

(No Model.)

T. A. CASEY.
ELECTRIC DOOR OPENER.

No. 322,681.

Patented July 21, 1885.

Fig. 1,

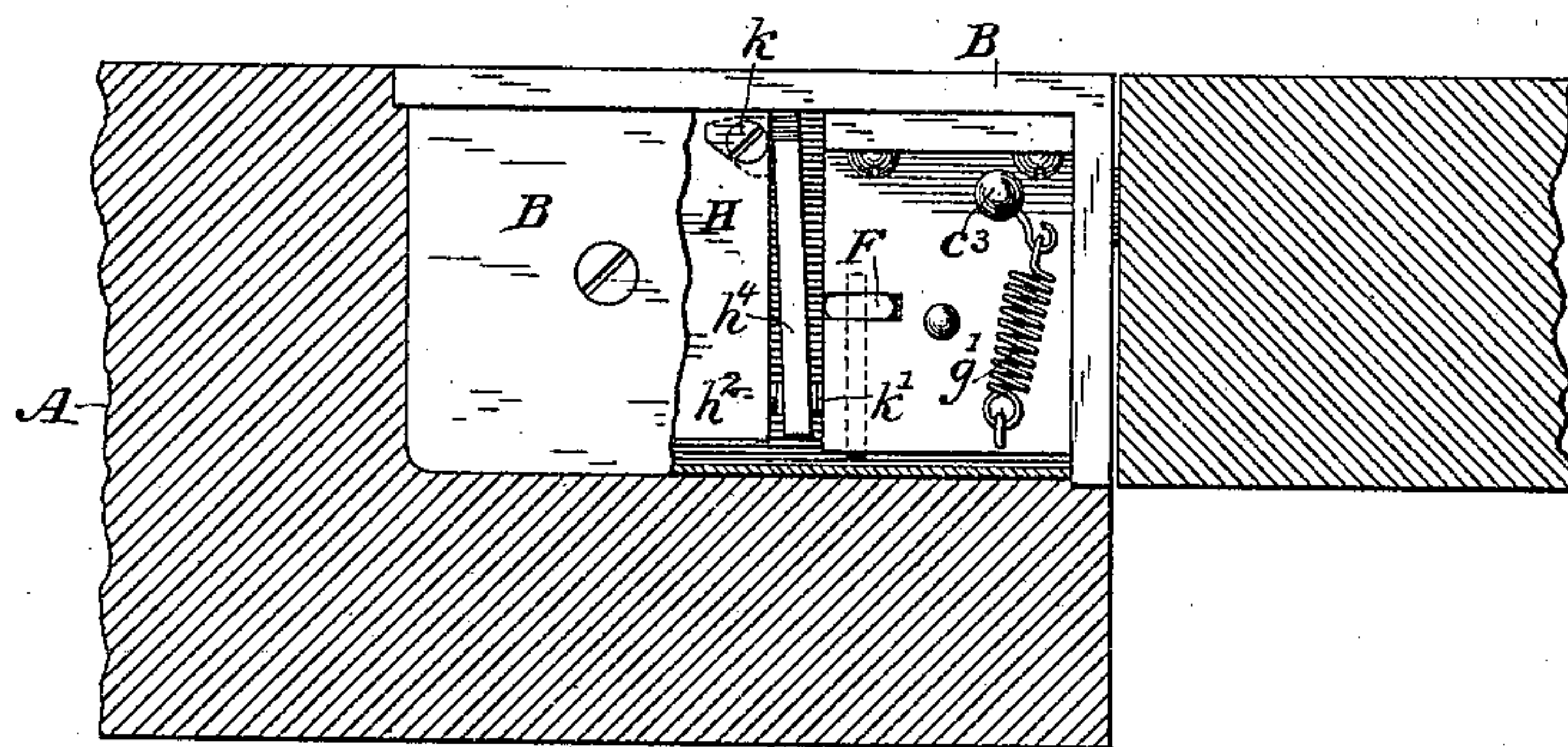


Fig. 2,

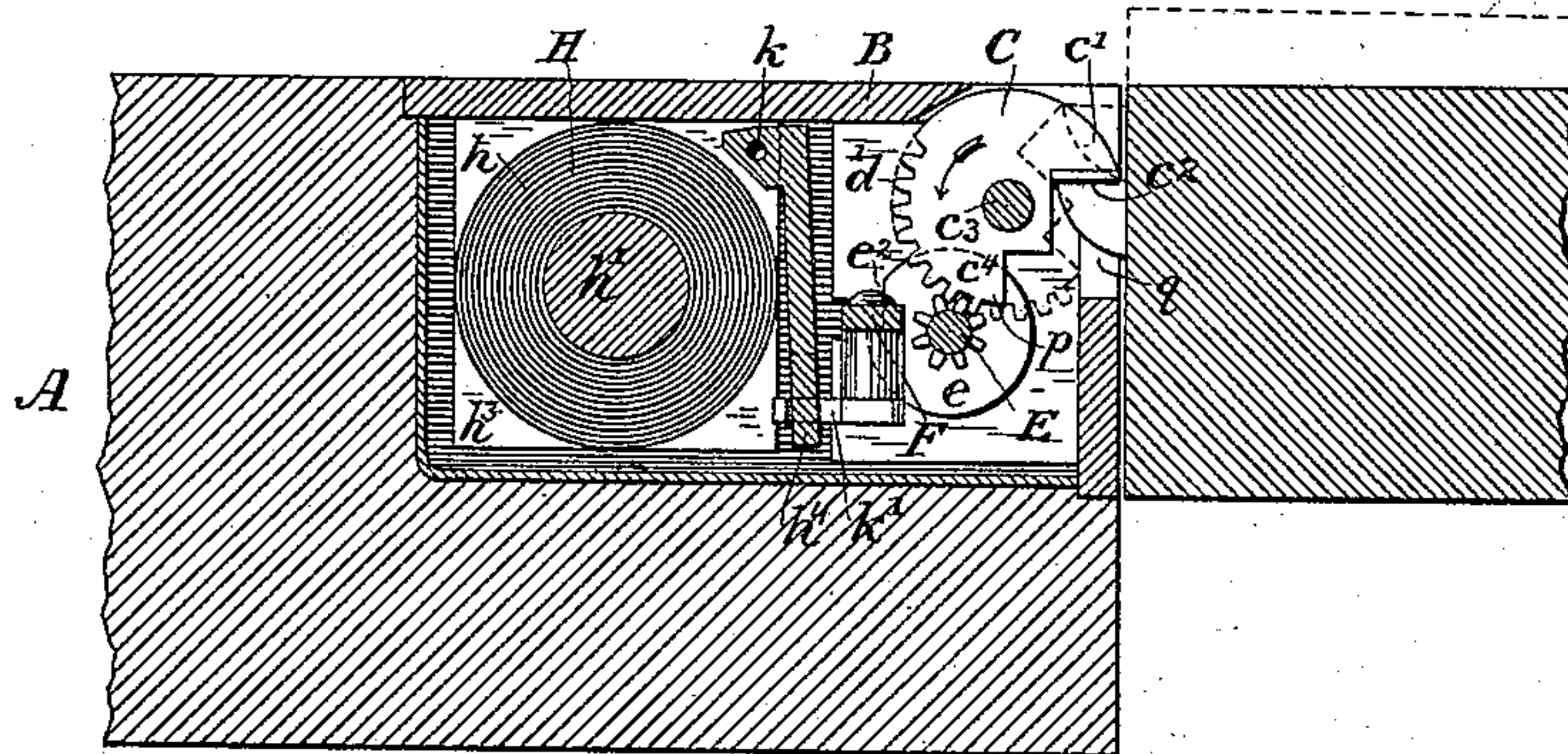
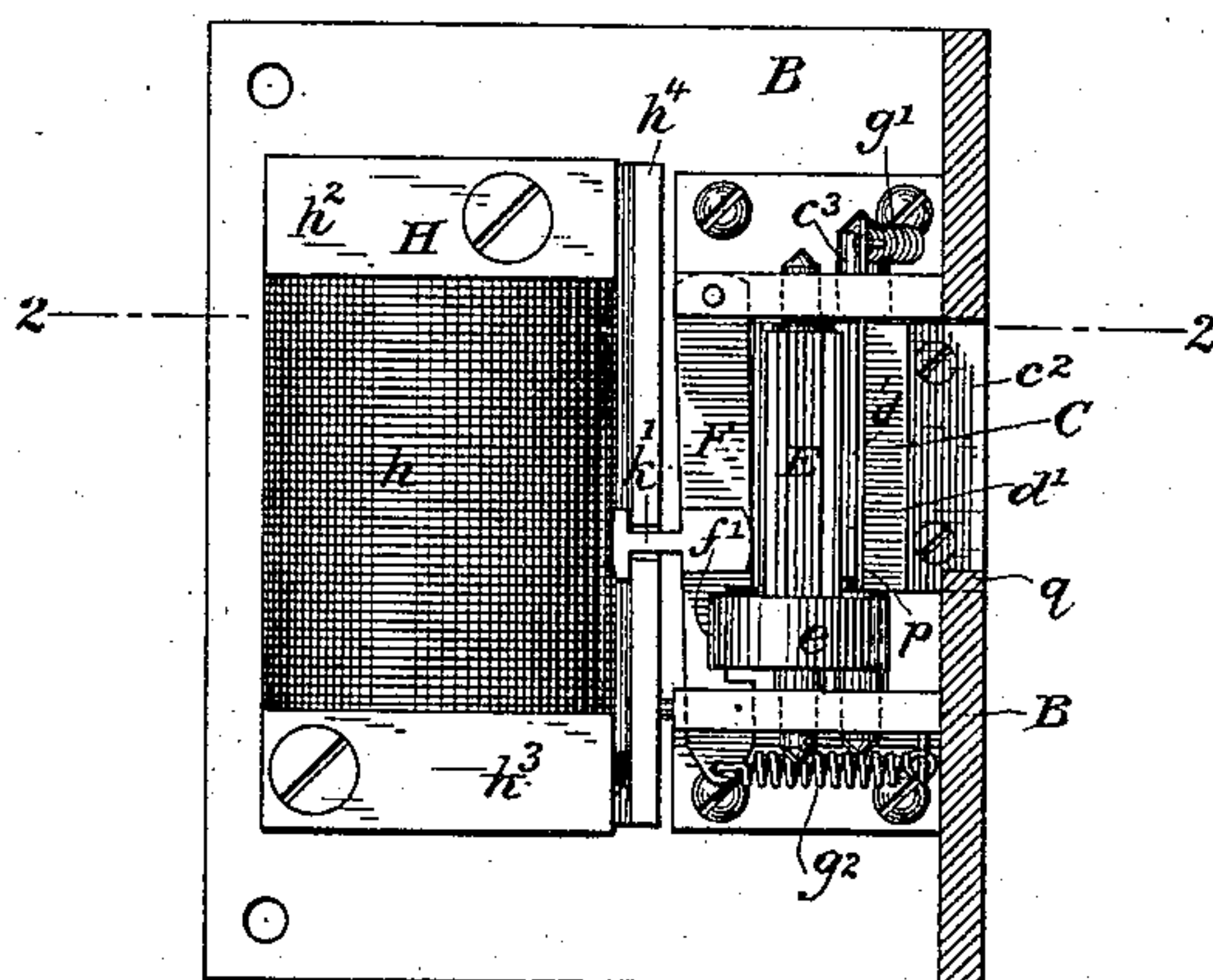


Fig. 3,



Witnesses

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OF SAME PLACE.

ELECTRIC DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 322,681, dated July 21, 1885.

Application filed May 14, 1884. (No model.)

To all whom it may concern:

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

My invention relates to the class of devices employed for releasing fastenings of doors through the instrumentality of an electro-magnet which is included in an electric circuit, the connections of which may be made or interrupted at one or more distant points. It has been customary to employ for this purpose a movable latch-plate, which is moved out of the path of the door-latch by being drawn back, either by an electro-magnet or through the agency of suitable mechanism. The force, however, with which the latch is liable to be pressed against the plate renders it difficult to insure that the plate will be withdrawn, unless a considerable force is applied thereto.

The object of my invention is to so construct the latch-plate and the means for releasing the same that the door-latch will itself serve to force the plate out of its path, thus permitting the door to be opened without drawing back the latch, and to control this device by means of an electro-magnet which may be caused to be vitalized at a number of remote points.

The invention consists in organizing the device in substantially the following manner: The latch-plate itself consists of a longitudinally-pivoted section of a cylinder, the convex portion of which constitutes the striking-surface for the latch of the door when it is being closed. Normally the section of cylinder constituting the latch-plate is locked in such position that the side which is cut away is presented to the door-latch. When the door is shut, the latch passes behind the section of the cylinder and is engaged by this flat portion, and the door cannot be opened without drawing back the latch in the usual manner.

The section of cylinder constituting the latch-plate is supported upon an axis which permits the plate to be revolved outward in such manner that, when it is released, the flattened portion behind which the door-latch

passes may be thrown entirely out of the path of the latch. Upon a portion of the surface of the cylinder there is formed a series of teeth, and these teeth engage a pinion, the axis of which is parallel therewith. Rigidly secured to this pinion is a disk having a notch or catch formed in its periphery. A pivoted locking-lever is normally held in position to enter the notch and prevent the pinion from turning. So long, therefore, as the disk is engaged both the pinion and the section of cylinder are rigidly held in position, whatever may be the pressure exerted upon the latter.

For the purpose of withdrawing the lever from engagement with the locking-disk an electro-magnet is employed. This electro-magnet is included in the circuit of a conductor leading to the various points from which it may be desired to cause the door to be released.

In the accompanying drawings, which illustrate my invention, Figure 1 is a plan with the cover partly broken away. Fig. 2 is a plan section taken on the line 2 2 of Fig. 3; and Fig. 3 is an elevation of the device.

Referring to the drawings, A represents the jamb of the door, in which is inserted a case, B, for supporting the latch-plate C and the various parts of its controlling mechanism. The latch-plate C is constructed in the form of a section of a cylinder, and it is supported upon a vertical axis, c^3 . A portion, c' , of the surface of the cylinder constitutes the striking-plate for the door-latch, and the recess or notch c^2 affords an opening for receiving the latch when the door is closed. A portion, c^4 , of the surface of the cylinder C, opposite the striking-face c' , is provided with longitudinal teeth d' , which gear into corresponding teeth formed upon a pinion, E. A locking disk or plate, e , is secured to the pinion E, and in the periphery of this disk there is formed a notch, e^2 . The cylinder and the pinion are so located with reference to each other that the one cannot be moved without actuating the other. Normally the disk, and thus the pinion and the latch-plate, are locked in the position shown in the drawings by means of a catch or locking lever, F, which enters the notch e^2 formed in the disk. A spring, g' , is applied to the latch-plate, and this spring nor-

mally holds the latch-plate in such position that the striking-face c' is presented upon the outside of the door-jamb, while the flattened portion c^2 is in a direction parallel with the door-jamb. The slot e^2 is thus engaged by the catch f' . A spring, g^2 , draws the catch or locking lever into the notch and thus prevents the pinion from turning. When, however, it is desired to release the pinion, and thus the latch-plate, it is necessary only to draw the locking-lever out from the notch. This is accomplished by means of an electro-magnet, H, the coil h of which is included in an electric circuit leading through the various points from which it may be desired to unlock or unfasten the door. The electro-magnet H, which I prefer to employ, consists of a single core, h' , having enlarged polar extensions h^2 and h^3 at its respective extremities. An armature, h^4 , is supported at one edge upon the axis k , parallel with the core of the electro-magnet, and is capable of a lateral movement toward and away from the polar extensions of the same. An arm, k' , extending from the locking-lever f' , links the latter to the armature in such a manner that when the latter is drawn toward the electro-magnet the lever is withdrawn from the path of the locking-disk. This movement of the armature and the locking-lever releases the latch-plate and permits the same to be turned outward upon its axis, and the latch, by pressing against the flattened portion c^2 , behind which it normally passes, readily forces the plate out of its path, thus permitting the door to be opened without drawing back the door-latch. As soon as the door is opened, the latch-plate is returned to its normal position and it is again locked, when the electro-magnet is demagnetized.

Any suitable well-known means may be employed for forcing the door outward sufficiently to spring it open when the latch-plate has been released—such, for instance, as a spring—which is compressed by the closing of the door.

For the purpose of preventing the section of cylinder from being turned an undue distance in either direction, a shoulder, q , is formed on the frame B, against which the face c^2 of the cylinder C rests when closed and the heel p strikes when opened, thus arresting the cylinder at the limit of its required movement in one direction or the other, as the case may be.

It will be observed that this invention is especially adapted to be employed in instances where the door-latch is liable to exert a considerable pressure against the latch-plate, for any increase in the pressure exerted will only serve to force the latch-plate back more readily when it is released.

It is not necessary that the latch-plate be cylindrical in form, for it is evident that the striking-face might be flattened or otherwise modified, the essential feature being that it be capable of being turned outward away from the latch.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, in a door-opener, with a revolving latch-plate, of a pinion geared thereto, a locking device normally holding said latch-plate in a given position, and an electro-magnet and its armature for actuating said locking device, substantially as described.

2. The combination, substantially as hereinbefore set forth, with a latch-plate in the form of a section of a cylinder, of a pinion geared thereto, a disk moving with said cylinder and having a notch formed in its periphery, a locking-lever normally engaging said disk, and an electro-magnet for withdrawing said lever, substantially as described.

3. In an automatic door-opener, the combination, substantially as hereinbefore set forth, of the pivoted latch-plate having a striking-face, c' , and the recess c^2 , the pinion E, geared to said plate, the disk e , the electro-magnet H, its armature, and the connections, substantially as described, between said pinion and said armature.

4. In a door-opener, the combination, substantially as hereinbefore set forth, with an electro-magnet, of a latch-plate, a pinion geared thereto, a spring normally tending to move said plate into position to engage the door-latch, a locking device applied to said pinion, and means, substantially such as described, for permitting said plate to be moved outward by the pressure of the door-latch.

In testimony whereof I have hereunto subscribed my name this 9th day of May, A. D. 1884.

THOMAS A. CASEY.

Witnesses:

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CHARLES A. TERRY.