

(No Model.)

4 Sheets—Sheet 1.

A. C. WOHRLE.

ELECTRIC DOOR OPENER.

No. 374,028.

Patented Nov. 29, 1887.

Fig. 1.

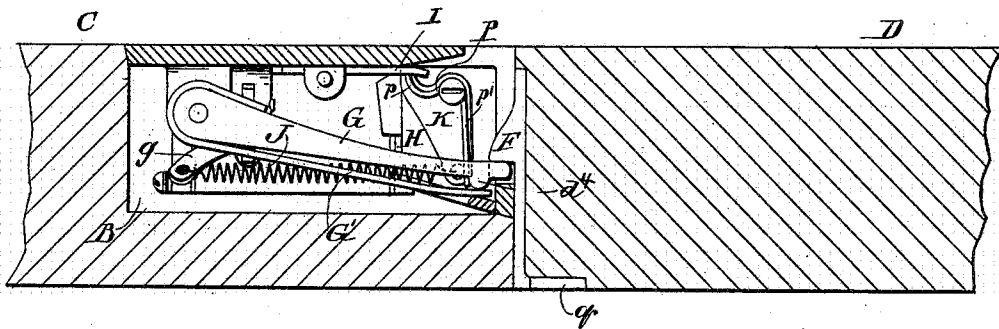


Fig. 2.

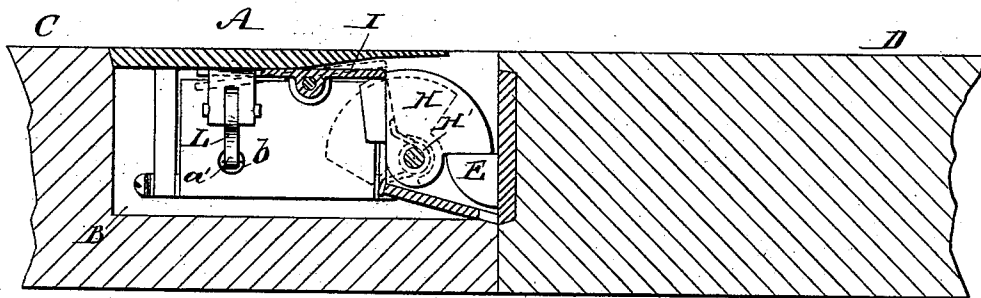
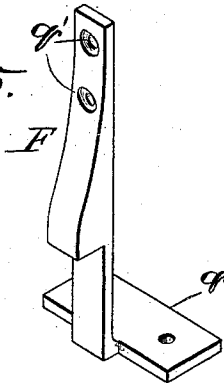


Fig. 5.



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Fig. 3.

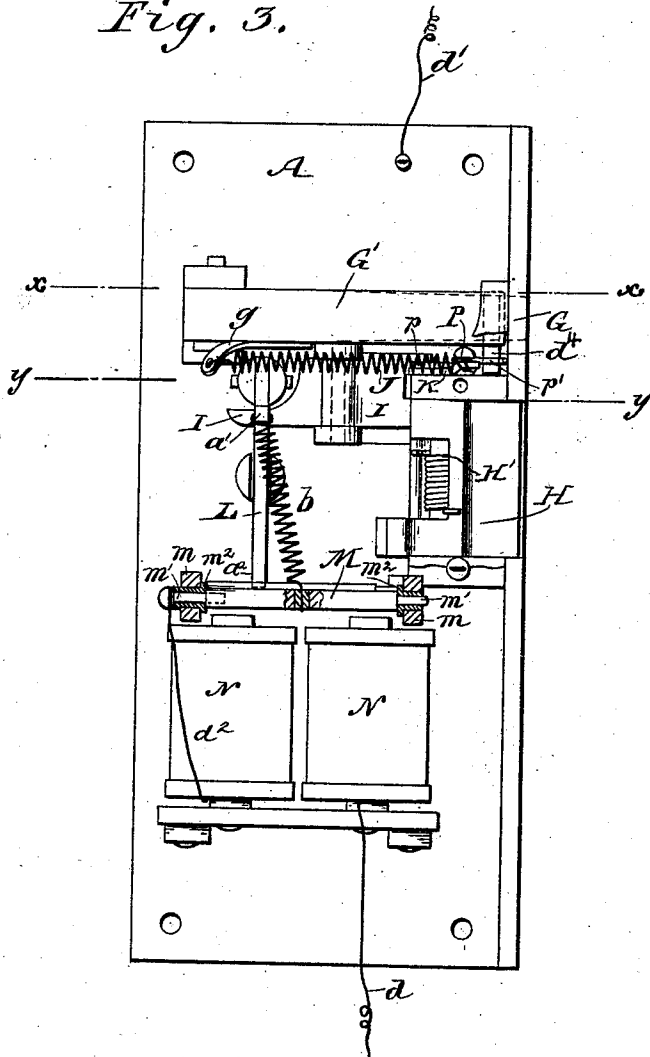
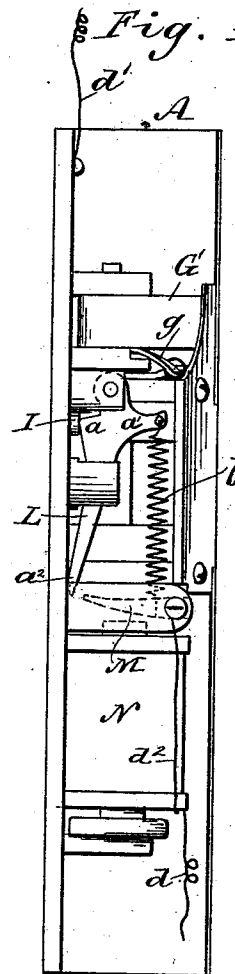


Fig. 4.



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Fig. 6.

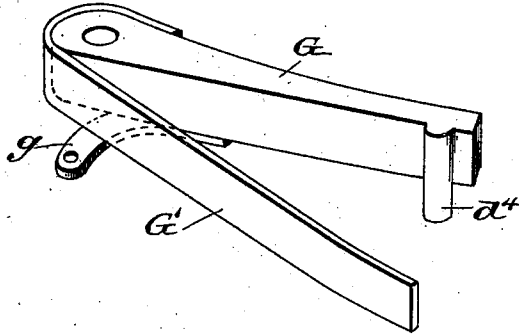
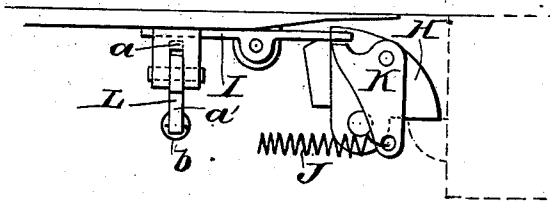


Fig. 7.



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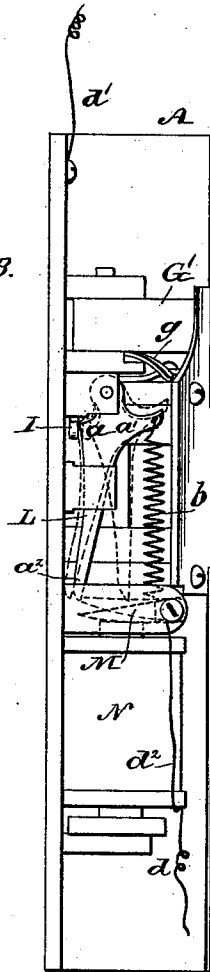
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Fig. 8.



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# UNITED STATES PATENT OFFICE.

ALBERT C. WOHRLE, OF NEW YORK, N. Y.

## ELECTRIC DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 374,028, dated November 29, 1887.

Application filed October 1, 1886. Serial No. 315,087. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT C. WOHRLE, of the city, county, and State of New York, have invented a new and Improved Door-Opener, of which the following is a full, clear, and exact description.

My invention relates to an electrical door-opener for use in apartment-houses; and the invention consists, principally, in so arranging the electrical connections that the circuit will be broken when the door stands open; also when closed and the button has been once pressed.

The invention also consists of the special construction of the door-opener, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional plan view taken on the line *xx* of Fig. 3, showing the opener applied to a door-casing and showing the door closed. Fig. 2 is similar view taken on the line *yy* of Fig. 3.

Fig. 3 is a view of the back of the lock, parts being broken away. Fig. 4 is an edge view of the lock, showing the parts in the position they assume when the door is open and the circuit broken. Fig. 5 is an enlarged perspective view of the operating stud-plate for the door.

Fig. 6 is an enlarged perspective view of the door-opening arm and spring for actuating the same for throwing the door open when the latch-block is released. Fig. 7 is a detailed view showing the plate for locking the latch-block and the plate and lever and springs for operating said plate, and showing the door and latch in dotted lines; and Fig. 8 is an edge view of the lock, showing the parts in full lines in the position they assume when the door is closed and the circuit made by the contact of the point of the lever *L* with the armature *M*, and showing in dotted line the position of the lever *L* when the door is open and the circuit broken, and showing, also in dotted lines, the position of the lever *L* and armature at the time a current of electricity is passed through the magnets.

*A* represents the frame or casing of the door-opener fitted in a recess, *B*, made in the door-frame *C*. The door *D* is provided with an ordinary spring locking-bolt, *E*, (see Fig. 2,) and also with a stud-plate, *F*, (see Figs. 1 and 5,) which latter, when the door is closed, forces backward the arm *G* of the door-opener.

The latch *E* is adapted to engage with the rotating latch-block *H*, as shown in Fig. 2, for holding the door closed. The arm *G* is acted upon by the spring *G'*, which tends constantly to force the arm *G* outward, so that the arm reacts upon the door and throws it open when the block *H* is released for releasing the latch *E*. The block *H* is acted upon by a coiled spring, *H'*, which tends constantly to force the block to the position shown in full lines in Fig. 2, where it is normally and rigidly held by a pivoted lock-plate, *I*. If the end of the plate *I* adjacent to the rotating block *H* be forced outward, it will release the block *H*, and the block *H* will then be swung by the pressure of the arm *G* and spring *G'* upon the door back to the position shown in dotted lines in Fig. 2, and thus release the door-latch *E* and permit the door to be thrown open by the action of the spring *G'* and arm *G*.

The plate *I* is acted upon, when the door is closed, by the spring *J* in such a manner that the spring constantly tends to force the forward end of said plate outward out of engagement with the back of the block *H*. The spring *J* might be variously arranged for this purpose; but I prefer to connect it at one end to the projection *g* of the arm *G* and at the other end to the pivoted plate *K*, which has a bell-crank action to transfer the tension of the spring *J* to the plate *I*. When the door is open, there is no tension upon the spring *J*, and hence no pressure upon the forward end of the plate *I*; but when the door is closed and the arm *G* pressed inward by the stud-plate *F* the projection *g* will be carried backward, which will distend the spring *J* and cause it to act upon the bell-crank plate *K* and the lock-plate *I*. The rear end of the lock-plate *I* is acted upon by the heel *a* of the lever *L*, which is acted upon by the spring *b*, connected at one end to the projection *a'* of the lever and at the other to the armature *M* of the magnet *N*; so the spring *b* also tends to draw the armature away from the magnets. The point *a''* of the lever *L* is of such length as to reach in front of the free edge of the armature *M*, as shown in Figs.

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4 and 8, when the armature is drawn away from the magnets—that is, when they are de-energized. When the point  $a^2$  of the lever L is so held by the armature N, as just stated, and as shown in full lines in Fig. 8, the heel  $a$  of the said lever L locks the plate I, so that its forward end can in no manner release the rotating-block H. The parts being in this position—that is, the lever L being moved toward the front plate of the main casing by the action of spring  $b$ , as described below, from its inner dotted position, (shown in Fig. 8,) and the block H locked by the plate I and the said lever L—if a current of electricity be now passed through the magnets A they will draw the armature M off from the lever L, thus releasing the same, whereupon the spring J (which is stronger than the spring  $b$ ) will act through the bell-crank plate K and depress the plate I, and thus release the rotating block H, which is then free to swing back to the position shown in dotted lines in Fig. 2. The spring G' and arm G will now act to throw the door open, and the spring J will be relieved of its tension by the forward movement of the projection  $g$  of the arm G. The spring  $b$  will now hold the point  $a^2$  of the lever L pressed against the front plate of the main casing A, out of contact with the armature M, as shown in full lines in Fig. 4. This breaks the circuit to the magnets N, as next described, so that when the door is open the batteries cannot be exhausted by the children playing with the buttons, as they are liable to do with ordinary electrical door-openers. With this opener no click can be produced, which in other openers is a strong temptation to children to play "telegraph," which is fatal to the battery.

The armature M is journaled in the posts  $mm$  upon the points  $m' m'$ , and these points are insulated with rubber or other material,  $n^2$ . One wire,  $d$ , from the battery is connected directly to the magnets, while the other wire,  $d'$ , is connected to the main casing A, and a wire,  $d''$ , connects the armature with one of the magnets; so the circuit is from wire  $d'$  through the casing, the lever L, the armature, the wire  $d''$ , through the magnets to the wire  $d$ . In this manner the lever L becomes a circuit-breaker, and the circuit is made only when the lever L is in contact with the armature M, which is never the case except when the door is closed.

P is an auxiliary spring, (shown in Fig. 1,) arranged to act upon the lock-plate I for depressing the same. It acts in conjunction with the spring J, so that if either spring weakens and fails to do its work the other will operate the plate I, and thus insure the reliable and positive action of the door-opener. The spring P in this instance is a wire bent to form the arms  $p p'$ , and is pivoted

at the angle upon the screw  $p^2$ , which also forms the pivot of the bell-crank K. The arm  $p$  of the spring impinges upon the plate I, while the arm  $p'$  projects nearly at right angle to the arm  $p$  and bears against a pin,  $d'$ , of the arm G, as shown in Figs. 1 and 3, so that when the arm G is forced inward by closing the door the pin  $d'$  will put a tension upon the spring P. The outward movement of the arm G, when the door is opened, will relieve the spring P of tension; so the spring  $b$ , of less strength, will operate the lever L, as above described, to break the circuit.

The stud-plate F is formed with an arm and with attaching-plate  $q$  at right angles to the arm, through which plate apertures are formed for the passage of screws for securing the stud-plate to the edge of the door. Apertures  $q'$  are formed through the arm, through which screws pass for securing the arm to the door, so that the stud-plate may be applied to any door.

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

1. The mechanism for opening the door and the electro-magnets, combined with an interposed circuit-breaker acted upon by the armature, whereby the act of energizing the magnets also breaks the circuit, substantially as described.

2. In an electric door-opener, the combination, with the lever L, arranged to hold the lock-plate I, of an insulated trip-plate arranged to be operated by the electro-magnet, substantially as described.

3. In an electric door-opener, the rotating block H, combined with the lock-plate I, levers L and K, springs G' J  $b$ , trip-plate M, and magnets N, substantially as described.

4. In an electric door opener, the combination, with the block H, lock-plate I, arm G, and spring J, arranged to act upon the plate I, of an auxiliary spring, P, also arranged to act upon the plate I, substantially as and for the purposes set forth.

5. In an electric door-opener, the armature M, arranged to swing in its supports and insulated, in combination with the magnets N, lever L, and spring  $b$ , attached to the lever, whereby the armature becomes a trip-plate and the lever a circuit-breaker, substantially as described.

6. In an electric door-opener, the combination, with the arm G, latch-plate I, and lever K, of the spring J, having one end attached to the lever K and its other end to the arm G, substantially as described.

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Witnesses:

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