

No. 832,417.

PATENTED OCT. 2, 1906.

C. S. RICE.
KEYLESS LOCK.

APPLICATION FILED APR. 20, 1905.

Fig. 1.

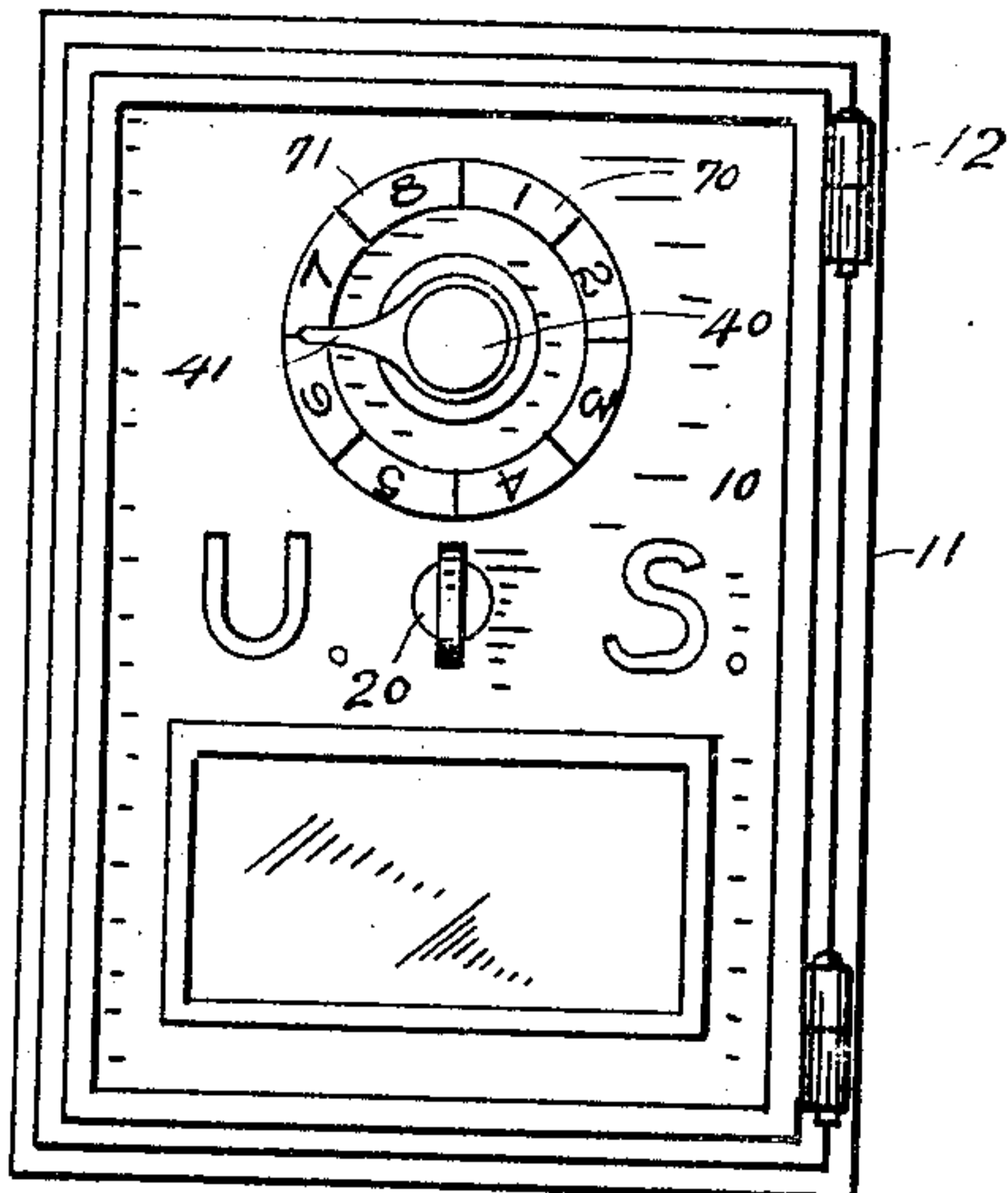


Fig. 2.

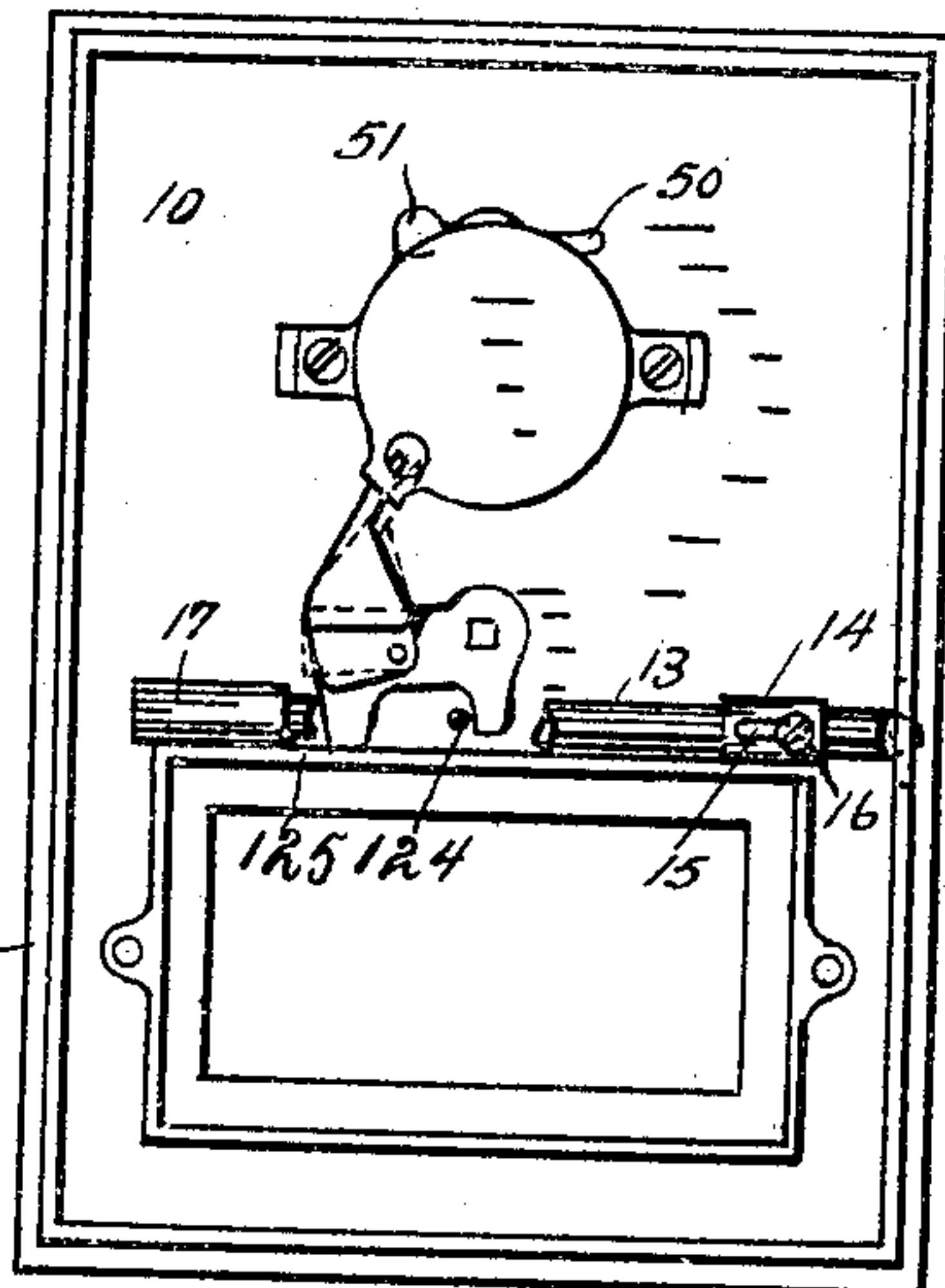


Fig. 3.

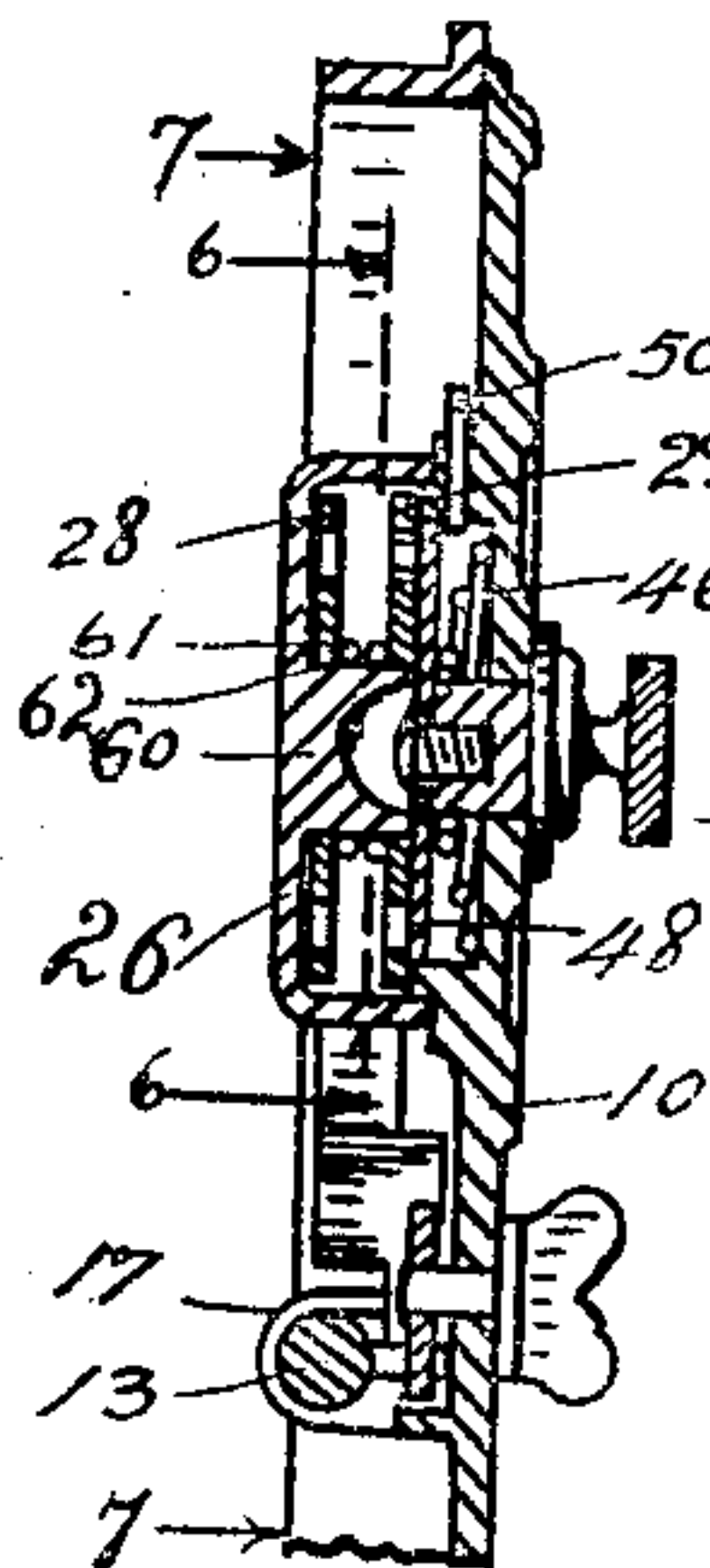


Fig. 4.

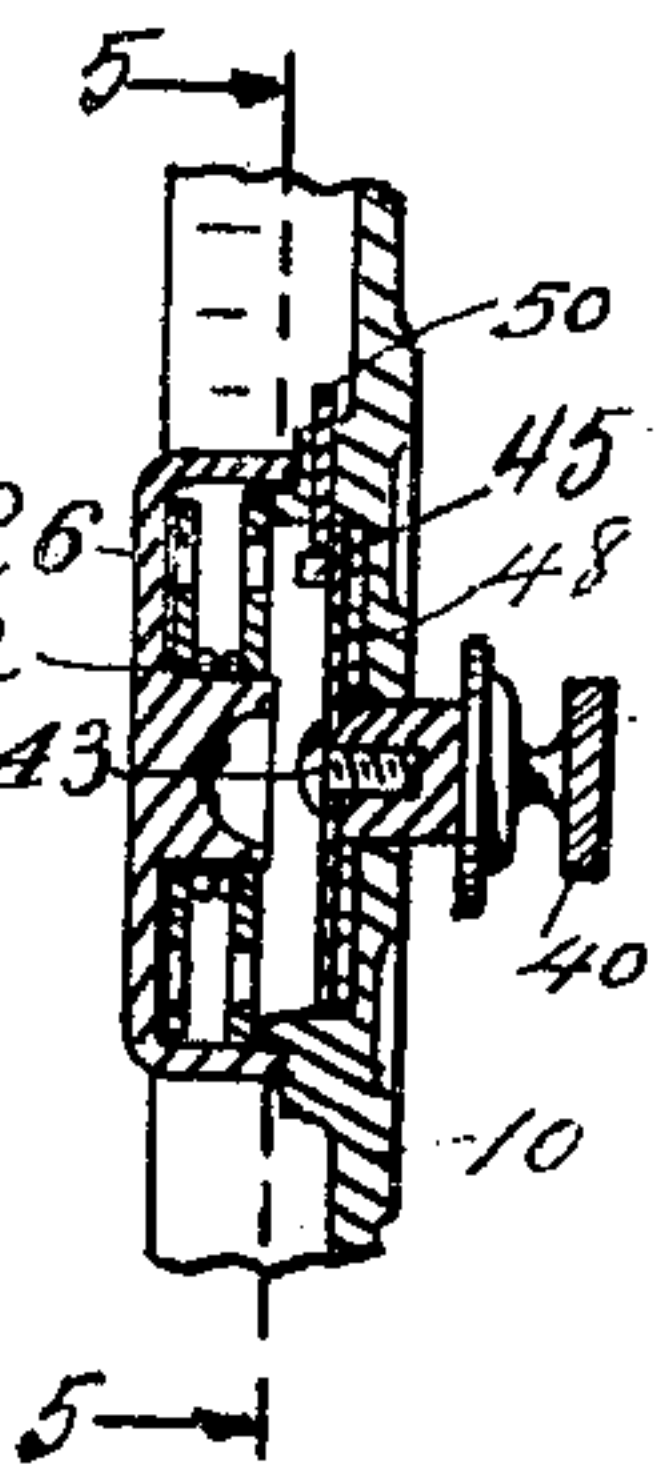


Fig. 5.

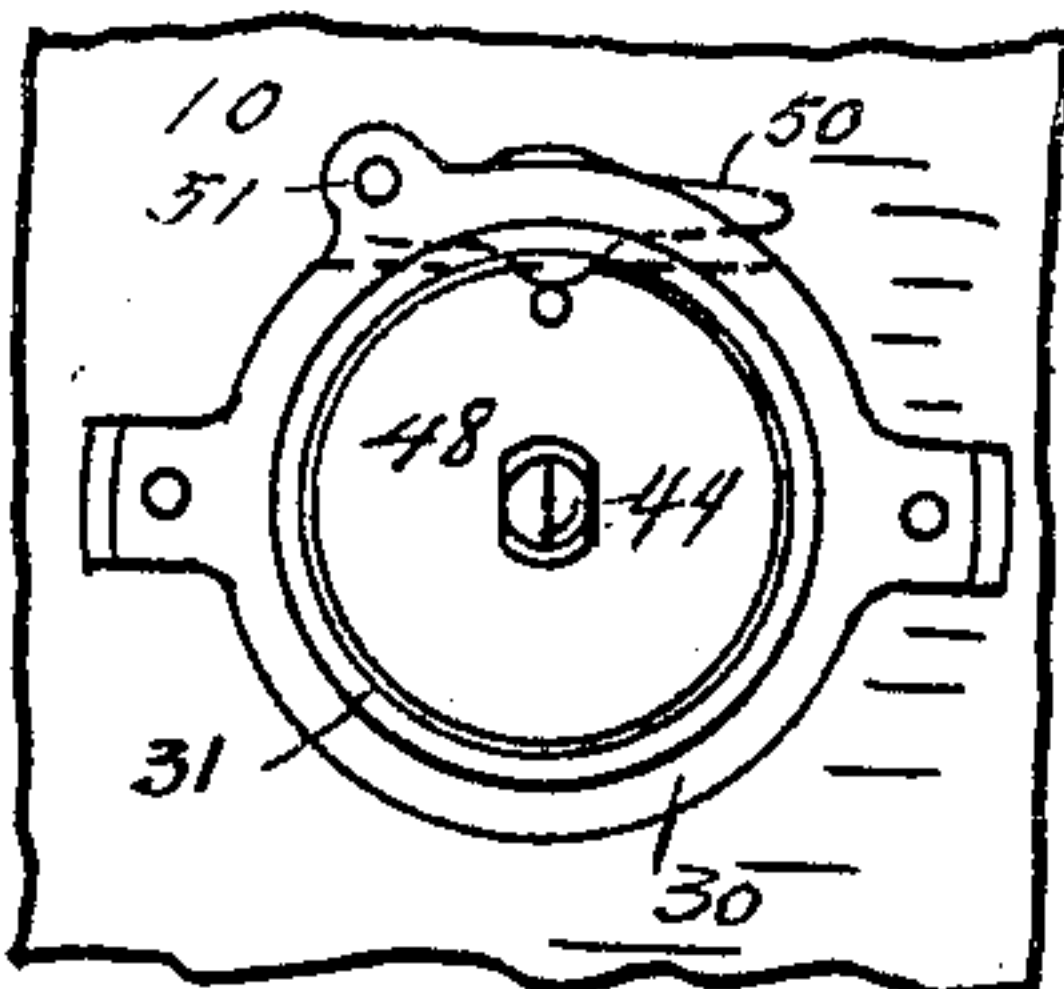


Fig. 6.

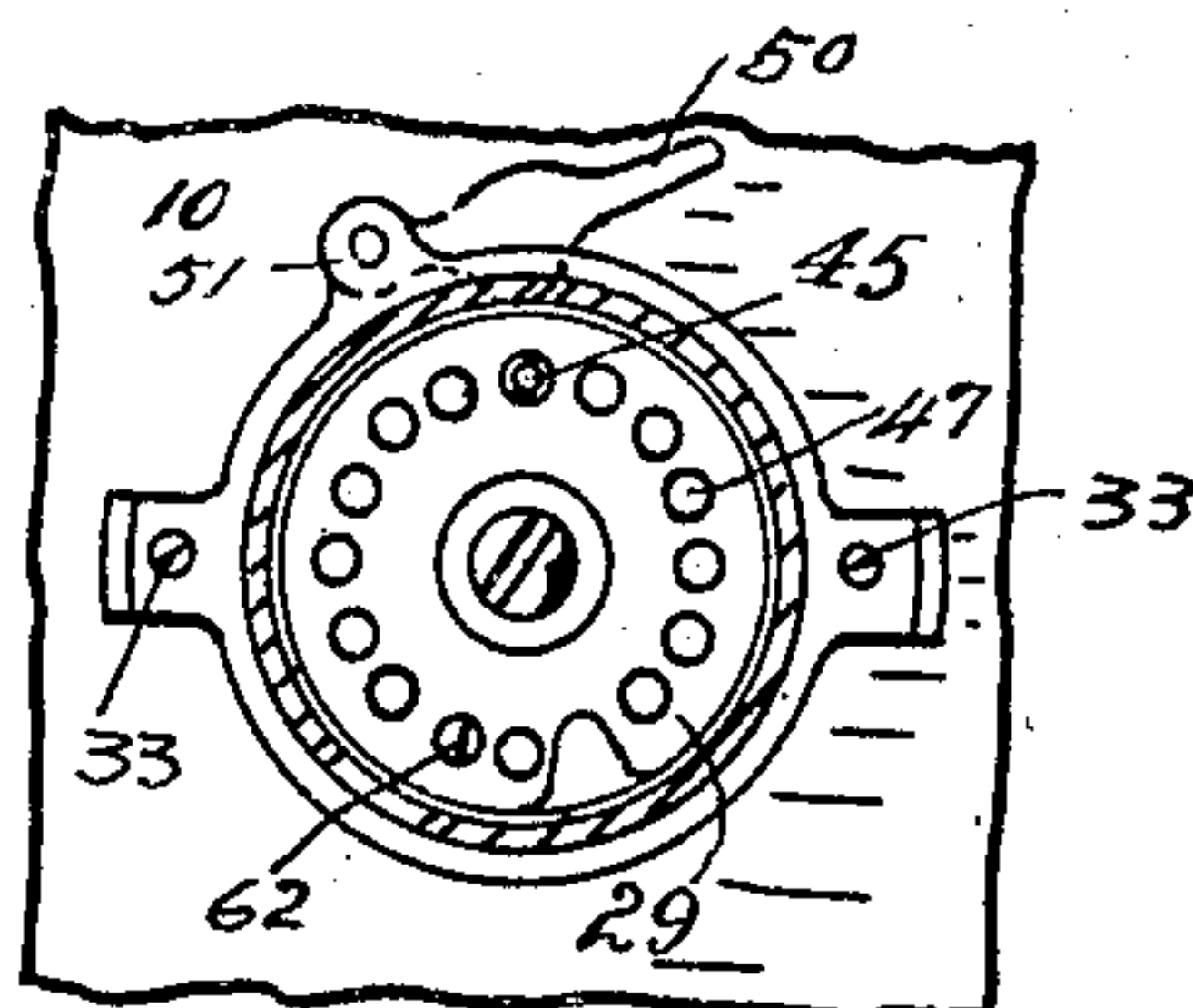


Fig. 7.

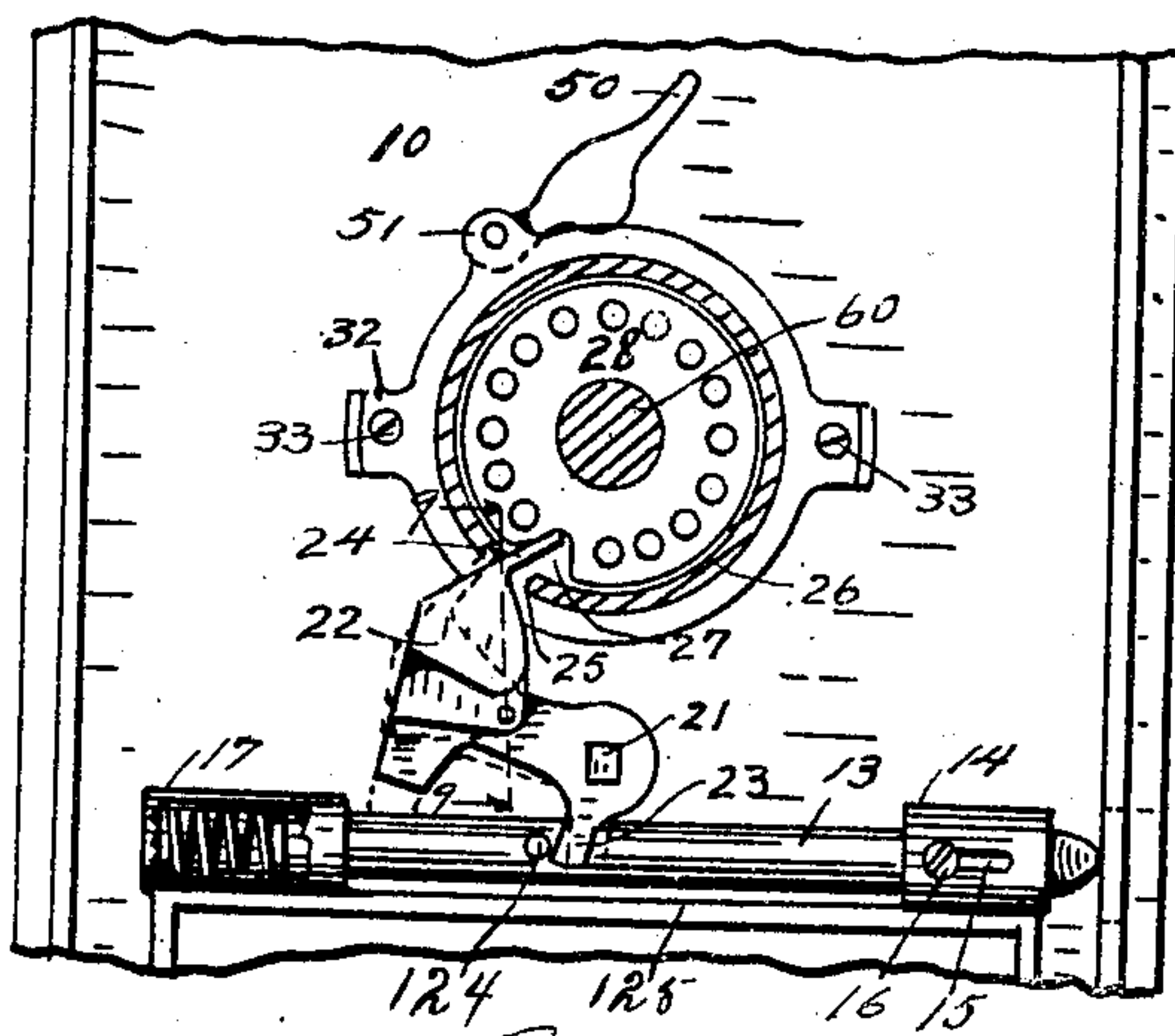


Fig. 8.

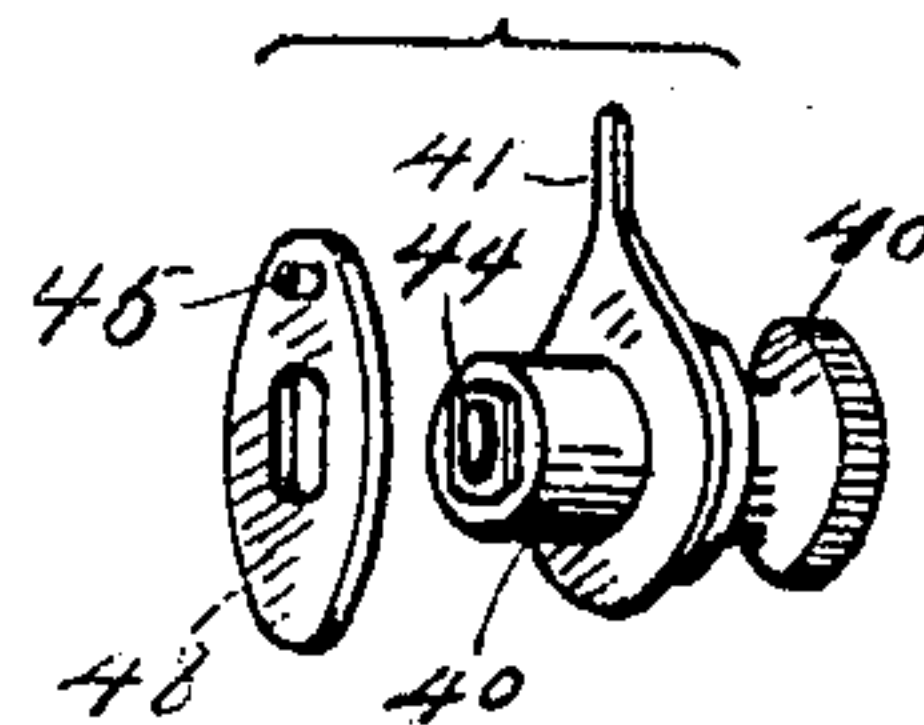


Fig. 9.

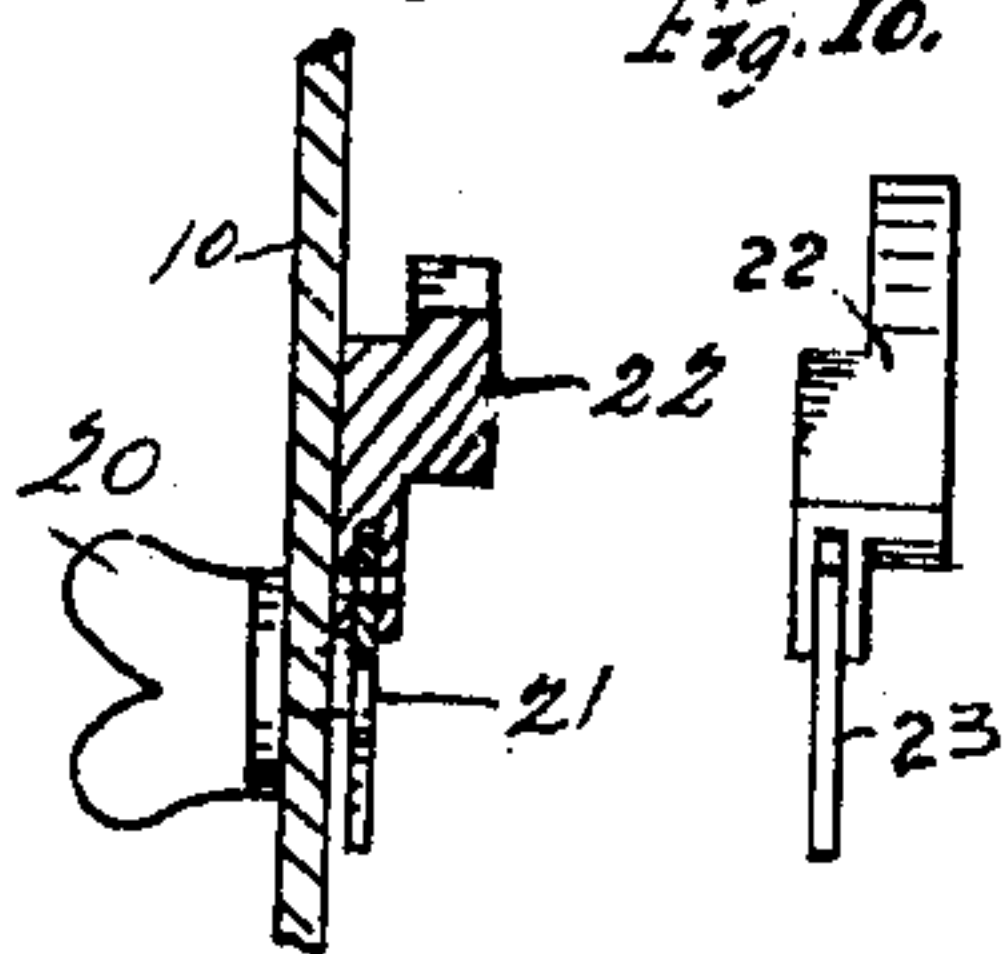


Fig. 10.

Witnesses

N. Allemon
C. H. H. H.

Inventor

Charles S.
Rice.

By V. H. Lockwood

Attorney

UNITED STATES PATENT OFFICE.

CLARENCE S. RICE, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE KEY-
LESS LOCK COMPANY, OF INDIANAPOLIS, INDIANA.

KEYLESS LOCK.

No. 832,417.

Specification of Letters Patent.

Patented Oct. 2, 1906.

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To all whom it may concern:

Be it known that I, CLARENCE S. RICE, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Keyless Lock; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

10 The object of this invention is to provide an improvement in the construction of combination or keyless locks.

One feature of the invention consists in the idea of mounting tumblers in a removable cap and independently of and not surrounding the indicator shaft or stem. This enables the tumblers to be readily removed without interfering with the remainder of the mechanism. The cap is cylindrical and the tumblers rotate within its periphery and surround, preferably, an arbor from said cap.

Another feature of invention consists in a novel construction whereby the combination may be changed. The indicator shaft or stem is longitudinally movable against the action of a spring, so that it may be drawn outward. A setting-disk is secured to its inner end, so that when the indicator is drawn outward the pin of the setting-disk disengages the tumbler and enables a new combination to be made. A latch for preventing this change of combination is placed on the inside, so that no one can make such change in the combination excepting one who can in the first place open the door on which the lock is mounted.

Another feature of the invention consists of means whereby the bolt is prevented by the tumblers from being operated. Said means is in the form of a dog, which is actuated by the means which throws the bolt, and its operation is interfered with by the tumblers, so that the bolt-throwing means cannot be operated unless the tumblers are so set as to permit the action of the dog.

45 In the drawings, Figure 1 is a plan view of a lock and a door and door-frame, such as is used for post-office boxes. Fig. 2 is an inside view of what is shown in Fig. 1 with parts of the bolt broken away. Fig. 3 is a vertical section through the upper two-thirds of Fig. 1 and the center of the lock, showing the lock in normal condition. Fig. 4 is a portion of Fig. 3 with the indicator and setting-disk

drawn outward, so that the combination may be changed. Fig. 5 is a plan view of a portion of the inside of the door and the casing thereon, the setting-disk, and the means for locking the setting-disk, being a view upon the line 5 5 of Fig. 4—that is, with the cap and its contents removed. Fig. 6 is a section on the line 6 6 of Fig. 3, showing one tumbler and the latch to prevent changing of the combination elevated to permit the change of combination. Fig. 7 is a section on the line 7 7 of Fig. 3. Fig. 8 is a perspective view of the indicator-stem and setting-disk. Fig. 9 is a section through the dog. Fig. 10 is a rear elevation of the dog and bell-crank carrying it.

The device shown herein to illustrate the invention consists of a door 10, hinged on the door-casing 11. The casing has a hole in one side to receive the bolt 13, that is slidably mounted on the door in sleeves 14 and 17, one of which is slotted at 15 and has a guiding-screw 16 extending through the slot into the bolt. The sleeve 17 is in the form of a barrel closed at the rear end, within which a spring is mounted for propelling the bolt outward.

In operation the bolt is opened against the action of the spring by turning the knob 20 on the outside to the left. It has a stem 21, carrying a bell-crank 23, rigidly secured to it. One arm of the bell-crank engages the pin 124 on the bolt, and this moves the bolt to open the door. The other arm of the bell-crank carries a dog 22, which is pivotally mounted astride the bell-crank—that is, the bell-crank extends and operates in a slot in the lower part of the dog, as indicated in Fig. 10, and gives the dog a relative movement independently of the bell-crank, as indicated in Fig. 2. The dog has a nose 24, that extends at an angle from the body of the dog and is adapted to enter the opening 25 in the side of the cap 26 and to engage the notches 27 in the tumblers 28 and 29 when said tumblers have been so positioned that the notches 27 will register with each other and with the nose of the dog as it approaches them, so that the dog can enter the notches. It is observed that the movement of the nose of the dog in approaching the tumblers is almost tangential with the tumblers, and consequently after the dog enters the notches in the tumblers it pushes the tumblers some-

what farther in the direction of the movement of the dog and turns the tumblers from the position at which they are set by the indicator on the outside. This movement of them by the dog causes a corresponding movement of the indicator on the outside and breaks the combination, so that no subsequent or repeated unlocking operation by any one is possible until the tumblers are again reset by one who knows the combination. In other words, with this arrangement the tumblers are moved into a locking position as the door is unlocked instead of the combination being left on and in the unlocking position after the unlocking operation, so that anybody could repeatedly open the door.

Because the dog is pivoted to the bell-crank and has some movement independently of the bell-crank it is dragged out of its engagement by the movement of the bell-crank on a slightly different line or angle from the way in which it entered the notches in the tumblers, whereby the dog does not return the tumblers to their original position, and therefore the indicator is not returned to the combination-number at which it was set in order to unlock the device. The return action of the bell-crank 23 is limited by a stop-plate 125, extending across the door beside the bolt 13.

On the door there is made integral with it on the inside a casing 30, that extends upward somewhat from the door and has a centering-flange 31. It has two oppositely-extending ears integral with the door and provided with holes for securing the cap 26 in place on said casing. The flange 31 centers the cap, and the cap has two oppositely-extending ears 32, perforated so that the cap may be secured in place by the screws 33. An indicator stem or shaft 40 extends through the door centrally of the casing 30 and has an indicator 41 on its outer end. The inner end has a screw-threaded hole centrally in it to receive the screw 43. The inner end of the indicator-stem 40 is turned down a slight distance and flattened on opposite sides at 44, as seen in Fig. 8, to receive the setting-disk 48, which has a central opening through it with straightened sides, so as to fit snugly on the reduced inner portion of the inner end of the stem, and the head of the screw 43 holds said setting-disk from escape.

A spiral push-spring 46 surrounds the stem 40 between the inner surface of the door and said setting-disk. The tendency of the spring is to push and hold said disk in engagement with the tumbler 29. The tumbler 29 has a number of holes 47, adapted to receive the pin 45 on the setting-disk. The combination is changed by drawing the stem 40 outward, as shown in Fig. 4, thus disengaging the pin 45 on the setting-disk 48 from the tumbler 29, and by turning said setting-

disk so that the pin 45 thereof will enter another one of the holes 47 in the tumbler. The spring 46 will return the parts into place. This resetting, however, cannot be done by a meddler or outsider who cannot open the lock because of the latch 50, pivoted at 51 to the casing 30 and having a downwardly-extending portion that enters a slot across the upper part of the casing 30 wide enough to receive said latch and permit it to drop down behind the setting-disk 48, as shown in Fig. 3. It is obvious that while that latch is down, as shown in Fig. 5, for instance, it is impossible to disengage the setting-disk from the tumbler to change the combination when the door is closed; but after the door has been opened one can readily throw said catch up out of the way, as shown in Figs. 6 and 7, and change the combination.

The cap 26 has an inwardly-extending arbor 60, as seen in Figs. 3 and 4, on which the two tumblers are mounted, with a washer or a wire 61 surrounding said arbor and lying between said tumblers and tending to properly space said tumblers from each other. The inner end of the arbor 60 is made concave to avoid interference with the head of the screw 43. Each tumbler has the usual pin 62 extending toward each other and adapted to engage each other at times during the operation of the device.

On the outside of the door 10 there is a dial 70, integral with the door and cast therewith, having indicating-numerals from "1" to "8" depressed therein and also partition-lines 71 between said numerals likewise depressed therein. Consequently the end of the indicator 41 travels immediately over the dial 70, thus making the construction very compact, bringing the indicator close to the dial. Also the position of the indicator is readily determined after dark by feeling with such closely-arranged construction.

A portion of the locking mechanism, in fact, all the tumblers, it is noticed, are mounted in the cap and are readily removable, so that the matter of assembling is very much simplified by this construction, and the tumblers are perfectly round and smooth, excepting the one notch in it, so that any attempt at sensitizing the lock by pressing the nose of the dog against the tumblers is frustrated, for while the notch on one tumbler is passing the nose of the dog the other tumbler still gives the nose of the dog the proper bearing and does not permit any one to discover when the slot in either tumbler is passing the nose of the dog.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a keyless lock, the combination of notched tumblers, with a bolt, oscillatory means for withdrawing the bolt, and a dog pivotally mounted on said withdrawing means with a nose extending approximately

tangential to said tumblers and adapted to enter the notches therein, the construction being such that the inner movement of the nose of said dog will move said tumblers off the combination, substantially as set forth.

2. In a keyless lock, the combination of notched tumblers, with a bolt, means apart from the tumblers for moving the bolt, and a dog pivotally mounted on said means that is adapted to enter the notches of the tumblers and move them off the combination and which prevents the operation of the bolt when the dog does not enter the notches in the tumblers, said dog having some movement independently of said bolt-actuating means so that it may withdraw from the notches in the tumblers without returning the tumblers thereby preventing the actuation of the bolt until the combination is again operated to bring the tumblers into their proper register, substantially as set forth.

3. In a keyless lock, notched tumblers, a door, a spring-bolt mounted thereon, a knob with a stem extending through the door, a bell-crank secured thereon adapted at one end to engage and withdraw the bolt, a dog pivotally mounted on the other end of said bell-crank so as to have some movement independently thereof with the nose projecting toward said tumblers substantially tangentially, and a stop to limit the return movement of said bell-crank.

4. In a keyless lock, a longitudinally-movable indicator-stem, a tumbler opposite the end of the stem, a resetting-disk mounted on the inner end of said stem adapted to engage said tumbler, and a spring for holding said resetting-disk in engagement with said tumbler, whereby the combination may be changed by withdrawing the resetting-disk from engagement with the tumbler and moving it to the desired position in relation to said tumbler.

5. In a keyless lock, a longitudinally-movable indicator-stem, a tumbler, a resetting-disk mounted on the inner end of said stem

adapted to engage the tumbler, and a spring for holding said resetting-disk in engagement with said tumbler, whereby the combination may be changed by withdrawing the resetting-disk from engagement with said tumbler, and means for preventing the withdrawal of said resetting-disk to prevent a change of the combination.

6. In a keyless lock, the combination with a door, of an indicator-stem mounted thereon longitudinally movable, a casing on the inner surface of said door with a peripheral slot therein, a tumbler, a resetting-disk secured on the inner end of the indicating-stem and adapted to engage the tumbler, a spring between the resetting-disk and the inner surface of said door tending to force said disk into engagement with the tumbler, but which permits said disk to be withdrawn from the tumbler by drawing the indicator-stem outward, and a latch pivoted to the casing and fitting into said peripheral slot between the disk and door so as to prevent a withdrawal of said disk until the latch is released.

7. In a keyless lock, the combination with a door, a casing secured on the inner surface of the door, an indicator-stem mounted on the door concentric with said casing, a tumbler-actuating disk on the inner end of said stem within said casing, a cap secured on said casing with an opening in one side thereof, tumblers mounted within said cap, each with a peripheral notch, a connection between said tumbler-actuating disk and one of said tumblers, a bolt, and an oscillating dog that throws the bolt only when said dog enters the notches in said tumblers.

In witness whereof I have hereunto affixed my signature in the presence of the witnesses herein named.

CLARENCE S. RICE.

Witnesses:

NELLIE ALLEMONG,
V. H. LOCKWOOD.