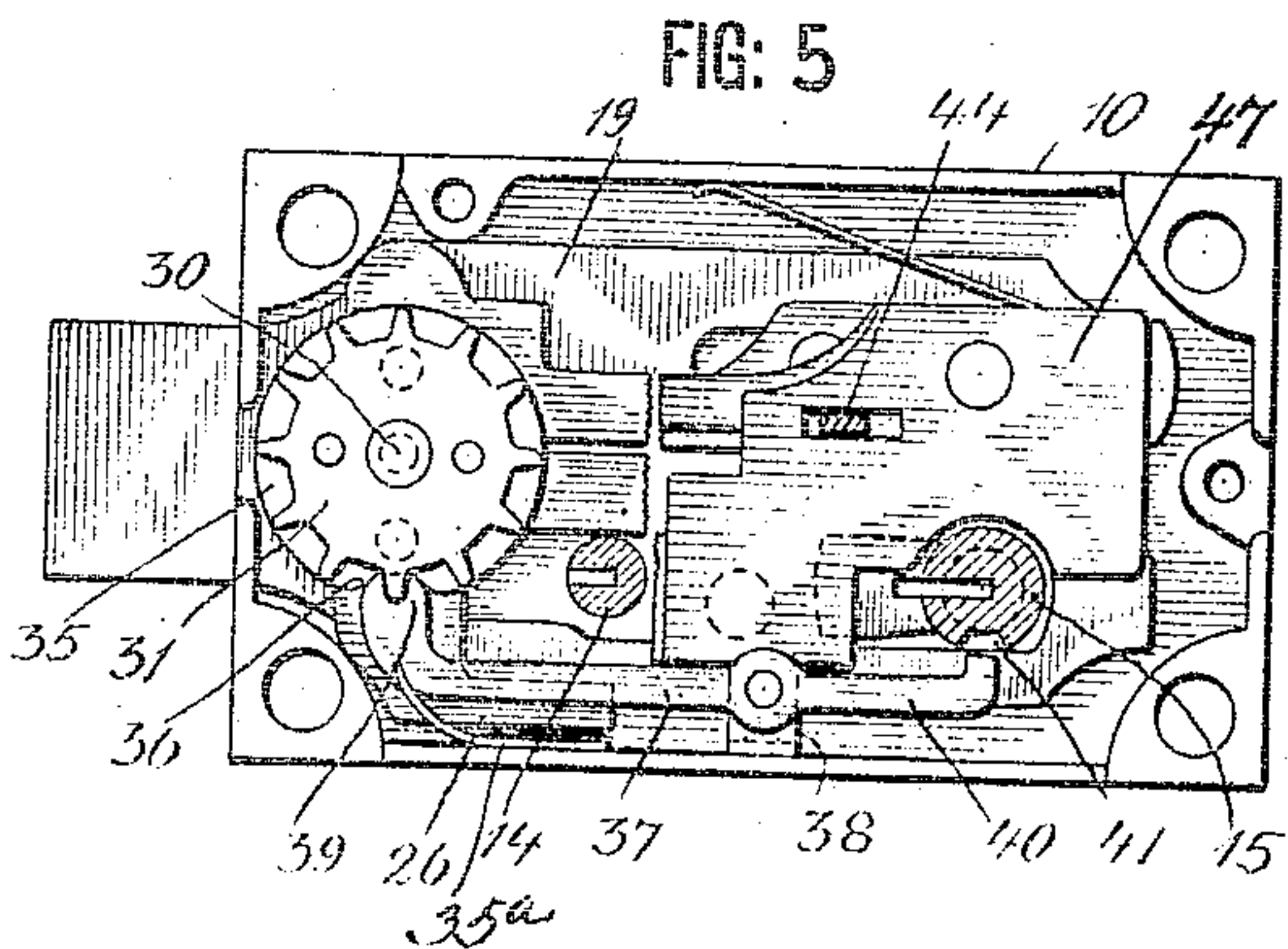
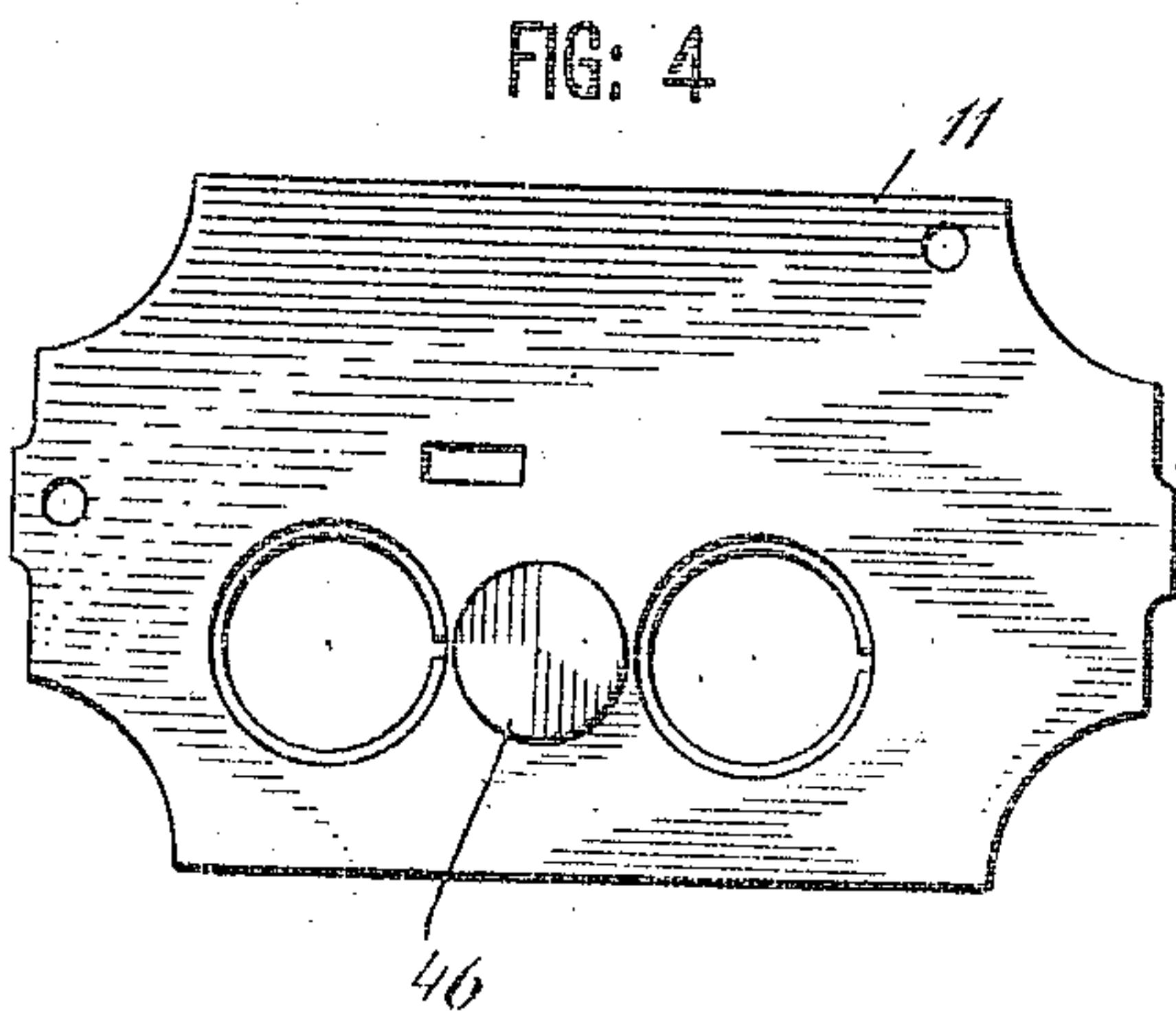
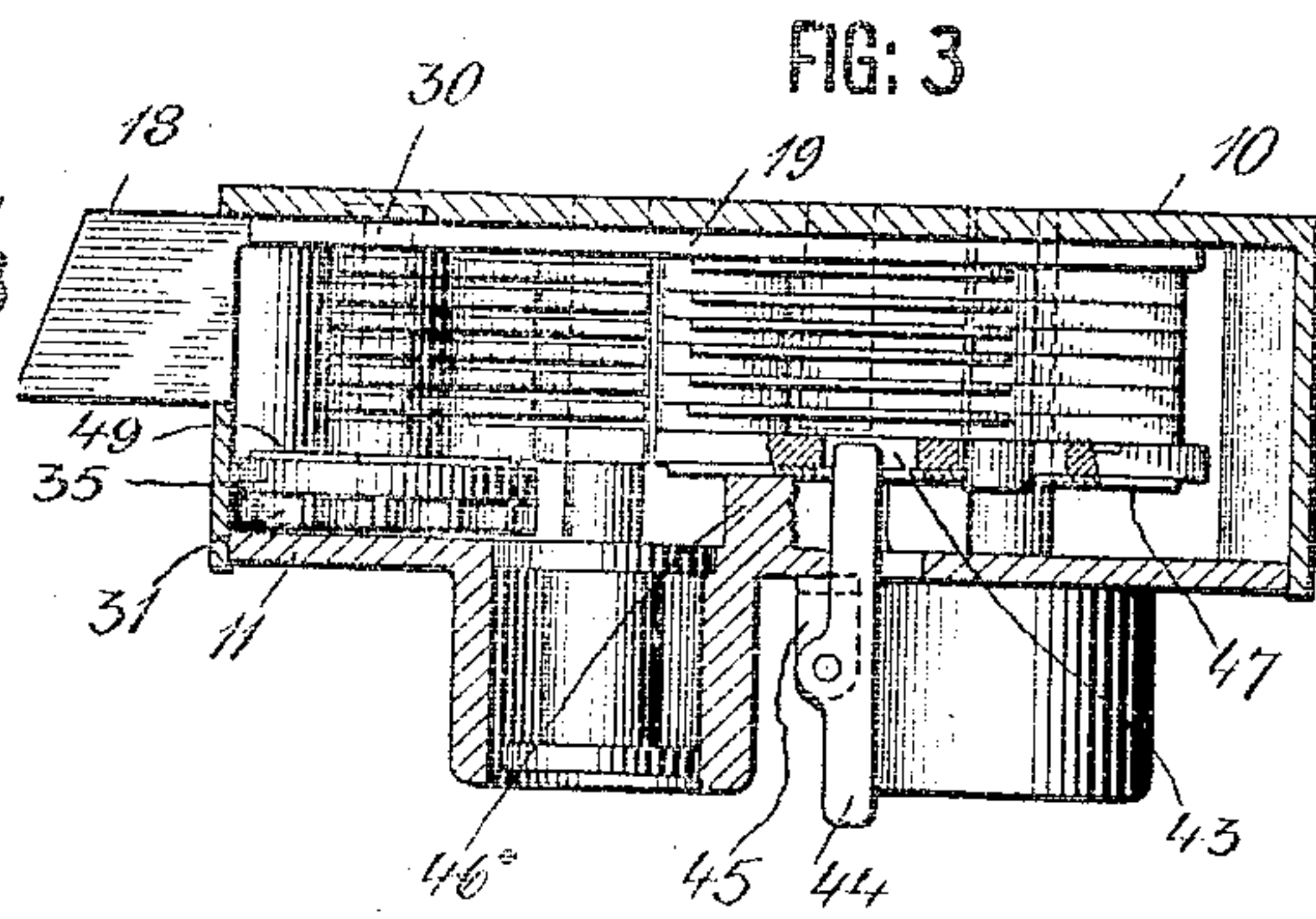
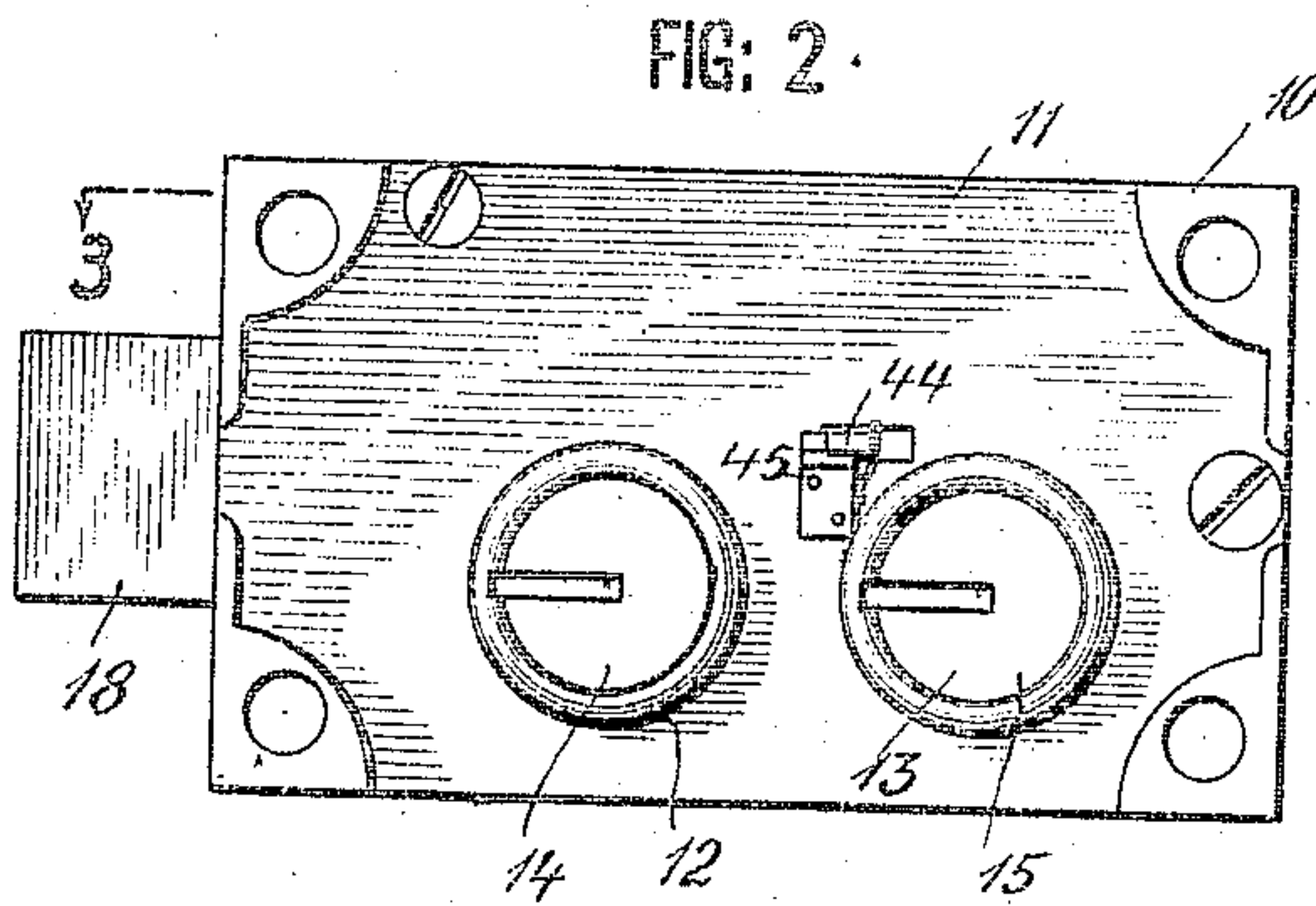
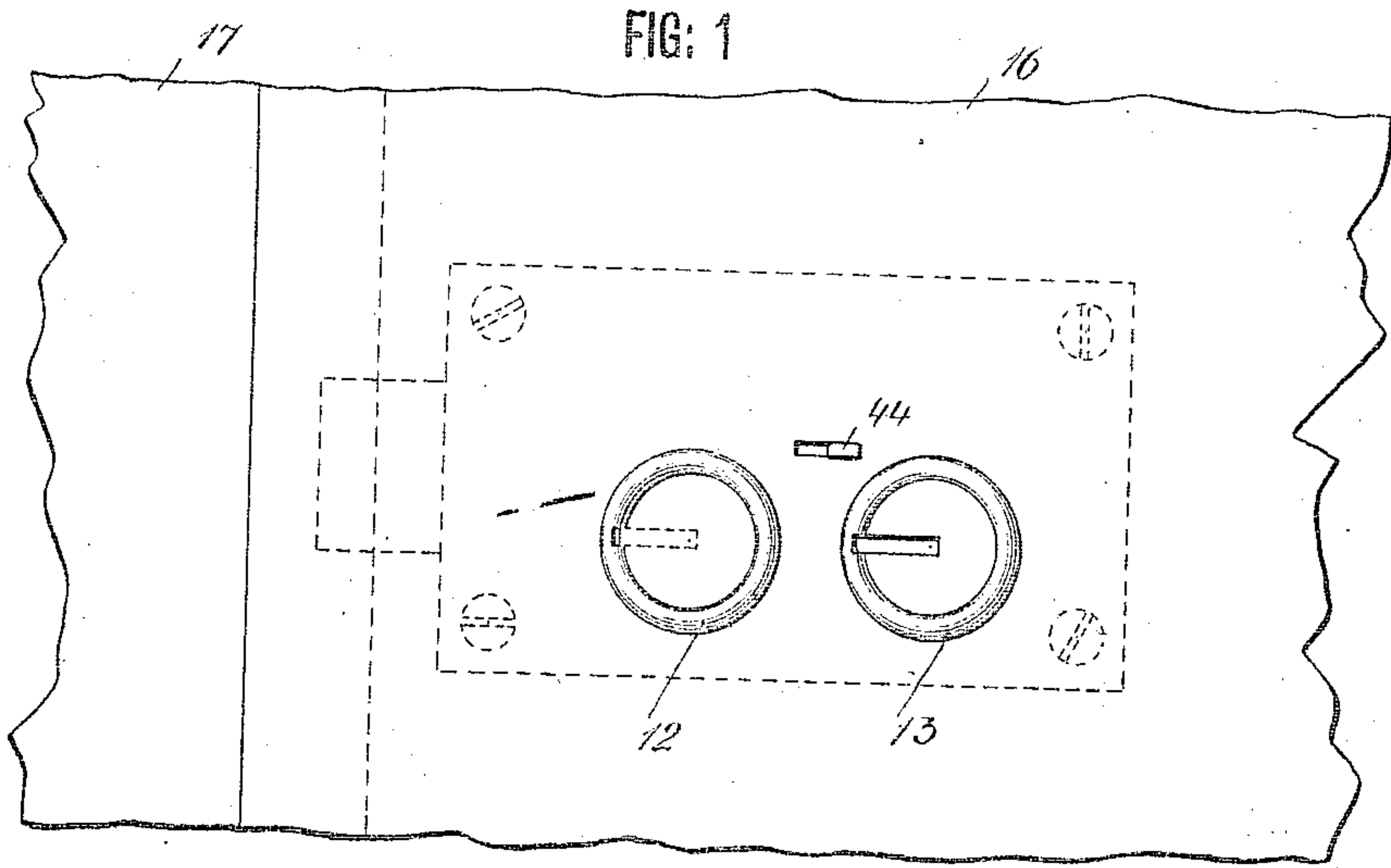


E. J. PRINDLE.
INTERCHANGEABLE KEY LOCK.
APPLICATION FILED JAN. 25, 1908.

953,641.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG: 6

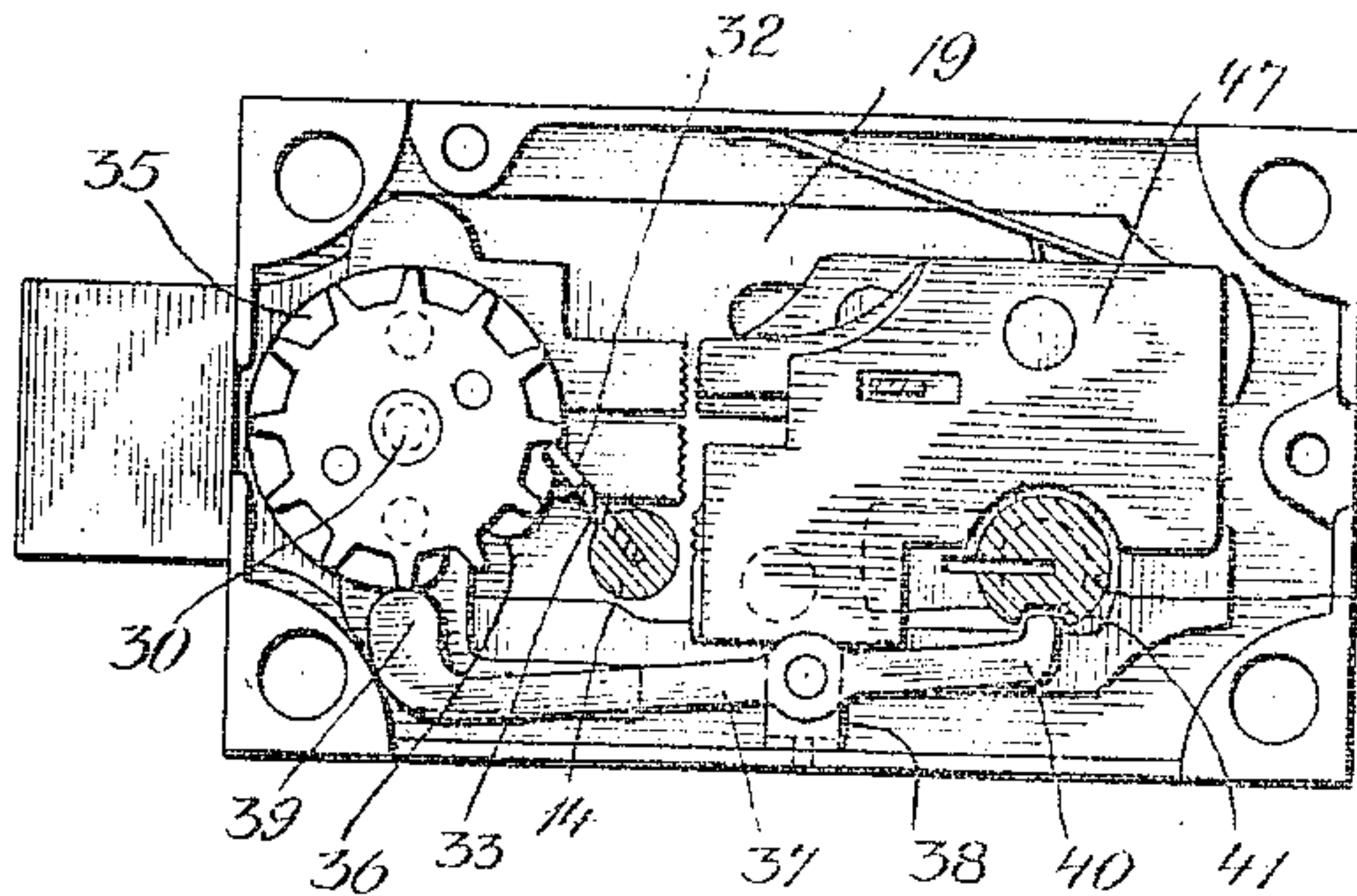


FIG: 7

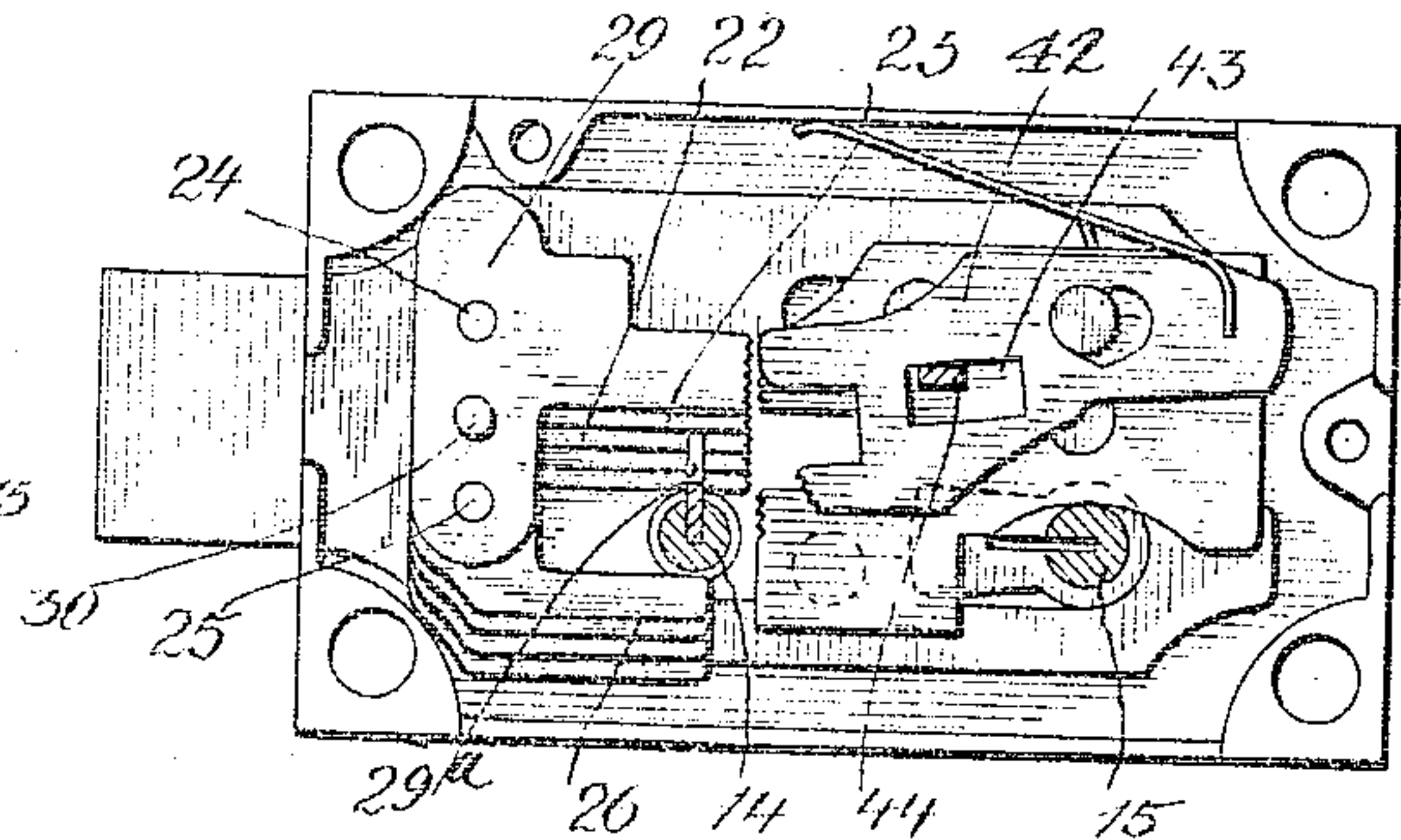


FIG: 8

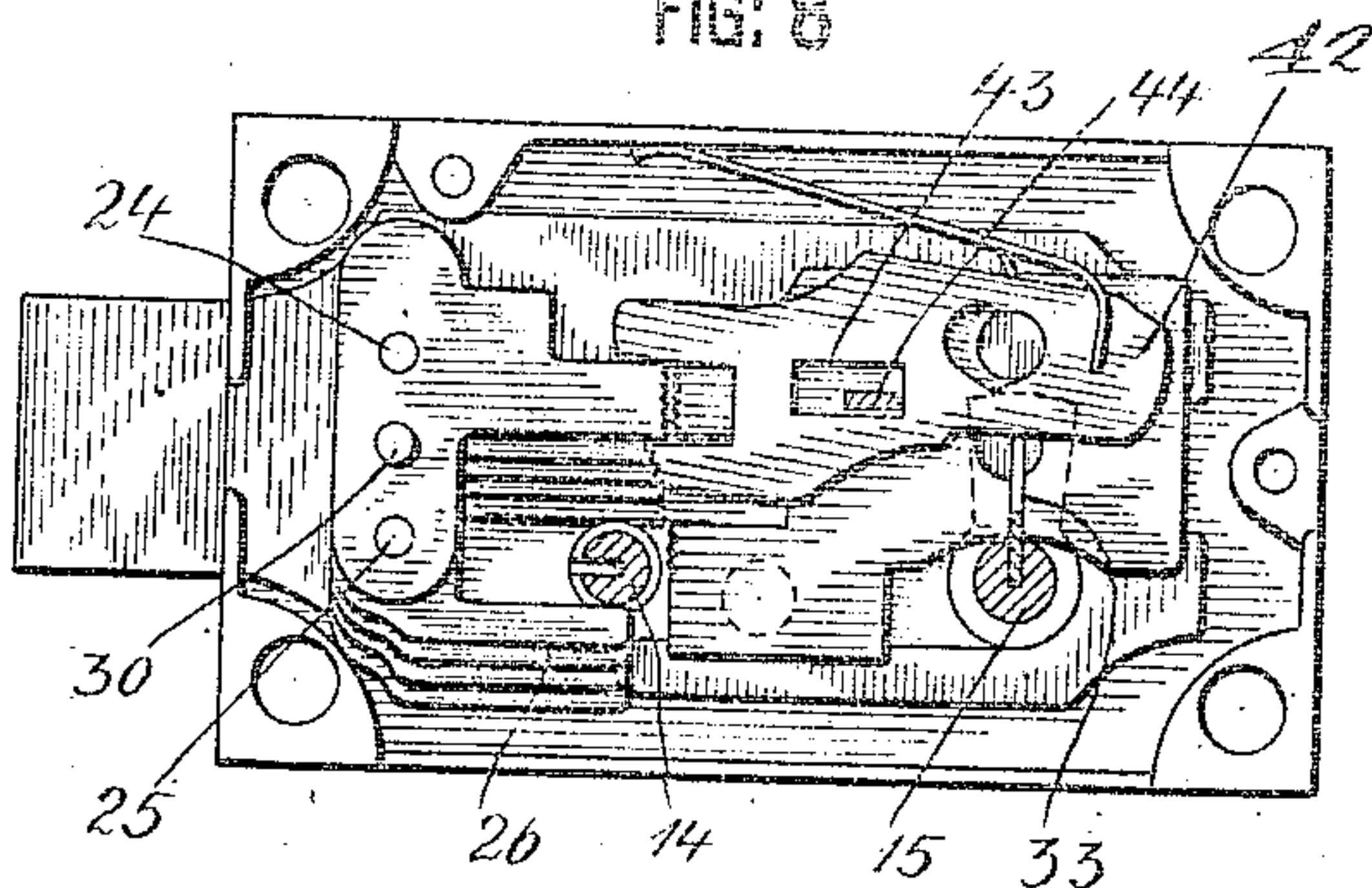


FIG: 9

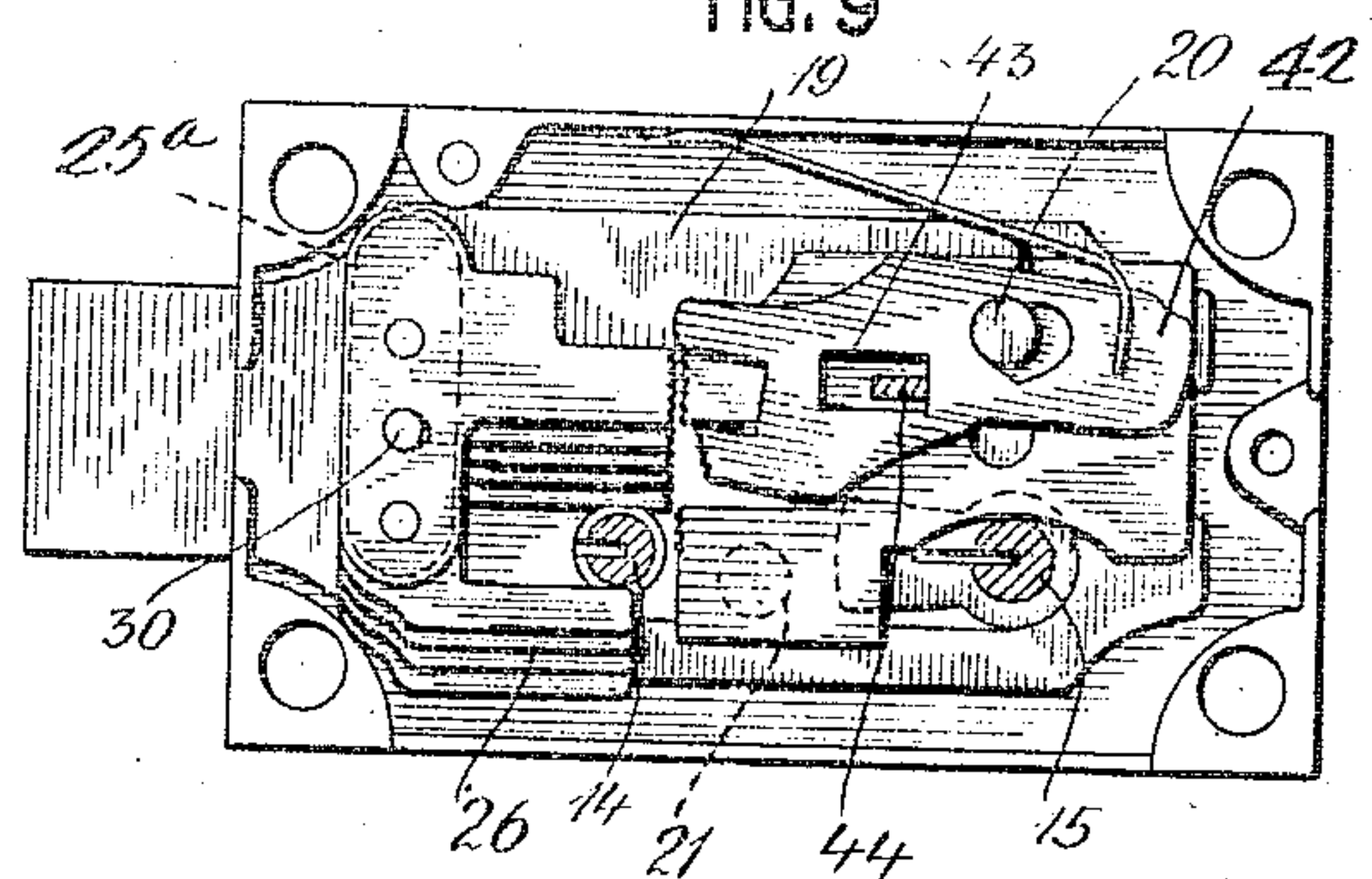


FIG: 10

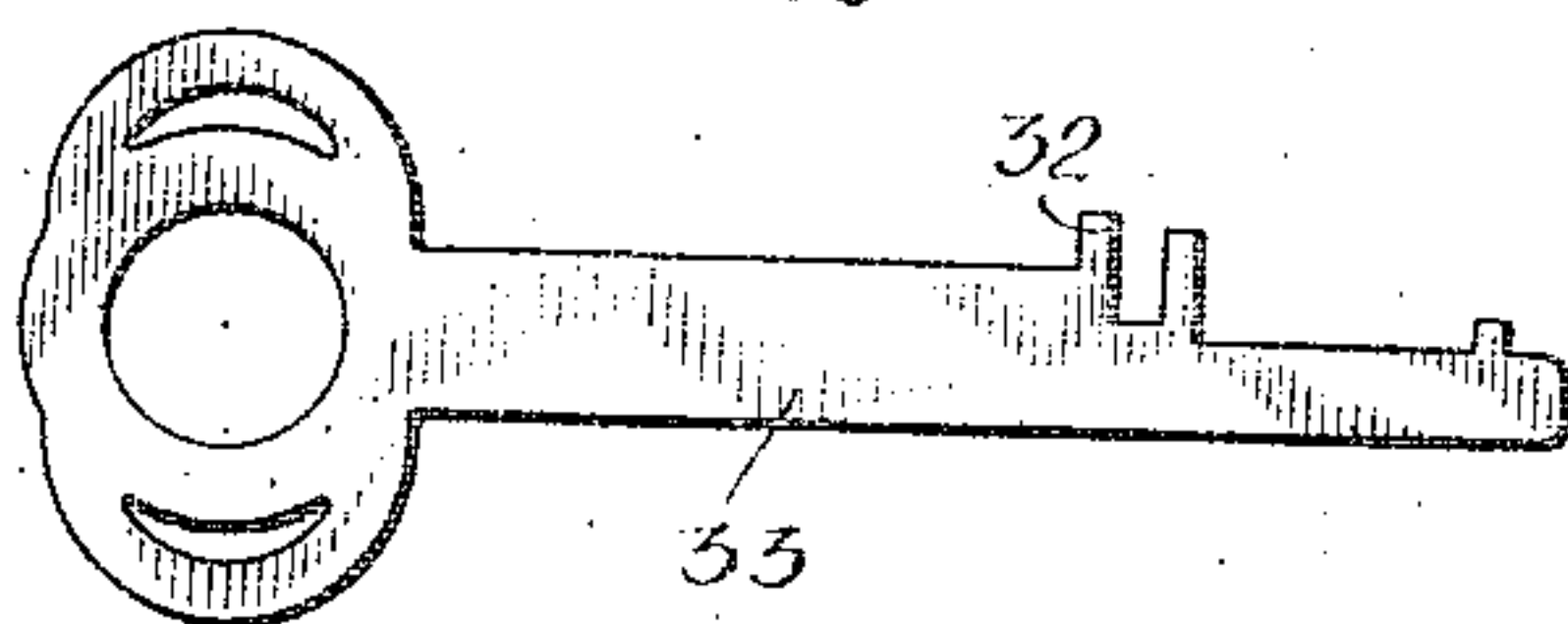


FIG: 11

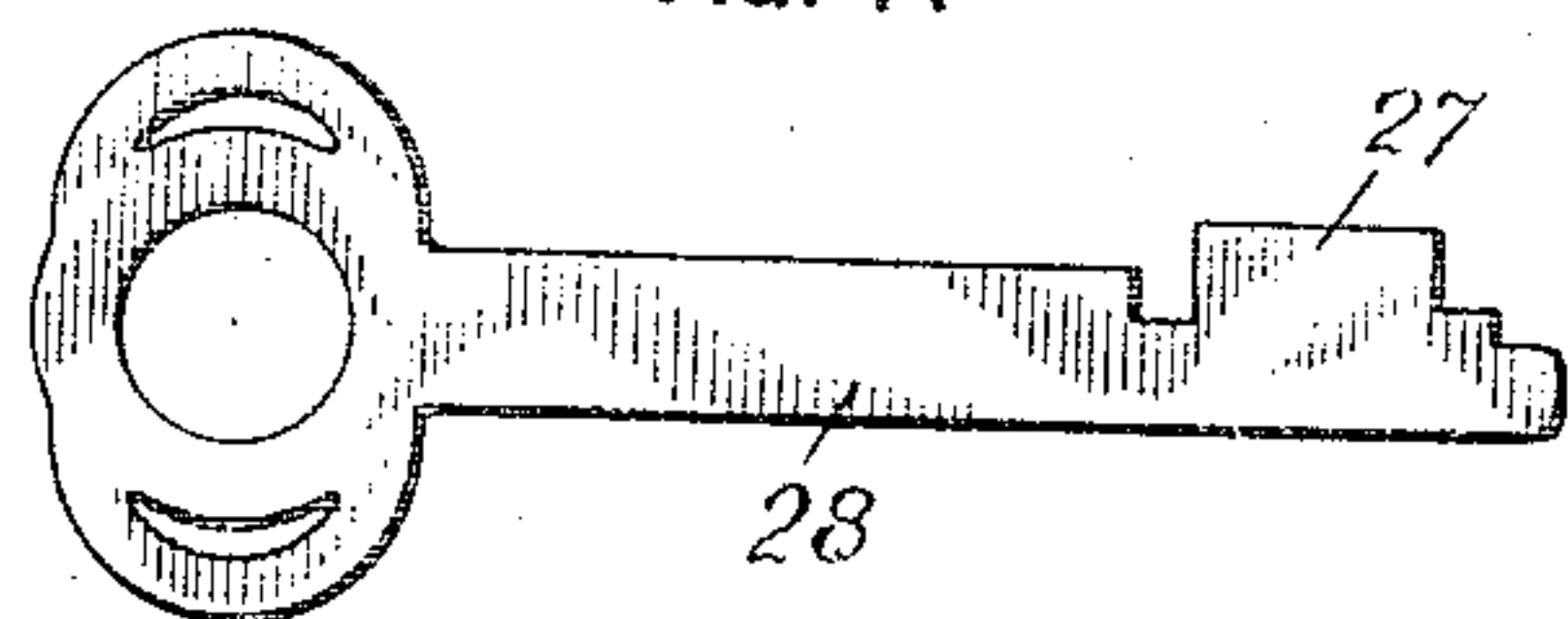
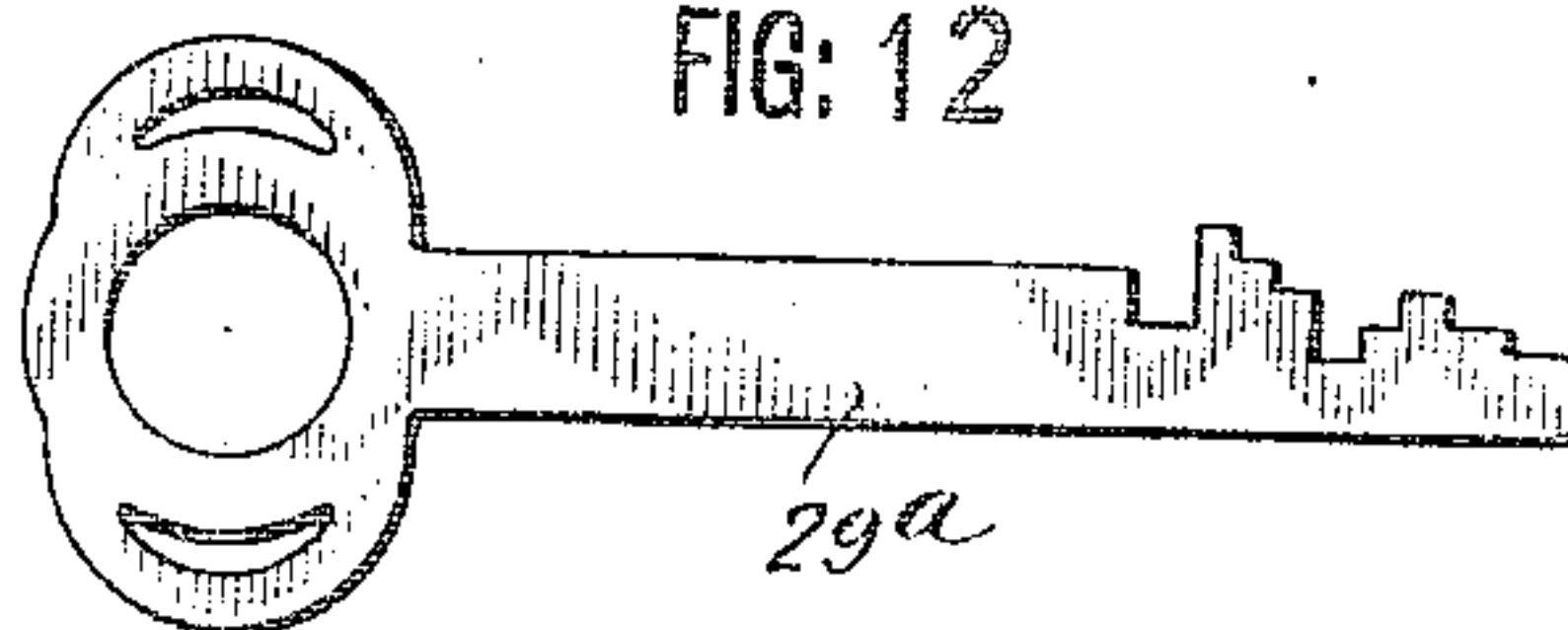


FIG: 12



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UNITED STATES PATENT OFFICE.

EDWIN J. PRINDLE, OF NEW YORK, N. Y., ASSIGNOR TO HERRING-HALL-MARVIN SAFE COMPANY, OF HAMILTON, OHIO.

INTERCHANGEABLE-KEY LOCK.

953,641.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed January 25, 1908. Serial No. 412,648.

To all whom it may concern:

Be it known that I, EDWIN J. PRINDLE, of New York, in the county of New York, and in the State of New York, have invented a certain new and useful Improvement in Interchangeable-Key Locks, and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the outside of the door of a safe deposit box having a lock applied thereto that embodies my invention; Fig. 2 is a front elevation of the lock; Fig. 3 is a section on the line 3—3 of Fig. 2; Fig. 4 is a rear view of the front plate of the lock; Fig. 5 is a front view of the lock, the front plate being removed but the parts being in normal position; Fig. 6 is a view similar to Fig. 5, the master key being shown as unscrewing the star wheel; Fig. 7 is a view similar to Fig. 6, the star wheel being removed and the depositor's key being shown in position to set the lock; Fig. 8 is a view similar to Fig. 7, but showing the master key operating its tumbler; Fig. 9 is a view similar to Fig. 7, but showing the master key tumbler released by a thumb lever just before dropping into normal position and showing thin plates separating the stumps; Fig. 10 is a view of the master key; Fig. 11 is a view of a key to be used for throwing the stump plates into normal position; and Fig. 12 is a view of the depositor's key.

The object of my invention has been to provide a lock, which, while based on the principle of the lock which is the subject of the application of Augustus W. Sibley, Serial No. 412,631, filed January 25th, 1908, shall contain certain improvements on the said lock in that it is adapted to be operated without the use of a screw-driver; that it provides for throwing the master tumbler to normal position in case after it has been thrown by its key, it is decided not to complete the unlocking of the lock, and that means are provided to prevent the unlocking of the lock except when the adjustable stumps are secured in adjusted position and are therefore safe from displacement; and to such ends my invention consists in the interchangeable key lock hereinafter specified. Except in those particulars mentioned, the lock which I have chosen as one illustration

is the same as the lock upon which it is an improvement.

Referring to the said drawings, the lock consists as before of a box-like casing 10 that is closed by a cover plate 11 having cylindrical bosses 12 and 13 in which key cylinders 14 and 15 are mounted. The lock is secured to the back of the door 16, the bosses 12 and 13 projecting through circular holes in the door, and the door closes an opening in the wall 17. Within the casing is a bolt consisting of a beveled head 18 and a plate 19, the plate being of the same shape as before and being guided in the casing on pins 20 and 21. A series of stump plates is mounted upon the bolt as before. There is a series of stump plates 22 for the depositor's key, the said plates having stumps 23 and having slots (not shown) by which they are slidably mounted upon pins 24 and 25 carried by the bolt plate. The stump plates are preferably separated by thin plates 25^a immovably mounted on the pins 24 and 25 so that the stump plates will not move each other by friction. In the present lock no springs bear upon the stump plates tending to throw them to their lower and normal position as in the lock upon which the present one is an improvement. Instead, however, each stump plate for the depositor's key has a lower arm 26 that is adapted to be engaged by the web 27 of a resetting key 28 when the latter is inserted in the key cylinder 14 and the said web moved downward. The downward movement of the said web striking the said arms 26 will cause all of the stump plates (when they are free to move) to move to their lowest positions ready to be engaged by the depositor's key for resetting. In addition to the stump plates for the depositor's key, there is a stump plate 29 for the master tumbler as in the previous lock, the stump plate 29 not being slotted so that it is not movable up and down upon the pins 24 and 25.

In order to secure the adjustable stump plates after they have been adjusted the following means are provided: A screw 30 is screwed in the bolt plate 19 and projects through the slots in the adjustable stump plates, the screw passing freely through the master stump plate 29. A nut is threaded on the fastened end of the screw 30, the nut being in the form of a star wheel 31. By

turning the star wheel it can be screwed up and down on the screw and the adjustable stump plates thus clamped. The teeth of the star wheel are adapted to be engaged by a lug 32 on the master key 33, Figs. 6 and 10, the key being inserted in the key cylinder 14 and being revolved continuously in the proper direction either to screw up or unscrew the nut formed by the star wheel.

In order to insure that the lock shall not be operated when the stumps are not securely clamped, I provide interlocking means between the star wheel and the key cylinder 15, which interlocking means may obviously take many forms. That form which I prefer and which I have chosen for illustration consists of a disk 35, which is either formed in one piece with the star wheel, or, as I prefer, separately formed and fastened thereto as by riveting, the said disk having an unbroken periphery except at one point where it is provided with a depression or notch 36. A lever 37 is pivoted on the casing as upon a bracket 38 riveted to a wall of the casing, and said lever has at one end a rounded nose 39 which is adapted to bear against the periphery of the disk 35, and at the proper time to be forced into the said notch by a spring 35^a. The opposite end 40 of the lever is adapted to enter a notch 41 formed in the key cylinder 15. The notch 36 is in such position that the nose 39 can only enter it when the star wheel is screwed up tight. When the nose 39 enters the said notch, the end 40 of the lever is withdrawn from the notch 41, thus leaving the cylinder 15 free to be rotated to unlock the lock.

The master tumbler 42 has a slot 43 into which projects one end of a lever 44 that is pivoted upon the frame as upon a bracket 45, Figs. 2 and 3. The lever projects outside the casing and can be engaged by the thumb for the purpose of retracting the master tumbler after it has been thrown to operative position, if it is decided not to unlock the lock. In order to provide room for the star wheel and the disk 35, the casing is made somewhat thicker than in the previous lock, and to fill up the space between the cover and the master tumbler, a lug 46 is formed on the cover plate and bears against plate 47 which stands over the master tumbler.

In the operation of the illustrated form of my invention, supposing the lock to be already set for one depositor's key and that it is desired to set it for another key, the first requirement is to unscrew the star wheel so as to permit the stump plates to be adjusted. For this purpose the master key 33 is inserted in the key cylinder 14 and is rotated in the proper direction to unscrew the star wheel, each rotation of the master key causes the lug 32 to move the star wheel the space

of one tooth. By properly proportioning the parts, any desired degree of power can be obtained. At the beginning of the movement, the star wheel being in screwed up position, the notch 36 is beneath the nose 39 of the lever, and thus the end 40 of the lever is disengaged from the key cylinder 15. The moment, however, the star wheel begins to rotate it carries the notch 36 out from under the nose of the lever, thus throwing the nose away from the star wheel and swinging the end 40 of the lever into the notch 41 in the key cylinder 15 and preventing the use of such key cylinder so long as the star wheel is unscrewed. The pressure having been removed from the stump plates for the depositor's key, the master key is removed from the key cylinder 14 the resetting key 28 is inserted and its web moved downward. The web 27 thus engages the arms 26 on the stump plates and throws all of the stump plates to their lowest positions. The depositor's key 29^a is now inserted into the key cylinder 14 and turned to a vertical position, as shown in Fig. 7, which movement sets the stump plates in positions corresponding with the notches or steps in the web of the depositor's key. The depositor's key is then removed from the cylinder 14 and the master key inserted and rotated in the proper direction to screw up the star wheel and thus to clamp the stump plates in adjusted position. As the star wheel arrives at its screwed up position, the notch 36 again comes in line with the nose 39 of the lever, and the lever is thrown by its spring to the position shown in Fig. 5, in which its end 41 is disengaged from the notch in the key cylinder 15. The lock is now ready for use with the new depositor's key. If the master key has been inserted and the master tumbler thrown to the position illustrated in Fig. 9 and it should then be decided not to complete the unlocking of the lock, the master tumbler can be restored to normal or unlocked position by means of the thumb lever 44.

It will be observed that my lock has among others the following advantages: The adjustable stumps can be fastened or unfastened in adjusted position entirely from the front of the door and without the use of a screw-driver. The bolt cannot be withdrawn unless and until the adjustable stumps have been secured in adjusted position. The master tumbler can be restored to normal or inoperative position without completely unlocking the lock, if it should be desirable, after it has once been set.

It is obvious that the web 27 for resetting the stump plates could be formed on the opposite end of the master key from the lugs 32 and 48 on said key, which lugs are respectively adapted for use with the star wheel and with the master tumbler. It is also obvious that various changes can be made in

the above illustrated construction which will be within the scope of my invention, and I desire not to be limited beyond the requirements of the prior art and the terms of my
 5 claims. For instance, instead of a separate spring for each stump plate, the stump plates might be made so as to press frictionally against the thin plates. Because of the im-
 10 movable thin plates interposed between the stump plates, it would be impossible for any given stump plate to shift any other one.

I claim:

1. In an interchangeable key lock, the combination of a series of adjustable stumps,
 15 a corresponding series of tumblers, means for securing the stumps in adjusted position, and interlocking means for preventing the operation of the tumblers when the stumps are unsecured.

20 2. In an interchangeable key lock, the combination of a series of adjustable stumps, a corresponding series of tumblers, a screw adapted to secure said stumps, a star wheel adapted to operate said screw and a key
 25 adapted to rotate said star wheel.

3. In an interchangeable key lock, the combination of a series of adjustable stumps, a screw adapted to secure said stumps in ad-
 30 justed position, a star wheel adapted to operate said screw, a circular disk connected with said star wheel and having a notch therein, a series of tumblers, a key cylinder for operating said tumblers and for throw-
 35 ing the bolt, said key cylinder also having a notch formed therein, and a part having a nose adapted to enter the notch in said disk and by the same movement to retract an end from the notch in said key cylinder, and vice versa.

40 4. In an interchangeable key lock, the combination of a casing, a bolt, a series of adjustable stump plates mounted on said bolt, a screw on said bolt and passing through slots in said stump plates, a star wheel for operat-
 45 ing said screw, a disk carried by said star

wheel and having a notch in its periphery, a series of tumblers, a key cylinder cooperating with said tumblers, said key cylinder having a notch formed therein, and a lever having its respective ends adapted to enter 50 the said notches, said parts being so arranged that when the screw is tightened the lever is withdrawn from the notch in the key cylinder, and when the screw is unscrewed the lever enters the notch in the key 55 cylinder.

5. In an interchangeable key lock, the combination of a casing, a bolt therein, a series of stump plates slidably mounted on said bolt, means for clamping said stump 60 plates to said bolt, said stump plates having substantially parallel opposing edges, one of said edges being adapted to be engaged by the key to which the lock is to be set, and the other of said edges being adapted to be en- 65 gaged by a resetting key.

6. In a lock, the combination of tumblers adapted to be operated by a given key, a tumbler adapted to be operated by another key, and means for releasing said last-men- 70 tioned tumbler, said means comprising a thumb piece adapted to move said tumbler in a direction opposed to the direction in which it is thrown by its key.

7. In a lock, the combination of a casing, 75 a bolt, a series of stumps on the bolt, a set of tumblers adapted to be operated by a depositor's key, a master tumbler adapted to be raised by the master key and to be partially engaged with its stump thereby, said 80 master tumbler having a slot therein, and a lever pivoted in the casing of the lock and adapted to engage said slot to retract the master tumbler.

In testimony that I claim the foregoing I 85 have hereunto set my hand.

EDWIN J. PRINDLE.

Witnesses:

A. NEWCOMB,
 M. REINERS.