W. A. LURIE.

DOOR LOCK.

APPLICATION FILED AUG. 30, 1915.

1,243,433.

Patented Oct. 16, 1917.

2 SHEETS—SHEET 1.

Fig. 1

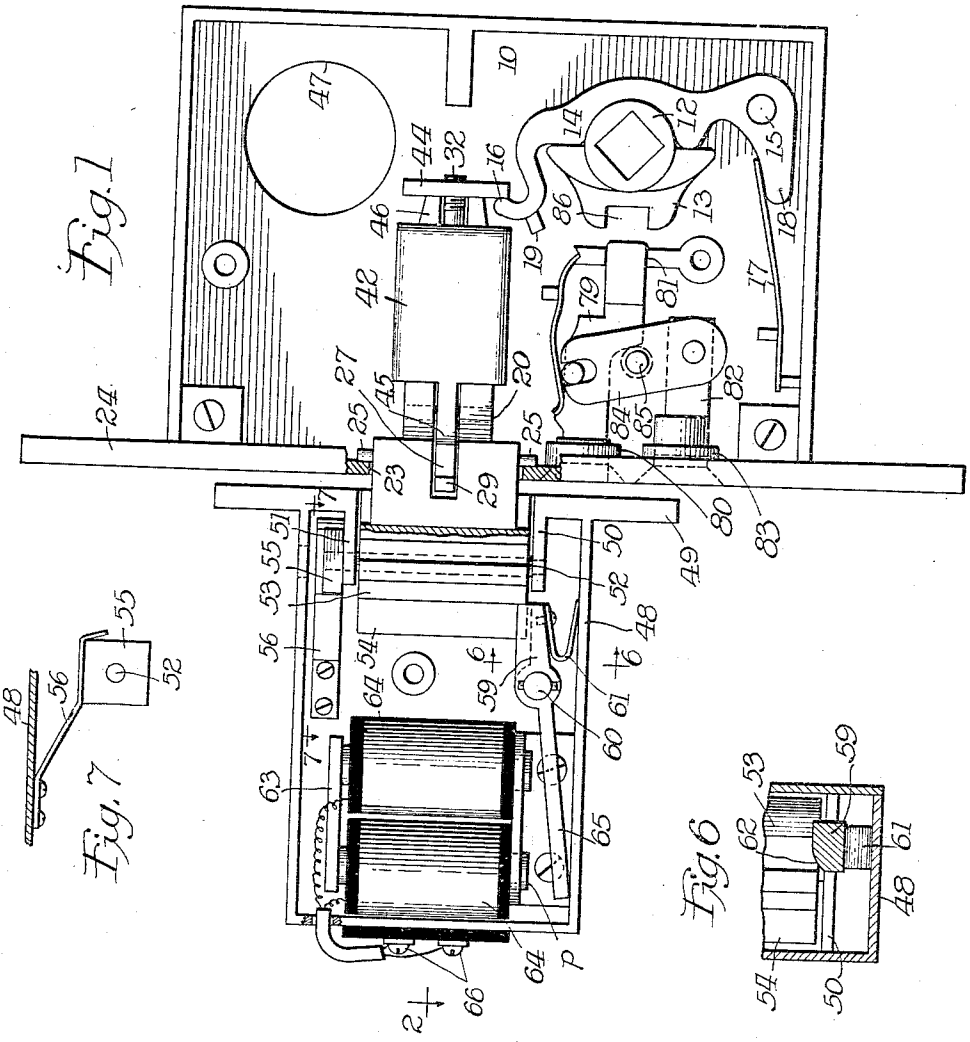


Fig. 7

Fig. 6

Witnesses:

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2 SHEETS—SHEET 2.

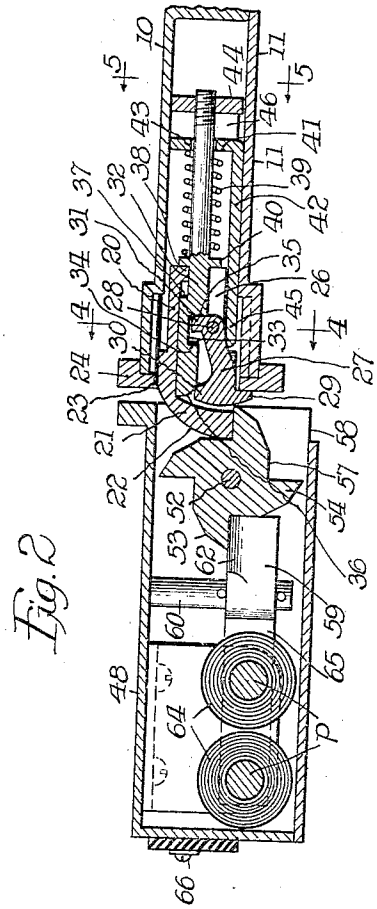


Fig. 2

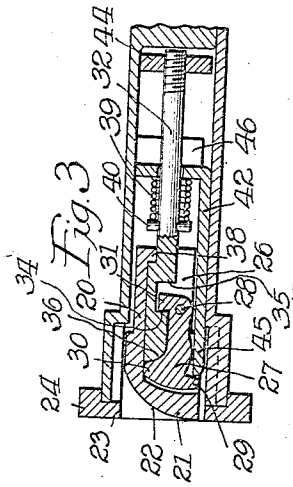


Fig. 3

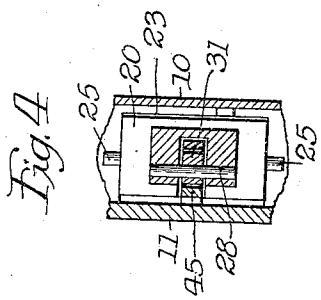


Fig. 4

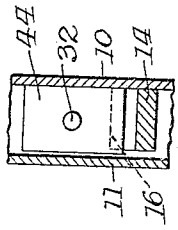


Fig. 5

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WILLIAM A. LURIE, OF CHICAGO, ILLINOIS.

DOOR-LOCK.

1,243,433. Specification of Letters Patent. Patented Oct. 16, 1917.

Application filed August 30, 1915. Serial No. 47,969.

To all whom it may concern:

Be it known that I, WILLIAM A. LURIE, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Door-Locks, of which the following is a specification.

My invention relates to locks and its object is to provide improved means for controlling the opening of the lock from a distance.

The features of my invention will be clearly understood by reference to the accompanying drawings in which—

Figure 1 is a plan view of the door and jamb lock sections with the top housing plates removed,

Fig. 2 is a sectional view on plane 2—2, Fig. 1,

Fig. 3 is a similar sectional view of the door lock part showing the bolt in its inner position,

Fig. 4 is a sectional view on plane 4—4, Fig. 2,

Fig. 5 is a sectional view on plane 5—5, Fig. 2,

Fig. 6 is a sectional view on plane 6—6, Fig. 1, and

Fig. 7 is a sectional view on plane 7—7, Fig. 1.

The door lock part comprises the rectangular housing box 10 for which the cover 11 is provided. Through the side walls of the housing the usual inlet openings are provided for the knob stems. Between these openings the inner and outer knob stem levers 12 and 13 are disposed, these being of the ordinary construction, the arrangement being for a divided knob stem whose inner section turns only the inner lever structure 12 and whose outer section turns only the outer lever structure 13. The operating lever 14 is pivoted at its lower end on the pin 15, its tip 16 coöperating with the bolt mechanism, as will be explained later. A spring 17 pressing on the foot 18 of the lever 14 tends to hold the lever against its stop 19. Turning of either knob section in either direction will swing the lever 14 to control the bolt mechanism.

Describing now the bolt mechanism, the bolt body 20 has the head 21 with the rounded entrance surface 22. The bolt is guided by the sides of the opening 23 in the escutcheon plate 24, and pins 25 extending from the upper and lower sides of the head limit the outward movement of the bolt. Within the chamber 26 formed in the bolt head and body is the detent pawl 27 pivoted at its inner end on the pin 28 extending through the body sides. The outer end of the pawl has the forwardly extending detent projection 29 and the rear cam extension 30. At its inner end it has the rearwardly extending arm 31. Extending into the chamber 26 behind the pawl is the releasing and locking bar 32 having the notch 33 in its front side for receiving the pawl arm 31 and providing the abutment shoulders 34 and 35 for engaging with this arm. The outer end of the bar 32 is rounded to provide the cam surface 36 for coöperating with the cam end 30 of the pawl. At its rear side the bar has the abutment shoulder 37 for coöperating with the abutment extension 38 on the bolt body to be limited in its movement outwardly of the bolt body. Surrounding the outer end of the bar is a compression spring 39 which abuts against the collar 40 on the bar and the inner side 41 of a box-like frame 42 which receives the bar and the rear end of the bolt body. The bar at its outer end extends through the opening 43 in the wall 41 and has secured thereto a plate 44, preferably screw-threaded thereon for purposes of adjustment. From the front wall of the frame 42 extends a tongue 45 for coöperating with the front side of pawl 27 to lock the pawl in its position entirely within the chamber 26.

Describing now the operation of the bolt mechanism, the end 16 of the lever 14 engages with the abutment plate 44. In Fig. 2 the bolt is shown out, the inner end of the bar 32 being above the cam end 30 of the pawl to hold the detent end 29 in front of the escutcheon plate to thus lock the bolt in its outer position. Upon turning of either door knob the bar will be shifted inwardly independently of the bolt body. Immediately upon such movement of the bar its front end will be drawn away from the pawl end, and then the shoulder 33 will engage with the arm 31 of the pawl and the pawl will be drawn into the chamber 26 to the position shown in Fig. 3. Then the shoulder 31 on the bar will engage with the projection 38 on the bolt body and the bolt itself will move inwardly. The frame 42 will be prevented from moving inwardly by the stop post 46 and during inward move-

ment of the bolt the front edge of the pawl will glide over the tongue 45 which will assist in shifting the pawl to its inner position, and then when the bolt is fully in the tongue will be in front of the pawl and will lock it in its position entirely within the chamber 26. When the door knob is now released the spring 39 will push the bolt structure outwardly until the bolt head is in its outermost position with its stop pins 25 engaging the escutcheon plate 24. The pawl is then free of the tongue 45 but still held in the chamber 26 by the shoulder 33 on the bar. When the bolt body stops the bar continues moving outwardly, its shoulder 33 releasing the pawl end 31 and its rounded front end 36 pushes against the cam end 30 of the pawl and the pawl is forcibly swung out of the chamber 26 to carry its detent end 29 into detent engagement with the front of the escutcheon plate. The shoulder 35 eventually reaches the pawl extension 31 and assures full outward movement of the pawl and the outer end of the bar is then behind the pawl end 30 and assists in holding the pawl out. The bolt is now locked in its outer position until the knob is turned or key mechanism, not shown, is actuated, an opening 47 being provided in the housing for the reception of suitable key mechanism.

The jamb mechanism for receiving the bolt head is arranged within a housing 48 which has the escutcheon plate 49. Extending into the housing from the escutcheon plate are two arms 50 and 51 for journaling a shaft 52 on which is secured a pawl cylinder 53 having a number of pawl extensions 54. One end of the shaft carries a block 55 which has as many sides as there are pawl extensions, and a spring 56 acting on this block serves to prevent accidental rotation of the pawl cylinder and to always hold the cylinder with one of its pawl arms extending outwardly, so that the rounded pawl back 57 will be in position to be engaged by the rounded surface 22 of the bolt, the escutcheon plate 49 being provided with an entrance opening 58 for the bolt. With this arrangement when the door is slammed or closed without turning of a knob or key the projecting bolt head will strike the back of the projecting pawl arm and will rotate the pawl cylinder until the spring 56 engages the next flat surface of the block 55, the next pawl arm being then brought to outer position to be in front of the bolt head. In order to prevent reverse movement of the pawl cylinder so that the bolt will remain blocked I provide a detent lever 59 pivoted on the post 60, this lever being adapted to swing in the direction of the pawl cylinder axis and engaged by a spring 61 which tends to swing it to bring its end against the back of one of the pawl arms when the pawl cylinder has been shifted into detent position with reference to the bolt. When the door is closed and the bolt engages the projected arm of the pawl cylinder, the front of the pawl in advance of the detent lever 59 will engage at its end with the rounded surface 62 of the lever and the lever will be cammed away from the pawl to allow turning thereof. But after the door is closed and the bolt is behind the then projected pawl arm the detent lever will again be in detent position behind another pawl arm and the bolt will be blocked and the door locked in closed position.

In order that the door may now be opened it will be necessary to positively release the pivot lever 59 from the pawl cylinder. In Fig. 1, electro-magnetic means are provided by means of which release of the detent lever may be controlled from a distance. A core frame 63 carries the winding spools 64 and the extension 65 on the detent lever 59 forms an armature for coöperating with the poles *p* of the electro-magnet. The winding of the electro-magnet spools connect with terminals 66 to which an electrical circuit may be connected to be controlled by a suitable switch located where desired. When the circuit is closed the armature extension 65 is attracted and the detent lever released from the pawl cylinder so that the door is free to be open, and in practice the door will have spring hinges or be otherwise controlled to open a distance after such release.

The usual means may be provided for locking the outer door knob section against turning. Such mechanism is shown in Fig. 1. A reciprocating bar 79 is guided by the passage of its button end 80 through the escutcheon plate and engages at its inner end in the guide slot 81. Below this bar is another bar 82 having the push button end 83 and these bars are connected by a lever 84 pivoted centrally to a pin 85, so that when the button 80 is pressed the bar 79 will move inwardly and when the button 83 is pressed this bar will be shifted outwardly. The door knob lever structure 13 has the slot 86 for receiving the inner end of bar 79 when this bar has been shifted inwardly, and during such locking engagement it will be impossible to turn the outer door knob.

On account of the positive locking of the lock bolt detent pawl in its outer position and the absence of trigger mechanism, it will be impossible to shift the bolt inwardly by prying between the door and jamb from the outside. It will also be impossible to reach the interior of the jamb mechanism from the outside to tamper with the pawl cylinder mechanism. My improved locking mechanism is therefore burglar-proof and unless one has a suitable key entrance can be had only by breaking the door or jamb.

I do not of course desire to be limited to the exact construction, arrangement and op-

eration shown and described as there may be modifications which would still come within the scope of the appended claim.

I claim as follows:

In locking mechanism of the class described, the combination of a door lock part having a bolt adapted to be locked in its outer position, a pawl cylinder having pawl arms adapted to extend into the path of said bolt, a shaft to which said pawl cylinder is secured, a polygonal block secured to the shaft end, a flat spring engaging with said block and tending to prevent rotation thereof and of the shaft and cylinder, a detent arm pivoted at an intermediate point and adapted to swing in a direction lengthwise of said cylinder, a spring tending to hold one end of said detent arm back of one pawl arm and above the next pawl arm whereby to lock the cylinder against movement which would release the bolt, the side of the detent arm engaging with said next pawl arm being beveled to permit outward swing of the arm when the cylinder is rotated by the bolt when the door is closed, the other end of said detent arm forming an armature, and an electro-magnet adjacent said armature end adapted when energized to attract said end to rotate the detent arm to release its other end from the pawl cylinder to permit rotation thereof and opening of the door.

In witness whereof I have hereunto set my hand this 26th day of August, A. D. 1915.

WILLIAM A. LURIE.

Witnesses:
CHARLES A. BASTAR,
E. BLUM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."