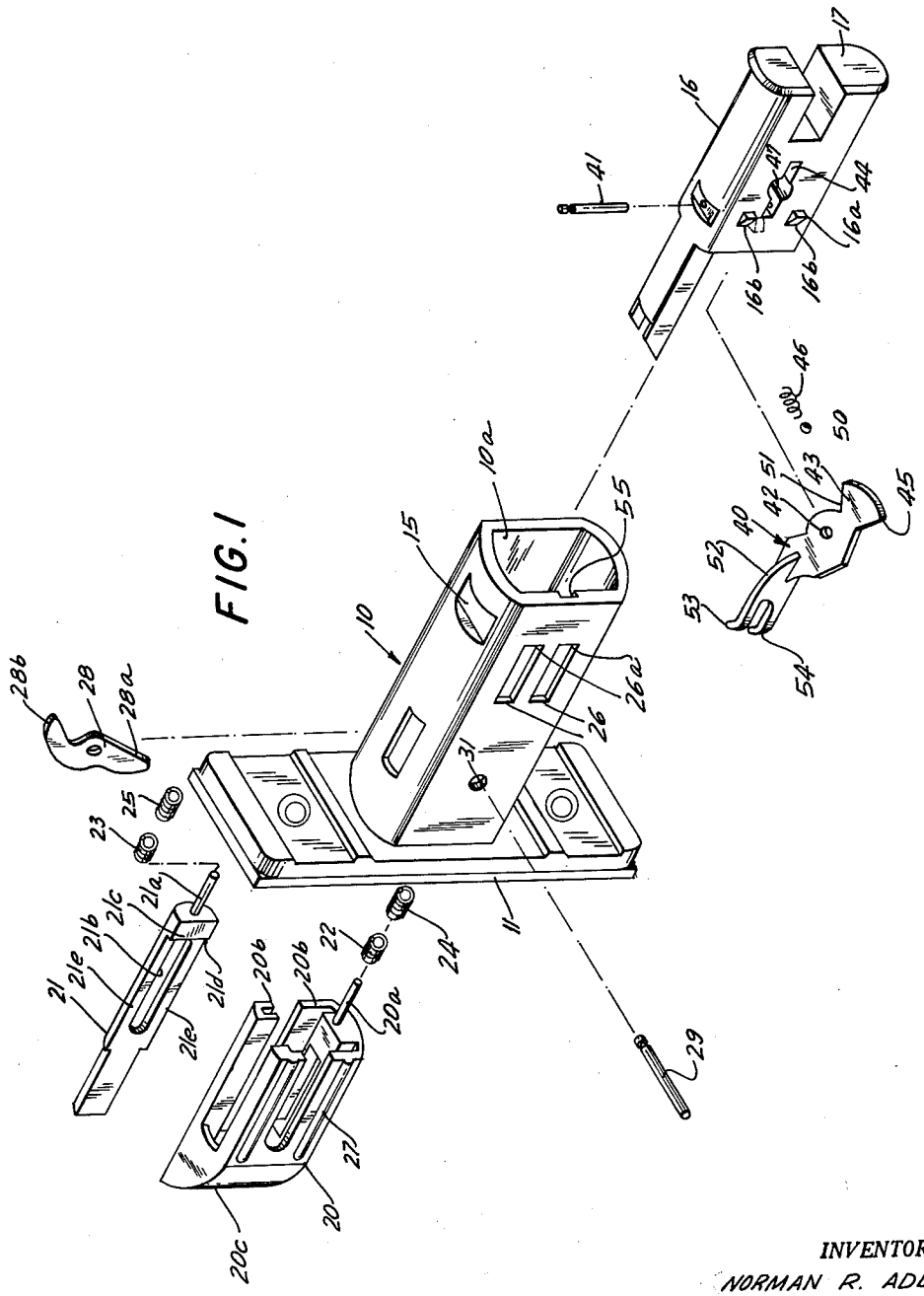
Dec. 3, 1963 N. R. ADLER 3,112,944

DEADLOCKING AUXILIARY LATCH CONSTRUCTION

Filed Dec. 5, 1960 4 Sheets-Sheet 1

FIG. 1



INVENTOR.
NORMAN R. ADLER

BY

J. G. Banuchey
his ATTORNEY

Dec. 3, 1963 N. R. ADLER 3,112,944

DEADLOCKING AUXILIARY LATCH CONSTRUCTION

Filed Dec. 5, 1960 4 Sheets-Sheet 2

FIG. 2

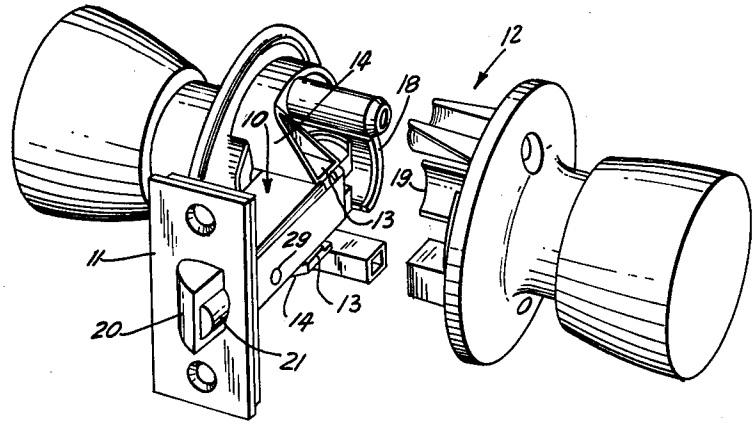


FIG. 3

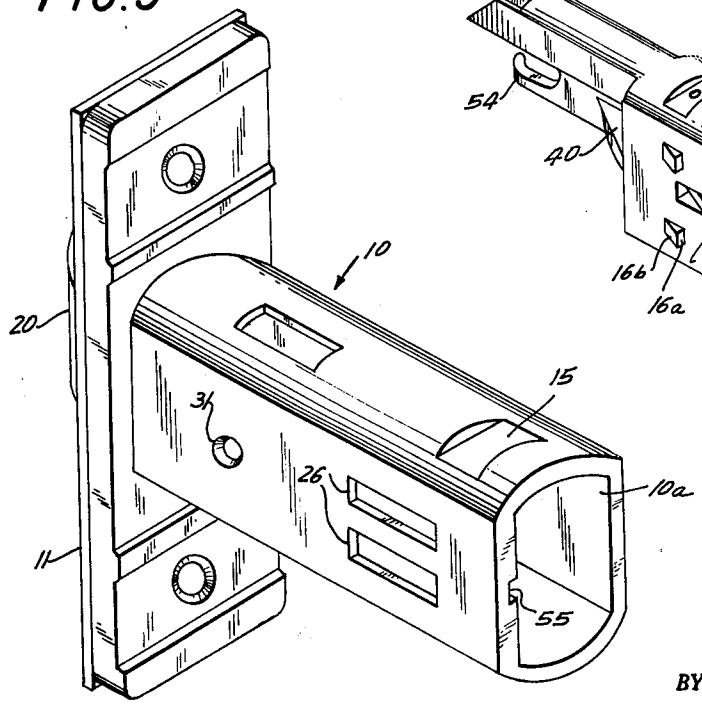
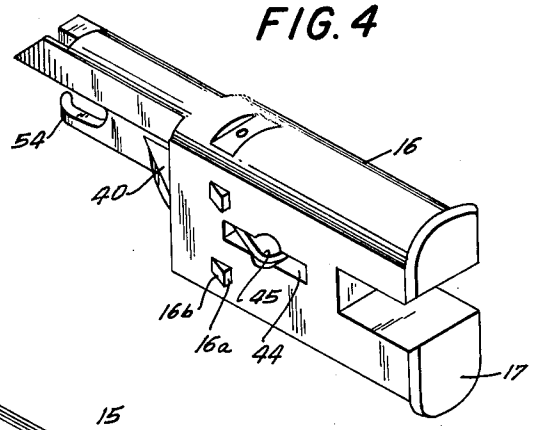


FIG. 4



INVENTOR.
NORMAN R. ADLER

BY

J. F. Bercuches
his ATTORNEY

Dec. 3, 1963 N. R. ADLER 3,112,944

DEADLOCKING AUXILIARY LATCH CONSTRUCTION

Filed Dec. 5, 1960 4 Sheets-Sheet 3

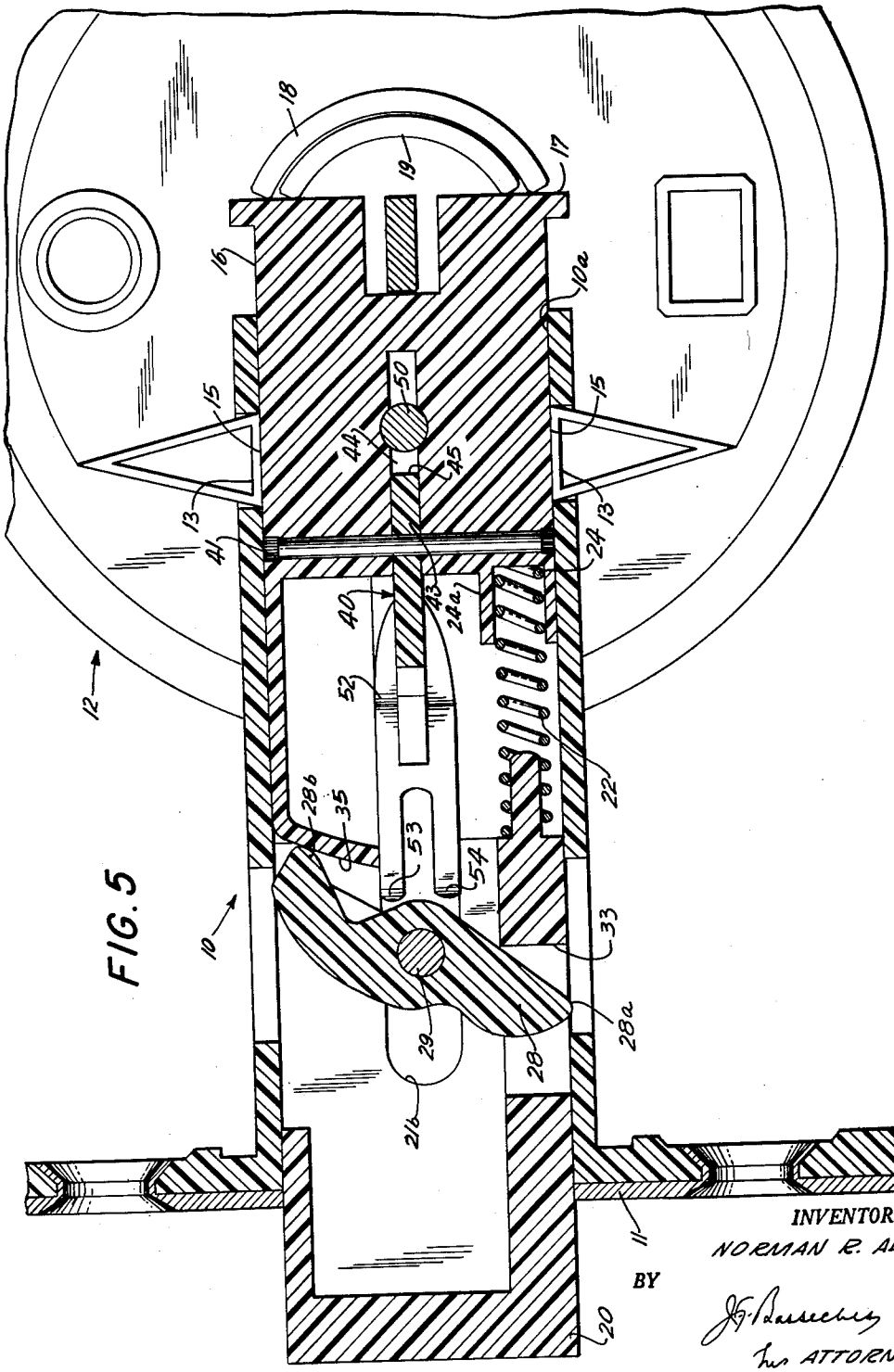


FIG. 5

INVENTOR.
NORMAN R. ADLER
BY
J. G. Baseches
Its ATTORNEY

Dec. 3, 1963 N. R. ADLER 3,112,944

DEADLOCKING AUXILIARY LATCH CONSTRUCTION

Filed Dec. 5, 1960 4 Sheets-Sheet 4

FIG. 6

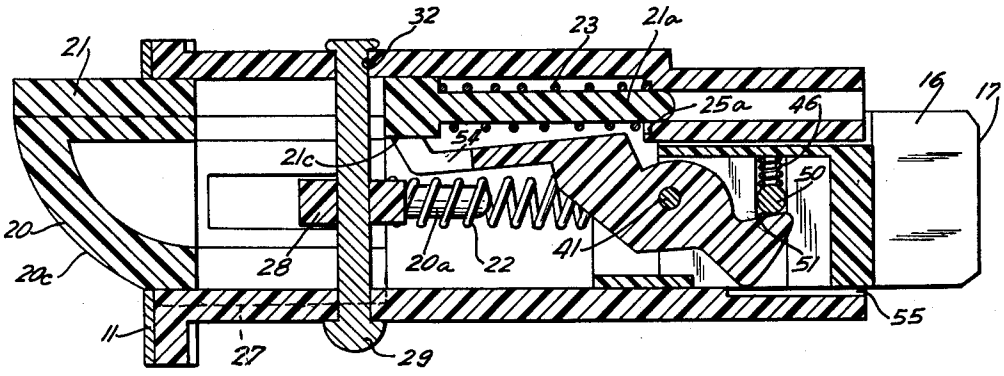


FIG. 7

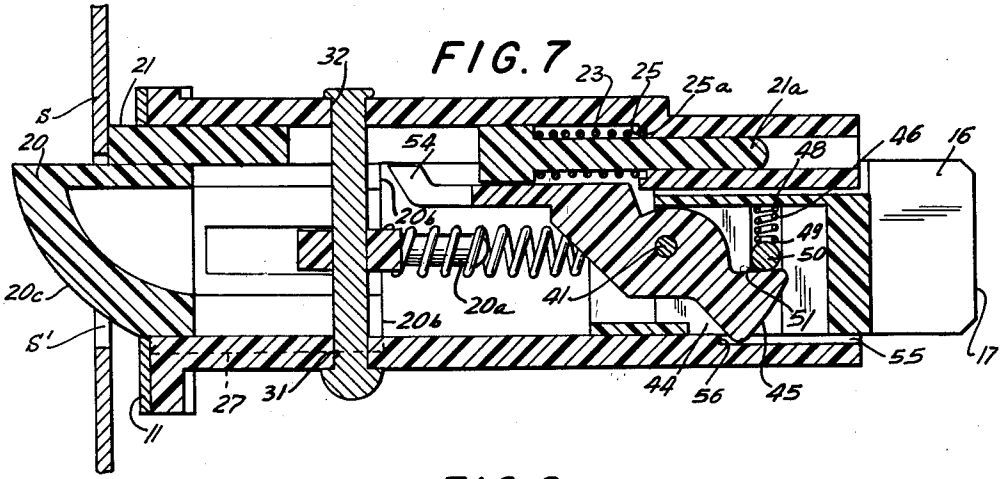
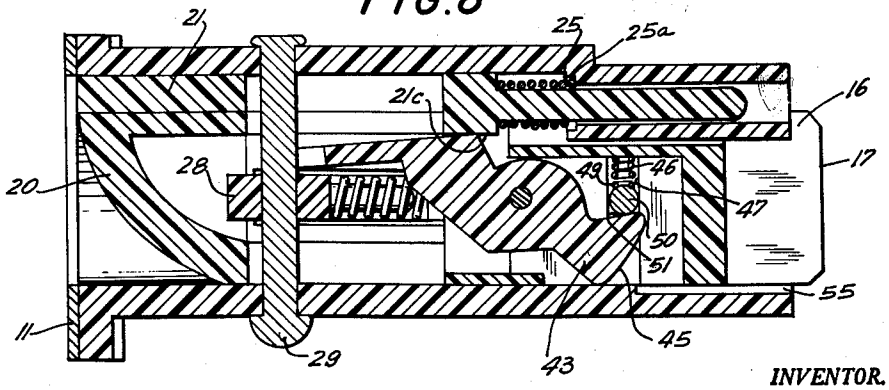


FIG. 8



INVENTOR.
NORMAN R. ADLER
BY
J. F. Burgess
his ATTORNEY

United States Patent Office 3,112,944 Patented Dec. 3, 1963

3,112,944
DEADLOCKING AUXILIARY LATCH CONSTRUCTION

Norman R. Adler, Fitchburg, Mass., assignor to Independent Lock Company, Fitchburg, Mass., a corporation of Massachusetts

Filed Dec. 5, 1960, Ser. No. 73,833
3 Claims. (Cl. 292—169)

This invention relates to a door lock assembly, and more particularly to at latch bolt construction for use in conjunction with a door lock assembly.

Still more particularly, this invention relates to a latch bolt assembly having deadlocking features.

Still more particularly, this invention relates to a latch bolt assembly for use in conjunction with latch bolt operating mechanism as disclosed in the joint application of George P. Patriquin and myself, Serial No. 828,530, dated July 21, 1959.

It is customary to provide the latch bolt of a door lock mechanism with an inclined or beveled face on the portion of the latch bolt which will contact the door strike in closing the door in order that the latch bolt may be retractible when the door is slammed or swung to the closed position. The cammed or beveled face of the latch bolt is thus, in the closed position of the door, exposed to a degree in the spacing between the door and strike plate. By thus providing access to a portion of the latch bolt, it is possible in certain instances to insert a picking tool, such as a resilient Celluloid card, between the door and frame and against the inclined face of the latch bolt, and by manipulating the tool, to force the latch bolt into the latch casing thus permitting opening of the door from the outside.

In the past, latch bolts have been provided with deadlocking expedients or auxiliary latches of various sorts, it being the function of such expedients to limit inward movement of the bolt toward the retracted position thereof when the bolt is seated within the strike plate on the door frame. While such deadlocking latch bolts have enjoyed considerable commercial success, such units have in the past been exceedingly difficult to manufacture, being both cumbersome to assemble and comprised of a plurality of intricately formed parts. In other known devices, operation depends upon intricate relative positioning of the parts; in many instances parts which are not permanently secured one to the other, involving costly problems of assembly, and which also after subsequent considerable periods of usage, become ineffective because of misalignment of the parts, often ultimately requiring repair and/or replacement of the latch bolt assembly.

It is accordingly an object of this invention to provide a latch bolt assembly for use in conjunction with a door lock mechanism having latch bolt dogging features whereby the bolt is dogged against the latch bolt casing by manipulation of the latch bolt from outside of the door.

A further object of this invention is to provide a latch bolt assembly as aforesaid manufactured in a manner to simplify assembly of the parts thereof, and to provide in essence two separable sub-assembly components.

Still a further object of this invention is to provide a deadlocking latch bolt assembly of novel construction wherein all the parts thereof are positively positioned with respect to the other parts so as greatly to simplify assembly over construction heretofore known.

Still a further object of this invention is to provide a deadlocking latch bolt assembly wherein undogging of the latch bolt upon normal key or knob operation of the lock assembly is positively accomplished.

In order to attain these objects and such other objects as may appear herein, or be hereinafter pointed out,

reference is made to the accompanying drawings in which:

FIGURE 1 is an exploded perspective pre-assembly view of the components of the retractor device;

FIGURE 2 is a perspective view of the latch bolt assembly mounted on a suitable knob actuator assembly prior to mounting on the door;

FIGURES 3 and 4 are magnified; perspective views of the major sub-assembly prior to integration whereby such sub-assemblies form a completed latch bolt unit;

FIGURE 5 is a magnified, vertical section through a door lock assembly in accordance with my invention; and

FIGURES 6, 7 and 8 are horizontal sections through the latch bolt assembly showing the position of the parts in the various stages of the operation of the latch bolt.

In accordance with the invention, the latch bolt assembly includes a latch bolt casing **10**, arranged to be mounted on the edge of the door with end plate **11** flush with an edge of the door. A latch bolt actuator assembly **12**, having the usual knob and/or key actuated bolt retractor elements, is mounted in a transverse bore formed through the door, the bolt casing **10** being secured to the actuator assembly as by lug retainer portions **13** extending from retainer posts **14** and which enter retainer slots **15** formed in the casing **10**.

The latch bolt assembly includes a retractor component **16** slidably secured within the casing **10**, a target, such as a shoe **17**, being provided on the rear face of the retractor member **16**, said target or shoe being positioned in the assembled condition of the unit on a door in the path or movement of retractor spindles **18**, **19**, which drive against target or shoe **17** upon rotation of one of the knobs, to cause retraction of the latch bolt **20**. Latch bolt **20** and auxiliary bolt **21** are mounted within the casing **10** and are normally projected beyond the face plate **11** thereof by the action of springs **22** and **23**, respectively, which are seated respectively over spring retainers **20***a* and **21***a*. The end **25** of spring **23** bears against shoulder **25***a* formed within latch casing **10**, thus serving normally to project auxiliary bolt **21** to the extended position shown in FIGURE 6.

The retractor unit **16** is slidably secured within end **10***a* of the casing **10** for limited oscillatory movement. The retractor unit **16** which, like the casing **10**, is preferably made of resilient plastic material, as more fully set forth in the copending application of George P. Patriquin and myself, Serial No. 828,530, filed July 21, 1959, is secured within the end **10***a* of the casing **10** by darts **16***a* having leading cam faces **16***b*. When the retractor **16** is forced into the end **10***a* of the casing **10**, came face **16***b* force the cam adjacent walls of the casing **10** outwardly until the darts **16***a* register with slots **26** whereupon the darts enter into said slots and movement of the retractor **16** is limited in an inward direction by the engagement of the end **10***a* with target **17** and in an outward direction by the darts **16***a* against end shoulders **26***a* of the slots **26**.

The end **24** of springs **22** is received in spring seat **24***a* formed in the leading edge of the retractor **16**, the spring **22** thus serving to bias the retractor **16** and the bolt **20** to the outer limitations thereof as shown in FIGURE 6, the bolt **20** being limited in its outward direction of movement by the engagement of the leading edges of ribs **27** against face plate **11**.

The latch bolt **20** and the retractor **16** are operatively connected by rectractor lever **28** trunnioned on pin **29** which extends through internal slot **21***b* of auxiliary bolt **21**, the ends of the pin **29** being secured in opposed apertures **31**, **32** in casing **10**, the ends of pin **29** being subsequently headed as by peening or the like, as shown in FIGURES 6 through 8 to assure permanent connection. The lower branch **28***a* of retractor lever **28** en-

gages outwardly directed shoulder 33 formed on latch bolt 20 and acts to withdraw the bolt 20 into the casing 10 when the upper arm 28*b* of retractor lever 28 is shifted forwardly or counterclockwise as seen in FIGURE 5, by abutment face 35 of the retractor member 16.

A dogging lever 40 is pivotally secured to be shiftable in a horizontal plane by vertically extending pin 41 forming a trunnion for bearing aperture 42, formed in lever 40. Dogging lever 40 includes a rearward branch 43 which rides in transverse slot 44 formed in retractor 16. The rearward arm 43 includes a cam face 45 normally projected through slot 44 and beyond the side edge of the retractor 16 by spring 46 positioned in transverse blind bore 47, one end 48 of said spring being biased against retractor 16, and the other end 49 bearing against a ball 50 which in turn engages face 51 of said rearward branch 43 (see FIGURES 6, 7 and 8).

The forward branch 52 of dogging lever 40 is bifurcated to provide spaced legs 53 and 54 which are angularly turned with respect to the main body portion of the lever 40. As shown in FIGURE 6, legs 53, 54 of dogging lever 40 in the open position of the door, i.e., in the projected position of auxiliary bolt 21, lie against the flat portion 21*c* of said auxiliary bolt adjacent spring retainer seat 21*a*. The legs 53, 54 are thus maintained by said flat portion 21*c* in the extended position of the auxiliary bolt 21, clear of the path of movement of the inner end shoulder 20*b* of the latch bolt 20.

The operation of the device is as follows:

In FIGURE 6, there is represented the position of the parts in the open condition of the door. As previously noted, locking fingers 53, 54 lie clear of the path of movement of the bolt 20 and accordingly, when the door is closed and the cam face 20*c* is forced against strike plate S (see FIGURE 7), the latch bolt 20 and auxiliary bolt 21 will be free to shift to a position within the casing 10, the inward component of movement provided by the engagement of the strike plate S with the face 20*c* being transmitted to the auxiliary bolt by the contact of shoulders 20*b* with the outwardly directed shoulder 21*d* of the auxiliary bolt 21. The strike S is provided with an aperture S', as shown in FIGURE 7, which aperture is dimensioned to permit in the closed position of the door, the latch bolt 20 to project therethrough but providing a barrier against which a bolt 21 is projected by spring 23. A condition is thus reached in which the bolt 20 is fully projected, but full projection of the auxiliary bolt 21 is not permitted. As seen in FIGURE 7, the partly withdrawn auxiliary bolt 21 has shifted the position of flat portion 21*c* to a point rearwardly of blocking fingers 53, 54 of dogging lever 40, and the lever 40 has thus been urged in a clockwise direction, as seen in FIGURE 7, to a point whereat blocking fingers 53, 54 rest against longitudinally extending portions 21*e* of the auxiliary bolt 21, and behind the shoulders 20*b* of the latch bolt 20. When the fingers 53, 54 are thus positioned, the latch bolt 20 cannot be shifted rearwardly into the casing 10 by force exerted against the latch bolt. Hence, fingers 53, 54 entered behind shoulder 20*b* positively limit such rearward movement of the bolt 20.

The bolt 20, when positioned as shown in FIGURE 7, may be withdrawn only by operation of the latch bolt actuator assembly 12. When the actuator assembly is operated, as by turning of the door knob or operation of the lock assembly, either of spindle segments 18 or 19 is rotated partially, urging the retractor unit 16 toward the edge of the door. The initial inward movement of the retractor unit 16 brings cam portion 45 of dogging lever 40 which previously was projected within slot 55 formed in the inner face of casing 10, into contact with follower shoulder portion 56 defining the limiting end portion of the slot 55 and thus, the initial inward movement of retractor 16 is accompanied by a counterclockwise rotation of the lever 40 against the biasing influence of the spring 46. The counterclockwise movement of the lever 40, aforesaid, results in shifting the blocking portions 53, 54 inwardly, or out of the path of movement of the shoulders 20*b*, thereby removing any obstacle to retraction of the bolt 20 provided by the dogging lever 40.

The aforesaid complete unit may be assembled as two components, one actuating component consisting of the retractor, dogging lever, and associated portions; and the other casing component comprising the latch bolt, auxiliary bolt, retractor lever, and the spring biasing components. Each component is self-sufficient and has the actuating parts which it carries located against displacement before interposing the biasing springs between one component and the other. Final assembly of the two components, as previously indicated, is effected merely by forcing and snapping the retractor 16 and its components into the casing 10 and its components until the darts 16*a* lie within the slots 26.

The above described latch bolt combination, apart from the ease of assembly, has been found extremely dependable in use, and free from any tendency toward jamming in the deadbolted position. Similarly, the novel design of such unit enables the deadbolting function to operate effectively to dog the latch bolt through a wide range of spacings between the edge of the door and the strike plate. Thus, while under optimum conditions of installation, the door is positioned closely adjacent the strike plate in the closed position thereof, inaccurate hanging of the door or poorly constructed door frame members ofter result in the strike plate being spaced up to half an inch from the edge of the door. Obviously, under such circumstances, the dogging of the latch bolt assumes greater importance since a relatively large area of the latch bolt in exposed to the outside of the door. In the instant device, a relatively small retraction of the auxiliary bolt with respect to the latch bolt is required to engage the dogging lever behind the latch bolt and the instant device therefore effectively dogs the latch bolt even where there is relatively great spacing between the edge of the door and the door frame portion bearing the strike plate.

Having thus described my invention and illustrated its use, what I claim is new and desire to secure by Letters Patent, is:

1. An auxiliary door latch mechanism including a latch housing, a latch bolt reciprocably mounted in said housing and biased normally to extend from one end of said housing, an endwisely insertible independent retractor assembly reciprocably mounted in and biased to extend from the other end of said housing, lever means pivotally supported on said housing operatively connecting said latch bolt and retractor assembly, and arranged to withdraw said latch bolt into said housing as said retractor assembly is shifted into said housing, a dogging lever having an annular bearing pivotally mounted on a cylindrical trunnion carried by said retractor assembly, said lever having forward and rearward branches, compression spring means interposed between said rearward branch and said retractor assembly biasing said forward branch in blocking position in the path of movement of said latch bolt as the same is shifted into said housing, and stationary means on said housing positioned to engage said rearward branch as said retractor assembly is shifted into said housing effective to pivot said lever to shift said forward branch out of said path of said latch bolt.

2. An auxiliary door latch mechanism including a latch housing, a latch bolt reciprocably mounted in said housing and biased normally to extend from one end of said housing, a separable retractor assembly reciprocably mounted in and biased to extend from the other end of said housing, lever means pivotally supported on said housing operatively connecting said latch bolt and retractor assembly, and arranged to withdraw said latch bolt into said housing as said retractor assembly is shifted into said housing, a dogging lever having a bearing pivotally mounted on a cylindrical trunnion carried by said retrac-

tor assembly, said lever having forward and rearward branches, compression spring means interposed between said rearward branch and said retractor assembly biasing said forward branch in blocking position in the path of movement of said latch bolt as the same is shifted into said housing, cam means on said rearward branch projecting laterally outwardly beyond a side portion of said retractor assembly, and a stationary follower portion on said housing positioned to engage said cam means and pivot said forward branch of said lever out of said path as said retractor assembly is shifted into said housing.

3. An auxiliary door lock mechanism including a latch housing, a latch bolt reciprocably mounted in said housing and biased normally to extend from one end thereof, an auxiliary bolt movably mounted in said housing and biased normally to extend from said one end of said housing, a separable retractor assembly reciprocably mounted in and biased to extend from the other end of said housing, lever means pivotably supported on said housing in operative connection with said latch bolt and said retractor assembly arranged to shift said latch bolt into said housing as said retractor assembly is shifted into said housing, a dogging lever having a bearing aperture pivotally mounted on a cylindrical trunnion carried by said retractor assembly, said lever having forward and rearward branches, compression spring means bearing against said rearward branch to tilt said lever about said trunnion and project said forward branch in blocking position in the path of movement of said latch bolt as the same is shifted into said housing, cam means on said dogging lever extending laterally beyond said retractor assembly into the path of a stationary portion of said housing as said retractor assembly is shifted into said housing, the engagement of said cam means and said portion being effective to tilt said forward branch out of said path, and means on said auxiliary bolt engaging said dogging lever in the extended position of said bolt effective to shift said forward branch out of said path.

References Cited in the file of this patent

UNITED STATES PATENTS

2,403,597	Hillgren	July 9, 1946
2,558,509	Cerf	June 26, 1951
2,661,972	Schlage	Dec. 8, 1953
2,730,391	Rayburn	Jan. 10, 1956
2,770,480	Linton	Nov. 13, 1956
2,946,612	Ahlgren	July 26, 1960