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PATENTED FEB. 9, 1904.

P. V. SIMMONDS.  
GRAVITY LOCK.

APPLICATION FILED MAR. 30, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

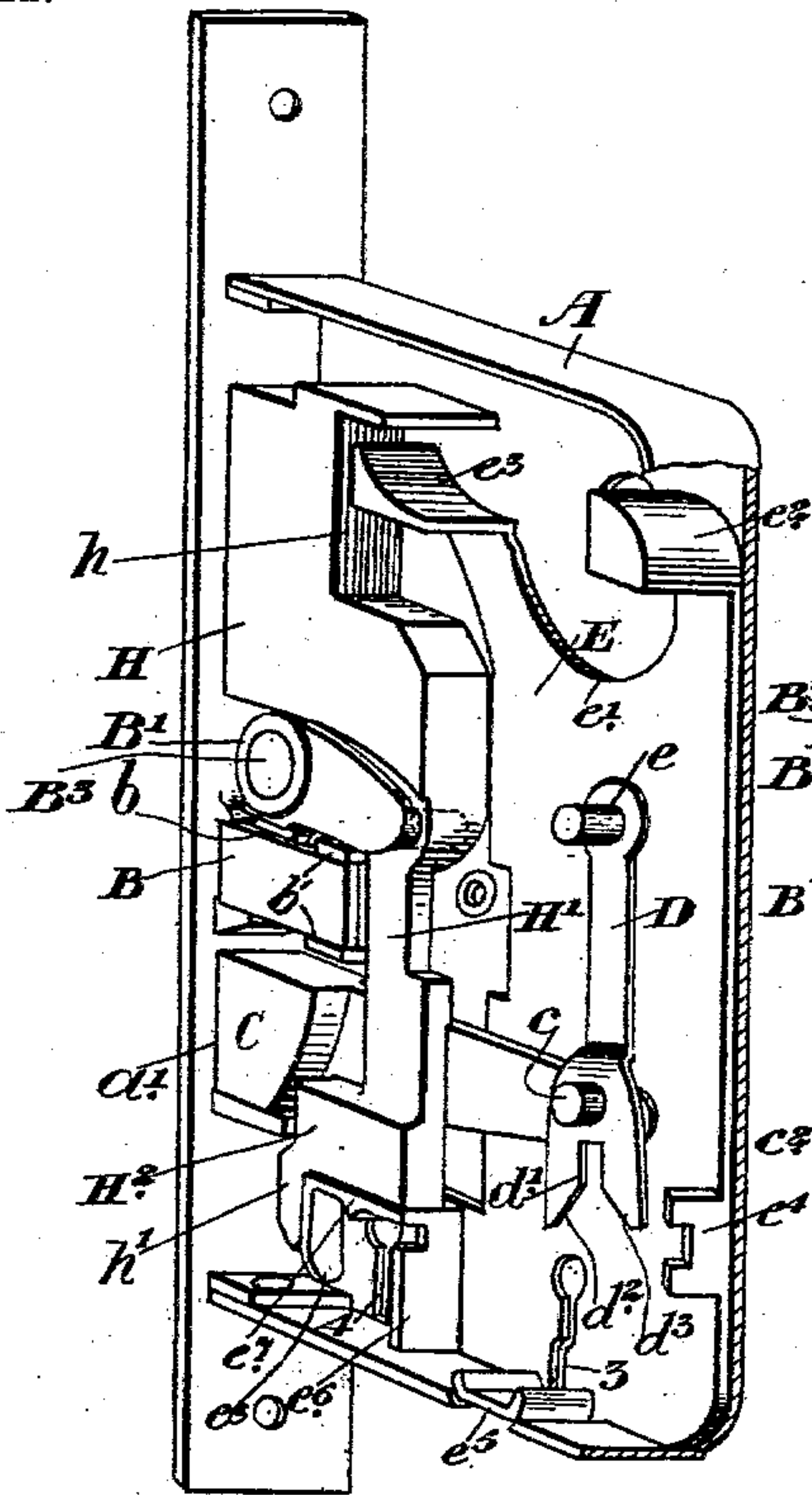


Fig. 3.

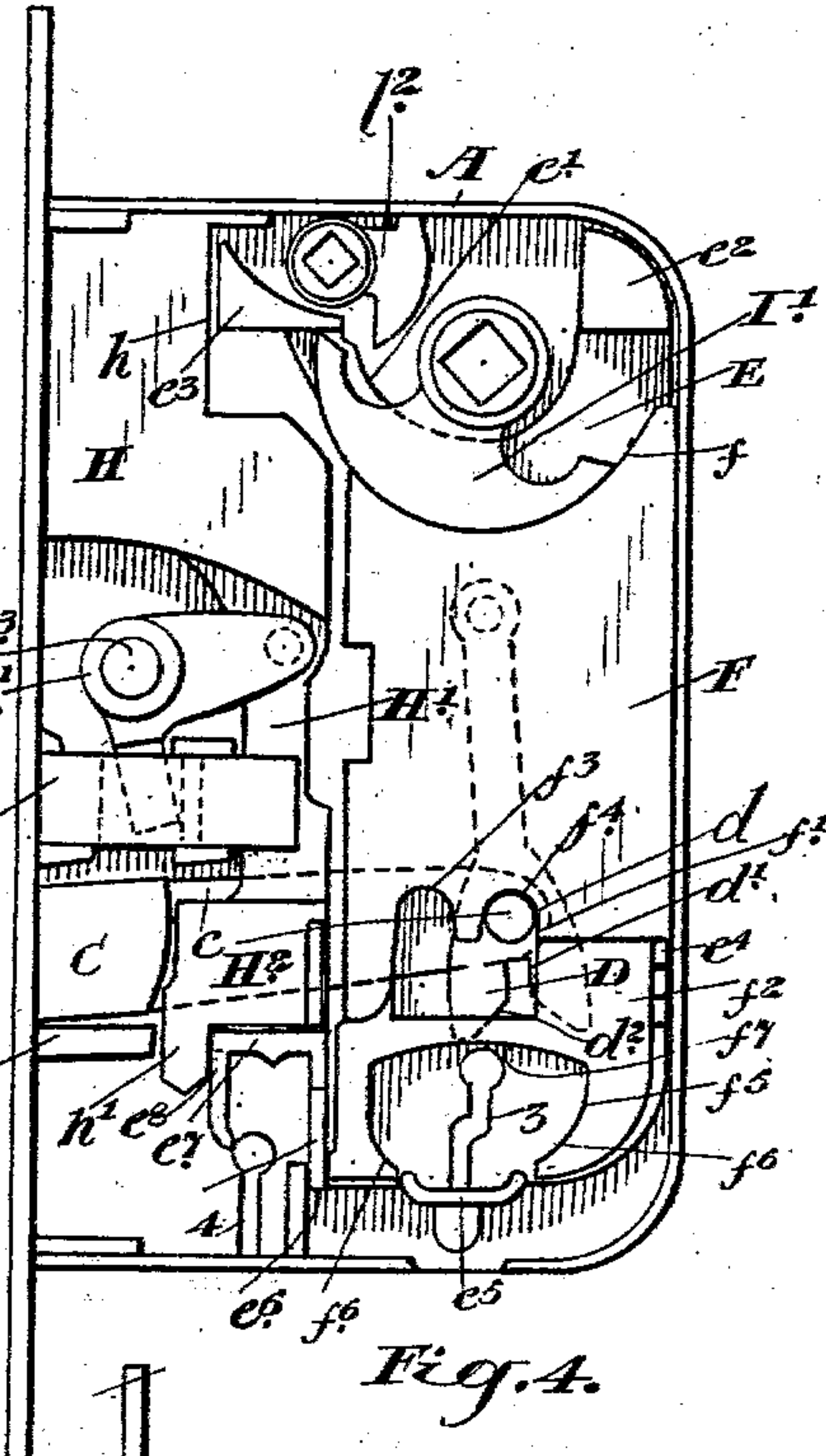


Fig. 4.

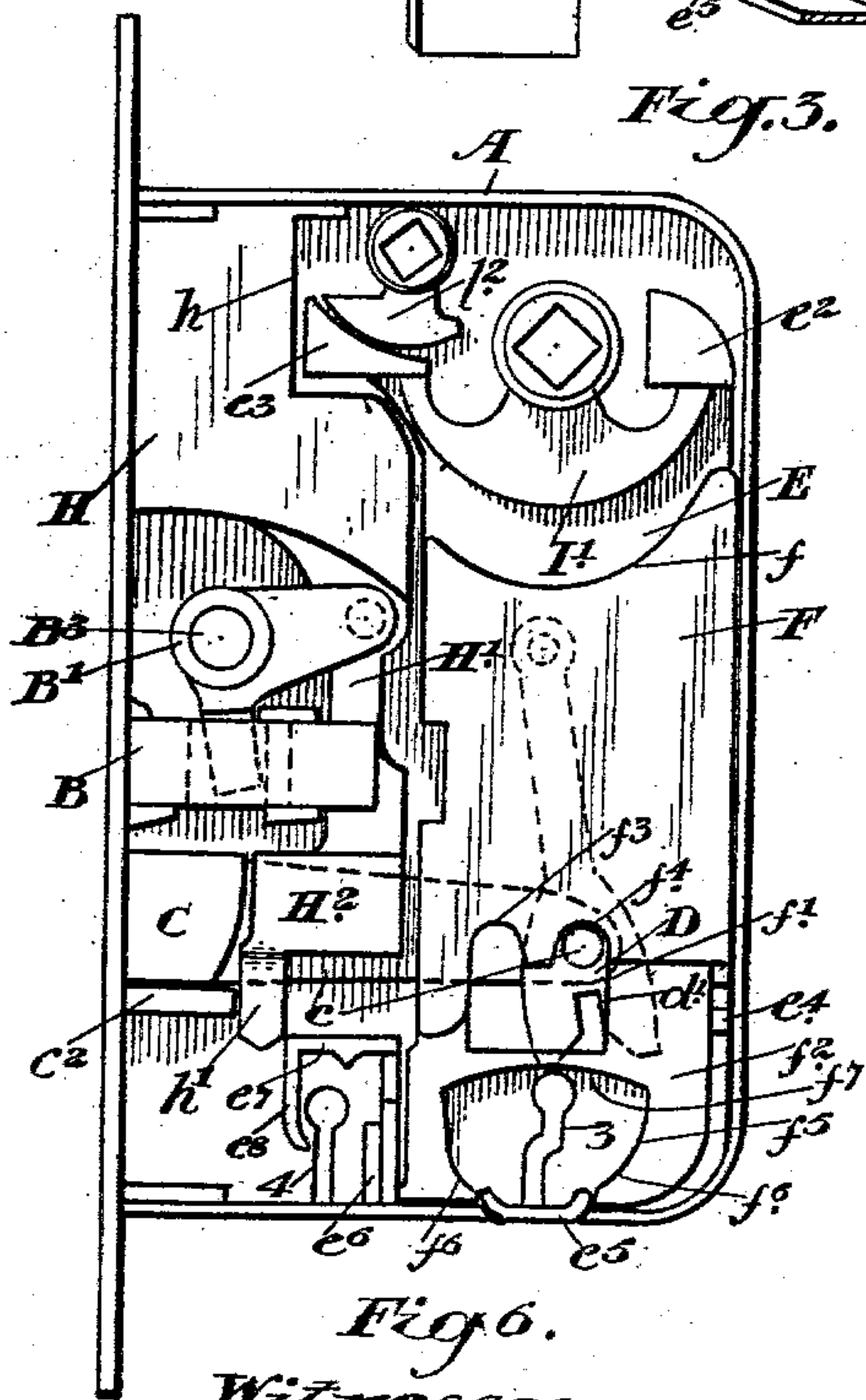


Fig. 6.

Witnesses.

A. J. L. Gentry  
B. B. Sheffield

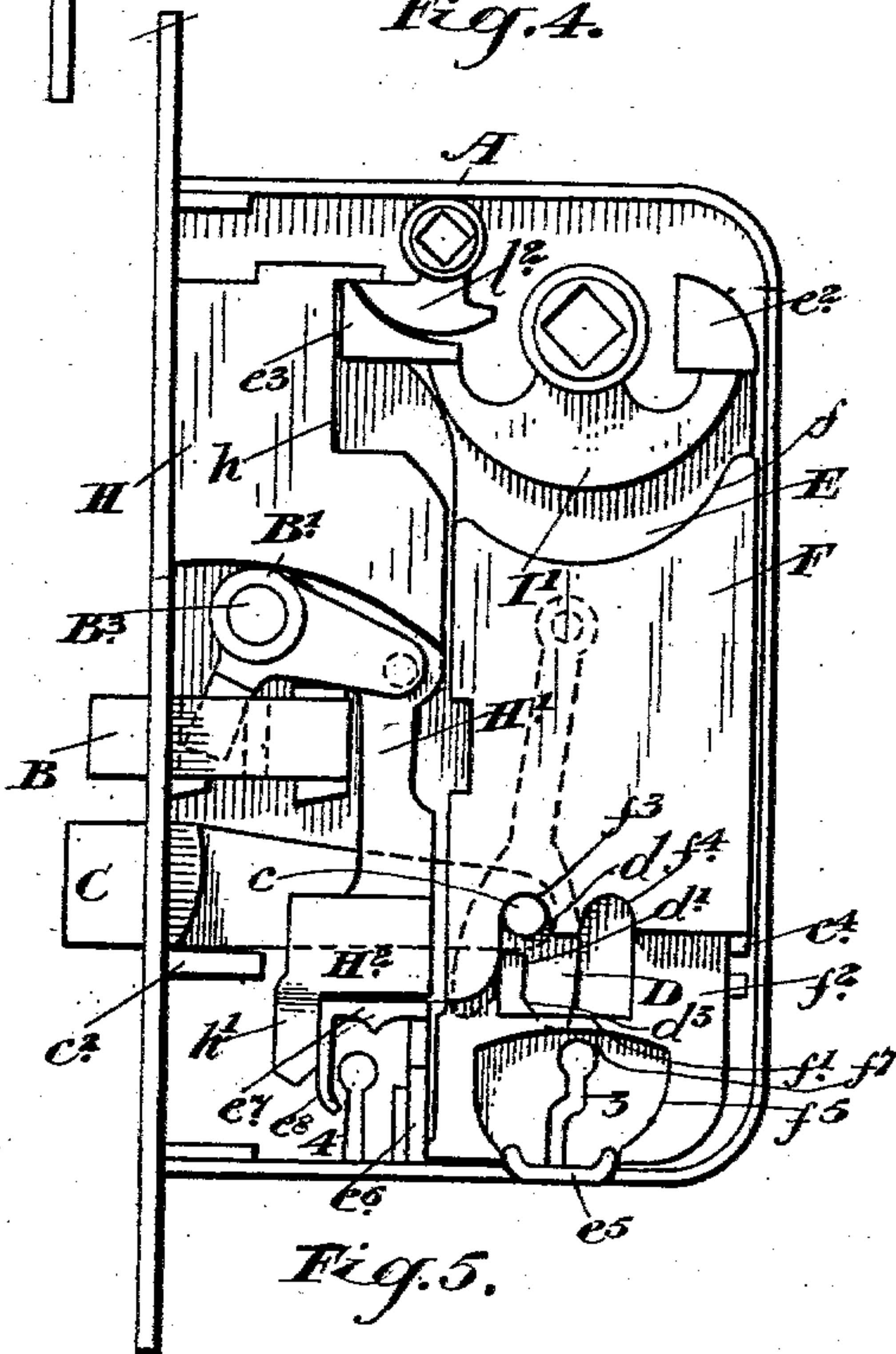


Fig. 5.

Inventor.

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# UNITED STATES PATENT OFFICE.

PERCY VINCENT SIMMONDS, OF TORONTO, CANADA, ASSIGNOR OF ONE-HALF TO JOHN O'CONNOR, OF TORONTO, CANADA.

## GRAVITY-LOCK.

SPECIFICATION forming part of Letters Patent No. 751,954, dated February 9, 1904.

Application filed March 30, 1903. Serial No. 150,330. (No model.)

*To all whom it may concern:*

Be it known that I, PERCY VINCENT SIMMONDS, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Gravity-Locks, of which the following is a specification.

My invention relates to improvements in gravity-locks; and the object of the invention is to devise a lock by which all springs will be done away with and the lock operated by gravitation, in which there will be no narrow or quickly-worn-out bearings or delicate parts to get out of order or which need too fine an adjustment, and in which the ordinary lock is combined with the latch-lock and has a double action, so that while the door is latched the knob of the door-handle offers resistance to the hand—that is to say, will not turn to unlatch the door. To carry out these objects, I have constructed my door-lock as hereinafter more particularly explained.

Figure 1 is a perspective view of portion of a door, showing my lock as a mortise-lock, portion of the door and the casing of lock being broken away to exhibit the interior construction. Fig. 2 is a perspective view of the door-lock, showing one side of the casing removed. Fig. 3 is a view from the opposite side to that shown in Fig. 2, showing the bolt-sliding weight removed. Fig. 4 is a side elevation with one side of the casing removed, showing the position of the parts when the latch-lock and ordinary bolt-lock are drawn into the casing, the latch-lock in this case being operated from the door handle or key. Fig. 5 is a similar view showing the position of the lock when the latch-lock and bolt are shot and the latch-lock is designed to be operated by the key alone. Fig. 6 is a similar view showing the latch-lock and bolt withdrawn, such latch-lock being so set in this case as to be operated by the key alone. Fig. 7 is a view from the back of the bolt-sliding plate. Fig. 8 is a detail of the inner case-cover. Figs. 9 and 10 are details of the latch-key and main bolt-key, respectively.

In the drawings like characters of reference indicate corresponding parts in each figure.

A is the lock-casing, and A' the removable side plate thereof.

B is the latch-bolt, which extends through a slot *a* in the casing A and is provided with a recess *b*.

C is the main bolt, which extends through a slot *a'* in the casing A. Both the slots *a* and *a'* are in the face-plate, which is screwed onto the edge of the door. The bolt C is provided with a reduced or thin extension, which is provided with a pin *c* at the inner end, to which is pivotally connected the bolt key-lever D by such pin extending through a hole *d*. The bolt key-lever is swung on a pin *e*, extending outwardly from the inner case E, and is provided at the bottom with a notch *d'*, having beveled sides *d''* and *d'''* leading thereinto. The inner case E is provided with an arc-shaped recess *e'* at the top and with projections *e''* and *e'''*. The top of the projection *e''* is arc-shaped, having an outward curve, and the bottom is straight, and the bottom of the projection *e'''* is arc-shaped, having an inward curve, and the bottom is straight. The lower portion of the plate is also provided with projections *e''''* *e'''''* *e''''''* and a depending tongue *e''''''''*.

F is the bolt-sliding weight, which is provided with an arc-shaped recess *f* at the top for a purpose which will hereinafter appear. The bolt-sliding weight F is provided with an opening *f'* near the bottom and a depressed portion *f''*. The opening *f'* has notches *f'''* and *f''''*, as indicated, and into one or the other of these notches the pin *d* is designed to extend, depending, of course, whether the bolt is in or out, such pin being manipulated, as will hereinafter appear, into either of the notches. The depressed portion *f''* is provided with a recess *f'''*, having arc-shaped sides *f''''*, which are so formed as to allow of the sweep of the key, and an upper arc-shaped side *f''''''*, with which the key is designed to come in contact to raise the bolt-sliding weight F. The back of the bolt-sliding weight F is recessed, as indicated in Fig. 7, and provided with a recess *f''''''''*, so as to provide for the free vertical movement of the weight over the pin *e*.

G is the inner-case cover, which is provided



with a keyhole 2 and inwardly-extending lugs  $g$  and  $g'$ , which fit into the jaws of the lug or projection  $e^4$  and underneath the projection  $e^7$ , respectively. The detail of this plate is shown in Fig. 8, and the position will be readily understood on reference to Fig. 2. The keyhole 2 is opposite the keyhole 3, which is made in the inner case E. The outer casing is provided with keyholes opposite the keyholes aforesaid.

4 is a keyhole for the latch-key, such keyhole being located at each side of the case in proximity to the depending projection  $e^8$ .

H is the latch-sliding weight, which is provided at the top with a recess  $h$ , into which extends the projection  $e^3$  at the top of the inner case E.

The latch-sliding weight H is provided with a shank  $H'$ , at the bottom of which is formed an offset  $H^2$ , which is provided with a depending lug  $h'$ , which is located in proximity to the depending lug  $e^8$ .

The main bolt C is provided with a supporting guiding-lug  $c^2$ , attached to or forming part of the casing, and the latch-bolt is supported in suitable guideways  $b'$ .

B' is the latch-lever, which is bell-crank shape in form, pivoted on a pin  $B^3$  and pivotally connected to the upper end of the shank  $H'$  by a pin extending thereinto, as indicated by dotted lines in Figs. 3 and 5. The opposite end of the bell-crank extends into the recess  $b$  in the latch-bolt.

I is the door handle or knob, and  $i$  the shank thereof, which extends through openings in the casing in the usual manner and is provided intermediate of its length with the knob-follower I', which is provided with an arc-shaped outer contour designed to work in the recess  $e'$  at the upper end of the inner case E.

J is a plate on the inside of the door, which is provided with a main-bolt keyhole  $j$  and the latch-bolt keyhole  $j'$  at the bottom and with a pawl-plate K at the top, which is located at a slight distance from the plate J and is secured thereto by screws extending through a depending lug  $k$ .

L is the thumb-lever, which is pivotally connected to the movable pawl M by the pin  $l$ . The movable pawl M is provided with a recess  $m$  and depending upper portions  $m'$ , which are designed to coact with a pin  $k'$ , extending between the plate J and the plate K at the top. The thumb-lever L has secured to it a shank  $l'$  at the inner end, which extends through the thumb-lever follower  $l^2$ , as indicated.

Having now described the principal parts involved in my invention, I shall briefly describe the operation and utility thereof.

By swinging the thumb-lever L upward from the position shown in Fig. 1 it will be seen that the follower  $l^2$  will be thrown into the position shown in Figs. 5 and 6 to lock

the inner case E against vertical movement by the contact of the follower  $l^2$  with the projection  $e^3$ , and hence the knob-follower I' will be held against rotation in either direction on account of the projections  $e^2$  and  $e^3$ . It will thus be seen that the latch-bolt cannot be operated from the knob with the parts in this position as it could with the parts in the position shown in Fig. 4, where the inner case is free to rise and lower. When the inner case is free to rise and is lifted by the rotation of the knob, as indicated in Fig. 4, it will be noticed that the keyhole rises also, and in order to permit the key to move upward with the inner case the slots on the outer case are made of a greater height than the slots on the inner case. As the thumb-lever L is raised in the manner just indicated it will be seen that the pawl M will be carried with it, owing to the pin connection  $l$ , until the projection  $m'$  falls to the right of pin  $k'$ , and thus holds the thumb-lever against accidental displacement; but the thumb-lever may be readily returned to normal position from the inside by raising the pawl M. When the thumb-lever follower  $l^2$  is in the position shown in Figs. 5 and 6, as before stated, the latch-bolt cannot be operated by the knob from either side. It is desirable to have the latch so constructed that it can be opened from the inside without releasing the latch-bolt, and this is accomplished by so constructing the follower  $l^2$  that it is capable of rotation beyond the position shown in Figs. 5 and 6 after disengaging the sliding case E. This is accomplished by simply pushing the thumb-lever L farther over until the nose of the follower  $l^2$  rises sufficiently from the position shown in Fig. 5 to raise the weight H into the position shown in Fig. 6, thus operating the latch-bolt.

I have referred to the part E as an "inner" case; but it will be understood that one of its functions, if not its main function, is to serve as a weight to maintain the knob-spindle in neutral position in the manner hereinbefore described, and I have not designated it as a "weight," for the reason that it carries or guides the weight F, which coöperates with the locking-bolt, and, further, as the term "inner" casing tends to distinguish it from the weights F and H, which are weights solely.

Although the latch cannot be operated by the handle, it will be readily seen that it can be operated by the latch-key, which would be arranged to pass the projection  $e^8$  and extend underneath the tongue  $h'$ , and thereby raise the shank  $H'$  and tilt the bell-crank B' on its pivot and draw back the latch.

Under ordinary circumstances it will be seen that the latch B will be held in the position shown in Figs. 1, 2, and 5 by the sliding or gravity weight H.

In order to operate the bolt, it is simply necessary to turn around the key within the



recess  $f^5$ , making the web of the key contact with the top of the recess, thereby raising the bolt gravity-weight above the level of the pin  $d$ , and thus coming in contact with the beveled side  $d^2$  and pushing the lever D from the position shown in Fig. 6 into the position shown in Fig. 5. After the web of the key has passed the beveled end of the lever, which it does in its rotation, the gravity-weight F falls down into the position shown in Fig. 5. To withdraw the bolt, the reverse operation is required.

In my form of lock also it will be noticed that the thumb-lever L may be utilized as aforesaid from the inside of the door whenever it is desired to use the lock as a latch-lock, and thereby avoid, as in the case of spring-locks, having to open the door in order to set the lock as a latch-lock.

What I claim as my invention is—

1. In a door-lock the combination with the casing of a gravity-weight, a latch-bolt having connections with the weight whereby vertical movement of the weight reciprocates the latch, an inner vertically-sliding case having a projection adapted to lift said weight, a knob-spindle having a follower adapted to lift said inner case and operate the weight and latch-bolt, means for locking said inner case against movement, and key-operated means for lifting the gravity-weight independent of the inner case.

2. In a door-lock, the combination with the casing, of a gravity-weight provided with a shank, a latch-bolt extending through the orifice in the edge plate provided with a recess, the bell-crank having one end extending into the recess in the latch-bolt and the other end pivotally connected to the shank, an inner case provided with an upper projection and a lower projection designed to come in contact with the bottom of the shank of the latch gravity-weight, the door handle or knob, the shank thereof and the knob-follower designed to come in contact with the projection at the top of the inner case as and for the purpose specified.

3. In a door-lock, the combination with the casing, of a gravity-weight provided with a shank, a latch-bolt extending through the orifice in the edge plate provided with a recess, the bell-crank having one end extending into the recess in the latch-bolt and the other end pivotally connected to the shank, an inner case provided with an upper projection and a lower projection designed to come in contact with the bottom of the shank of the latch gravity-weight, a depending projection from such latter projection, which the key is so formed as to pass, and a depending projection from the bottom of the gravity-weight shank designed to be engaged by the latch-key, so as to raise the gravity-weight and withdraw the latch as and for the purpose specified.

4. In a door-lock, the combination with the

casing, of a gravity-weight provided with a shank, a latch-bolt extending through the orifice in the edge plate provided with a recess, the bell-crank having one end extending into the recess in the latch-bolt and the other end pivotally connected to the shank, an inner case provided with an upper projection and a lower projection designed to come in contact with the bottom of the shank of the latch gravity-weight, the door handle or knob, the shank thereof and the knob-follower designed to come in contact with the projection at the top of the inner case, a thumb-lever provided with a shank, a follower secured to the inner end of the shank within the casing and designed to be brought over the projection at the top of the inner case as and for the purpose specified.

5. In a door-lock, the combination with the casing, of a gravity-weight provided with a shank, a latch-bolt extending through the orifice in the edge plate provided with a recess, the bell-crank having one end extending into the recess in the latch-bolt and the other end pivotally connected to the shank, an inner case provided with an upper projection and a lower projection designed to come in contact with the bottom of the shank of the latch gravity-weight, the door handle or knob, the shank thereof and the knob-follower designed to come in contact with the projection at the top of the inner case, a thumb-lever provided with a shank, a follower secured to the inner end of the shank within the casing and designed to be brought over the projection at the top of the inner case, a pin extending outwardly from the inner door-plate of the lock, and a pawl pivotally connected to the thumb-lever at one end and provided with a recess and tongue at the other end as and for the purpose specified.

6. In a door-lock, the combination with the case and inner case, of the bolt extending through an orifice on the edge plate and provided with a thin inner end extending underneath the shank of the latch gravity-weight, the inner case, the lever pivoted on the inner case and provided with a notched lower end, the pin connecting the lever to the thin inner end of the bolt, the bolt gravity or slide weight provided with an intermediate recess with two notches into one or the other of which the pin on the inner end of the bolt extends, and the bottom recess having arc-shaped sides and an arc-shaped top designed to be engaged by the web of the key to raise the bolt gravity or sliding weight and engage with the notched bottom end of the lever to move the bolt and transfer the pin on the inner end of the bolt from one notch in the intermediate recess to the other, as and for the purpose specified.

7. In a door-lock, the combination with the case and inner case, of the bolt extending through an orifice on the edge plate and provided with a thin inner end extending underneath the shank of the latch gravity-weight,



the inner case, the lever pivoted on the inner case and provided with a notched lower end, the pin connecting the lever to the thin inner end of the bolt, the bolt gravity or slide weight provided with an intermediate recess with two notches into one or the other of which the pin on the inner end of the bolt extends, and means operated by the key for raising the bolt gravity or slide weight as and for the purpose specified.

8. In a door-lock, the combination with the casing of a gravity-weight, a latch-bolt connected therewith so as to be operated by movement of the weight, a knob-spindle, means whereby the rotation of said knob-spindle raises said weight to operate the bolt, and a thumb-lever having means for preventing the

rotation of the knob-spindle, means being also provided whereby said thumb-lever may be operated to open the latch-bolt without releasing the knob.

9. In a door-lock, the combination with the latch and latch gravity-weight suitably connected thereto, and the projection formed at the upper end of the latch gravity-weight, of the thumb-lever, the shank thereof, the thumb-lever follower, and the coacting pawl and pin with which the same is designed to engage all arranged as shown and for the purpose specified.

PERCY VINCENT SIMMONDS.

Witnesses:

B. BOYD,

M. McLAREN.