Aug. 26, 1952 R. H. WISE 2,608,429

DOOR LOCK

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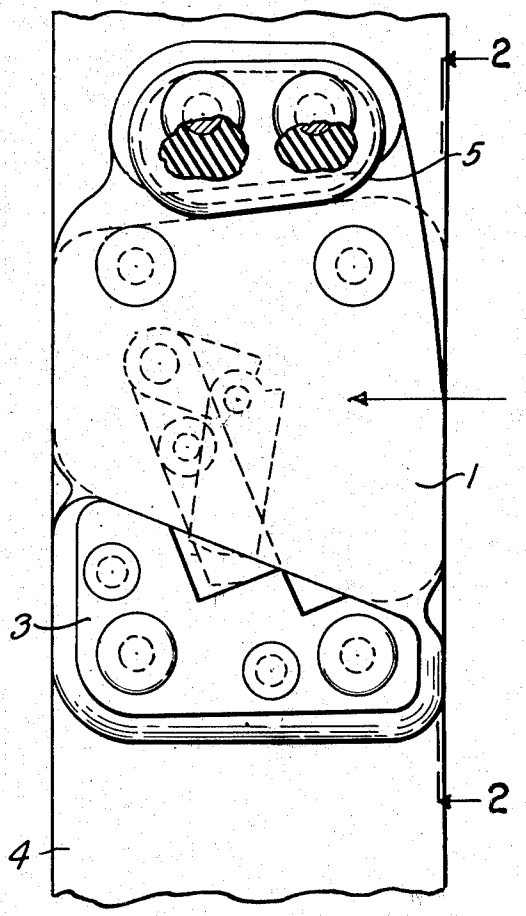
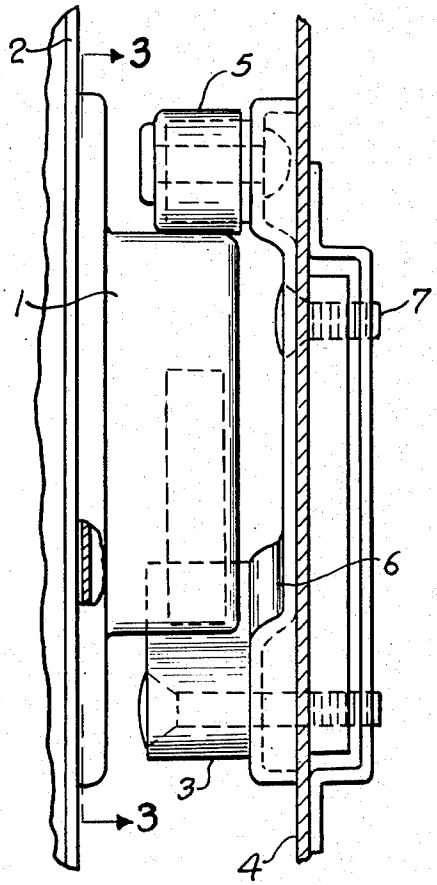


FIG. 1.

FIG. 2.



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FIG. 3.

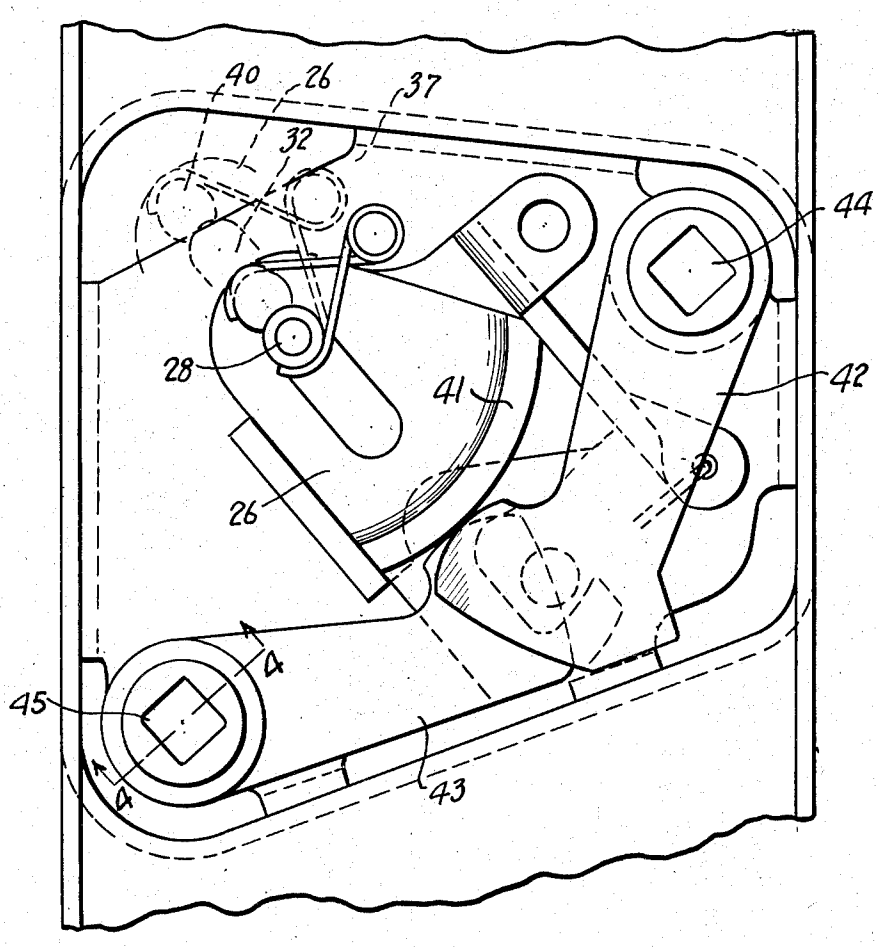
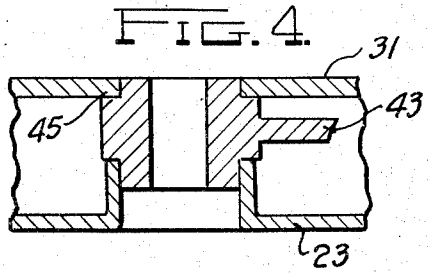


FIG. 4.



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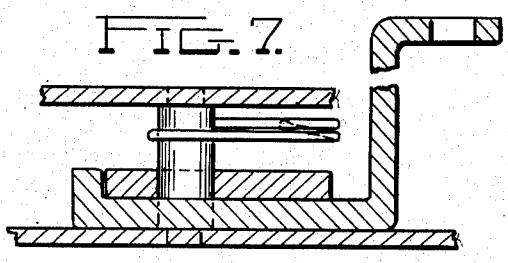
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FIG. 7.



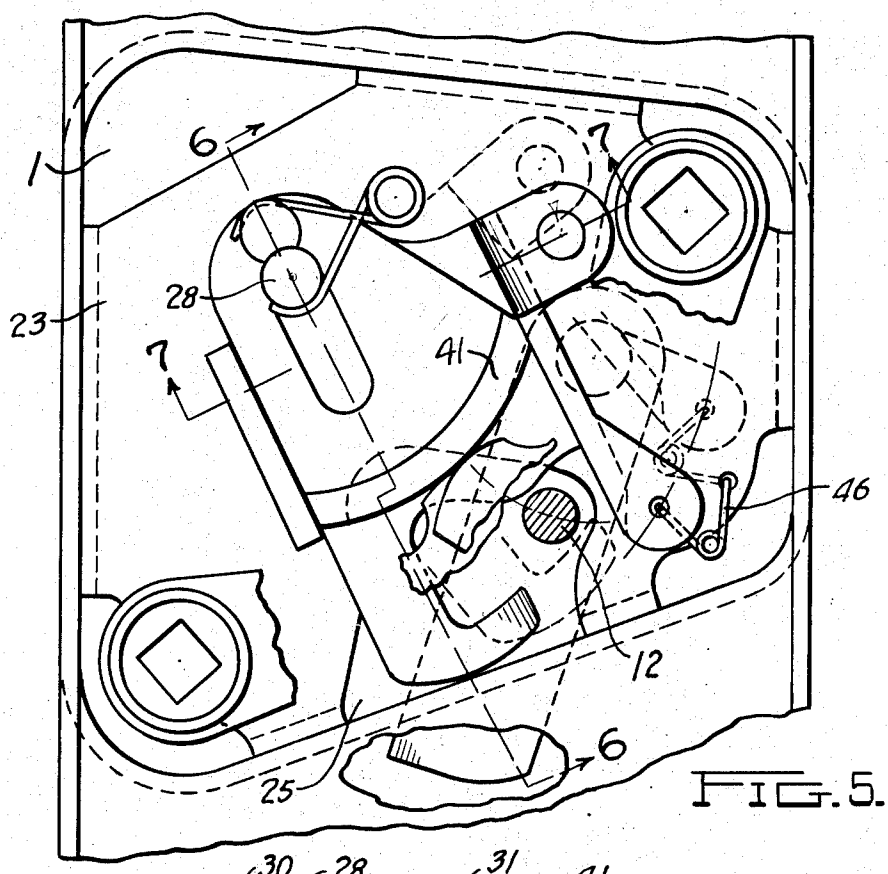


FIG. 5.

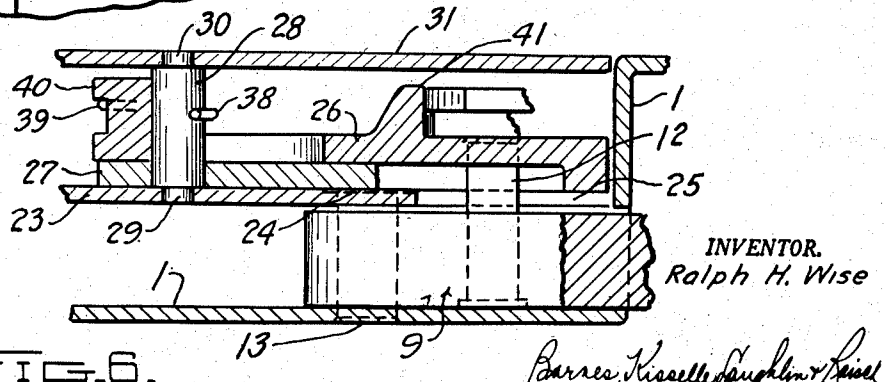


FIG. 6.

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FIG. 8.

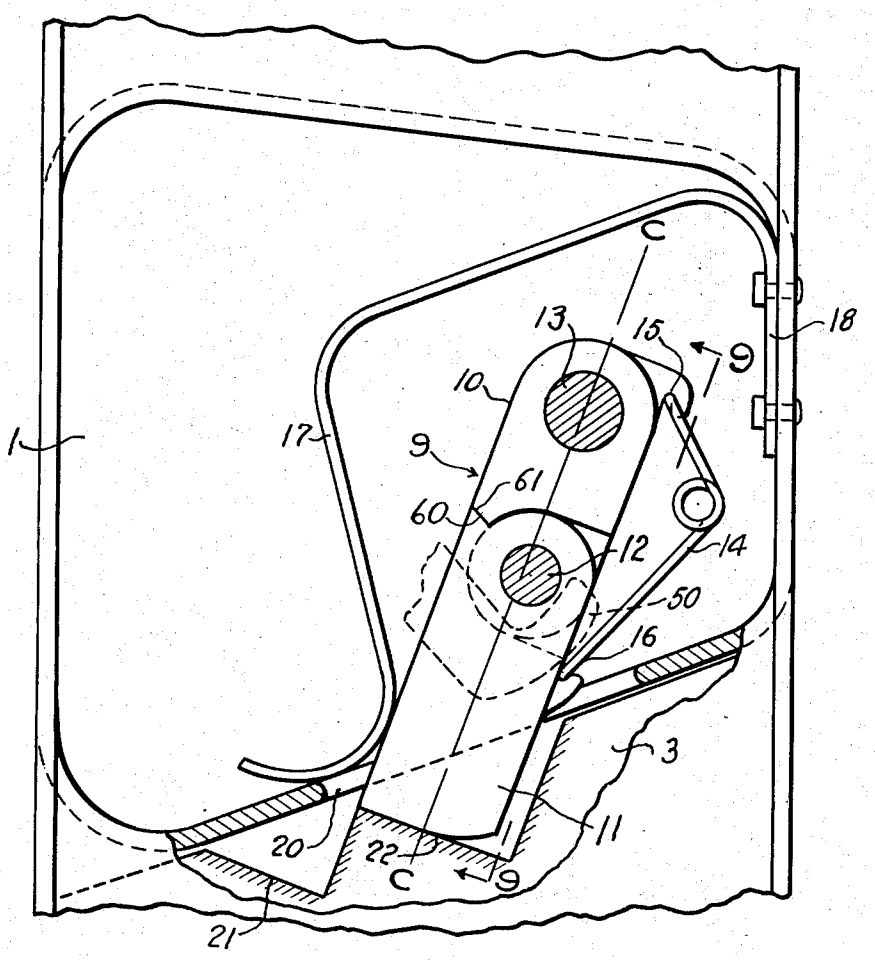
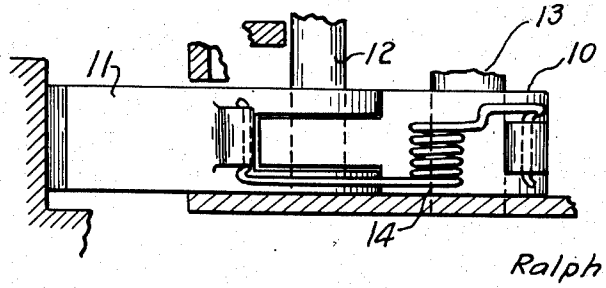


FIG. 9.



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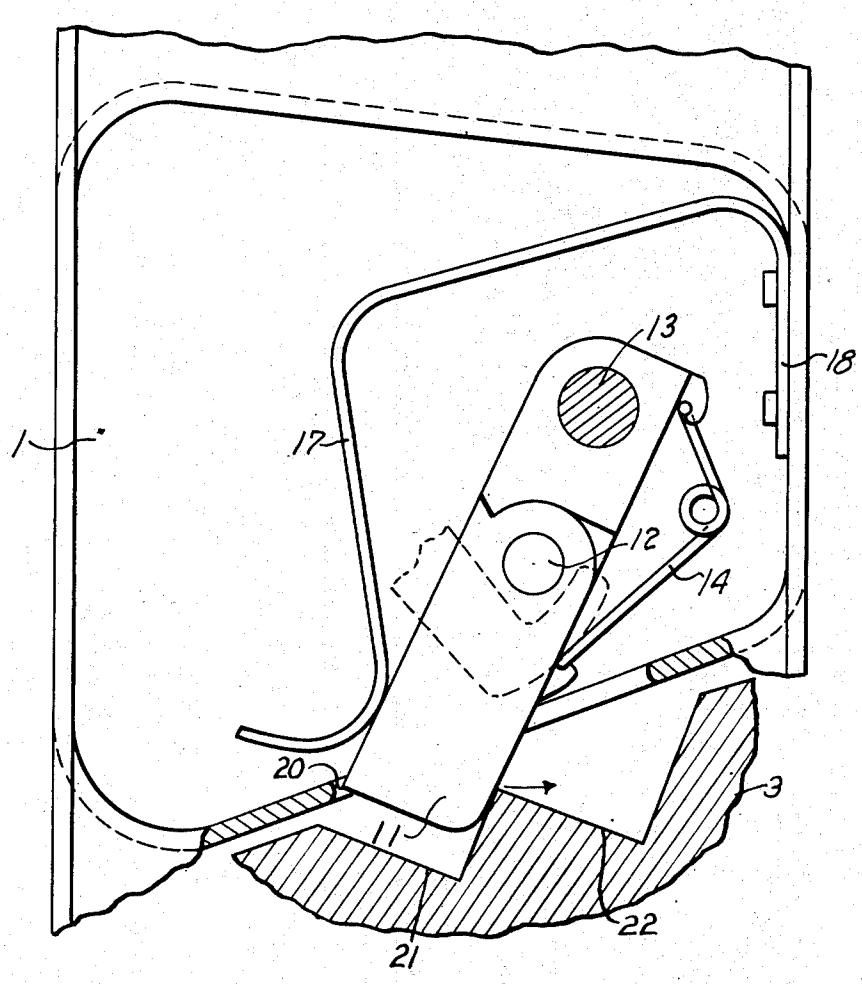
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FIG. 10.



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FIG. 11.

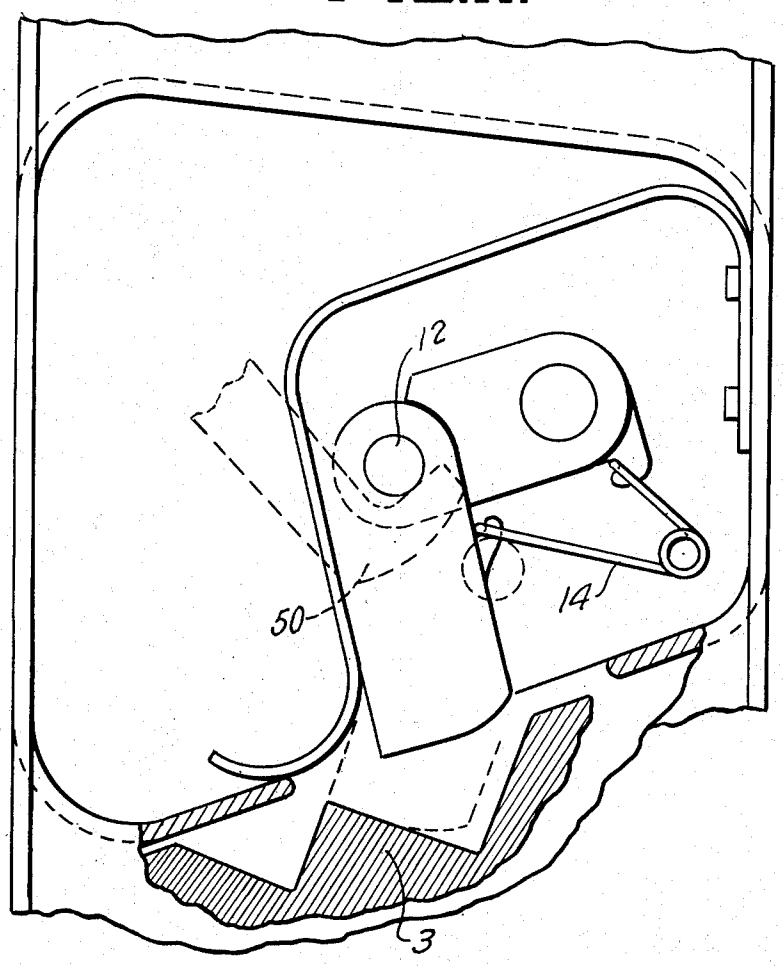


FIG. 12.

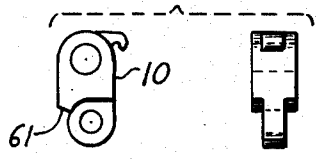
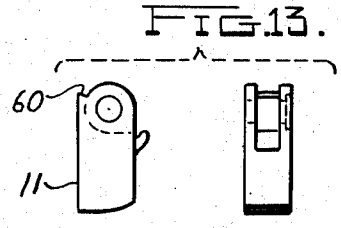


FIG. 13.



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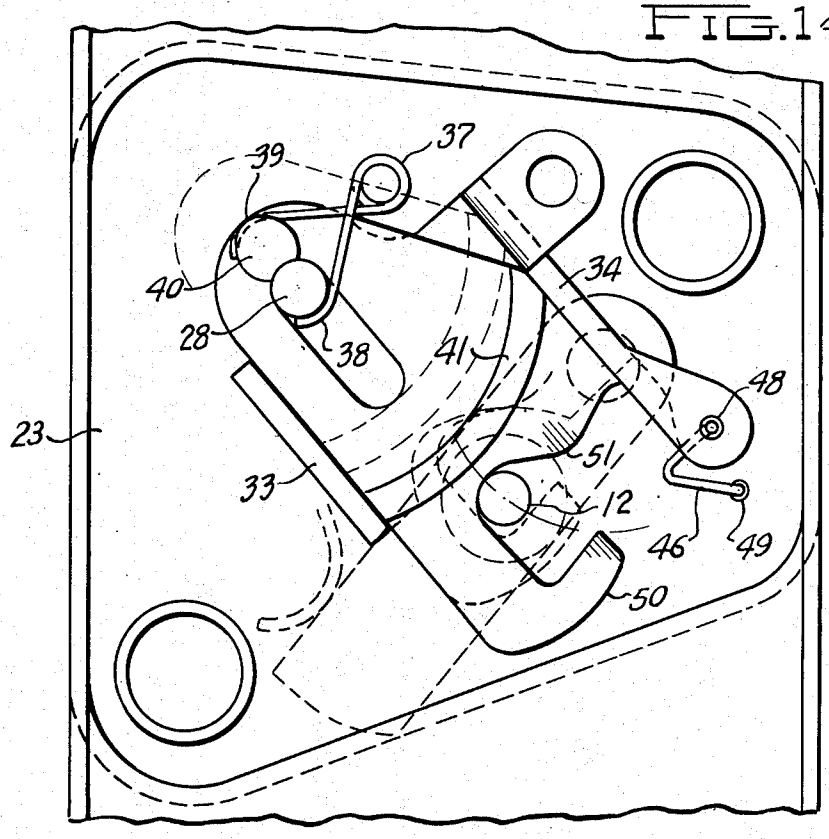
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FIG. 14.



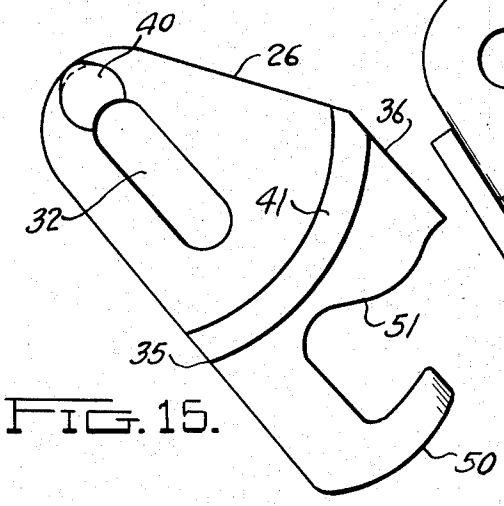


FIG. 15.

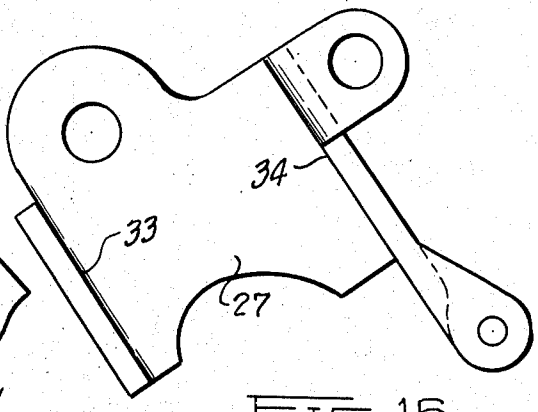


FIG. 16.

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Patented Aug. 26, 1952

2,608,429

UNITED STATES PATENT OFFICE

2,608,429

DOOR LOCK

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Application May 15, 1947, Serial No. 748,183

7 Claims. (Cl. 292—222)

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This invention relates to a door lock and particularly a lock for an automobile door.

It is an object of this invention to produce a lock which will lend itself to operation with a minimum of effort, that is, a lock which will permit the vehicle door to close easily and quietly but will securely and safely retain the door in locked or latched condition while closed, and be exceptionally theft-proof because of its design and method of installation.

My invention also contemplates a lock in which the latch bolt can be retracted with a minimum of effort preparatory to opening the door.

In the drawings:

Fig. 1 is a side elevation showing my lock mounted on the door and body lock pillars of an automobile body.

Fig. 2 is an elevation partly in section along the line 2—2 of Fig. 1 showing the lock as viewed from outside the vehicle body when the door is closed.

Fig. 3 is a section along the line 3—3 of Fig. 2.

Fig. 4 is a section along the line 4—4 of Fig. 3.

Fig. 5 is a view similar to that of Fig. 3 but showing the inside and outside rollbacks disconnected from the bolt.

Figs. 6 and 7 are sections along the lines 6—6 and 7—7 of Fig. 5.

Fig. 8 is a detail of the toggle latch bolt.

Fig. 9 is a section along the line 9—9 of Fig. 8.

Fig. 10 is a detail of the toggle latch bolt showing the position of the toggle bolt as it rides over the striker plate during the closing of the door.

Fig. 11 is a detail of the toggle bolt in retracted position.

Figs. 12 and 13 are details of the two members which make up the toggle bolt.

Fig. 14 is a detail showing the toggle bolt camming the cam back to unlocked position during the closing of the door.

Fig. 15 is a detail of the cam.

Fig. 16 is a detail of the guide for the latch cam.

Referring more particularly to the drawings, it will be seen that my lock is of the type wherein the lock and dovetail are combined. Thus, the striker casing 1, which is secured to the door pillar 2, comprises the male member of the dovetail, and the lock keeper plate 3, which is secured to the body lock pillar 4, comprises the lower member of the dovetail or door registering device, and wedge plate 5 constitutes the upper member of the dovetail socket. Keeper plate 3 and wedge plate 5 are secured to plate 6 which is in turn secured by bolts 7 to body pillar 4.

Referring to Fig. 8, it will be seen that the latch bolt generally designated 9 is in the form of toggle arms comprising members 10 and 11 which are pivoted to each other by pin 12 and

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to the lock frame or case 1 by post 13. Spring 14 is anchored as at 15 to member 10 and at 16 to member 11. This spring 14 tends to maintain bolt 9 in made or straightened position. Thus, bolt 9 and spring 14 swing as a unit about post 13. Leaf spring 17 is anchored at 18 to lock case 1, presses against bolt member 11, and projects bolt 9 through opening 20 in lock case 1 into interengagement with the safety step 21 or final step 22 of lock striker 3. By comparing Figs. 8 and 11, it will be seen that bolt 9 can break at the knee only when toggle member 11 rotates counterclockwise about pin 12 relative to member 10.

The mechanism for operating latch bolt 9 will now be described. It will be noted from Figs. 8 and 6 how latch bolt 9 is mounted. The dovetail striker or male member 1 is provided with a partition plate 23 which, in effect divides the case 1 into one compartment in which bolt 9 is mounted and another compartment in which the mechanism for operating latch bolt 9 is mounted. Post 13, upon which bolt 9 is pivoted, is anchored at its opposite ends in striker case 1 and in plate 23 as at 24, Fig. 6. Plate or partition 23 is secured within case 1 and is provided with a cut-out portion 25 through which pin 12 projects, Fig. 5.

The mechanism for operating the toggle bolt comprises a cam 26 which is slidably mounted in a guide 27, Figs. 14–16, which is pivotally mounted on post 28. The lower end 29 of post 28 is fixed in plate 23 and the upper end 30 is fixed in cover plate 31 for casing 1, Fig. 5. Cam 26 is provided with an elongated slot 32 to permit relative sliding movement between post 28 and cam 26. Side walls 33 and 34 of guide 27 have a sliding contact with the side edges 35 and 36, respectively, of cam 26 for guiding the same. Spring 37 has one end 38 anchored on post 28 and the other end 39 anchored on post 40 which is fixed on cam 26. Cam 26 is provided with an arcuate flange 41 which is arranged to be contacted by the inside rollback 42 and the outside rollback 43 pivoted, respectively, at 44 and 45 between the lock cover plate 31 and partition 23, Fig. 4. Rollback 42 is adapted for operation by a handle (not shown) positioned within the vehicle body and rollback 43 is arranged for operation by a door handle (not shown) positioned outside the vehicle body. Spring 37 tends to keep anchor post 40 in contact with post 28. In other words, spring 37 tends at all times to project cam 26.

Guide 27 is adapted to be pivoted about post 28 in either "locked" or "unlocked" position. An over-center spring 46 has one end anchored to guide 27 as at 48 and the other end anchored to plate 23 as at 49. Cam 26 is provided with a hook 50 which is arranged to engage the upper end of pin 12 for retracting toggle bolt 9. This

retraction is effected by breaking toggle bolt 9 at its knee 12, see Fig. 11. Cam plate 26 has a cam surface 51 arranged to co-act with pin 12 at certain times when the latch bolt 9 rides over the striker for reconnecting cam hook 50 with pin 12.

Operation.—When the door is closed, toggle bolt 9 will be interengaged with final catch 22 of striker 3, Fig. 8. Toggle bolt 9 has its pin 12 at this time slightly over-center so that the door cannot be opened unless toggle 9 is broken at the knee. Spring 14 maintains toggle bolt 9 in made or straightened condition and spring 17 holds bolt 9 projected. To retract the bolt either the inside rollback 42 can be rotated clockwise or the outside rollback 43 can be rotated counterclockwise, Fig. 3. When either rollback 42 or 43 is rotated the free end of the rollback will engage arcuate flange 41 on cam 26, Fig. 3, and slide cam 26 in guide 27 to the dotted line position. Elongated slot 32 in cam 26 permits relative movement between cam 26 and post 28. This retraction of cam 26 by either of the rollbacks will only retract the bolt provided the lock is in "unlocked" condition, that is, provided guide plate 27 has been swung to the position shown in Figs. 3 and 14 so that hook 50, upon retraction of cam 26, will pick up or engage post 12 to thereby break the toggle at the knee and retract the bolt from interengagement with striker 3, Fig. 11. This permits the door to be swung open.

If the guide plate has been pivoted counterclockwise from the position shown in Fig. 14 to that shown in the full lines Fig. 5, then if either rollback is actuated to retract cam 26, hook 50 will simply ride freely by post 12, will not interengage the same and consequently both the inside and outside rollbacks or door handles are ineffective to retract the latch bolt and the door or lock will be in locked condition.

To reconnect the rollbacks with the latch bolts it will be necessary to shift guide plate 27 from the full line position to the dotted line position, Fig. 5, about post 28. Spring 46 will hold guide plate 27 in either locked or unlocked position.

My lock is arranged so that the operator will not unconsciously lock himself out of his automobile. If, while the automobile door is open, guide 27 is shifted to the full line position shown in Fig. 5 so that the latch is locked, that is, the inner and outer rollbacks or door handles are ineffective to retract the bolt, then upon closing the door, latch bolt 9 will be swung clockwise, Fig. 10, as it rides over the striker plate 3. As bolt 9 is swung clockwise about post 13 by the striker plate during closing of the door, pin 12 will ride along cam surface 54 on cam 26 and thereby rotate cam 26 and guide 27 from the full line to the dotted line position shown in Fig. 5. The camming action is illustrated in Fig. 14. Thus, closing of the door will automatically reset cam plate 26 so that the hook 50 will engage pin 12 and the rollbacks will again be effective to retract bolt 9.

If, while the door is open, the lock parts are in the position shown in Fig. 5, full lines, so that the rollbacks are ineffective to retract the bolt, and it is desired to maintain the lock in this "locked" condition upon closing the door, this can be accomplished by swinging the outside door handle, that is, the outside rollback 43, to bolt retracting position which will retract slide 26 and cam surface 51 toward post 28 so that cam surface 51 will be out of the range of travel of pin 12 as the bolt 9 is pivoted while riding over the striker plate during closing of the door. After the door is closed the outside rollback can be released and the retractor or cam 26 will return to the full line position, Fig. 5, where it is ineffective to retract the bolt. Thus, while the door is open, the lock can be set in locked condition and maintained so during the closing of the door and, in effect, the door can be locked without a key.

Guide plate 27, of course, will be arranged to be operated by a lever on the inside of the door or by a conventional push button extending up through the garnish molding. Such an arrangement is shown in the Andersen-Bowlus Patent No. 2,039,873.

In Fig. 8 the center line of the toggle bolt 9 is referenced C—C. It will be noted that the center of pin 12 is slightly to the right of, but substantially on the, center line C—C and that stop 60 on toggle member 11 is against stop 61 on toggle member 10. When the door is latched, as shown in Fig. 8, the reaction between bolt 11 and keeper 3 is tending to turn bolt 9 counterclockwise about pin 13 and is tending to rotate toggle member 11 clockwise about pin 12 because pin 12 is to the right of center. Thus, it will be seen that bolt 9 cannot be retracted except by swinging pin 12 to the left of center C—C, which is the function of cam hook or retractor 50.

I claim:

1. A lock comprising a lock frame, a toggle bolt pivoted adjacent one end upon the lock frame and having its other end adapted to project beyond the lock frame and adapted to interengage a keeper, resilient means acting between the members comprising said toggle bolt to hold the same in longitudinal alignment, the said toggle bolt and resilient means being swingable as a unit about its pivotal support upon the lock frame while the toggle members are maintained in longitudinal alignment, a retractor cam adapted to engage the toggle bolt at the knee and to break the toggle at the knee and retract the free end of the toggle bolt inwardly of the lock frame whereby the toggle bolt is disengaged from its keeper, and a rollback adapted to engage and operate said cam.

2. In a lock, a casing, a plate mounted in said casing and dividing the same into two compartments, a two arm toggle bolt positioned in the one compartment and pivoted adjacent one end to said casing, the other end of the toggle bolt projecting without the casing and adapted to interengage a keeper when the toggle bolt is projected, a pivotal connection between the two members of the toggle bolt and positioned substantially at the longitudinal center of the toggle bolt when straightened, means at the knee of said toggle bolt projecting into the other compartment, and a retractor positioned in the other compartment adapted to engage the said means and break the toggle bolt at the knee to disengage the toggle bolt from its keeper.

3. The combination as set forth in claim 2 wherein the toggle bolt swings as a unit with the toggle bolt members in longitudinal alignment as the bolt rides over the striker and the retractor is slidable transversely of the toggle bolt.

4. The combination as set forth in claim 3 including a guide member pivotally mounted on said plate, the said retractor being slidably mounted in said guide plate, the guide member being pivotable to one position where the retractor is effective to break the toggle bolt at the knee and to another position where the retractor is ineffective upon retraction to break the toggle at the knee.

5. In a lock, a casing, a two arm toggle bolt pivoted at one end to said casing, the other end of the toggle projecting without the casing and adapted to interengage a keeper when the toggle is straightened, a guide plate pivotally mounted on the lock casing to swing about a different center than that of the toggle bolt, a retractor slidably mounted in said guide plate, the said guide plate being shiftable to locked and unlocked positions, the said guide plate when in locked position locating the retractor in a position where it is ineffective to break the toggle bolt at the knee, the said guide plate when in unlocked position bringing the retractor into a position where it is effective upon retraction to break the toggle bolt at the knee.

6. The combination as set forth in claim 5 wherein the retractor member has a cam surface and the toggle bolt is provided with a pin for contacting said cam surface whereby when the guide plate is in locked position swinging of the latch bolt about its pivot will cause said means on the latch bolt to ride along the cam surface and shift said guide plate and retractor to unlocked position.

7. The combination as set forth in claim 6 wherein the retractor is shiftable on its guide

plate to a position where the cam surface is outside the range of the pin on the toggle bolt so that swinging of the toggle bolt about its pivot will be ineffective to shift the guide plate from locked to unlocked position.

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