A. LEE.

DOOR LOCK.

APPLICATION FILED NOV. 8, 1910.

1,000,527. **Patented Aug. 15, 1911.**

Fig. 1.

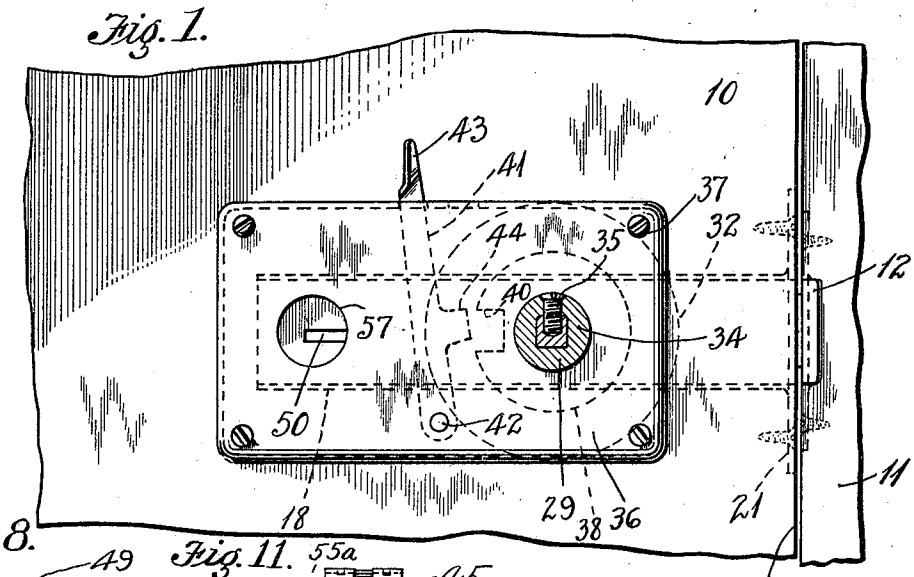


Fig. 8.

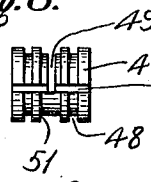


Fig. 11.

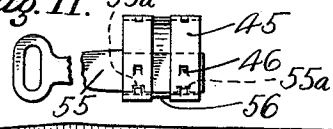


Fig. 2.

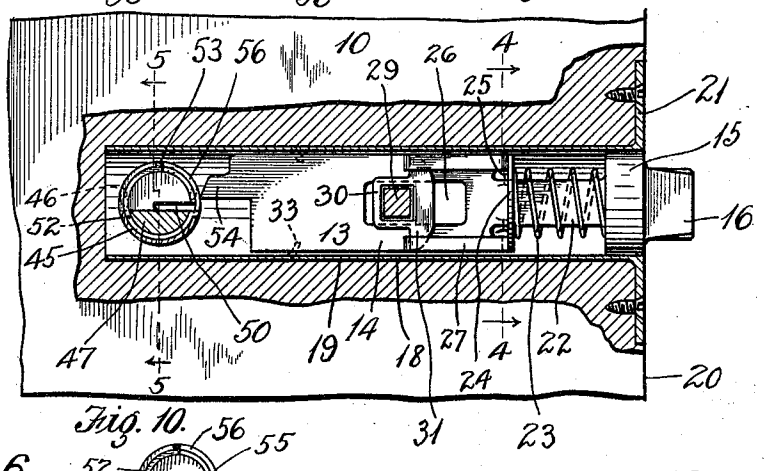


Fig. 5.

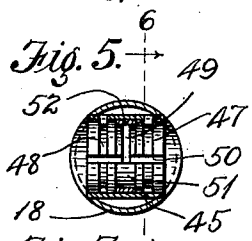


Fig. 7.

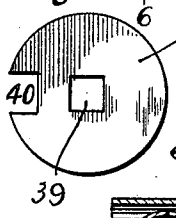


Fig. 10.

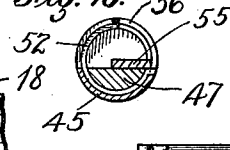


Fig. 6.

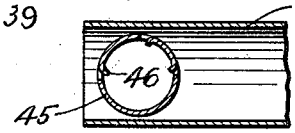


Fig. 3.

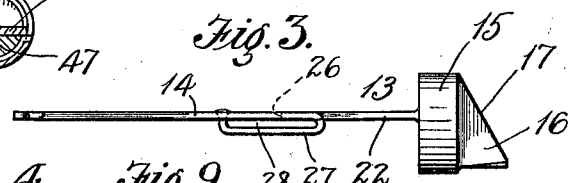


Fig. 4.

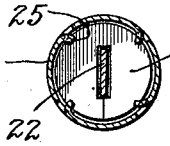
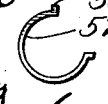


Fig. 9.



Witnesses.

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DOOR-LOCK.

1,000,527. Specification of Letters Patent. **Patented Aug. 15, 1911.**

Application filed November 8, 1910. Serial No. 591,244.

To all whom it may concern:

Be it known that I, ANTON LEE, a citizen of the United States, residing at Los Angeles, county of Los Angeles, State of California, have invented new and useful Improvements in Door-Locks, of which the following is a specification.

This invention relates to door locks and the object of the invention is to produce a lock of simple construction having a single blade which can be controlled as an ordinary latch by means of a knob and which can also be controlled by a key so that a single bolt performs the function of latch and lock bolt. The bolt is housed in a cylindrical barrel which enables the lock to be set in the edge of the door in a bored hole and in this way the amount of work ordinarily necessary with a chisel to form the recess for the lock is greatly reduced.

In the drawing forming a part of the annexed specification, Figure 1 is a side elevation showing a portion of a door to which my lock is applied, showing also a portion of the jamb and showing the neck of the adjacent knob in cross section. Fig. 2 is similar to Fig. 1 but shows the material of the door broken away with the case of the lock in longitudinal section so as to disclose the inner construction. Fig. 3 is a plan or upper edge view of the bolt removed from the lock. Fig. 4 is a cross section through the lock taken on the line 4—4 of Fig. 2 and illustrating the manner of seating the spring which tends to force the bolt outwardly. Fig. 5 is a cross section through the rear portion of the lock taken on the line 5—5 of Fig. 2. Fig. 6 is a longitudinal section taken at the rear end of the lock on the line 6—6 of Fig. 5 and showing details of the construction, a portion of the mechanism being removed. Fig. 7 is a side elevation of a tumbler which is carried by the spindle of the lock and which affords means for holding the spindle against rotation when desired. Fig. 8 is a side elevation of the main tumbler of the lock. Fig. 9 is a side elevation showing the tumbler ring which is carried by the tumbler and which is controlled by the key. Fig. 10 is a cross section taken through the barrel showing the key in the slot. Fig. 11 is a plan of the barrel detached and showing the key therein.

Referring more particularly to the parts 10 represents the door which coöperates with a jamb 11, said jamb having a suitable keeper 12 with which the bolt 13 of the lock coöperates. This bolt 13 has a body 14 in the form of an elongated plate and at its outer end this plate carries a rigid head 15 which is of round form, and beyond this head, a nose 16 is formed on the bolt having an inclined face 17 which enables the bolt to snap into position when the door is closed as will be readily understood. This bolt 13 is received in a cylindrical casing 18 which extends into a cylindrical bore 19 which is formed in the door by drilling in from the edge 20 of the door. And the edge 20 is provided with a recess which receives a counter-sunk end plate 21 which is rigid with the casing 18 as indicated.

Adjacent to the head 15 the bolt body is formed into a shank 22 of reduced width and around this shank there is received a coiled spring 23, the forward end of which thrusts against the rear face of the head 15. The rear or inner end of this spring thrusts against the washer 24 which is simply a disk, the edge of which seats against inwardly projecting spurs 25 struck in from the material of the cylindrical casing as shown in Fig. 4.

The body 14 is provided at a suitable point with a longitudinal opening 26 of rectangular form and adjacent to this opening the body is provided with longitudinally disposed straps 27 which are formed integrally with the bolt body so as to form elongated eyes 28 as shown. These straps 27 are disposed respectively above and below the opening 26. Through the opening 26 the shank 29 of the lock spindle passes said shank being of angular or square form and carrying a rigid collar 30. This collar 30 has toes 31 which project into the ends of the eyes 28 and are adapted to abut against the rear ends of the loops or straps 27. The arrangement is such that if the knob 32 is rotated in either direction one or the other of the toes 31 will force the bolt rearwardly so as to release the nose 16 thereof from the keeper.

In order to guide the bolt and keep the plate body 14 in a vertical position the interior of the cylindrical casing 18 is struck in to form guide spurs 33 engaging the edges of the body as indicated. Each of the knobs 32 is formed with a neck 34 which is attached to the spindle or shank 29 by a suitable set screw 35 as shown.

The face of the door is provided with an

escutcheon or face plate 36 which is secured in place by suitable fastening devices 27. Just under this escutcheon the spindle 29 of the door is provided with a tumbler disk or auxiliary tumbler 38 which has a square opening 39 receiving the spindle so that when the spindle rotates it will rotate the disk, and this disk has an enlarged notch 40 in the edge thereof as shown. On the inner side of the plate 36 a latch lever 41 is pivotally attached at 42 and the upper end of this lever projects above the escutcheon so as to form a handle 43 to enable the lever to be swung toward the tumbler disk 38 or away from the same. This lever has a dog 44 formed on the side thereof toward the disk 38 and this dog is adapted to come into the notch 40 to lock the tumbler disk against rotation. By means of this lever it will therefore be evident that the bolt can be locked from the inside of the door to prevent its being opened by rotation of the knob.

In the rear or inner end of the casing 18 a barrel 45 is fixed, said barrel being of cylindrical form as shown in Fig. 6 and having a plurality of inwardly projecting spurs 46 struck therefrom for the purpose of retaining a tumbler 47, said tumbler having circumferential grooves 48 formed therein, into which these spurs project to retain the tumbler as will be understood. This tumbler is clearly illustrated in Fig. 8. It is formed at its middle point with a bolt-slot 49 which extends half way through it in a plane at right angles to its longitudinal axis and it is provided also with a longitudinal key-slot 50 which extends longitudinally throughout its entire length, the inner edge or bottom of this slot lying near the axis of the tumbler. In other words these slots 49 and 50 are radial slots disposed at right angles to each other.

The middle portion of the tumbler is formed into a wide circumferential groove 51 and in this groove there is received a tumbler ring 52 which is illustrated in Fig. 9; this ring 52 is not a complete circle but passes substantially three-quarters of the way around the tumbler and is formed at its ends with outwardly projecting lugs 53 for a purpose which will appear more fully hereinafter. This tumbler ring occupies the groove 51 and may cover or uncover the bolt-slot 49. When it uncovers the bolt slot it permits the bolt 13 to move rearwardly. This arrangement will appear from inspection of Fig. 2 in which the rear end of the bolt is formed with a rearwardly projecting nose 54 which normally lies adjacent to the slot 49 and in alinement therewith. The barrel 45 has a slot 56 in alinement with the slot 49, as shown in Fig. 2.

When it is desired to lock the bolt against rearward movement this can be accomplished by inserting a key 55 in the key slot 50 as indicated in Fig. 10. The edge of this key at the wide groove 51 engages with either of the lugs 53 so as to rotate the tumbler ring 52 when the tumbler is rotated; thus if the key is inserted with the tumbler ring in the position shown in Fig. 2 the key would be rotated in a left-hand direction, that is anti-clockwise, and when the barrel rotates through 90 degrees the edge of the key will strike the uppermost lug 53 and rotate the ring with the barrel through an angle of 90 degrees. This will project the ring across the slot 49 on the forward side of the barrel to prevent the nose 54 from passing rearwardly.

The key 55 has notches 55^a on its edge which permit the outer edge of the key to pass the spurs 46 as the key rotates. On account of the tumbler ring it is impossible to open the lock with a knife or similar flat instrument as the tumbler ring cannot be rotated. For if such an instrument were wide enough to strike the lugs 53 it would be prevented from rotating by the spurs 46 and if it were not so wide as this it would simply rotate the tumbler 47 without rotating the tumbler ring. The lugs 53 of the tubular ring projecting out through the slot 56 and the edges of the slot 56 are in the path of the lugs and limit the rotation of the ring in either direction.

The mode of operation is simple. When the tumbler is in the position shown in Fig. 2 there is no obstruction to prevent the nose 54 of the bolt from passing rearwardly through the slots 56 and 49. When the tumbler has been rotated by the key the tumbler ring moves on its forward side so as to place itself as an obstruction just behind the slot 56.

The general mode of operation of the lock will now briefly be described. When the parts of the lock are in the relation shown in Fig. 2 the bolt may be freely withdrawn by rotating either of the knobs 32 in either direction, it being understood that there is a knob on each side of the door as is usual. If it is desired to lock the bolt against being operated by the knob this can be accomplished by means of the lever 41 engaging the dog 44 in the notch 40, it being understood that in the normal position of the bolt the notch 40 is opposite to the dog. When it is desired to lock the bolt by means of the key, the key is inserted in the key slot 50 and actuates the tumbler ring 52 as described to obstruct the rearward sliding movement of the bolt. The head 15 is of round form so as to operate as a piston filling the end of the casing so as to exclude dirt and dust from the interior mechanism of the lock. In order to give access to the key slot 50 the escutcheon 36 is formed with a circular opening 57 as shown in Fig. 1.

Special attention is called to the fact that

with a lock constructed as described a single bolt operates as a latch and a lock and this bolt is normally controlled by the knobs of the lock but can be latched from the inside; and in addition to this the bolt can be locked against withdrawal by means of the key.

While I have represented the key slot 50 as of plain form it should be understood that this slot may be given any distinctive shape or figuration adapting the lock to be opened only by the key which will fit.

What I claim is:—

1. In a lock, in combination, a casing, a bolt sliding in said casing, a knob, means for actuating said bolt by said knob, means for locking said bolt against operation by said knob comprising a slotted tumbler and means for covering the slot in said tumbler for locking the said bolt against operation by said knob.

2. A lock comprising, in combination, a casing, a bolt mounted to slide in said casing, a knob for actuating said bolt, a tumbler having an opening to accommodate the bolt, a member mounted in said casing and capable of covering said opening, and means for controlling said member by a key to throw the same over the opening to lock said bolt against withdrawal.

3. In a lock, in combination, a casing, a bolt sliding in said casing and having a nose at the rear end thereof, a tumbler disposed in the path of said nose, and a movable part operable on said tumbler adapted to be controlled by a key to obstruct the path of said nose, and a knob connected with said bolt for actuating the same.

4. In a lock, in combination, a casing, a bolt sliding longitudinally in said casing, a barrel disposed transversely of said casing, a tumbler in said barrel, said tumbler and said barrel having slots adapted to aline to permit a rearward movement of said bolt, a member movably mounted on said tumbler adapted to obstruct the path of said bolt to prevent the rearward movement thereof, and means for actuating said bolt.

5. In a lock, in combination, a casing, a bolt mounted to slide in said casing and having a longitudinal slot therein, a spindle passing through said slot, a collar carried by said spindle and engaging said bolt to withdraw the same by the rotation of said spindle, a spring tending to hold said bolt in an extended position, a transverse barrel mounted in said casing adjacent the rear end of said bolt and having a slot permitting the rear end of said bolt to pass rearwardly, a key operated tumbler mounted in said barrel, and means on said tumbler and also operable by key for obstructing said slot to prevent the withdrawal of said bolt.

6. In a lock, in combination, a casing, a bolt mounted to slide in said casing and having a longitudinal slot therein, a spindle passing through said slot, a collar carried by said spindle, and engaging said bolt to withdraw the same by the rotation of said spindle, a spring tending to hold said bolt in an extended position, a transverse barrel mounted in said casing adjacent the rear end of said bolt and having a slot permitting the rear end of said bolt to pass rearwardly, a key operated tumbler mounted in said barrel and tumbler ring for obstructing said slot to prevent the withdrawal of said bolt, a second tumbler fixed on said spindle and a movable lever coöperating with said last named tumbler to lock said spindle against rotation.

7. A lock comprising a casing, a bolt mounted to slide in said casing, a knob for actuating said bolt, a transverse casing extending across the path of the bolt, and having a slot therein adapted to receive a portion of said bolt when the mechanism is in unlocked position, a tumbler revolubly mounted in said casing and having a slot to coincide with the slot in said casing, a tumbler ring mounted in said casing and extending partially around said tumbler and operable only by a key, to permit the actuation of the said tumbler, the said transverse casing having projections preventing the turning of said tumbler ring except by the key.

In witness that I claim the foregoing I have hereunto subscribed my name this 1st day of Nov., 1910.

ANTON LEE.

Witnesses:
F. D. AMMEN,
EDMUND A. STRAUSE.