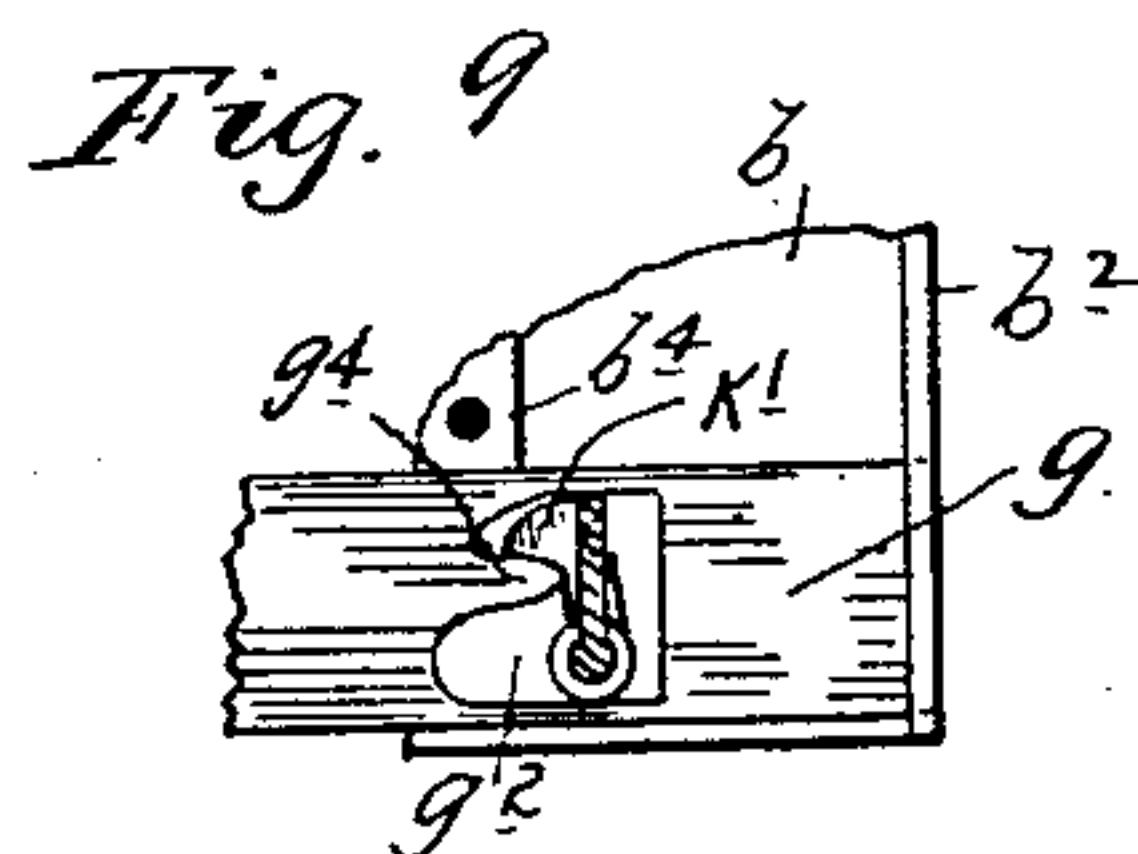
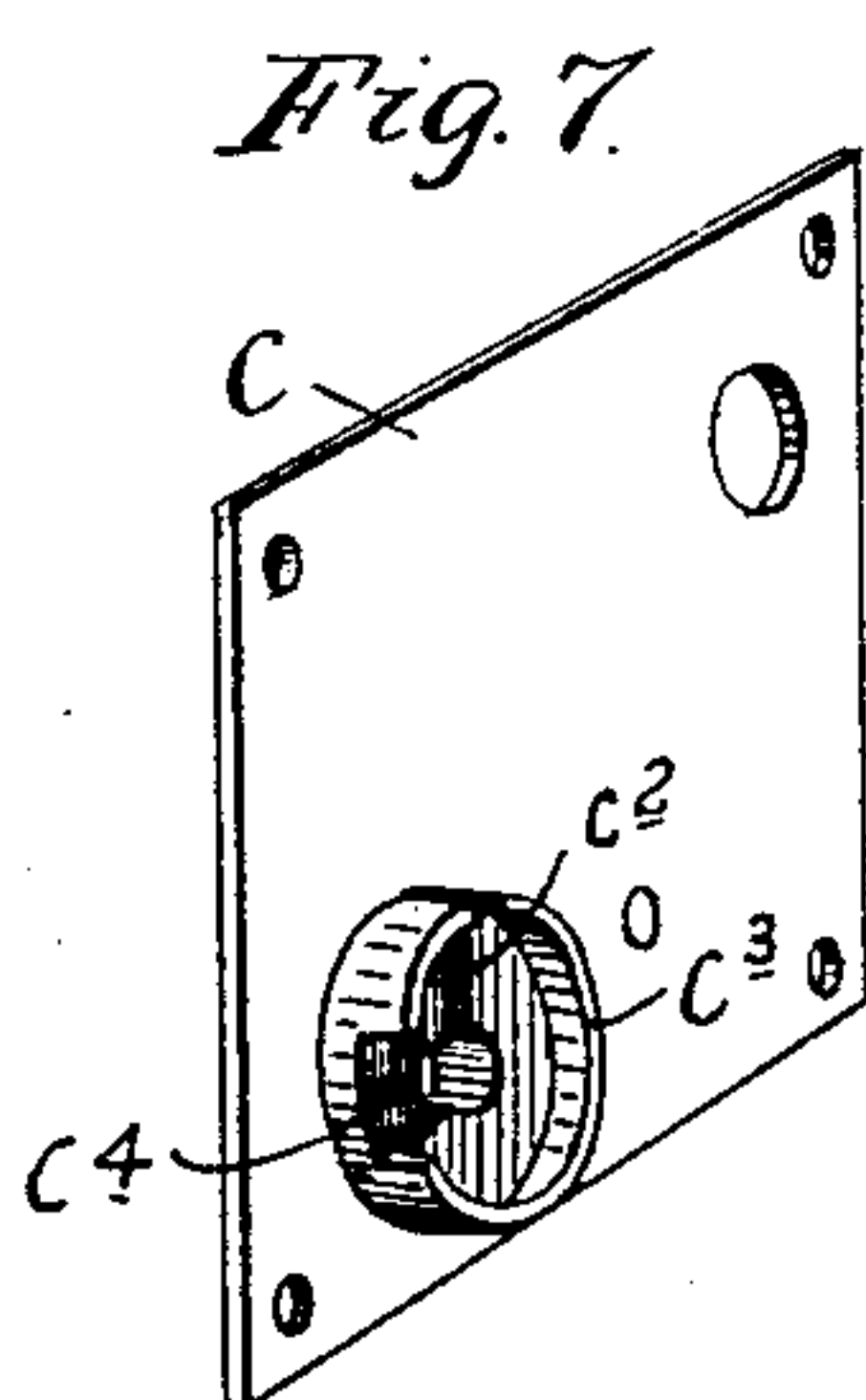
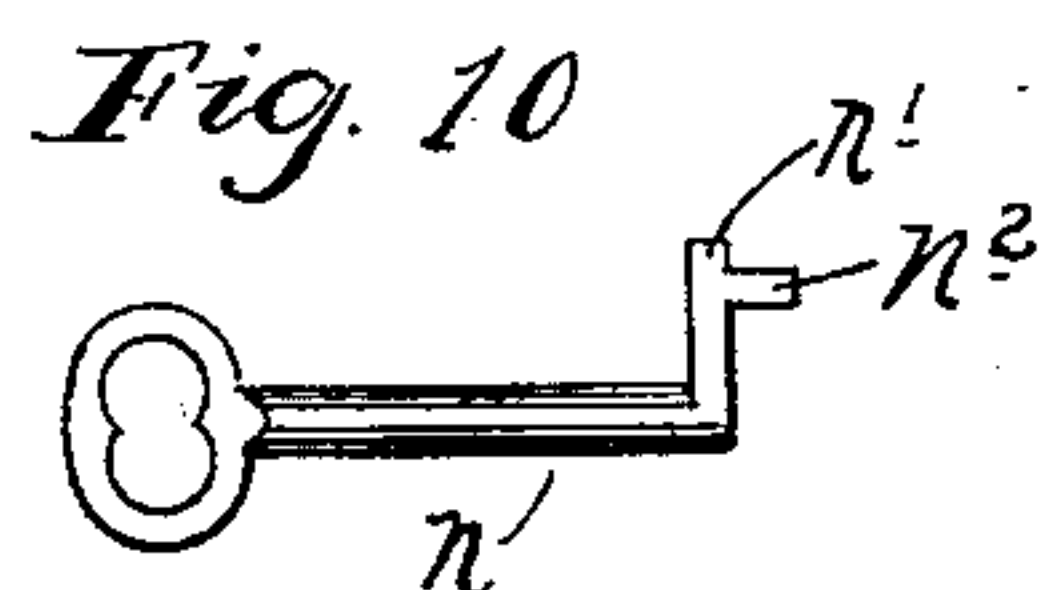
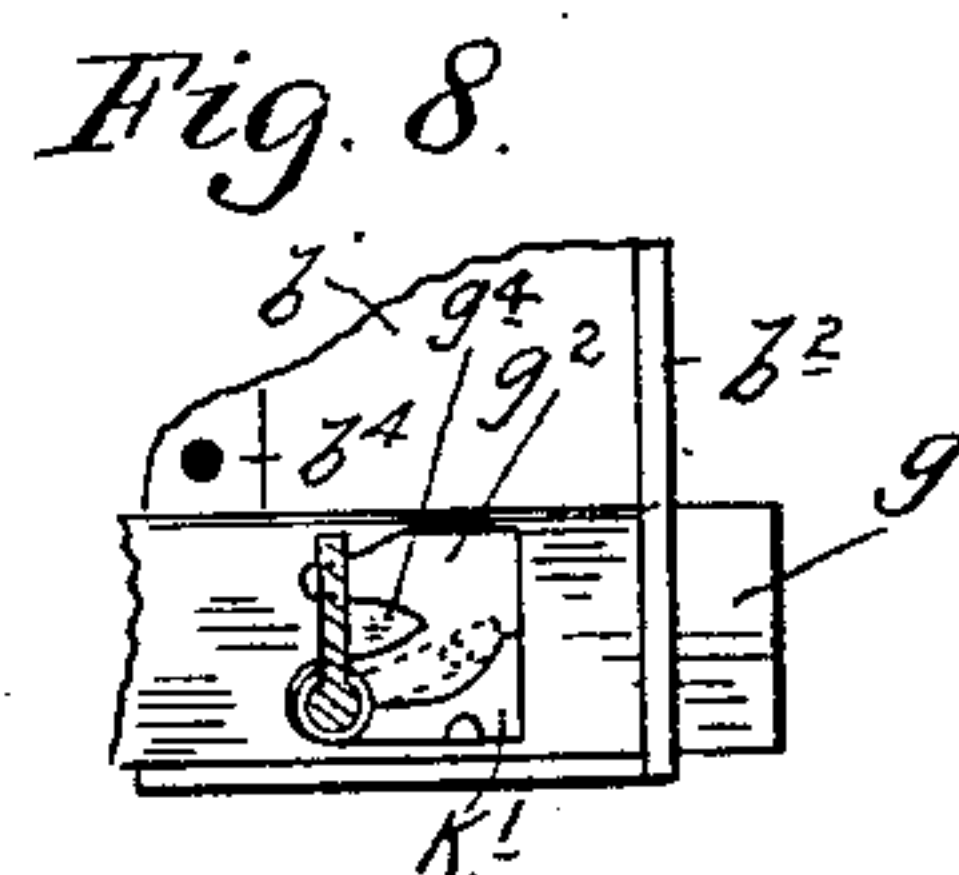
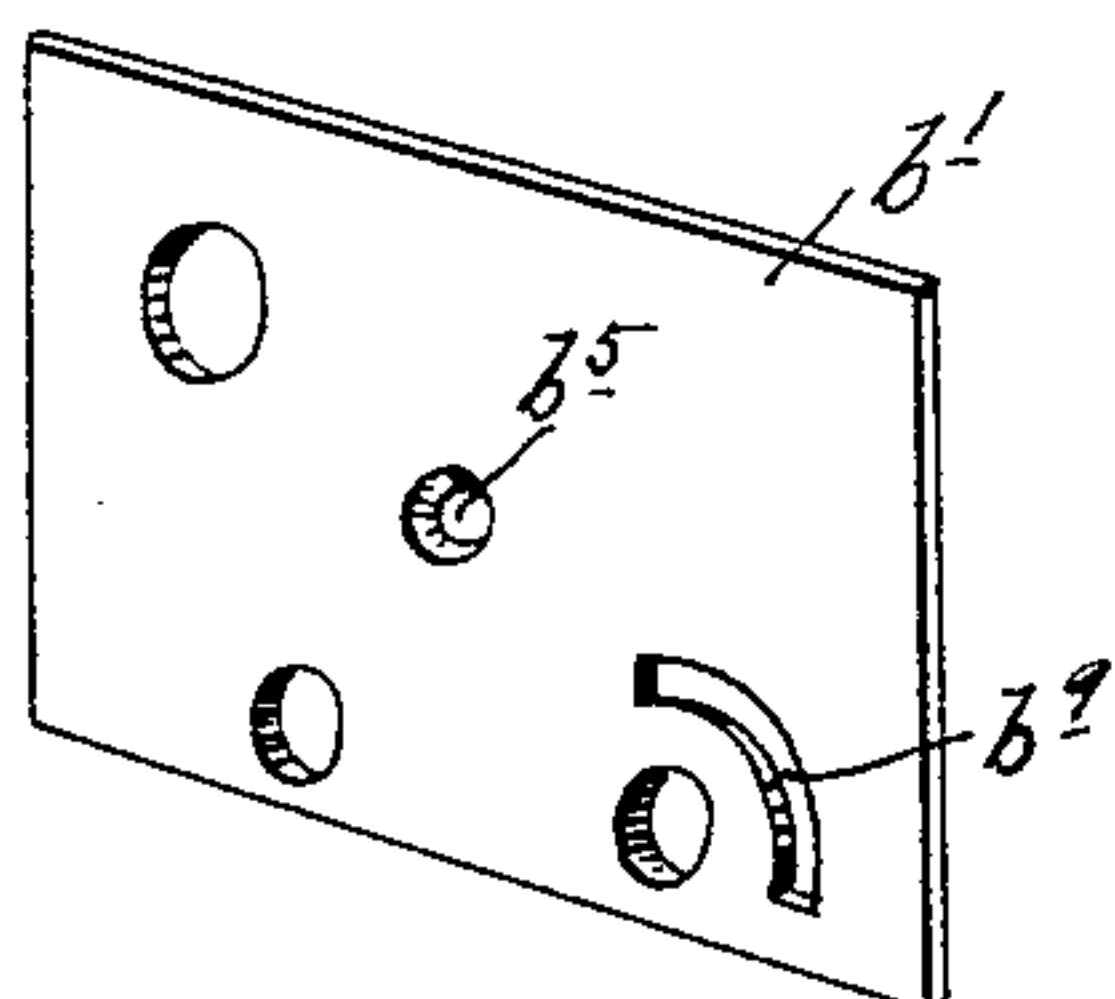
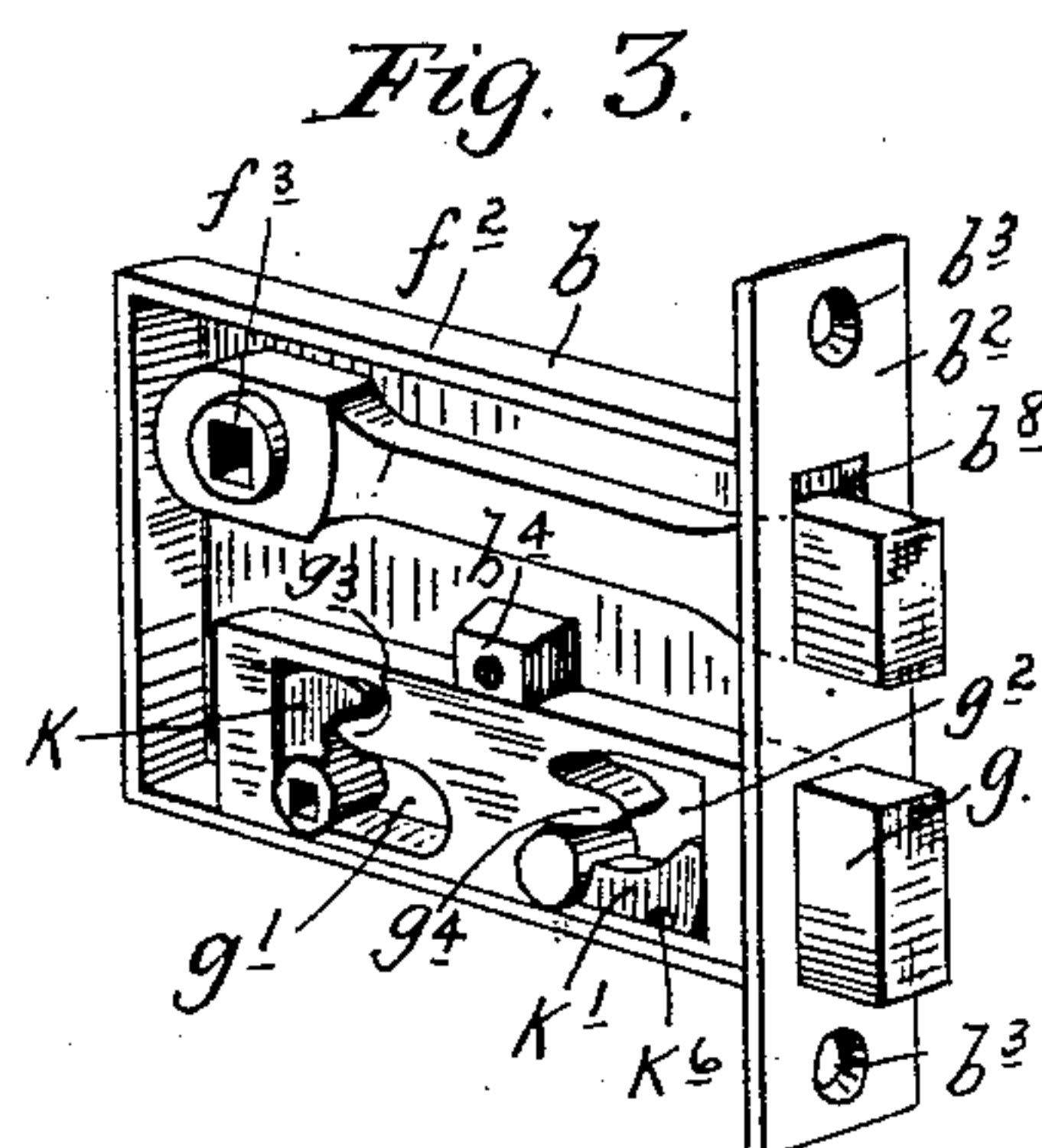
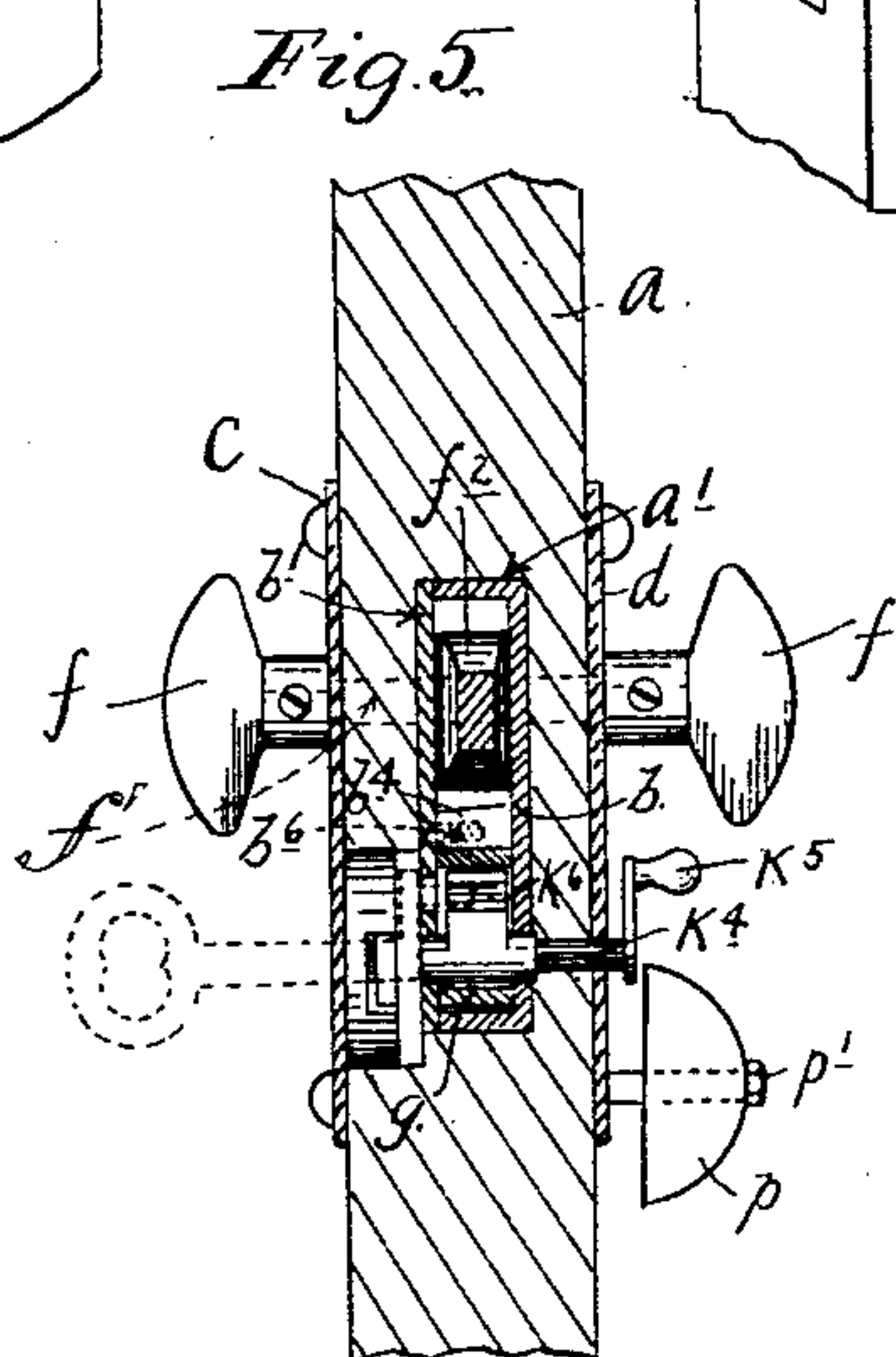
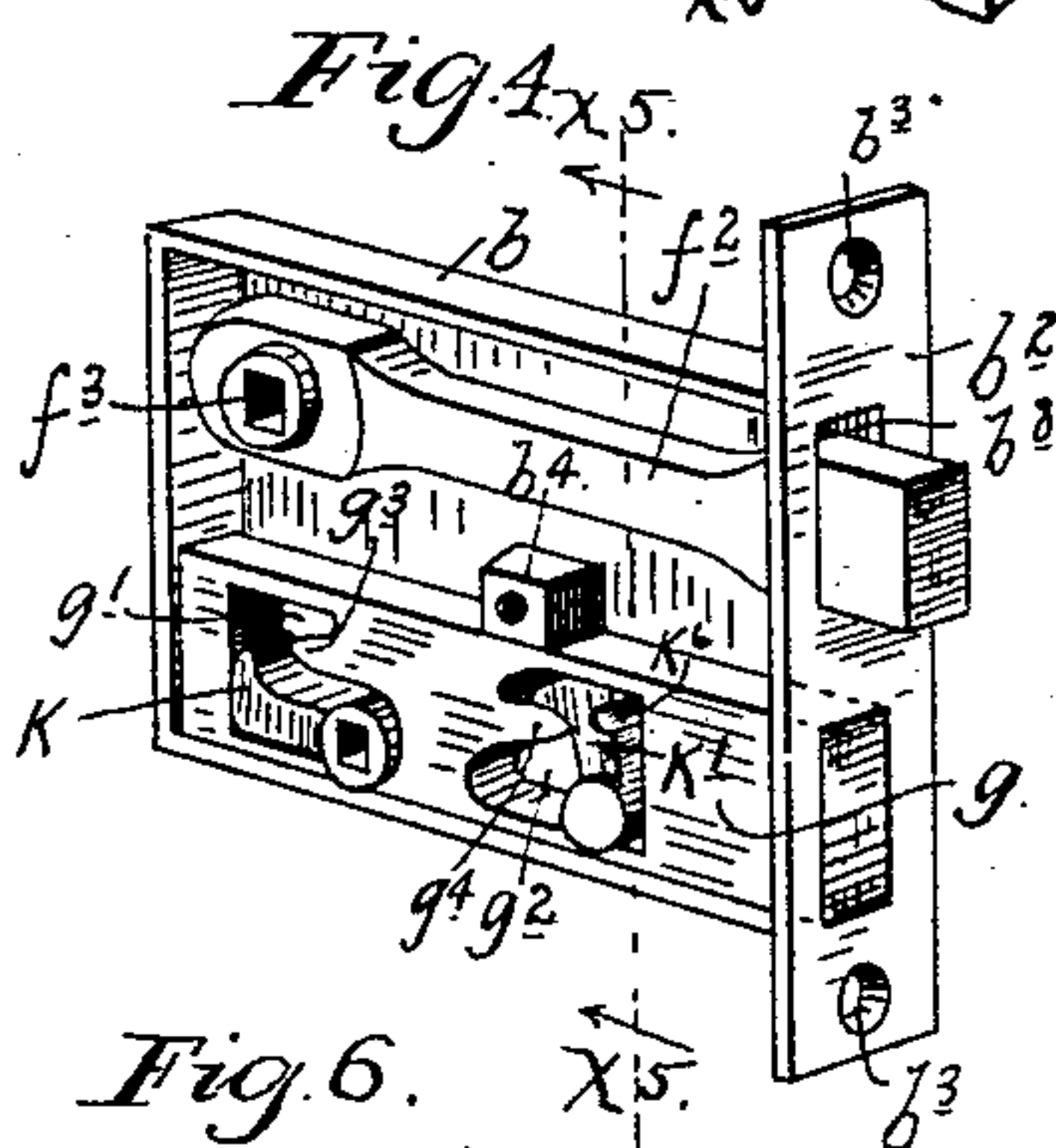
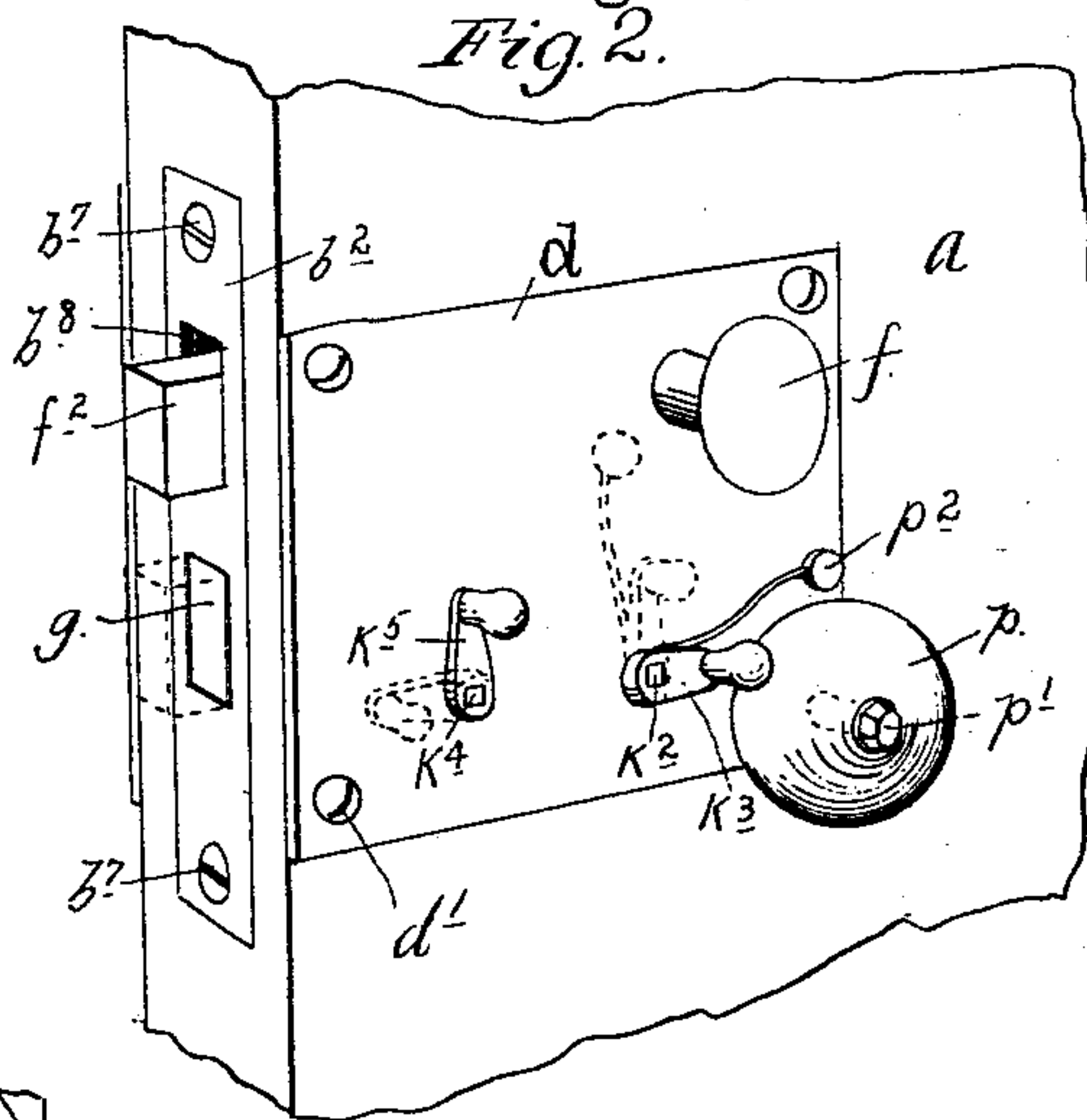
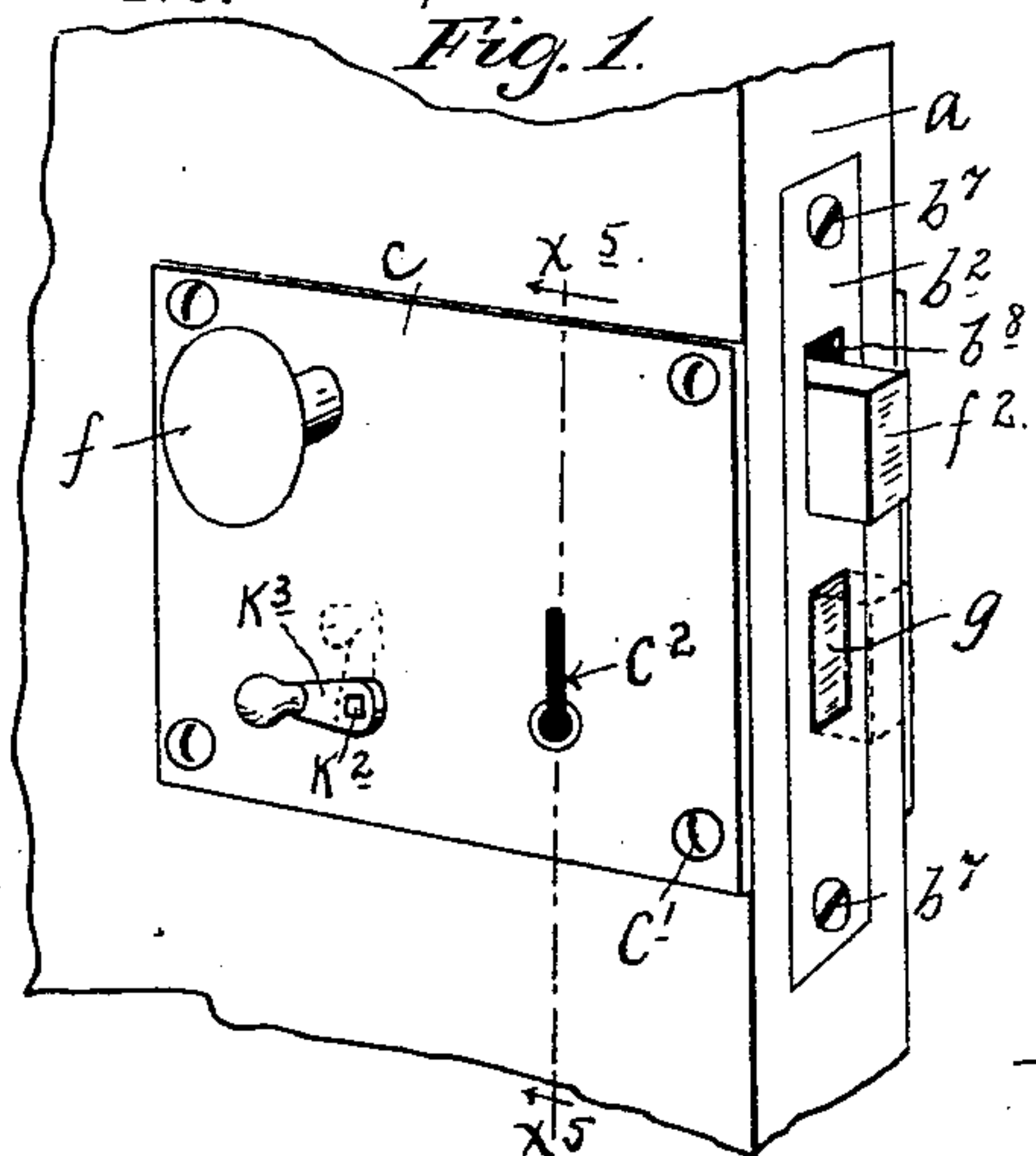


(No Model.)

J. F. RUTLEDGE.  
DOOR LOCK.

No. 587,659.

Patented Aug. 3, 1897.



Witnesses  
C. F. Kilmora  
R. D. Merchant

Inventor:  
James F. Rutledge  
By His Attorney

James F. Williamson



# UNITED STATES PATENT OFFICE.

JAMES F. RUTLEDGE, OF MINNEAPOLIS, MINNESOTA.

## DOOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 587,659, dated August 3, 1897.

Application filed April 10, 1897. Serial No. 631,511. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. RUTLEDGE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Door-Locks; and I do hereby 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.

My invention has for its object to provide an improved lock especially adapted for use on outside doors of dwelling-houses or other buildings; and to this end my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The preferred form of my invention is illustrated in the accompanying drawings, wherein, like characters indicating like parts throughout the several views—

Figures 1 and 2 are perspective views showing my improved lock applied in working position on a door, which may be assumed to be the front door of a building or residence, the said views indicating, respectively, the inside and outside of said door, some parts being broken away. Figs. 3 and 4 are perspective views showing the lock removed from the door and with one side plate of the lock-case removed, which views illustrate, respectively, the locking and unlocking positions of the locking mechanism. Fig. 5 is a transverse vertical section, taken through the lock and door, substantially on the line  $x^5 x^5$  of Figs. 1 and 4. Fig. 6 is a perspective view of the removable side plate of the lock-case. Fig. 7 is a perspective view of the outside member of the escutcheon-plates. Figs. 8 and 9 are detail views with some parts broken away and others removed, illustrating the action of the key on the locking mechanism; and Fig. 10 is a plan view of the lock-key.

$a$  indicates the body of a door, which is recessed in the ordinary manner to receive the lock, as illustrated at  $a'$ .

$b$  indicates the lock-case, which is in the form of a rectangular box provided with a removable side plate  $b'$  and with an end flange  $b^2$ , which is shown as provided in its projecting ends with screw-passages  $b^3$ . The case-section  $b$  is provided with a central interior

lug  $b^4$ , and the removable lock-plate  $b'$  is provided with a screw-passage  $b^5$ , located opposite to said lug  $b^4$ . The side plate  $b'$  is secured to the case-section  $b$  by means of a screw  $b^6$ , passed through said perforation  $b^5$  and screwed into said lug  $b^4$ . When the lock-case is placed in working position in the seat  $a'$  of the door  $a$ , its end flange  $b^2$  is countersunk and will lie flush with the edge of said door. Screws  $b^7$  are then passed through the perforations  $b^3$  and are screwed into the door to hold said case firmly in working position.

$c$  indicates the outside member, and  $d$  the inside member, of a pair of escutcheon-plates which are secured in line with each other on opposite sides of the lock-case by means of screws  $c'$  and  $d'$ , respectively.

The door-knobs  $f$  are connected by a stem  $f'$ , which, as shown, is square in cross-section and works with freedom for rotary movement in suitable seats or passages formed in the door  $a$ , the lock-case sections  $b$  and  $b'$ , and the escutcheon-plates  $c$  and  $d$ . An ordinary pivoted latch  $f^2$  within the lock-case  $b b'$  is provided with a square passage  $f^3$ , extending transversely through its inner end. The knob stem or shaft  $f'$  is passed through the square seat  $f^3$  of the latch  $f^2$ , thus connecting said latch for pivotal movement with the knobs  $f$ . The free end of the latch  $f^2$  works through a slot  $b^8$  in the lock-case flange  $b^2$  and projects from the lock and door for coöperation with a suitable detent (not shown) secured on the door-casing.

The locking plunger or bolt  $g$  is mounted for sliding movement in the lock-case in a suitable guideway formed between the side plates of the case and between the bottom of the same and the central lug  $b^4$ . The outer end of the plunger or bolt  $g$  works through a suitable seat formed in the end flange  $b^2$  of the case-section  $b$  and is adapted for coöperation with a suitable latch or detent plate (not shown,) which would be secured on the door-casing in the ordinary manner. The said locking plunger or bolt  $g$  is moved from its unlocking into its locking position, and vice versa, by means of a pair of tumblers, which are arranged to be operated in reverse order, the one serving to lock said plunger in one extreme position and the other serving to lock the same in its other extreme position.



To receive the pair of tumblers, the locking-plunger  $g$  is provided with a pair of irregular perforations or tumbler-seats  $g'$   $g''$ , which, as shown, are formed with intumed finger portions  $g^3$   $g^4$ , respectively. The tumblers  $k$  and  $k'$  work, respectively, in the seats  $g'$  and  $g''$ . The rear tumbler  $k$  is secured on a short transverse pivot-shaft  $k^2$ , the ends of which extend through the sides of the lock-case, through the body of the door, and through the escutcheon-plates  $c$  and  $d$  and terminate at their extremities in operating-cranks or finger-pieces  $k^3$ , which permit the said tumblers  $k$  to be operated either from the inside or outside of the door. The forward tumbler  $k'$  is secured on a short shaft  $k^4$ , which extends in one direction only from said tumbler—that is, through the back of the case-section  $b$ , through the door  $a$ , and through the inner escutcheon-plate  $d$ . To the projecting end of the shaft  $k^4$  on the inside of the door an operating-crank or finger-piece  $k^5$  is rigidly secured. The exact relation of the tumblers  $k$  and  $k'$  to each other and to the seats  $g'$  and  $g''$  in the locking plunger or bolt  $g$  will be clearly brought out in the description of the operation. The forward tumbler  $k'$  is provided with a seat for the reception of the operating-key. As shown, this seat is in the form of a notch  $k^6$  cut in the forward or under edge of said tumbler  $k'$ .

In Fig. 10,  $n$  indicates a key the operating end of which is turned at a right angle to the stem of the key to form a foot  $n'$ , and this foot  $n'$  is provided near its extremity with a toe or pin  $n^2$ , which is adapted to be engaged with the seat  $k^6$  in the tumbler  $k'$ , as will hereinafter appear.

The key  $n$  is adapted to be inserted into the lock from the outside of the door. To accomplish this, the outer member  $c$  of the escutcheon-plates is provided with a keyhole  $c^2$  in proper position to permit the key to be inserted with its stem end in axial line with the pivotal center of the tumbler  $k'$ . The inner face of the escutcheon-plate  $c$  is provided with a broken annular flange  $c^3$ , which extends substantially on a line of the circle which would be described by the pivotal movement of the free end of the key-foot  $n'$ . This flange  $c^3$  is entirely cut away at the point where it intersects the keyhole  $c^2$ , and is again cut away to form a notch  $c^4$ , which is sufficiently extended to permit some little movement of the key within its limits. The removable side plate  $b'$  of the lock-case is provided with a segmental slot  $b^9$ , which is adapted to pass the toe or finger  $n^2$  of the key  $n$  and permit said key to be moved through a little more than a quarter of a revolution, which movement is sufficient to operate the tumbler  $k'$ .

The distance between the inner end of the annular flange  $c^3$  and the opposing face of the tumbler  $k'$  is such that the toe or pin  $n^2$  of the key  $n$  cannot be turned by said tumbler  $k'$  while the foot portion  $n'$  rides on the

edge of said flange  $c^3$ . To engage said toe or pin  $n^2$  with the seat  $k^6$ , it is necessary first to insert the key through the keyhole  $c^2$  and segmental slot  $b^9$ , as illustrated by dotted lines in Fig. 5 and in section in Fig. 8. Then the key must be turned forward, or toward the right, into the position illustrated by dotted lines in Fig. 8, in which position the foot  $n'$  stands within the limits of the slot  $c^4$  of the flange  $c^3$ . Then the key must be drawn outward or into the slot  $c^4$ , in which position it may be turned farther toward the right by the tumbler  $k'$  and into line with the seat  $k^6$ . Next the key should be forced inward, so that the toe or pin  $n^2$  will engage into the seat  $k^6$ , and, finally, the engagement of said toe or pin  $n^2$  with said seat  $k^6$  having been accomplished, the key should be returned into line with the keyhole  $c^2$ , which latter movement forces the tumbler  $k'$  and locking plunger or bolt  $g$  into their unlocking positions, as illustrated in Fig. 9. The tumbler  $k'$ , in forcing the locking plunger or bolt  $g$  into its normal or unlocking position, (best illustrated in Fig. 4,) engages the finger portion  $g^4$ , and in this normal position the tumbler  $k$  falls to its limit of downward movement and positively holds said locking-plunger in its unlocking position. Hence said locking plunger or bolt can be moved into its locking position only by the movement of the tumbler  $k$  from the position illustrated in Fig. 4 into the position illustrated in Fig. 3. In this movement the tumbler  $k$  engages the finger portion  $g^3$  of the plunger or bolt  $g$ . By means of the operating-cranks  $k^3$  on the opposite ends of the tumbler-shaft  $k^2$  the tumbler  $k$  may be moved from either side of the door, and hence the door may be locked when closed either from within or without.

In the locking position of the plunger or bolt (best illustrated in Fig. 3) the tumbler  $k'$  falls to its extreme lowermost position and positively locks or holds said plunger set in its locking position. Hence the unlocking movement of the plunger or bolt  $g$  can be effected only by the movement of said tumbler  $k'$ . As already indicated, the door may be unlocked from the outside by the use of the key. From the inside of the door, however, the tumbler  $k'$  may be moved and the door unlocked by means of the crank or finger-piece  $k^5$ . In other words, a person standing within the house or building may with the greatest ease either lock or unlock the door by manipulating the crank  $k^5$  and the inner member of the cranks  $k^3$ , while a person standing outside the door may, by the use of the outer member of the cranks  $k^3$ , readily lock the door, but must possess a key in order to unlock the door. To unlock the door by the use of the key, the operator must have a key that will fit the lock, and, furthermore, a person possessing a key and not knowing the proper combinations of turns and endwise movements of the key necessary to effect the unlocking movements of the tumbler  $k'$  and



locking-plunger  $g$  will find great difficulty in unlocking the door. This makes the lock doubly secure.

I also preferably add another very important feature to my improved lock above described, which is in the nature of a bell or gong which will be sounded whenever the locking plunger or bolt is moved from its locking into its unlocking position. In the construction shown  $p$  indicates a small bell or gong which is secured on a stud  $p'$ , the base end of which is secured to the inner member  $d$  of the escutcheon-plates. This bell or gong is sounded by means of a hammer  $p^2$ , the stem of which is secured to the inner member of the cranks  $k^3$ . When the locking bolt or plunger  $g$  is in its locking position, said crank  $k^3$  and hammer  $p^2$  will stand in the positions illustrated by dotted lines in Fig. 2, and when the said plunger or bolt  $g$  is moved into its unlocking position said crank and hammer will fall into the positions indicated by full lines in Fig. 2, under the action of which movement the ball-like end of the hammer  $p^2$  will strike and sound the bell or gong  $p$ , thus giving a signal that the door is being unlocked. This gong therefore serves as an efficient burglar-alarm.

From the foregoing it is thought to be obvious that I have provided an extremely simple and efficient lock. It will be understood, of course, that various alterations in the specific details of construction above set forth may be made without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a lock, the combination with a locking plunger or bolt, of a pair of operating-tumblers, arranged for similar actions in reverse order, each serving in turn to move said locking-plunger into one of its extreme positions, and the other to lock the same where so set, substantially as described.

2. In a lock, the combination with a locking plunger or bolt, of a pair of tumblers op-

erating one to move said plunger or bolt into its locking position, and the other to move the same into its unlocking position, a pair of finger-pieces, one on each side of said lock, for operating the former of said tumblers, a single finger-piece on the inner side of said lock, for operating the latter of said tumblers, which latter of said tumblers may be operated from the outer side of the lock only by means of a key, substantially as described.

3. In a lock, the combination with the plunger or bolt  $g$  provided with the tumbler-seats  $g'$  and  $g^2$  and fingers  $g^3$   $g^4$ , of the tumbler  $k$  working in the seat  $g'$  and provided with the pair of operating-cranks  $k^3$ , the tumbler  $k'$  working in said seat  $g^2$  and provided with the single operating-crank  $k^5$ , and a key for operating said tumbler  $k'$  from the outer side of the lock, said parts operating substantially as described.

4. In a lock, the combination with the locking plunger or bolt  $g$  provided with the tumbler-seat  $g^2$ , of the tumbler  $k'$  working in said seat  $g^2$ , provided with the seat  $k^6$  and operated by a finger-piece projecting from the inner side of the lock, and the keyway involving the keyhole  $c^2$ , the flange  $c^3$  and notched portion  $c^4$ , substantially as described.

5. In a lock, the combination with a locking plunger or bolt, of a pair of operating-plungers, arranged for similar actions in reverse order, each serving, in turn, to move said locking-plunger into one of its extreme positions and the other to lock the same where set, a gong or bell secured to the lock-case or parts securable therewith, and a gong-sounding hammer mounted for movement with one of said tumblers to indicate when the unlocking movement of said locking-plunger takes place, substantially as described.

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

JAMES F. RUTLEDGE.

Witnesses:

LILLIAN C. ELMORE,  
F. D. MERCHANT.