

**Nov. 19, 1940.**

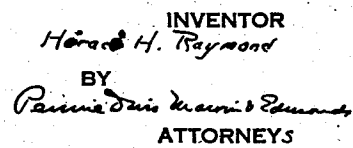
**H. H. RAYMOND**

**2,222,553**

## REMOTE CONTROL FOR LATCHES AND LOCKS

Filed June 15, 1938

4 Sheets-Sheet 1



Nov. 19, 1940.

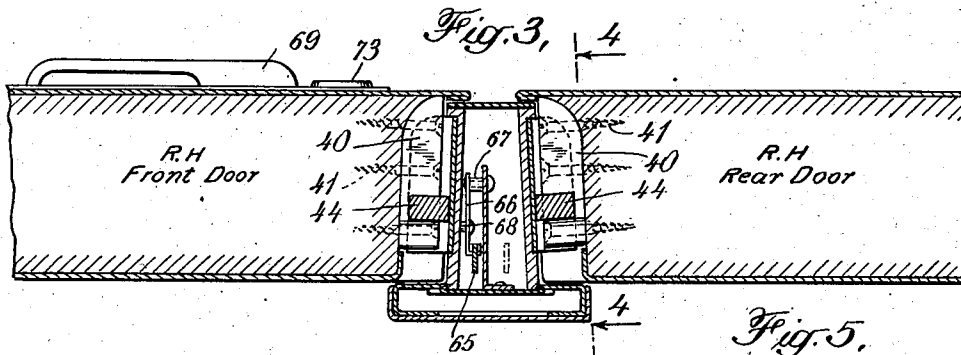
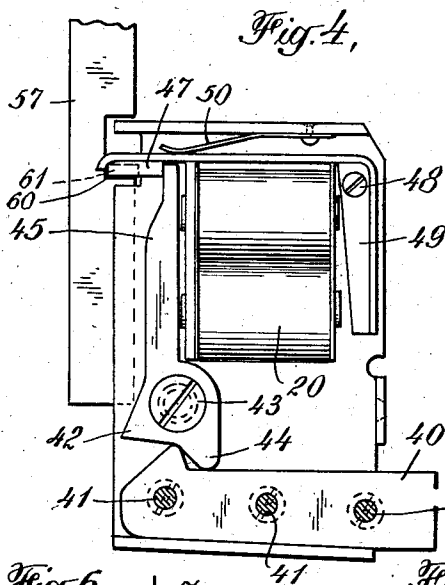
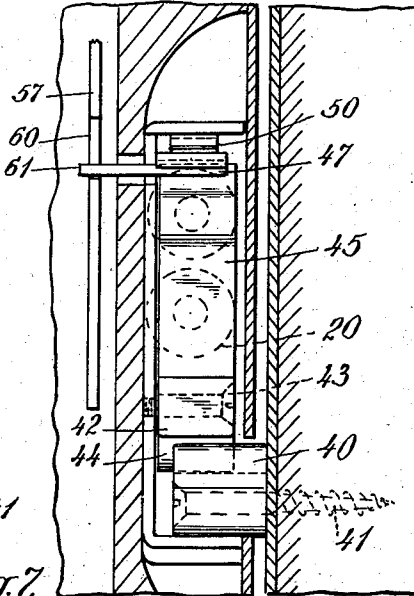
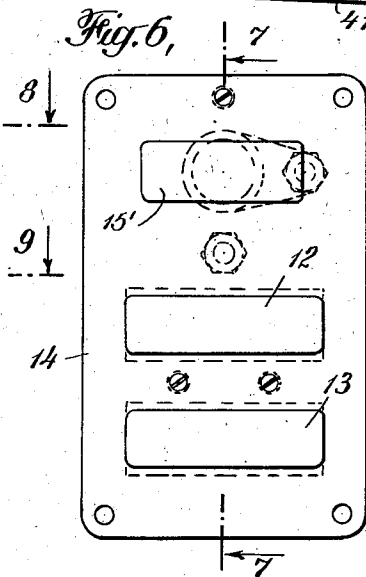
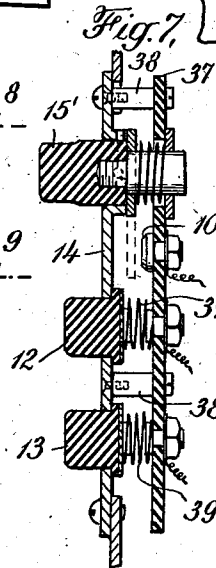
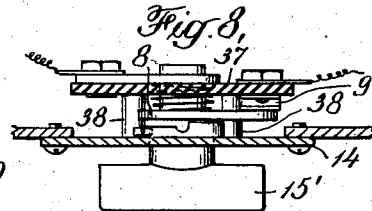
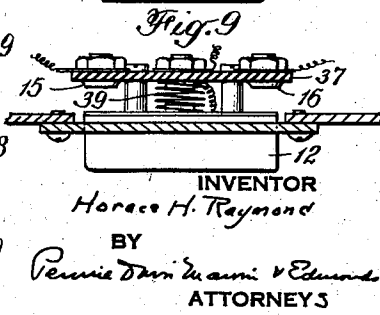
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REMOTE CONTROL FOR LATCHES AND LOCKS

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4 Sheets-Sheet 2



Nov. 19, 1940.

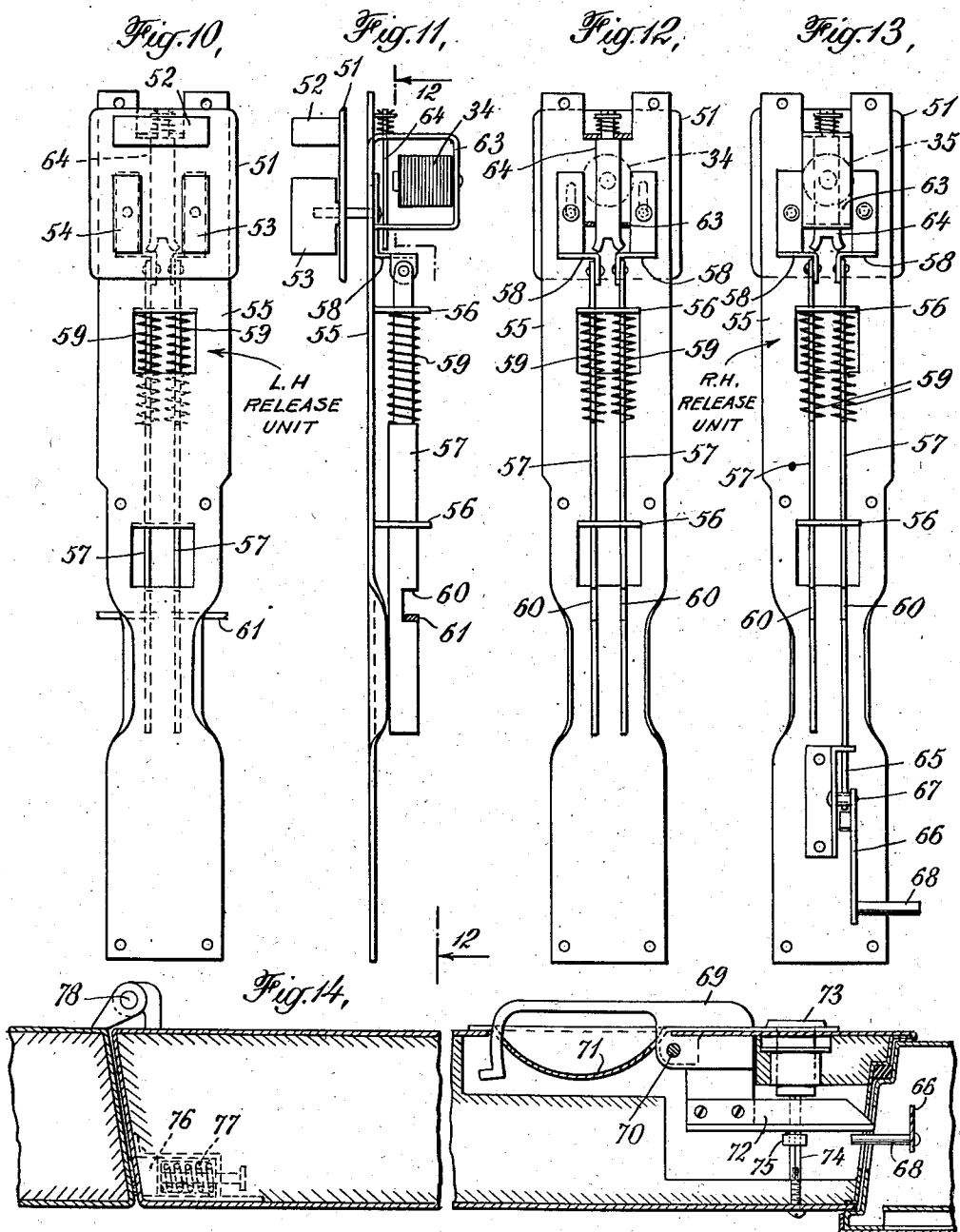
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REMOTE CONTROL FOR LATCHES AND LOCKS

Filed June 15, 1938

4 Sheets-Sheet 3



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**Nov. 19, 1940.**

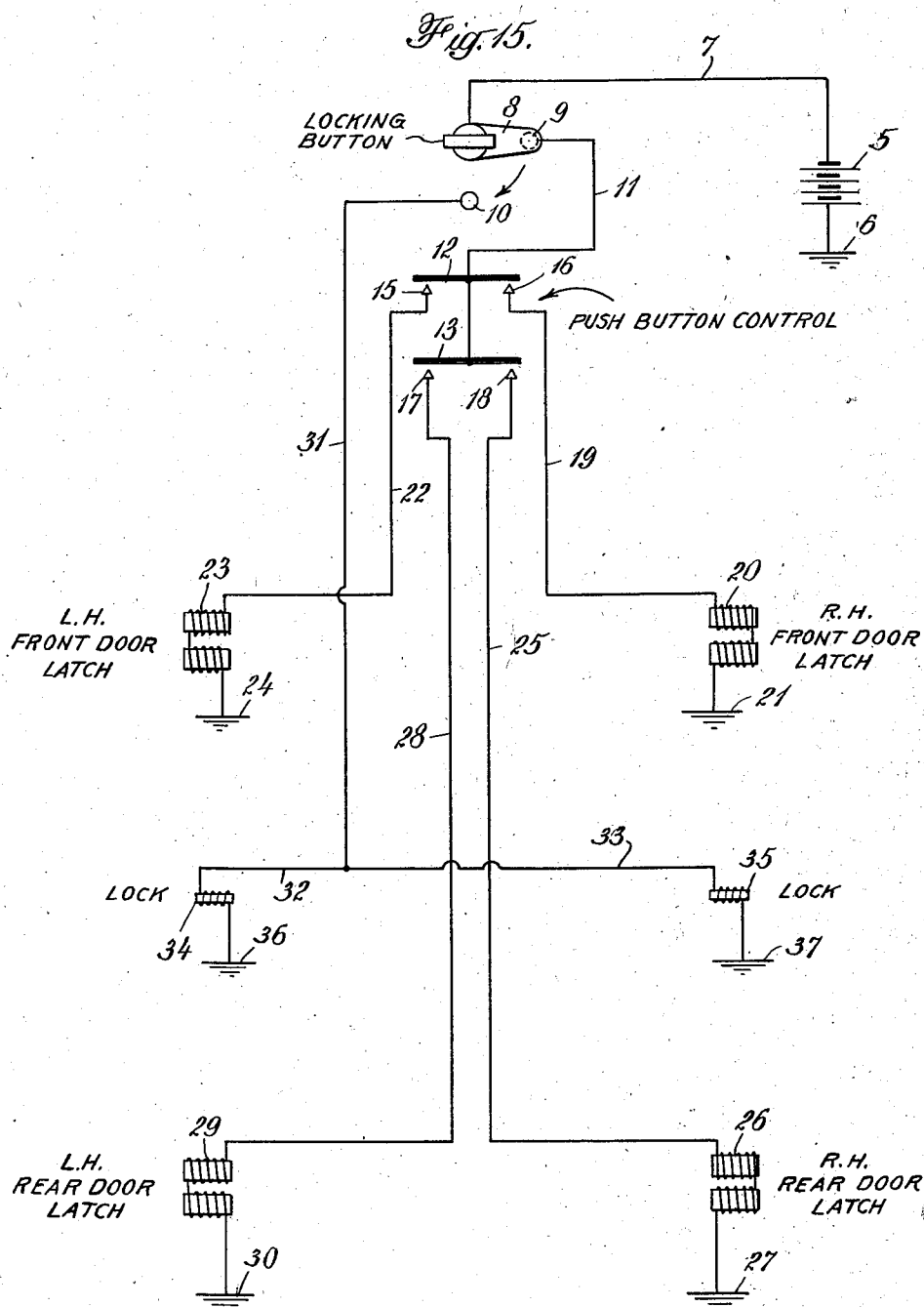
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## REMOTE CONTROL FOR LATCHES AND LOCKS

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4 Sheets-Sheet 4



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## UNITED STATES PATENT OFFICE

2,222,553

REMOTE CONTROL FOR LATCHES AND  
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Application June 15, 1938, Serial No. 213,748

6 Claims. (Cl. 292—210)

This invention relates to remote control of latches and locks for doors and similar closures. While the invention is adapted particularly to permit control of the doors of an automobile from the point adjacent the driver's seat, it may be utilized in connection with the doors of other enclosures where control from a remote point is desirable.

In describing the invention in more detail, reference is made particularly to the doors of automobiles including pleasure vehicles, taxicabs, trucks and the like. Such vehicles have usually one or more doors provided with latches and locking means for the latches which are controlled individually by handles provided on the exterior and interior of the doors. The handles commonly project on the outside of the doors and have been a source of numerous accidents due to catching of the clothing of passengers or persons outside the vehicle by the projecting handles. Another difficulty which arises as a result of the ordinary construction of vehicle doors is that passengers cannot be protected adequately. Children may inadvertently release the latches and fall from the vehicle, and holdups and robberies have frequently occurred owing to the possibility of opening the doors from the exterior of the vehicle. Furthermore, the numerous projecting handles on the interior of the vehicle are a frequent cause of injury to passengers.

It is the primary object of the invention to provide for the remote control of doors and similar closures so that the latches of such doors may be released at will and selectively from a remote point.

Another object of the invention is the provision of locking means controlled at a relatively remote point from the doors or other closures, whereby release of the latches is prevented except through the operation of the controlling means.

Another object of the invention is the elimination of projecting door handles, both on the inside and outside of the vehicle and of the elaborate hardware and mechanism which is associated with such handles.

Another object of the invention is the provision of door latching and locking means which permits more adequate streamlining of vehicles and especially the avoidance of projecting handles, it being necessary only to provide a single door-opening mechanism on the exterior of the vehicle on the right hand side to permit access thereto.

Other objects and advantages of the invention will be apparent as it is better understood by reference to the following specification and accompanying drawings, in which

Fig. 1 is an elevation partially in section illustrating the pillar and portions of the adjacent doors of the vehicle with the mechanism which is disposed within the pillar and one of the co-operating latches;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged section on the line 4—4 of Fig. 3, illustrating the latch and controlling device therefor.

Fig. 5 is an enlarged section illustrating the latching mechanism;

Fig. 6 is an elevation of the control panel adapted to be disposed adjacent the driver's seat;

Fig. 7 is a section on the line 7—7 of Fig. 6;

Fig. 8 is a section on the line 8—8 of Fig. 6;

Fig. 9 is a section on the line 9—9 of Fig. 6;

Fig. 10 is an elevation of the mechanical releasing unit for the left-hand doors;

Fig. 11 is a side elevation of the structure shown in Fig. 10;

Fig. 12 is a section on the line 12—12 of Fig. 11;

Fig. 13 is a view similar to Fig. 12 illustrating the release unit for the right-hand door;

Fig. 14 is an enlarged section on the line 14—14 of Fig. 1; and

Fig. 15 is a diagram illustrating the electrical connections to permit control of the several door latches.

The invention will be described more particularly with reference to a vehicle having the usual four doors of a standard sedan. It may be applied similarly, however, to vehicles having fewer doors, such as the two-door sedan, coupe, truck cab and the like. As already indicated, the invention may be applied also to doors or closures which are not related to vehicles.

In carrying out the invention, the doors are provided with latches hereinafter more fully described. The latch mechanisms are selectively controlled from a central point by electromagnetic devices energized at will from a source of current such as the battery of the car. Provision is made also for preventing the operation of the latches by electromagnetic locking devices which may be energized likewise from a central point. To permit release of the doors in the event of failure of the current, manually operable releasing devices are provided, such devices being so disposed that they are not likely to

be operated inadvertently. Furthermore, the manual devices are locked when the electrical locking control is in operation. Consequently, the doors can be released manually only when the operator of the vehicle has released the locks, or in the event of failure of current. With the arrangement as described, it is possible for the driver of the vehicle to effectively lock all of the doors thereof. He may nevertheless, by a simple movement, release the locks and thereafter he may release selectively and individually the latches of any of the doors. When the latches are thus released, the doors spring open sufficiently to permit further opening for ingress or egress. When the doors are again closed, the latches become effective and the driver may then lock the doors again so that no one may leave or enter the vehicle until the locks are again released. Provision is made at the forward right-hand door for the usual lock, so that the driver may secure the vehicle when it is parked and left unattended.

A handle is provided on the forward right-hand door to permit entrance to the vehicle when the manual lock is released. The handle is disposed in a depression so that it does not project from the side of the vehicle. No door handles are provided on the outside of the three remaining doors. On the inside, cords or soft fabric handles may be provided to facilitate closing the doors from the interior of the vehicle. The usual inside metal handles are eliminated. Thus, possible injury to passengers, or to persons outside the vehicle by contact with door handles is avoided, the streamlining is improved, persons within the vehicle are prevented from falling therefrom through the inadvertent opening of doors and are protected from persons outside the vehicle seeking the unauthorized entrance thereof.

The invention will be more easily comprehended by reference first to the diagram, Fig. 15, in which 5 indicates the source of current such as the usual battery of an automobile. One side of the battery is grounded at 6 in the usual manner. The other side is connected by a conductor 7 to a manually operable switch 8 which is adapted to engage either of the switch points 9 and 10. The switch point 9 is connected by a conductor 11 to tilting switch bars 12 and 13 disposed on the panel 14 (Fig. 6), together with the switch handle 15' which is connected to the switch 8. The panel may be disposed at any convenient point adjacent the driver's seat so that it is readily accessible. The switch bars 12 and 13 are adapted to be depressed to engage switch points 15, 16, 17 and 18 selectively to release the latch bolts of the respective doors. The switch point 16 is connected by a conductor 19 to an electromagnet 20 and thence to ground 21 to control the right-hand door latch bolt. The switch point 15 is connected by conductor 22 to the electromagnet 23 and thence to ground 24 to control the left-hand front door latch bolt. The switch point 18 is connected by a conductor 25 to electromagnet 26 and thence to ground 27 to control the right-hand rear door latch bolt, and the switch point 17 is connected by a conductor 28 to electromagnet 29 and thence to ground 30 to control the left-hand rear door latch bolt. The mechanism affected by such control will be described later.

To lock the latch bolts and thereby prevent release thereof, the switch point 10 is connected by a conductor 31 and branch conductors 32 and 33 to electromagnets 34 and 35 disposed in the

pillars adjacent the latching mechanism and thence to grounds 36 and 37. The electrical circuits are thus completed to permit the selective releasing of the several door latches and the locking thereof against release at the will of the driver of the vehicle.

The mechanism embodied in the panel 14 is illustrated in detail in Figs. 7 to 9 inclusive. The panel is provided with an insulating plate 37 supported on the posts 38. The insulating plate carries the switch points 9, 10, 15, 16, 17 and 18. The switch handle 15' is supported for rotary movement to permit the switch arm 8 to engage either of the points 9 and 10, as previously described. The bars 12 and 13 are supported by springs 39 so that they may be tilted to engage either of their respective switch points, thus permitting closure of the respective circuits.

Referring to Fig. 4, each of the doors is provided with a keeper 40 secured thereto by screws 41 and projecting so as to engage a latch bolt 42 pivoted at 43 and provided with a cam-faced projection 44 and an arm 45 which is adapted to rest in spaced relation to the poles of the electromagnet 20 which is mounted in the pillar adjacent the edge of the door. A dog or catch 47 is pivoted at 48 and is adapted to engage the tail of the arm 45 to hold the latch bolt in the position indicated in Fig. 4, so that the door is held in closed position. A bell crank arm 49 is connected to the dog or catch 47 which is normally held by a spring 50 in the position indicated in Fig. 4 when the door is closed.

The arm 45 is of magnetic material. The dog or catch 47 is non-magnetic to prevent short circuiting of the magnetic flux, but the bell crank arm 49 is of magnetic material. It will be noted that the air gap is much greater between the poles of the electromagnet 20 in the case of the arm 49 than in respect to the arm 45. The force exerted by the electromagnet is correspondingly less in attracting the arm 49. When the electromagnet 20 is energized, the pull exerted on the arm 45 is sufficient to overcome the force exerted by the door through the keeper 40 to an extent sufficient to relieve pressure on the dog or catch 47. At the same time, the bell crank arm 49 tends to approach the poles of the electromagnet and sufficient force is exerted to lift the dog or catch 47 against the spring 50. When the circuit is again opened, the pull of the electromagnet on the arm 45 is relieved, and tension exerted by the door causes the latch bolt 42 to revolve sufficiently to release the keeper 40, which slips past the projection 44, thus releasing the door, which then may be manually opened. This action occurs before the spring 50 can move the dog or catch 47 into position to engage the tail of the arm 45. The arm 45 remains in open position until the door is again closed, thereby moving the arm into the position indicated in Fig. 4. The door may be closed and latched again by simply moving it to the closed position, whereupon the keeper 40 again engages the latch bolt 42, the tail of the arm 45 being in turn engaged by the dog or catch 47, thus holding the door in closed position. It will be understood that the several doors controlled by the electromagnets 23, 26 and 29 are similarly held and released by closing the respective circuits through the controlling switch points.

In the event that current fails, it is necessary to provide manual means for releasing the doors. Such manual means is provided in the pillars at the opposite sides of the vehicle adjacent the

doors. Control is effected through a panel 51 disposed on the outside of the pillar and having a fixed abutment 52 thereon and two movable buttons 53 and 54 to permit actuation of the releasing mechanism for the respective adjacent doors. The mechanism is more clearly shown in Figs. 10 to 13 inclusive, and includes a supporting plate 55 having brackets 56 mounted thereon to receive two sliding bars 57 which are connected by members 58 to the respective buttons 53 and 54. The bars 57 are normally held in their lower position by springs 59, but may be lifted against the tension of the springs by actuating buttons 53 and 54. Notches 60 are provided in the bars 57 to engage the tails 61 of the keepers 47, as indicated in Fig. 4. Thus, by lifting either of the buttons 53 or 54, the corresponding latch bolt may be released so that the door may be opened independently of the electrical controlling mechanism for the latches.

To effect the locking of the doors against release by electrical or manual control, electromagnets 34 and 35 are supported in frames 63 on the plates 55. These electromagnets are connected to the electrical control circuit as previously described. When energized by movement of the switch arm 8 to the switch point 10, the electromagnets attract arms 64 pivotally supported in the frame 63, and normally resting in the position indicated in Fig. 11. When the arms 64 are attracted by the electromagnets 34 and 35, the arms move into position so as to block movement of the members 58 so that the bars 57 can no longer be raised manually. When the switch arm 8 is engaged with the switch point 10, the circuits to the several electromagnets 20, 23, 26 and 29 are dead, and consequently the doors cannot be released.

As illustrated in Figs. 2 and 13, one of the bars 57 is provided with an extension 65 which is adapted to engage a bell crank 66 pivoted at 67 and provided with a projecting pin 68. This is designed to permit the control of the latch structure of the forward right-hand door by the externally disposed handle 69, thus permitting entrance to the vehicle when the operator has left it temporarily. The handle 69 is pivoted at 70 and is practically flush with the exterior of the door, a recess 71 being provided so that the fingers may be disposed rearwardly of the handle. The handle is adapted to turn on its pivot 70 and is provided with a projecting member 72 which engages the pin 68. When the pin 68 is thus actuated, the bell crank 66 is turned, thus lifting the corresponding bar 57 and releasing the latch bolt of the door so that it may be opened. The usual cylinder lock 73 is mounted in the door and is adapted to be actuated by a key (not shown). The lock carries a projecting pin 74 having a member 75 thereon which, in locking position, is behind the member 72. When the door is thus locked, the handle 69 cannot be turned upon its pivot and consequently the door cannot be released. When the key is inserted and the lock is turned, the member 75 is moved out of the path of the member 72, thus permitting actuation of the handle 69.

Each of the doors may be provided, as indicated in Fig. 14, with any suitable tension device, for example a plunger 76 actuated by a spring 77 which, when the latch is released, will move the door outwardly on its hinge 78 sufficiently to permit further opening for ingress or egress. The tension device also acts upon the latch mechanism and ensures tightness thereof and conse-

quent freedom from rattles. The doors may be provided, moreover, with the usual bumpers or other rattle-preventing devices.

With the mechanism as described, the desired results as hereinbefore outlined are readily attained. The vehicle may be parked and locked in the usual way, and the operator may enter the vehicle through the right-hand front door as is customary. In the vehicle, the operator may release any of the doors selectively, either through the electrically controlled mechanism or manually. Dual control is provided for each of the doors, and either electrical or manual control can be employed as may be desired to release the latches. If the operator desires to lock all the doors from the inside, he may effect this result by a single operation of the switch arm 8, which is moved to engage the switch point 10. Thereafter, the doors remain locked and cannot be opened until the switch arm is again returned to its position in engagement with the switch point 9 unless the current fails, in which event the electrically controlled mechanism becomes ineffective. When the doors are locked in the manner described, children cannot inadvertently fall from the vehicle, and persons riding therein cannot leave it except at the will of the operator.

Various changes may be made in the form and arrangement of the parts, and particularly the details thereof, and numerous modifications may be utilized in applying the invention to vehicles and especially in adapting it for controlling the latch mechanisms of doors and other closures not associated with vehicles.

I claim:

1. A latch mechanism comprising a movable latching means, movable means operative upon said latching means to restrain movement thereof to unlatched position, and means associated with both said means adapted to so control the movement of both said means that the effective restraining action of said operative means is reduced prior to actual release of said latching means.

2. A latch mechanism comprising a movable latching means, movable means operative upon said latching means to restrain movement thereof to unlatched position, and electromagnetic means effective upon both said means adapted to so control the movement of both said means that the effective restraining action of said operative means is reduced prior to actual release of said latching means.

3. A latching mechanism comprising a bolt element, a catch for the bolt element, and electromagnetic means adapted to attract the bolt element, said electromagnetic means also being adapted simultaneously to attract the catch to withdraw the same from the bolt element.

4. A latch mechanism for doors which are maintained closed under tension comprising movable latching means against which the tension under which the door is maintained closed is effective, movable means operative upon said latching means to restrain movement to unlatched position, and means associated with both of said means adapted to so control the movement of both said means that the effective restraining action of said operative means is reduced prior to actual release of said latching means.

5. A latch mechanism for doors which are maintained closed under tension comprising movable latching means against which the ten-

sion under which the door is maintained closed is effective, movable means operative upon said latching means to restrain movement to unlatched position, and electromagnetic means effective upon both of said means adapted, when energized, to so control the movement of both of said means that the effective restraining action of the means operative upon the latch to restrain movement thereof to unlatched position is reduced prior to actual release of said latching means.

6. A latch mechanism for a door which is

maintained closed under tension comprising a latch bolt against which the tension under which the door is maintained closed is effective and which tends to move the latch bolt to unlatched position, a catch for said latch bolt, electromagnetic means adapted, when energized, to attract the catch to withdraw it from the latch bolt and simultaneously exert an attractive force on the latch bolt in opposition to the force tending to move the latch bolt to unlatched position.

HORACE H. RAYMOND.