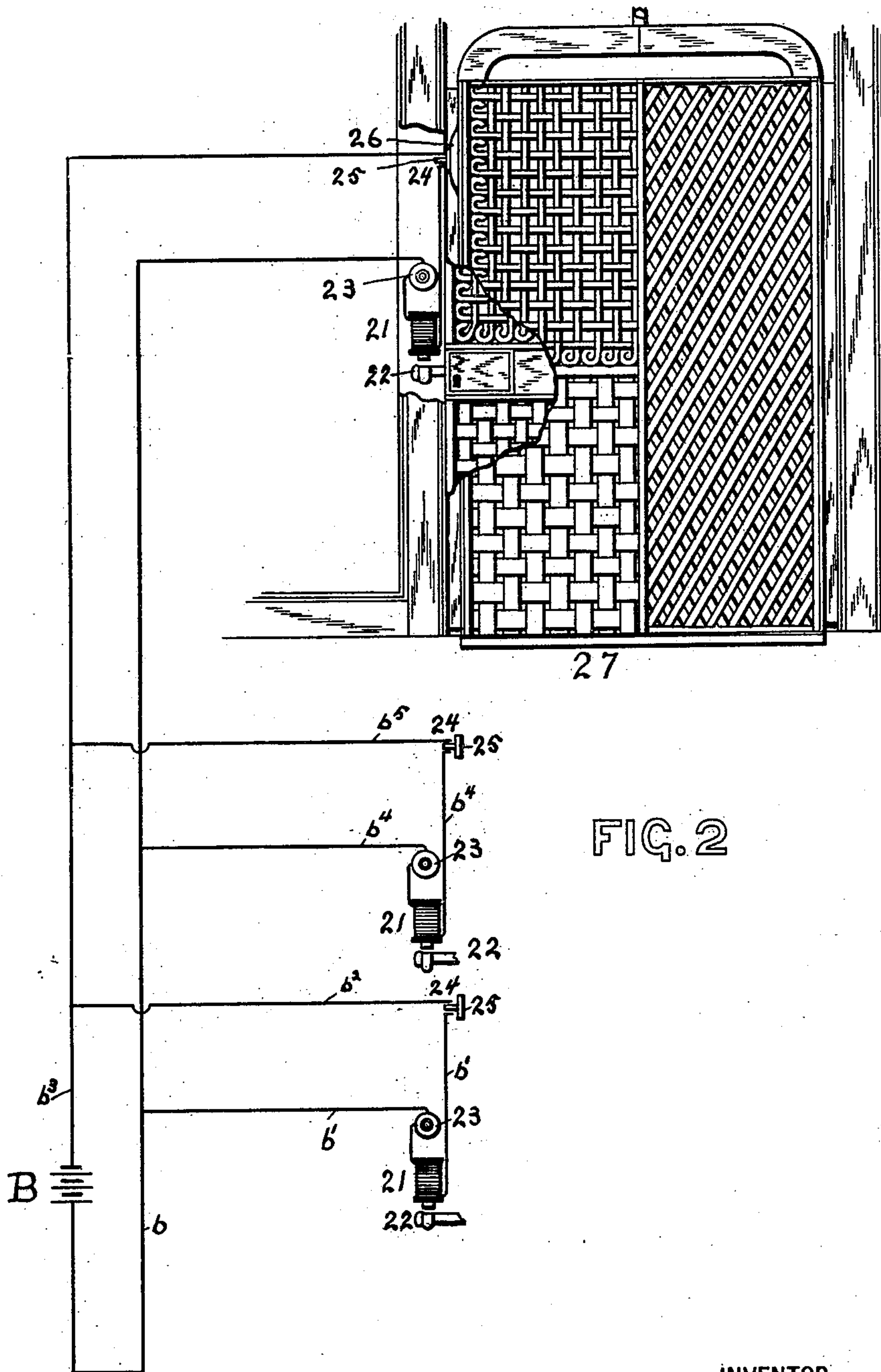
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2 Sheets—Sheet 2.

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE A. LE FEVRE, OF NEW YORK, N. Y.

## CONTROLLING DEVICE FOR ELECTRICAL DOOR-OPENERS.

SPECIFICATION forming part of Letters Patent No. 677,783, dated July 2, 1901.

Application filed July 30, 1900. Serial No. 25,359. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. LE FEVRE, of the city, county, and State of New York, have invented certain new and useful Improvements in Controlling Devices for Electrical Door-Openers, of which the following is a full, clear, and exact description.

My invention relates to improvements in attachments for elevator-wells, and especially for use in connection with electrically-operated or partially-operated door-openers.

The object of my invention is to produce a very simple electrical device by means of which the door-openers of the several floors of a building are arranged on an open circuit and held thus, so that they cannot be operated until the elevator-cage reaches the floor at which it is desired to have the door open, when the circuit will be automatically closed and the door-opener capable of the usual operation.

My invention is intended for use with any ordinary door-opener, and relates especially to automatic means for closing the circuit at just the right time and for holding the circuit open at all other times, and it will be seen that this will prevent any accidental or mischievous operation of the doors of an elevator-well.

To these ends my invention consists of certain features of construction and in the arrangement or organization of certain circuits and circuit-closing devices, which will be hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar characters of reference refer to similar parts throughout both views.

Figure 1 is a diagrammatic elevation of a portion of an elevator-well, a series of door-openers, the circuits, and the means for closing the circuits embodying my invention; and Fig. 2 is a similar view, but illustrates a modification of the invention, in which the elevator-cage actually closes the circuit, whereas in Fig. 1 the circuit is closed by a mechanism connected with the gearing of the elevator.

In Fig. 1 I have illustrated diagrammatically three floors of a building having the usual elevator-well, and at a point within easy connection of the elevator-gearing or operating

mechanism—say in the basement—are located pairs of contacts 10 and 10<sup>a</sup>, 11 and 11<sup>a</sup>, and 12 and 12<sup>a</sup>, there being a pair of contacts for each floor of the building. These contacts are arranged on a convenient support, as 13, so that a contact-plate 14 may be made to slide over their faces, and the length of the contact-plate is such that it will successively engage each pair of contacts and will electrically connect them at the proper time. The contact-plate 14 is carried by a belt 15, running over suitable pulleys or drums 16, and the belt, as illustrated, is frictionally driven by a wheel 17, and the latter is turned by a sprocket-wheel 18, which is driven by a chain 19, connected with a second sprocket-wheel 20, and this in turn may be driven from some convenient part of the elevator-gearing—as, for instance, the shaft 20<sup>a</sup> of the cable-winding drum 20<sup>b</sup>. The mechanism for moving the contact-plate 14 is timed so that when the elevator-cage is opposite the first floor of the building the contact-plate 14 will engage and close the circuit through the contacts 10 and 10<sup>a</sup>. When the elevator-cage reaches the second floor, the contact-plate will close the circuit through the contacts 11 and 11<sup>a</sup>, and when the cage is opposite the third floor the contact-plate will close the circuit through the contacts 12 and 12<sup>a</sup>. It will be readily seen that this arrangement may be carried out for any number of floors, and it will also be understood that the means for moving the contact-plate is immaterial and that very many mechanical devices can be used for bringing the plate to the correct position as the car or cage progresses upward and downward. While other devices may be used for moving the belt 15 and the contact-plate 14 over the several contacts, yet the fact that these contacts 10, 11, 11<sup>a</sup>, 12, and 12<sup>a</sup>, &c., are grouped and centralized in one compact body is a very important feature of the invention, as it enables the mechanical part of the circuit-closing mechanism to be arranged in some small and inconspicuous place.

In the drawings I have shown diagrammatically the most common form, 21, of electrical door-opener in use, in which when the circuit



is closed through it the magnet of the door-opener lifts the latch 22 of the door to the elevator-well, permitting the door to be opened either manually or by mechanism. It will be  
 5 noticed that the parts 21 when operated simply release the door; but I have referred to them as "door-openers," as this is their ordinary trade-name, and obviously my invention can be used with any usual style door-  
 10 opener. The door-opener is provided with a push-button 23 or other form of circuit-closer, so that the circuit may at the proper time be closed and the door opened. This arrangement is not novel, but is novel in connection  
 15 with the circuits and the circuit-closing mechanism which I have partly described above and will continue below. The circuits, as illustrated, are as follows: for the first floor, from the battery A, through the wires  $a$   $a'$ ,  
 20 the circuit-closer 21 of the first floor, wire  $a^2$ , the contacts 10 and 10<sup>a</sup>, the contact-plate 14, and wire  $a^3$ , back to the battery; for the second floor, from the battery A, through the  
 25 wire  $a$ , the wire  $a^4$ , the door-opener of the second floor, the wire  $a^5$ , the contacts 11 and 11<sup>a</sup>, the contact-plate 14, the wire  $a^6$ , and the wire  $a^3$ , back to the battery; for the third  
 30 floor, from the battery A, through the wire  $a$ , the door-opener of the third floor, the wire  $a^7$ , the contacts 12 and 12<sup>a</sup>, the contact-plate 14, and the wires  $a^8$  and  $a^3$ , back to the battery.

As illustrated in Fig. 1, the circuit is closed through the door-opener of the first floor, and at this point the elevator car or cage will be  
 35 at the first floor, and it will be seen that if a person should attempt to open a door at any other floor he would be unable to do so, as the circuit would be broken at the contacts 11 and 11<sup>a</sup> or 12 and 12<sup>a</sup>. When, however,  
 40 the push-button or circuit-closer 23 is operated at the appropriate floor, as at the first floor in the case mentioned, the circuit will be closed in the manner just above traced and the door can be operated. Of course it will  
 45 be understood that where the time push-buttons are used—that is, the push-buttons which stay in on a closed circuit for a certain time—the push-buttons might be operated when the elevator-cage is at any floor  
 50 and the circuit would be closed and the door opened when the cage reached the desired floor, as in this case the contact-plate 14 would have come opposite the appropriate contacts and the circuit would be closed, as above described.  
 55

To illustrate the fact that many devices may be used for closing the circuit at the desired time and for holding it open at all other times, I have shown a modification in Fig. 2.  
 60 Here the door-opener is as already described; but at every floor is a break in the circuit, as at 24, which is closed by a contact-plate 25, and the latter, as illustrated, is pushed into position to close the circuit by the striking  
 65 plate or cam 26 or equivalent device, which is carried on the cage 27. As illustrated in

Fig. 2, the several circuits are as follows: for the first floor, from the battery B, through the wire  $b$ , the wire  $b'$ , and door-opener 21 of the first floor, the contacts and circuit-closer 70 24 and 25, the wire  $b^2$ , and the wire  $b^3$ , back to the battery; for the second floor, from the battery B, through the wire  $b$ , the wire  $b^4$ , and door-opener 21 of the second floor, the contacts and circuit-closer 24 and 25 of the 75 second floor, and the wires  $b^5$  and  $b^3$ , back to the battery; for the third floor, from the battery B, through the wire  $b$  and door-opener 21 of the third floor, the contacts and circuit-closer 24 and 25 of the third floor, and 80 the wire  $b^3$ , back to the battery. It will be seen, therefore, that the structure shown in Fig. 2 is the same in principle as that shown in Fig. 1, only the closing of the circuit is effected by the movement of the car itself in- 85 stead of by the movement of some part actuated by the gearing of the car; but in both cases the circuit is closed when the car comes to rest at any floor, subject, of course, to the operation of the push-button. 90

In the foregoing description I have described a moving part of the elevator apparatus as closing the circuit through the door-openers 21; but it will be understood, of course, that this circuit is subject to the 95 control of the ordinary push-button 23 or an equivalent circuit-closing device. I have, therefore, in the claims referred to the mechanism operated by some moving part of the elevator apparatus as closing the circuit, and 100 it will be understood that while the circuit is controlled by the push-button to a certain extent it can only be so controlled when the circuit is closed through the apparatus forming a part of my invention, and the structure 105 in the claims is therefore believed to be sufficiently defined.

It will be noticed in my invention that hardly any mechanism is used and that the operation of the door-opener is subject really 110 to two circuit-closers, one being closed by the elevator car or gearing, as described, and the other by the push-button, but that the push-button is of no use except when the first circuit-closer is operated. 115

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

1. In an elevator, the combination with the operating mechanism and the electrical door- 120 openers, of a circuit-closer automatically operated by the movement of a portion of the elevator apparatus as the car reaches a floor, and a second circuit-closer operative in connection with the first circuit-closer to release 125 the door-opener.

2. In an elevator, the combination with the operating mechanism and the electrical door- 130 openers at the several floors of the elevator-well, of a centralized series of contacts comprising a pair of contacts in the circuit of each door-opener, a contact-plate slidable



over the several pairs of contacts, and means  
for moving the contact-plate from the eleva-  
tor-operating mechanism, said means being  
timed so that the plate will engage a pair of  
5 contacts at the same time that the elevator-  
cage comes opposite the door-opener which is  
in the circuit of the said contacts.

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

GEORGE A. LE FEVRE.

Witnesses:

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WILLIAM N. BARRY.