

[54] **DEVICE SIMULTANEOUSLY
CONTROLLING THE LOCKING AND
RELEASE OF A PLURALITY OF DOORS**

[75] Inventors: Andre Leger, Sartrouville; Gerard
Mauron, Versailles, both of France

[73] Assignee: Automobiles Peugeot, Paris;
Regie Nationale Des Usines
Renault, Billancourt, both of
France

[22] Filed: Nov. 8, 1971

[21] Appl. No.: 196,410

[30] **Foreign Application Priority Data**

Nov. 30, 1970 France 7043001

[52] U.S. Cl. 70/264, 292/201, 317/155.5

[51] Int. Cl. E05b 65/36

[58] Field of Search 70/264, 279, 282;
292/144, 201; 317/134, 155.5

[56] **References Cited**

UNITED STATES PATENTS

3,386,761 6/1968 Johnstone et al. 292/201

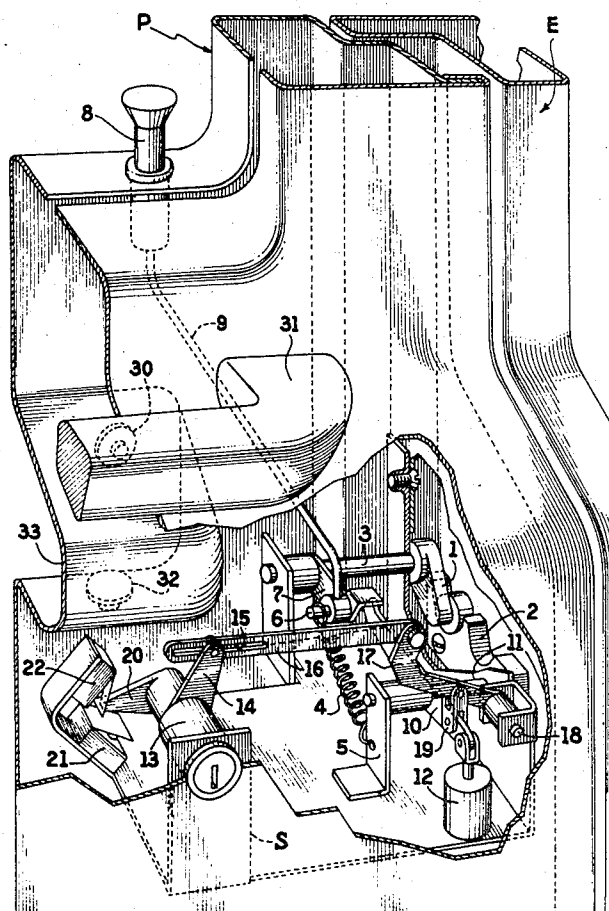
2,219,132 10/1940 Hohmann et al. 292/45
3,054,282 9/1962 Bacon 70/264
2,506,851 5/1950 Ayers 70/264

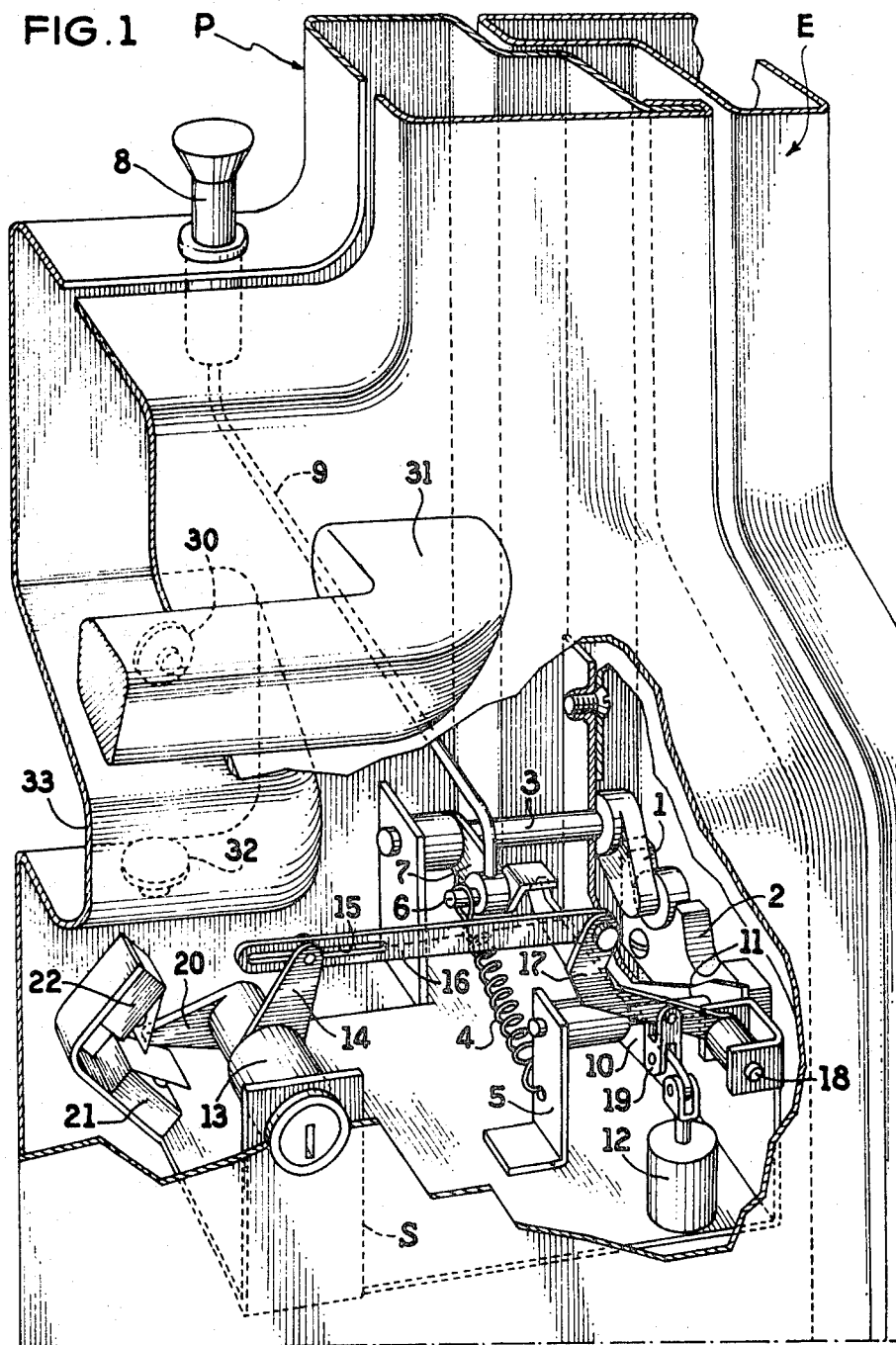
Primary Examiner—Albert G. Craig, Jr.
Attorney—Robert S. Swecker

[57] **ABSTRACT**

Device for simultaneously locking or releasing a plural-
ity of doors of a vehicle. Each door has an electrical
latch and each electromagnet for withdrawing the bolt
of the latch is connected to a source of voltage through
a common switch. The latter is connected in series with
the electromagnets and actuatable by a first coil which
is connected to the source through at least one switch
in series for locking the doors. The common switch is
also actuatable by a second coil connected to the
source through at least one switch in series for releasing
the doors.

2 Claims, 3 Drawing Figures





3. 6. 11

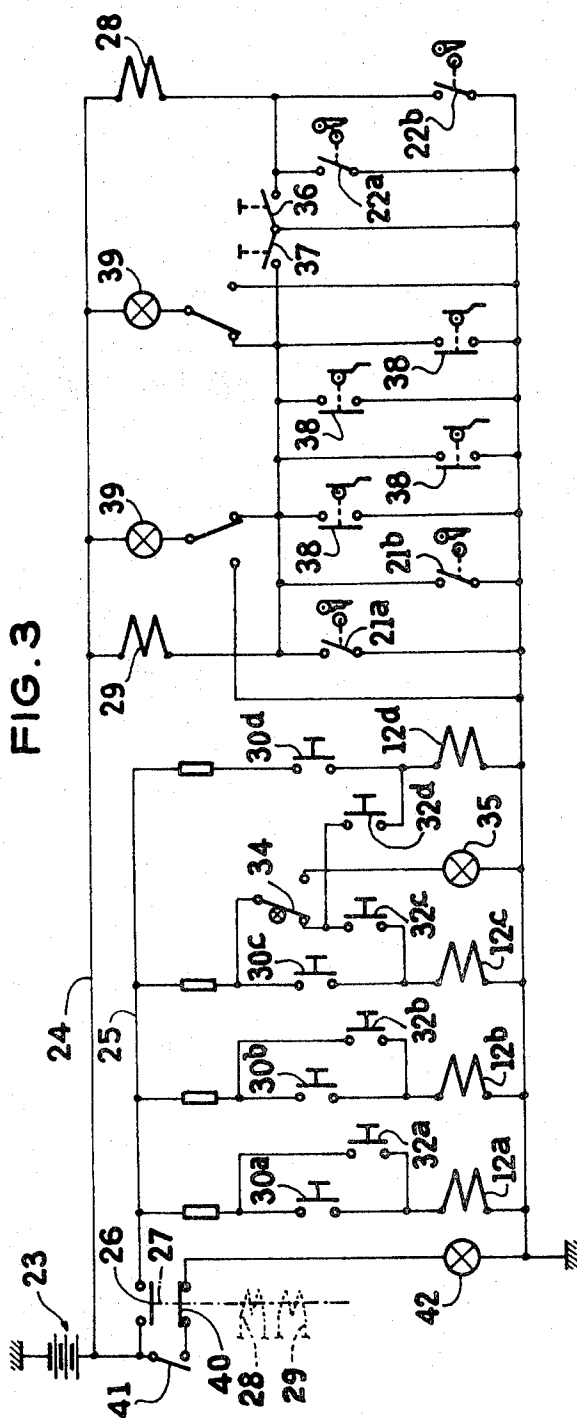
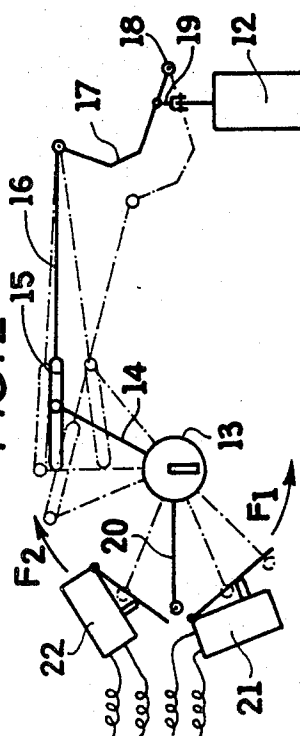


FIG. 2



DEVICE SIMULTANEOUSLY CONTROLLING THE LOCKING AND RELEASE OF A PLURALITY OF DOORS

The present invention relates to a device for simultaneously controlling a plurality of doors provided with electrical latches and is in particular but not exclusively applicable to the locking and release of automobile vehicle doors.

The practical advantages of the simultaneous locking or release of all the doors of a vehicle are well known and various structures have already been proposed.

Most of the known devices, whether electrical or air-operated, act by holding stationary locking means of a mechanical latch. Unfortunately, these arrangements are often relatively complicated if all the possibilities of conventional latches are desired, such as:

- operation in the case of breakdown;
- impossible to lock the doors from outside the vehicle if the ignition key remains inside;
- control from either of the two front doors indifferently;
- control from inside the vehicle.

When the doors are equipped with electrical latches the opening of which is achieved individually by supplying power to an electromagnet which withdraws the bolt of the latch, it is of course very easy to lock the latch by opening the circuit which connects the current supply to all the electromagnets. However, presently-known arrangements employing, for example, a remote-controlled switch do not have sufficient flexibility to afford all the aforementioned possibilities.

An object of the invention is to remedy the aforementioned drawbacks.

The invention provides a device for simultaneously controlling a plurality of doors, in particular of an automobile vehicle, to lock or release doors, the doors being provided with electrical latches each of which comprises an electromagnet whose moving part is mechanically connected to the bolt of the latch, each door being opened by withdrawing the bolt by supplying power to the electromagnet from a supply, wherein the electromagnet of each latch is connected to the terminals of said supply in series with a common switch which is actuable by a first coil supplied with power by said supply and connected to the terminals of said supply in series with at least one door-locking switch and by a second coil also supplied with power by said supply and connected to the terminals of said supply in series with at least one door-release switch.

Further features and advantages of the invention will be apparent from the ensuing description with reference to the accompanying drawing.

In the drawing:

FIG. 1 is a perspective partial view, with parts cut away, of a latch arranged in accordance with the invention for a front door of a vehicle;

FIG. 2 is a diagram of the operation of the latch shown in FIG. 1, and

FIG. 3 is a circuit diagram of the device according to the invention.

The latch mechanism shown in FIG. 1 is intended for the front doors P of a vehicle and is mounted in a support S. The doors are maintained in the closed position by the engagement of a bolt 1 of the door P in a corresponding cavity of a keeper 2 carried by the frame E surrounding the door.

The bolt 1 is fixed on a rotatable pin 3 and is biased into the end of the recess of the keeper 2 by a spring 4 one end of which is fixed to a bracket 5 fixed relative to the door and the other end of which is engaged on a pin 6 integral with a member 7 fixed to the pin 3.

A pull-rod 8, solely accessible from inside the vehicle, enables the bolt 1 to be disengaged from the keeper for manually opening the door from inside the vehicle. For this purpose the pull-rod 8 is connected to the member 7 by a rod 9.

The bolt 1 can also be disengaged from its cavity in the keeper 2 by a lever 10 which is pivotally mounted on a pin 11 fixed to the bracket 5. The lever 10 can be shifted either electrically by energizing an electromagnet 12 or by rotating a lock 13 controlled from outside the vehicle by means of a key.

The lock 13 comprises an arm 14 whose end is slidably mounted in a slot 15 in a link 16. The end of the link 16 is pivoted to a cranked lever 17 which is pivotable about a fixed pin 18 and connected by means of a double-fork member 19 to the lever 10. The lock 13 also includes another arm 20 which is capable of acting on a switch 21 or on a switch 22.

The circuit diagram shown in FIG. 3 represents the device for simultaneously controlling the doors of a vehicle having four doors.

The latch mechanisms for the rear doors (not shown) do not include a lock and comprise solely a bolt which co-operates with a keeper mounted on the frame surrounding the door, a bolt return spring, a pull-rod for shifting the bolt from inside the vehicle, an electromagnet and a motion-transmitting lever for transmitting the motion of the electromagnet to the bolt.

In FIG. 3 all of the means for locking and releasing the doors are supplied with power from a D.C. supply 23, such as the battery of the vehicle, through a line 24. All of the electrical latch-opening means are supplied with power by way of a line 25 through a switch 26.

The switch 26 is actuated by a bistable relay 27 of conventional type comprising a coil 28 termed a locking coil and a coil 29 termed a release coil.

Four electromagnets, namely 12^a and 12^b for the front doors and 12^c and 12^d for the rear doors, such as the electromagnet 12 shown in FIG. 1, are connected in parallel between the line 25 and ground.

Each electromagnet can be supplied with power either by the closure of a switch connected to a button 30^a, 30^b, 30^c or 30^d, accessible from outside the vehicle, such as the push-button 30 mounted on the outer door handle 31 of the door P, or by the closure of a switch connected to a button 32^a, 32^b, 32^c or 32^d accessible from inside the vehicle, such as the push-button 32 mounted in the recess 33 of the inner wall of the door P (FIG. 1).

The switches of the doors 32^c and 32^d are moreover connected in series with a switch 34 which, when open, supplies power through its other contact to a warning light 35. This switch 34 constitutes the "child safety" precaution. Indeed, when open, it neutralizes the action of the inner switches 32^c and 32^d. The locking coil 28 of the bistable relay is connected in series with either of the switches 22^a and 22^b, such as the switch 22 shown in FIG. 1, pertaining to the latches of the front doors and with an inside locking switch 36 actuated by a pushbutton.

The release coil 29 of the bistable relay 27 is connected in series with the following switches connected

in parallel : a switch 37 which is normally open, the switches 21^a and 21^b which are normally open, pertaining to the latches of the front doors, rabbit contacts 38 disposed on each of the doors. The contacts 38 which are opened when the doors are closed are normally employed for lighting up the inside roof or ceiling light 39. The switch 36 and the switch 37 are actuated by a single swinging button having two unstable positions and one stable position in which both switches are open.

The circuit diagram shown in FIG. 3 is completed by a switch 40 actuated by the bistable relay 27 and connected in series with the main switch 41 of the vehicle and with a warning light 42. The switch 40 is closed when the switch 26 is opened and vice versa.

The arrangement just described operates in the following manner :

When the vehicle is stationary and the doors are closed and locked and the "child safety" precaution is inoperative, the various switches are in the positions shown in FIG. 3 and the mechanical parts of the latches are in the positions shown in full line in FIG. 2. It can be seen in particular that it is impossible to supply power to the electromagnets 12^a-12^c by closing the corresponding switches 32^a-32^d or the switches 30^a-30^d because the switch 26 is open.

Opening is possible from either of the front doors with a key turned in the direction of F₁ (FIG. 2) until the arm 20 closes the switch 21. In the course of this movement, the end of the arm 14 slides in the slot 15 of the link 16 and the cranked lever 17 remains stationary.

Closure of the contact 21^a or 21^b, depending on the side of the vehicle, energizes the release coil 29 which closes the contact 26. All the doors are then released and it is then possible to open them from inside and outside the vehicle by depressing one of the buttons 30^a-30^d or 32^a-32^d so as to actuate one of the electromagnets 12^a-12^d of the corresponding door.

If the switch 21 by chance does not operate, continuing the movement of rotation of the key in the direction F₁ causes the lever 14 to shift the link 16 and consequently the lever 17 so that the lever 10 is pivoted and disengages the lock 1. The opening of the door closes the corresponding rabbit contact 38 and thus supplies power to the coil 29 and releases all the other doors.

In the case of breakdown of the entire electrical equipment, for example in the event of the battery being discharged, it is still possible to open the front doors mechanically either from outside as shown in the foregoing paragraph or from inside the vehicle by means of the pull-rod 8, the opening of the rear doors being also possible by means of corresponding pull-rods.

The outside locking is effected from either front door

by turning the lock 13 by means of its key in the direction of arrow F₂ (FIG. 2). The lever 20 then closes the switch 22 which supplies power to the locking coil 28 and opens the switch 26. The doors can no longer be opened from outside the vehicle without the key.

In the course of the displacement of the lock in the direction of arrow F₂, the lever 14 slides in the slot 15 of the link 16 and the lever 17 remains stationary.

The switch 36 enables the doors to be locked if desired from inside the vehicle. In this case, the doors are released either by closing the switch 37 or by opening any one of the doors. It will be observed that the fact of ensuring the release by the opening of one door forbids achieving the locking from outside the vehicle if the key remains inside.

When the doors are locked while the main switch 41 is closed, which corresponds to the case where the locking is controlled from inside the vehicle, the warning light 42 stays on.

Having now described our invention what We claim and desire to secure by Letters Patent is :

1. A device for simultaneously controlling a plurality of doors of a vehicle for the purpose of selectively locking and releasing the doors, comprising for each door an electrical latch which comprises a withdrawable bolt, an electromagnet having a moving part connected to the bolt for withdrawing the bolt when the electromagnet is energized ; a source of voltage having terminals ; a common switch connected in series with each electromagnet for connecting each electromagnet to said terminals ; a first coil for actuating the common switch ; at least one switch for locking the doors connected in series with the first coil for connecting the first coil to said terminals ; a second coil for actuating the common switch ; at least one switch for releasing the doors connected in series with the second coil for connecting the second coil to said terminals, said device further comprising a moving part of a latch on one of the doors associated with the switch for locking the doors, said moving part of the latch being movable from outside the door by means of a key which causes, when the key is rotated in a first direction, the mechanical releasing of the door by the moving part of the latch and, when the key is rotated in the opposite direction, the closing of the switch for locking the doors by the moving part of the latch.

2. A device as claimed in claim 1, wherein said switch for releasing the doors is associated with said moving part of the latch, the switch for releasing the doors being closed by an initial movement of the moving part of the latch in a direction for mechanically opening the door before withdrawing the bolt of the latch.

* * * * *