No. 886,827. PATENTED MAY 5, 1908.

J. LOCH.

ELECTRIC DOOR OPENER.

APPLICATION FILED APR. 16, 1907.

Fig. 1.

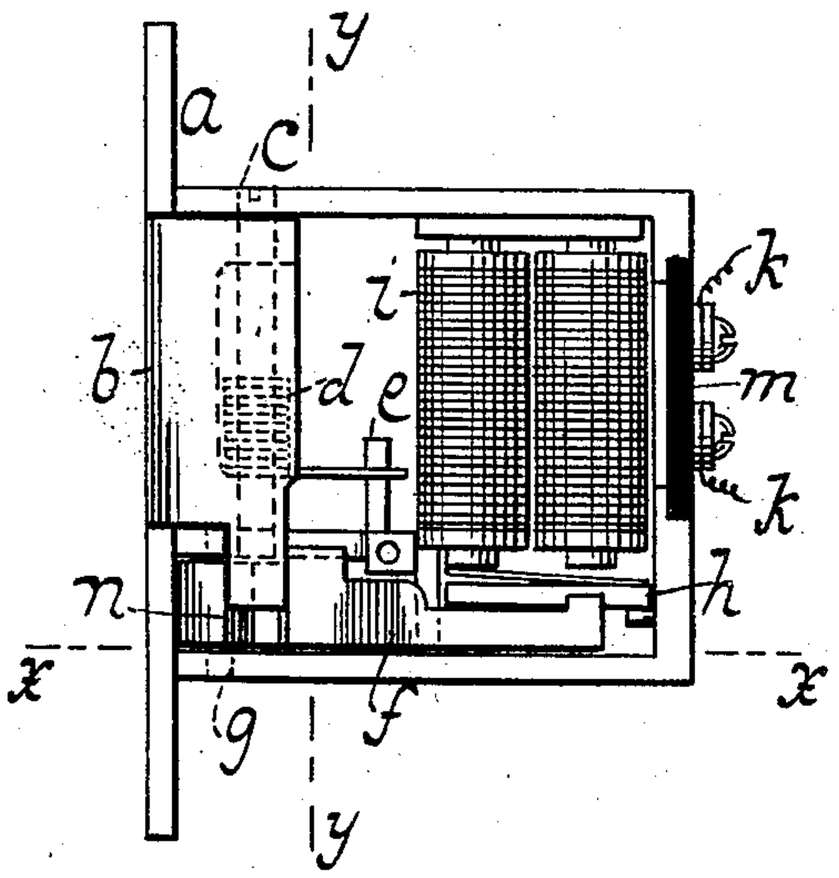


Fig. 2.

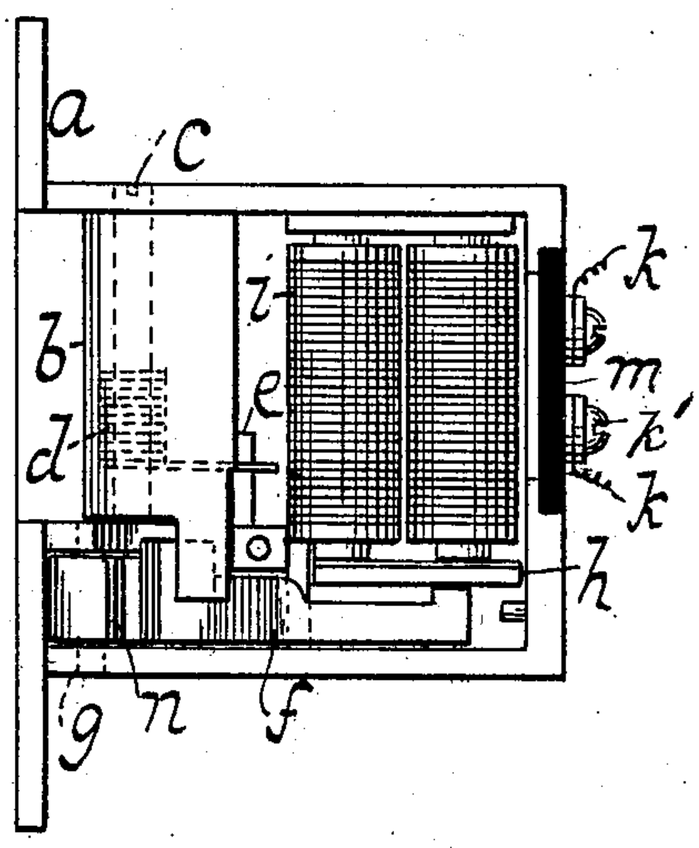


Fig. 3.

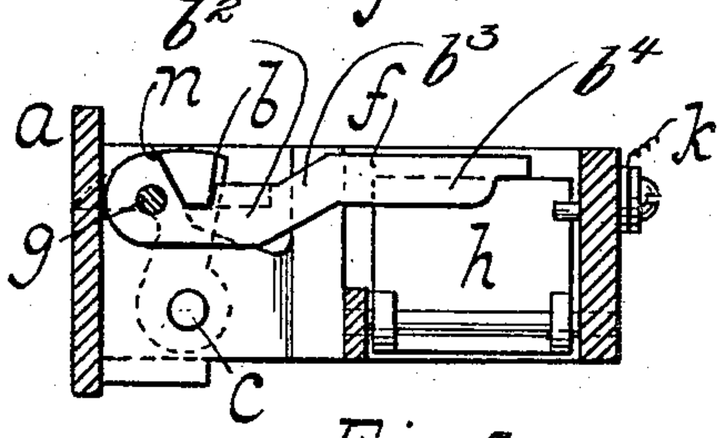


Fig. 4.

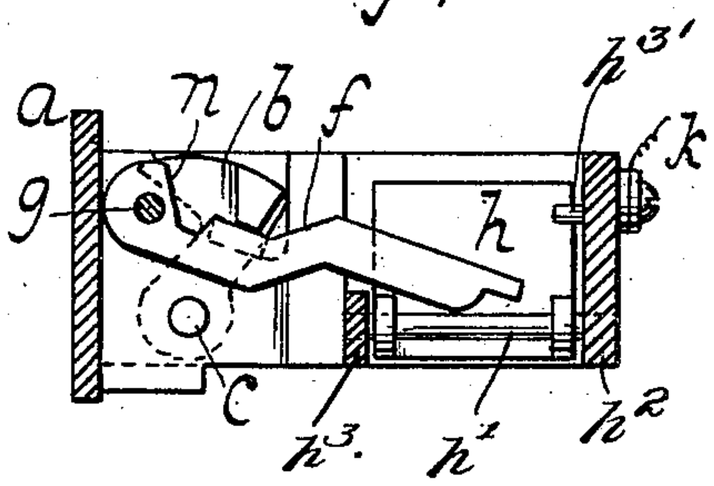


Fig. 5.

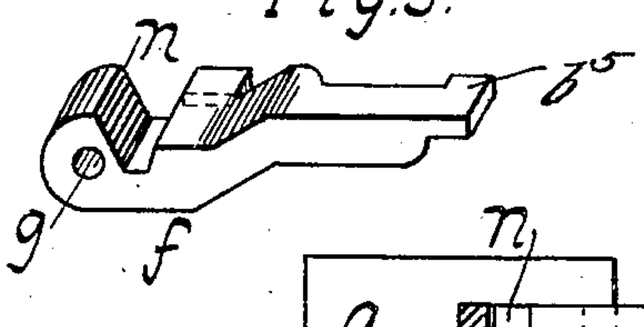
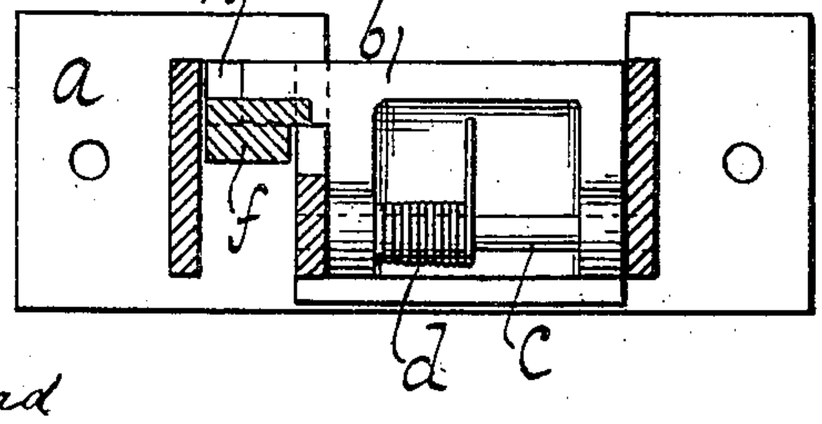


Fig. 6.



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ELECTRIC DOOR-OPENER.

No. 886,827. Specification of Letters Patent. Patented May 5, 1908.

Application filed April 16, 1907. Serial No. 368,466.

To all whom it may concern:

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

In electric door openers it is desirable to have the parts so arranged that the magnet will operate under small electric force no matter how much pressure is exerted on the closed door or how much pressure is applied to the door before the opener has been operated or released.

According to this invention the parts are so arranged that a pressure on the lock bolt or a pressure by the bolt on the keeper will not be transmitted or but slightly transmitted by the keeper to the armature. The armature is thus left free for easy operation or to respond or release the keeper even if but slight electric force is employed.

This invention is set forth in the following specification and claim and illustrated in the annexed drawing in which

Figure 1 is a side elevation of a lock or device embodying this invention. Fig. 2 shows the device of Fig. 1 when unlocked. Fig. 3 is a section along *x x* Fig. 1. Fig. 4 is a like section of Fig. 2. Fig. 5 shows a keeper. Fig. 6 is a section along *y y* Fig. 1.

Referring to the drawings in detail, *a* denotes a casing in which is arranged a bolt *b* connected to a vertically-extending pintle *c* which is mounted in the wall of the casing. The bolt *b* is cut away and arranged in the cut-away portion of the bolt and surrounding the pintle *c* is a coiled spring *d*. Arranged within the casing is a vertically-extending arm *e* against which bears one end of the spring *d*. The function of the arm *e*, in connection with the spring *d*, is to hold the bolt to catch position, or to return the bolt to such position after having been retracted or moved to releasing position. Mounted within the casing *a* is a vertically-extending pivot *g*, said pivot arranged at one side of the pintle *c* and mounted upon the said pivot *g* is one end of a keeper *f*. The latter in close proximity to the pivot *g* is formed with a wedge-shaped recess *n* adapted to receive a wedge-shaped protuberance *b'* which depends from the lower end of the bolt *b*. The keeper *f* is furthermore provided at that side in which is arranged the recess *n* with a horizontally-extending portion b^2 and an outwardly-inclined portion b^3. Upon one side of the portion b^2 rides the protuberance *b'* when shifted out of the recess *n*. The inclined portion b^3 terminates in a horizontally-extending portion b^4 which has one side face thereof in alinement with the outer end of one of the walls of the recess *n* and by such an arrangement the portion b^4 is positioned at one side of the casing *a* at the bottom thereof.

The portion b^4 terminates in a depending lug b^5 which is adapted to engage one side of an armature *h*, whereby the keeper *f* is retained in the position shown in Fig. 3 and which maintains the bolt *b* from movement owing to the fact that the protuberance *b'* engages in the recess *n*. The armature *h* carries a rod *h'* which is pivoted in one wall h^2 of the casing *a* and an apertured lug h^3 supported upon the bottom. Projecting inwardly from the wall h^2 is a stop h^3 for arresting the downward movement of the free end of the armature *h*. The armature *h* has its free end when in its lowered position arranged in the path of the lug b^5, consequently arresting the movement of the keeper *f* and retaining the bolt *b* in the position shown in Fig. 3. Arranged in operative relation with respect to the armature *h* and supported within the casing *a* is an electromagnet *i*. Leading-in wires to the magnet are indicated by the reference character *k* which are connected with the magnet by the binding screws *k'* mounted against a strip of insulating material *m*.

As the armature is withdrawn or attracted Figs. 2 and 4 a push on the door (not shown) or on the bolt will swing the latter as also the freed keeper so that the bolt will leave the door free to open. As the current is cut off from the magnet the armature moves back to keeper engaging position and the spring *d* returns the bolt and the keeper, said parts being engaged together by the shoulders at *n*.

As the keeper directly engages the armature and the bolt and keeper directly engage one another few parts suffice to make the structure. The keeper is pivoted at one end portion and at its other end portion directly engages the armature.

The pivot *c* of the bolt is back of the pivot *g* of the keeper and a pressure tending to swing the bolt to releasing or open position will not exert excessive pressure on the free end of the keeper nor on the armature. The latter is thus not jammed or prevented from

easy opening and a slight electric current will suffice to attract or free the armature from the keeper.

In a test a pressure of one hundred pounds was applied to the bolt in the direction of its opening swing, but even under such pressure the armature was found to respond readily or to be easily attracted even though only the ordinary electric current used in door openers of this class was employed. The armature *h* swings transversely to the keeper and the magnet is set parallel to the bolt pivot *c*. The device can thus be made short or compact.

What I claim is

1. An electric door opener comprising a magnet, a hinged armature arranged at one end thereof, a vertically-extending spring-controlled pintle, a bolt carried by the pintle and provided with a protuberance, and a keeper mounted at one end upon a vertically-extending pivot having its free end provided with a lug adapted to engage one side of the armature when the magnet is deënergized and further provided with a recess in close proximity to its pivot adapted to receive said lug to arrest the movement of the bolt, said spring-controlled pintle adapted to shift the bolt when the magnet is energized, causing thereby the shifting of the keeper and the freeing of the protuberance from said recess.

2. An electric door opener comprising a magnet, an armature arranged at one end thereof, a spring-controlled pintle, a bolt carried by the pintle and provided with a protuberance, and a keeper mounted upon a vertically-extending pivot, provided with a lug adapted to engage one side of the armature when the magnet is deënergized, and further provided with a recess adapted to receive said protuberance to arrest the movement of the bolt when the magnet is deënergized, said spring-controlled pintle adapted to shift the bolt when the magnet is energized, causing thereby the shifting of the keeper and the freeing of the lug from said recess.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH LOCH.

Witnesses:

EDWARD WIESNER,

CHRISTIAN ALMSTEAD.