Oct. 5, 1965 A. L. PELCIN 3,209,564

DOOR CONTROL MECHANISM

Filed Oct. 1, 1962 2 Sheets-Sheet 1

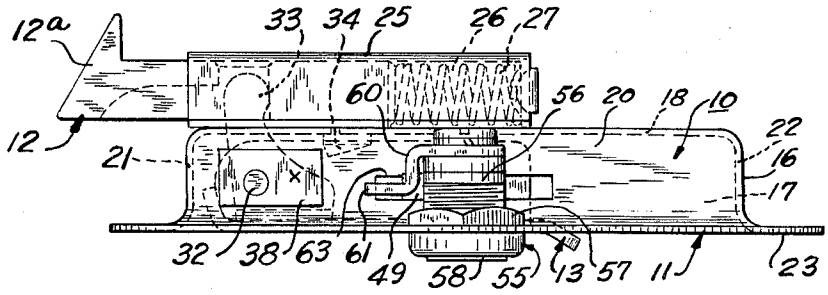


FIG. 2

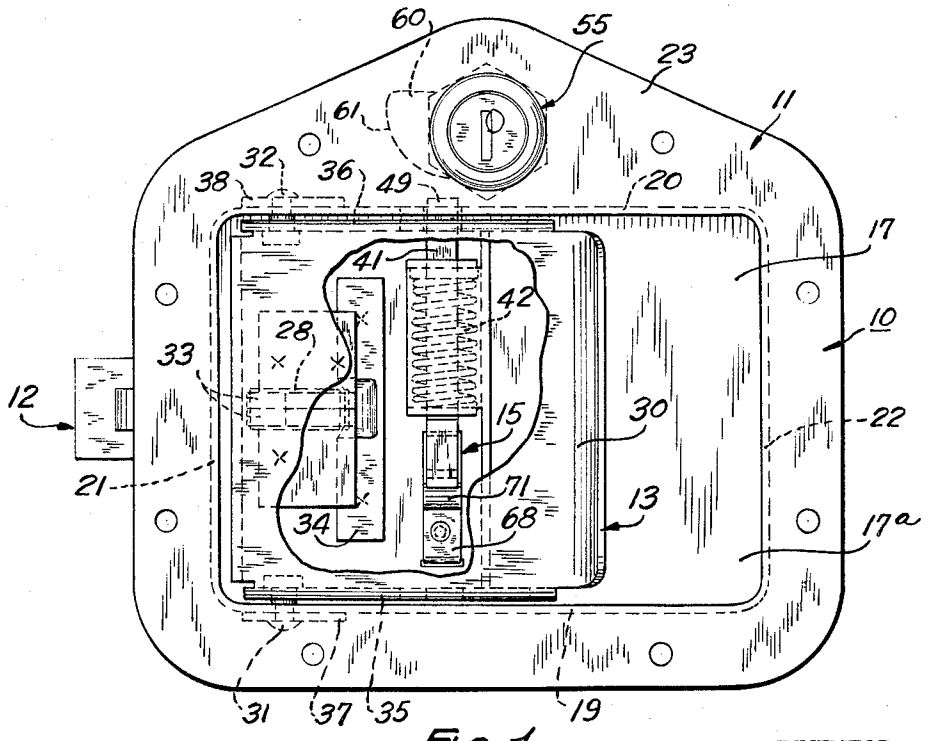


FIG. 1

INVENTOR.
ALBERT L. PELCIN
BY Williams, David, Hoffmann & Yount.
ATTORNEYS

Oct. 5, 1965 A. L. PELCIN 3,209,564

DOOR CONTROL MECHANISM

Filed Oct. 1, 1962 2 Sheets-Sheet 2

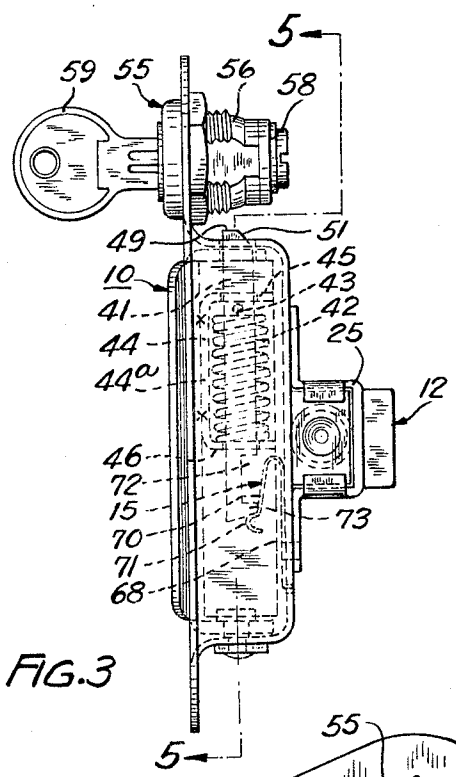


FIG. 3

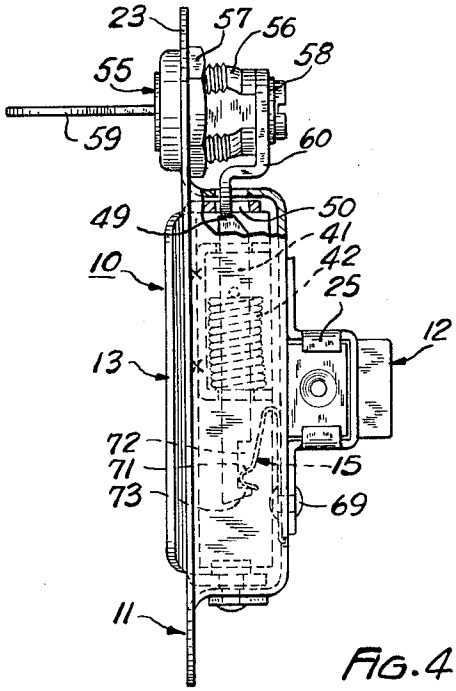


FIG. 4

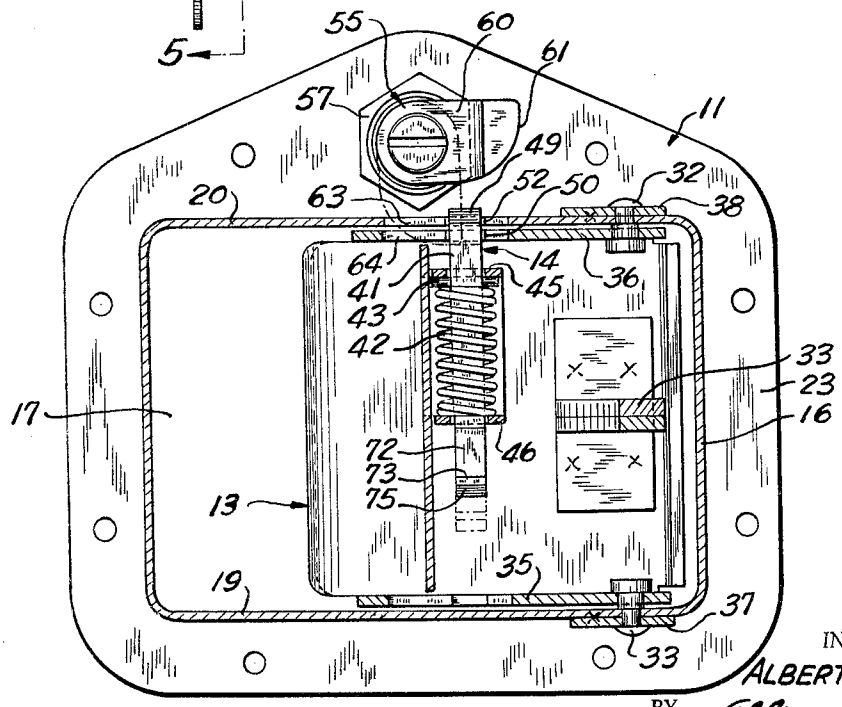


FIG. 5

INVENTOR.
ALBERT L. PELCIN
BY Williams, David, Hoffmann & Yount.
ATTORNEYS

United States Patent Office

3,209,564

Patented Oct. 5, 1965

3,209,564

DOOR CONTROL MECHANISM

Albert L. Pelcin, Bedford, Ohio, assignor to The Eastern Company, Cleveland, Ohio, a corporation of Connecticut

Filed Oct. 1, 1962, Ser. No. 227,239
18 Claims. (Cl. 70—148)

This invention relates to door locks and, more particularly, to locks of the self-locking slam-type which are desirable for certain uses such as for the doors of tool compartments of utility trucks.

Although the lock mechanism of this invention is applicable to various other uses, it is especially suitable for the doors of compartments containing tools or supplies. When the lock mechanism is used on such a compartment door, it is normally in a door-latched and locked condition and, when the operator desires access to the compartment for removing tools or supplies therefrom, he uses a key to unlock the mechanism whereupon the mechanism can be unlatched and the door can be opened. When the operator leaves the truck with the desired tools or supplies, he slams the door shut whereupon the mechanism reassumes its door-latched and locked condition by reason of a self-locking action of the locking means, as will be described in detail hereinafter.

An object of this invention is to provide a novel door lock mechanism having a handle structure movable to an unlatching position and a locking member manually actuatable to a releasably-held ineffective or unlocking position, the locking member being automatically releasable and actuatable to an effective position for causing a locked condition of the mechanism in response to a one-trip unlatching actuation of the handle structure.

Another object is to provide a novel self-locking door lock mechanism in which the handle structure is movable to an extended position relative to a support structure for the one-trip unlatching actuation of the latch member, and wherein detent means for holding the locking member in its ineffective position is responsive to the unlatching actuation of the handle structure for automatically releasing the locking member for a spring-biased movement to its effective position.

Still another object is to provide a novel door lock mechanism of the character above indicated wherein the handle structure includes a plate portion swingable away from a wall portion of the support structure, and wherein the locking member is mounted on the underside of such plate portion and the detent means controlling the locking member is mounted on such wall portion.

Other objects, novel characteristics and advantages of this invention will be apparent in the following detailed description and in the accompanying drawings forming a part of this specification and in which,

FIG. 1 is a plan view showing the novel door lock mechanism with portions of the handle structure broken away and with the locking member in its effective position;

FIG. 2 is a side elevation of the mechanism as seen from one side edge thereof;

FIG. 3 is an end elevation of the mechanism showing the same with the locking member in its effective position and with the handle structure in its retracted but locked condition;

FIG. 4 is a similar elevational view but showing the locking member releasably held in its ineffective position and with the handle structure in its retracted but unlocked condition; and

FIG. 5 is a sectional plan view taken through the mechanism as indicated by section line 5—5 of FIG. 3.

The accompanying drawings show, as one preferred embodiment of this invention, a door lock mechanism 10 of a novel construction providing a self-locking action following a one-trip unlatching actuation thereof. The lock mechanism 10 is shown of a construction intended for a substantially flush mounting on the door and comprises, in general, a support structure 11 supporting a movable latch member 12, and a handle structure 13 swingable away from the support structure for causing an unlatching actuation of the latch member. The lock mechanism 10 also includes a locking means 14 which is controlled by a detent means 15 and by which a self-locking action is achieved for locking the handle structure 13 immediately following a one-trip unlatching actuation thereof.

The support structure 11 is here shown in the form of a pan-shaped sheet metal body member 16 having a shallow recess 17 extending thereinto from the front thereof and which includes a bottom wall 18 at the bottom of the recess. The body member 16 is formed with pairs of opposed side and end walls 19, 20 and 21, 22 on opposite sides of the recess 17. The body member 16 is also provided with a laterally projecting flange means 23 which in this case extends around the perimeter of the recess 17 and provides for the substantially flush mounting of the mechanism 10 on a door or the like (not shown).

The support structure 11 also includes a bolt housing 25 formed thereon or connected therewith and, in this case, located on the bottom wall 18 on the remote side thereof from the recess 17. The bolt housing 25 provides a guideway 26 in which a portion of the latch member 12 is guided and reciprocably movable. Another portion 12a of the latch member normally projects from the bolt housing 25 for latching engagement with a portion of a doorframe or with suitable keeper (not shown). A compression spring 27 located in the bolt housing 25 normally urges the latch member 12 in an outward direction for latching co-operation with the associated keeper. The guidway 26 of the bolt housing 25 is in communication with the recess 17 through an access slot 28 provided in the bottom wall 18.

The handle structure 13 is here shown as comprising a plate member 30 located in the recess 17 and swingably connected with the support structure 11 by suitable pivot means such as by a pair of riveted pivot pins 31 and 32. A trigger 33 secured on the underside of the plate member 30 projects into the guideway 26 through the access slot 28 and engages the latch member 12 for retracting the same in opposition to the spring 27 upon swinging of the handle structure 13 in a direction away from the bottom wall 18 of the support structure 11. The bottom wall 18 is suitably reinforced adjacent one end of the slot 28 as by a strip 34 which also forms a stop for the latch-retracting movement of the trigger 33.

The plate member 30 is here shown as having flanges 35 and 36 extending along opposite sides thereof and which are pivoted on the pins 31 and 32 for the swingable mounting of the handle structure 13. The side walls 19 and 20 of the body member 16 can be suitably reinforced at the location of the pivot pins 31 and 32 as by means of reinforcing clips 37 and 38 welded to such side walls.

The locking means 14 is effective between the support structure 11 and the handle structure 13 for locking the latter against swinging threof in an outward direction from its normally retracted position in the recess 17. In the accompanying drawings the handle structure 13 is shown in this normally retracted position in which the plate member 30 forms a partial cover for the recess 17. The size and shape of the plate member 30 is such

as to leave the portion 17a of the recess 17 in an uncovered condition for the insertion of the operator's fingers beneath the plate portion for applying the outward swinging movement to the handle structure 13.

The locking means 14 comprises a locking member 41, which is here shown as carried by the handle structure 13, and a compression spring 42 effective against a transverse pin 43 of the locking member for normally urging the latter toward an effective position in which this member is shown in the accompanying drawings. The locking member 41 is supported on the handle structure 13 by a substantially U-shaped bracket 44 having the intermediate portion 44a thereof attached to the underside of the plate member 30 as by suitable welds. The bracket 44 has spaced arms 45 and 46 at the ends thereof which are provided with laterally aligned guide openings in which the locking member 41 is reciprocably movable.

The locking member 41 is located on the handle structure 13 so that the direction and path of its reciprocating movement in the openings of the bracket 44 are parallel to the pivot axis provided by the pins 31 and 32. The locking member 41 thus extends transversely of the plate portion 30 of the handle structure 13 at a location spaced from the pivot axis and includes a projecting end portion 49 which normally projects beyond the handle structure for locking co-operation with the support structure 11. When the locking member 41 is in the effective position just described, the end portion 49 projects through an opening 50 of the flange 36.

The end portion 49 is provided with a bevel surface 51 for camming co-operation with the support structure 11 when the handle structure 13 swings to its retracted position in the recess 17. The expansive action of the spring 27 and the reactive force thereof against the latch member 12 causes the return swinging movement of the handle structure 13 to its retracted position when it is released by the operator. As the handle structure 13 approaches its fully retracted position in the recess 17, the projecting end portion 49 of the locking member 41 engages in an opening 52 of the side wall 29 for retaining the handle structure in a locked condition in the recess. Unlocking of the mechanism 10, to permit swinging of the handle structure 13 toward its extended position for retracting the latch member 12, is achieved by an inward shifting of the locking member 41 in opposition to the spring 42 by which the end portion 49 is disengaged from the opening 52.

This unlocking movement of the locking member 41 in opposition to the spring 42 shifts this member to its ineffective position shown in FIG. 4 and the movement of the locking member to such ineffective position is accomplished by a key-actuatable means 55 provided on the support structure 11 and, in this case, mounted on the flange means 23. The key-actuatable means 55 comprises a support sleeve 56 secured on the flange means 23 as by a clamping nut 57 and a cylinder unit 58 rotatable in the support sleeve by means of a key 59 inserted into such unit.

The key-actuatable means 55 also includes an actuator arm 60 secured to the cylinder unit 58 for swinging thereby and which arm is provided with a cam portion 61 for wedging engagement with the projecting end 49 of the locking member 41. The side wall 29 of the support structure 11 and the flange 36 of the handle structure 13 are provided, respectively, with clearance slots 63 and 64 which intersect the openings 52 and 50 and accommodate the cam portion 61 of the actuator arm 60. The normal position of the actuator arm 60 is in a disengaged relation from the locking member 41, as shown in FIGS. 1 and 5.

The above-mentioned detent means 15 releasably retains the locking member 41 in its ineffective position when it has been shifted to that position by the key actuatable means 55 to permit the one-trip unlatching swinging movement of the handle structure 13. The detent means 15 is effective between the support structure 11 and the locking member 41 for thus retaining the latter while the handle structure 13 is in its retracted position, but automatically releases the locking member for actuation to its effective position by the spring 42 in response to swinging of the handle structure away from the bottom wall 18.

The detent means 15 is here shown as comprising a plate spring member 68 secured on the bottom wall 18 of the support structure 11 as by suitable rivets 69. The spring member 68 is of a shape to provide a flexibly movable arm 70 carrying a detent element 71. The locking member 41 is provided with a notch 72 and an adjacent stop 73 at the inner end of such notch for co-operation with the detent element 71.

When the key-actuatable means 55 is manipulated by means of the key 59 to swing the arm 60 into actuating engagement with the projecting end portion 49 of the locking member 41, this member is shifted in opposition to the spring 42 to thereby move the stop 73 across and beyond the detent element 71. The detent element 71 thereupon moves into the notch 72 and is engaged by the stop 73 to thereby hold the locking member 41 in its ineffective position. The movement of the stop 73 past the detent element 71 is facilitated by providing a bevel surface 75 on the inner end of the locking member 41 for camming co-operation with the detent element.

When the locking member 41 has been thus shifted to its ineffective position by manipulation of the key-actuatable means 55 and is being held in the ineffective position by the detent element 71, the handle structure 13 can be freely swung to its extended position for retracting the latch member 12. The operator can then open the compartment door for removing tools or supplies from the compartment. As the handle structure 13 is thus swung to its extended position, the locking member 41 is carried along with the handle structure and the stop 73 is thereby disengaged from the detent element 71.

This disengagement permits the spring 42 to shift the locking member 41 to its effective position while the handle structure 13 is in its outwardly swung position. The end portion 49 of the locking member 41 then projects beyond the flange 36 and, when the handle structure 13 returns to its retracted position in the recess 17, the projecting portion re-engages in the opening 52 of the side wall 29. The re-engagement of the projecting portion 49 in the opening 52 is facilitated by a camming action of the bevel surface 51 of the locking member with the support structure 11.

From the accompanying drawings and the foregoing detailed description it will now be understood that this invention provides door lock mechanism of a simple and highly practical form in which a one-trip unlatching movement of a handle structure is obtainable for unlocking and opening of a compartment door in such a manner that an automatic locking of the mechanism and door will be achieved upon reclosing of the door. Since the structural characteristics and advantageous functioning of the novel lock mechanism have already been described hereinabove, they need not be further summarized at this point.

Although the door lock mechanism of this invention has been illustrated and described herein to a somewhat detailed extent, it will be understood, of course, that the invention is not to be regarded as being limited correspondingly in scope but includes all changes and modifications coming within the terms of the claims hereof.

Having described my invention, I claim:

1. In latch mechanism; a support structure including guide means; a latch member guided by said guide means and movable to latching and unlatching positions; a first spring means urging said latch member toward said latching position; a handle structure connected with said support structure for swinging from a retracted position to and extended position and being co-operable with said latch member for moving the latter to said unlatching po-

sition in opposition to said first spring means in response to the swinging of the handle structure to said extended position; a locking member on one of said structures and movable from an ineffective position to an effective position for locking engagement with the other of said structures for locking said handle structure in said retracted position; a second spring means normally urging said locking member toward said effective position; manually operable means co-operable with said locking member for moving the latter from said effective position to said ineffective position in opposition to said second spring means to unlock said handle structure and allow said handle structure to be manually swung to said extended position, said first spring means being reactively effective to automatically return said handle structure, when released, from its extended position to its retracted position and co-operating surfaces on said locking member and said other of said structures for moving said locking member against said second spring means when said handle structure is swung from its extended position to its retracted position by said first spring means.

2. Latch mechanism according to claim 1 wherein said manually operable means comprises a key-actuatable means located on said other structure.

3. In latch mechanism; a support structure including guide means; a latch member guided by said guide means and movable to latching and unlatching positions; a first spring means urging said latch member toward said latching position; a handle structure connected with said support structure for swinging from a retracted position to an extended position and being co-operable with said latch member for moving the latter to said unlatching position in opposition to said first spring means in response to the swinging of the handle structure to said extended position; a locking member on one of said structures and movable from an ineffective position to an effective position for locking engagement with the other of said structures for locking said handle structure in said retracted position; a second spring means normally urging said locking member toward said effective position; manually operable means co-operable with said locking member for moving the latter from said effective position to said ineffective position in opposition to said second spring means to unlock said handle structure for swinging to said extended position; and holding means co-operable with said locking member and effective to releasably hold the same in said ineffective position while said handle structure is in said retracted position and to release said locking member from said ineffective position upon swinging of said handle structure toward said extended position.

4. Latch mechanism according to claim 3 wherein said first spring means is reactively effective to return said handle structure to its retracted position; said second spring means being effective to move said locking member to said effective position upon release of the locking member by said holding means; and cam means providing for an automatic ratchet-action movement of said locking member to said effective position by said second spring means for locking engagement with said other structure during the swinging of said handle structure to its retracted position.

5. In latch mechanism; a support structure including guide means; a latch member guided by said guide means and movable to latching and unlatching positions; a first spring means urging said latch member toward said latching position; a handle structure connected with said support structure for swinging from a retracted position to an extended position and being co-operable with said latch member for moving the latter to said unlatching position in opposition to said first spring means in response to the swinging of the handle structure to said extended position; a locking member carried by said handle structure and being also movable relative thereto from an ineffective position to an effective position for locking engagement with said support structure for preventing the swinging of said handle structure to said extended position; a second spring means normally urging said locking member toward said effective position; manually operable means on one of said structures and co-operable with said locking member for moving the latter from said effective position and locking engagement to said ineffective position in opposition to said second spring means to release said handle structure and allow said handle structure to be manually swung from said retracted position to said extended position; said first spring means being reactively effective to automatically return said handle structure, when released, from its extended position to its retracted position and said locking member and said support structure having cooperating surfaces for moving said locking member against said second spring means when said handle structure is swung ot said retracted position from its extended position by said first spring means.

6. Latch mechanism according to claim 5 wherein said manually operable means is located on said support structure.

7. Latch mechanism according to claim 5 wherein said locking member extends in a direction transversely of said handle structure and has an end portion projecting therebeyond when the locking member is in said effective position; said manually operable means being located on said support structure and engageable with said end portion for moving said locking member to said ineffective position.

8. Latch mechanism according to claim 5 wherein said locking member is reciprocably movable in a direction transversely of said handle structure and has an end portion projecting therebeyond when the locking member is in said effective position; said manually operable means being located on said support structure and comprising swingable means adapted for camming engagement with said end portion for moving said locking member to said ineffective position.

9. In latch mechanism; a support structure including guide means; a latch member guided by said guide means and movable to latching and unlatching positions; a first spring means urging said latch member toward said latching position; a handle structure connected with said support structure for swinging from a retracted position to an extended position and being co-operable with said latch member for moving the latter to said unlatching position in opposition to said first spring means in response to the swinging of the handle structure to said extended position; a locking member on one of said structures and movable in opposite directions along a given path between an ineffective position and an effective position for locking engagement with the other of said structures for preventing the swinging of said handle structure to said extended position; a second spring means normally urging said locking member toward said effective position; manually operable means co-operable with said locking member for moving the latter from said effective position to said ineffective position in opposition to said second spring means to release said handle structure for swinging to said extended position; and a holding member on the other of said structures; said holding member and said locking member having portions co-operably engageable for retaining the latter in said ineffective position while said handle structure is in said retracted position and being disengageable to release said locking member for movement to said effective position upon swinging of said handle structure toward said extended position.

10. Latch mechanism according to claim 9 wherein said holding member comprises a spring detent on the other of said structures; said co-operable portions being disengageable for releasing the locking member for movement to said effective position in response to separating movement between said locking member and spring detent in a direction transverse to said given path.

11. In door lock mechanism; a support structure having a recess and a bottom wall; a first guide means on said bottom wall; a latch member guided by said first guide means and movable between latching and unlatching positions; a first spring means urging said latch member toward said latching position; a handle structure connected with said support structure for swinging from a retracted position in said recess to an extended position and being effective to move said latch member to said unlatching pisition in opposition to said first spring means; a second guide means on said handle structure; a locking member carried by said handle structure and guided by said second guide means for movement between effective and ineffective positions; said locking member having a locking portion engageable with said support structure for preventing swinging of said handle structure to said extended position; a second spring means effective on said locking member for urging the same toward said effective position for locking engagement of said locking portion with said support structure; manually operable means on one of said structures and engageable with said locking member for moving the latter to said ineffective position in opposition to said second spring means for releasing said locking engagement whereby said handle structure can be manually swung from said retractable position to an extended position, said first spring means being reactively effective to automatically return said handle structure, when released, from its extended position to said retractable position and a cam or beveled surface on said locking member for cooperation with said other of said structures for moving said locking member against said second spring means if said locking member is in its effective position when said handle structure is swung to its retracted position from an extended position by said first spring means.

12. In door lock mechanism; a support structure having a recess and a bottom wall; a first guide means on said bottom wall; a latch member guided by said first guide means and movable between latching and unlatching positions; a first spring means urging said latch member toward said latching position; a handle structure connected with said support structure for swinging from a retracted position in said recess to an extended position and being effective to move said latch member to said unlatching position in opposition to said first spring means; a second guide means on said handle structure; a locking member carried by said handle structure and guided by said second guide means for movement between effective and ineffective positions; said locking member having a locking portion engageable with said support structure for preventing swinging of said handle structure to said extended position; a second spring means effective on said locking member for urging the same toward said effective position; manually operable means on said support structure and engageable with said locking member for moving the latter to said ineffective position in opposition to said second spring means; and detent means on said bottom wall and effective on said locking member for releasably holding the latter in said ineffective position when said handle structure is in said retracted position; said detent means being disengageable from said locking member upon swinging of said handle structure toward said extended position.

13. Door lock mechanism according to claim 12 wherein said detent means comprises a spring pawl having a holding portion, and stop means on said locking member

and presented for engagement with said holding portion; the movement of said locking member to said ineffective position by said manually operable means being constrained by said second guide means to a movement substantially parallel to said bottom wall for causing the cooperative engagement between said holding portion and stop means.

14. Door lock mechanism according to claim 12 and including pivot means providing for the swinging of said handle structure; said detent means comprising a spring pawl having a holding portion, and stop means on said locking member and presented for engagement with said holding portion; said locking member being constrained by said second guide means to a movement substantially parallel with the axis of said pivot means.

15. Door lock mechanism according to claim 12 wherein said handle structure comprises plate means forming a partial cover for said recess when the handle structure is in said retracted position; said second guide means being located on the underside of said plate means.

16. Door lock mechanism according to claim 12 wherein said support structure includes laterally projecting flange means; said manually operable means being mounted on said flange means and comprising a key-actuatable pivoted core and cam means swingable by said core for engagement with said locking member.

17. In door lock mechanism; a support structure supporting a movable latch member; a handle structure swingable to extended and retracted positions relative to said support structure for causing actuation of said latch member; a locking member mounted on one of said structures for movement between effective and ineffective positions; said locking member when in said effective position being engageable with the other of said structures for producing a locked condition of said handle structure in response to swinging of the latter to its retracted position; detent means effective between said other structure and said locking member for holding the latter in said ineffective position and being operable to release said locking member in response to a one-trip swinging of said handle structure to its extended position; spring means for urging said locking member to said effective position upon release of said detent means; and key-actuatable manual means on one of said structures for moving said locking member to said ineffective position while said handle structure is in said retracted position.

18. Door lock mechanism according to claim 17 wherein said support structure has a recess therein and includes a first wall portion at the bottom of said recess; said handle structure having a second wall portion movable toward and away from said first wall portion during the swinging of said handle structure; said locking member being mounted on the underside of said second wall portion; said detent means comprising a plate spring detent member mounted on first wall portion.

References Cited by the Examiner

UNITED STATES PATENTS

1,995,338	3/35	Andrews	70—146
2,195,195	3/40	Wartian	70—146
2,222,105	11/40	King	70—146
2,642,300	6/53	Pelcin	70—208 XR
2,655,027	10/53	Lynxwiler	292—254 XR

M. HENSON WOOD, JR., *Primary Examiner.*