No. 829,737. PATENTED AUG. 28, 1906.

C. S. RICE.

KEYLESS LOCK.

APPLICATION FILED MAY 20, 1904.

Fig. 1.

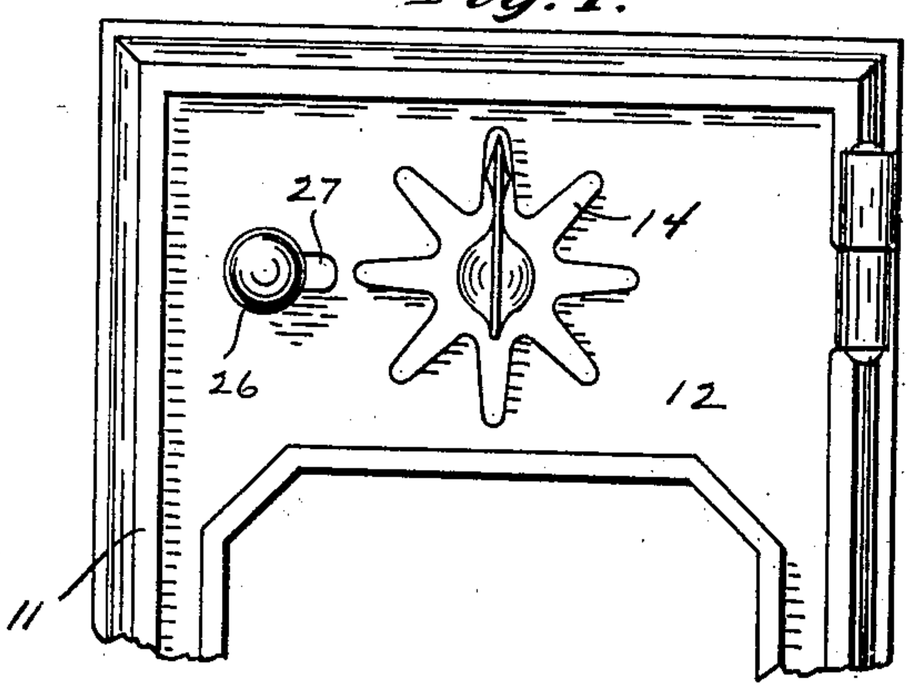


Fig. 2.

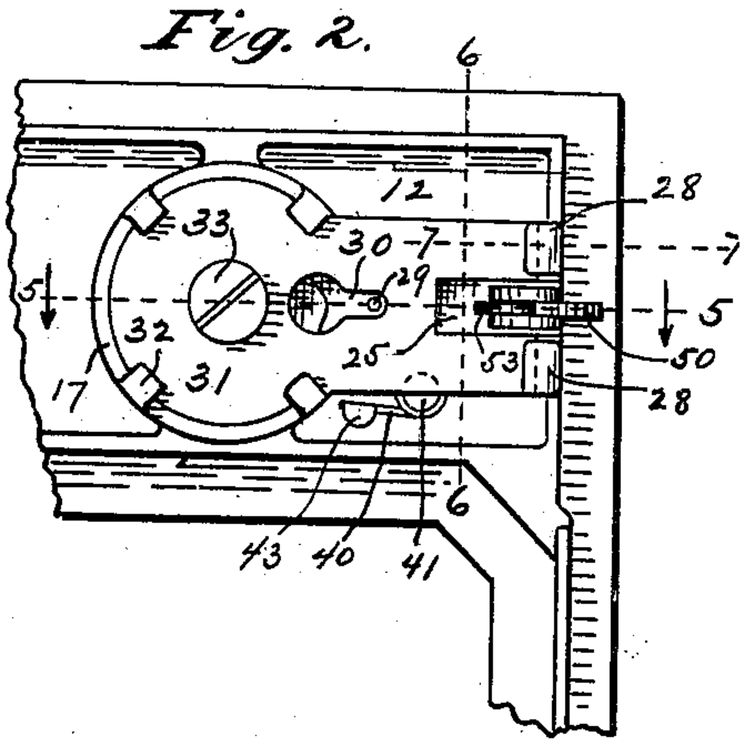


Fig. 6.

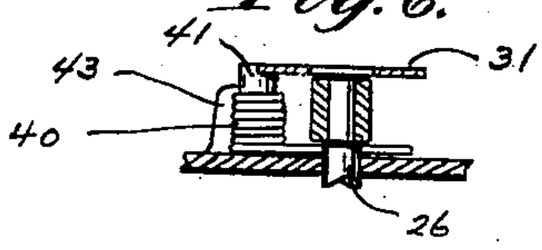


Fig. 3.

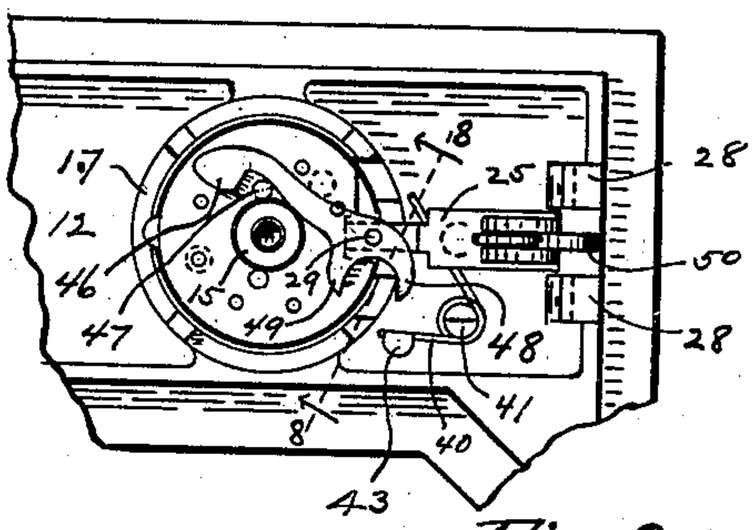


Fig. 7.

Fig. 4.

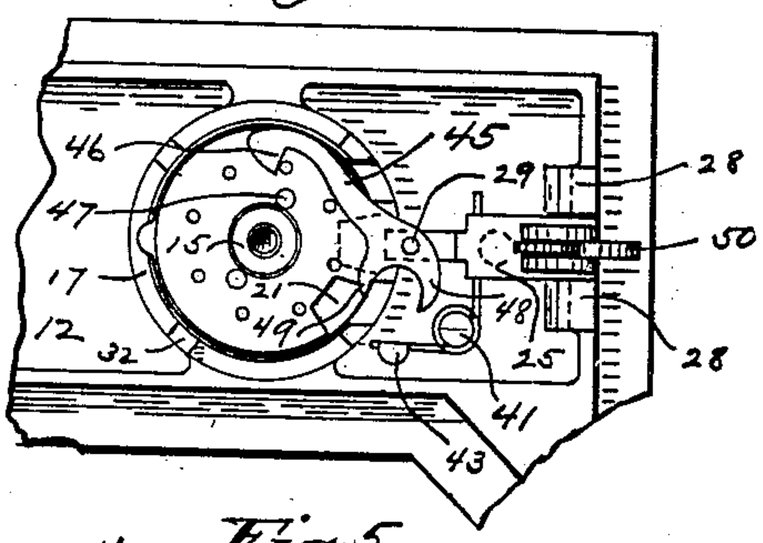


Fig. 8.

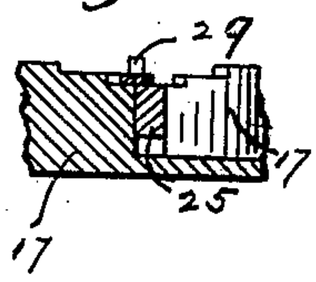


Fig. 9.

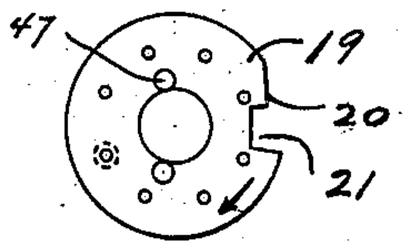


Fig. 11.

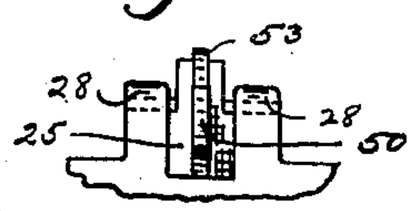


Fig. 5.

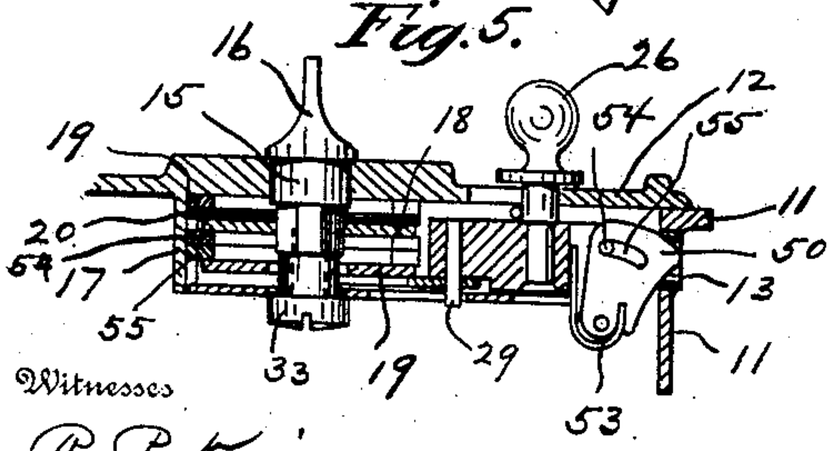
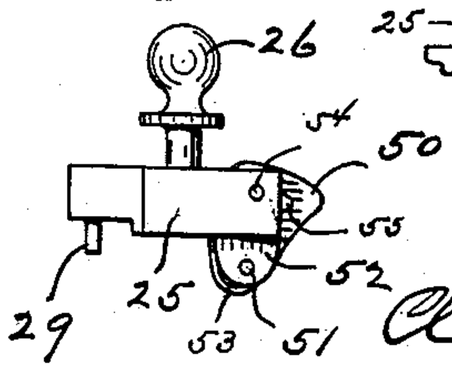


Fig 10.



Witnesses

P. P. King.

N. Allenny.

Inventor

Clarence S. Rice

By T. H. Lockwood

His Attorney

UNITED STATES PATENT OFFICE.

CLARENCE S. RICE, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO KEYLESS LOCK COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

KEYLESS LOCK.

No. 829,737. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed May 20, 1904. Serial No. 208,975.

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.

The object of this invention is to provide improvements in keyless locks, as indicated in the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a front elevation of the upper end of a door on which the keyless lock is mounted and the door-frame surrounding the same, the lower part being broken away. Fig. 2 is an inside elevation of a portion of the door shown in Fig. 1, showing the lock, parts being broken away. Fig. 3 is a similar view of the major portion of Fig. 2, the cover-plate being removed and the bolt being at its inward limit of movement. Fig. 4 is the same as Fig. 3, with the bolt at its outward limit of movement. Fig. 5 is a section on the line 5 5 of Fig. 2. Fig. 6 is a section on the line 6 6 of Fig. 2. Fig. 7 is a section on the line 7 7 of Fig. 2, showing means for holding the cover-plate in place. Fig. 8 is a section of parts on the line 8 8 of Fig. 3. Fig. 9 is a plan view of the inner tumbler. Fig. 10 is a side elevation of the bolt. Fig. 11 is an end elevation of the bolt and guiding means, part of the latter being broken away.

In the drawings herein, 11 is the door-frame, and 12 the door hinged thereto. The door-frame at one side has an opening 13 through it for the bolt, as seen in Fig. 5. The door-frame is omitted in Figs. 2, 3, and 4.

On the outside of the door an eight-pointed star-shaped figure 14 is provided, it being intergal with the door and elevated above the surface thereof. Centrally through the door and this star 14 a hole is bored, as shown in Fig. 5, through which an indicator-shaft 15 extends, which has on its outer end an indicator 16.

Within the door a casing 17 is provided, preferably integral with the door and extending therefrom concentric with the axis of the shaft 15. Within the casing 17 there are loosely mounted tumblers 18 and 19 of usual form and combined in the usual way with the shaft 15, and also the ring washers 54 and disk washers 55. There is nothing novel in the tumbler construction or arrangement, excepting the inner tumbler 19 has the corner 20 adjacent the bolt-notch 21 cut away, so that said tumbler will not engage with the end of the bolt while the bolt is moving away from the tumblers to the locking position, as will appear later. A single bolt 25 is employed in this lock, being slidably mounted with a knob 26 extending through a slot 27 in the door. Said bolt slides also through a recess between the two lugs 28, extending inward from the door. Those lugs guide the end of the bolt. The inner end of the bolt is guided by a slot in the casing 17, as seen in Fig. 8. The cover-plate 31 has two ends or portions, one end being circular to fit over the tumblers and within the casing 17. It is held down by prongs 32 integral with the casing 17 and bent down over the cover after the latter is in place. The outer portion of the cover-plate covers the bolt and other parts and holds them in place, the extreme outer end of the plate fitting in inwardly-facing notches in the lugs 28, as seen in Figs. 2 and 7. The cover-plate 31 when put in place is first inserted in said notches and then the circular end pushed into the casing 17 and the prongs 32 bent down upon it.

As shown in Fig. 11, the bolt 25 has a pair of upwardly-extending ears 52, and the cover-plate 31 has a slot at its outer end to accommodate said ears as the bolt is reciprocated. Said bolt extends laterally beyond said ears somewhat, so that the bolt may be said to be wider than the ears and furnish a shoulder on each side of the ears, against which the cover-plate 30 rests and bears. This is for the purpose of holding said bolt downward in position during its reciprocation. The slot in the plate, therefore, is not as wide as the bolt. The bolt has a pin 29 extending from it through the slot 30 in the cover-plate, whereby the movements of the bolt are limited. A screw 33 extends through the cover-plate and screws into a hole in the inner end of the shaft 15 for holding said shaft in place.

The bolt 25 is normally pressed outward by a spring 40, which is wrapped about a post 41, extending inward from the door and abutting against the cover-plate 31, whereby the spring cannot escape from said post. One end of the spring is held by a lug 43 on the

door, and the other end presses against the portion of the knob 26 that is adjacent the bolt. In its normal position the spring is as shown in Fig. 4, when the bolt is in its locked position. When the bolt is moved inward by a hand applied to the knob 26, its inner end passes into the notches 21 of the tumblers. When the tumblers are not set with the notches 21 registering with the end of the bolt, of course the bolt cannot be moved inward nor can the door be unlocked.

It is desirable for at least one of the tumblers to be automatically moved at the time of the outward or locking movement of the bolt, so that the notch 21 in it will not register with the bolt, and therefore the locking be automatically effected. This is accomplished by a hook 45 that is fulcrumed or pivoted on the pin 29 on the bolt. Said hook has an end 46, adapted to catch over a pin 47 in the tumbler 19, when the bolt is pushed inward to the unlocking position shown in Fig. 3. The hook is thrown into this position by an arm 48 on the hook engaging the outer side of the casing 17, as seen in Fig. 3. When the bolt is released by a person unlocking the door, the spring 40 immediately throws it outward into the position shown in Fig. 4. Such outward movement draws the hook 45 outward and the end 46 on the hook draws the pin 47 along with it, causing a partial rotation of the tumbler 19 from the position shown in Fig. 3 to substantially the position shown in Fig. 4. The sudden action of the spring 40 gives the hook a jerk outward, which causes it to give a sudden movement to the tumbler. With the tumbler thus thrown around into the position shown in Fig. 4 the locking is automatically effected, for then the bolt cannot be retracted until the tumblers are again set in position. This movement of the tumbler 19 to the locking position could not be effected without the corner 20 of said tumbler being cut away so that the tumbler could move when it was given the sudden rotary movement by the hook, and as the bolt is thrown by the spring to its outer position another arm 49 on the hook 45 engages the inner surface of the casing 17, and that throws the end of the hook 45 up and out of the way of any pins on the tumbler 19 during the rotation of said tumbler by a person working at the lock from the outside. It is only after the tumbler 19 is again set in proper position and the bolt forced inward that the hook will again drop down into the position shown in Fig. 3.

The bolt has on its extreme outer end a pivoted catch 50, fulcrumed by the pin 51 between the ears 52, extending inward from the bolt 25. The catch is normally forced outward by a flat spring 53 that has one end extending in a notch in the catch 50, and the spring then is bent over the fulcrumed portion of the catch and the other end extends into the recess in the outer end of the bolt in which said catch 50 operates. This spring action throws the nose of the catch outward into the hole 13 of the door-frame. The outward movement of said catch is limited by a pin 54 from the bolt that extends through a slot 55 in the catch and is curved concentric with the pivot 51 of the catch. The advantage of this spring-controlled catch on the end of the bolt is that the door can be closed without the bolt being retracted. The catch 50 will retract sufficiently to permit the door to be closed without any movement inward of the bolt, for, as we have seen, the bolt cannot be moved inward again until the tumblers are reset. This results from the locking movement of the tumbler 19 when the bolt is released. When a person opens the door, he first sets his tumblers in position and then with his fingers on the knob 26 forces the bolt inward, thus disengaging the nose of the catch 50 from the door-frame. He then opens the door and immediately releases his hold on the knob 26. The spring 40 immediately throws said bolt outward into a locked position and the tumbler 19 is automatically moved into a locked position, so that the locking operation is effected as soon as he releases his hold on the knob 26 and before the door is closed, and, as stated, the arrangement of the catch 50 permits him to close such locked door without unlocking or releasing the bolt.

The outer face of the catch 50 is inclined so that when it engages the door-frame the latter will force the catch laterally and inwardly against the bolt until it passes the door-frame and enters the hole 13 therein. It is then impossible to open the door until the bolt is moved. In the use of such a lock the door-frame is embedded in a suitable construction surrounding it which renders the hole 13 in the frame, as well as the catch 50, inaccessible to anybody.

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

1. In a keyless lock, a tumbler with a pin extending therefrom, a bolt movable into and out of engagement with said tumbler, a hook pivoted on the end of said bolt having one end adapted to engage the pin on the tumbler when the bolt is moved inward, the other end of said bolt provided with a pair of oppositely-extending arms, and means for engaging said arms as the bolt is moved inward to force the hook into engagement with the pin on the tumbler and for throwing the hook out of the path of the pin on the tumbler when the bolt of the lock is moved outward.

2. In a keyless lock, a tumbler with a pin extending therefrom, a casing in which said tumbler fits and operates, a bolt movable through a slot in said casing into and out of engagement with said tumbler, a hook pivoted on said bolt with one end adapted to

engage the pin on the tumbler when the bolt is moved inward, a pair of oppositely-placed arms extending from the other end of said hook, one arm within the casing and the other outside the casing, the outside arm adapted to engage the casing when the bolt is moved inward to force the hook into engagement with the pin on the tumbler, and the inside arm adapted to engage the inside of the casing as the bolt is moved outward to throw the hook out of the path of the pin on the tumbler.

3. In a keyless lock, the combination with a bolt that is slotted at its outer end and with a pair of ears extending up on each side of said slot, of a catch fitting in said slot and pivoted in said ears and having a notch in it outside of its pivotal point, a spring fitting in said notch and bent over the pivoted end of the catch and extending into the slot in the bolt, a slot in the catch concentric with the pivotal point of the catch, and a pin extending from the bolt through the slot in the catch.

4. The combination with a door, of a set of tumblers, a casing for said tumblers with inwardly-extending prongs, a bolt controlled by said tumblers, a lug on the door on each side of said bolt for guiding the bolt, each lug being provided with a notch facing said casing, and a cover-plate for said tumblers and bolt, one end of which is circular for fitting over the tumblers in the casing so as to be held down by the prongs on the casing, and the other end of said plate fitting in the notches in said lugs.

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

CLARENCE S. RICE.

Witnesses:

V. H. LOCKWOOD,

N. ALLEMONG.