March 16, 1926. 1,576,877

B. E. TAYLOR

VEHICLE DOOR LATCH

Filed Feb. 28, 1923 3 Sheets-Sheet 1

FIG. 1

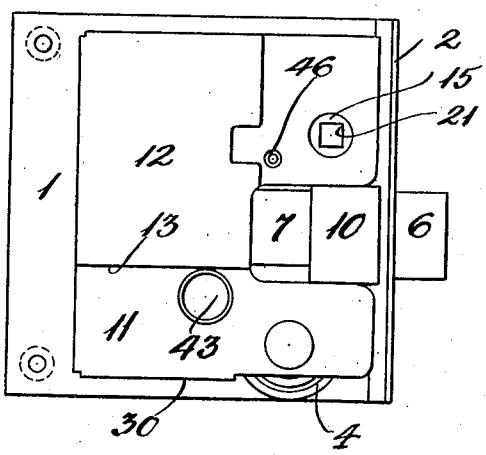


FIG. 4

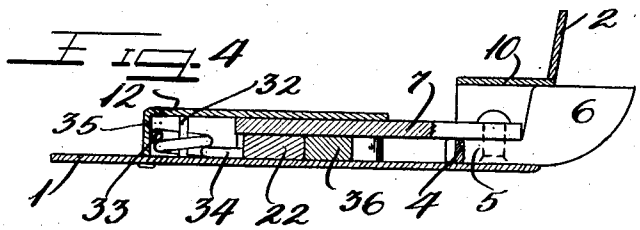


FIG. 5

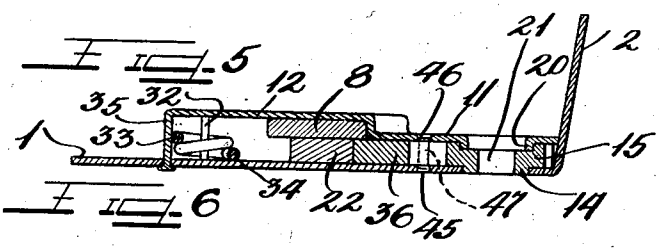
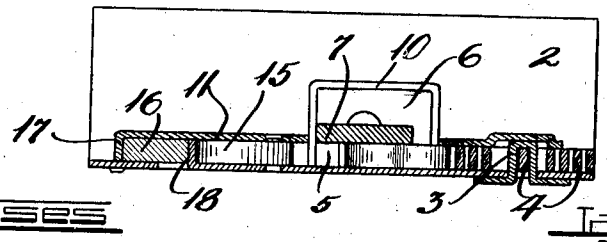


FIG. 6



Witnesses

H. G. Parks

Fred E. Lasler

Inventor

Bayard E. Taylor

by Charles Hall

Atty.

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B. E. TAYLOR

VEHICLE DOOR LATCH

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FIG. 2

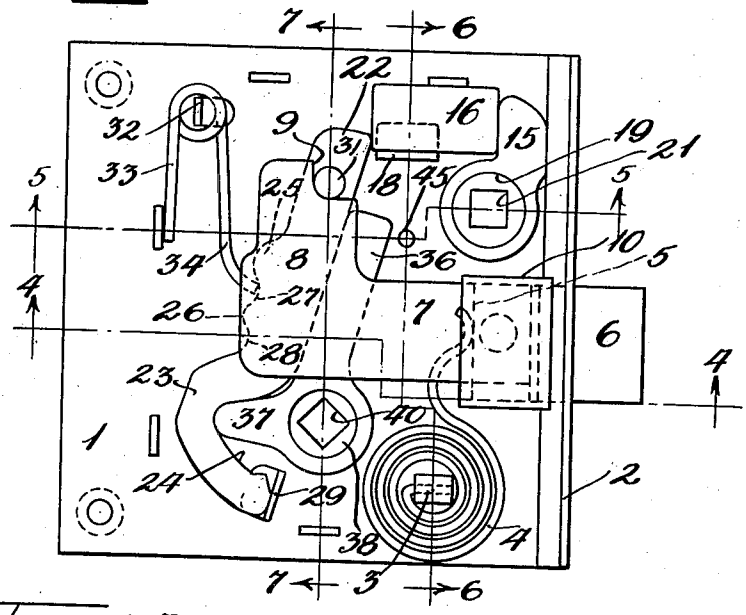
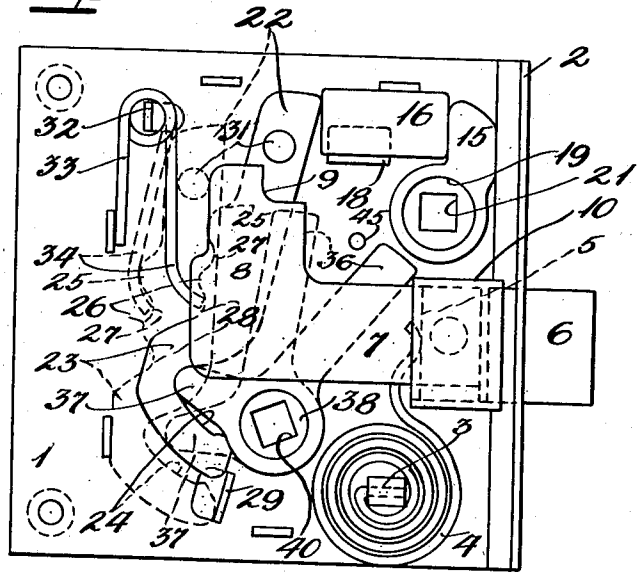


FIG. 3



Witnesses
H. G. Marks
Fred E. Paesler

Inventor
Bayard E. Taylor
Charles W. Hills
Atty.

by

March 16, 1926. 1,576,877

B. E. TAYLOR

VEHICLE DOOR LATCH

Filed Feb. 28, 1923 3 Sheets-Sheet 3

FIG. 8

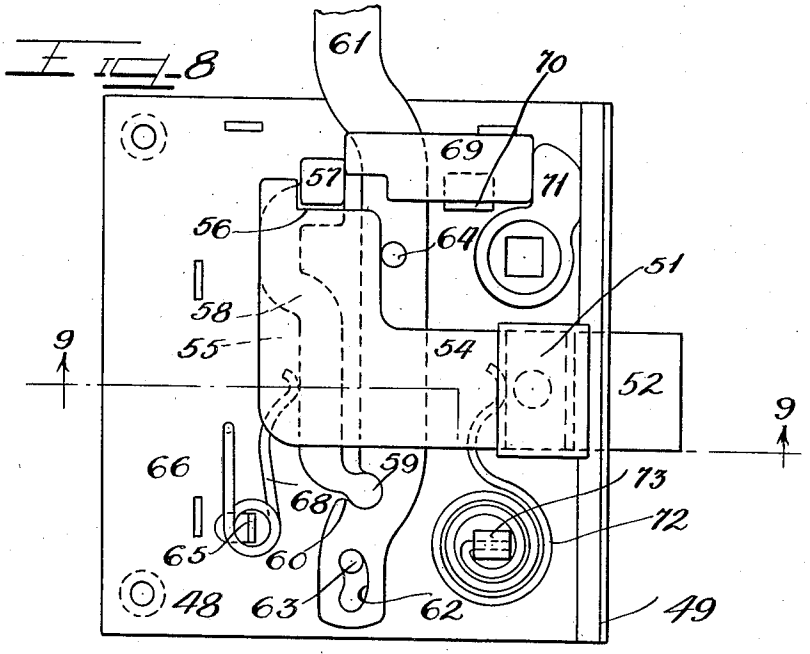


FIG. 9

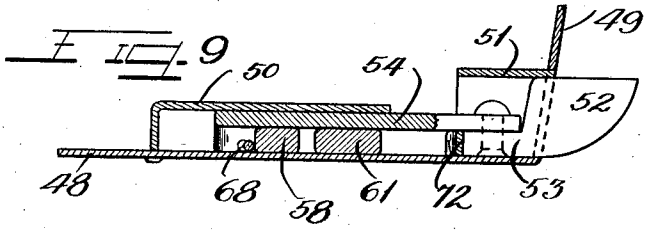
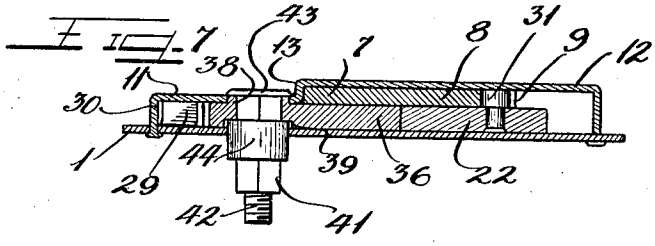


FIG. 7



Witnesses
H. G. Parks
Fred E. Paesler

Inventor
Bayard E. Taylor

by

Atty.

Patented Mar. 16, 1926. 1,576,877

UNITED STATES PATENT OFFICE.

BAYARD E. TAYLOR, OF OAK PARK, ILLINOIS.

VEHICLE DOOR LATCH.

Application filed February 28, 1923. Serial No. 621,701.

To all whom it may concern:

Be it known that I, BAYARD E. TAYLOR, a citizen of the United States, and a resident of the village of Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Vehicle Door Latch; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates more particularly to vehicle door latches or locks adapted to be locked and unlocked from the interior of the vehicle without the use of a key by merely operating the inner handle of the door lock, thereby providing a door lock with which all but one of the doors of a closed vehicle may be equipped to permit said doors to be locked and unlocked only from the interior of the vehicle, while the remaining door may be equipped with a door lock of a type similar to the other door locks with the exception that said last mentioned door is provided with an externally accessible key lock mechanism to permit the last door to be locked and unlocked from the exterior of the vehicle.

It is an object of this invention to provide a vehicle door latch adapted to have the latch bolt actuating member moved by operation of the inner handle into a position wherein operation of said actuating member by the outer handle will not effect a retraction of the latch bolt.

It is also an object of the invention to provide an automobile door lock wherein the inner handle is adapted to be operated to not only retract the latch bolt but to move the latch bolt retracting member out of engagement with the latch bolt so that operation of the outer handle will not cause a retraction of the latch bolt.

It is another object of the invention to provide a vehicle door lock wherein the latch bolt retracting member is adapted to be moved into and out of engagement with the latch bolt by the operation of the inner handle.

It is a further object of this invention to provide a vehicle door latch wherein a latch bolt retracting member is adapted to be moved into a retracted position to lock the latch bolt against retraction by simultaneously operating both of the door latch handles after the retracting member has been shifted out of engagement with the latch bolt by swinging the inner handle in a direction opposite to that required to cause retraction of the latch bolt.

It is furthermore an object of this invention to provide a vehicle door lock wherein one of the latch bolt retracting handles is rendered ineffective in causing retraction of the latch bolt by the operation of a second handle which may be moved to opposite sides of a neutral position to either cause retraction of the latch bolt or movement of a retracting member out of coacting engagement with the latch bolt.

It is also an object of the invention to provide a vehicle door lock wherein the inner and outer handles are controlled by a single spring which acts on a latch bolt retracting member to hold the handles in inoperative or normal positions when the latch bolt is partly projected.

It is another object of the invention to provide a door lock with a latch bolt retracting member adapted to be shifted by the operation of one handle to render the operation of the other handle ineffective in causing retraction of the latch bolt, said door lock further adapted to be provided with means for preventing shifting of the retracting member so that the second mentioned handle cannot be rendered ineffective in causing retraction of the latch bolt.

It is a further object of the invention to provide a door lock wherein a double lock is adapted to be created to lock the outer handle against operation and also lock the latch bolt against retraction until released by a combination operation of the inner handle.

It is an important object of this invention to provide a vehicle door lock of comparatively thin and inexpensive construction adapted to render the operation of the outer handle effective or ineffective, in causing retraction of the latch bolt, by simply operating the inner handle in opposite directions from a normal position.

Other and further important objects of

this invention will be apparent from the disclosures in the specification and the accompanying drawings.

The invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a plan view of a vehicle door latch embodying the principles of this invention.

Figure 2 is an enlarged plan view of the door latch with the casing removed showing the parts in normal operating position.

Figure 3 is a similar view showing the latch retracting member shifted into a position to render the outer handle ineffective in causing retraction of the latch bolt, and furthermore illustrating in dotted lines the position into which the retracting member may be moved to render both handles ineffective in causing retraction of the latch bolt.

Figure 4 is a section taken on line 4—4 of Figure 2.

Figure 5 is a section taken on line 5—5 of Figure 2.

Figure 6 is a section taken on line 6—6 of Figure 2.

Figure 7 is a section taken on line 7—7 of Figure 2.

Figure 8 is a plan view of a modified form of a door lock with the cover removed.

Figure 9 is a section taken on line 9—9 of Figure 8.

As shown on the drawings:

The type of vehicle door lock illustrated in Figures 1 to 7 inclusive comprises a mounting plate or back plate 1, one end of which is bent at an angle to afford a flange 2 having a latch bolt opening therein. Secured in a boss or stud 3 formed on the mounting plate 1 is the inner end of a heavy coiled spring 4, the outer end of which projects to engage against a heel or shoulder 5 formed on a latch bolt head 6 positioned to project through the opening in the mounting plate flange 2. Rigidly secured to the latch bolt head 6 by a rivet or other suitable means is a latch bolt shank or stem 7 the inner end of which has integrally formed thereon at right angles an arm 8 having a notch 9 therein. Rigidly secured to the mounting plate 1 against the inner face of the flange 2 is a U-shaped strap 10 which affords a guide for the latch bolt head 6.

A cover or casing 11 is secured to the mounting plate 1 to enclose the operating mechanisms of the lock. The casing 11 is formed with a raised portion 12 having a side wall or flange 13 which affords a guide for the latch bolt shank 7.

Rotatable in an opening in the mounting plate 1 is a boss 14 of an outer handle roll back 15 positioned to coact with a slide bar or block 16. The slide bar 16 is guided in its movement between a wall or flange 17 of the casing 11 and a flange 18 struck inwardly from the mounting plate 1. The outer handle roll back boss 14 is formed by partially pressing out a portion thereof leaving a recess 19 into which a circular flange or ring 20 struck from the casing 11 projects. The roll back 15 is provided with a square opening 21 for receiving the squared inner end of a stem of an outer handle (not shown).

The inner end of the slide bar 16 contacts the upper end or corner of a latch bolt retracting member comprising a flat metal arm 22 having integrally formed at the lower end thereof a flat hook-shaped head 23 having a cam notch or edge 24. Formed on one edge of the arm 22 are a pair of humps 25 and 26 forming notches 27 and 28. The end of the hook-shaped head 23 is positioned to pivot or rest against a lug 29 struck from the mounting plate 1, and also contacts the casing wall 30. Secured to the upper portion of the latch bolt retracting member 22 is a pin 31 which normally engages in the notch 9 of the latch bolt arm 8 (Figure 2).

Struck from the mounting plate 1 is a lug 32 around which is engaged the coiled portion of a heavy control spring having a short arm 33 and a long arm 34. The short spring arm 33 presses against the casing wall 35, while the end of the long spring arm 34 normally seats in the notch 27 of the latch bolt retracting member arm 22 to resiliently hold the retracting member arm 22 in contact with the outer handle slide bar 16. The spring arm 34 also serves to resiliently hold the retracting member arm 22 against an inner handle roll back arm 36. A cam arm 37 is integrally formed at one end of the roll back arm 36 and projects into the cam notch 24 of the hook portion 23 of the retracting member. The inner handle roll back 36 and the cam arm 37 form a bell crank member the bight of which has a part thereof pressed upwardly to form a boss 38 on one surface of the bell crank bight and provide a recess 39 in the opposite surface. The boss 38 projects into an opening provided in the casing 11 and has a squared opening 40 therein. Projecting through the boss 38 and out through an opening in the mounting plate 1 is a square stem or stud 41 having a reduced threaded end 42 on which the inner handle is to be secured. A beveled head plate 43 is integrally formed on the opposite end of the stem 41 and seats against the end of the boss 38. A collar 44 is secured on the squared stem 41 and projects through the opening in the mounting plate 1 and seats in the recess 39 of the bell crank member 36—37.

In order that the fourth or last door of an automobile may be locked and unlocked

from the exterior of the automobile by means of a key-operated lock and still be equipped with a door lock similar in construction to the door locks used on the other doors of the automobile, it is necessary to lock the latch bolt retracting member against a shifting operation by the cam arm 37 and the inner handle. For this purpose the door lock mounting plate 1 is provided with a threaded aperture 45 disposed directly below an opening 46 in the casing 11 (Figures 1 and 5). A screw or pin 47 (Figure 5) is adapted to be engaged through the casing opening 46 and threaded into the mounting plate opening 45 adjacent the inner handle roll back 36. The pin 47 acts as a stop to lock the inner handle roll back arm 36 against movement in one direction to hold the retracting member 22 locked against being shifted upwardly by the inner handle cam arm 36, but still permitting the inner handle to be operated in an opposite direction to cause retraction of the latch bolt. The locking pin 47, while locking the retracting member 22 against a shifting movement by the inner handle, permits retraction of the latch bolt by the operation of either the outer handle roll back 15 or the inner handle roll back 36. The last door of the vehicle may be equipped with an independent key-operated lock whereby the last door may be locked or unlocked from the exterior of an automobile. All the doors of an automobile may be equipped with the improved type of door locks, while it is only necessary that one of said door locks need be provided with the locking pin 47.

Figures 8 and 9 illustrate a modified form of a vehicle door lock comprising a mounting plate 48 having an integral flange 49 provided with a latch bolt opening. Secured to the mounting plate is a casing 50. Also secured to the mounting plate is a U-shaped strap 51 which affords a guide for a latch bolt. The latch bolt embraces a head 52 having an integral shoulder 53 to which one end of a latch bolt shank 54 is secured. Formed at right angles to the latch bolt shank 54 is an arm 55 having a notch 56 therein. Projecting into the notch 56 is a finger 57 which is integrally formed at right angles to the upper end of a latch bolt retracting member 58, the lower end of which has a curved head 59 integrally formed thereon. The head 59 is pivotally seated in a curved notch 60 provided in the lower portion of an inner handle 61 of the lever type. The inner handle 61 has a curved slot 62 therein to receive a pin 63 secured to the mounting plate 48. A pin 64 is fastened to the inner handle 61 and is in contact with one edge of the latch bolt arm 55. Struck from the mounting plate 1 is a lug 65 around which a spring is engaged. One arm 66 of the spring is bent to project into an aperture in the mounting plate 48, while the other spring arm 68 is curved and engages against one edge of the retracting member 58 to hold the head 59 seated in the inner handle notch 60 and also serving to hold the finger 57 resiliently pressed against the inner end of a slide bar or block 69.

The slide bar 69 is guided by means of a lug 70 struck from the mounting plate 48 and by one of the walls of the casing 50. Contacting the second end of the slide bar 69 is an outer handle roll back 71 adapted to be operated by means of an outer handle not shown.

Pressing against the shoulder 53 of the latch bolt head is one end of a coiled spring 72 the inner end of which is secured to a retaining member 73 on the mounting plate 48.

The operation is as follows:

In the form of door lock illustrated in Figures 1 to 7 inclusive, the main spring 4 presses against the latch bolt shoulder 5 and acts to normally hold the latch bolt head 6 in its projected latching position. The lock is adapted to be mounted in a vehicle door in the usual manner to permit the projecting latch bolt head to project into an opening in a door frame strike plate to hold the door rigidly in place in the door frame.

When the latch bolt is projected the second spring 33—34 acts to resiliently hold the retracting member 22 projected against the outer handle slide bar 16 and against the inner handle roll back 36, thereby serving to normally hold the two handles in their operating positions against rattling with the various lock members positioned as illustrated in Figure 2.

With the door in closed position the same may be readily opened from the exterior of the automobile by simply turning the outer handle thereby rotating the roll back 15 to cause the same to move the slide bar 16 against the action of the spring 33—34. Movement of the slide bar 16 causes the retracting member 22 to pivot about its lower end, thereby causing the pin 31 to act on the arm 8 to retract the latch bolt against the action of the main spring 4. With the latch bolt retracted the door may be swung into open position. Release of the outer handle permits the stressed springs 4 and 33—34 to respectively return the latch bolt and the slide bar back into their normal positions. Return of the slide bar 16 serves to return the roll back 15 and the outer handle to their normal positions.

The door may also be opened from the interior of the automobile. This is done by swinging the inner handle to one side of its normal position, thereby causing the inner handle roll back 36 to act against the retracting member 22 to swing the same about its lower end so that the pin 31 will act on the

latch bolt arm 8 to retract the latch bolt against the action of the main spring 4. With the release of the inner handle after the opening of the door, the springs 4 and 33—34 respectively act to return the latch bolt and the inner handle to their normal positions.

The door lock is constructed to be adjusted to render operation of the outer handle ineffective in causing retraction of the latch bolt. To render the operation of the outer handle ineffective in retracting the latch bolt, the inner handle is moved in a direction opposite from that required to cause retraction of the latch bolt. When this is done the cam arm 37 is moved from the position illustrated in Figure 2 into the full line position of Figure 3. This movement of the cam arm 37 causes the retracting member 22 to be shifted from its normal position shown in Figure 2 into the full line position of Figure 3, thereby moving the pin 31 out of the latch bolt notch 9. When the retracting member 22 is shifted into the position shown in Figure 3, the end of the hump 26 stresses the spring arm 34, the end of which moves from the notch 27 into the notch 28. If the outer handle is now operated the roll back 15 will cause sliding of the slide bar 16 and a pivotal movement of the retracting member 22. The pin 31 having been raised clears the upper end of the latch bolt arm 8, thereby rendering the operation of the outer handle ineffective in causing a retraction of the latch bolt from the exterior of the automobile. When the outer handle is released after an ineffective operation, the stressed spring 33—34 acts to automatically return the same to normal position.

To restore the retracting member 22 back into normal retracting position, it is only necessary to move the inner handle back into its normal position whereby the cam arm 37 acts to pull the retracting member 22 downwardly to again position the pin 31 in the latch bolt notch 9.

When the pin 31 is moved out of the latch bolt notch 9 by the single operation of the inner handle, the latch bolt 6 is not locked so that if the door is open it may be pushed shut permitting the latch bolt to be retracted and then projected into engagement with the opening in the strike plate. The door is accordingly locked against being opened from the exterior of the automobile.

In this type of door lock the latch bolt is free to be retracted by the operation of the inner handle even when the retracting member 22 is positioned to make operation of the outer handle ineffective. To retract the latch bolt from the interior of the automobile when the pin 31 is in its elevated inoperative position with respect to the latch bolt, it is only necessary to move the inner handle back through normal position thereby first causing return of the retracting member 22 back to its lower position and then causing said retracting member to pivot so that the pin 31 will act to retract the latch bolt.

To lock the latch bolt against retraction, the inner handle is first operated to shift the retracting member 22 to move the pin 31 out of engagement with the latch bolt to render the outer handle ineffective for causing retraction of the latch bolt. A composite operation of the handles is now necessary, that is the outer handle is operated to cause the slide bar 16 to swing the retracting member 22 from the full line position of Figure 3 toward the spring 33—34 with the pin 31 positioned beyond the inner end of the latch bolt. The outer handle is held to prevent return of the retracting member by the spring 33—34, and the inner handle is now moved back through normal position thereby causing the retracting member to be lowered to position the pin 31 in back of the inner end of the latch bolt, as shown in dotted lines in Figure 3, to lock the latch bolt against retraction. The pin 31 may be returned to the full line position of Figure 3 by moving the inner handle in a direction to cause lifting of the retracting member 22 until the pin 31 clears the upper end of the latch bolt arm 8 when the spring 33—34 acts to move the retracting member back into the full line position of Figure 3 ready to be lowered by another operation of the inner handle back into its normal position.

The last or fourth door of the automobile may be equipped with a door lock similar to the other door locks except that a pin 47 is engaged in the openings 46 and 45, thereby locking the inner handle against operation in a direction to cause elevation of the retracting member 22. The fourth door may be provided with a separate key lock to permit the last door to be locked and unlocked from the exterior of the automobile.

In the modified form of door lock illustrated in Figures 8 and 9, the latch bolt may be retracted by swinging the inner handle 61 so that the pin 64 thereon will act on the latch bolt arm 55 to slide the latch bolt inwardly against the resistance of the main spring 72. When the outer handle is operated the roll back 71 slides the bar 69 inwardly thereby causing the finger 57 to act on the latch bolt arm 55 to retract the latch bolt 52 allowing the inner handle to remain undisturbed since the member 58 is permitted to pivot about its pivoted end 59.

When it is desired to lock the door against being opened from the exterior of the automobile, the inner handle 61 is simply pulled upwardly through the distance permitted by the handle slot 62, thereby causing elevation of the retracting member 58 and movement of the finger 57 out of engage-

ment with the latch bolt arm 55. Operation of the outer handle is now ineffective in causing retraction of the latch bolt since the finger 57 clears the upper end of the latch bolt arm. By pushing the inner handle back into normal position, the latch bolt may be retracted by the operation of the outer handle.

I am aware that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

1. An automobile door lock comprising a latch bolt, an outer handle mechanism, a shiftable latch bolt retracting member engaged with said latch bolt and coacting with said outer handle mechanism, and an inner handle mechanism adapted to be operated in one direction to cause retraction of the latch bolt and further adapted to be operated in an opposite direction to cause shifting of the retracting member out of engagement with the latch bolt to render operation of the outer handle mechanism ineffective in retracting the latch bolt.

2. An automobile door lock comprising a latch bolt, an outer handle mechanism, a shiftable latch bolt retracting member engaged with said latch bolt, a spring for resiliently holding the retracting member in contact with said outer handle mechanism, and an inner handle mechanism adapted to be operated to shift said retracting member out of engagement with said latch bolt to render operation of the outer handle ineffective in retracting the latch bolt.

3. An automobile door lock comprising a spring impelled latch bolt, a spring impelled retracting member engaged with said latch bolt, a slide bar in contact with said retracting member, an outer handle roll back adapted to be operated to cause the slide bar to actuate the retracting member to retract the latch bolt, an inner handle roll back adapted to be operated in one direction to cause the retracting member to retract the latch bolt, and an arm on said inner handle roll back adapted to shift the retracting member out of engagement with the latch bolt when the inner handle roll back is operated in an opposite direction.

4. An automobile door lock comprising a spring impelled latch bolt, a spring impelled retracting member, a pin thereon normally engaged with said latch bolt, a slide bar in contact with the retracting member, an outer handle roll back adapted to be operated to cause the slide bar to actuate the retracting member so that the pin will retract the latch bolt, and an inner handle roll back adapted to be operated in one direction to cause the pin to retract the latch bolt and further adapted to be operated in an opposite direction to shift the retracting member so that the pin is moved out of engagement with the latch bolt to prevent retraction of the latch bolt when the outer handle roll back is operated.

5. An automobile door lock comprising a latch bolt, an outer handle mechanism, a latch bolt retracting member, a pin thereon engaging the latch bolt for retracting the same, and an inner handle mechanism adapted to be operated to move the retracting member and said pin into a position wherein operation of the retracting member by said outer handle mechanism will not retract the latch bolt.

6. In a vehicle door lock, the combination with inner and outer handles, of a latch bolt actuating mechanism shiftably mounted adjacent the inner handle and adapted to be shifted by the inner handle to render operation of the outer handle ineffective.

7. In a vehicle door lock the combination with inner and outer handles, of a latch bolt, and a spring impelled shiftable latch bolt retracting mechanism engaged with the latch bolt to retract the same and further adapted to be shifted out of contact with the latch bolt by the operation of one of said handles to render both of said handles ineffective until the retracting mechanism has first been moved back into contact with the latch bolt by a reverse operation of said handle.

8. In a door lock the combination with an outer handle mechanism, of a latch bolt retracting member, an inner handle mechanism adapted to be operated to move the latch bolt retracting member into a position to render operation of the outer handle mechanism ineffective, and means for locking the inner handle mechanism against operation to cause movement of the latch bolt retracting mechanism into a position for rendering operation of the outer handle ineffective.

9. In a door lock the combination with an outer handle mechanism, a latch bolt, a shiftable member adapted to be pivoted by the outer handle mechanism to cause retraction of the latch bolt, an inner handle mechanism adapted to be operated to slide the shiftable member into a position wherein operation thereof by the outer handle mechanism will not cause retraction of the latch bolt, and means adapted to be engaged in the door lock to lock the inner handle mechanism against operation in a direction to cause sliding of the shiftable member but permitting both the outer handle mechanism and the inner handle mechanism to be actuated to cause retraction of the latch bolt.

10. In a door lock the combination with a latch bolt, of a retracting member engaged therewith having notches therein, a handle

mechanism engaged with said retracting member adapted to be operated to cause retraction of the latch bolt, a spring engaged in one of the retracting member notches for holding the same in engagement with the handle mechanism, and a second handle mechanism adapted to be operated to move the retracting member out of engagement with the latch bolt and causing the spring to engage in another of the notches of the retracting member.

11. In a vehicle door lock of the class described the combination with a latch bolt, of a plurality of handle mechanisms, and a latch bolt retracting member engaged with the latch bolt and adapted to be actuated by said handle mechanisms to cause retraction of the latch bolt, said retracting member furthermore adapted to be moved out of engagement with the latch bolt by the operation of one of said handle mechanisms to render operation of the other handle mechanism ineffective in causing retraction of the latch bolt.

12. An automobile door lock comprising a latch bolt, an outer handle mechanism, an inner handle mechanism, and a retracting member adapted to be operated by either of said handle mechanisms to cause retraction of the latch bolt and further adapted to be moved by a composite operation of said handle mechanisms into a position to lock the latch bolt against retraction.

13. A vehicle door lock comprising a latch bolt, a notched arm formed thereon, a spring-impelled retracting member, a pin thereon normally engaged in the notched arm, an outer handle mechanism adapted to be operated to cause operation of the retracting member whereby the pin will retract the latch bolt, and an inner handle mechanism adapted to be operated independently of the outer handle mechanism to operate the retracting member to cause the pin to retract the latch bolt, said inner and outer handle mechanisms further adapted to be operated in combination with one another to first shift the retracting member in one direction to move the pin out of engagement with the notched arm and then operate and shift the retracting member to position the pin in back of the notched arm to hold the latch bolt locked against retraction.

14. In a door lock the combination with a latch bolt, of a member for retracting the same, and a plurality of handle mechanisms adapted to be operated independently of one another to cause said member to retract the latch bolt, and further adapted to be operated in combination to cause said member to move into a position to lock the latch bolt against retraction and one of said handle mechanisms against operation.

In testimony whereof I have hereunto subscribed my name.

BAYARD E. TAYLOR.