

July 12, 1938.

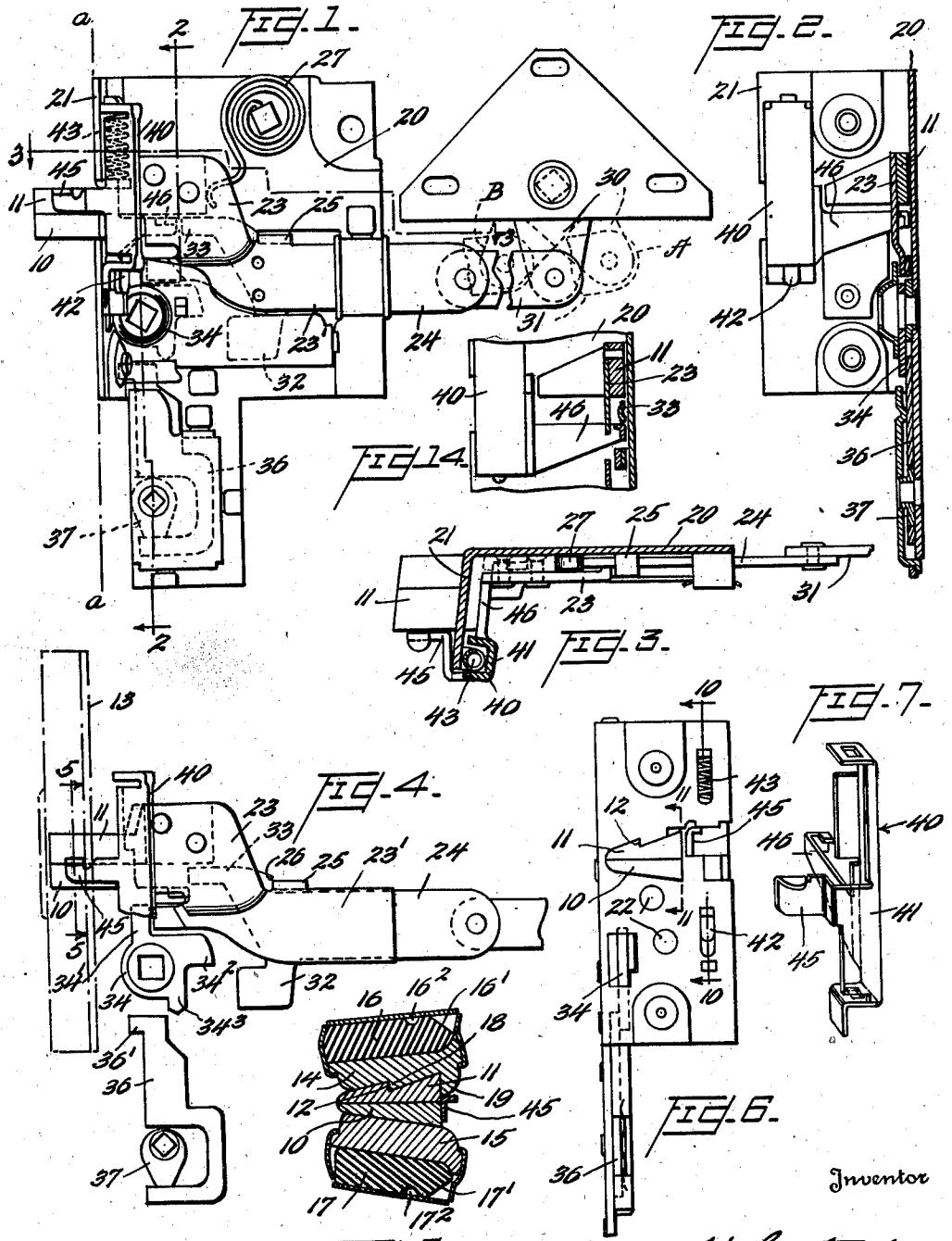
A. HABERSTUMP

2,123,303

COMBINED LOCK AND DOOR RETAINER

Filed Sept. 17, 1935

3 Sheets-Sheet 1



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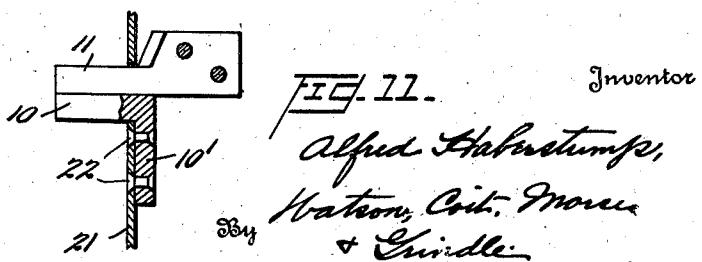
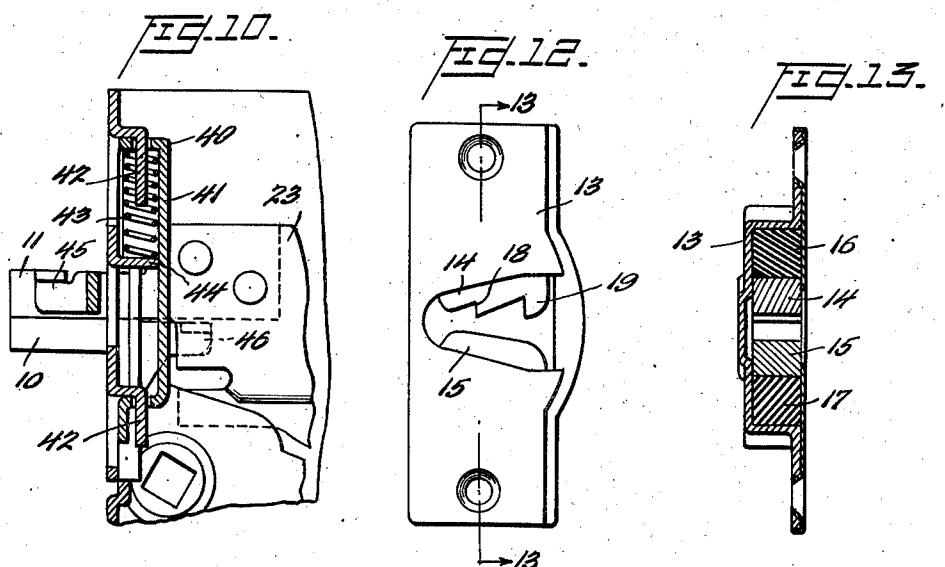
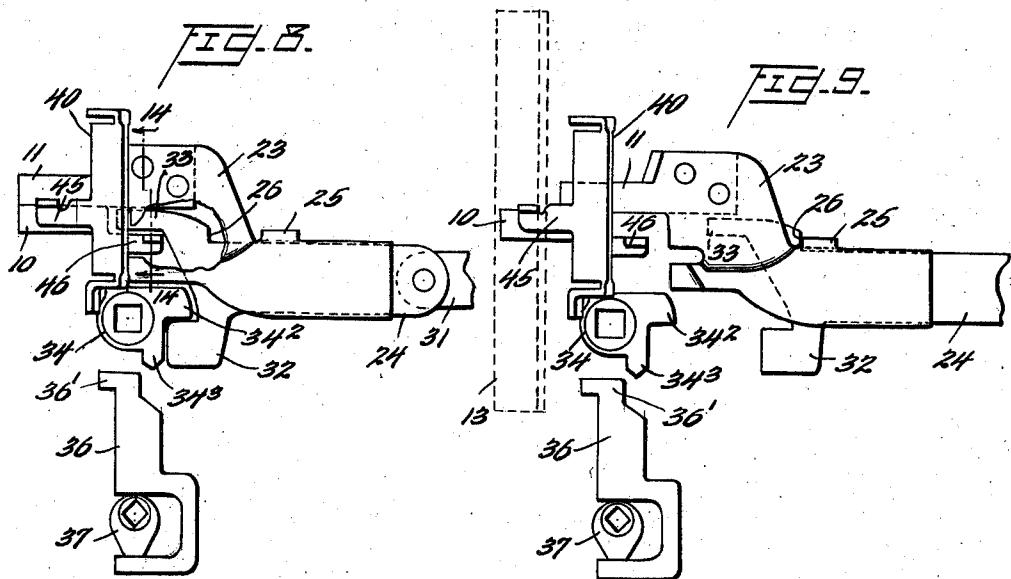
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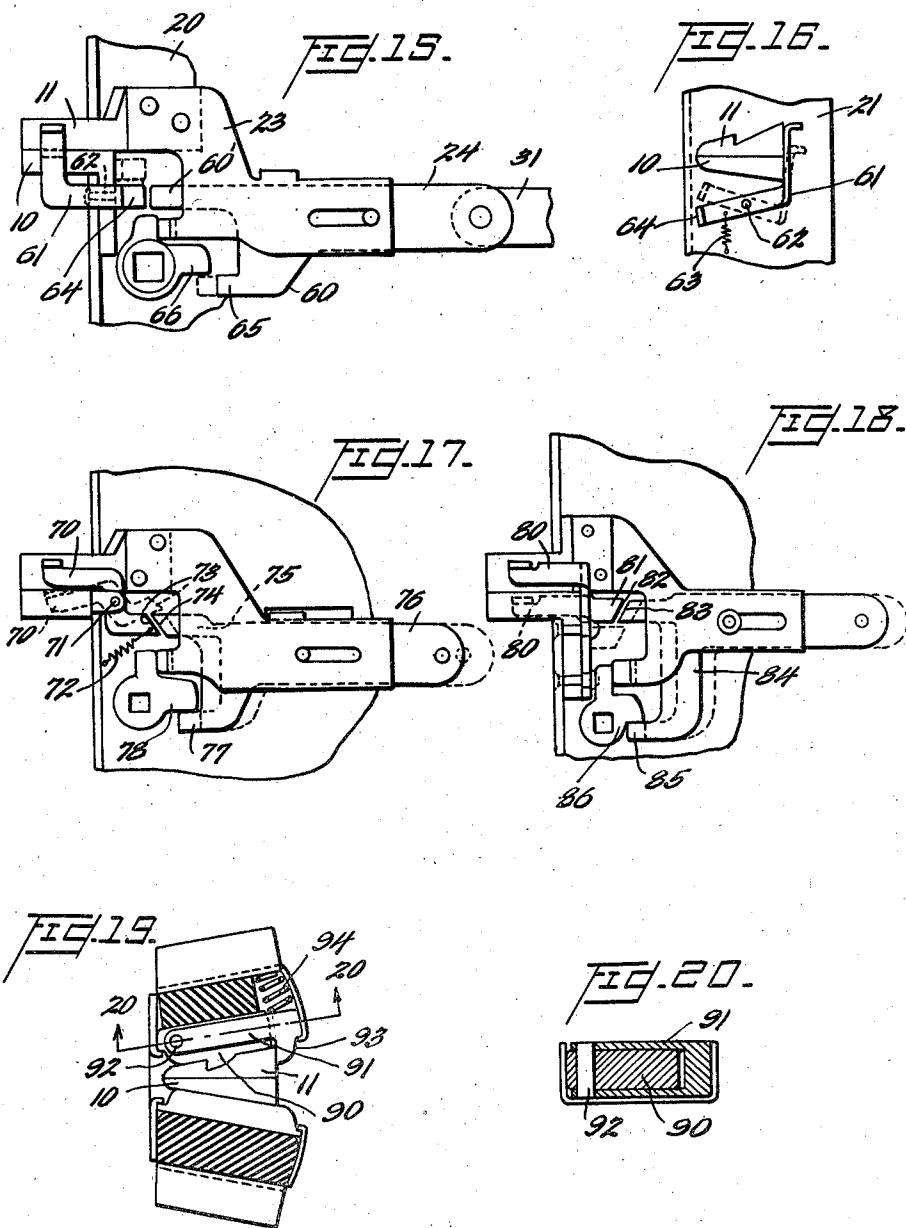
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COMBINED LOCK AND DOOR RETAINER

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3 Sheets-Sheet 3



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2,123,303

COMBINED LOCK AND DOOR RETAINER

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Application September 17, 1935, Serial No. 40,982

9 Claims. (Cl. 292—164)

This invention relates to improvements in locks for doors and particularly to locks for securing the doors of motor vehicles.

In my Patent No. 1,908,343, granted May 9, 1932, is disclosed a lock and latch which comprises essentially a wedging means adapted to be secured to a door and a wedge receiving means adapted to be secured to a door frame, the wedge receiving means including resilient elements for damping the vibrations of the door due to movements of the vehicle and a portion of the wedging means comprising a latch bolt which, when withdrawn, effects the release of the door, permitting it to be opened. The latch bolt of a lock of the type disclosed in the patent just mentioned may be operated by means of a lever or handle positioned close to the lock or from a distant point by means of the so-called "remote control", the operating handle of which is generally positioned at or near the center of the door. As is well-known, the operating handle of the remote control devices customarily employed for the operation of motor vehicle locks may be moved in either of two directions, movement in one direction effecting retraction of the latch bolt and thus releasing the door, and movement in the other direction effecting the locking of the latch bolt so that the lock may not be released or operated by anyone without the vehicle. Without additional means it is possible for the operator of a motor vehicle of the closed body type to so adjust the locks of the vehicle doors that, after the operator has moved to the outside of the vehicle and closed the doors thereof, he cannot thereafter open them, being effectively locked out.

Hence it is customary for manufacturers of such vehicles to provide mechanism in addition to the ordinary latch and remote control mechanism for preventing the operator from locking himself out of the vehicle by a certain procedure in manipulating the remote control handles, which in turn operates the inside locking device; for example, if the operator of a four door sedan body, after completely locking the car from the inside, chooses to exit from the left front door, and after leaving the vehicle and while the door is still open locks the door by reversing the remote control handles and then slams the door shut, he would find himself completely locked out of the car. The device comprising the subject matter of my invention prevents the operator from locking the door while it is in the open position, but rather necessitates him to close the left front door and lock from the inside, then exit from the right front door, which ordinarily con-

tains the outside lock, and lock the vehicle with the key. It is customary in this country to provide the outside key lock on the right side of the vehicle next to the curb when parking, and the steering wheel on the left side of the vehicle, while in certain countries this practice is reversed, therefore necessitating the reversal of the procedure of locking.

The present invention contemplates the addition to and combination with the novel form of lock and latch disclosed in my prior patent of a mechanism of the type just referred to. That is, a mechanism which makes it impossible for a vehicle operator to lock the door to which the mechanism is applied by operating the inside locking device save with the door in completely closed position. The invention contemplates the combination with the wedging means which is to be applied to a door of a device which cooperates with the moving parts of the lock in such manner as to insure that these parts may not be set by the operator prior to his leaving the vehicle in such manner as to automatically lock him out when the door is closed after his exit therefrom.

Numerous ways of effecting the desired objects may be devised and in the accompanying drawings several mechanisms of this character are illustrated by way of example.

In the drawings:

Figure 1 is a side elevation of the lock and portion of the remote control mechanism;

Figure 2 is a section on line 2—2 of Figure 1;

Figure 3 is a section on line 3—3 of Figure 1;

Figure 4 is a view generally similar to Figure 1 but portions of the lock having been omitted to more clearly disclose other portions;

Figure 5 is a section on line 5—5 of Figure 4;

Figure 6 is an elevation of the lock showing in full view the portion thereof which lies flush with the edge of a door, after the lock has been applied;

Figure 7 is a perspective view of the locking slide;

Figure 8 is a view similar to Figure 4 but showing the parts in different relative positions;

Figure 9 is also a view similar to Figure 4 but showing various operating parts of the lock in still further positions;

Figure 10 is a section on line 10—10 of Figure 6;

Figure 11 is a section on line 11—11 of Figure 6;

Figure 12 is a front elevation of the retainer or wedge receiving means adapted to be secured to a door frame;

Figure 13 is a section on line 13—13 of Figure 12;

Figure 14 is a section on line 14—14 of Figure 8; Figure 15 is a side elevation of certain parts of a modified form of lock;

Figure 16 is a front elevation of the same;

5 Figure 17 shows in side elevation certain of the parts of a further modified form of lock; Figure 18 is a similar view of another modification;

10 Figure 19 is a sectional view through a modified form of wedge receiving means; and

Figure 20 is a section on line 20—20 of Figure 19.

Numerous parts of the lock supporting frame and certain of its operating members may be 15 of conventional form and need not be described in great detail. A complete locking unit, however, will comprise a wedging means and its associated parts, such as illustrated in the first ten figures of the drawings, which means is 20 adapted to be mounted upon a door, and the wedge receiving means illustrated in Figures 12 and 13, which is adapted to be mounted upon the door frame. Conceivably, in certain instances the wedge receiving means may be 25 mounted upon the door and the wedging means upon the door frame, as will be understood, but preferably the wedging means, which includes the latch bolt, will be mounted upon the door and the wedge receiving means upon the door 30 frame.

Referring now to the preferred form of the invention shown in Figures 1 to 13 inclusive. The wedging means previously referred to comprises essentially a supporting arm or lug 10 which 35 is adapted to project beyond the free edge of the door for a comparatively short distance as shown in Figure 1 in which the approximate position of the free edge of the door is indicated by the chain line a—a. The flat upper surface of arm 10 is preferably substantially horizontal in the case of vehicle doors or at any rate is disposed substantially normally to the axis about which the door swings in its opening and closing movements. In cross-section, 40 member 10 is itself slightly wedge shaped, as shown in Figures 5 and 6 with its thinner edge rounded as shown. The wedging means includes not only the member 10 but also the latch bolt 11, this bolt having a flat lower surface which 45 slidably rests upon and is supported by, the flat upper surface of the supporting arm 10. The latch bolt portion 11 of the wedging means is likewise itself wedge shaped in cross-section, its thinner or leading edge being rounded as shown. 50 Intermediate its edges the latch bolt is provided on its upper surface with a tooth 12, which tooth will perform latching functions when the door is only partially closed.

The wedge receiving means includes a suitable casing or housing member 13, the details of which may vary within wide limits, and which is adapted to be firmly secured to a door frame member and to serve as a housing and support for the operating parts of the wedge receiving 55 means. This wedge receiving means includes spaced metallic wedge contacting members 14 and 15 and backing and supporting blocks 16 and 17 of rubber, these blocks serving to resiliently support, against separation, the jaws 60 14 and 15. The upper surface of the lower metallic jaw member 15 is inclined as shown in Figure 5 and is a smooth surface in order that it may have full contact with the inclined lower surface of supporting arm 10 when the door is 65 closed, as indicated in this figure. The lower

surface of the upper jaw 14 of the wedging means is toothed or serrated, the intermediate tooth 18 thereof being adapted to drop down behind tooth 12 of the wedging means when the door is completely closed and the enlarged tooth 19 being adapted to drop down behind the rear edge surface of the latch bolt member 11 when the door is fully closed, as indicated in Figure 5, the teeth 18 and 19 of the wedge receiving means cooperating to lock the wedging means in the position shown in this figure when the door is closed.

The door is closed in the customary manner, i. e., by slamming and the wedging means forces its way into the position in which it is shown in Figure 5 during the final closing movement of the door, the rubber blocks 16 and 17 respectively being compressed as the upper and lower jaws 14 and 15 are parted to receive the wedging means and thereafter expanded to maintain the jaws 14 and 15 in tight engagement with the wedging means. Any portion of the weight of the door which may not be carried by the hinges, due to looseness and wear, will be transmitted to the jaw 15 and thence through the rubber block 17 to the door frame so that it is apparent that at all times while the door is shut it is resiliently supported at its free edge by the wedge receiving means, thus taking a portion of the weight of the door off the hinges if the wedge receiving means is properly positioned, and preventing rattling due to vertical movements of the door or to vibrations of the vehicle to which it is attached, the upper expandable rubber block 16 pressing the upper jaw 14 downwardly at all times into close engagement with the upper surface of the latch bolt. In the event that the door is only partially closed, the shoulder 12 of the latch bolt will engage in behind the tooth 19 of the upper jaw 14 and the door will be retained in this position, effectively locked against outward swinging, until the operator has opportunity to effect the complete closure thereof.

To permit opening the door, the latch bolt portion 11 of the wedging means is axially retracted, causing its upper surface to disengage the lower surface of the upper jaw 14 of the wedge receiving means and thereafter the door may be freely swung open. The various parts thus far described are, in essence, described and claimed in my prior patent above referred to.

As will be observed upon an inspection of Figure 5, the rubber blocks 16 and 17 do not solidly fill the housings or casings within which they are 55 contained but the outer ends are cut away at 16' and 17' and slight recesses 16' and 17' also formed therein. This causes the outer ends of the cushioning blocks to be more freely yieldable than the remaining portions and facilitates the 60 closing movement of the door by permitting the wedging means, i. e., the arm 10 and latch bolt 11, to more easily pass the depending tooth 19.

The base or supporting plate upon which the operating parts of the lock are mounted is indicated generally at 20 and this plate is of conventional form, the main portion thereof being adapted to lie parallel to the plane of the door and an integral part 21, disposed at approximately right angles to the main portion, being 65 adapted to lie flush with the edge surface of the door. The supporting arm or lug 10 projects through an opening formed in part 21 of the plate 20 and a downwardly extending portion 10' thereof is firmly secured to plate 20 by means of 70

rivets 22 so that, base plate 20 being rigidly secured to the door, the supporting arm 10 is rigid with the door.

The latch bolt member 11 of the wedging means likewise projects through the aperture formed in the face plate 21 and its inner end is attached to the member 23, as shown in several figures of the drawings. Member 23 may be slidably mounted upon the supporting or base plate 20 in any conventional manner, has the somewhat irregular shape shown in the drawings, and is disposed in a generally vertical plane parallel to the plate 20. The enlarged end of member 23 adjacent latch bolt 11 is slightly raised with respect to the remainder of the member and is disposed in a plane parallel to the remainder thereof (as viewed in Figure 1) but the member as a whole may be described as being generally flat. Member 23, and hence the latch bolt, is operated when the slide 24 is longitudinally reciprocated, from the position in which it is shown in Figures 1 and 4, to the position in which it is shown in Figure 9, the latch bolt being shown as fully retracted in this last mentioned figure, a lug 25 projecting laterally from member 23 lying in the path of movement of a shoulder 26 of slide 24 so that member 23 and slide 24 move simultaneously to the right (Figure 9) when slide 24 is drawn in that direction due to interengagement of lug 25 and shoulder 26. In so reTRACTING the latch bolt, the spring 27 is tensioned, this spring having one end attached to plate 20 and its other end free and bearing upon the inner end of the latch bolt, as shown in Figure 1. When the slide 24 is released, therefore, both member 23 and the slide are moved forwardly or to the left (Figure 1) by reason of the action of the spring 27, and this movement continues until the latch bolt is fully projected and occupies the position in which it is shown in Figures 1 and 4.

Retraction of the slide 24 in the manner just described may be effected by means of the "distant control", parts of which are shown in Figure 1. A specific description of a distant control need not be given, inasmuch as it may be of conventional type, it being sufficient for present purposes to state that the lever 30 of this mechanism may be manually operated to effect retraction of a slide 24, through the intermediary of the link 31, which is pivotally connected both to lever 30 and slide 24. Normally the lever 30 occupies the positions in which it is shown in full lines in Figure 1. When the latch bolt is to be retracted by means of the distant control, the lever 30 is moved to the position in which it is shown in dotted lines in Figure 1 and indicated at A. When the distant control is to be actuated to bring about setting of the lock so that it may not be opened from without the vehicle by the manipulation of the customary handle, it is moved to dotted line position B, thus thrusting outwardly or to the left (Figure 8) the slide 24 and thereby bringing the locking lug 32 of this slide into position to prevent rotation of the door operating handle from without, as will be hereinafter more particularly described. Slide 24 also includes an outwardly projecting portion 33 the function of which will be hereinafter fully described.

Not only may the member 23 be operated by the distant control to effect retraction of the latch bolt but it may likewise be retracted or thrust to the right (Figure 4) by the camming member 34 which may be revolved about a horizontal axis by the usual operating handle so that its upwardly projecting portion 34' contacts with the forward

end of member 23 when rotated in a clockwise direction (Figure 4) to therefore thrust member 23 to the right and effect retraction of the latch bolt. When camming member 34 is released it is returned automatically to the position in which it is shown in Figure 4 by the action of spring 27. When slide 24 is moved by means of operating lever 30 and link 31 to the position in which it is shown in Figure 8, the locking lug 32 of this slide projects into the angle between arms 34² and 34³, and in this way the camming member is locked against rotation in either direction by the slide.

Likewise the camming member 34 may be locked against rotation in either direction by a locking device which includes the vertically slideable member 36 and the cam 37 which may be manipulated from without the vehicle, as by means of a key to raise slide 36 from the position in which it is shown in Figure 4 to the position in which its upper end 36' lies in the path of movement of the arm 34³ of the camming member 34, thus preventing rotation of the camming member and retractive movement of the latch bolt. To make it necessary for the operator of the vehicle, in effecting the vehicle locking thereof, to use the key from the outside, it is necessary to provide means for rendering the distant control mechanism ineffective to accomplish locking of the camming member 34 by preventing movement of the distant control operated slide 24 into such position that the locking lug 32 thereof moves to the position in which it is shown in Figure 8 when the door is open.

This means includes a sliding frame, generally indicated at 40, having a vertically extending body portion 41 slidably mounted upon vertically extending prongs 42 integral with the face plate 21 and normally maintained in the position in which it is shown in Figure 10, by means of a compression spring 43, the upper end of which bears against the sliding frame and the lower end of which rests upon an inwardly projecting lug 44 integral with the face plate 21. Sliding frame 40 has a slide obstructing arm 46 which normally lies in the plane of slide 24 and directly in the path of movement of the forwardly projecting portion 33 of the slide, as shown in Figure 1. Hence it is apparent that the distant control may not be so operated as to move slide 24 into the position in which it is shown in Figure 8, so long as the sliding frame 40 occupies its normal position, thus making it impossible for a person to lock the camming member 34 against movement until the obstructing arm 46 is lowered from the position in which it is shown in Figure 1 to the position in which it is shown in Figure 8. Lowering of the sliding frame 40 is only effected when the door is closed and the wedging means is in full engagement with the wedge receiving means, as shown in Figure 5, the sliding frame being provided with a second arm 45 positioned closely adjacent the relative face of the wedging means comprising lug 10 and latch bolt 11 and normally lying immediately in rear of the latch bolt, as indicated in Figure 10. When the door is slammed and the wedging and wedge receiving means come into full engagement, as shown in Figure 5, the arm 45 of the sliding frame will be engaged by the tooth 19 as full wedging engagement of the parts is realized and will be moved downwardly, carrying the entire frame 40 with it, the arm 45 being moved to the position in which it is shown in Figure 5 and arm 75

- 46 to the position in which it is shown in Figures 8 and 9. With the frame in this position, therefore, the slide obstructing arm 46 is displaced from the portion 32 of the slide and the 5 slide may therefore be advanced to the position in which it is shown in Figure 8 if desired, with portion 32 of the slide locking the camming member 34 against rotation by means of the outside door handle.
- 10 Assuming a vehicle to be equipped with locks of the character just described, it will of course be possible for the occupant to lock all the doors by setting the respective distant control devices into locking position. Obviously, however, it 15 would be impossible for such occupant to himself open any one of the doors from the inside in order to get out of the vehicle without first releasing the camming member 34 of one of the locks by operating the distant control device 20 to retract the latch bolt. After having done this and opened the door, the locking slide 40 will move to the position in which it is shown in Figures 1 and 10, thus preventing setting of the lever 30 and slide 24 to locking position. When 25 the door is closed, therefore, it may be locked from the outside by means of a key which is provided to effect rotation of cam 37 and elevation of slide 36 into locking engagement with cam member 34, or may be locked from the inside. It may, however, be freely opened from the outside unless either locked by means of a key or by manipulation of the same by one on the inside.

Several forms of the invention and whereby 35 the same objectives may be achieved are also illustrated in the drawings. In the form of the invention shown in Figures 15 and 16 the sliding frame of the first form of the invention is dispensed with, the means for blocking sliding 40 movement of the slide 60, save under the conditions aforesaid, comprising an angular member 61 in the nature of a lever which is pivoted for rocking movement about the axis 62 and is normally held in its uppermost and full line 45 position (Figure 16) by means of a spring 63. The inner end 64 of lever 61 normally lies in the path of the forward projection 60' of slide 60 but, when the wedging and wedge receiving means are in full engagement, the wedge receiving 50 means acts to depress the upper end of lever 61 from its full to its dotted line position, thus elevating its lower and inner end from the position in which it is shown in full lines in Figures 15 and 16 to positions in which it is shown 55 in dotted lines in this figure. When in dotted line position the lever cannot oppose movement of the slide 60 toward the left (Figure 15) and hence engagement of the locking lug 65 of this slide with the slide actuating or camming member 66. As the action is generally similar to the action of the form of the invention first described, no detailed explanation is necessary.

In the form of the invention shown in Figure 17, the locking lever 70 is pivoted at 71 and 65 normally maintained by a spring 72 in its full line position, in which position its inclined inner and edge surface 73 lies closely adjacent to the correspondingly inclined forward edge surface 74 of the projection 75 of the slide member 76. 70 When the door is closed, the lever 70 is depressed by the wedge receiving means, as before, and its inner end is lifted upwardly, as indicated in dotted lines in Figure 17, its inner edge surface 73 acting as a cam as it slides along the correspondingly formed end surface 74 and slide 76

thus retracting the slide from its full line to its dotted line position and causing the lower locking lug 77 of the slide to disengage the slide camming or operating member 78.

A similar result is obtained in the case of the 5 form of the invention shown in Figure 18, but in this case a frame 80 is mounted for vertical sliding movement, as was the sliding frame 40 in the case of the form of the invention first described, the arm 81 of the vertically sliding frame, 10 however, has its inner end edge surface 82 inclined and adapted to slidably engage the correspondingly inclined edge surface 83 of the slide 84 as it moves from its full to its dotted line position, thus camming the slide 84 to the right 15 (Figure 18) from full to dotted line position and causing the locking lug 85 of this slide to disengage the slide operating cam 86, to prevent free rotation thereof.

If desired, the upper jaw member 14 of the 20 wedge receiving means, such as shown in Figure 5, may be replaced with the jaw member shown in Figures 19 and 20. Here the jaw member is formed in two parts, the block 90 being centrally mounted in a vertical slot in the rocking member 91, and pivotally connected thereto at 92 so that it may be oscillated in a vertical plane. Rocking member 91 carries a downwardly projecting tooth 93 at its free end and is normally pressed downwardly by means of a coiled compression spring 94. The tooth 93 is adapted to bear down and actuate any one of the several levers illustrated in the preceding figures of the drawings. By reason of the mounting of the tooth upon the rocking member 91 this tooth may 30 have a relatively different vertical movement without necessitating simultaneous and equal movement of the jaw 90. Other forms of the invention may be devised to state the circumstances of particular cases, as will be apparent 40 to one skilled in the art.

Having thus described the invention, what is 45 claimed as new and desired to be secured by Letters Patent is:

1. A door lock comprising wedge receiving 45 means, wedging means including a latch bolt, means for retracting the latch bolt, a device for engaging and locking said retracting means against operation, and mechanism for rendering said device ineffective to lock the retracting means when the wedging means is out of engagement with the wedge receiving means.

2. A door lock comprising wedge receiving 50 means, wedging means including a latch bolt, means for retracting the latch bolt, a member for locking the latch bolt retracting means against operation, and mechanism for automatically blocking movement of said member toward said bolt retracting means when the wedge receiving and wedging means are disengaged.

3. The combination set forth in claim 2 in 55 which said mechanism comprises an element movable with the wedging means into or out of engagement with the wedge receiving means.

4. The combination set forth in claim 2 in 60 which said mechanism comprises an element associated with the wedging means, yielding means normally urging said element into position to be contacted and deflected by the wedge receiving means when said means are brought into engagement.

5. A door lock including a retainer and a latch bolt, means for retracting the latch bolt, means for engaging and locking the retracting means against operation, and mechanism for blocking 65

the action of said locking means save when the latch bolt and retainer are in engagement.

6. A door lock comprising a slidably mounted latch bolt and a retainer therefor, a movably mounted element normally urged to predetermined position by yielding means and adapted to be deflected from such position by the retainer when the latch bolt and retainer are brought into interlocking engagement, a manually operable latch bolt retracting member, and manually operable means for locking said member against movement, said element normally lying in the path of and blocking movement of said locking means save when the element is in deflected position.

7. A latch bolt engaging jaw for a door lock retainer comprising a metallic block, having an elongated slot formed therein and extending

therethrough, and a toothed member secured within said slot for pivotal movement relatively to the block.

8. The combination set forth in claim 7 in which the block is resiliently supported by a rubber element and the toothed member is in part supported by said element and in part by a spring.

9. A door lock including a retainer and a retractable latch bolt, means for retracting the latch bolt, a member movable into position to engage and render inoperative the latch bolt retracting means, and an element adapted to engage the retainer and to be moved thereby into position to block the movement of said member toward said latch bolt retracting means.

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