

July 16, 1940.

E. N. JACOBI

2,208,003

COMPARTMENT DOOR LATCH

Filed June 9, 1939

2 Sheets-Sheet 1

Fig. 1.

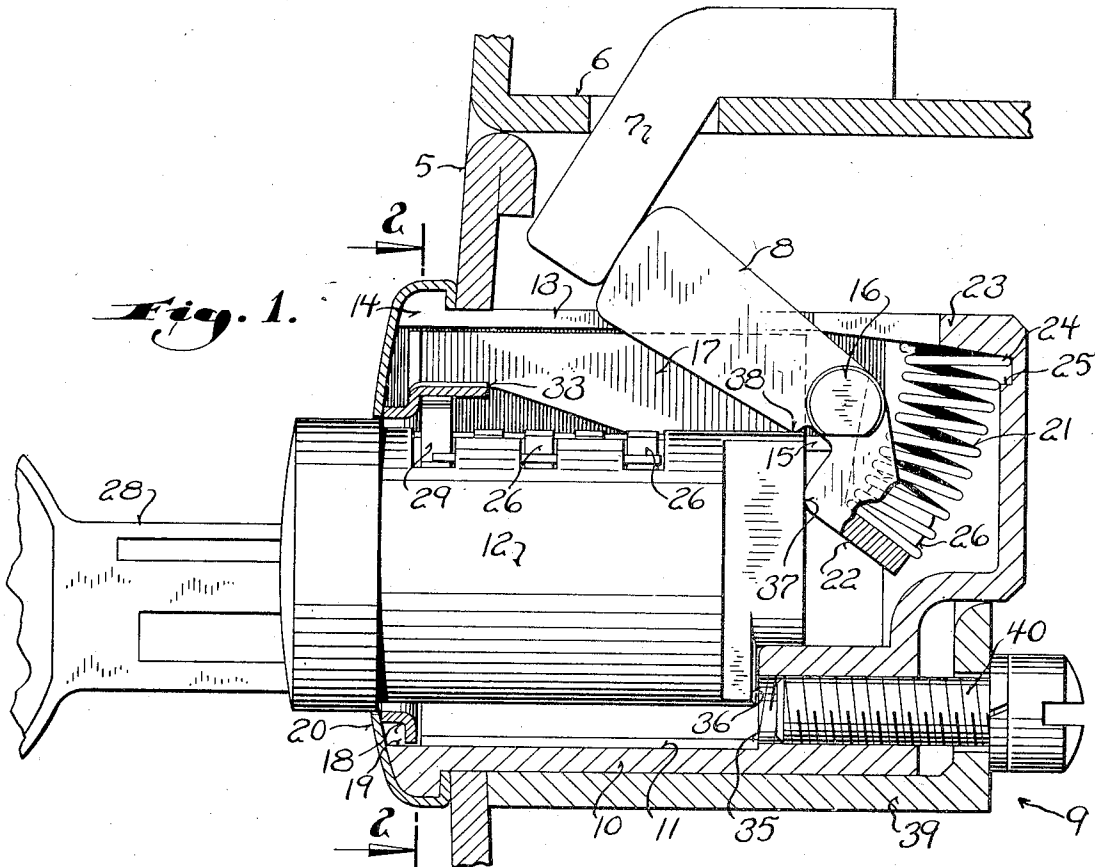


Fig. 2.

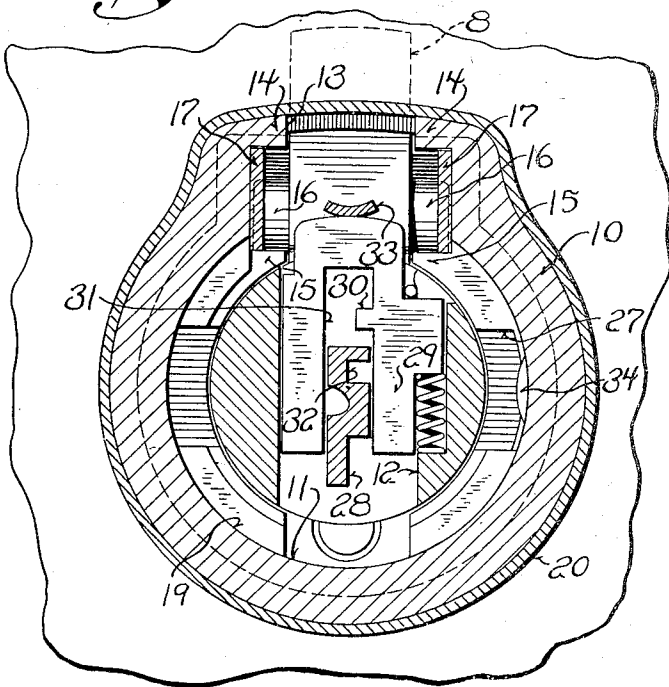
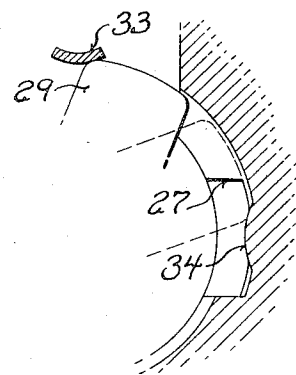


Fig. 5.



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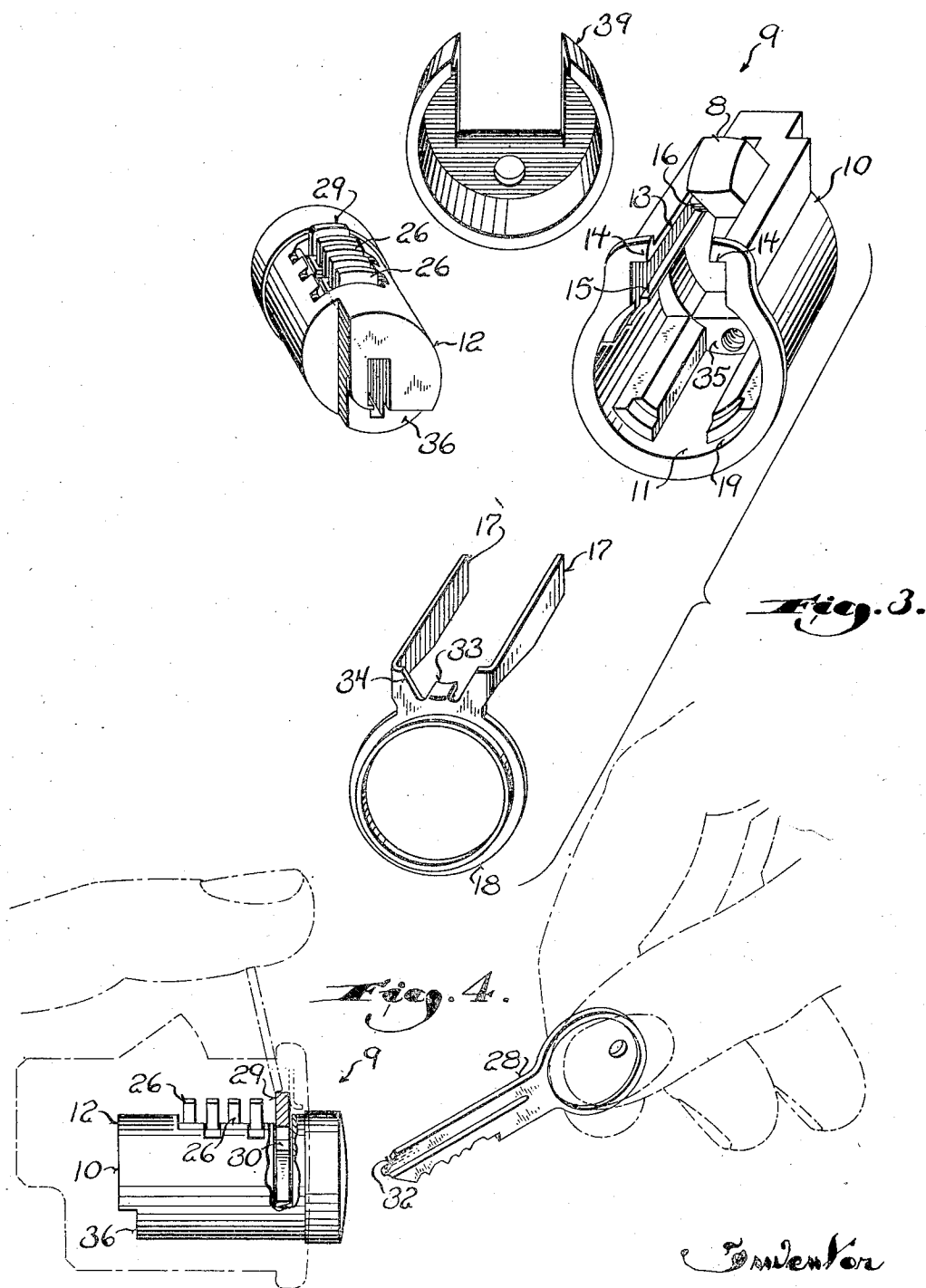
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,208,003

COMPARTMENT DOOR LATCH

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Application June 9, 1939, Serial No. 278,183

21 Claims. (Cl. 70—81)

This invention relates to locks, and refers particularly to door latch locks of the type designed for use on the glove compartment doors of automobiles.

As illustrated in the patent of Edward N. Jacobi for Compartment door latch, No. 2,172,586, Sept. 12, 1939, glove compartment doors of automobiles are now generally equipped with locking latches capable of being secured against opening by key controlled lock mechanism and provided with push button means for retracting the latch.

In lock devices of this character heretofore in use, the arrangement has been such that the latch bolt projected from the rear or inner end of the lock device. This necessitated locating the striker plate a substantial distance inwardly of the door frame at the mouth of the opening leading to the glove compartment, an objection which the present invention seeks to overcome by having the latch bolt point forwardly toward the front of the lock.

Another object of this invention is to provide a lock device of the character described wherein the latch bolt is so located that in securing the door closed, it acts in compression to more securely oppose attempts at forcible opening of the door.

Another object of this invention is to provide a lock device of the character described which is so designed that assembly of the parts is facilitated and a more compact construction obtained.

Another object of this invention is to provide a lock suitable for the purposes stated which is equipped with spring pressed means acting against cam surfaces in such a manner as to hold the parts against rattling.

Another object of this invention resides in the provision of novel means for removably securing the cylinder of the lock in position.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a longitudinal sectional view

through a lock device constructed in accordance with this invention;

Figure 2 is a cross sectional view taken through Figure 1 on the plane of the line 2—2;

Figure 3 is a perspective view of the several parts of the lock device shown disassembled;

Figure 4 is a detail view showing the manner in which the cylinder is removably secured in its casing; and

Figure 5 is a detail view to illustrate the manner in which the cylinder retainer acts to secure the parts against rattling.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts, the numeral 5 designates the door of a glove compartment, only the upper wall 6 of which is shown. Extending down from the upper wall 6 directly adjacent to the door frame is a striker plate 7 behind which a latch bolt 8 carried by the lock device, indicated generally by the numeral 9, engages to secure the compartment door 5 closed. The lock device 9 is mounted on the door so that when the door is closed, the latch bolt automatically engages the striker plate.

The lock device comprises a casing 10, preferably formed as a die casting, and having a bore 11 to slidably and rotatably receive a lock cylinder 12. A longitudinal slot 13 formed in the top wall of the casing accommodates the latch bolt 8.

The side walls of the slot 13 have longitudinal ledges 14 and 15 projecting inwardly from the top and bottom thereof to give the side walls of the groove a channel-shaped cross section. These channels or grooves receive trunnions 16 projecting from the sides of the latch bolt to pivotally mount the bolt at the closed inner ends of the grooves, the trunnions being held against sliding forward in the slot by rearwardly extending legs 17 carried by a retainer 18, but having limited motion transversely of the grooves and radially to the casing bore.

The legs 17, as best shown in Figure 2, fit the grooves or channels in the slot side walls and terminate a distance from the inner ends thereof sufficient to accommodate the diameter of the trunnions.

The outer washer-like portion of the retainer is seated in a counterbore 19 at the mouth of the bore 11 and is held in place by an escutcheon cap 20 clinched over the front flanged end of the casing.

The latch bolt is yieldingly urged to its operative position projecting through the slot 13, by a spring 21 confined between a tail-piece 22 on the bolt and the rear portion 23 of the upper wall

of the casing. The spring is held against displacement by the engagement of an enlarged coil 24 in a notch 25 in the adjacent rear wall of the casing and by a tit 26 on the tail-piece 22.

5 When the latch is in its fully projected operative keeper engaging position, as shown in Figure 1, the thrust of the spring is applied to the lock cylinder which is removably secured against forward motion in a manner now about to be described, and which, when in its unlocked position of rotation is depressible as a push button to retract the latch bolt from engagement with the striker plate.

15 The lock cylinder, as is customary, is provided with a plurality of conventional tumblers 26, spring pressed to operative positions projecting into the slot 13 which serves as a tumbler receiving groove in the locked position of rotation, and into a tumbler receiving groove 27 in the unlocked position of rotation, the groove 27 being at right angles to the slot 13.

20 Upon insertion of a proper key 28, the tumblers are retracted into the confines of the cylinder to free the cylinder for rotation in the usual manner. The foremost tumbler 29, however, is longer than the rest and is not retractible by the key 28. Its outer end portion thus engages in back of the annular flange formed by the retainer 18, space being provided therefor by having the counterbore stepped inwardly for the angular distance between the slot 13 and the groove 27. This foremost tumbler 29 thus constitutes a cylinder retainer, and to give it the necessary strength for this function, it is preferably stamped from steel.

35 If it is desired to release the cylinder for withdrawal, a piece of wire or any other suitable instrumentality, is inserted through the slot 13 to press the outer end of the tumbler down, as shown in Figure 4. This action, of course, necessitates that the key be removed.

40 When the tumbler or retainer 29 is fully retracted in this manner, a lug 30 thereon, which projects into its key slot 31, is in position to be engaged by the longitudinal groove 32 in the key so that upon insertion of the key, the tumbler or retainer is held in its fully retracted position, and as the remaining tumblers are retracted by the insertion of the key, it follows that the cylinder is freed for withdrawal.

50 The tumbler or retainer 29 is spring pressed to its operative position as are the other tumblers, and the spring tension applied thereto is utilized to hold the front end of the cylinder against rattling in the casing when it is in its locked and unlocked positions of rotation. To this end, the retainer 18 has a tang 33 struck rearwardly from its wall portion 34 which extends across the front end of the slot 13, to be engaged by the outer end of the tumbler or retainer.

65 This tang, as clearly shown in Figure 2, is curved or bulged inwardly to provide cam surfaces under which the tumbler or retainer cams itself as the cylinder is turned to its locked position of rotation, thus holding the parts under the tension of the tumbler spring and securing them against rattling.

70 A similar action takes place when the cylinder is turned to its unlocked position of rotation, for in this position the tumbler rides up on a cam surface 34 protruding inwardly from the bottom of the counterbore in line with the groove 27,

The manner in which this cam action takes place is clearly illustrated in Figure 5.

5 When the cylinder is in its locked position of rotation, depression thereof is prevented by a stop 35 formed in the inner end of the casing and positioned to engage a shoulder 36 on the inner end of the cylinder. Rotation of the cylinder to its unlocked position, disaligns this shoulder 36 from the stop and permits the cylinder to be pushed in, in the manner of a push button, to retract the bolt, as will be readily apparent.

15 Attention is directed to the fact that the thrust of the spring is at all times applied to the cylinder by the engagement of either or both of its fulcrums 37 and 38 carried by the tail-piece 22, with the cylinder, and that this condition obtains even though the latch may be held partly depressed by frictional contact with the striker. Hence, the inner end of the cylinder and the bolt is held against rattling.

20 The entire lock mechanism is held in place on the compartment door by a cap 39 fitted over the casing from the rear thereof and bearing against the rear face of the door to confine the door between it and the flange at the front end of the casing. A screw 40 threaded into the casing draws this cap down tight to clamp the door between it and the casing flange.

30 From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent that this invention provides a push button type of locking door latch suitable for glove compartment doors of automobiles, which is extremely compact and simple in design and construction, and that by having the latch bolt mounted to project forwardly, it acts as a toggle in the performance of its securing function. This disposition of the latch bolt also adds materially to the strength of the lock for any attempt to pry the door open places the latch bolt in compression.

45 During such attempted forcible opening of the door, the slight turning force applied to the latch bolt and acting against the cylinder to thrust the same forwardly is, of course, carried by the escutcheon cap, being applied through the cylinder retaining tumbler 29; but this force is distributed over the entire peripheral portion of the cap by the strong washer-like retainer 18 which receives the thrust of the retainer directly.

What I claim as my invention is:

55 1. A lock device of the character described comprising: a lock body having a flanged front end adapted to engage against the front face of a door; a pivoted latch bolt mounted in the lock body with its pivot point near the rear end of the body and its operative striker plate engaging portion facing forwardly toward the flanged front end so that the door is between said portion and the flanged front end of the lock body; and means in the lock body for moving the latch bolt to a retracted inoperative position.

70 2. In a lock device of the character described: a casing having a bore opening to the front end thereof and having a radial opening communicating with the bore; a latch bolt pivotally mounted in the casing with the axis of its pivot between the ends of the casing and with its keeper engaging portion projecting through the opening and toward but terminating short of the front end of the casing so that all portions

of the latch bolt lie between the ends of the casing; a spring urging the latch bolt to a position projecting its keeper engaging portion outwardly through the radial opening; and a key controlled lock cylinder in the bore of the casing having tumblers projectable into said radial opening and operable to retract the latch bolt.

3. In a lock device of the character described: a bored casing having a radial opening through its side wall; a latch bolt having trunnions at two centers; means at the inner end of the radial opening engaging the trunnions at one of said centers to pivotally mount the latch bolt in the casing with an end portion projectable through the radial opening toward the front of the casing; a spring acting on the latch bolt to yieldingly urge the same to a position projecting said end portion through the radial opening; and a lock cylinder slidable in the casing bore and operable upon inward endwise motion thereof to retract the bolt against the action of its spring, the trunnion at the other center engaging the side of the lock cylinder under the influence of said spring.

4. In a lock device of the character described: a casing having a bore opening to one end and having a radial opening through its side wall; a latch bolt; means pivotally mounting the latch bolt in the casing with an end portion thereof projecting through the radial opening and pointed toward the end of the casing to which the bore opens and with an opposite end portion projecting into the bore; a depressible actuator slidable in the bore with its end engageable with said last named end portion to retract the bolt into the casing; and a spring acting on the bolt to yieldingly urge the same to its operative position projecting its first named end portion out of the radial opening, the thrust of the spring being received by the actuator, whereby the latch bolt and the actuator are held against rattling by the spring.

5. In a lock device of the character described: a casing having a bore opening to one end and having a radial opening through its side wall; an abutment on said end of the casing to which the bore opens engageable with the front face of a closure panel on which the casing may be mounted; means cooperating with said abutment and engageable with the rear face of the panel for securing the casing to the panel; a latch bolt pivoted in the inner end portion of the casing with its operative end portion projecting through the radial opening toward the abutment on the casing to be engageable with a striker plate positioned in the path of the latch bolt for securing the closure panel in its closed position, said disposition of the latch bolt placing the same in compression in the event of attempts at forced opening of the closure panel; means for yieldingly urging the latch bolt to its operative striker plate engaging position; and an actuator movable in the bore of the casing for retracting the latch bolt.

6. A lock device of the character described comprising: a casing having a bore opening to one end and a radial slot opening through its side wall and extending to said end of the casing; shoulders projecting from the side walls of the slot at its inner end; a latch bolt having trunnions engaging the shoulders and mounting the bolt in the casing with an end portion thereof projecting through the slot toward said end of the cas-

ing; a retainer mounted in the front end of the casing and having arms extending down along the side walls of the slot to engage the trunnions of the bolt and confine the same in place; means for yieldingly urging the bolt to its operative position; and an actuator movable in the bore and operable on the bolt to retract the same.

7. A lock device of the character described comprising: a casing having a bore opening to its front end and having a slot through its side wall also opening to the front end; spaced ledges extending inwardly from each of the side walls of the slot to provide channels closed at their inner ends; a latch bolt having trunnions received in said channels and having an end portion projecting through the slot toward the front end of the casing; a retainer mounted in the casing and having portions thereof extending longitudinally along said channels to engage the trunnions of the bolt and retain the same in place; a spring yieldingly urging the bolt to its operative position protruding from the slot; and an actuator movable in the bore and operable on the bolt to retract the same.

8. In a lock device of the character described: a casing having a bore and a counterbore opening to its front end and having a radial slot opening through its side wall and to the front end of the casing, the side walls of the slot being longitudinally grooved to provide channels closed at the inner end of the casing; a latch bolt having trunnions received in the grooves of the slot side walls and having a portion protruding from the slot and projecting toward the front end of the casing; a retainer seated in the counterbore and having arms extending longitudinally along the grooves of the slot side walls to engage the trunnions and hold the same in place; an escutcheon cap fitted over the front end of the casing and securing the retainer in place; a spring yieldingly urging the latch bolt to its position protruding from the slot; and an actuator movable in the bore and operable on the bolt to retract the same.

9. In a lock device of the character described: a casing having a bore and a counterbore opening to its front end and having a radial slot opening through its side wall and to the front end of the casing, the side walls of the slot being longitudinally grooved to provide channels closed at the inner end of the casing; a latch bolt having trunnions received in the grooves of the slot side walls and having a portion protruding from the slot and projecting toward the front end of the casing; a retainer seated in the counterbore and having arms extending longitudinally along the grooves of the slot side walls to engage the trunnions and hold the same in place; an escutcheon cap fitted over the front end of the casing and securing the retainer in place; a spring yieldingly urging the latch bolt to its position protruding from the slot; an actuator movable in the bore and operable on the bolt to retract the same; and releasable means on the actuator engageable with the retainer for releasably securing the actuator in the bore.

10. In a lock device of the character described: a casing having a bore opening to one end and having a radial opening through its side wall; a rocking latch bolt in the form of a bell crank lever having one arm projecting angularly outward through the radial opening in the direction of the end having the bore opening, and its other arm projecting into the bore; bearings for the bolt including means to guide the same for sliding translating motion radial to the casing; a spring

resiliently acting on the bolt to project its arm outward through the radial opening; and an actuator for retracting the bolt against the spring.

11. In a lock device of the character described:
 5 a casing having a bore opening to one end and having a radial opening through its side wall; a rocking latch bolt in the form of a bell crank lever having one arm projecting angularly outward through the radial opening in the direction
 10 of the end having the bore opening, and its other arm projecting into the bore; bearings for the bell crank including means for guiding the bell crank center for motion radially of the casing; a spring between the casing and the bell crank to
 15 rotate the bell crank in the direction projecting its arm outward through the radial opening and to move the bell crank bodily radially toward the center of the casing; and an actuator sliding in the bore against the arm of the bell crank therein
 20 for retracting the bolt.

12. In a lock device of the character described: a casing having a bore opening to one end and having a radial opening through its side wall; a rocking latch bolt in the form of a bell crank
 25 lever having one arm projecting angularly outward through the radial opening in the direction of the end having the bore opening, and its other arm projecting into the bore; bearings for the bell crank including means for guiding the
 30 bell crank center for motion radially of the casing; a push button actuator sliding in the bore against the arm of the bell crank therein for retracting the bolt; a projecting fulcrum point on the bell crank adjacent to the side of the push
 35 button actuator near the center of the bell crank whereby the bell crank lever rotates about said fulcrum point; and a spring between the casing and the bell crank.

13. In a lock of the character described: a
 40 bored casing; a cylinder rotatable therein; key operable spring pressed tumblers carried by the cylinder and projectable therefrom for engagement with the casing, the casing having a tumbler receiving groove to receive the projecting ends
 45 of the tumblers when the cylinder is in its locked position of rotation; and a cam surface in the groove engageable with the projecting end portion of at least one tumbler to hold the same slightly depressed so that its spring tension serves
 50 to hold the cylinder against rattling.

14. In a lock of the character described: a bored casing having angularly disposed tumbler receiving grooves opening to its bore; a lock
 55 cylinder rotatable in the bore; key operable spring pressed tumblers carried by the cylinder with their ends projectable into the tumbler receiving grooves in locked and unlocked positions of rotation of the cylinder; and cam surfaces in the
 60 tumbler receiving grooves engageable with at least one of said tumblers to hold the same slightly depressed so that the spring tension of said tumbler acts to prevent rattling of the cylinder when in its locked and unlocked positions of rotation.

15. In a lock of the character described: a
 65 bored casing; a lock cylinder rotatable therein between predetermined locked and unlocked positions of rotation; a spring pressed retainer mounted in the cylinder and projecting therefrom, the casing having a passage to receive the
 70 projecting portion of the retainer; a wall on the retainer closing the front of said passage and with which the retainer engages to secure the cylinder in the bore, said retainer being depressible in a predetermined position of rotation

of the cylinder to clear said wall and free the cylinder for withdrawal; and cam surfaces in said passage engageable with the retainer when the cylinder is in its locked and unlocked positions of rotation to depress the retainer and place its
 5 spring under tension so that the spring of the retainer holds the parts against rattling in said two positions of rotation of the cylinder.

16. In a lock device of the character described: a casing having a bore and a radial opening
 10 through its side wall; a bolt having trunnions; means at the inner end of the casing to receive the trunnions and pivotally mount the bolt with a portion thereof protruding through the radial opening; a spring yieldingly urging the bolt to
 15 its position protruding from the opening; a strong retaining member having a portion positioned at the mouth of the bore and having a portion extending longitudinally along the radial opening to contact the bolt trunnions and hold the same
 20 in place; an actuator movable in the bore and operable to retract the bolt; means on the actuator engageable behind the portion of the strong retainer located at the mouth of the bore for securing the actuator in position; and an escutcheon cap fitted over the front end of the casing and holding said strong retainer in place.

17. In a lock device of the character described: a casing having a bore and a counterbore opening to its front end and having a radial opening
 30 through its side wall and to its front end; a latch bolt having trunnions; means at the inner end of the radial opening engaging the trunnions to pivotally mount the bolt, said means permitting forward motion of the trunnions and a limited motion thereof radially of the casing; a spring yieldingly urging the latch bolt to a position projecting a portion thereof through the radial opening and toward the front end of the casing; a strong stamped retaining member having a washer-like
 40 portion seated in the counterbore and having legs extending longitudinally along the slot to engage the trunnions and hold the bolt in place; an escutcheon cap fitted to the front end of the casing and securing said retaining member in place; and an actuator mounted in the casing bore and operable on the bolt to retract the same.

18. In a lock device of the character described: a casing having a bore and a counterbore opening to its front end and having a radial opening
 50 through its side wall and to its front end; a latch bolt having trunnions; means at the inner end of the radial opening engaging the trunnions to pivotally mount the bolt, said means permitting forward motion of the trunnions and a limited motion thereof radially of the casing; a spring yieldingly urging the latch bolt to a position projecting a portion thereof through the radial opening and toward the front end of the casing; a strong stamped retaining member having a washer-like
 55 portion seated in the counterbore and having legs extending longitudinally along the slot to engage the trunnions and hold the bolt in place; an escutcheon cap fitted to the front end of the casing and securing said retaining member in place; a lock cylinder mounted in the bore and operable on the bolt to retract the same; and a strong depressible retainer carried by the cylinder and engageable behind the washer-like portion of the retaining member for securing the lock cylinder in the bore.

19. In a lock device of the character described: a casing having a bore opening to its front end and having a radial opening through its side wall; a latch bolt pivoted in the inner end of the casing

with a part projecting through the radial opening toward the front end of the casing, said bolt being positionable in the casing through the front end thereof; a spring acting on the bolt to yieldingly project the same through the radial opening, said spring also tending to move the bolt forwardly toward the front end of the casing; a retaining member at the front of the casing having portions thereof projecting rearwardly to engage the bolt and hold the same in place against the tension of its spring; an escutcheon cap secured to the front end of the casing and securing the retaining member in position; and an actuator in the casing bore operable on the bolt to retract the same against the tension of its spring.

20. A latch device for securing a door closed by having a latch bolt engage behind a fixed striker comprising: a casing braced against the face of the door and extending inwardly behind the door; a latch bolt; bolt actuating mechanism housed in said casing to be guided thereby; means pivotally mounting the latch bolt on the casing at a point spaced inwardly of the door with its striker en-

gaging portion extending forwardly alongside the actuating mechanism to engage behind the striker when the door is closed so that an outward pull on the door places the latch bolt in compression and draws the casing against the face of the door; and means exposed at the front of the door for actuating the bolt to disengage it from the striker.

21. A lock device of the character described comprising: a bored casing having an opening through one wall thereof, the bore of the casing forming a guideway from one end thereof to a point near its opposite end; a flange on the front end of the casing; a latch bolt pivotally mounted adjacent to said opposite end of the casing with its outer operative end portion projecting through the opening therein toward its flanged front end; means slidable in the casing bore and operable on the bolt to retract the same to an inoperative position; and means yieldingly urging the latch bolt to its operative position and against a portion of the slidable means.

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