(No Model.) 3 Sheets—Sheet 1.

J. SCHNEIDER.

ELECTRIC DOOR OPENER.

No. 381,725. Patented Apr. 24, 1888.

Fig. 1.

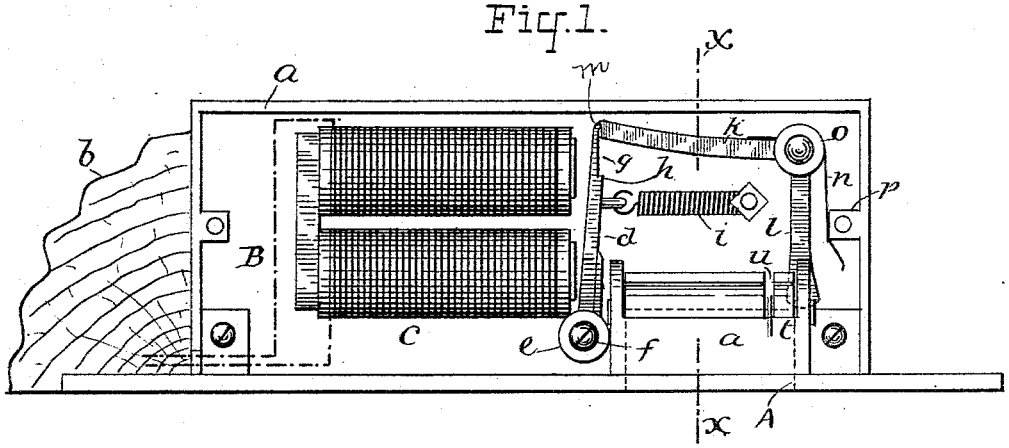


Fig. 3.

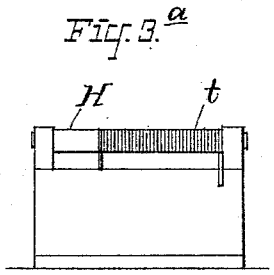


Fig. 3.

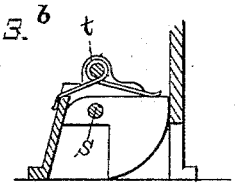


Fig. 2.

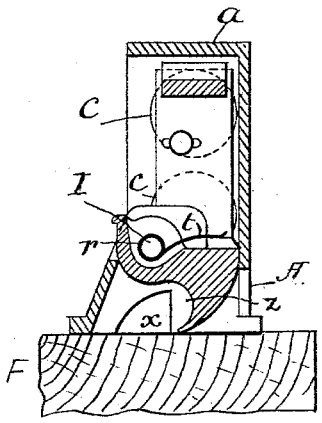
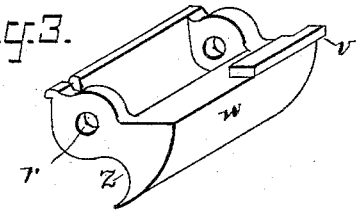


Fig. 3.



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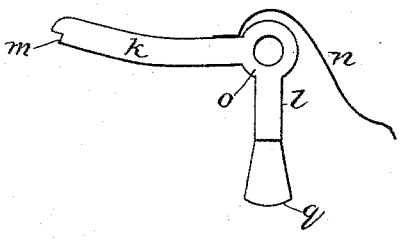
ELECTRIC DOOR OPENER.

No. 381,725. Patented Apr. 24, 1888.

Fig. 4.



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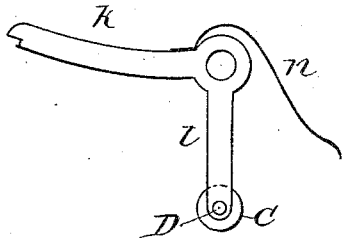


Fig. 5.

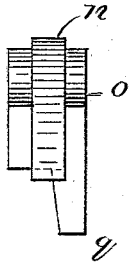


Fig. 7.

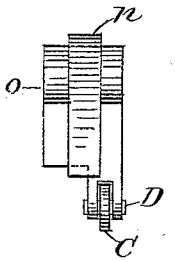
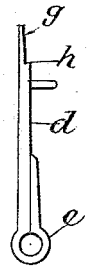


Fig. 8.



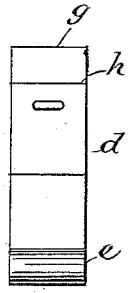
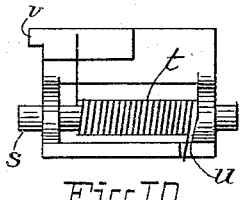


Fig. 9.

Fig. 10.



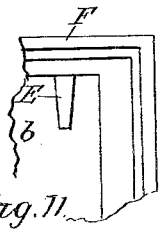


Fig. 11.

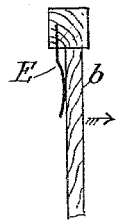


Fig. 12.

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J. SCHNEIDER.

ELECTRIC DOOR OPENER.

No. 381,725. Patented Apr. 24, 1888.

Fig. 13

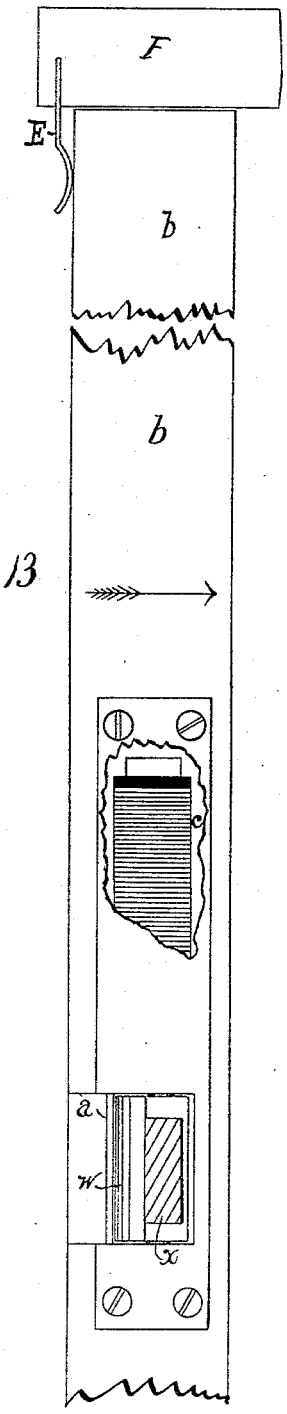


Fig. 14

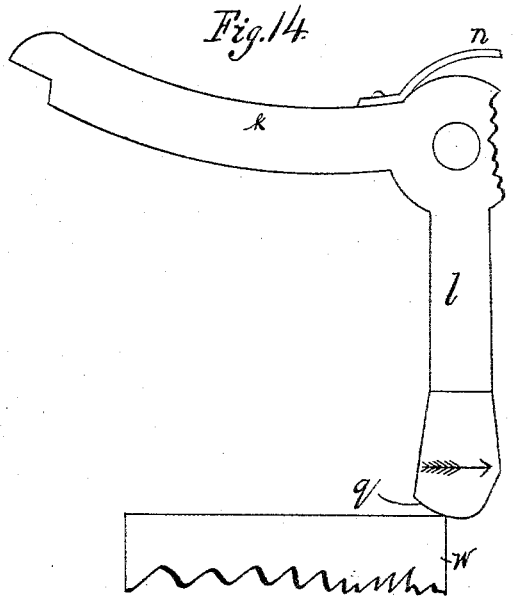
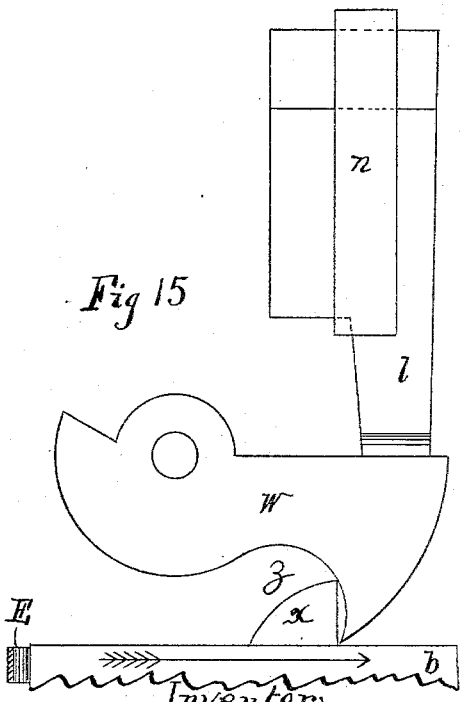


Fig 15



Witnesses:
Benjamin Tag Clark.
Agnes V. Sales.

Inventor:
John Schneider,
By his Attorney,
Edward P. Thompson.

UNITED STATES PATENT OFFICE.

JOHN SCHNEIDER, OF NEW YORK, N. Y.

ELECTRIC DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 381,725, dated April 24, 1888.

Application filed June 10, 1887. Serial No. 240,883. (No model.)

To all whom it may concern:

Be it known that I, JOHN SCHNEIDER, a citizen of United States, and a resident of New York, county and State of New York, have invented certain new and useful Improvements in Electric Door-Openers, of which the following is a specification.

The invention relates to the mechanical construction of an electric door lock and opener.

The object of the invention is to provide simplicity of construction, and especially simplicity of operation, as well as compactness, which is an element highly desirable in all forms of door-locks.

Figure 1 is a general front view of the device with the cover removed; Fig. 2 is a sectional view of Fig. 1 at the line X. Fig. 3 is a two-sided view of the catch or latch. Figs. 3^a and 3^b are modified forms of the latch. Figs. 4 and 5 are different views of the bent lever and retractile spring. Figs. 6 and 7 represent modifications of Figs. 4 and 5. Figs. 8 and 9 are different views of the armature. Fig. 10 is a view of the latch and its rectractile spring, being a rear view of the latch as shown in Fig. 1. Figs. 11 and 12 are different views of the spring for throwing open the door when the electric lock releases the door. Fig. 13 shows the spring E in operative connection with the electric lock. It shows the lock screwed to the door, which is represented in elevation and partly broken away. The arrow indicates the direction in which the door opens when the magnet attracts its armature, the spring forcing it in the said direction. Part of the casing of the lock is also broken away to show the magnet. Fig. 14 shows on an enlarged scale the surface *q* pressing obliquely upon the edge of the lock-latch *w*, which is only partly represented. The arrow upon the arm *l* indicates the direction of movement of the said arm. Fig. 15 is a view showing the latch *x* in operative connection with the lock. The latch *x* in this figure is mounted upon the door *b* and the latch *w* upon the jamb.

The device consists of the combination of a casing, *a*, which fits in the door, shown partially by *b;* an electro-magnet, *c*, supported in the casing and having its arms parallel to the back of the casing; an armature, *d*, of soft iron, riveted or similarly fixed to a brass bearing, *e*, which is rotatable upon the fixed screw *f*, the said armature having at the end opposite the bearing a thinner portion, *g*, and projection or stop *h*, and a retractile spring, *i;* a bent lever having a curved arm, *k*, and a straight arm, *l*, the curved arm having a notch, *m*, which normally contains the free end of said armature; a retractile spring, *n*, secured to said bent arm, curved over the bearing *o* of the bent lever, and pressing against a projection, *p*, of said casing; an enlarged free end to said straight arm *l*, having upon its end a surface, *q*, which is curved in reference to the center of the bearing of the lever as its central point, the said surface being cylindrical in its nature and normally pressing against the rear surface of the latch; a latch having bearings *r;* a journal, *s;* a coiled retractile spring, *t*, surrounding said journal, one end of said spring passing through a notch, *u*, in the latch and pressing upon the casing *a*, the other end of the spring pressing upon the latch itself; a projection or stop, *v*, which strikes against the casing *a* to limit its motions; a curved surface, *w*, against which the second latch, *x*, which belongs to the door-jamb F, strikes when the door is being shut; a groove, *z*, in the first latch, into which the latch *x* enters when the door is shut, and a recess, A, in the casing, in which the first latch operates, the axes of the armature-journal and of the bent-lever journal being parallel to each other, and the orthographic projection of the axis of the journal of the first-named latch upon the other named axes being perpendicular to said axes. The first-named latch may, for convenience, be termed the "lock-latch." The latch *x* may be fixed to the door-jamb F or movable therein. The circuit B, which passes through the electro-magnet, includes any suitable electric generator and push-button, which are not shown in the drawings.

In Figs. 6 and 7 the curved surface *q* is replaced by a rotary curved surface belonging to the little roller C, supported upon a bearing, D, which is fixed to the straight arm *l* of the bent lever.

The operation of the device is as follows: When an electric current of sufficient power

passes through the electro-magnet, its armature is attracted, thereby releasing the bent lever, which, however, does not move except by the force of the spring E, which is fixed to the door-jamb F and presses upon the door *b*. The spring *t* presses upon the lock-latch and rotates the same through an angle of about ninety degrees. The rotation of the lock-latch causes the surface *q* to slide more and more rapidly to the right. Just as soon as the latch *x* escapes from the lock-latch the latter turns back to its normal position on account of its retractile spring *t*, the bent lever returns to its normal position on account of its retractile spring *n*, and, the circuit being broken, the armature returns to its normal position on account of its retractile spring *i*. If the door is pulled upon with an effort to open the same before the circuit is completed, it will be found that the device serves as a very efficient lock, because the straight arm *l* presses approximately perpendicularly upon the rear surface of the lock-latch, and because the free end of the bent arm *k* presses at right angles upon the armature.

The object of having the arm *k* curved is for the sake of strength.

While in Fig. 2 the retractile spring *t* of the latch is plainly seen to be located upon the shaft of the latch, yet the location of this spring may be changed, if desired. In Figs. 3^a and 3^b this retractile spring is located upon a rod, H, which is carried by the latch, but is independent of the shaft I of the latch.

On account of the peculiar construction of the device hereinbefore described, the closing of the electric circuit will cause the latch to release the door even if a person or other object is pressing against the door.

When the armature is attracted, the latch *x*, being attached to the door in Fig. 15, rotates the lock latch *w* and causes the surface *q* to slide from the said latch and move the door in the direction of the arrow shown in Fig. 15. Consequently the latch *x* and door *b* act in a similar manner when the latch *x* is attached to the jamb and the lock-latch *w* to the door, as in Fig. 13.

I claim as my invention—

1. In an electric door opener and lock, the combination of a lock-latch, a magnet-armature, and a bent lever, one arm pressing upon the lock-latch in a direction to partially resist the movement of the lock-latch and the other arm pressing upon the armature in a direction to form an approximate right angle with said armature.

2. In an electric door opener and lock, the combination of a lock-latch, a magnet-armature, and a bent lever, one arm pressing upon the lock-latch in a direction to partially resist the movement of the lock-latch and the other arm pressing upon the armature in a direction to form an approximate right angle with said armature.

3. In an electric door opener and lock, the combination of an electro-magnet, a pivoted armature therefor having a retractile spring tending to hold the armature from the magnet, a shoulder or projection upon the armature on that side opposite to the magnet, a pivoted bent lever having one arm rectilinear and the other arm curved, a notch upon the end of the curved arm, a retractile spring tending to press the notch *m* of the curved arm upon the end of the armature in a direction to form an approximate right angle between said armature and the curved arm, and an enlarged portion upon the rectilinear arm, having a curved surface pressing upon the lock-latch and tending to hold the same in normal position, the said lock-latch being pivoted in a direction at right angles to that of the bent lever and being provided with a retractile spring which tends to rotate the latch.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 9th day of May, 1887.

JOHN SCHNEIDER.

Witnesses:

EDWARD P. THOMPSON,

HAROLD G. HENDERSON.