(No Model.) 2 Sheets—Sheet 1.

C. H. GREBENSTEIN.

DOOR OPENER.

No. 467,684. Patented Jan. 26, 1892.

Fig. 1.

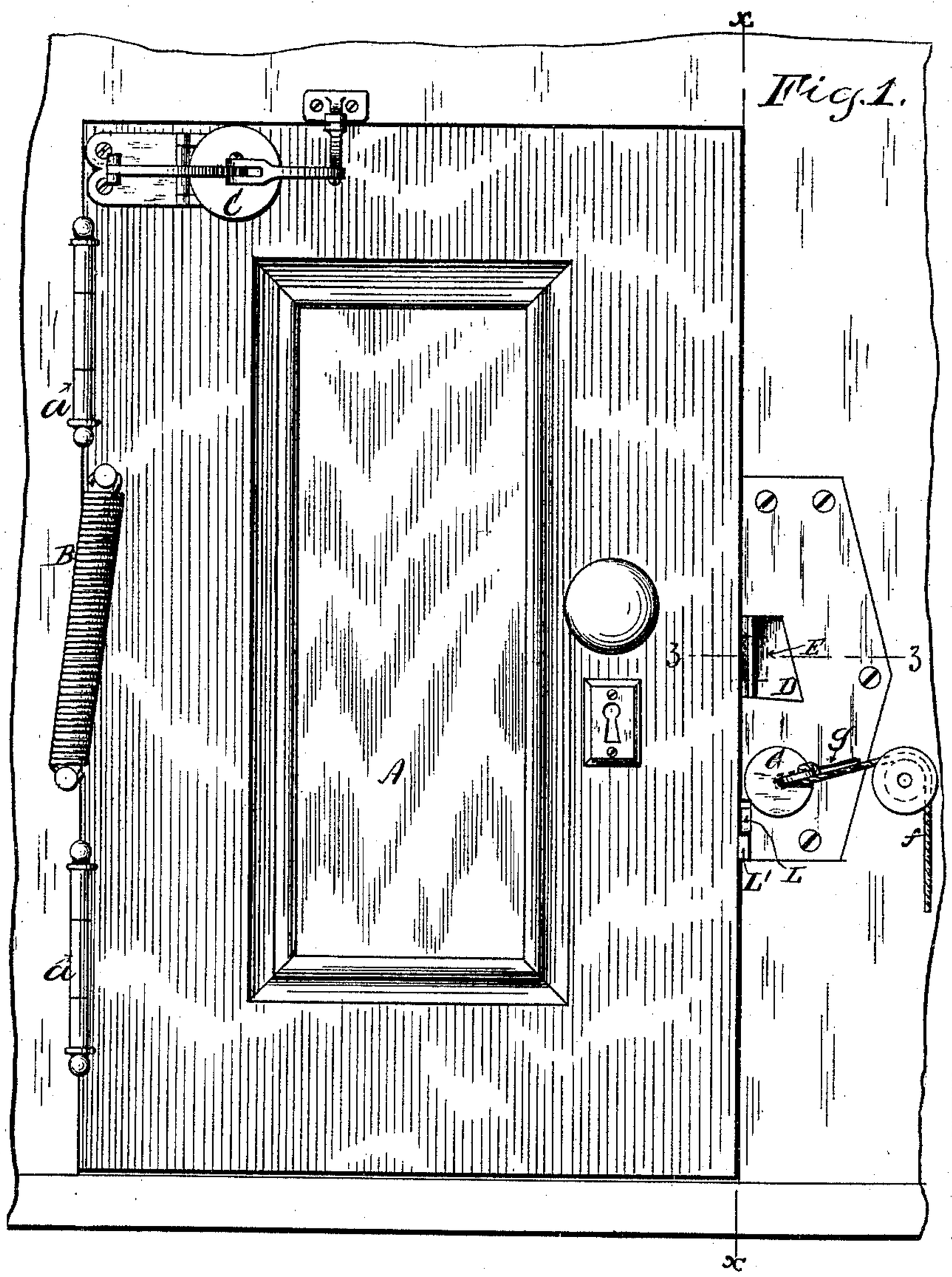


Fig. 2.

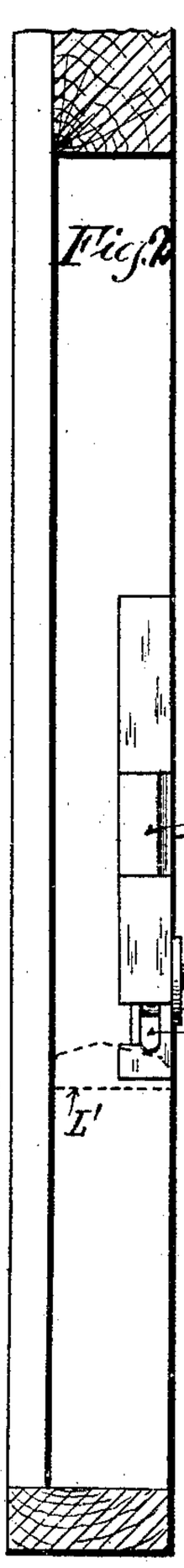


Fig. 3.

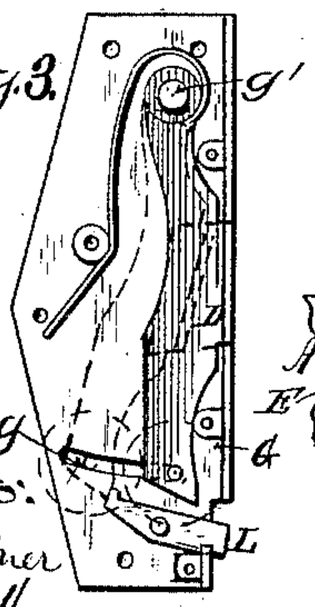


Fig. 4.

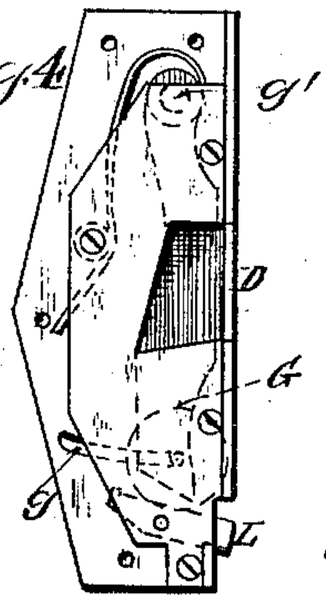


Fig. 5.

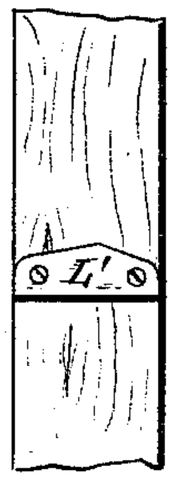
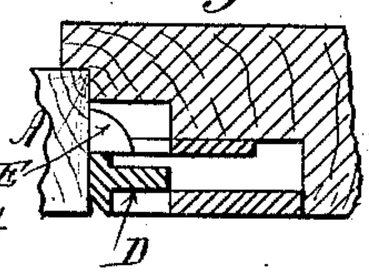


Fig. 8.



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By his attorney
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(No Model.) 2 Sheets—Sheet 2.

C. H. GREBENSTEIN

DOOR OPENER.

No. 467,684. Patented Jan. 26, 1892.

Fig. 6.

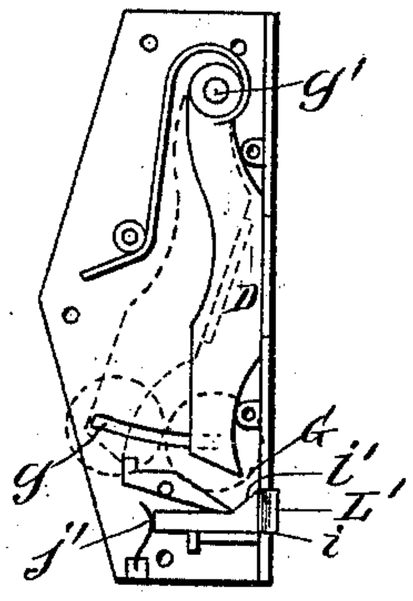
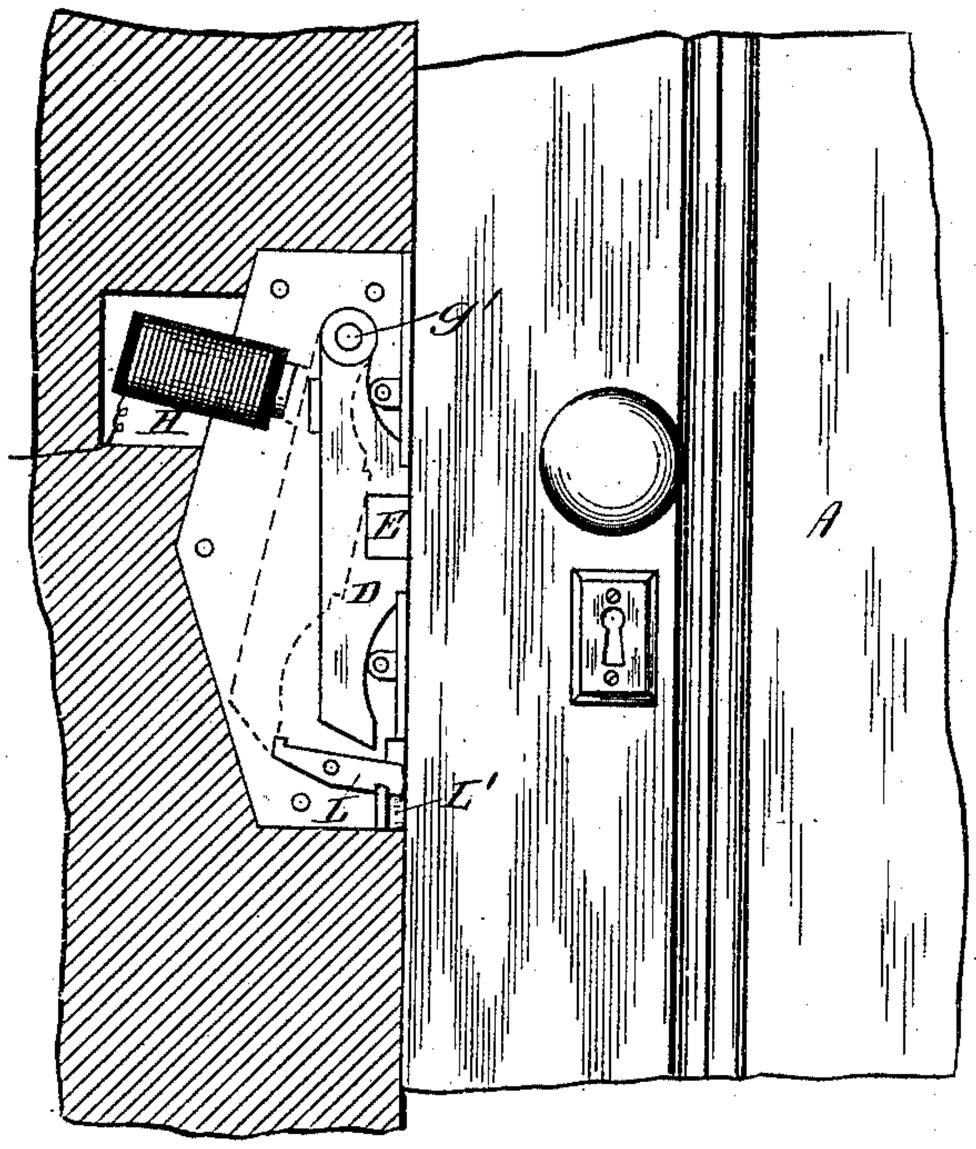


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES H. GREBENSTEIN, OF NEW YORK, N. Y.

DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 467,684, dated January 26, 1892.

Application filed June 26, 1891. Serial No. 397,571. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. GREBENSTEIN, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Door-Openers, of which the following is a description sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

My improvements relate to that class of door-locking devices in which the bolt is released from a distance by the retraction of the lock-keeper, which is effected through the medium of a wire pull or cord or by an electro-magnet in any of the well-known ways now in use.

The door-openers are used mainly in connection with the hall-doors of tenement and apartment houses where it is especially desirable to insure the closing and locking, as well as the temporary opening, of the door under the conditions of constant use.

The object of my invention is to permit of the employment of the ordinary automatic self or slow closing devices in conjunction with door-opening mechanism of substantially the same construction and arrangement as that at present in use; and my invention consists, essentially, in the combination and arrangement, with the lock-keeper, of an automatic latch or dog holder, which catches the lock-keeper when retracted and holds it in that position until tripped by an inclined plane attached to the door. Thus upon the operation of the door-opening device, the door is left unlocked, though held shut by the automatic closing device until opened, when the latch is tripped and the lock-keeper released, after which the door closes automatically under the impetus of the closing-spring again tripping the lock-keeper, which gives away before it and again secures the bolt.

My improvements may of course be used in connection with a door unprovided with self-closing apparatus, since in that case the door will simply remain unlocked until opened and again closed by hand; but when used in conjunction with automatic-closing devices the invention is especially efficacious, and in fact is designed mainly to permit of the use of the latter under conditions in which they have not heretofore been available.

In carrying out my improvements it is obvious that it is immaterial what form of automatic-closing device is used upon the door, pneumatic, slow-closes, springs, &c., being equally applicable.

Figure 1 is an elevation of the inner side of a door provided with my improvements; Fig. 2, a vertical section upon plane of line *x x*, Fig. 1, looking toward the door-jamb; Fig. 3, an elevation of the inner side of the lock-keeper, &c., the inner plate being removed; Fig. 4, a similar view with the inner plate in place; Fig. 5, an elevation of a portion of the edge of the door, showing the cam for tripping the lock-keeper latch; Fig. 6, an elevation of the inner side of the lock-keeper plate, &c., showing a modified arrangement for tripping the lock-keeper latch; Fig. 7, a sectional view of the door-jamb and elevation of the adjoining portion of the door illustrating the use of an electro-magnet for retracting the lock-keeper; Fig. 8, a transverse section upon line *z z*, Fig. 1.

In the drawings, A represents a door of ordinary size and construction hung upon hinges *a a*.

B is an ordinary coiled spring for closing the door, and C represents a pneumatic slow-closing apparatus similar to those in use. Either or both of these forms of door-closing devices may be used, or, if preferred, they may be dispensed with and the door closed by hand.

Inserted in the jamb of the door in the usual manner is the lock-keeper D, engaging, when in its normal position, with the bolt E of a mortised or other suitable form of lock upon the door A. The lock-keeper D may be varied in form and arrangement to meet the requirements of use, and is preferably pivotally supported in a suitable metal frame inserted in the jamb of the door. It tends constantly to assume its normal position, in which it confines the end of the bolt E by reason of gravity, as in Fig. 7, or of spring-pressure, as in Figs. 3 and 6. The retraction of the lock-keeper D may be effected in any suitable or well-known manner. In the arrangement shown in the first

six figures it is retracted directly by a pull-cord *f*, connected with an exterior projection of the lock-keeper D, the adjoining exterior plate G being formed with a slot *g* to permit of the swinging back and forth of the lower end of the keeper D, the upper end of which is pivotally suspended at *g'*.

In Fig. 7 the keeper D is pivoted at its upper end, as before, and is retracted by a current of electricity passed through an electro-magnet H, falling back by its own gravity when released by the secession of the current.

In Figs. 3, 4, 6, and 7 the lock-keeper is shown retracted in dotted lines, and the function of the latch L in holding it in that position will be readily understood. The inclined plate or cam L' as the door closes tilts up the outer end of the catch L, thereby releasing the lock-keeper, which returns to its normal position and confines the bolt.

In Fig. 6 the inclined surface or cam L' upon the door is dispensed with and an equivalent arrangement of a sliding cam L' is substituted. This substitute L' consists of a slide, the outer end *i* of which is chamfered or wedge-shaped, and the inner end of which rests against a spring *j*, which tends constantly to press the chamfered end *i* outward, as shown in the figure. The outer end of the catch L rests against the cam-surface *i'*. Hence when the door is closed its outer edge encounters and forces back the slide L' against the spring *j*, at the same time raising the outer end of the catch L and releasing the lock-keeper D.

It will be noticed that here, as before, the opening or closing of the door releases the lock-keeper, and this is a distinguishing feature of my invention throughout.

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

1. In a door-opener substantially such as described, the combination of a lock-keeper normally pressed forward into the locking position, mechanism for retracting said lock-keeper against said pressure, a latch for retaining said lock-keeper in its retracted position, and a cam-surface arranged to trip said latch and release the lock-keeper to be again returned to the locking position by the aforesaid pressure.

2. In an electric door-opener substantially such as described, the combination of a lock-keeper formed with an armature, an electro-magnet for retracting the said lock-keeper, a latch for holding the said lock-keeper in the retracted position, and a cam-surface arranged to trip said latch and release the said lock-keeper.

CHARLES H. GREBENSTEIN.

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