(Model.)

L. BATES.

ELECTRIC DOOR OPENER.

No. 480,546. Patented Aug. 9, 1892.

Fig 1

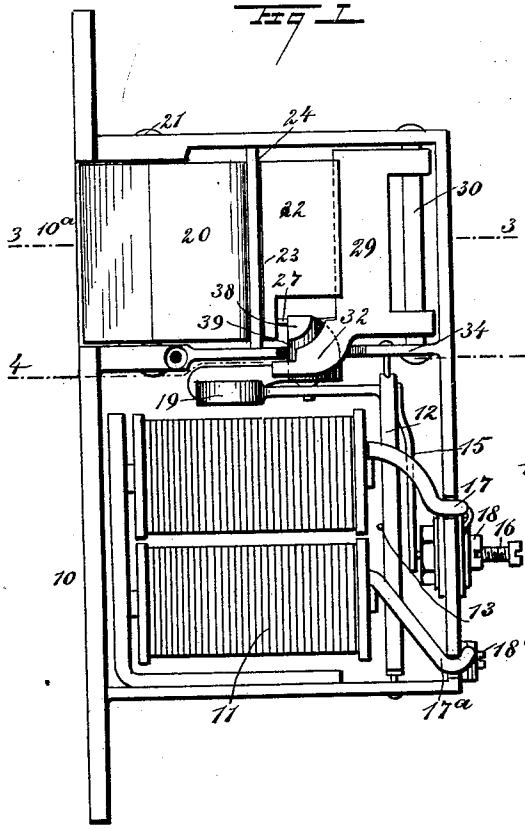


Fig 2

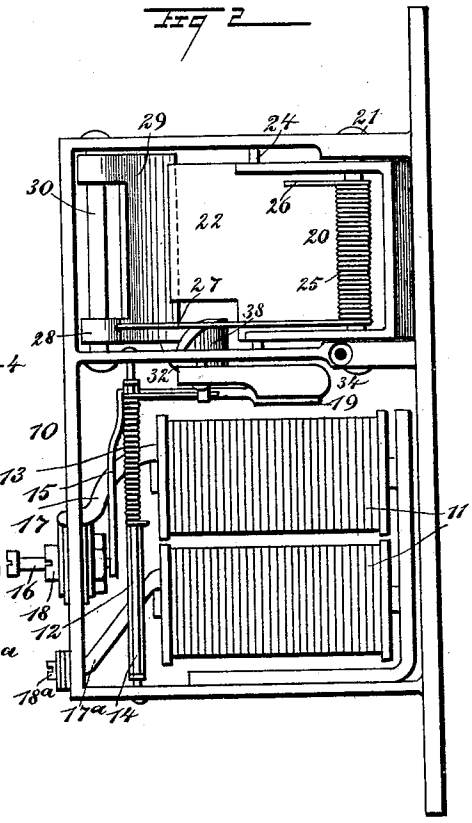


Fig 3

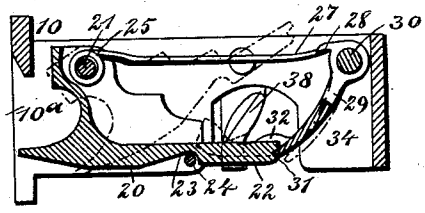
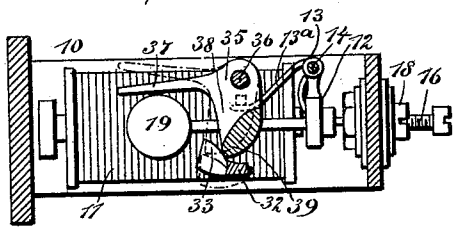


Fig 4



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LOUIS BATES, OF JERSEY CITY, NEW JERSEY.

ELECTRIC DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 480,546, dated August 9, 1892.

Application filed August 13, 1891. Serial No. 402,530. (Model.)

To all whom it may concern:

Be it known that I, LOUIS BATES, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Electric Door-Opener, of which the following is a full, clear, and exact description.

My invention relates to improvements in electric door-openers; and the object of my invention is to improve the construction of that class of electric door-openers which are adapted to lock and unlock a door, the special object of the invention being to improve the construction of the door-opener for which I obtained Letters Patent of the United States March 10, 1891, No. 448,110.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

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

Figure 1 is a side elevation of the door-opener embodying my invention, showing one side of the case removed. Fig. 2 is a side elevation taken from the opposite side. Fig. 3 is a sectional plan on the line 3 3 in Fig. 1, and Fig. 4 is a sectional plan on the line 4 4 in Fig. 1.

The device is provided with a main case 10, similar to a lock-case, which case is adapted to be let into a door-frame and has an opening 10^a in one side, through which the latch moves. In one end of the case are electro-magnets 11, opposite which is a vibratory armature 12, which armature is held normally away from the magnets by a spring 13, which is coiled around a rod 14 in the case and one end of which presses against the side of the armature, as shown in Fig. 1. The armature has also a flat spring 15 on its back, which contacts with a screw 16, extending through one of the binding-screws 18 of the case, and the terminals of the magnets extend through the rubber insulating-tubes 17 and 17^a and connect with the binding-screws 18 and 18^a.

The armature 12 is provided at its free end with a laterally-extending hammer 19, which is adapted to operate the releasing-latch 35, as hereinafter described, and when the circuit is closed through the magnets the armature and hammer will be given a rapid vibrating movement, and the hammer will thus strike rapid blows upon the releasing-latch, as described below. The main latch 20 is pivoted in the end of the case opposite the magnets on a pin 21 and is provided with an extension 22, which projects into the case and which is recessed on one side, as shown at 23, so as to engage a cross-pin 24 and limit the forward movement of the latch.

The above-described mechanism, with the exception of the releasing-latch 35, the recess 23, and cross-pin 24, is substantially the same as that shown in my former patent above referred to and forms no part of this invention.

The latch 20 is normally held forward, so as to engage the bolt of a door, by means of a strong spiral spring 25, which is coiled around the pin 21 and one end 26 of which presses against the extension 22 of the latch, as best shown in Fig. 2. The opposite end 27 of the spring 25 extends to the opposite side of the case and engages a lug 28 on the locking-pawl 29, which pawl is pivoted on a pin 30, and the pressure of the spring will normally swing the pawl forward and cause it to engage a notch in the inner end of the extension 22 of the latch 20, as shown at 31 in Fig. 3. This holds the latch in a locked position, as it cannot swing so as to allow the door-bolt to escape until the pawl 29 is released.

The pawl 29 has an arm 32, which extends from one corner of the pawl through a partition 34 in the main case, and this arm has a thickened and inclined free end 33, as best shown in Fig. 4. A releasing-latch 35, which is shaped like a bell-crank, is pivoted at its elbow on a pin 36, which is secured to the partition 34, and one arm 37 of the releasing-latch extends into the path of the hammer 19. The opposite arm 38 is arranged horizontally in the case and is provided with a shoulder 39, which is adapted to engage the inclined end 33 of the arm 32 of the locking-pawl.

The releasing-latch is normally pressed by an extended end 13^a of the spring 13, which works the armature, so that the shoulder 39 will not engage the inclined end 33 of the

locking-pawl, and when in this position the locking-pawl will engage the main latch; but when the releasing-latch is swung against the spring 13 the shoulder 39 will travel up the incline of the arm 32, and will thus tilt the pawl 29 on its bearings, so that it will be released and held away from the end of the extension 22 of the main latch and the door may then be opened, as the latch will swing upon its pivot.

The operation of the device is as follows: When the door is to be unlocked, the circuit is closed through the magnets by means of a push-button in the ordinary way, and when the circuit is closed the armature 12 is rapidly vibrated and the hammer 19 strikes violently and rapidly against the arm 37 of the releasing-latch 35. This swings the latch on its pivot and causes the shoulder 39 to move against the inclined end 33 of the arm 32 of the locking-pawl 29, thus swinging the locking-pawl away from the main latch, where it holds it, and if the door is then pushed inward the door-bolt will cause the main latch to swing upon its pivot, thus allowing the door to open freely, and after the door is opened and the circuit broken through the magnets the armature ceases to vibrate, the spring 25 returns the main latch 20 and the locking-pawl 29 to their normal positions and the end 13^a of the spring 13 returns the releasing-latch 35 to its normal position. When the releasing-latch is operated by the hammer, the free end of the arm 38 is swung forward against the main latch 20, and when the door is opened the main latch swings on its pivot and pushes the releasing-latch back to its normal position, thus setting it for another operation. It will be seen, therefore, that by my present construction the locking-pawl 29 may be released from the main latch 20 and held in this position until the person sees proper to push the door open, whereas in my patented lock, hereinbefore referred to, the pawl has no means for holding it away from the main latch, and therefore the door with which it is to be used must be provided with a spring to throw it open when the hammer strikes the arm on the pawl, for the pawl after every stroke will fly back and lock the main latch. In the present instance, however, the main latch may be electrically released and so remain until the person opens the door, as before stated.

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

1. In an electric door-opener, the combination, with the spring-pressed main latch, a spring-pressed locking-pawl arranged to engage a notch in the inner end of the latch, the electro-magnets, the vibratory armature, and the hammer secured thereto, of a bent releasing-latch pivoted in the case, said latch having one end arranged in the path of the hammer and the opposite end adapted to release the locking-pawl and hold it out of engagement with the main latch, substantially as described.

2. The combination, with the spring-pressed main latch, the spring-pressed locking-pawl adapted to engage the inner end of the same, said pawl having a projecting arm with an inclined end, the electro-magnets, the vibratory armature, and the hammer secured to the armature, of the releasing-latch pivoted in the case, said latch having one arm extending into the path of the hammer and the opposite arm provided with a shoulder arranged to engage the inclined end of the locking-pawl arm and hold said pawl out of engagement, substantially as described.

3. The combination, with the main latch having an extended end with a notch therein and a locking-pawl adapted to engage the notched end of the main latch, of a spring coiled around the main latch-pivot, one end of the spring pressing against the main latch and the opposite end engaging a lug on the locking-pawl, substantially as described.

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