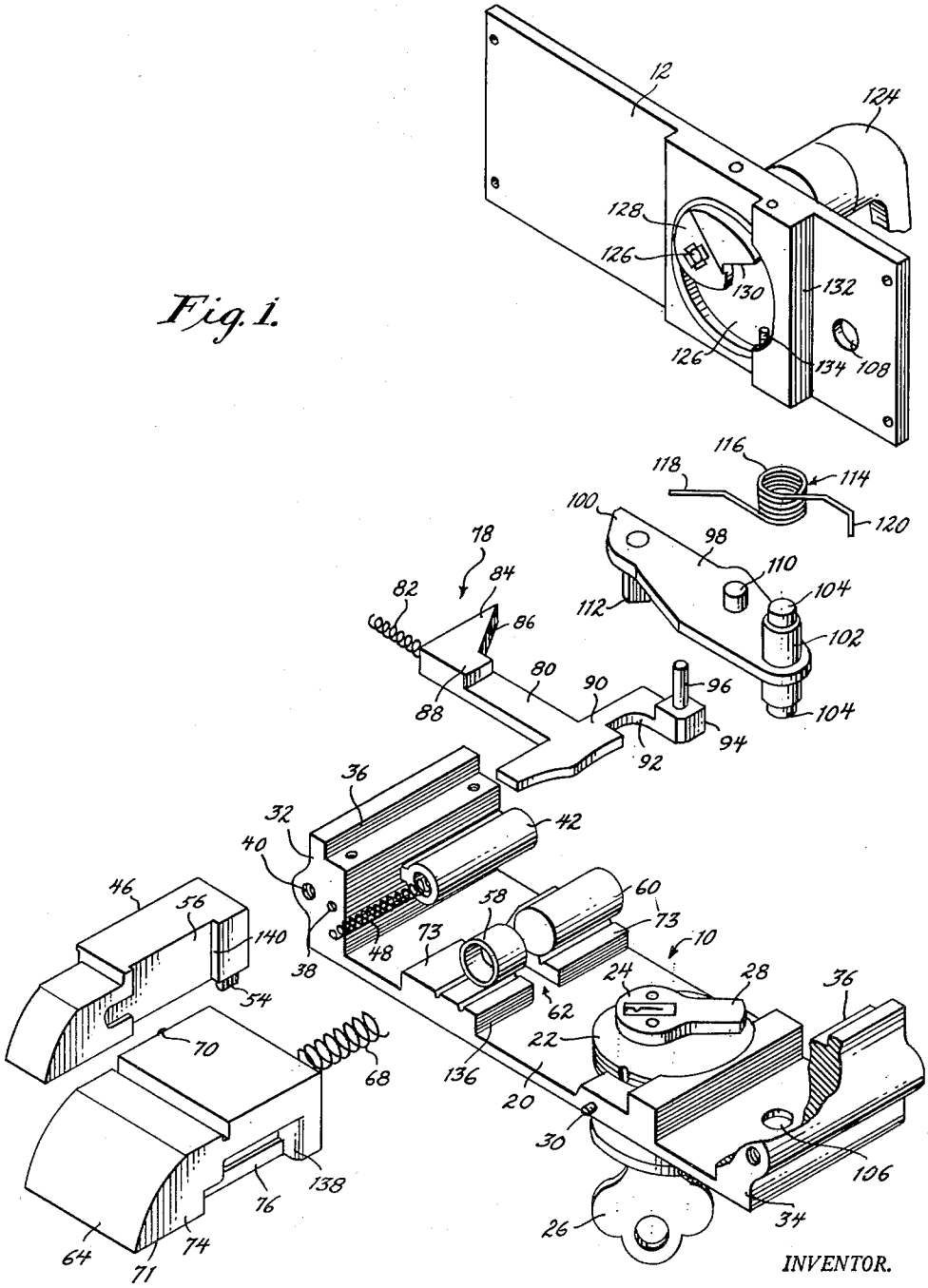
April 3, 1962 G. WINDMASSINGER 3,027,745

LATCH LOCK FOR NARROW STILE DOOR

Filed March 28, 1960 3 Sheets-Sheet 1

Fig. 1.



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LATCH LOCK FOR NARROW STILE DOOR

Filed March 28, 1960 3 Sheets-Sheet 2

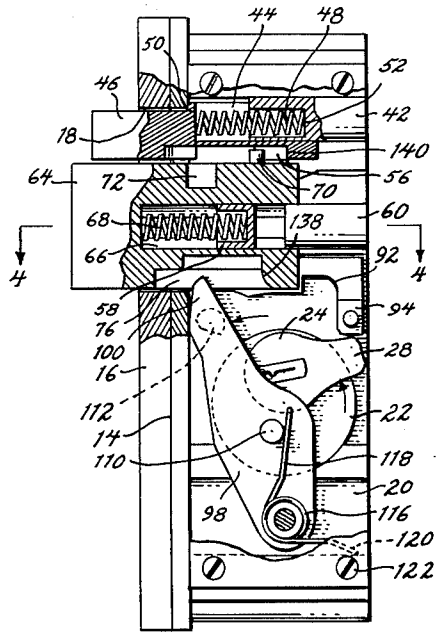


Fig. 2.

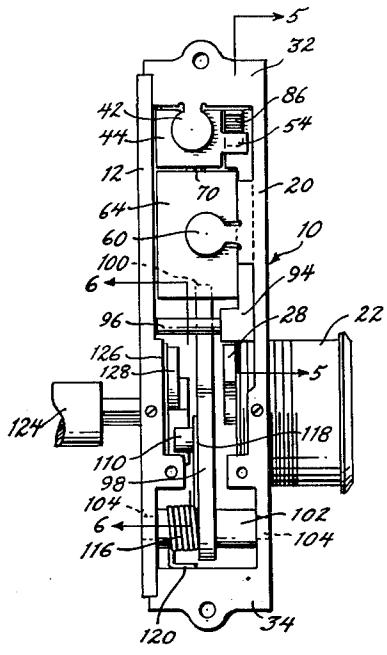


Fig. 3.

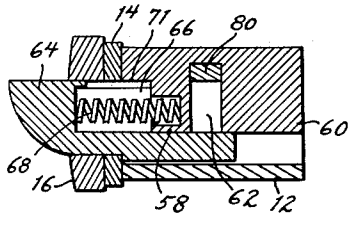


Fig. 4.

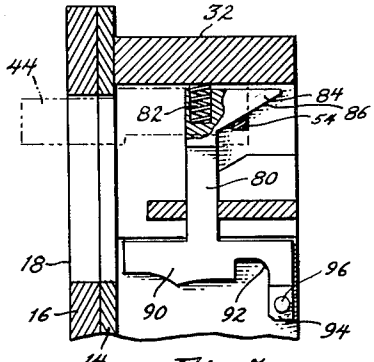


Fig. 5.

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LATCH LOCK FOR NARROW STILE DOOR

Filed March 28, 1960 3 Sheets-Sheet 3

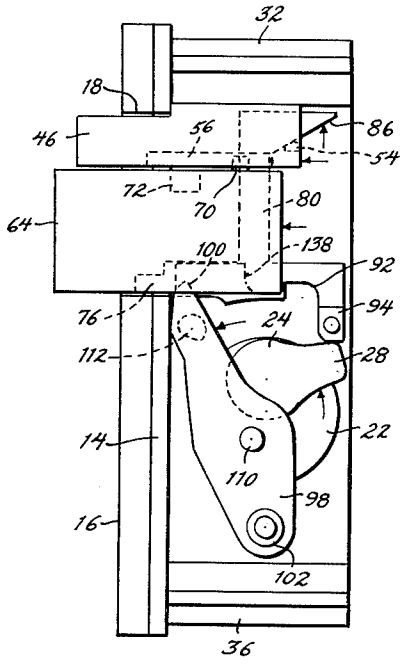


Fig. 7.

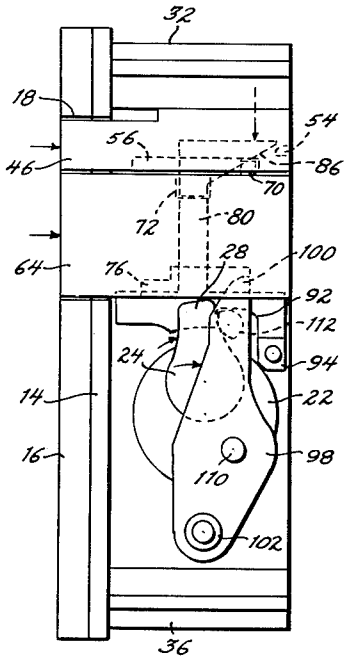


Fig. 8.

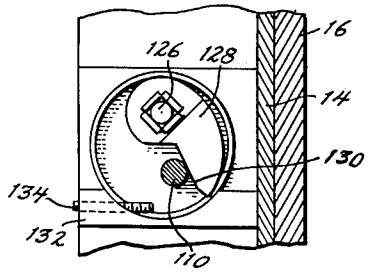


Fig. 6.

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LATCH LOCK FOR NARROW STILE DOOR

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Filed Mar. 28, 1960, Ser. No. 18,021

8 Claims. (Cl. 70—150)

This invention relates to a latch lock mechanism especially well adapted for installation in narrow stile doors now commonly employed in office buildings and constitutes an improvement over the latch lock disclosed in my copending application Serial Number 683,332, filed September 11, 1957, now Patent No. 2,942,451.

The primary object of the invention is to provide a lock mechanism operable by a lever handle from one side and a key from the other in such a way that when the latch bolt is retracted by key operation, the bolt is held in a fixed fully retracted position whereas it is not so held when the latch bolt is retracted by operation of the lever handle. In the position wherein the bolt has been fully retracted by key operation, the lever handle is incapable of affecting the lock mechanism so that the door is freely movable from inside and outside the door in which it is installed. This is the position of the lock during office hours. On the other hand, when the key is operated to release the latch bolt to the door locking position the lever handle is capable of releasably retracting the latch bolt but it cannot retract the bolt to a position where it remains fixedly open, as is possible with key operation. Thus the lever handle can open the door from the inside and automatically lock it when the handle is released. From the outside only key operation can open the door. This is the after-office hours position of the lock.

A further object of the invention is to provide a lock mechanism of the character described in association with an auxiliary lock which prevents the main latch bolt from being retracted by prying implements applied to the bolt.

And yet another object of the invention is to provide a lock mechanism which can be manufactured of standard parts, which is relatively simple to assemble, relatively easy to install in narrow metallic door frame extrusions and relatively easy to repair.

These and other objects of the invention will become more apparent as the following description proceeds in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a group perspective view of the latch lock mechanism;

FIGURE 2 is a side elevation of the mechanism with the main bolt in the locked position, parts being broken away to show details of construction;

FIGURE 3 is a rear end elevation view of the lock mechanism;

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 3;

FIGURE 6 is a sectional view taken on the line 6—6 of FIGURE 3;

FIGURE 7 is a diagrammatic view of the lock mechanism with the main bolt in its locked position;

FIGURE 8 is a view similar to FIGURE 7 showing the unlocked position of the lock mechanism.

Specific reference is now made to the drawings wherein similar reference characters are used for corresponding elements throughout.

The lock mechanism is contained in a housing comprised of a front member 10, a rear plate 12, an end plate 14, a face plate 16 thereagainst and aligned openings 18 therein through which the latch bolts are slidable. The front member includes a front plate 20 having

an opening into which is threaded the barrel 22 of a conventional pin tumbler lock which rotatably mounts a plug 24 operable by a key 26. The plug mounts an arm 28 which is disposed in the housing, the proper adjusted position of the barrel being fixed by an appropriate set screw 30 which enters an axial groove on the side of the barrel.

As is evident from FIGURE 1, the front member is preferably a cast or stamped one-piece member having end portions 32 and 34 which are substantially perpendicular to the front plate 20, the end portions being recessed as at 36 for a purpose later to appear. The end plate 14 is attached to the end portions 32 and 34 via screws which are made to extend into threaded holes 38 in said end portions and the face plate 16 is secured against the end plate 14 via screws which are made to extend through threaded holes 40 also provided in said end portions.

Depending from the upper end portion 32 is a guide member 42, preferably circular in cross section, which is slidably received in a longitudinal bore 44 provided in an auxiliary bolt 46, there being a spring 48 in the bore terminally bearing against a seat 50 in the bolt and a seat 52 in the guide member and urging said bolt into an extended position. The face of the auxiliary bolt which confronts the front plate 20 is provided at its rear end with a lug 54 which extends towards the front plate. The face of the auxiliary bolt which faces the lower end member 36 is provided with a longitudinal recess 56.

Spaced from the upper end member 32 and preferably integral with the front plate 20 is a pair of upstanding guide members 58 and 60, also preferably circular in cross section, the members being spaced apart centrally of the plate 20 as at 62 for a purpose soon to appear. A main bolt 64 is provided which is generally of the same shape but larger than the auxiliary bolt 46, the same including a longitudinal bore 66 slidably receiving said guide members 58 and 60, there being a spring 68 in the bore bearing terminally against a seat in the bolt and against a seat in the forward guide 58 and urging the bolt outwardly into an extended position.

The surface of the main bolt which faces the upper end member 32 includes an upstanding pin 70 which is received in the lower recess 56 of the auxiliary bolt 46. At the juncture of the face carrying the pin 70 and the face 71 confronting the plate 20, the main bolt also includes a vertically extending notch 72. The surface 74 of the main bolt which faces the lower end member 36 includes a longitudinal recess 76. Attention is here called to the fact that the guide members 58 and 60 are carried on pedestals 73 of predetermined height and that the face 71 of the main bolt rides on the upper surfaces of said pedestals.

A vertical slide member 78 is provided for releasably locking said bolts in their retracted positions by key operation, said member including a bar 80 which bears slidably against the plate 20 and is disposed in the space 62 between the guide members 58 and 60, the thickness of the bar being slightly less than the height of the pedestals 73. The upper end of the bar includes a recess for seating a spring 82 which also bears against the inner surface of the upper end member 32, see FIGURE 5, and thereby urges the slide member 78 downwardly away from said upper end member 32. At the upper end of said bar is a rearwardly extending triangular cam member 84 having an upwardly and rearwardly inclined cam surface 86. Adjacent its upper end near the lower portion of the cam surface 86, the bar 80 includes a raised portion 88 dimensioned to enter the notch 72 in the main bolt 64, the overall thickness of the bar and the raised portion exceeding the height of the pedestals. The lower end of the bar 80 is provided with a cross member 90, the portion extending to the rear of the housing including a

corner notch 92, an enlarged corner portion 94 and an upstanding rod 96.

The member actuated by a key or handle operation to retract the bolts comprises a lever bar 98 which overlies the plug arm 28 and includes a curved nose portion 100 that extends into the recess 76 in the lower face of the main bolt 64. Opposite its nose, the lever bar is pivoted at its lower end about an axis perpendicular to the plane of front plate 20. This is accomplished by providing a short rod 102 which is secured to the lever bar and extends through both sides thereof, the ends of the rod being reduced to form pintles 104, one of which is journaled in an opening 106 in plate 20 and the other of which is journaled in an aligned opening 108 in the rear plate 12. Centrally, the lever bar 98 has a short pin 110 which extends towards the rear plate 12. Adjacent its nose 100, the lever bar 98 carries another short pin 112 which extends towards the front plate 20. A spring 114 is provided having a medial coil portion 116 wound about the short rod 102 and terminal portions 118 and 120, the former bearing against the central pin 110 and the latter against the lower end member 34 so that the lever bar 98 is biased to urge the bolts into their extended positions to the left of the figures.

The rear plate 12 is mounted on the front member 10 by having its ends engage in the recesses 36 in the end portions 32 and 34 of the front member there to be secured by appropriate screws 122. A lever handle 124 is mounted by any suitable means on the plate 12, the handle having a shank 126 extending rotatably through a circular member 126 and being secured at its inner end to a cam member 128. Thus the cam member 128 is rotatable with the handle, the cam member including a portion 130 adapted to bear against the pin 110 on the lever bar 98 upon clockwise rotation of the handle, there being a spring (not shown) normally urging the handle in a counter-clockwise direction. The rear member 10 is further provided with a block 132 in which is threaded a set screw 134, the same being so set that the portion 130 of the cam member strikes the same before the latch bolts are fully retracted.

The key operation of the lock is as follows. In the extended or door-locking position of the latch bolts 46 and 64, FIGURES 2 and 7, the nose 100 of the lever bar 98 has been urged by spring 114 towards the end of the recess 76 in main bolt 64 which is adjacent the curved portion of the bolt adapted to enter a keeper. The auxiliary and main bolts have also been urged into their extended positions by their springs 48 and 68 respectively. As the auxiliary bolt had moved to the extended position, the lug 54 rode against the cam surface 86 of the vertical slide bar 80 urging the latter upwardly against action of its spring 82 so that at the fully extended position of the latch bolts the cross member 90 of the vertical slide bar 80 butts against the lower edges 136 of the main bolt guide member pedestals 73. Upon counter-clockwise movement of the key, the arm 28 also moves counter-clockwise until it strikes the pin 112. Continued movement of the key and associated arm pulls the nose 100 of the lever bar 98 to the other or rear end of the recess 76 where it engages the shoulder 138 in the main bolt at the end of said recess thereby pulling the main bolt 64 until the pin 70 on the main bolt strikes the shoulder 140 at the rear of the recess 56 in the auxiliary bolt 46. Continued rotation of the key then causes both main and auxiliary bolts to be retracted towards the rear of the housing.

As the bolts are retracted, the lug 54 on the auxiliary bolt 46 moves to the right of the figures until it is beyond the cam surface 86, as shown in FIGURE 8. During this retraction, the vertical slide member 78 has been urged in a downward direction by its spring 82 and when the lug 54 has reached a position clear of the cam member 84, the notch 72 on the main bolt has attained a position of vertical alignment or registry with the slide bar 80. At this point the slide member 78 drops and the enlarged portion 88 on the bar 80 slips into said notch 72. Also at this point, the slide member has dropped to the point where its notch 92 has engaged the pin 112 of the lever bar 98. Thus the bolts are locked in their retracted positions as is the lever bar 98.

Upon clockwise rotation of the key and the associated arm 28, the latter strikes the enlarged corner 94 of the slide member 78 and raises the latter to the point where the enlarged portion 88 of the slide bar 80 is free of the notch 72 in the main bolt and the notch 92 of the slide member is free of pin 112 of the lever bar, whereupon the springs 48, 68 and 114 combine to snap the bolts to their extended positions. In so doing the lug 54 on the auxiliary bolt rides against the cam surface 86 of the slide member lifting the latter against action of its spring 82 and retaining it in this raised position.

Regarding the handle operation of the lock, when the latter has been snapped by the key and the bolts are in their extended positions, a counter-clockwise rotation of the handle 124 will cause the cam surface 130 to engage the central pin 110 on the lever bar 98 and continued rotation of the handle will cause a retraction of the bolts as previously described; except that before the lug 54 is free of the cam surface 86 of the vertical slide member and before the pin 112 is in position to engage in the notch 92, the cam member 128 strikes the set screw 134 preventing further rotation of the handle. Hence, the slide member 78 cannot drop fully and the enlarged portion 88 on bar 80 cannot enter the notch 72 in the main bolt and accordingly, at the end of the arc of rotation of the handle, the bolts are not locked in the retracted position although they are sufficiently withdrawn out of the keeper and into the lock housing to permit the door to be swung open. As soon, however, as the door comes back to position it automatically locks. Thus, those wishing to leave an office building in which the instant lock is installed can readily do so after hours by operation of the handle. Those wishing to return after hours must use a key. During office hours the lock can be retained in the open or retracted position by key operation.

While a preferred embodiment of the invention is here shown and described, minor variations may be made by a skilled artisan without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A latch lock mechanism comprising an elongated vertically extending housing, a guide member in said housing extending laterally thereof, a latch bolt slidably mounted on said guide member for movement laterally of said housing, spring means urging said bolt to an extended position through an opening provided in one side of said housing, a lever bar below said latch bolt and pivoted at one of its ends in said housing to move from said one side to the opposite side of said housing, said lever bar including an end portion opposite said pivoted end engageable with said bolt, a key-operated plug rotatably mounted on said housing including an arm therein operative upon said lever bar to pull the same away from said one side of said housing and thereby retract said bolt, a member slidable vertically in said housing, spring means urging said slide member downwardly towards the pivoted end of said lever bar, means coacting between said slide member and said bolt to lock the latter in its retracted position when said slide member is in a predetermined downward position, means coacting between said slide member and said lever bar to lock the latter when said bolt is in its retracted position and said slide member is in said predetermined downward position, said slide member including a portion engageable by said key-operated plug arm when the latter is rotated in a reverse direction whereby said slide member is raised sufficiently to release said bolt and lever bar locking means, said means to lock said bolt in its retracted position comprising a notch in said bolt and a shoulder portion upstanding

from said slide member engageable in said notch and means operative between said bolt and said slide member retaining said slide member in a raised position whereby said shoulder portion and said notch are out of registry, said last-named means being inoperative when said bolt is moved to a fully retracted position whereby said shoulder portion enters said notch.

2. The combination of claim 1 and spring means urging said lever bar towards said one side of said housing.

3. The combination of claim 1 wherein said guide member comprises two pedestals spaced laterally from each other, male members upstanding from said pedestals and slidably received in a bore provided in said bolt, said bolt including a face riding on said pedestals, said slide member including a bar positioned in the space between said pedestals and of thickness no greater than the height of said pedestals, the combined thickness of said bar and said shoulder portion upstanding therefrom exceeding the height of said pedestals.

4. The combination of claim 1 wherein said means to retain said slide in the raised position comprises a laterally extending cam at the upper end of said slide member having a cam surface upwardly inclined away from said one side of said housing and a lug carried by said bolt extending towards said slide member and riding against said cam surface, said bolt lug being free of said cam when said bolt is fully retracted.

5. The combination of claim 1 wherein said means to lock the lever bar when said bolt is fully retracted comprises a pin carried by said bar extending towards said slide member and a notch in said slide member remote from said one side of said housing, said slide member dropping when said bolt is fully retracted whereby said notch receives said pin.

6. In a latch lock mechanism having an elongated vertically extending housing, a latch bolt slidably mounted therein for movement laterally thereof, resilient means urging said bolt into an extended position through an opening provided in one side of said housing; a member slidable vertically in said housing, resilient means urging said slide member downwardly and means coacting between said slide member and said bolt to lock the latter in its retracted position when said slide member is in a predetermined downward position, said means to lock said bolt in its retracted position comprising a notch in said bolt and a shoulder portion upstanding from said slide member engageable in said notch and means operative between said bolt and said slide member retaining said slide member in a raised position whereby said shoulder portion and said notch are out of registry, said last-named means being inoperative when said bolt is moved to a fully retracted position whereby said shoulder portion enters said notch.

7. The combination of claim 6 wherein said means to retain said slide in the raised position comprises a laterally extending cam at the upper end of said slide member having a cam surface upwardly inclined away from said one side of said housing and a lug carried by said bolt extending towards said slide member and riding against said cam surface, said bolt lug being free of said cam when said bolt is fully retracted.

8. The combination of claim 6 and a guide member in said housing upon which said latch bolt is slidably mounted, said guide member comprising pedestals spaced laterally from each other, male members upstanding from said pedestals and slidably received in a bore provided in said bolt, said bolt including a face riding on said pedestals, said slide member including a bar positioned in the space between said pedestals and of thickness no greater than the height of said pedestals, the combined thickness of said bar and said shoulder portion upstanding therefrom exceeding the height of said pedestals.

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