May 17, 1938. H. J. GODFRIED 2,117,715

LOCK AND LATCH

Filed June 17, 1936 2 Sheets-Sheet 1

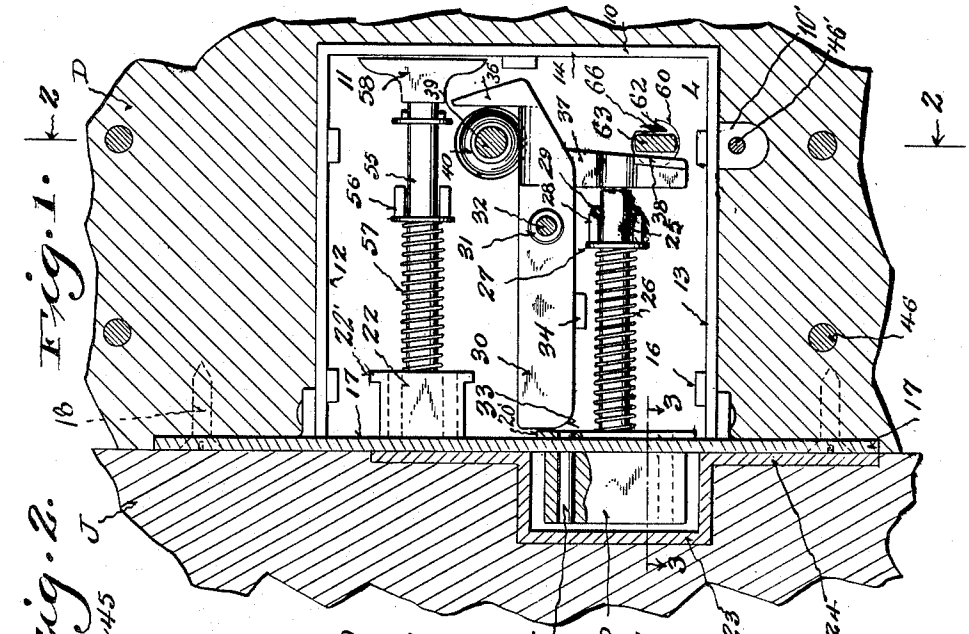


Fig. 1.

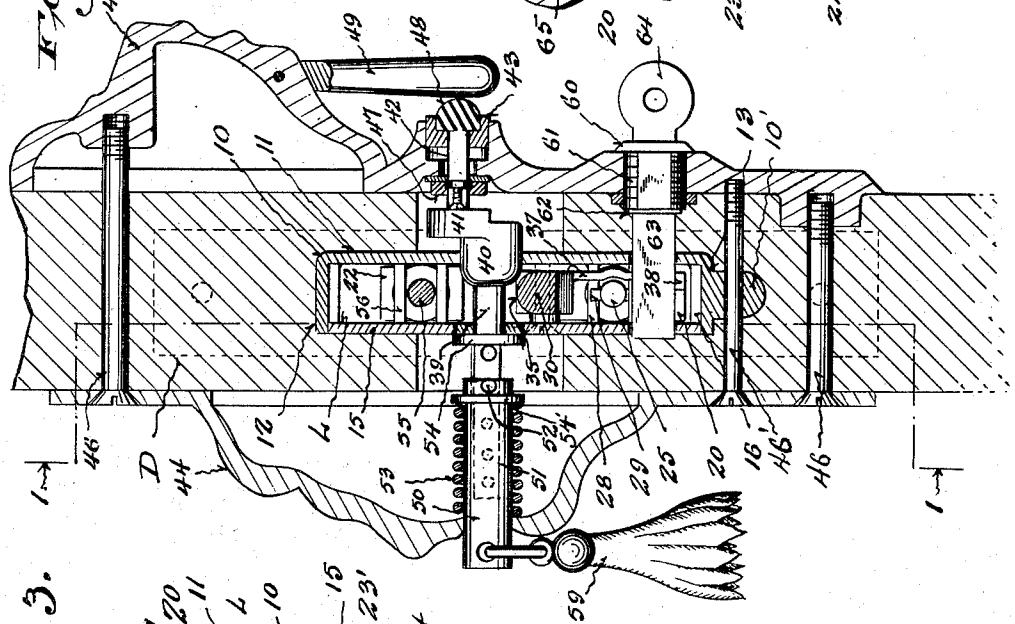


Fig. 2.

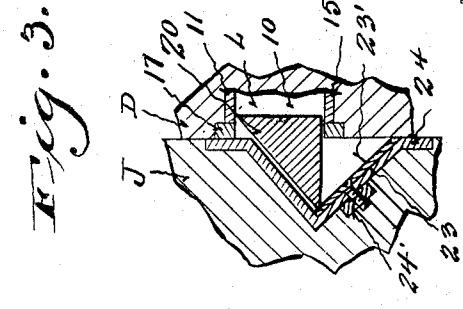


Fig. 3.

Inventor
H. J. Godfried
By Young & Young
Attorneys

May 17, 1938. H. J. GODFRIED 2,117,715

LOCK AND LATCH

Filed June 17, 1936 2 Sheets-Sheet 2

Fig. 4.

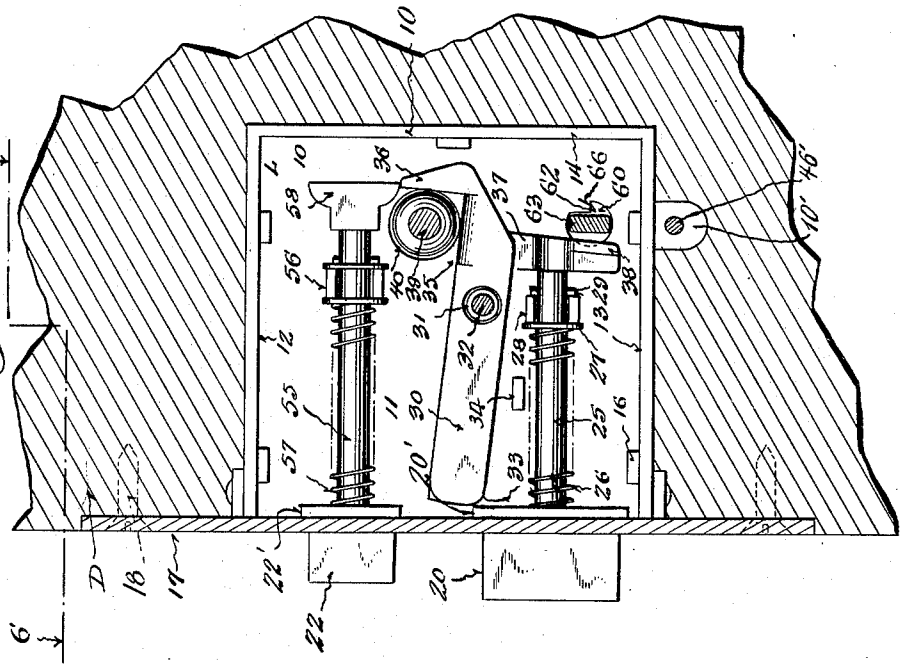


Fig. 5.

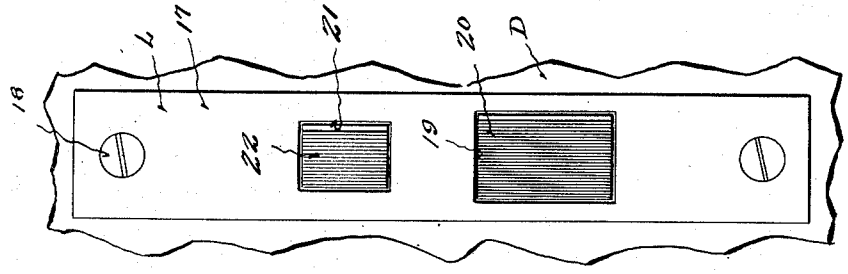
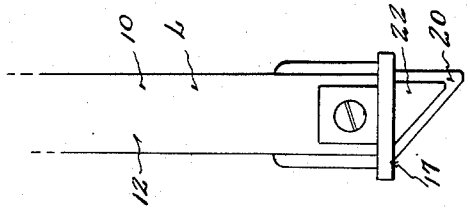


Fig. 6.



Inventor
H. J. Godfried
By
Attorneys

Patented May 17, 1938 2,117,715

UNITED STATES PATENT OFFICE

2,117,715

LOCK AND LATCH

Hiram J. Godfried, Milwaukee, Wis.

Application June 17, 1936, Serial No. 85,744

3 Claims. (Cl. 70—149)

This invention appertains to locks and latches for swinging closures, and more particularly to an improved type of door lock.

One of the primary objects of my invention is to provide a novel door latch, in which the door can be readily and quickly opened from the outside, without undue force, by mere pressure on an operating part of the latch, and from the inside of the door by merely pulling on the operating part of the latch.

Another object of my invention is the provision of novel means for forming the bolt and its keeper, whereby upon release of the bolt-holding means the bolt can be retracted by camming action between itself and its keeper upon opening movement of the door.

Another salient object of my invention is the provision of a device automatically operable upon the opening of the door, for moving the bolt-holding means to an inoperative position, whereby the bolt is freely movable upon the closing of the door, said device being moved out of the path of the bolt-holding means when the door is in its closed position.

A further important object of my invention is the provision of novel means for setting the operating part of the latch in such a manner that operation of the latch from the outside of the door by unauthorized persons will be prevented.

A further object of my invention is the provision of key-operated means for actuating the bolt-holding means from the outside of the door, when said operating part of the latch has been set to preclude exterior actuation thereof, so that the door can be opened by persons possessing the correct key.

A still further object of my invention is to provide an improved door-fastening device of the above character, which will be durable and efficient in use, one that will be simple and easy to manufacture, and one which can be placed upon the market and incorporated with a door at a small expense.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary vertical section through a door-jamb and door, showing my improved latch and lock incorporated therewith, the view being taken substantially on the line 1—1 of Figure 2.

Figure 2 is a transverse section through the door and latch taken substantially on the line 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is a detail horizontal section taken substantially on the line 3—3 of Figure 1, looking in the direction of the arrows, illustrating the construction of the keeper, and showing the position of the bolt when the door is in its closed position.

Figure 4 is a view similar to Figure 1, with the door in its open position, to illustrate the release of the bolt-holding means so that the bolt can be retracted upon the closing of the door.

Figure 5 is a fragmentary edge elevation of a door showing my improved latch incorporated therewith.

Figure 6 is a top plan view of the door latch, illustrating the position of the bolt and automatic releasing member for the bolt-holding device.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter J generally indicates a jamb for a door D, which is adapted to be normally held closed by my improved latch and lock mechanism L. The front edge of the door D is provided with a mortice for receiving the casing 10 of the lock and latch L, which can be formed in any preferred manner. As shown, the casing 10 includes a side wall 11, having formed thereon the top and bottom walls 12 and 13, and the rear wall 14. A removable cover plate 15 is provided for closing the casing, and this cover plate can be held in position by the use of suitable fastening elements. Formed on the casing are stop lugs 16, on which the cover plate is adapted to rest. Rigidly secured to the casing is a face plate 17, which is set into the front edge of the door, and secured thereto by screws 18 or the like. The face plate 17 is provided with an opening 19 for the bolt 20, and an opening 21 for the automatic releasing member 22 for the bolt-holding device, which will be later set forth.

At this point it is to be noted that both the bolt 20 and the automatic releasing member 22 have their outer faces beveled and arranged at an incline to permit the same to be forced inwardly during the opening and closing of the door. Outward sliding movement of the members 20 and 22 is limited by lips 20' and 22', respectively, which engage the inner face of the face plate 17. The door jamb J is provided with a keeper 23 for the bolt 20, and this keeper is counter-sunk within the door jamb, and can be

formed on a strike-plate 24, the strike-plate being adapted to be set into the face of the door jamb. As clearly shown in Figure 3 of the drawings, the keeper 23 is of a substantially V shape in horizontal cross section, for a purpose which will also be later set forth. As illustrated, one side of the keeper is provided with a removable wear plate 23', which can be held in place by a screw 24'. Obviously, plates of different thicknesses can be utilized, best suited for the bolt of the lock.

The bolt 20 is slidably mounted within the lock casing 10, and includes an inwardly extending shank 25. An expansion spring 26 is coiled about the shank, and one end of the same rests against the bolt head, and the other end against a washer 27. This washer 27 in turn rests against stationary guides 28 carried by the lock casing for the bolt shank. Thus the spring 26 functions to normally urge the bolt out of the lock casing and through the face plate 17. Outward movement of the bolt can also be limited by cross-pin 29 carried by said bolt and disposed in the path of the guide lugs 28. Rockably mounted within the casing 10 is the bolt-holding device or tumbler 30. The tumbler 30 adjacent to its rear end is rockably mounted upon a suitable bushing 31 carried by a cross-pin 32, which is rigidly connected with the lock casing. The forward end of the tumbler, due to its weight, is normally held in a lowered position, and in the path of the head of the bolt 20, and consequently normally prevents inward movement of the bolt.

The lower forward corner of the tumbler is rounded, as at 33, so that when the tumbler is partially raised, rear movement of the head of the bolt will cam up the tumbler, and thereby allow inward movement of said bolt. Downward swinging movement of the tumbler beyond a predetermined point is limited by a stop lug 34 arranged in the path of the tumbler. The tumbler in rear of the pivot pin 32 has its top face curved arcuately, as at 35, to form a cam surface, the purpose of which will also be later set forth.

Directly in rear of the cam surface 35 is an upwardly extending guide leg 36. Depending from the tumbler, in rear of the pivot pin 32, is the tail-piece 37, and it is to be noted that this tail-piece is arranged at one side of the bolt 20 so as not to interfere with the sliding movement of the bolt. The tail-piece 37 can also be provided with a right-angularly extending arm 38, if so preferred.

In order to provide means for actuating the tumbler 30, I provide a slide rod 39. This slide rod 39 extends transversely through the lock casing 10, and has formed thereon a rounded head 40 forming a cam face for engaging the cam face 35 of the tumbler. One end of the head 40 has formed thereon the radially projecting foot 41, which is normally disposed in the path of a push rod 42. The outer end of the push rod 42 carries a button 43. The door D is recessed on opposite sides of the lock casing 10 for the slide bar 39, and the push rod 42. These recesses are covered by the inner and outer escutcheon plates 44 and 45, which can be of any desired ornamental character. These plates 44 and 45 are held in place by bolts 46, which extend through the door. As shown, the bolts are placed in position from the inside of the door so that they cannot be tampered with from the outside.

The lock casing 10 has formed thereon a depending apertured lug 10' for the reception of a holding screw or bolt 46', which facilitates the centering of the various parts relative to one another, during the placing of the lock and the escutcheon plates on a door.

The push rod 42, and its button 43, are slidably carried by the outer escutcheon plate 45, and it is to be noted that the push rod is adjustably connected to the button so that the push rod can be adjusted within certain limits to permit the correct contact between the same and the foot 41 of the slide bar 39. An adjustable stop 47 is carried by the inner end of the push rod 42, so as to limit the outward movement thereof. If desired, a cushion head 48 can be carried by the button, and the button is adapted to be actuated by the person opening the door in any preferred manner.

In order to add to the appearance of my improved door-fastening device, the escutcheon plate 45 can carry a pivot knocker bail or handle 49, and the lower end of this knocker bail or handle is disposed in the path of the button 43, so that upon inward movement of the handle 49 the push button and its rod will be forced inwardly. Upon inward movement of the push rod 42 the same will engage the foot 41, and consequently move inwardly the slide bar 39 and its head 40. The engagement of the curved face of the head 40 with the curved edge 35 of the tumbler will cam the rear end of the tumbler downwardly, and thereby raise the forward end of the tumbler away from the head of the bolt 20, and permit the pushing open of the door.

When it is desired to open the door from the inside, the slide bar 39 is pulled by the operator, which will move the head 40 thereof into engagement with the rear end of the tumbler, and, as shown, the slide bar extends through the escutcheon plate 44. The length of the slide bar can be adjustable so that different thicknesses of doors and escutcheon plates can be taken care of. Hence, the outer end is slidably received within the bore of a sleeve 50. The sleeve 50 is provided with an opening, and openings 51 in the slide bar are adapted to register with any selected opening 51 in the sleeve, and these parts are thereafter held against independent movement by a set screw or the like 52.

The expansion coil spring 53 is placed about the sleeve 50, and the opposite ends engage against the escutcheon plate 44 and a collar 54' on the sleeve, which is held in place by the set screw or pin 52. This spring functions to normally hold the head 40 away from the tumbler 30 and foot 41 in engagement with the push rod 42. A collar 54 can also be carried by the slide bar for engagement with the lock casing to limit the sliding movement of the bar in one direction.

From the construction so far, it can be seen that the operation of the latch is as follows:—When it is desired to open the door from the outside, the button 43 is pushed inwardly, which will move down the rear end of the tumbler and lift the forward end of the tumbler, as heretofore stated. This movement is very slight, but is sufficient to raise the forward end of the tumbler enough to dispose the curved face 33 in the path of the head of the bolt. Upon continued pushing movement the cam face of the bolt head, riding on the inclined face of the keeper 23, will force the bolt inwardly, allowing the opening of the door with a single, continuous pushing movement.

The door is opened from the inside in substantially the same manner, the only difference being that a pull is exerted on the sliding bar. As soon as the slide bar is released, the same returns

to its normal position under influence of its spring 53, and hence the forward end of the tumbler will again drop in the path of the bolt head and prevent inward movement thereof.

In order to allow the inward movement of the bolt automatically upon the closing of the door, I provide novel means for actuating the tumbler. This means includes the member 22, and it is to be noted that this member includes the rearwardly directed shank 55. The shank 55 is disposed in parallel relation to the shank 25 of the bolt 20, and is mounted in suitable guides 56 carried by the lock casing 10. An expansion spring 57 is employed for normally urging the head of the member 22 outwardly beyond the free edge of the door D, and through the face plate 17. The extreme inner end of the shank 55 carries the cam 58, and this cam is adapted to engage the leg 36 formed on the rear end of the tumbler 30 when the member 22 is moved outwardly of the door, as shown in Figure 4 of the drawings. The engagement of the cam 58 with the leg 36 pushes down the rear end of the tumbler 30, and lifts up the forward end of the tumbler so that the bolt can be cammed inwardly when the bolt engages the strike plate 24 of the keeper 23. This position of the latch is clearly shown in Figure 4 of the drawings.

When the door is moved to its closed position, the member 22 is forced inwardly, and hence the cam 58 will be moved away from the leg 36. By referring to Figures 4, 5, and 6, it can be seen that the head of the bolt projects a greater distance beyond the face plate 17 than the head of the member 22. Consequently, the bolt will be moving inwardly by the time the head of the member 22 engages the strike plate 24. Thus the proper operation of the latch is insured.

At this point it is to be noted that the bolt 20, and the member 22, can be removed from the casing, and the position thereof reversed so as to dispose the cam faces of these members on the other side from that shown in Figure 5 of the drawings. This allows the latch to be associated with doors hung to move inwardly or outwardly.

In conjunction with the latch I provide novel means for preventing the operation thereof, when so desired, on the outside of the door by unauthorized persons. This means includes the foot 41, and by turning the slide bar 39 the foot 41 can be swung down, thereby moving the same out of the path of the push rod 42, so that inward movement of the push rod 42 will not actuate the slide bar. Thus when a person desires to lock the door against unauthorized opening, the slide bar 39 is turned from the inside of the door.

Means can be provided for releasably holding the slide bar 39 against accidental turning movement. In the present instance I have shown a weighted tassel 59 connected with the sleeve 50, and this tassel tends to hold the bar against rotation. The opposite sides of the tassel are preferably of different colors, so as to indicate to persons familiar with the device to know whether the door is locked or unlocked. If desired, means can be associated with one side of the tassel so that persons fingering the same in the dark will know whether the door is locked or unlocked by the position of the tassel. Obviously, the use of the tassel is optional, and any equivalent means can be utilized instead of the same.

When the foot 41 has been turned to its lowered position so that operation of the slide bar 39 is prevented by the push button 43, means is provided for permitting the operation of the latch by authorized persons. This means includes a pin tumbler lock 60. The barrel 61 of the pin tumbler lock is secured to the escutcheon plate 45 in any preferred manner, and rotatably supports the rotatable plug 62 of the lock. Formed on or secured to the plug 62, in any desired manner, is the inwardly extending arm 63. This arm 63 is disposed in the path of the tail-piece 37 of the tumbler. Consequently, when the correct key 64 is placed in the lock, and the plug 62 is turned thereby, the arm 63 will strike the tail-piece 37 and rock the tumbler 30 on its pivot pin 32. The rocking movement of the tumbler is sufficient to raise the forward end thereof, so that a push upon the door will permit the camming of the bolt 20. The wall of the opening in the lock casing for the arm 63 is provided with a stop 66 to limit the turning movement of the arm.

From the foregoing description, it can be seen that I have provided an exceptionally simple and novel form of door fastener, which can be conveniently and expeditiously operated. I prefer to embed hardened steel pins 65 in the head of the bolt 20 so that if an attempt is made by unauthorized persons to saw off the bolt head, the saw will encounter the hardened pins, and thereby prevent or delay the cutting of the bolt head.

Changes in details may be made without departing from the spirit or scope of this invention, but what I claim as new is:

1. In a door fastener, a normally spring-projected latch carried by the door, a tumbler, a pin rockably supporting the tumbler intermediate its ends, the forward end of the tumbler being normally disposed in the path of the head of the bolt to resist inward movement of said bolt, a cam face on the tumbler disposed in rear of the pivot, an operating bar slidably and rotatably carried by the door, a pull handle on one end of the bar, a cam head on the bar adapted to be moved into and out of engagement with the cam face of the tumbler, for rocking the tumbler on its pivot, a radially extending foot formed on the head, a push rod slidably carried by the door and disposed on the opposite face of the door from the pull handle, said foot being movable into and out of the path of the push rod whereby the bar can be operated from the push rod when the foot is in one of its positions, and a key-operated lock for actuating the tumbler when the foot is disposed out of the path of the push rod.

2. In a door fastener, a normally spring-projected bolt carried by the door, a tumbler, a pivot pin rockably supporting the tumbler intermediate its ends, the forward end of the tumbler being normally disposed in the path of the bolt to resist inward movement thereof, a cam face on the tumbler in rear of the pivot pin, a depending tail-piece on the tumbler below said cam face and in rear of the pivot pin, an operating bar rotatably and slidably carried by the door, a pull handle for said bar arranged on the interior of the door, a cam head on the bar movable into engagement with the cam face of the tumbler upon sliding movement of the bar, a push button carried by the exterior face of the door, a radially extending foot on the cam head movable into and out of the path of the push button by turning movement of the bar, and a key-operated lock disposed on the exterior of the door for engaging said tail-piece whereby to move the tumbler out of the path of the bolt.

3. In a door fastener, a normally spring projected bolt carried by the door, a tumbler, a

pivot pin rockably supporting the tumbler intermediate its ends, the forward end of the tumbler being normally disposed in the path of the bolt to resist inward movement thereof, a cam face on the tumbler in rear of the pivot pin, a depending tail piece on the tumbler below said cam face and in rear of the pivot pin, an operating bar rotatably and slidably carried by the door, a pull handle for said bar arranged on the interior of the door, a cam head on the bar movable into engagement with the cam face of the tumbler upon sliding movement of the bar, a push button carried by the exterior face of the door, and a radially extending foot on the cam head movable into and out of the path of the push button by turning movement of the bar.

HIRAM J. GODFRIED.