March 14, 1933. F. BEAL 1,901,721

ELECTRIC DOORLOCK

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Fig. 1

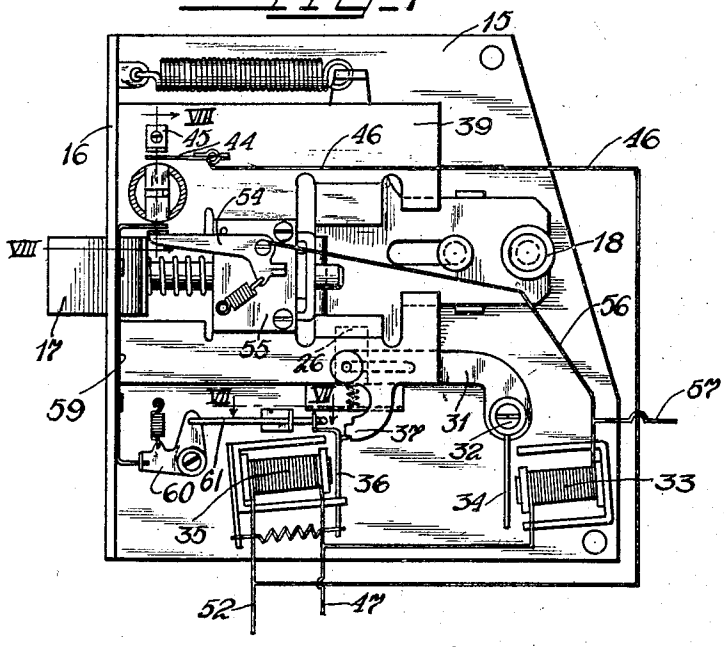
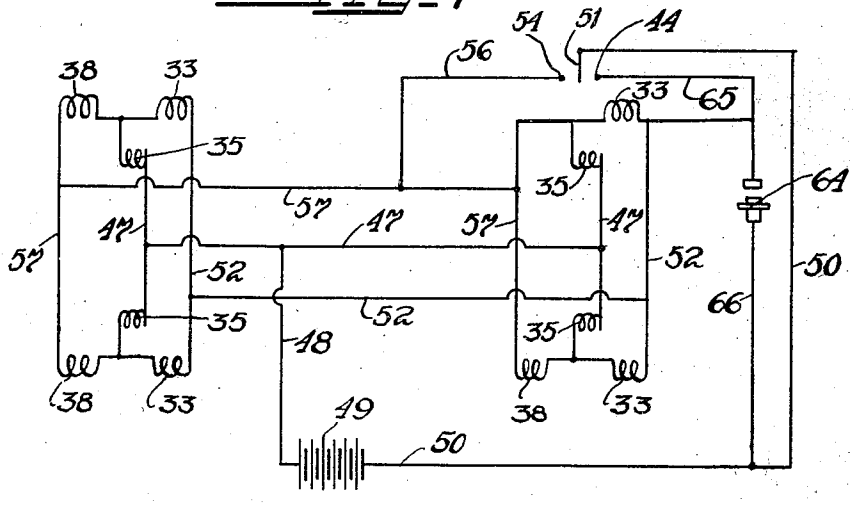



Fig. 4




Inventor

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Fig. 2.

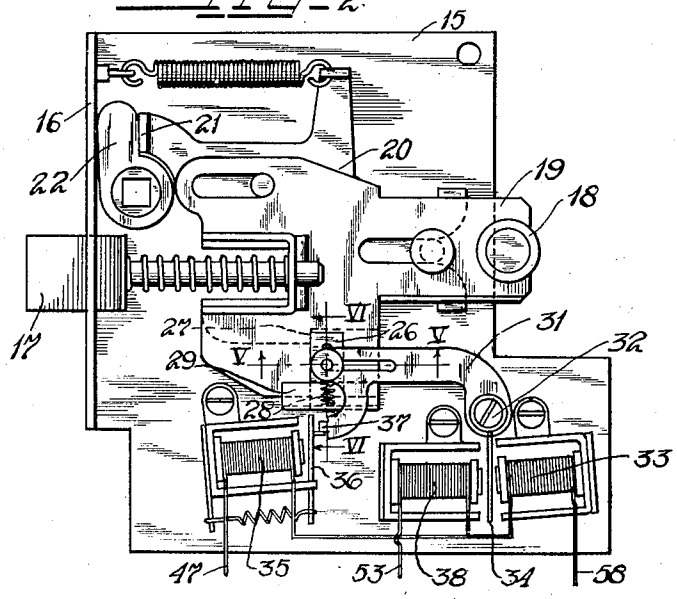
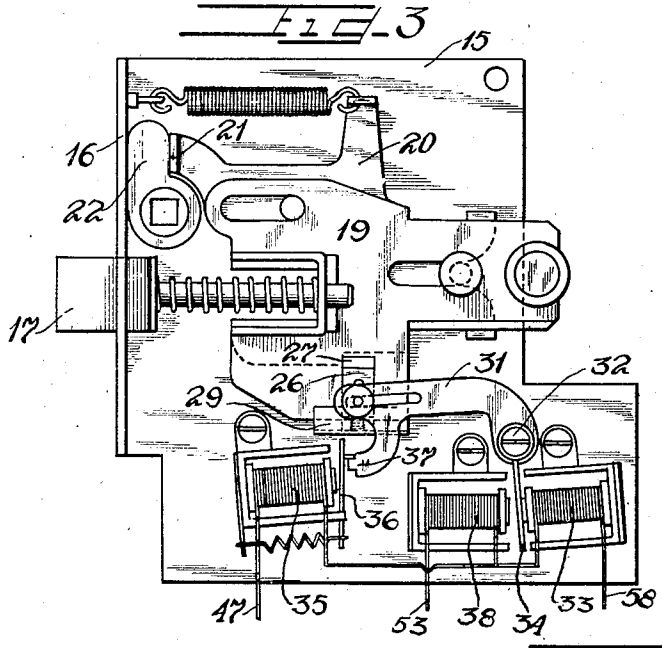



Fig. 3.




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Fig. 5

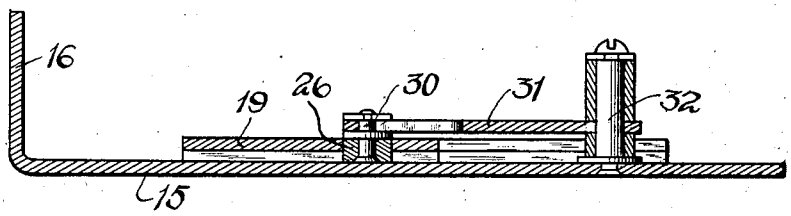



Fig. 6

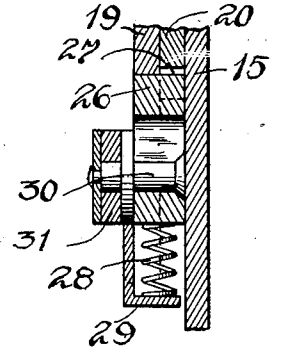



Fig. 7

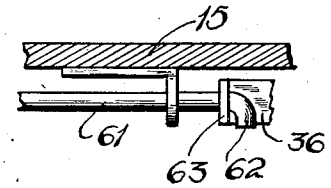



Fig. 9

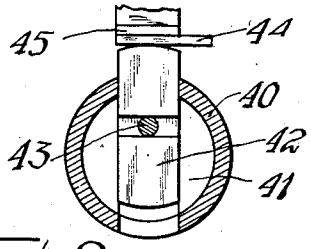



Fig. 10

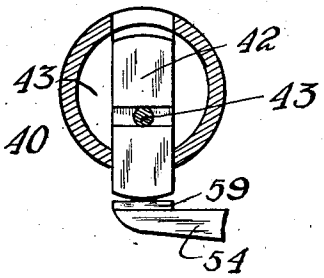
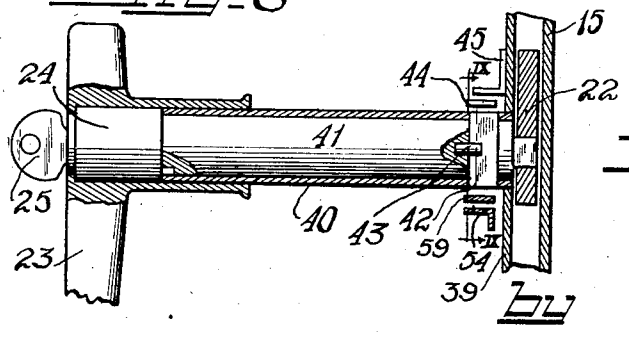



Fig. 8




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Patented Mar. 14, 1933

1,901,721

# UNITED STATES PATENT OFFICE

RAY BRAL, OF KOKOMO, INDIANA, ASSIGNOR TO KINGSTON PRODUCTS CORPORATION, OF KOKOMO, INDIANA, A CORPORATION OF INDIANA

## ELECTRIC DOORLOCK

Application filed January 27, 1930. Serial No. 423,632.

This invention relates to improved and simplified means for simultaneously locking and unlocking a plurality of doors from one or more control points, and has special reference to locking the doors of a vehicle.

It is one object of this invention to provide an improved multiple door lock of the class described which may be set for locking prior to emerging from a vehicle, the closing of the door of exit serving to automatically lock the same. As a corrollary to this object, the hereinafter disclosed structure is capable of being temporarily released from inside the vehicle while remaining locked as to external attempts at entry, the locking mechanism being unaffected by opening the door from the inside. This arrangement offers important advantages, since the door latches may be set in their locked position upon entering the vehicle so that the doors are automatically locked upon exit therefrom.

It is another object of this invention to provide an improved device of the class described operated by an electrical mechanism, together with a manual release for one door so that in the event that the vehicle battery becomes run down, entry may still be made. With a straight electrical system, a broken wire or run down battery might prevent opening of the doors with the consequent necessity of forcible entry.

It is also an object of this invention to provide an improved locking and unlocking mechanism of the class described, wherein a master lock associated with one door, has mechanical unlocking means associated therewith and is connected with electrically energized locking and unlocking mechanisms associated with the other doors, whereby the door latching mechanisms of all the doors will be controlled by the master lock.

The present invention is in part an improvement over that shown in my co-pending application, Serial No. 401,053, filed October 21, 1929.

Other and further important objects of this invention will be apparent from the disclosures in the specification and accompanying drawings.

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

On the drawings:

Figure 1 is a plan view of a door locking and unlocking mechanism to which a master lock embodying features of this invention has been applied.

Figure 2 is a similar view of a door locking and unlocking mechanism having electrically operated locking mechanism shown in its unlocked position.

Figure 3 corresponds to Figure 2 with the parts shown in their locked position.

Figure 4 is a wiring diagram for the electrical system controlling three door locks from a fourth door lock, embodying a manually controlled master key lock.

Figure 5 is an enlarged fragmental section on the line V—V of Figure 2.

Figure 6 is an enlarged fragmental section on the line VI—VI of Figure 2.

Figure 7 is an enlarged fragmental section on the line VII—VII of Figure 1.

Figure 8 is an enlarged fragmental section on the line VIII—VIII of Figure 1.

Figure 9 is an enlarged fragmental section on the line IX—IX of Figure 8 in locked position.

Figure 10 is an enlarged fragmental section on the line IX—IX of Figure 8 in unlocked position.

As shown on the drawings:

The present invention is intended to be an addition to a mechanical door lock or latch mechanism, to operate a plurality of locks in unison from one or more points. Broadly the mechanical lock mechanism comprises a base plate 15 having a flanged edge 16 through which a spring urged latch bolt 17 projects to engage a strike plate mounted in the door pillar or frame. This latch bolt is beveled on the inside and is retractable regardless of whether the door mechanism is locked or not so that the mechanism can be set to lock without interfering with the opening of the door from the inside by means of suitable mechanism engaging a stud 18 on a slidable plate 19 mounted over a second plate 20 having an upstanding ear 21 engaged by a cam 22 exter-

nally operated by the usual door handle or knob 23, similar to that shown in Figure 8 as associated with a master lock cylinder 24, operated by a key 25. Either of the plates 19 and 20 is adapted to retract the latch bolt 17 when the latch 26 is in its upper or unlocked position but when the latch 26 is in the lower or locked position the second plate 20 is movable but will not retract the latch bolt 17 so that the door is locked as regards the external handle; although the latch bolt can still be pushed in as by closing the door, because the beveled surface of the latch hits the strike plate and is retracted thereby.

The locking means of this invention comprises a latch 26 vertically slidable in a slot in the slidable plate 19. In its upper position it engages a shoulder 27 formed in the second plate 20 and this is acted upon by the movement of the plate 20 to retract the latch bolt 17 when the plate 20 is moved by the handle 23 and cam 22. This latch 26 is urged upwardly by a spring 28 therebeneath and since it is necessarily movable with the plate 19 the spring is supported by an elongated bracket 29. The downward or locking movement of the latch 26 is accomplished by a pin 30 engaged between the latch 26 and a slot in a lever 31 pivoted at 32, this lever being tilted counterclockwise by an electromagnet or solenoid 33 acting on an armature 34 associated with the lever 31. In order to hold the lever in its set position a detent solenoid 35 controls the retraction of a spring urged detent lever 36 engaging either above or below a suitably formed lug 37 associated with the lever 31, the retraction of the detent permitting movement of the lever. The above described structure is common to both the master locks of Figures 2 and 3, the latter two figures showing the lever and latch positions for the unlocked and locked positions.

The controlled locks of Figures 2 and 3 are further provided with an unlocking solenoid 38 oppositely disposed relative to the armature 34 to act thereon to move the lever 31 clockwise into its unlocked position.

The master lock of Figure 1 is provided with a cover plate 39 over the plate 20, through which plate 39 the tubular shank 40 of the handle 23 projects. This handle of the shank contains a rotatable extension 41 connecting the lock cylinder 24 to a reciprocating bar 42 actuated by an eccentric pin 43 in the end of the extension, so that a partial rotation of the lock cylinder serves to project the bar 42 from the top or bottom of the shank as viewed in Figure 1.

When the bar 42 moves upwardly as shown in Figure 9, it presses a lever 44 into contact with a grounding bracket 45, the lever being connected by a wire 46 to the winding of the detent solenoid 35. All the detent solenoids are interconnected by wires 47 as shown in the wiring diagram of Figure 4, and the wires 47 are in turn connected by a wire 48 to a battery 49. The opposite terminal of the battery may be grounded as is customary but in the wiring diagram the ground is represented by the wiring 50 leading to the switch lever 51 representing the bar 42.

In the case of the master lock of Figure 1, no unlocking solenoid is provided since the latch 26 will engage plate 20 when the detent is released due to the spring. The wire 46 is also connected by a wire 52 to the terminals 53 of the unlocking solenoids 38. The downward movement of the bar 42 as shown in Figure 10 actuates a mechanical detent release and also makes electrical contact with a lever 54 mounted on an insulated base 55 and connected by wiring 56 to the locking solenoid 33, this wiring having branches 57 connecting to the terminals 58 of the other locking solenoids. In each case, the unlocking and locking solenoids are jointly connected in series with their common detent solenoids which are in turn interconnected by the wires 47 as previously described.

The mechanical detent release mentioned heretofore comprises a vertically sliding member 59 adapted to be pushed downwardly by the lock bar 42, the downward movement thereof being transmitted by a bell crank lever 60 to a rod 61 having a hook 62 engaging in an apertured lug 63 on the detent lever 36 to retract the same. This hooked rod 61 is so formed as not to interfere with the normal electrically controlled movement of the detent lever, but serves to mechanically release the same in the case a run down battery fails to pull the detent free of the locking lever lug 37 to permit the unlocking movement thereof. Thus the unlocking solenoid 38 on the master lock is optional and might be omitted for the purpose of cheaper construction.

A push button 64 is connected by wires 65 and 66 between the locking contact 44 and the battery return 50 to be in parallel with the locking circuit to in effect short circuit the switch. By pressing on this push button at any time, all the doors will be set in locked position, relative to the external operating mechanism, so that while the doors can still be opened from the inside, as when leaving the vehicle, the reclosing of the door automatically locks the same against re-entry except by the operation of the master key lock. The push button may be mounted on one of the door pillars or on the instrument board and is much more convenient in operation than the use of a key lock.

It will thus be seen that the present invention comprises an improved and simplified multiple door locking system that may be controlled from one or more points and may be pre-set for locking, permitting free exit thereafter but automatically being locked against entrance.

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. In combination with a plurality of door locks for an automobile, each of said locks including a latch element, an outside and an inside operating handle therefor, a source of electrical energy, interlock means adapted when set to operably disconnect said outside handles from said latches to prevent latch releasing movement thereby, means for electrically actuating said interlock means to set and released positions, a master lock, means associated with said master lock for temporarily connecting the electrically actuating means to the source of electrical energy when the master lock is actuated, means operably connecting the inside handles to the latch elements whereby each latch may be individually retracted when said outside handles are operably disconnected from said latches.

2. In combination with a plurality of door locks for an automobile, each of said locks including a latch element, an outside and an inside operating handle therefor, a source of electrical energy, interlock means adapted when set to operably disconnect said outside handles from said latches to prevent latch releasing movement, thereby for electrically actuating said interlock means to set and released positions, a master lock, means associated with said master lock for temporarily connecting the electrically actuating means to the source of electrical energy when the master lock is actuated, means operably connecting the inside handles to the latch elements whereby each latch may be individually retracted when said outside handles are operably disconnected from said latches, and means actuated by said master lock for mechanically releasing the interlock means in one of said locks.

3. Door locking means for simultaneously locking and unlocking several doors, comprising in combination with manual door latching mechanisms including latch elements, outside and inside latch actuating handles, shiftable interlock means adapted to be interposed in said mechanisms to operably connect said outside handles to said latch elements, said means adapted to be shifted to disengaged position for operably disconnecting said outside handles from said latches, a source of electrical energy, locking and unlocking solenoids cooperating with said means to shift the same into operative and disengaged positions, a master lock, means associated therewith adapted to momentarily complete the circuit through said source of electrical energy to said locking and unlocking solenoids, and means operably connecting the inside latch operating handles to said latch elements whereby the same may be actuated when operably disconnected from said outside handles.

4. Door locking means for simultaneously locking and unlocking several doors, comprising in combination with manual door latching mechanisms including latch elements, outside and inside latch actuating handles, shiftable interlock means adapted to be interposed in said mechanisms to operably connect said outside handles to said latch elements, said means adapted to be shifted to disengaged position for operably disconnecting said outside handles from said latches, a source of electrical energy, locking and unlocking solenoids cooperating with said means to shift the same into operative and disengaged positions, a master lock, means associated therewith adapted to momentarily complete the circuit through said source of electrical energy to said locking and unlocking solenoids, and means operably connecting the inside latch operating handles to said latch elements whereby the same may be actuated when operably disconnected from said outside handles, and means actuated by said master lock for mechanically releasing said shiftable interlock means in one of the locks to cause movement thereof to disengaged position.

In testimony whereof I have hereunto subscribed my name at Kokomo, Howard County, Indiana.

FAY BEAL.