Nov. 3, 1931. H. E. OLSON 1,830,288

LATCH FOR HINGED DOORS

Filed April 17, 1930 2 Sheets-Sheet 1

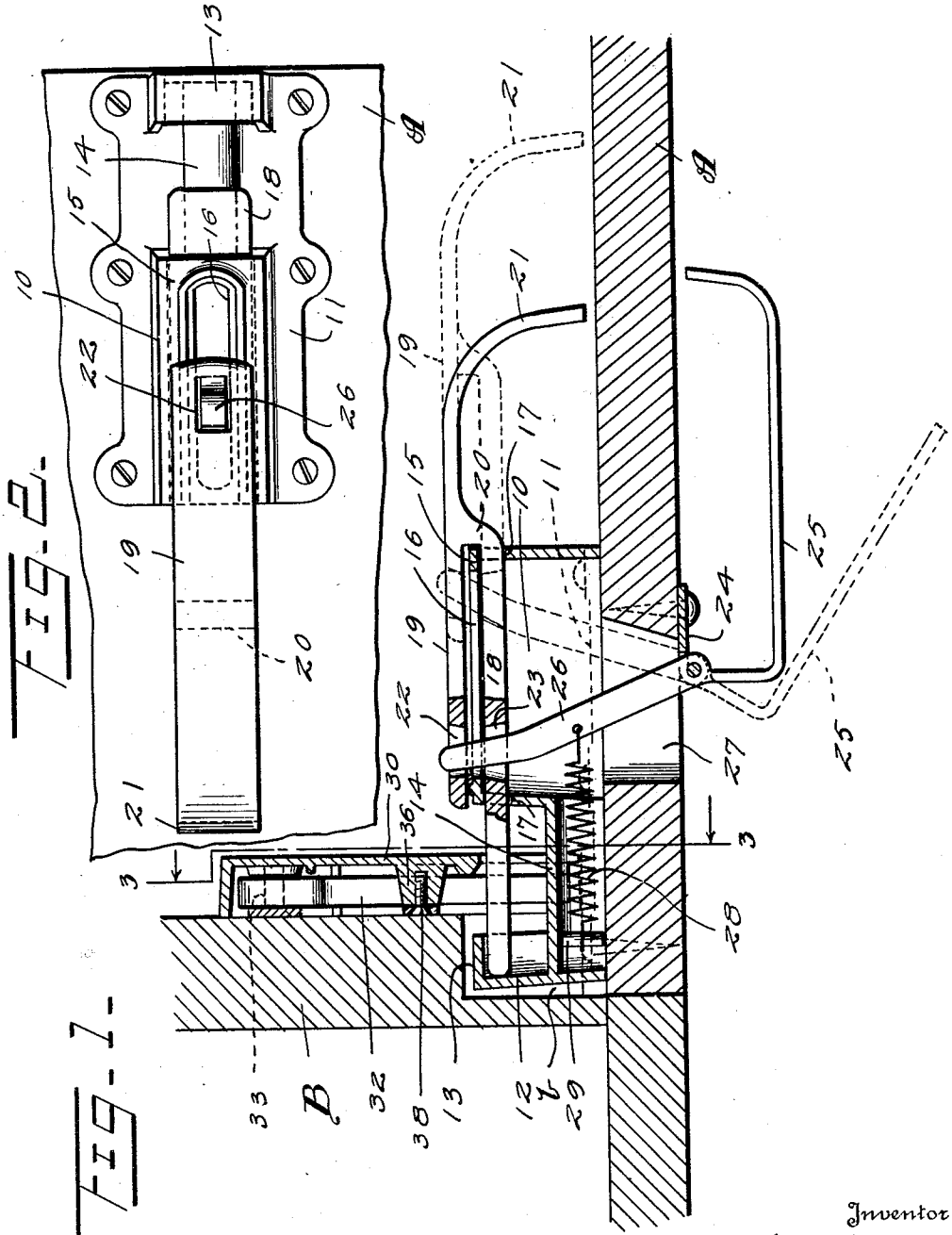


Fig. 2.

Fig. 1.

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Fig 3.

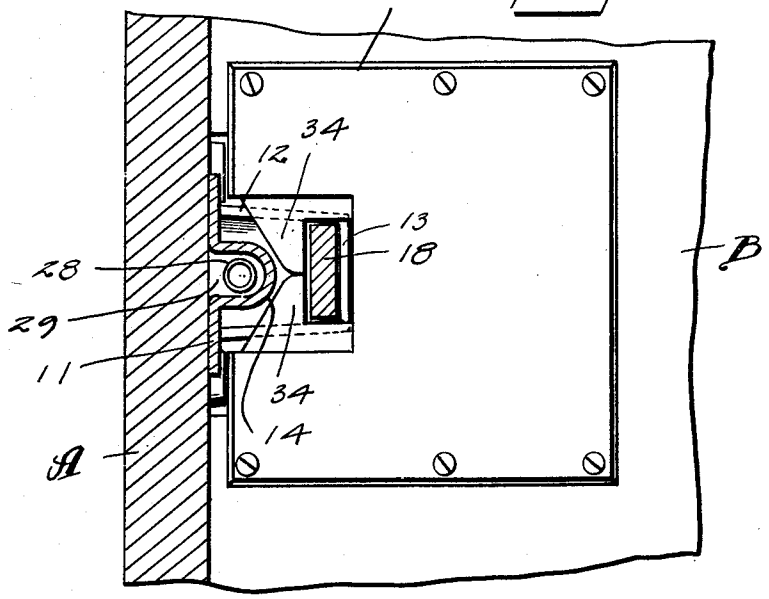
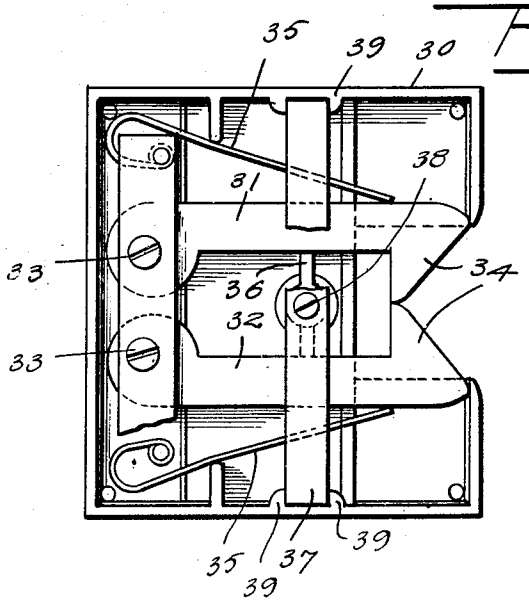


Fig 4.



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UNITED STATES PATENT OFFICE

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LATCH FOR HINGED DOORS

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This invention relates to door latches and particularly to latches for swinging doors.

The general object of the invention is the provision of a latch for a swinging door having means whereby the latch may be opened from opposite sides of the door, and which is so constructed that a relatively powerful bolt may be used to hold the door closed.

A further object is to provide a lock of this character with a sliding bolt, provide a pivoted combined door handle and latch operating means on the exterior of the door, and a sliding latch operating means upon the interior of the door, and to provide means whereby the latch may be engaged automatically by a keeper when the door is swung closed without the necessity of actuating the latch to withdraw the bolt prior to closing the door.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a sectional view through a door and a portion of a door frame showing my improved latch attached thereto;

Figure 2 is a rear face view of the latch;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is an inside face view of the keeper casing showing the keeper mechanism.

Referring to these drawings, A designates the door proper and B designates the jamb of the door cut out as at *b* to receive the bolt on the door when the door is closed. On the inside face of the door A, there is attached the bolt housing 10 having a base 11 attached by screws to the door, the outwardly extending wall 12 with the overhanging lip 13 and the semi-cylindrical spring housing 14. The outer wall 15 of the housing 10 is slotted as at 16 and the end walls of the housing 10 are slotted as at 17. Operating through these slots 17 and beneath the outer wall 16 is a bolt 18 having an outer member 19 which operates over the face of the housing 10, that is, over the slotted wall 16. The member 19 and the bolt proper 18 are joined to each other at 20 and then rearwardly and inwardly extended in a curve as at 21 to form a handle. The portion 19, it will be seen, is shorter than the bolt 18 and both the bolt and the portion 19 are formed with apertures 22 and 23. When the bolt is shifted forward to its extreme forward position, the extremity of the bolt will engage beneath the lip 13.

Mounted by a hinge member 24 upon the outer face of the door A is a handle 25 which beyond the hinge member is formed to provide a shank 26 which extends through a slot 27 in the door and extends through the slots 22 and 23. Attached to the shank 26 is a spring 28 which in turn is attached to a stud 29 projecting from the spring housing 14. It will be obvious now that the spring 28 will act to urge the bolt to a projected position, but that when the handle 25 is grasped and pulled as if to open the door, the shank 26 will move rearward against the action of the spring 28 and retract the bolt 18 and, of course, the portion 19 and handle 21. If on the other hand, the door is locked and the person on the inside of the door wishes to open it, he takes hold of the handle 21 and simply pulls laterally which will act to retract the bolt against the action of the spring 28. It will be seen that the bolt is very strongly engaged with the housing because it consists of two parts, namely the bolt 18 and the portion 19 which engages on opposite sides of the wall 15 and furthermore because the extremity of the bolt is engaged beneath the lip 13.

The keeper whereby the bolt is engaged is illustrated in Figure 4 and is mounted upon the jamb B. This keeper comprises the casing 30 within which is disposed two pivoted keepers proper 31 and 32, each of these being pivoted at 33. The extremities of these keepers are formed with the divergently beveled heads 34. Leaf springs 35 bear against the keepers and force them toward each other and against a central stop 36 to which a cross bar 37 is attached as by the screw 38, this cross bar at its ends fitting in recesses 39 formed in the wall of the casing. As the door is moving to its fully closed position, the bolt 18 bears against the beveled faces of the keepers, forces these keepers laterally in opposite directions until the bolt has passed the

heads 34, whereupon the keepers snap closed and the door is latched. It cannot be pulled open except by operating the handles 21 or 25 as the case may be. It will be seen that the body of the latch is disposed entirely inside of the door and cannot be meddled with. It is obvious that the handle 25 may have a slot so that when the handle is closed, it can pass over a staple so that the handle may be locked by a padlock passed through the staple and thus the door is locked. It will be seen that with this construction, the natural movement of the hand in opening the door by means of the handle 25 will release the latch and that on the inside of the door, it is only necessary to pull the latch laterally by means of the handle 21 to secure the same result.

This lock is very simple, can be cheaply manufactured and has been found to be particularly effective for barn doors, garage doors and other heavy swinging doors.

It will be noted that practically all of this latch is disposed on the inside of the door, thus keeping it from exposure to the weather and being tampered with. One of the most important advantages of my invention resides in the fact that the latch is practically unaffected by any ordinary shrinkage or expansion of the door due to the dry or wet weather. With other locks known to me, when the material of the door shrinks or the material of the door casing shrinks, the lock will be caused to move back too far from the keeper so that it prevents the bolt from getting a firm hold and keeping the door closed and if on the other hand the material of the door expands, it will bring the lock too close to the retainer which will make it hard to close unless it is closed by hand, that is, by positive retraction of the bolt.

My latch will be actuated to latch the door closed without operating the handle, but merely by pushing the door toward a closed position.

In my latch, the keeper is disposed on the jamb which gives it a good solid foundation by which to hold the door shut whereas in most latches known to me the keeper is mounted upon the door casing which soon becomes loose and renders the lock inefficient. In my construction the door is held closed by two keepers 31 and 32 which engage the bolt and thus there is no chance for the door to open and thus act to hold the door closed so long as they are fast to the door. With other latches known to me, very little effort is required to break the door open as the retainers or keepers are short as are the bolts and ordinarily there is only a single keeper for the bolt to engage with. This is particularly true when the door has shrunk in dry weather. The door in that case is held by only a slight engagement of the bolt with the keeper. With my latch the door can have half an inch shrinkage and still the keeper will hold the bolt in place. Furthermore, with my construction, there are very few projecting elements which are liable to catch on clothes of persons passing into or out of the door whereas on other latches particularly the latches used on barns, the keepers project to an extent as to make them inconvenient especially for horses with harness on them.

It will be seen that my latch is particularly strong, relatively simple, and easily operated from both sides of the door. Obviously slight changes might be made in the details of construction without departing from the spirit of the invention as defined in the appended claims.

I claim:—

1. A latch of the character described, comprising a housing adapted to be mounted upon the inside of a swinging door and having an opening at each end, a bolt slidingly supported within the outer wall of the housing, the bolt extending through the opposite openings in the end walls of the housing and having a portion extending over the outer face of the housing wall, and there being a handle attached to the bolt and the outer portion, the housing having an extension formed with a lip beneath which the bolt extends, a pivoted handle having a shank extending through the bolt, the outer wall of the housing and the portion extending over said outer wall, the outer wall of the housing being slotted to permit the shank to move longitudinally, and a spring mounted at one end upon the extension of said housing and at its other end engaged with said shank.

2. The combination with a swinging door having an opening therethrough, a housing mounted upon the inner face of the opening and having an outer wall longitudinally slotted, and having alined openings in its end walls a bolt disposed to extend through the openings in the end walls of the housing just inward of the outer wall, the bolt at its rear end terminating in a handle and the bolt having a portion extending over the outer face of the housing wall, the bolt and said portion being apertured, the housing having an extension carrying a lip with which the extremity of the bolt is adapted to engage, a handle hinged to the outer face of said door and having a shank extending through the opening of the door and through the openings in the bolt and through the portion overlying the outer face of said housing, and a spring engaging with said shank and with said extension, the spring acting to urge the bolt to a closed position.

3. The combination with a swinging door having an opening therethrough, a housing mounted upon the inner face of the opening and having a wall longitudinally slotted, a bolt disposed to extend through the housing

just inward of the outer wall, the bolt at its rear end terminating in a handle and the bolt having a portion extending over the outer face of the housing wall, the bolt and said portion being apertured, the housing having an extension carrying a lip with which the extremity of the bolt is adapted to engage, a handle hinged to the outer face of said door and having a shank extending through the opening of the door and through the openings in the bolt and through the portion overlying the outer face of said housing, a spring engaging with said shank and with said extension, the spring acting to urge the bolt to a closed position, and coacting means on the door jamb with which the bolt engages comprising two opposed pivoted keepers having convergently beveled outer faces facing toward the door and springs urging said keepers toward each other, the bolt being adapted to pass the keepers as the door is being closed.

4. The combination with a swinging door and a jamb with which the door coacts, of means for latching the door closed including opposed spring actuated keepers mounted upon the door jamb and having beveled faces confronting the door, a housing mounted upon the inner face of the door, a sliding bolt operatively supported upon the housing and having a handle, the housing having an end wall provided with a lip with which the extremity of the bolt engages when the bolt is projected, a spring urging the bolt to a projected position, and a handle upon the exterior of the door whereby the bolt may be retracted.

5. The combination with a hinged door and a door jamb therefor, the door jamb having a face extending at right angles to the inner face of the door when the door is closed, keepers mounted upon the inner face of the door jamb and having convergently beveled heads at their outer ends, springs urging said keepers toward each other, the door when closed extending beyond the plane of said keepers, a housing mounted upon the inner face of the door and having a portion thereof extending adjacent to the free edge of the door and beyond the plane of said keepers, the housing at this point having an end wall provided with a lip, a sliding bolt mounted upon the housing and when closed engaging said lip, whereby the bolt is supported in the housing at points on each side of the keepers, resilient means urging the bolt to a projected position, and means on the door whereby the bolt may be retracted.

In testimony whereof I hereunto affix my signature.

HENRY E. OLSON.