F. J. DOWLING.

LOCK.

APPLICATION FILED APR. 25, 1919.

1,387,245.

Patented Aug. 9, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

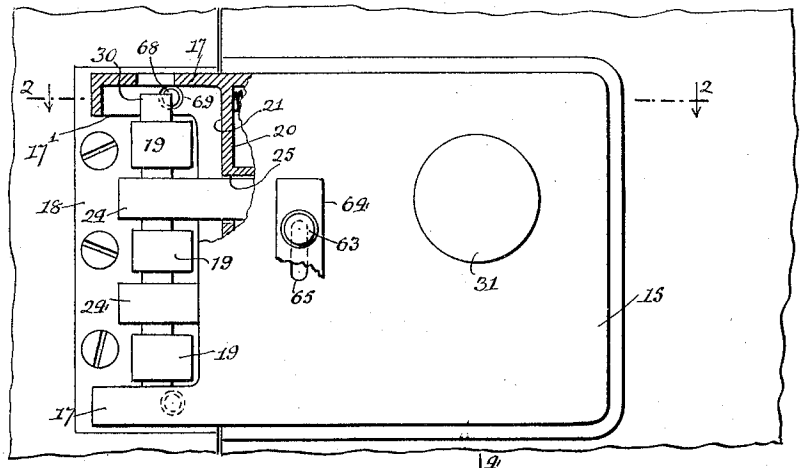


Fig. 2.

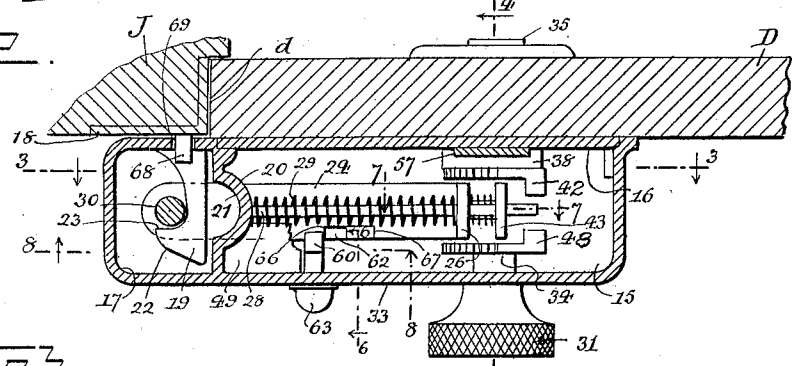
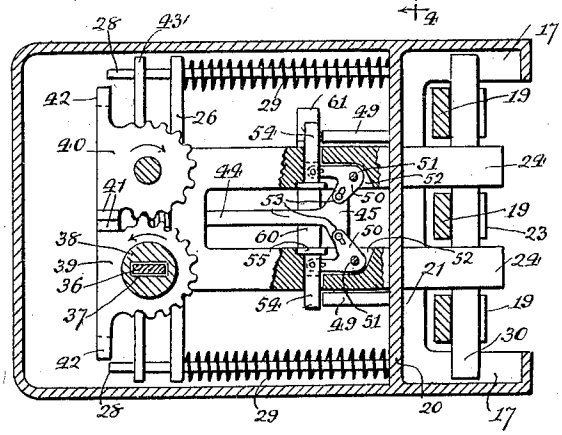


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 8.

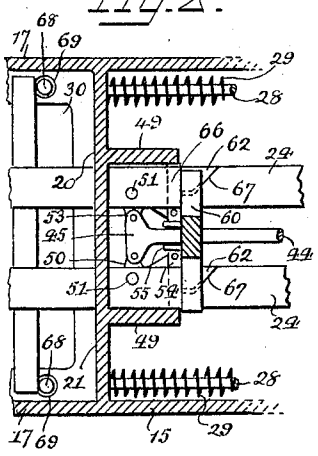


Fig. 4.

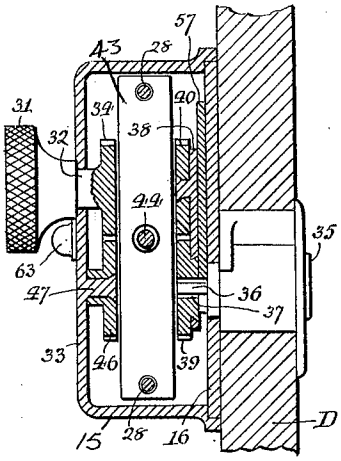


Fig. 5.

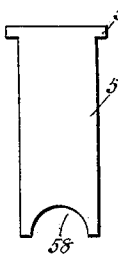


Fig. 6.

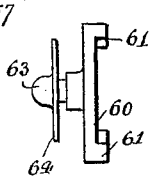


Fig. 9.

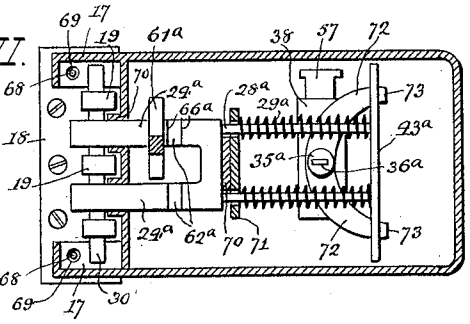


Fig. 7.

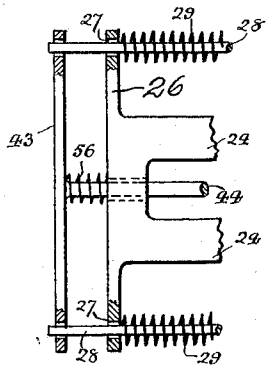


Fig. 10. Fig. 11.

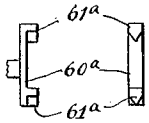


Fig. 12.

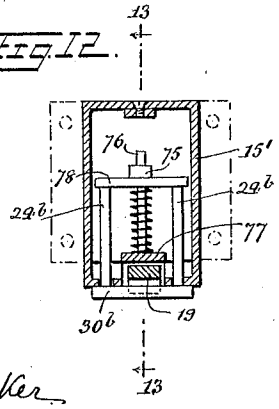
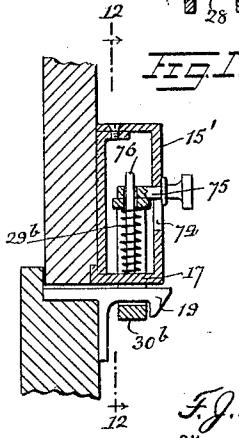


Fig. 13.



WITNESSES

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FRANCIS J. DOWLING, OF NEW YORK, N. Y.

LOCK.

1,387,245. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed April 25, 1919. Serial No. 292,540.

To all whom it may concern:

Be it known that I, FRANCIS J. DOWLING, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Lock, of which the following is a full, clear, and exact description.

This invention relates to builders' hardware and has particular reference to locks and latches for doors, window sashes, or the like.

Among the objects of the invention is to provide a lock having safety means for the purpose of preventing the surreptitious opening of a door locked thereby, by a jimmying action.

Another object of the invention is to provide for a lock a safety means serving automatically to close the key opening in the event that the key barrel be severed from the lock.

A further object of the invention is to provide a means whereby the sliding or bolt portion of the lock may be held in either of two different positions independent of the jamb devices, one of which positions is for the purpose of holding the bolt projected in position to be further projected by the door jamb while the other position is to prevent coöperation with the door jamb device.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a face view or elevation of one form of my improved lock indicating its position on the inside of the door, a portion of the lock casing being broken away.

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section on the line 3—3 of Fig. 2 looking in the opposite direction from Fig. 1.

Fig. 4 is a vertical transverse section on the line 4—4 of Fig. 2.

Fig. 5 is a side elevation of the safety plate.

Fig. 6 is a side elevation of my improved night latch keeper as it would be seen from the plane of the line 6—6 of Fig. 2.

Fig. 7 is a side elevation partly in section of the bolt structure on the line 7—7 of Fig. 2.

Fig. 8 is a vertical longitudinal sectional detail on the line 8—8 of Fig. 2, the jamb devices being omitted, though with the bolt held projected in its intermediate stage.

Fig. 9 is a vertical longitudinal section of a modified form of the invention.

Figs. 10 and 11 are side and edge views respectively of the form of latch keeper of Fig. 9.

Fig. 12 is a longitudinal section of a further modification on the line 12—12 of Fig. 13, indicating that adaptation of my invention suitable for cupboard doors, refrigerators, bookcases or the like; and

Fig. 13 is a longitudinal section on the line 13—13 of Fig. 12.

Referring now more specifically to the first set of figures I show a lock adapted especially for the entrance doors of apartments, dwellings, stores, or the like, controllable by a knob or its equivalent on the inside and a key on the outside. This lock comprises a casing 15 including an inner plate 16 adapted to be secured by any convenient or well known means to the inner surface of the door D adjacent to its striking edge *d*. I wish to state, however, that the lock may be adapted for use as a mortise lock without departing materially from the principal features of novelty and hence I do not wish to be limited in the use of the lock to that illustrated. The lock casing includes also a sort of hood 17 projecting beyond the striking edge of the door, the same being cut away on the inner face at 17′ except at the top and bottom along the door jamb J.

Registering with the cut-away 17′ when the door is closed is a strong plate 18 carrying one or more rigid horns 19 in the form of horizontal hooks adapted to project through the cut-away 17′ and into the hood portion 17 of the casing between the outer portion of the hood and an inner wall 20 having a concave seat 21, the vertical axis of whose concavity is substantially central of the casing and about in alinement with the striking edge of the door. As will be appreciated from Fig. 2 the horns are provided with bevels 22 sloping toward the wall and away from the door and having recesses 23 on the side thereof remote from the door.

The bolt structure in the principal forms of the invention comprises two parallel bolts 24 slidable horizontally or longitudinally of the casing 15 through holes 25 in the wall 20, the axes of the bolts defining a plane intersecting the axis of the concave seat 21 of said wall. The inner or heel portion of the bolt comprises a bar 26 projecting above and below the bolt and having holes 27 formed therein through which guide rods 28 fixed to the wall 20 project adjacent to the upper and lower edges of the casing. A pair of stiff coil springs 29 surround the guide rods 28 and, bearing against the wall 20 at one end and the bar 26 at the other end, tend to hold the bolt retracted into the casing. The outer ends of the bolt members 24 carry a bar 30 having a driving fit in the ends of the bolt members and adapted to seat in the concave seat 21 of the casing wall 20, when the bolt is in its innermost retracted position and in which position the door may be opened or closed freely without coöperation between the bar 30 and the horns 19.

Whereas in an ordinary lock the bolt is projected outward from the casing for locking it and is retracted into the casing for unlocking, in my improved lock the reverse action obtains and the bolt is projected outward bringing the bar 30 into coöperation with the beveled surfaces 22 of the horns so that when the door is being closed the bolt bar 30 will ride over the beveled surfaces 22 causing the bolt to be projected still farther into the casing into locking position, and so to unlock the door the bolt must be given an outward movement rather than an inward movement. It will be noted that the bolt has three positions, namely, an unlocked or retracted position, an outer or projected position and an intermediate or locked position.

The manipulation of the bolt may be effected either by means of a knob 31 journaled at 32 in the wall 33 of the casing 15 and connected to a gear 34 within the casing, or it may be manipulated from the outside of the door by the insertion of a key of any well known type into a barrel 35 which carries an inwardly projecting key bar 36 projectable into a slot 37 formed in a bracket 38 upon which are journaled a pair of gears 39 and 40. See Fig. 3. These gears have coöperating lugs 41 acting as positive stops limiting the rotation of the gears in one direction, and at their upper and lower extremities they are provided with lugs 42 adapted to bear against a plate 43 guided loosely upon the inner ends of the guide bars 28 while a central bar 44 fixed to the center of the plate 43 is guided outward through the center of the bolt bar 26 and having at its opposite end a cross head 45. The gear 34 meshes with a gear 46 journaled upon a stud 47 on the casing wall 33. These gears 34 and 46 have lugs 48 corresponding with the aforesaid lugs 42 to the lugs 42 of the outer pair of gears and are adapted for coöperation with the loose plate 43 when the knob 31 is turned.

At 49 I show a pair of horizontal abutment members fixed in parallel planes one above the other on the inner surface of the wall 20 just above and below the bolt elements 24 respectively. 50 indicates upper and lower dogs pivoted at 51 to said bolt elements respectively, the dogs being countersunk in recesses 52 formed in the sides of the bolts. These dogs are in the nature of bell cranks to one arm of each of which is pivoted at 53 the crosshead 45 of the releasing mechanism. To the free end of each dog 50 is pivotally connected a pin 54 slidable through the bolt member 24 and having a head 55 adapted to seat in a countersink in that side of the bolt adjacent to the other pin facing the opposite bolt. A spring 56 surrounds the releasing bar 44 between the bar 26 and the plate 43 and tends to hold the crosshead 45 drawn inward or in the direction to insure the coöperation between the pins 54 and the abutment members 49. It will thus be seen that the lock includes not only the coöperating bar 30 and the hook shaped horns 19, but also the coöperating pins 54 and abutment 49 serving to prevent unauthorized separation of the bar 30 from the horns.

In locks having a key barrel 35 and an inwardly projecting key bar 36 or their equivalent, burglaries have been committed as a result of the forcing loose of the barrel and bar portions of the lock giving direct access to the member having the slot 37 so that by introducing a screw driver or the like inward through the barrel opening and into the slot 37 the lock may be opened. To avoid this objection I provide a safety plate 57 having the lower end thereof at 58 bearing upon the rotatable barrel or the bar projecting therefrom. If the barrel and key bar 36 should be withdrawn the plate 57 will drop down between the bracket 38 and the casing wall 16 closing the opening and frustrating the attempt to introduce a tool into the lock. The upper end of the plate is provided with ears 59 which limit the downward movement of the plate by striking against the bracket 38.

The member 60 may be termed a keeper or night latch device, but in the form of the invention shown in the first set of figures this keeper is designed particularly for holding the bolt device temporarily in the outer of the two positions earlier described so as to engage with and slide over the beveled surfaces 22 of the horns when the door is to be locked. For this purpose the lugs 61 connected to the upper and lower ends of the keeper are brought down into notches 62

formed in the upper edges of the bolt members 24 by means of a finger piece 63 carrying a plate 64 slidable down over a slot 65 in the wall 33 of the casing, after the bolt members have been projected to such position by turning the knob 31 or the key. The outer ends of the notches 62 consist of square shoulders 66 while the inner edges are beveled at 67. When the parts are adjusted as shown in Fig. 8 the lugs 61 located in the notches 62 will bear against the square shoulders 66 and prevent the springs 29 from forcing the bar 30 into the concave seat 21. Hence when the door is closed thereafter the bar 30 will be engaged by the horns and carried outwardly and then inwardly into the locked position shown in Fig. 2. The beveled shoulders 67 will not prevent this outward movement of the bolt members and will cause the moving of the latch 60 into idle position where it will be held by friction between the plate 64 and the casing so that when the door is then unlocked again the bolt bar 30 may be retracted into its innermost position out of coöperation with the keeper hooks assuming that this lock is attached to a door fitted with an automatic closer and the door is to be kept unlocked during the day or for any other length of time there will be no interlocking or coöperating action between the bar 30 and the horns so long as the latch keeper is maintained in its idle position.

In view of the foregoing specific description of the mechanism the operation of the devices thus far described may be briefly set forth as follows: Following the description according to Fig. 8 the closing of the door will cause the locking thereof in the manner shown in Fig. 2 at which time rigid pins 68 carried by the angle plate with their axes parallel to the direction of movement of the door will be received into holes 69 formed in the inner wall portions of the overhanging hoods 17. While these pins are not absolutely necessary to the proper operation of the lock they coöperate with the other features to make the lock more effective in practice. The pins prevent movement of the lock casing in a direction parallel to the face of the door. The horns 19 being rigid and having positive interlocking coöperation with the bar 30 prevent movement of the lock directly away from the jamb which otherwise would permit the removal of the casing from the pins 68. Since the bolts 24 are held from outward movement when the lock is set or locked as shown in Fig. 2, by virtue of the nose pieces 54 and abutments 49, the interlocking bar 30 and horns 19 will prevent any attempt to spread the door jamb from the striking edge of the door by a jimmying action, and consequently it will be impossible for the door to be unlocked or opened in such an attempt. When, however, the door is to be unlocked by an authorized person by means of a key from the outside or by the turning of the knob 31 on the inside the plate 43 is first projected toward the bar 26 by either the lugs 48 or 42 and against the force of the spring 56, which being weaker than the springs 29 will cause the swinging of the dogs 50 around their pivots 51 and the withdrawing of the nose pieces 54 out of position to engage the abutments 49. Consequently the continued movement of the opening device, the key or the knob, against the force of the springs 29 will cause the bar 30 to be carried outward from the undercut seats 23 of the horns so setting free the door to swing on its hinges. The hood 17 may be omitted so far as the practical operation of the lock is concerned, but by its use a neater finish is afforded to the structure. After the door has been opened as just described the keeper 60 will be in its elevated or idle position, and if the lock is to be retained in its idle position the springs 29 will force the bar 30 back into its seat 21 where it will remain until it is desired to again lock the door. In this condition the door may be opened freely from the inside by pulling upon the knob, or from the outside by an inward push. From the foregoing it will be understood that the locking bolt is adapted to occupy with respect to the casing any one of three distinct stages, namely, the idle stage wherein the bar 30 lies in the cavity 21 allowing the door to swing freely without locking or catching; secondly, the locking or intermediate position as indicated in Figs. 1 and 2, and thirdly, the projected position as indicated in Fig. 8. In the locking or intermediate position the members 54 coöperate with the abutments 49 and prevent such movement of the bolt as would permit jimmying of the door, but in the intermediate stage of Fig. 8 the members 54 occupy a position between the ends of the abutments 49 and the cavity 21 so as to permit the bolt to move upward freely as it wipes over the faces 22 of the horns.

The structure of Figs. 9, 10 and 11 is in the main similar to that already described with respect to the bolt members 24^a, the horns 19, the plate 18 and the bar 30 carried by the bolt members. The casing is provided with rigid abutments 70 which limit the inward movement of the bolt members to the locking position as shown in Fig. 9. A pair of guide rods 28^a are fixed to the inner end of the bolt members and have secured to their other ends a plate 43^a through which the turning of the barrel 35^a by a key or otherwise will cause the projection of the bolt members for unlocking the same from the horns, against the force of main springs 29^a arranged around the rods 28^a and located between the plate 43^a and a plate 71 slipped loosely upon the rods 28^a and

abutting against the abutment 79. This form of the invention is provided also with the same safety plate 57 as above described for the closing of the key barrel opening in case the barrel should be forced out of place.

The night latch keeper 60^a of this form of the invention differs somewhat in that its lugs 61^a have positive coöperation in notches 62^a formed in the bolt members 24^a, there being provided square shoulders 66^a on both sides of the keeper and so positioned that when the bolt bar 30 is in interlocking or set position the keeper will not engage but when the bolt is to be held projected to prevent locking of the door the keeper is slipped into place between the shoulders, so that the bar will be positioned outward beyond and pass clear of the horns in the normal opening and closing of the door. The key operated member 35^a has connected to it a pair of arms 72 terminating in lugs 73 engaging over the face of the plate 43^a remote from the bolt so that when the key device is turned in either direction the bolt will be projected and unlocked from the horns.

In each of the principal forms of the invention the bolt in locking position is held positively by means auxiliary to the hook shaped horns from movement with respect to the casing, and consequently any attempt to jimmy the door will not only be frustrated but will fail to even cause the pulling of the bolt out of the casing or what might be termed the stretching of the bolt due to its interlocking engagement with the horns. I am aware that it is not broadly new to provide a door lock in which the bolt has an inherent tendency to retract toward the casing for locking purposes, but so far as I have been advised I believe it is broadly new to provide a lock having a bolt of this type having means auxiliary to the bolt to make the locking thereof positive so as to resist any jimmying tendency to spread the door from the jamb. More definitely stated in the first form of the invention such stretching action of the bolt is resisted both by the pins 68 and the abutments 49, while in the second main form of the invention such tendency is resisted by the pins 68. Without the pins, however, coöperating with the hood or casing projection in the simpler form of the invention shown in the drawings on sheet 2, there would be but a limited amount of stretching of the bolt because of the engagement between the hood and the bar 30 constituting a portion of the bolt means.

In the simpler form of the device shown in Figs. 12 and 13 the casing 15′ is provided with a simple slot 74 through which the knob shank 75 projects and threaded over a fixed bar 76 fixed to a portion 77 of the casing. The bolt members 24^b are combined with the bar member 30^b and are projected by the sliding movement of the finger piece along the slot 74 and against the force of a spring 29^b surrounding the rod 76 and bearing at one end against the casing member 77 while at the other end the spring bears against a crossbar 78 to which the inner ends of the bolt members 24^b are fixed. The single horn 19 is fixed to the door jamb and coöperates with the bolt devices in the manner already described when the door is closed or being closed.

I claim:

1. In a door lock, the combination of a casing having a portion projecting beyond the striking edge of the door, bolt means carried by the casing and projecting beyond the door within the projecting portion of the casing and movable inward automatically with respect to the casing into locking position, means carried by the casing to control the movement of the bolt means, a stationary plate for the door jamb, and rigid means carried by the plate and projecting therefrom perpendicular to the plane of the door for coöperation with said bolt means and the casing projection whereby relative movement between the casing, the bolt means and the plate is prevented in every direction when the door is locked.

2. In a door lock, the combination of a casing having an integral extension projecting beyond the striking edge of the door, a bolt movable in the casing and projecting into the extension, the outer portion of the extension lying in the path of movement of the bolt and serving thereby to limit the outward movement thereof, a rigid stationary member for the jamb toward which the casing extension moves while the door is being closed and rigid hook means carried by said stationary member around and with which the bolt interlocks within the casing extension by movement toward the casing, and means within the casing to control the movements of the bolt.

3. In a door lock, the combination of a casing for the door, a stationary member for the jamb, a hook shaped horn fixed rigidly to the stationary member, a bolt movable in the casing, means to cause the bolt to move inward with respect to the casing and engage in interlocking position around said horn, and rigid means auxiliary to the bolt and horn to positively prevent the stretching of the bolt from the casing by a jimmying action.

4. In a door lock, the combination of a casing for the door, a stationary member for the jamb, a hook shaped horn fixed rigidly to the stationary member, a bolt movable in the casing, means to cause the bolt to move inward with respect to the casing and engage in interlocking position around said horn, rigid means carried within the casing auxiliary to the bolt to lock the bolt in fixed position with respect to the casing when the bolt is interlocked over the horn, and man-

ual means to unlock the bolt from the horn, said manual means acting initially to release said auxiliary means, while a continued movement of the manual means will effect the unlocking of the bolt.

5. The herein described door lock comprising a casing, a relatively stationary member coöperating therewith, a bolt fitted slidably in the casing, said stationary member having a horn, means acting upon the bolt to automatically retract it toward and into the casing, means acting upon the bolt to cause it to engage over the horn on the side thereof remote from the casing under the force of said automatic retracting means during the locking action, means auxiliary to the bolt and horn serving to prevent unauthorized outward movement of the bolt with respect to the casing, and manual means to unlock the bolt from the horn, said manual means acting initially to release said auxiliary means, while a continued movement of the manual means will effect the unlocking of the bolt.

6. In a door lock, the combination of a casing, a bolt slidable therein, spring means acting upon the bolt tending to retract the same into the casing, rigid means around and over which the bolt engages and interlocks when moved inward into locking position, said rigid means having an inclined face, and a latch keeper coöperating with the bolt to hold it in an intermediate position for engagement with the inclined face of said rigid means and thereby cause said bolt to move outward over said rigid means, said latch keeper being automatically released from its holding position by said outward movement of the bolt.

7. In a door lock, the combination with a casing, bolt means movably carried within the casing and means acting through the casing upon the bolt means to control the action thereof and including a key barrel and key bar extension, of a safety member within the casing movable automatically into position to close the opening for the key barrel and key bar extension in the event of the barrel being forced from its position.

8. In a door lock, the combination with a casing, bolt means movable therein and means to control the movements of the bolt including a key barrel and key bar extension therefrom extending through one side of the casing, of means to bar access to the interior of the casing in the event of the removal of the key barrel and bar extension, said means including a plate movable automatically into position to close the opening leading to the interior of the casing.

9. In a door lock, the combination of a casing, movable locking members including a normally spring retracted bolt carried therein, means to control the action of the locking members, and a stationary jamb plate against which a portion of the casing is adapted to abut, means carried by said jamb plate interlocking with said spring retracted bolt to lock the door from movement in door opening direction, said jamb plate and casing having interlocking pins and holes to prevent relative movement between the casing and plate at an angle to said door opening direction.

10. In a door lock, the combination of a casing to be carried by a swinging door and having a hood portion projecting beyond the striking edge of the door, a bolt member slidable in the casing in a plane parallel to the door, the direction of movement of the bolt being inwardly with respect to the casing in locking action, means to control the action of the bolt member, a stationary plate adapted to be fixed to the jamb and against which the projecting portion of the casing is adapted to strike when the door is closed and means projecting from said stationary plate interlocking with said bolt to lock said door when the bolt is moved to a locked position, said projecting portion of the casing having a hole and the plate having a pin which is received in said hole when the door is closed, the axis of the pin being perpendicular to the plane of the door whereby the casing and plate are interlocked to prevent movement of the casing in any direction in the plane of the door.

11. In a door lock, the combination of a casing having along its edges projecting hood portions and between which is a cutaway, bolt means carried by the casing and projecting into the cutaway between the hoods, means carried by the casing to control the movement of the bolt means, a stationary plate for the door jamb and rigid means carried by the plate and projecting therefrom perpendicular to the plane of the door for coöperation with said bolt means and the hoods whereby relative movement between the casing and the plate is prevented in every direction when the door is locked.

12. In a door lock, the combination of a casing, a stationary member, a member carried by the stationary member and rigid with respect thereto, a bolt movable in the casing and adapted with respect thereto to occupy three distinct stages including an idle, inactive stage, automatic means to retract the bolt inward from intermediate to locking stage with respect to the casing to engage in interlocking position around said rigid stationary member, and means coöperating with the bolt and movable automatically into position to hold the bolt in locking stage.

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