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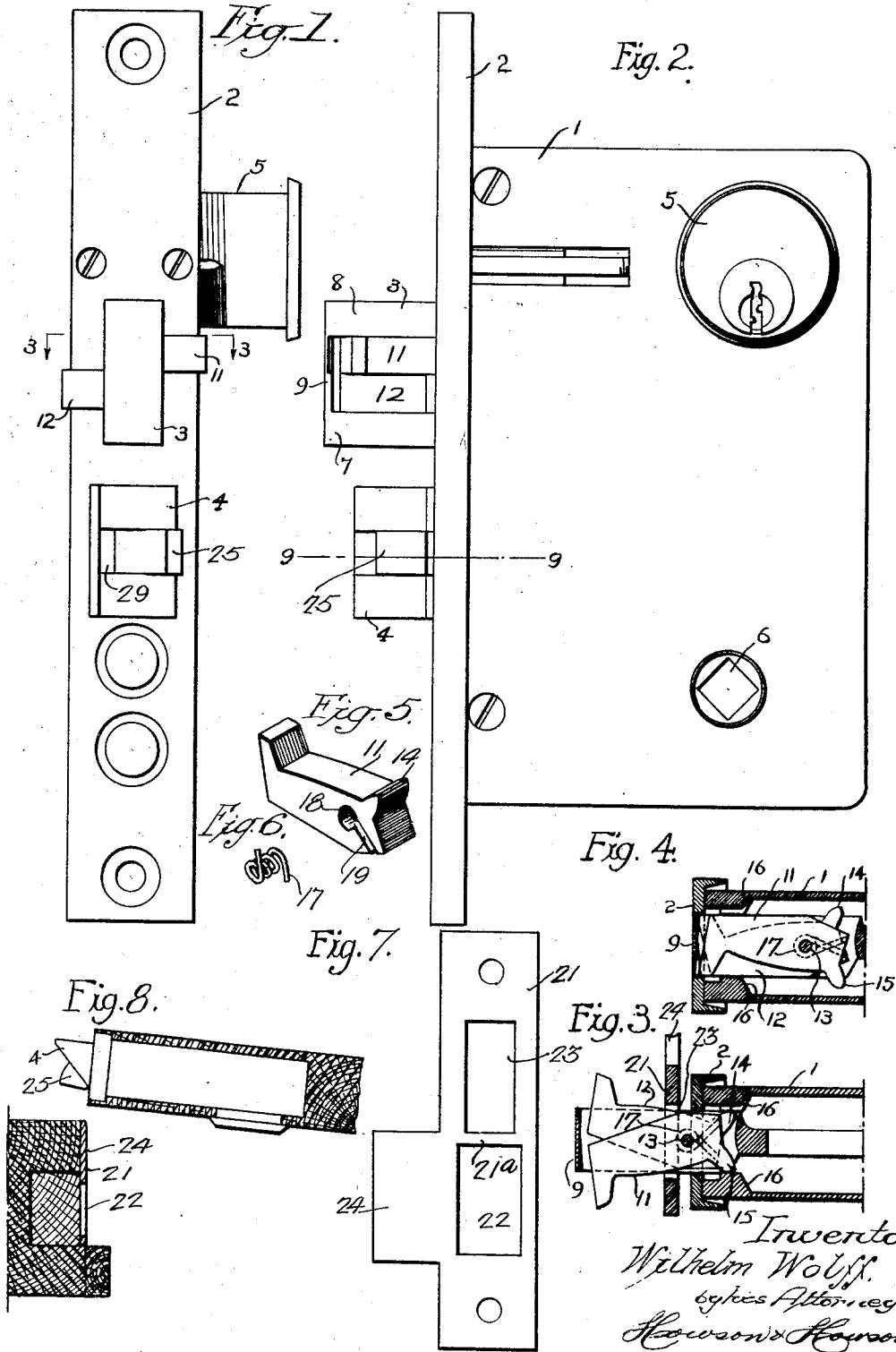
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1,777,951

LOCK

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2 Sheets-Sheet 1



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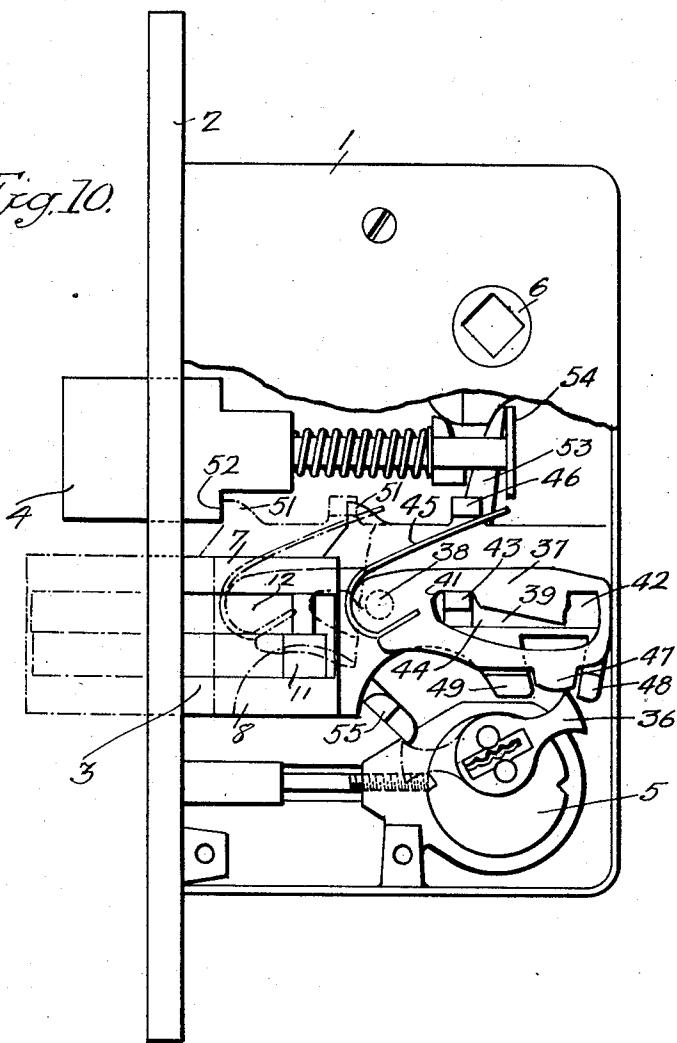
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Fig. 10.



## UNITED STATES PATENT OFFICE

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## LOCK

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This invention relates to improvements in locks, and more particularly to that class of locks known as "jimmy-proof."

The principal object of my invention is to provide a "jimmy-proof" lock adapted for use on swinging doors which shall have certain desirable structural and design and operating features which make it particularly effective for the purpose for which it is intended, as hereinafter set forth in detail.

In the attached drawings:

Figure 1 is a front view of a mortise lock made in accordance with my invention with the bolt extended;

Fig. 2 is a side view of the lock;

Fig. 3 is a section on the line 3—3, Fig. 1;

Fig. 4 is a sectional view similar to that of Fig. 3 but showing the bolt retracted;

Fig. 5 is a view in perspective of one of 20 the locking elements;

Fig. 6 is a view in perspective of the spring controlling the locking elements;

Fig. 7 is a rear view of the strike forming a part of the lock as a whole;

Fig. 8 is a sectional diagrammatic view 25 showing the lock as applied to a door;

Fig. 9 is a section on the line 9—9, Fig. 2, and

Fig. 10 is a face view of the lock with 30 the cover plate removed showing details of the operating mechanism.

With reference to the drawings, the lock may comprise the usual casing 1 which in the present instance is of the form adapted 35 to be set into a mortise in the door, the casing having secured at one edge a front plate 2 which lies flush with the outer edge of the door in well known manner. This plate 2 is apertured for the passage of a dead-bolt 3 and a latch-bolt 4, the bolt 4 normally occupying an extended position, and both of these elements are actuatable by mechanism within the casing 1 through the medium of a key inserted in a cylinder lock 5 detachably secured in the casing, as illustrated and in a manner well understood in the art. The latch-bolt 4 is also retractible by means of a handle having a shaft extending into a socket 6 in the casing. The lock in so far as de- 40 scribed above is in general of well known

type the general operation of which will be readily understood.

Referring now to Figures 2 to 4, inclusive, of the drawings, it will be noted that the dead-bolt 3, instead of being of the standard solid form, is composed of two side members 55 7 and 8 spaced apart and joined at their outer ends by means of a bridge 9. Within the space between the side bars 7 and 8 are pivotally mounted a pair of hooked elements 11 and 12 which, when the bolt is retracted, as shown in Fig. 4, lie in their outer portions entirely within the planes defined by the sides of the bolt so that no part thereof projects 60 beyond the faces of the side bars 7 and 8. 65

As shown in Figs. 3 and 4, the hooked elements 11 and 12 are pivotally mounted on a transverse pin 13 extending between the side bars 7 and 8 of the bolt and are provided at their inner ends with lugs 14 and 15 which, 70 when the bolt is retracted as shown in Fig. 4, are free to project beyond the planes of the side faces of the bars 7 and 8. When the bolt is advanced, as shown in Fig. 3, these projecting lugs 14 and 15 come into contact 75 with fixed abutments or shoulders 16, 16 in the casing 1 which are positioned in the path of the projecting ends of the lugs 14 and 15, with the result that as the bolt is forced outwardly, the lugs 14 and 15 are forced inwardly and toward each other, as shown in Fig. 3, 80 with the result that the outer hooked ends of the members 11 and 12 are projected beyond the planes of the side faces of the bars 7 and 8, and are held in this position by contact 85 between the lugs 14 and 15 and the sides of the casing. As the bolt is withdrawn into the casing and the lugs 14 and 15 clear the shoulders 16, the members 11 and 12 are permitted to return to their normal retracted 90 positions, which is accomplished promptly in the present instance by means of a spring 17 on the pin 13 seated in recesses 18 in the abutting faces of the said members with the extremities thereof secured in grooves 19 extending from the recesses. Not only does the spring function to immediately retract the members 11 and 12 when the lugs 14 and 15, 95 on the inward movement of the bolt, clear the shoulders 16; but it insures retention of 100

the members 11 and 12 in the retracted positions in the advance movement of the bolt until the said lugs actually engage the shoulders. This insures a proper operation of the bolt under all conditions.

5 In conjunction with the aforescribed lock, a strike plate may be employed, as shown in Figs. 3, 7, 8 and 9, this strike plate 21 being adapted to be secured in well known 10 manner to the door frame and having an opening 22 for reception of the latch-bolt and a second opening 23 for reception of the dead-bolt. It will be apparent that when the bolt 3 is projected through this opening 23 15 in the strike plate and into the recess in the door frame provided for its reception, the extended hook members 11 and 12 positively preclude retraction of the bolt through the opening 23 except in normal manner by 20 means of key or handle. Otherwise, the hook members 11 and 12 being held positively in the projected position prevent such withdrawal.

Opposite the opening 22 of the plate 21 is 25 the usual extension 24 which is engaged by the latch-bolt when the door is closed and which constitutes the "strike" proper. The latch bolt in the present instance is provided with a buffer 25 adapted to engage the strike 24 in advance of the bolt head and to largely 30 eliminate friction between the strike and the bolt parts.

The buffer 25 and its mounting is shown in Fig. 9. The buffer has an extension 26 the 35 outer cylindrical end of which is seated in a socket formed by a recess 27, in the upper edge of the lock casing 28, in conjunction with the plate 2 which surrounds the recess on two sides. The buffer, confined in the slot 29 in the bolt body, pivots about this point. The inner side of the buffer is provided with a concaved recess 31 into which projects a flange 32 on the bolt body. When the outer 40 face of the buffer is engaged by the strike 24, the buffer will be forced inwardly, pivoting as described, and the edge 33 of the recess 31, engaging the outer face of the flange 32 will exert a camming action thereon resulting in a retraction of the bolt body into the casing. 45 It will be noted that a recess 34 similar and opposite to the recess 27 is provided in the casing cover plate 35 which makes the latch-bolt with its buffer mechanism reversible in the casing. The form and mounting of buffer described above combine to produce a "long-throw" bolt action which is highly desirable.

The bolt-operating mechanism is illustrated in Fig. 10. The cylinder lock 5 has the 60 usual dog or lever 36 which when turned in one direction by means of a key is adapted to engage the inner end of the dead-bolt 3 and to move the entire bolt body forwardly in the casing to the position shown in broken lines. 65 The dead-bolt 3 is normally locked in the re-

tracted and extended positions by means of a locking member 37 pivotally mounted at 38 upon the bolt body. This member 37 has a longitudinal slot 39 with transverse portions 41 and 42 at the opposite ends which are 70 adapted to receive a lug 43 which projects upwardly from the lock casing through a longitudinal slot 44 in the body of the dead-bolt. A spring 45 on the member 37, which abuts a lug 46 on the dead-bolt body, tends to 75 retain the member 37 in the position shown in Fig. 10, and when in this position with the lug 43 occupying either of the recesses 41 or 42, it will be apparent that the dead-bolt will be locked temporarily against movement in 80 either direction. The member 37 has a part 47 projecting between upturned lugs 48 and 49 against the inner faces of which the dog or lever 36 operates in advancing and retracting the bolt. The dog or lever 36, however, 85 in being turned to actuate the bolt in either direction first engages the protecting part 47 of the locking member 37, with the result that the locking member is oscillated in a counter-clockwise direction, Fig. 10, around the pivot 90 38 to such an extent that the lug 43 is freed from the recess 41 or 42, as the case may be, thereby permitting by further movement of the actuating dog or lever 36 longitudinal movement of the dead-bolt in either the advanced or retracted direction. When the dead-bolt has reached either the fully advanced or retracted position, the actuating 95 lever 36 moves away from the bolt to permit the locking member 37 to move into the locking position.

It will be noted that the dead-bolt 3 has a lug 51 projecting therefrom which, when the bolt is advanced, as indicated in broken lines, takes a position in back of the shoulder 100 52 of the latch-bolt 4. With the dead-bolt locked in the advanced position as described above, it will be apparent that by reason of this lug 51, the latch-bolt 4 will also be locked in the advanced position and cannot be drawn 105 or forced in until the dead-bolt 3 has again been retracted.

As stated above, the latch-bolt 4 is of the long-throw type and the actuating mechanism described above also is designed to afford a long-throw of the dead-bolt 3. It 110 will be apparent that by a single turn of the key, the bolt 3 is projected from the casing to an extent far exceeding that obtainable by the usual bolt-actuating mechanism. A single turn of the key not only affords a long projection of the dead-bolt, but results in a rigid locking in position both of the dead-bolt and the latch-bolt.

The actuating lever 36 of the cylinder bolt 115 mechanism also is effective for retracting the latch-bolt 4 after retraction of the dead-bolt. This is accomplished through a common lever mechanism underlying the dead-bolt 3, one end 53 of which engages the rear end 54 120

of the latch bolt, while the other end 55 of the lever mechanism is engaged, as indicated in broken lines, by the lever 36.

Particular attention is directed to the form 5 of the bolt 3. This bolt as set forth above comprises the two side members 7 and 8, the outer end or bridge member 9, and the hook elements 11 and 12 pivotally mounted between the side members 7 and 8 and adapted 10 for transverse projection. In this type of swinging door lock, material advantages result from the transverse projection of the hooks as compared for example to projection from the narrow sides or ends of the bolt. As 15 described above, these locks comprise the dead-bolt and latch-bolt arranged end to end and in proximity. By means of the transverse hook arrangement this proximity of bolt and latch may be preserved so that full 20 advantage of the "jimmy-proof" feature is obtainable in a lock as compact in form as the same general type of lock without this feature. Transverse projection of the hooks is 25 also desirable by reason of bringing the hooks behind the relatively strong sides of the strike instead of the relatively weak bar portion 21<sup>a</sup> separating the openings 22 and 23, as would be the case were the hooks projected vertically from the narrow sides of the 30 bolt.

The bridge construction is also of advantage in that it protects the hooks and by reinforcing and strengthening the bolt as a whole makes practicable the "long throw" which 35 increases the "jimmy-proof" characteristics and is further desirable by reason of the fact that with a long bolt the efficiency of the lock is not affected by warping or shrinkage of the door or frame.

40 I claim:

1. In a lock, a casing, a latch-bolt, a spring normally resiliently holding said latch-bolt in the projected position, a buffer element operatively associated with said bolt, a recess in the casing, a projection on said buffer element pivotally seated in said recess and constituting a fulcrum about which the said buffer is adapted to pivot, a recess in the inner side of said buffer element, and a flange on said bolt projecting into said recess whereby the overlying portion of the buffer is adapted to engage the outer surface of the flange to force the bolt inwardly when the buffer is forcibly pivoted inwardly about said 55 fulcrum.

2. In a lock, a casing comprising an apertured end plate, said casing having in one edge a recess embraced on two sides by said end plate, a latch-bolt slidably mounted in the casing and normally projecting through the said end plate, a spring normally retaining the bolt in the projected position, a latch-bolt buffer element having a part pivotally seated and confined in said recess and having 65 a portion normally projecting through said

end plate to the exterior of the casing, said buffer having at its inner side a concaved recess, and a flange on said bolt projecting into said recess and adapted to be engaged by the overlying portion of the buffer element whereby when said buffer is pivoted inwardly of the casing by engagement with an external relatively fixed element, the said latch is forced into the casing.

3. In a lock, a casing comprising an apertured end plate, said casing having in one edge a recess embraced on two sides by said end plate, a latch-bolt slidably mounted in the casing and normally projecting through the said end plate, a spring normally retaining the bolt in the projected position, a latch-bolt buffer element having a part pivotally seated and confined in said recess and having a portion normally projecting through said end plate to the exterior of the casing, said buffer having at its inner side a concaved recess, a flange on said bolt projecting into said recess and adapted to be engaged by the overlying portion of the buffer element whereby when said buffer is pivoted inwardly of the casing by engagement with an external relatively fixed element, the said latch is forced into the casing, and means permitting an angular adjustment of 180° in the position of the latch-bolt and buffer element in the casing.

4. In a lock, a casing, a bolt, mechanism for projecting the bolt from the casing and for retracting the bolt, said bolt comprising spaced longitudinal bars, a pin extending between the bars at the base thereof, hooked elements pivotally mounted on said pin and normally occupying a position between the planes defined by the opposite longitudinal edges of said bars, means operative when the bolt is projected for causing said hooked elements to project beyond said planes, and a bar joining the outer ends of said longitudinal bars and protecting the outer ends of the hooked elements.

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