

(No Model.)

E. W. BRETTELL.

LOCK.

No. 319,058.

Patented June 2, 1885.

Fig. 1.

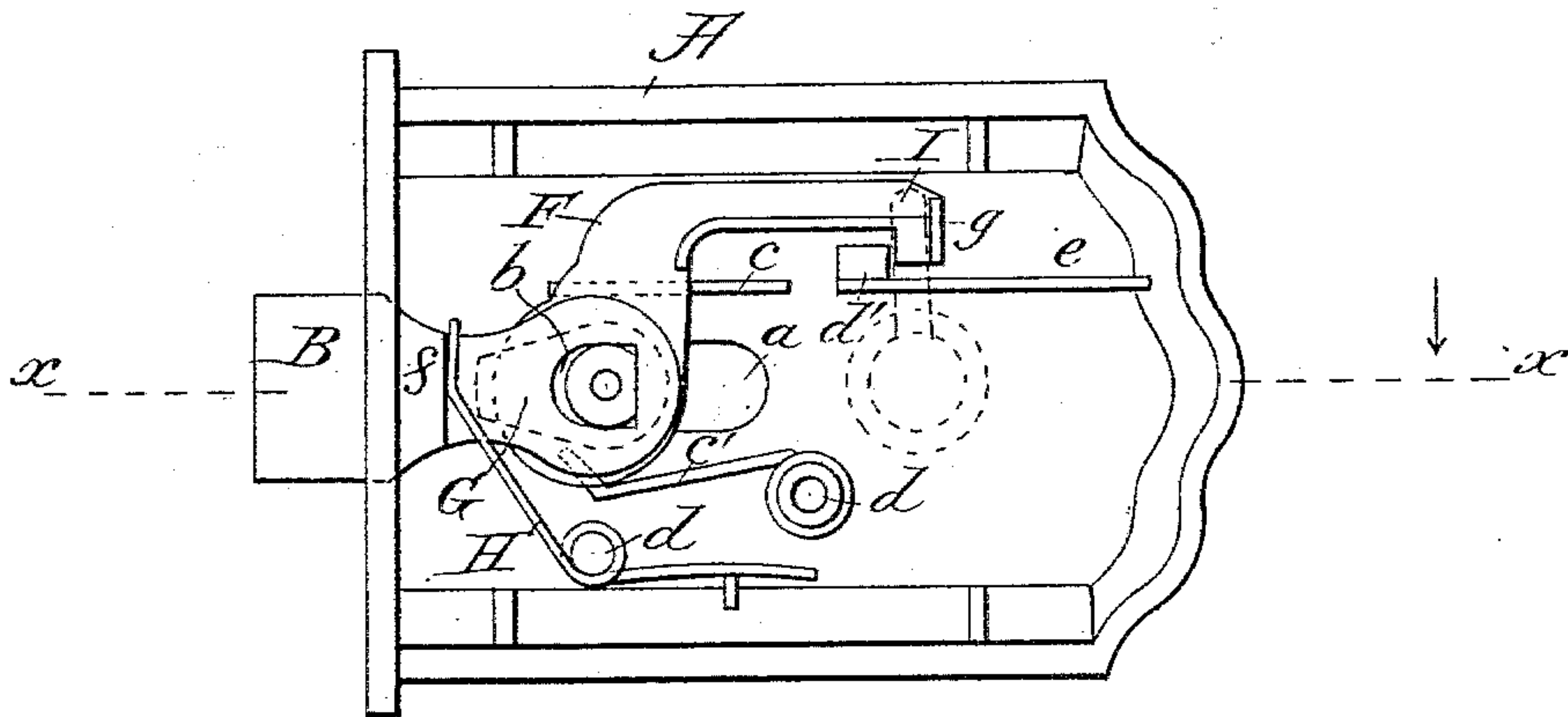


Fig. 2.

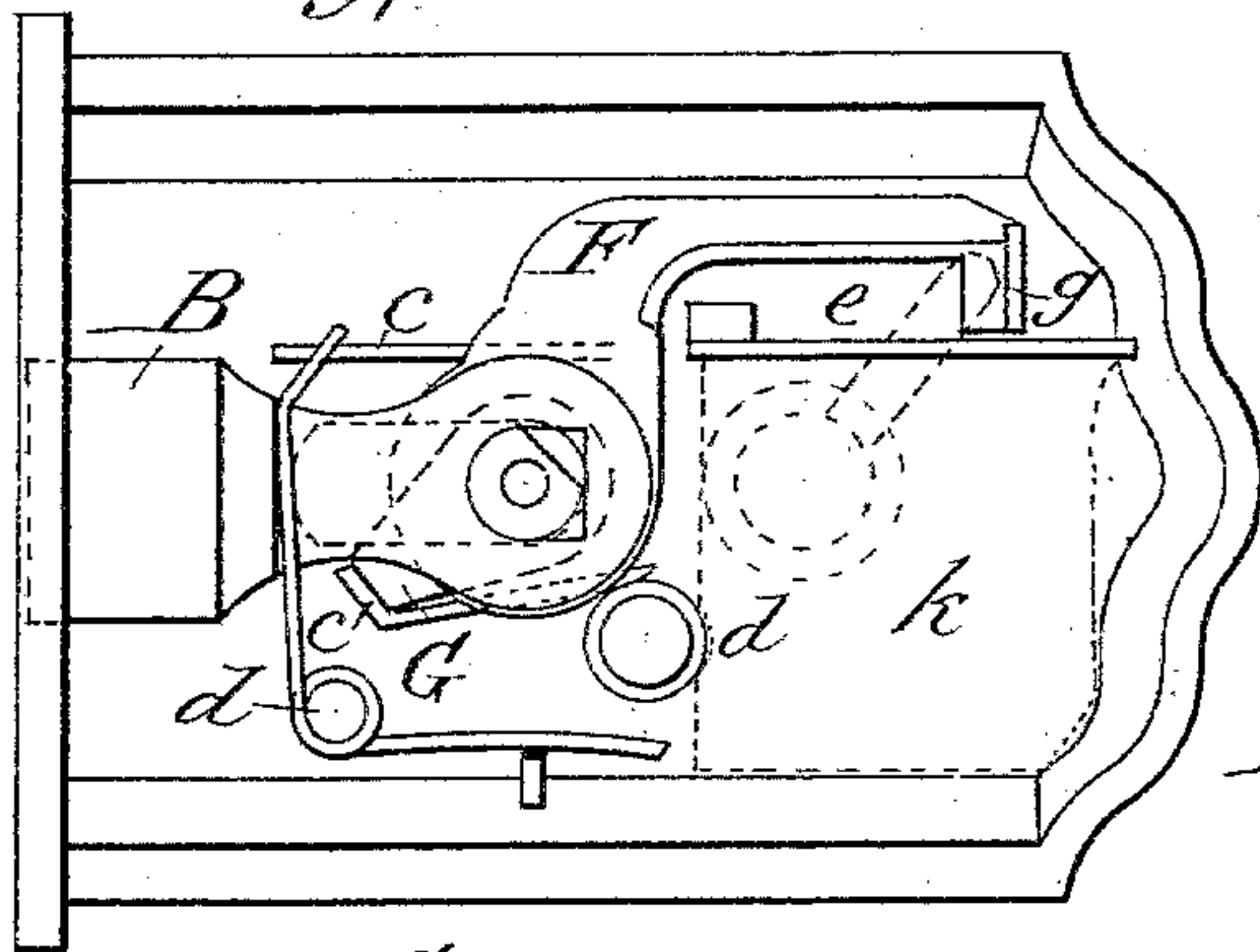


Fig. 3.

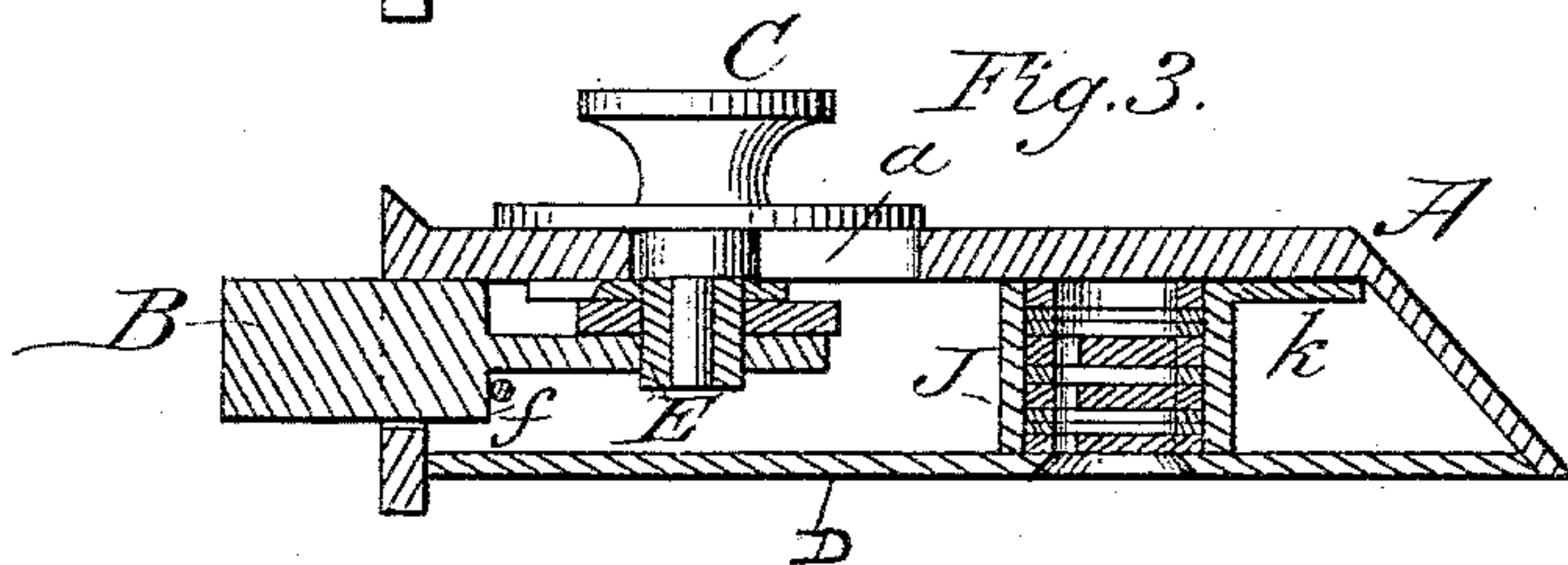


Fig. 4.

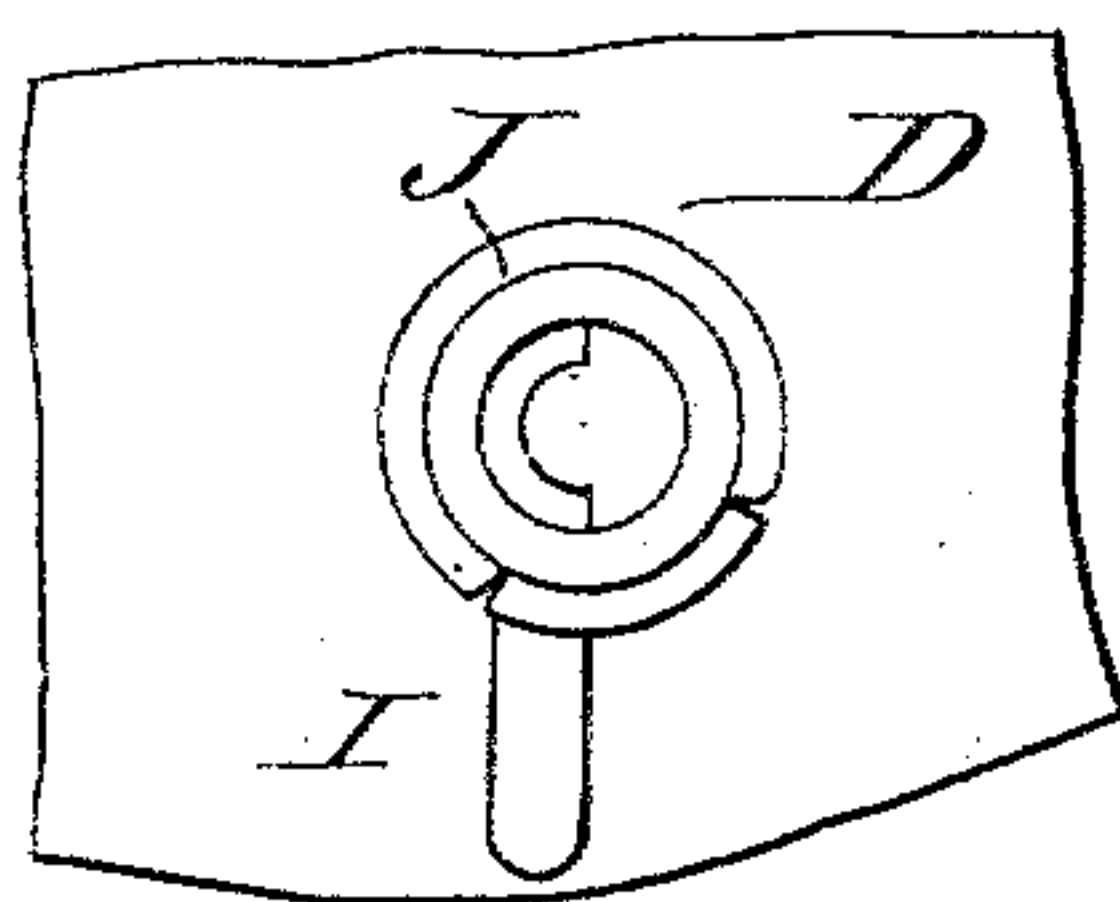


Fig. 5.

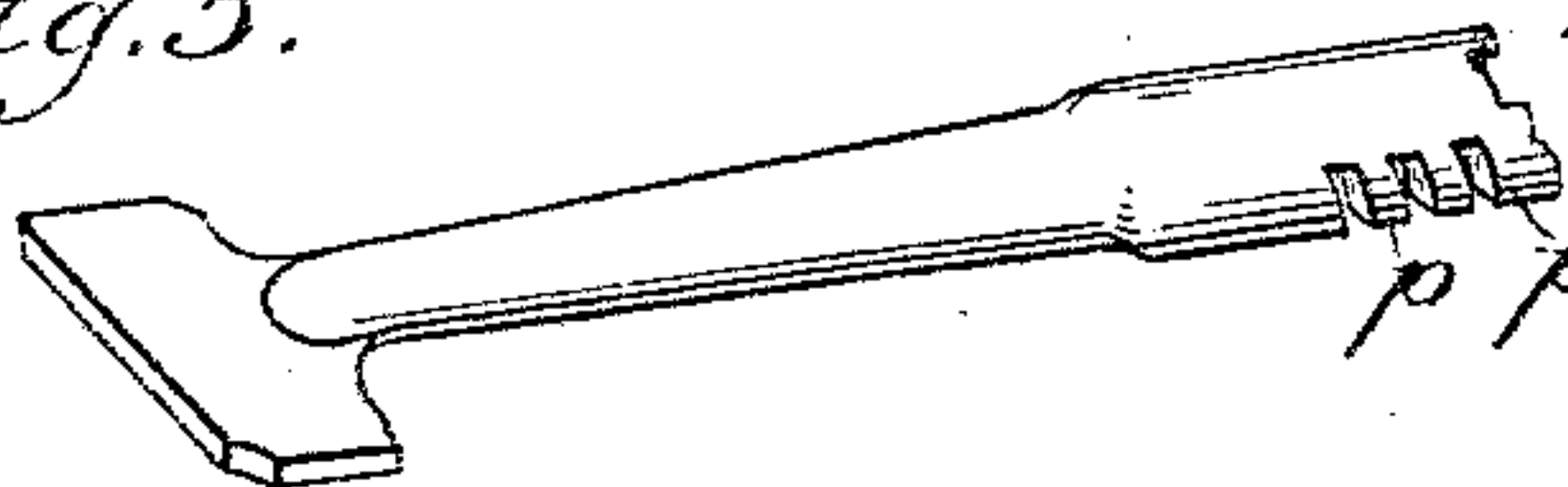


Fig. 6.

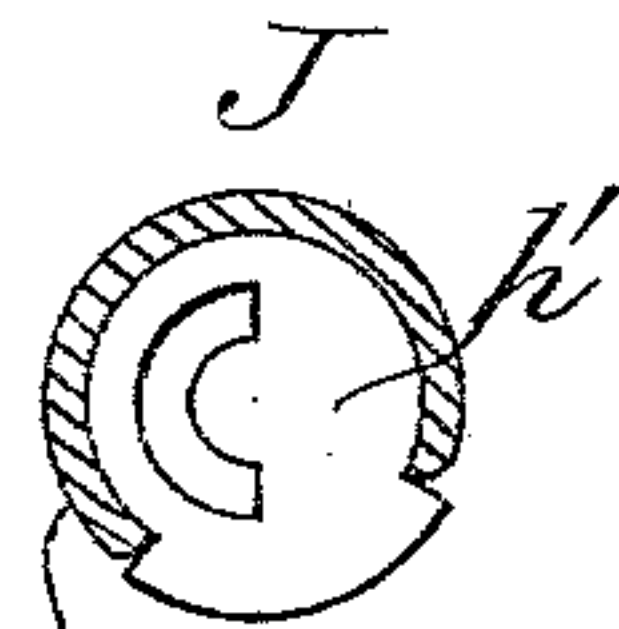
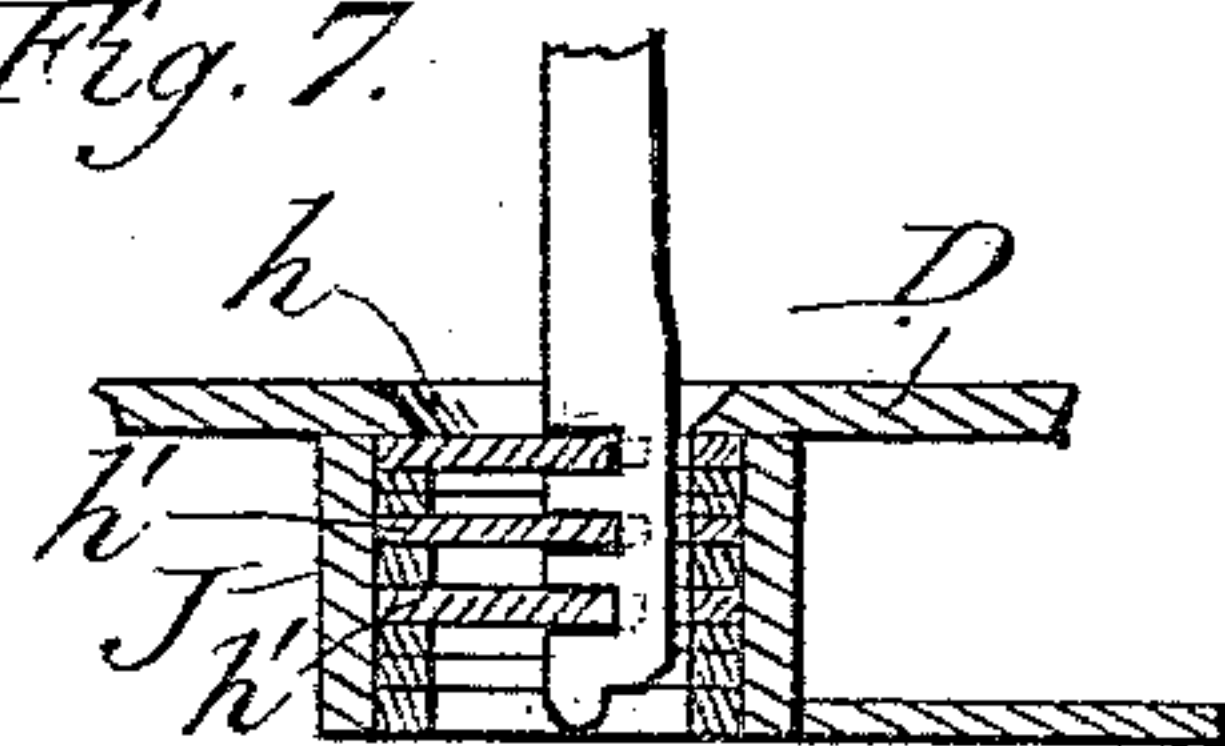


Fig. 7.



Attest:

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UNITED STATES PATENT OFFICE.

EDWARD W. BRETTELL, OF NEWARK, N. J., ASSIGNOR OF ONE-HALF TO
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LOCK.

SPECIFICATION forming part of Letters Patent No. 319,058, dated June 2, 1885.

Application filed March 17, 1885. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. BRETTELL, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Locks; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in latch-locks and their key mechanism; and it consists, particularly, of an improved construction of the parts of a key mechanism adapted to be operated by a semicircular key, as will be hereinafter more fully described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a plan view of my improved lock with back plate removed, showing the bolt projected. Fig. 2 is a similar view showing the bolt retracted. Fig. 3 is a sectional view on the line *xx* of Fig. 1. Fig. 4 is a partial inside plan view of the back plate and key mechanism. Fig. 5 is a perspective of the semicircular key. Fig. 6 is a view of one of the wards, and also of the lever-carrying wheel or tumbler of the key mechanism; and Fig. 7 is a cross-section of a cylinder supporting the key mechanism, and shows the clefts and bits of the key in their relation to the wards of said mechanism.

Like letters of reference designate like parts in the several views.

A represents a lock-case, of which D is the back plate, having in one end an aperture, which admits of the protrusion or retraction of the bolt B, and having on its face a slot, *a*, for the reception of the sliding and rotating thumb-button C. The interior of the casing A has formed upon its surface ridges *c c'* and *e* and posts or studs *d d'*, which serve as bearings and guideways for the various parts of the internal arrangement. The ridge *c'* is formed angularly, so as to afford a locking bearing against which a stop-lever, G, upon the spindle E of the thumb-button C may rest

whenever it is desired to hold the bolt in a retracted position.

The inner end of the bolt B is provided with an aperture, *b*, through which the spindle E of the sliding and rotating thumb-button C passes, so that said bolt can be actuated from the inner side of the door by means of the button; for it will readily be seen that when the bolt is projected, as shown in Fig. 1, it can be retracted by simply sliding back the knob C, the bolt being then held, if desired, in a drawn position by rotating the button C until the lever-arm G braces against the angular ridge *c'*.

Around the pin or stud *d* is coiled a spring, H, the two free long ends of which bear the one against the wall of the casing, and the other against a lug, *f*, on the bolt B. If, now, the thumb-button is rotated so as to disengage the arm-lever G from the ridge *c'*, the bolt will be again projected under the pressure of this spring H.

The bolt B is made much thinner in its inner than in its outer and latching half, so as to form a lug or bearing, *f*, on both sides. (See Fig. 3.) It will thus be observed that the bolt is reversible, and may be used to fit both right and left hand locks, and in both cases a lug will be provided for the bearing of the spring H. This bolt is connected with the key mechanism by means of a dog, F, whose shape is shown in Figs. 1 and 2, and which slides upon the ridge *c* and between the wall of the casing and the ridge *e*. This dog has an opening in one end, which engages with the spindle E of the thumb button or knob, and it is situated between the lever G and bolt B, so that the spindle passes through and connects all three. The inner or forward end of the dog is curved around the post or stud *d'*, and carries a lug, *g*, that is adapted to engage the lever of the tumbler I.

The back plate, D, may have secured to its inner surface, and made a part thereof by casting or welding, a partial cylinder, J, as shown in Figs. 4 and 6, of a length equal to the thickness of the lock-case, so that when the back plate is in position the end of the cylinder will rest against the face-plate. This may be a semi-cylinder, or two segments of a wide cyl-

inder, or an almost complete cylinder, the object being to break away only so much of the wall of the cylinder as will enable the inclosed tumblers to rotate sufficiently on one or both sides that these levers may act upon the dog *g* as desired. This cylinder incloses a stationary hub or trunnion having a semicircular key-slot, two or more wards, one or more tumblers, and the rest of the key mechanism, all the parts of which are placed upon each other in a perpendicular series within the cylinder. The hub *h* itself is thin and of the same shape and size as one of the wards. There may be any number of wards *h' h' h'*, made of the form shown in Fig. 6, each being pierced with a semicircular aperture for the passage of the key. The circular portion of the ward fits tightly within the cylinder, and is kept from rotating by a projecting portion, which bears upon both edges of the wall of the cylinder *J*, where it is broken away, as shown in Fig. 6. The various wards are separated at suitable distances by thin perforated disks placed between them, as shown in Fig. 7, excepting those wards situated above and below the tumbler or tumblers.

The key mechanism thus described is adjusted within the cylinder as follows: Into the end of the cylinder is first placed a ward. This covers the circular orifice in the back plate, *D*, excepting its own semicircular aperture, which is thus brought into position, and is left open for the insertion of the key. Upon this hub two or more disks are placed, and then another ward, leaving room enough between the wards for the play of one of the bits of the key in its rotation. Then place in position the irregular disk and its lever *I*, which together act as a tumbler. The form of the irregular disk of the tumbler is represented in Fig. 6, the interior periphery being notched at *i* to form a lug or bearing for the bits of the key. On the tumbler lies another ward, then two or more perforated disks, and, finally, this perpendicular series of disks, wards, and tumblers is completed and secured by a disk or plate at the end of the cylinder fastened therein immovably.

This arrangement of wards, disks, and tumblers may be varied more or less to correspond with the clefts and grooves of a semicircular key; but the only movable part of the mechanism is the tumblers. This key is shown in Fig. 5, and is stamped from a single piece of metal or cast, and is peculiarly adapted to be used with this mechanism. Care must be taken to suit the situation of the wards always to the clefts in the key, for no lock can then be opened except by its own proper key.

When the semicircular key is inserted in its key-hole, it must be pushed in far enough to come in contact with the opposite wall of the lock, when it will be in proper position for rotation. When being rotated, the wards and hub will remain stationary, the bits *p* of the key resting and turning around upon them freely, excepting the one bit or web which

comes into engagement with the tumbler. By revolving the key the tumbler will be rotated under the action of the key-bit *p*, and the lever *I*, bearing against the lug *g*, will throw back the sliding dog and shoot the bolt. As soon as the bolt is retracted the door may be opened. Then the tension of the spring *H* will again project the bolt, and return the key to the position it held before its rotation, so that it can be withdrawn from the lock; for inasmuch as neither the hub nor any of the wards rotate, but all remain stationary, the edges of the key must be brought into alignment with the walls of the semicircular key-slot when it is to be withdrawn from it as well as when it is to be inserted into it; but if it is desired to hold the bolt retracted, this can be done by turning the thumb-button and allowing the arm-lever to perform its function as above described, in which case the key may be rotated back by hand and disengaged.

By my improved construction of a lock, having a key mechanism which is peculiarly adapted for the use of a semicircular metal key, many advantages are to be derived; and keys struck up or made in semicircular form from steel, iron, brass, or other metal possess all the advantages of the old-fashioned round-stemmed keys, in that they are easily supported during rotation, and they also have the advantages of being adapted for use with a keyway whose two lateral walls are parallel with each other—a shape of keyway which greatly obstructs the picking of the lock. Thus I afford a lock of extremely simple construction which affords all the security against picking that is afforded by very complicated and expensive locks. The semicircular form of key-hole will obstruct the entrance of almost any picking-tool, and the fact that this key-hole is situated in a stationary hub increases the difficulty, for the convexity of the hub in the keyway projects inward even beyond the central line of the keyway. A picking-tool, therefore, cannot be tilted sufficiently to accomplish its purpose.

It will be noted that the cylinder *J*, which incloses the key mechanism, may be made a part of the back plate, as above described, or it may be made detachable therefrom. In the latter case the end opposite the keyway will be provided with a flat supporting-plate, *k*, Fig. 3, and shown by dotted lines in Fig. 2. The plate serves only as a base to hold the cylinder in its position, and the arrangement of the internal mechanism is not necessarily varied from the form used with a cylinder that is not detachable.

When desired, the lock may have a key-hole in the front plate, as well as in the back plate, without material change in the construction of the key mechanism. In this event the key may be notched on both sides to enable it to be inserted from either side of the door.

It will be noted that in this application I do not claim separately a semicircular sheet-

metal key as such; but it is not my intention, therefore, to abandon such an article to the public, but merely to reserve it for a future application for Letters Patent.

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

10 In a lock, the combination of a key mechanism inclosed in a case of cylindrical form, said mechanism consisting of three or more wards and one or more tumblers, all provided with semicircular key-slots, and the tumblers

formed with levers, and thin flat perforated disks separating said wards and tumblers, with a semicircular metal key adapted to 15 operate said mechanism, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD W. BRETTELL.

Witnesses:

HORACE F. BALDWIN,
CHAS. E. BALDWIN.