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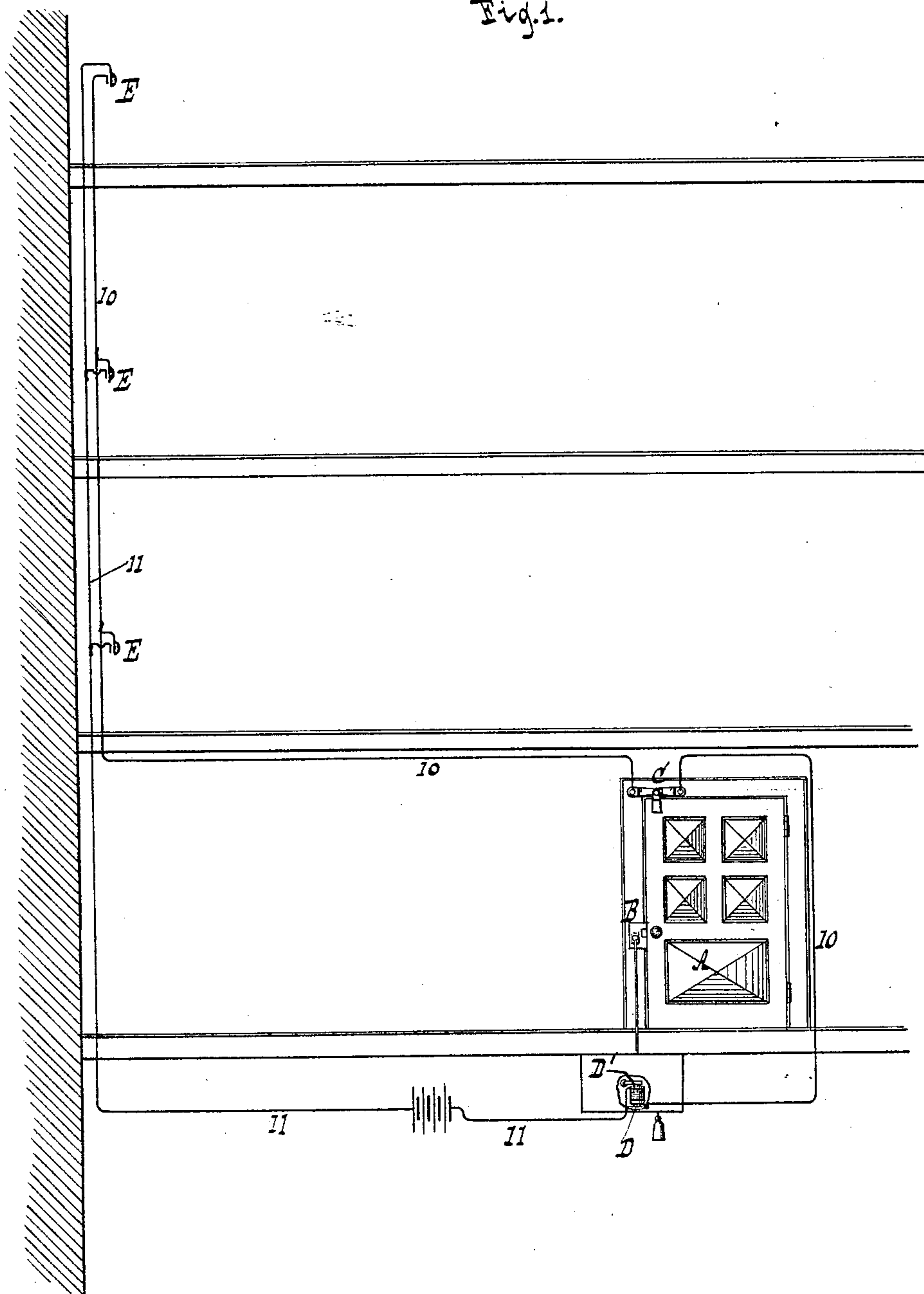
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A. T. SMITH.  
ELECTRICAL DOOR OPENER.

No. 273,622.

Patented Mar. 6, 1883.

Fig. 1.



WITNESSES:

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*William Miller*

INVENTOR

*Adolph T. Smith*

BY *Van Santvoord & Haiff*

ATTORNEYS

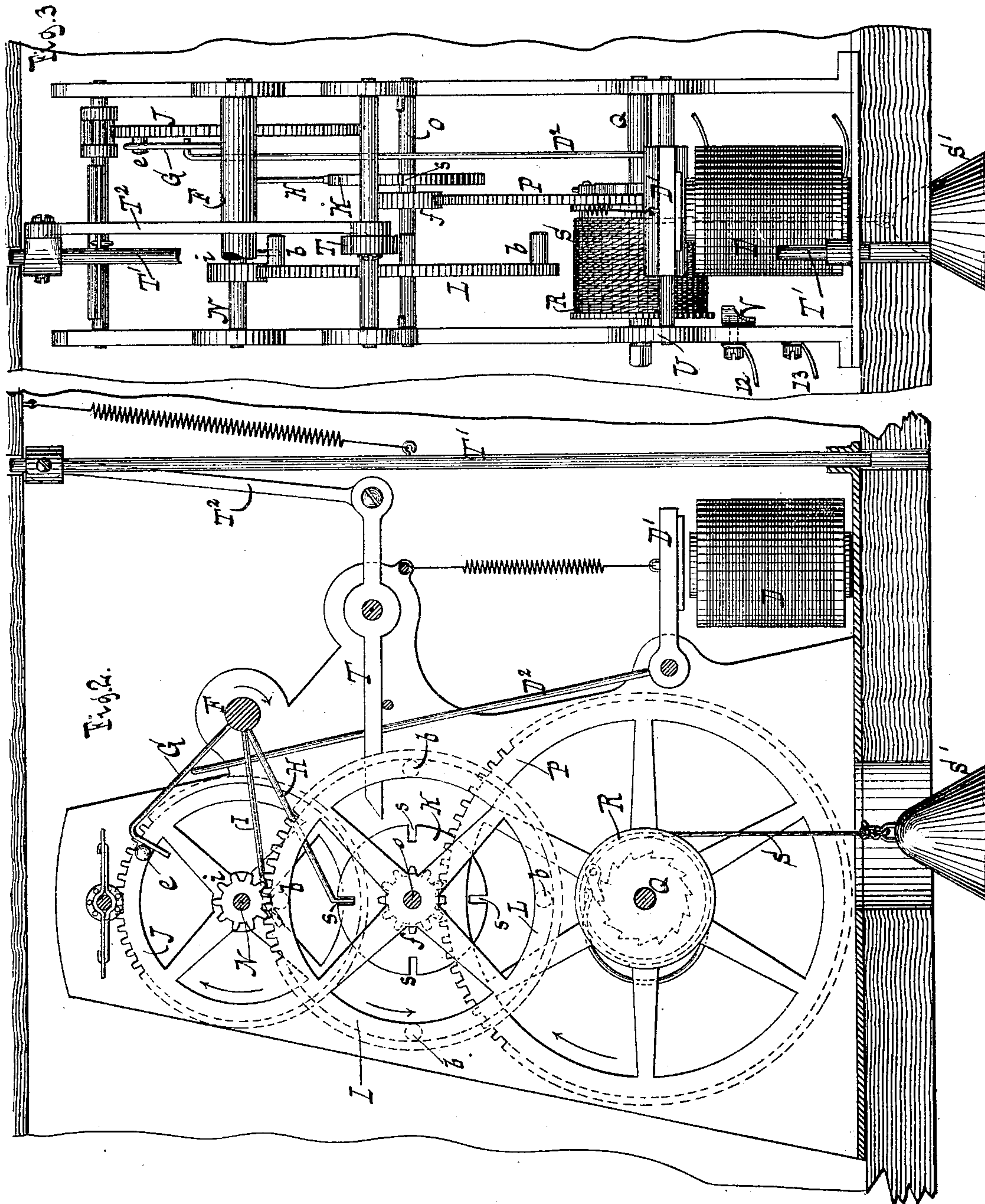
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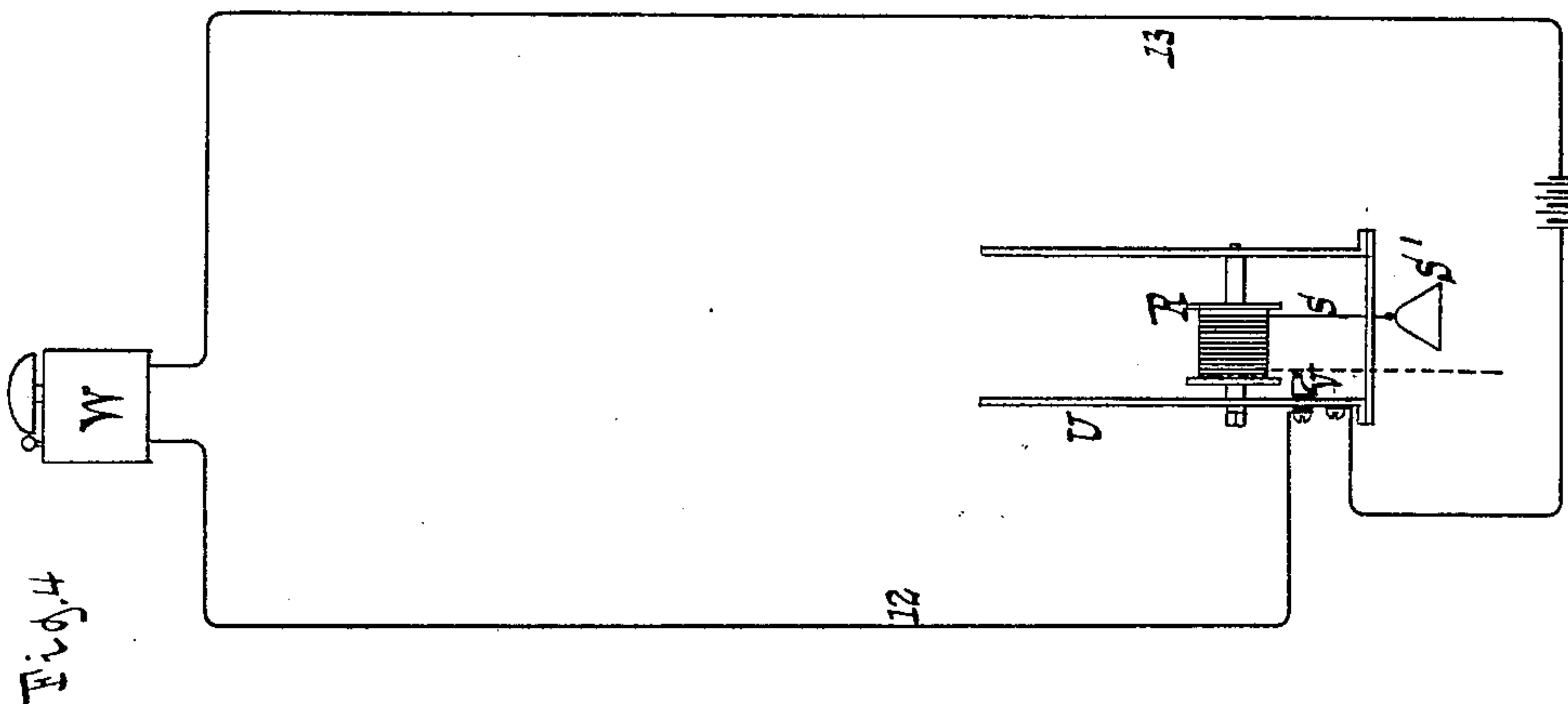
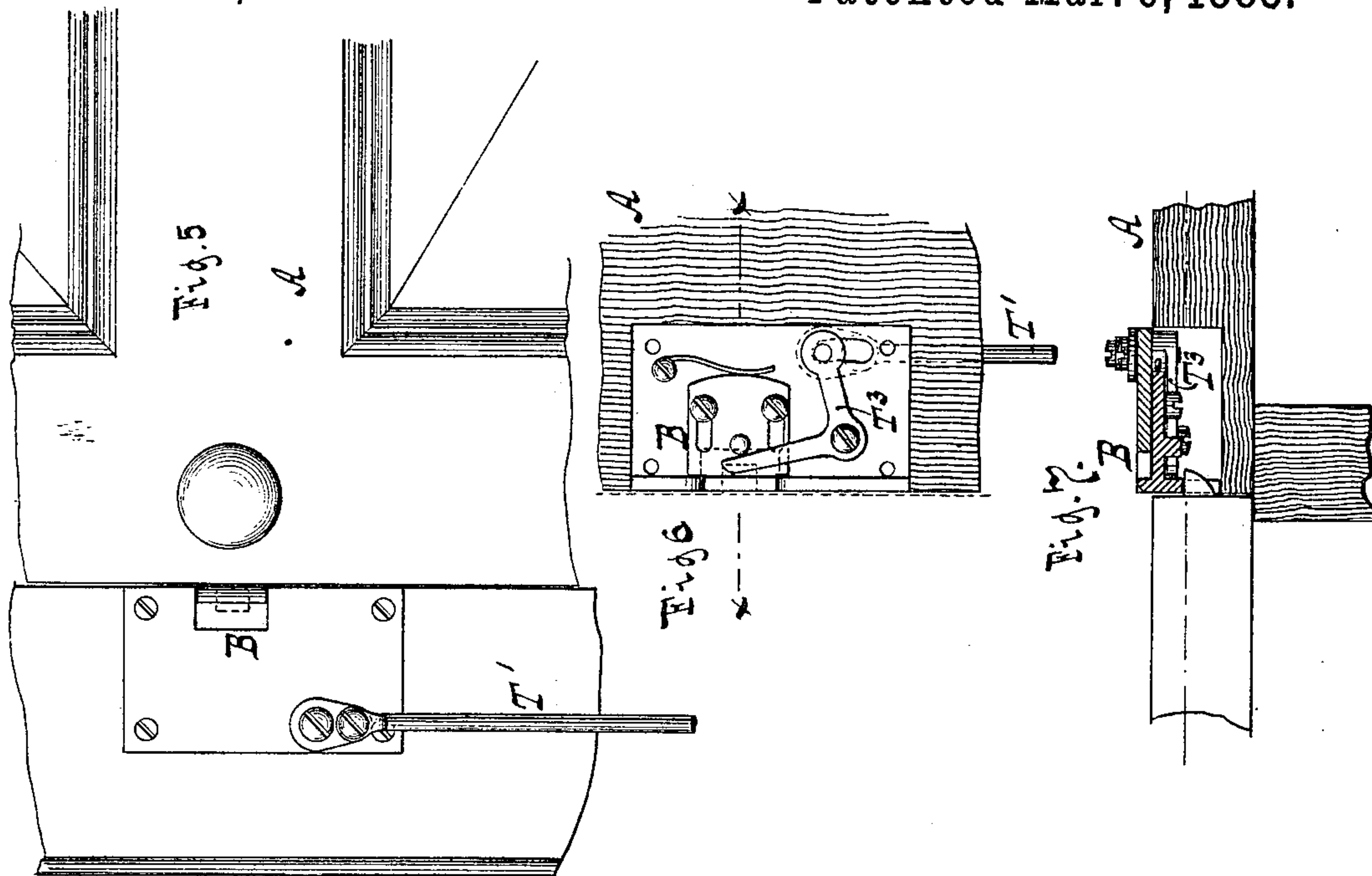
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# UNITED STATES PATENT OFFICE.

ADOLPH T. SMITH, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO  
ADOLPH PRAMANN, OF SAME PLACE.

## ELECTRICAL DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 273,622, dated March 6, 1883.

Application filed December 20, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH T. SMITH, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Door-Openers, of which the following is a specification.

This invention relates to that class of door-openers which are adapted to be operated from the different floors of a building, as of a "flat," so called, for opening the main or hall door; and it consists in the novel combinations of parts, hereinafter described, whereby the circuit through an electro-magnet capable of being closed by means of finger-keys on either of the floors or other location operates to temporarily release a train of wheels subjected to the action of a weight or its equivalent for retracting the door-latch. A spring which serves to throw open the door is arranged in the circuit of the electro-magnet, so that when the door is opened such circuit is broken and the apparatus is rendered inoperative until the door has again been closed. Said actuating-weight of the train of wheels is hung to a metallic cord which is wound on a metallic drum arranged in the circuit of an alarm in such a manner that when the cord becomes unwound from the drum it serves to close such circuit, thereby sounding the alarm.

This invention is illustrated in the accompanying drawings, in which Figure 1 illustrates the circuit of the electro-magnet. Fig. 2 is a side view, partly in section, of the gearing. Fig. 3 is an end view thereof, partly in section. Fig. 4 illustrates the alarm-circuit. Fig. 5 is a front view of a portion of the door and its latch. Fig. 6 is a front view of the latch, omitting the face-plate. Fig. 7 is a cross-section thereof on the line *x x*, Fig. 6.

Similar letters indicate corresponding parts.

The letter A designates the main or hall door of a building provided with a locking-latch, B, and spring C, by which latter it is forced or thrown open, when the latch is retracted in a well-known manner. Said spring C, which in this example is doubled, is placed in the circuit of an electro-magnet, D, the wires 10 11 of which communicate with a gal-

vanic battery or other source of electricity, and are conducted through the building, they being connected on each of the floors or other parts of the building with finger-keys E, Fig. 1, of well-known form, whereby the said circuit may be closed at pleasure. The armature D' of said electro-magnet (see Figs. 2 and 3) forms one arm of an elbow-lever, the other or long arm, D<sup>2</sup>, of which is arranged to engage a rock-shaft, F, through an arm, G, fixed thereto, in such a manner that when the armature is attracted it operates to turn said shaft in the direction of the arrow shown in Fig. 2. The arm G is bent at the end into the path of a pin, *e*, projecting laterally from a stop-wheel, J, and to the rock-shaft F are fixed additional arms, H I, the former of which is bent at the end to drop into one of a series of sockets, *s*, formed in the periphery of a regulating-wheel, K, which is similar to the striking-wheel of a clock-movement, while the arm I is bent at the end into the path of a series of pins, *b*, projecting laterally from a trip-wheel, L, said pins being equal in number and opposite to the notches of the regulating-wheel. The stop-wheel J is fixed to a shaft, N, which is geared by means of a pinion, *i*, with the trip-wheel L, the latter being toothed for this purpose, and said trip-wheel, together with the regulating-wheel K, is fixed to a shaft, O, which is geared by means of a pinion, *f*, with a driving-wheel, P, fixed to a shaft, Q. To this shaft Q is also fixed a drum or windlass, R, to which is fastened a cord, S, carrying a weight, S', so that when said cord is wound on the drum the weight acts on the shaft Q with a tendency to turn it, together with the driving-wheel P, in the direction of the arrow shown in Fig. 2, while this wheel in turn acts on the shaft O, and thence on the shaft N, through the described gearing, to turn said shafts and their wheels in the directions indicated. The arms G H, however, under normal conditions, both act as stops to prevent the several shafts from turning—that is to say, until the rock-shaft F is actuated by the armature-lever D' D<sup>2</sup>, when the arm G is lifted out of the path of the pin *e* and the arm H out of the socket *s* in which it may be contained. The shafts,



&c., are then permitted to turn until the arm H drops into another or succeeding socket, s, (the rock-shaft F having meanwhile been released,) and during this rotary movement one of the pins b of the trip-wheel comes in contact with and passes a lever, T, which is connected to the door-latch B in such a manner that the latch is retracted by that means. Hence whenever it is desired to open the door it is only necessary to press the key E on either floor of the building, thereby closing the circuit, 10, 11, and by the attraction of the armature D' of the electro-magnet setting free the train of wheels a sufficient length of time, according to the distance between the sockets s of the regulating-wheel, to permit the required action thereof on the latch under the impulse of the weight.

The connection of the latch-operating lever T with the latch is effected through the medium of a reciprocating rod, T', which is connected to said lever by a link, T<sup>2</sup>, Figs. 2 and 5, and to the latch by an elbow-lever, T<sup>3</sup>, Figs. 6 and 7; but it is evident that other contrivances may be devised and used for this purpose.

The stop-wheel J makes one complete revolution to each quarter-revolution of the regulating-wheel K, and when the gravitating arm H drops into the successive notches s the pin e of the stop-wheel comes in contact with the arm G, and thus acts thereon with a tendency to retain said gravitating arm in its notch.

When the train of wheels is at rest the arm H lies immediately above one of the pins b of the trip-wheel, as shown in Fig. 2, and when the wheels begin to turn said pin acts on the bent portion of the arm H with a tendency to keep it, together with its fellow arms, lifted, so that the gravitating arm H is not liable to fall back into the socket that it may have vacated. Said arms G I and the stop-wheel J thus form very useful adjuncts to the apparatus; but they may, if desired, be omitted. A separate arm, moreover, may be used to engage with the armature-lever, and the electro-magnet may be placed exterior of the machine-frame.

As before stated, the door-opening spring C is in the circuit 10 11 of the electro-magnet, and the effect of this arrangement is that when the door is opened such circuit is at once broken, due to the separation of one part or member of the spring from the other, and hence the apparatus is rendered inoperative while the door is open or until it is again closed. The fulfillment of this condition is of great importance, because the apparatus is thus not liable to be set in operation unnecessarily for playful or mischievous purposes.

The cord S is composed of metal, as of wire, while the winding-drum R also is metallic, and is in metallic contact with a standard, U, forming one side of the frame which supports the train of wheels. Said standard, moreover, carries an insulated spring, V, to which and

the standard are connected the wires 12 13 of an electro-magnetic alarm, W, such wires being in communication with a battery or other source of electricity. The spring V is located below the drum R, near that side thereof which is farthest from the terminal of the cord S when the latter is fully wound up on the drum, and when in the operation of the apparatus the cord is nearly or wholly unwound from the drum it comes in contact with the spring, and thus closes a circuit through the alarm W, thereby indicating, as to the janitor of the building, that the cord needs to be rewound.

It should be remarked that a latch-retracting mechanism different in construction from that herein described may be used in connection with the electric house-circuit, provided such mechanism is capable of being set free by the action of the armature-lever concomitant to the electro-magnet, and, instead of the finger-keys E, various other well-known means can be employed for closing the circuit.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, substantially as hereinbefore set forth, with the door and its locking-latch, of the electric circuit adapted to be closed on either floor or other portion of the building, the electro-magnet, the armature-lever, and the latch-retracting mechanism co-operating with the armature-lever.

2. The combination, substantially as hereinbefore set forth, with the door and its locking-latch, of the electric circuit adapted to be closed on either floor or other portion of the building, the door-opening spring arranged in such circuit, the electro-magnet, the armature-lever, and the latch-retracting mechanism co-operating with the armature-lever.

3. The combination, substantially as hereinbefore described, of the electro-magnet, the armature-lever, the rock-shaft F adapted to be turned by the armature-lever, the gravitating arm H, fixed to the rock-shaft, the regulating-wheel K, having the peripheral sockets s for the reception of the gravitating arm, the trip-wheel L, having the laterally-projecting pins b, the driving-wheel P, the drum R, the cord S, its weight S', and the latch-retracting lever T, adapted to be actuated by the trip-wheel.

4. The combination, substantially as hereinbefore set forth, of the electro-magnet, the armature-lever, the rock-shaft F, adapted to be turned by the armature-lever, gravitating arm H, fixed to the rock-shaft, the regulating-wheel K, having the peripheral sockets s for the reception of the gravitating arm, the trip-wheel L, having the laterally-projecting pins b, the driving-wheel P, the drum R, the cord S, its weight S', the latch-retracting lever T, adapted to be actuated by the trip-wheel, the stop-wheel having the laterally-projecting pin e, the arm G, arranged in the path of said pin, and the arm I, arranged to rest on the pins of the trip-wheel.

5. The combination, substantially as herein-



before set forth, with the regulating-wheel O, the trip-wheel L, the driving-wheel P, and the electro-magnetic alarm of the metallic drum R, the metallic cord S and its weight S', the standard U, the insulated spring V, and the wires 12 13, forming an alarm-circuit.

In testimony whereof I have hereunto set my

hand and seal in the presence of two subscribing witnesses.

ADOLPH T. SMITH. [L. S.]

Witnesses:

CHAS. WAHLERS,  
WILLIAM MILLER.