

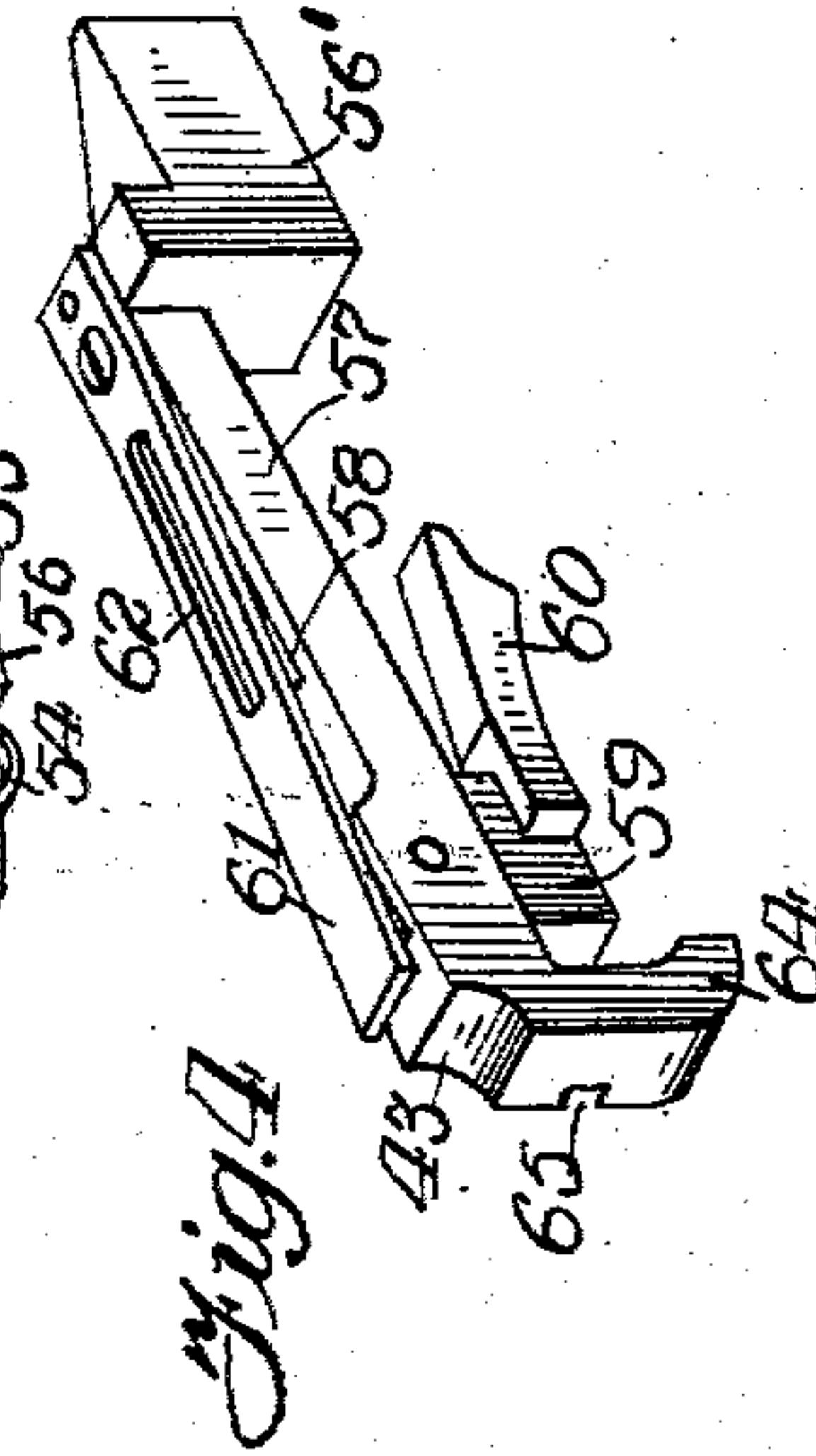
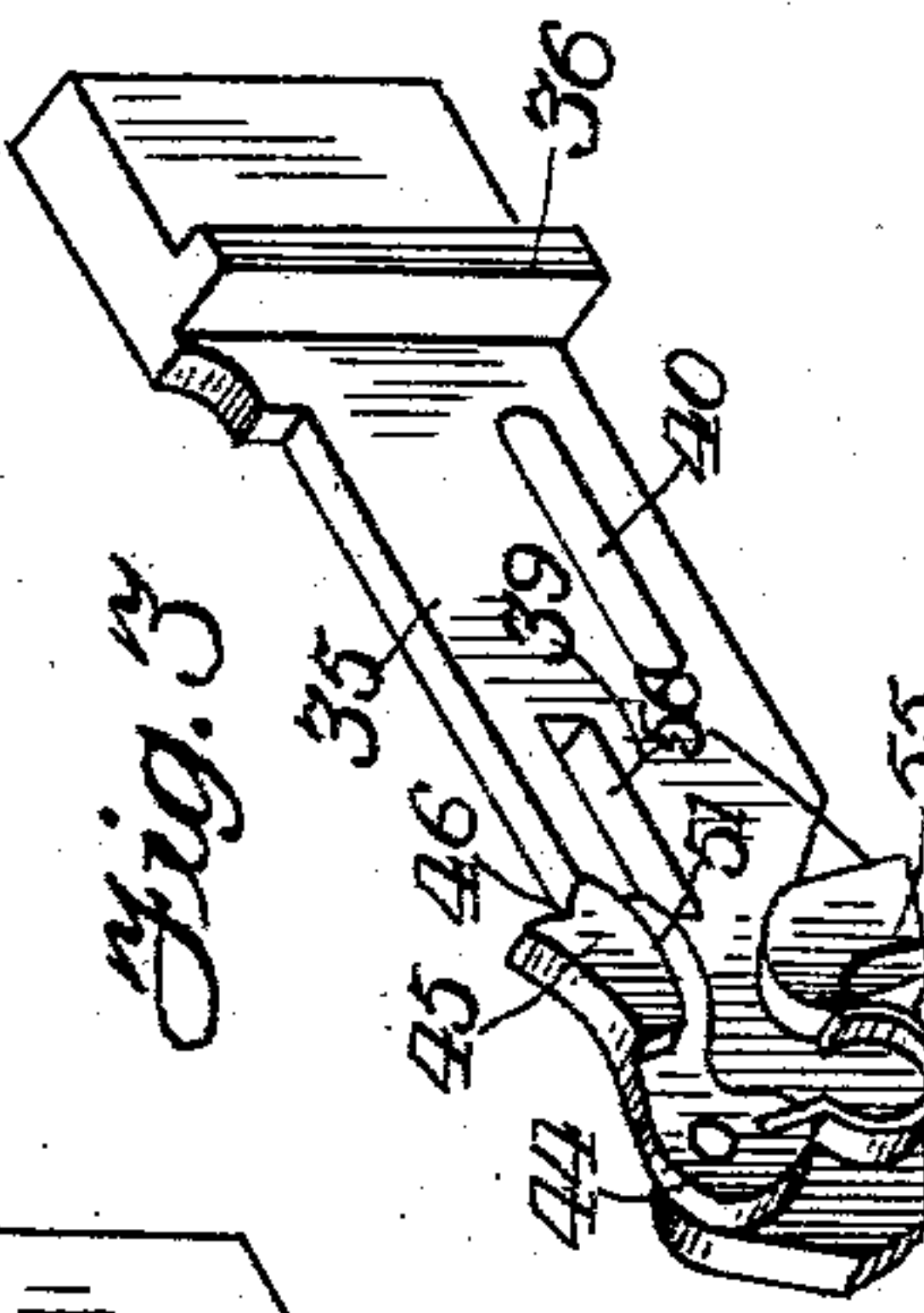
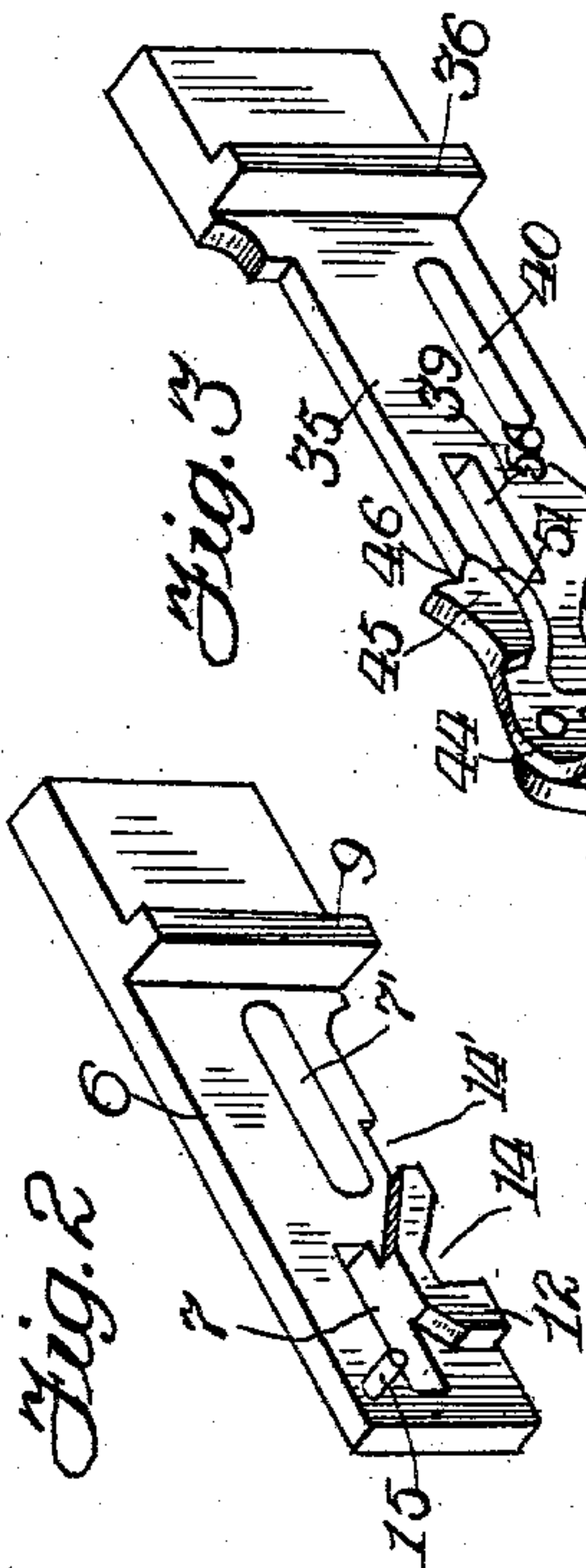
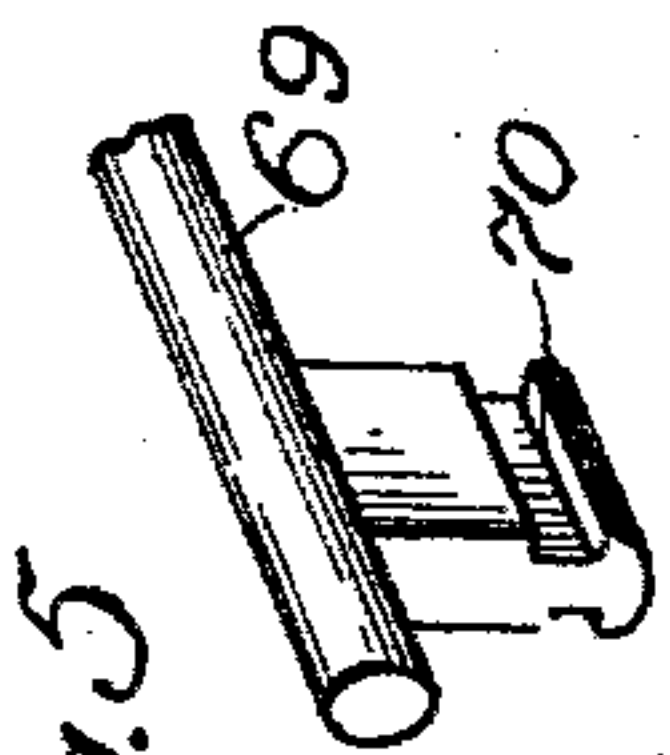
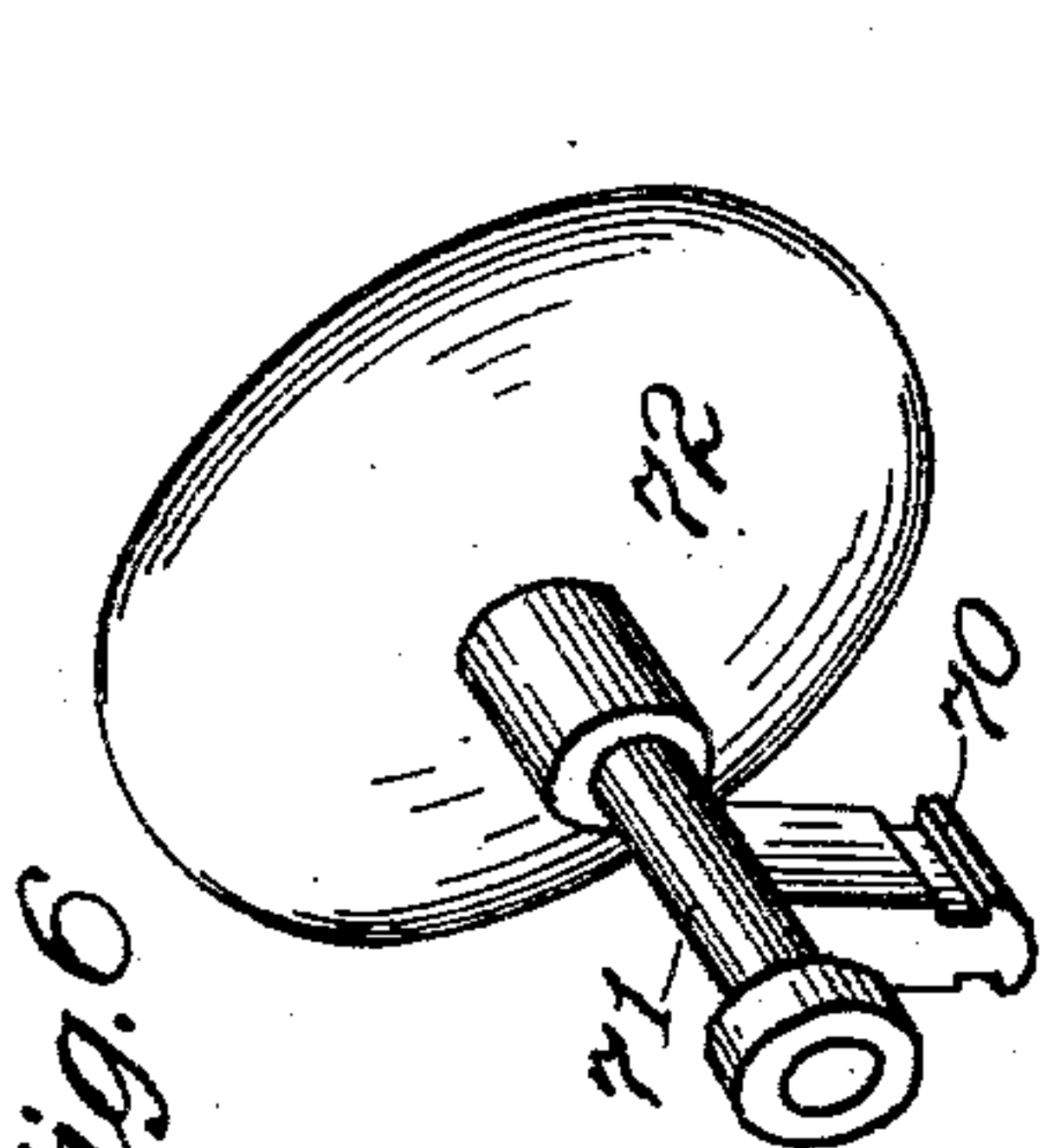
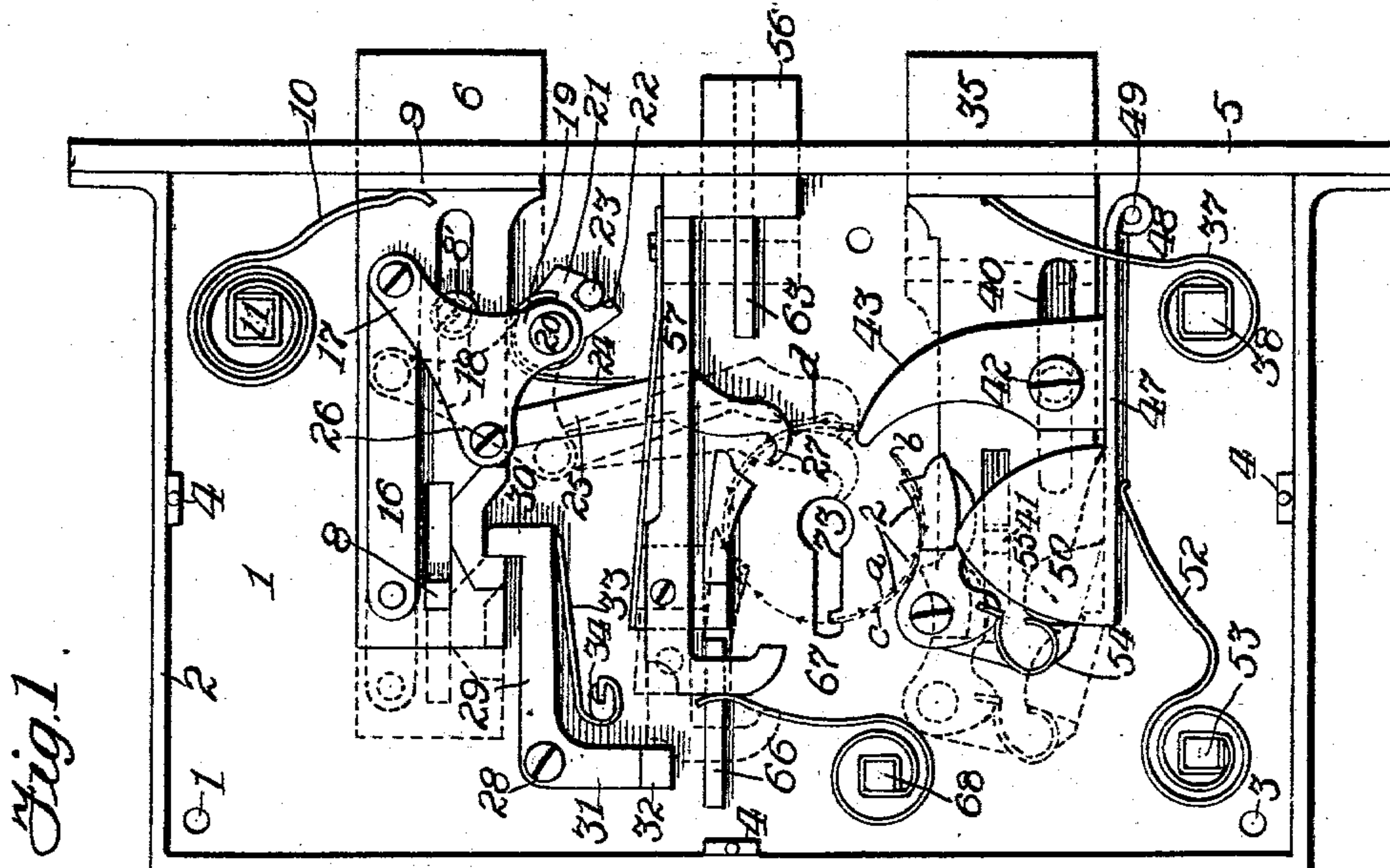
No. 752,009.

PATENTED FEB. 9, 1904.

P. STEIN.
LOCK.

APPLICATION FILED SEPT. 29, 1903.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

PAUL STEIN, OF HOMESTEAD, PENNSYLVANIA.

LOCK.

SPECIFICATION forming part of Letters Patent No. 752,009, dated February 9, 1904.

Application filed September 29, 1903. Serial No. 175,047. (No model.)

To all whom it may concern:

Be it known that I, PAUL STEIN, a subject of the Emperor of Austria-Hungary, residing at Homestead, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in locks, and relates more particularly to that type of locks which employ lock-bolts that require the key-ward actuating the same to be turned in a particular manner to unlock the bolt-lock.

15 Briefly described, the present invention comprises a plurality of lock-bolts and a latch-bolt which may be operated to retract the same either by a key or by a key-ward mounted on the knob-shank, but which lock-bolts and latch-bolt are only operative by the turning of the key-ward or knob-shank in a certain manner, whereby to successively retract said lock-bolts and latch-bolt.

25 In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

30 Figure 1 is a plan view of a lock constructed in accordance with my invention, one plate of the casing being removed to show the various parts in their position, the said parts being shown in full lines in the locked position and in dotted lines in the unlocked or retracted position. Fig. 2 is a detached detail perspective view of one of the lock-bolts. Fig. 3 is a similar view of the other of the lock-bolts. Fig. 4 is a like view of the latch-bolt. Fig. 5 is a like view of a part of the key, and Fig. 6 is a like view showing the ward formed on the shank of the door-knob.

45 My improved lock resembles the principle of the combination-lock in that it requires specific knowledge by the operator of the particular manner in which the key must be manipulated in order to retract or unlock the lock-bolts and latch-bolt. By this means I am enabled to construct a lock of the ordinary

lock-bolt type generally employed in connection with doors, which may not be "picked" or opened by unauthorized persons.

To put the invention into practice, I provide a casing of the usual type employed embodying a side plate 1, which carries the rim or flange 2, on which the opposite side plate (not shown) rests and against which it is held by screws (not shown) passed through apertures 3 in the plate 1. As is generally the case, the flange or rim 2 is provided with pins 4 for engagement into the side plate, which is not shown. The flange or rim 2 has its ends flanged or bent outwardly at right angles and secured to the inner face of the escutcheon-plate 5, which is provided with openings to receive the lock-bolts and the latch-bolt. I may employ a single lock-bolt in connection with a single latch-bolt or a plurality of lock-bolts in connection with a latch-bolt, and in the present illustration I have shown two lock-bolts and a latch-bolt. The lock-bolt 6 is provided with slots 7 7', that receive guide-pins 8 8', carried by the plate 1, the bolt being limited in its movement into locking position by these pins, as well as by a rib or flange 9, carried by the bolt to engage with the inner face of the escutcheon-plate. This rib or flange also serves as the part of the bolt to be engaged by the spring 10, which forces the bolt into locked position when the means is released which holds same in the unlocked position. This spring has one end bearing against said rib or flange and is wound or coiled around a stud or pin 11, with its other end held rigid on said pin or stud. This bolt 6 carries on its upper face along one side and adjacent its inner end a boss 12, provided with a notch 14, the notch being cut into the edge of the bolt as well as into the edge of the boss, and the specific purpose of which notch will more presently appear.

The bolt 6 carries near its inner end a pin 15, to which is pivotally connected one end of a link 16, the other end of which link is pivotally attached to the arm 17 of the substantially triangular lever 18, which has its arm 19 pivotally mounted on a pin or stud 20, carried by the plate 1. This pin or stud 20 has pivotally mounted thereon underneath the arm 19

of the triangular lever 18 a bushing 21, provided with a notch 22 to receive a pin 23, carried by the plate 1. This bushing has attached thereto one end of a spring 24 that
 5 bears against the throwing-lever 25, said lever having its one end pivotally attached to the arm 26 of the triangular lever 18. The outer end 27 of this lever is substantially hook-shaped, as shown, to be engaged with the
 10 ward, as will be more fully explained. The lock-bolt 6 is held in the unlocked or retracted position by means of a locking-lever pivotally attached, as at 28, to the plate 1 and having its longer leg 29 provided at its free end with a
 15 right-angular lug 30, which is adapted to engage in the notch 14 of the boss 12 when the latch-bolt 6 is in the locked position and when the said bolt is in the retracted position is adapted to engage the forward end of the boss
 20 12, a notch 14' being provided in the edge of the lock-bolt 6 to permit this engagement of the lug 30 with the end of the boss 12. The shorter leg 31 of the locking-lever is provided with a right-angular extending lug 32, extending outwardly toward the opposite side
 25 plate and which is adapted to be engaged by the heel of the latch-bolt when the latter is operated, whereby to disengage the locking-lever from the lock-bolt and permit the latter
 30 to assume its locked position. A spring 33 bears against the back of the locking-lever for the purpose of holding said lever in the notch 14 when the lock-bolt 6 is in the locked position and in the notch 14' when the lock-bolt 6
 35 is in the unlocked position, the one end of this spring being rigidly secured to a stud or pin 34, secured to the plate 1.

A lock-bolt 35 is provided with a rib or flange 36 of the same form as the rib or flange
 40 9 of the lock-bolt 6. A spring 37 engages this rib or flange and has its one end affixed to the boss or stud 38. The lock-bolt 35 is provided with longitudinal slots 39 40, the former of which receives the guide-pin 41, carried by the plate 1, and the slot 40 receiving a screw or pin 42, on which is pivotally
 45 mounted a finger 43. A dog 44 is pivoted on the lock-bolt 35 near its inner end and is provided near its free end on the upper face with a boss 45 and has a shoulder or notch 46 formed on the free end of said boss or dog. The lock-
 50 plate 47 is arranged at one side edge of the lock-bolt 35 and formed with an eye 48, which receives the pin 49, carried by the plate 1. This lock-plate 47 carries a right-angular extending plate 50, which is adapted to engage with the lower edge 51 of boss 45, as seen in
 55 Fig. 1 of the drawings. The lock-plate 47 is engaged by a spring 52, having its inner end coiled around and secured to stud or pin 53, carried by the plate 1. A spring 54 is secured to the dog 44 and bears against, or may be secured thereto, a lug 55, carried on the upper
 60 face of the lock-bolt 35 near its inner end, against the shoulder 56 of which lug the lower

end of the plate 47 is adapted to engage when the lock-bolt 35 is in the unlocked or retracted position.

The latch-bolt comprises a latch-head 56', to which is secured in any desirable manner the
 70 shank 57. This shank is provided with a slot 58, through which extends the throwing-lever 25 for actuating the lock-bolt 6. Pivotaly mounted in the shank 57 is a block 59, which carries a ward or tumbler 60, adapted to be
 75 engaged by the ward on the key-shank or on the shank of the door-knob, as the case may be. The block 59 extends through the shank 57 and is engaged by the spring 61, securely fastened at its other end to the shank of the
 80 latch-head and provided with a slot 62, registering with the slot 58, whereby to receive the throwing-lever 25. The latch-head 56' is provided with a channel or groove to receive the rib or guide 63, mounted on the plate 1,
 85 and at its inner end the shank 57 is provided with a right-angular portion 64, also provided with a groove 65 to receive the guide-rib 66, mounted on said plate 1. The right-angular portion 64 of the shank 57 is engaged by the
 90 spring 67, having its one end secured to a stud or pin 68 in the plate 1.

In Fig. 5 I show a key-shank 69, provided with a bit 70 for actuating the lock-bolts and latch-bolt, and in Fig. 6 I show this bit 70
 95 provided on the shank 71 of the door-knob 72, this latter construction practically making a combination-lock.

To clearly describe the operation, we will assume that the latch and lock bolts are in the
 100 locked position, as shown by full lines in Fig. 1, and it is desired to unlock the same. The key-bit 70 (assuming that the lock is to be operated by a key) is inserted through the key-hole 73, and the key is turned in the direc-
 105 tion of arrows 2, until the bit reaches point b. The reverse movement is then imparted to the key, so as to move the bit in the direction of arrows c, and in this reverse or return
 110 movement the bit 70 engages with the notched or shouldered end 46 of the pivoted dog 44 and carries said dog and the lock-bolt 35 inward to the retracted or unlocked position, (shown in dotted lines in Fig. 1,) and as the lug 55
 115 passes end of lock-plate 47 the latter is forced inwardly by spring 52, whereby to hold the said lock-bolt in the retracted or unlocked position. It will be observed that the bit 70 of the key in its movement in the direction
 120 indicated by arrows a pressed dog 44 out of the way, the shoulder 51 of said dog pressing against plate 50 to depress the lock-plate 47. The lock-bolt 35 is now in the unlocked position, and the movement of the ward in direction of arrows c is continued, the ward engaging
 125 dog or pawl 60, which, being pivoted, moves to allow the bit to pass the same and permits the said bit to be engaged with the hook end 27 of the throwing-lever 25. Continued turning of the key in this direction carries the
 130

throwing-lever 25 therewith, moving the same over to the position shown in dotted lines, and this movement of the lever 25 actuates the lock-bolt 6 through the medium of the rock-lever 18 and link 16, moving said lock-bolt to the retracted or unlocked position. (Shown in dotted lines in Fig. 1.) When the lock-bolt assumes the retracted or unlocked position, spring 33 forces lug 30 into engagement with notch 14', so it will be engaged with the forward end of boss 12, and thus hold said lock-bolt in the retracted or unlocked position. Now the movement of the key-bit is again reversed or moved back in the direction of the arrows *d*, and in this return movement it engages with the end of pawl or dog 60 and carries the latch-bolt backward therewith, and as soon as this latch-bolt head is within the escutcheon-plate the door may then be opened. The relieving of the pressure on the key as soon as the latch-head is moved back far enough to permit the opening of the door allows the latch-bolt to return to the position shown in full lines, which is its normal position. If, however, the movement of the key-bit in the direction of arrows *d* is continued until the notched heel 43 of the shank 57 engages with lug 32, the locking-lever for lock-bolt 6 will be rocked on its pivot 28 and lug 30 will be withdrawn from engagement in notch 14, and the spring 10 will return the lock-bolt 6 to its locked position. The continued turning of the bit in the direction of arrows *a* brings said bit into engagement with the finger or dog 43, and as said dog or finger is moved on its pivot by the engagement of the bit with the dog or finger the latter depresses lock-plate 47, so as to move it out of engagement with lug 55, and spring 47 then forces the lock-bolt 35 into its locked position again. Reverse movement or movement in direction of arrows *c* is now imparted to the key-bit to bring it into position to remove through the keyhole the finger or dog 43, moving on its pivot 42 to allow the key-bit to pass and merely depressing lock-plate 47 without retracting lock-bolt 35.

It will thus be seen that the same security is obtained with a lock of the lock-bolt principle as is obtained with a combination-lock having tumblers, and while I have herein shown and described a practical embodiment of my invention as it is practiced by me, yet it will be apparent that various changes may be made in the details of construction without departing from the general spirit of my invention.

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

1. In a lock of the type described, the combination with a casing, of a lock-bolt, a spring

engaging said lock-bolt for normally holding same in the locked position, a throwing-lever pivotally connected to the lock-bolt for moving the same to the unlocked position, spring-pressed means for holding said bolt in the unlocked position, a latch-bolt having a slot in its shank to receive the throwing-lever of the lock-bolt, a pivoted dog or pawl carried by the shank of said latch-bolt to be engaged by the key-bit for retracting said latch-bolt, and a spring for normally holding said latch-bolt in the locked position.

2. In a lock of the type described, the combination with a casing, of a slidably-mounted lock-bolt, a slidably-mounted latch-bolt, a throwing-lever pivoted to the lock-bolt and a pawl or dog pivoted to the latch-bolt, means for holding the lock-bolt in the unlocked position, said latch-bolt acting as a releasing means for said holding means, substantially as described.

3. In a lock of the type described, two slidably-mounted lock-bolts, in combination with a slidably-mounted latch-bolt, and means carried by the latch-bolt and lock-bolts whereby they may be operated from the same point by reverse movements of the key-bit.

4. In a lock of the type described, two slidably-mounted lock-bolts, and separate means for holding each lock-bolt in the retracted or unlocked position, in combination with a slidably-mounted latch-bolt adapted when moved to the unlocked position to release the holding means for one of the lock-bolts, and means carried by the lock-bolts and latch-bolt whereby they may be operated by the same key at a common point through reverse movements of the key-bit.

5. In a lock of the type described, a slidably-mounted lock-bolt, and means for holding said bolt in the retracted or unlocked position, in combination with a slidably-mounted latch-bolt, and means carried by said lock-bolt and separate means on the latch-bolt whereby they may be operated by the same key at a common point by reverse movements of the key-bit.

6. In a lock of the type described, a slidably-mounted lock-bolt, and means for holding said bolt in the retracted or unlocked position, in combination with a slidably-mounted latch-bolt adapted when actuated by the key to release the holding, means for the lock-bolt upon reversal of the movement of the key, substantially as described.

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

PAUL STEIN.

Witnesses:

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E. E. POTTER.