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ELECTRICAL COINCIDENTAL LOCKING SYSTEM FOR AUTOMOBILES

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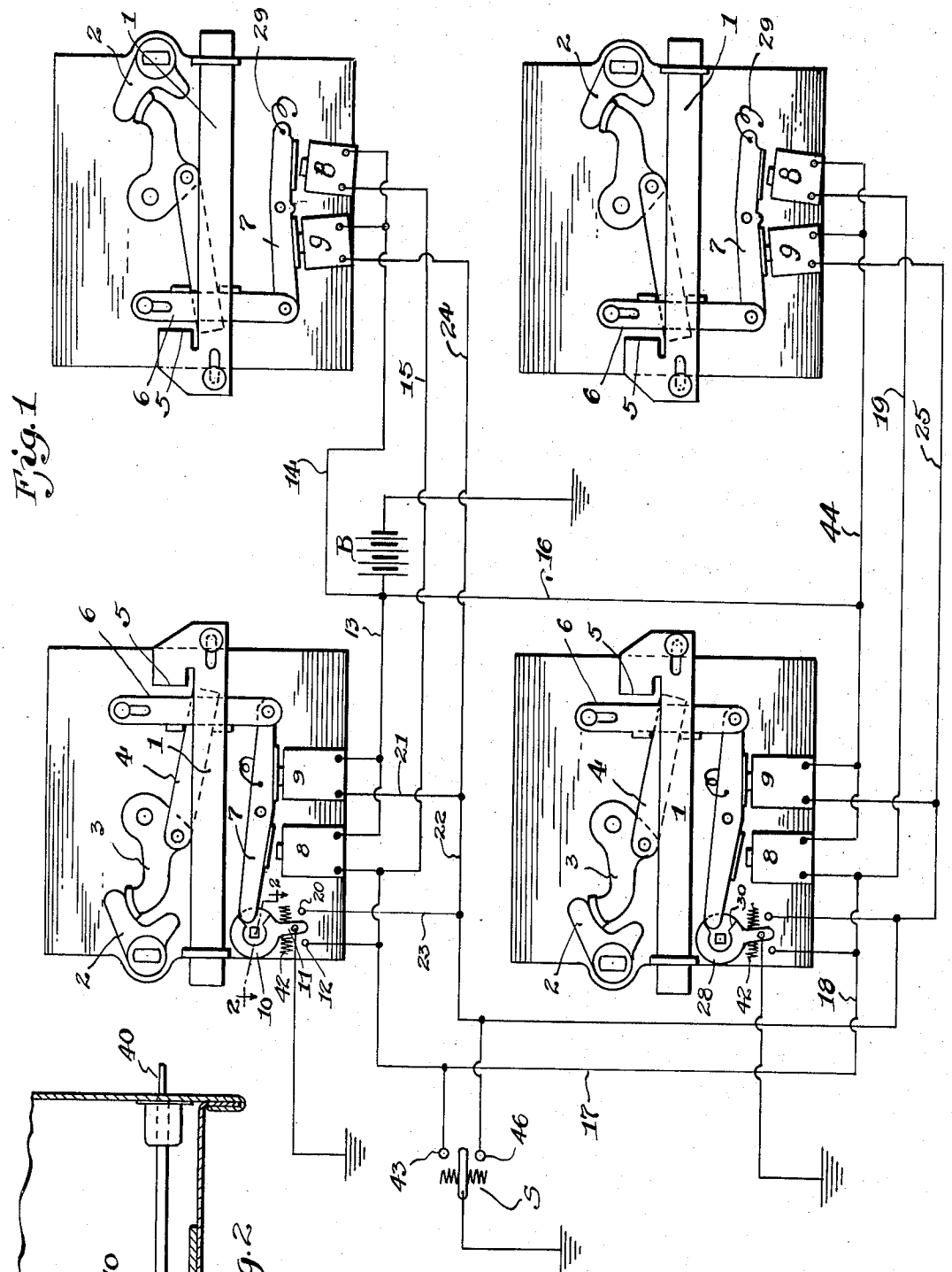


Fig. 1

Fig. 2

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ELECTRICAL COINCIDENTAL LOCKING SYSTEM FOR AUTOMOBILES

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7 Claims. (Cl. 70—264)

This invention relates to an electrical coincidental locking system for automobiles and other vehicles with a plurality of doors.

Electrical coincidental locking systems have heretofore been proposed, but so far as I am aware, none have been used or published in which the system is controlled from either front door. It has already been proposed in the application of Ward and Dean, Serial No. 375,118, filed January 21, 1941, to control electrical coincidental systems from the two front doors. This system involves a system of master switches and subsidiary or local switches in each of the several locks in the car.

It is the object of the present invention to provide a coincidental locking system which may be controlled from each front door or several points and which eliminates a series of master and subsidiary switches and thereby cheapens and simplifies the electrical installation.

Referring to the drawing:

Fig. 1 is a plan view of the apparatus.

Fig. 2 is a section showing how the key cylinder and the inside thumb lever are connected with the combined controlling switch and the mechanical shifter.

The two locks at the left-hand side are the front door locks and the two locks at the right-hand side are the rear door locks. Each of these locks has the usual sliding bolt 1 which is operated by the outside rollback 2 which shifts bell crank lever 3 and thrust link 4. The thrust link 4 is shown in the drawing to be in the inoperative position out of contact with abutment 5 on the bolt. Thrust link 4 may be raised and lowered by shifting link 6 through lever 7. This is a semi-free-wheeling type of handle that has been extensively used and is described and claimed in the Andersen and Bowlus Patent No. 2,039,873.

Lever 7 on the rear locks can be shifted only by the energization of solenoid 8 or 9. The same solenoids also shift the lever or armature 7 on the front locks, but the lever may also be shifted on the front locks by the slotted cylinder or cam 10 which, with the plate 11, forms a combined master switch and mechanical shifter. The slotted cylinder 10, as shown in Fig. 2, is operable either by a key 40 from the outside or the thumb lever 41 on the inside of the door. A suitable spring 42 keeps this combined switch and mechanical shifter in neutral position when not operated. When the thumb lever is released or the key is taken out of the lock the switch and mechanical shifter returns to the neutral position.

As shown in Fig. 1, all the locks are in locked position; that is, they are in a position where the turning of the outside handle will not shift the bolt because the thrust link 4 is in the disconnected position.

If one desires to unlock all the locks or make the outside retractor effective in all the locks, the combined switch and mechanical shifter is operated either with the thumb lever on the inside or the key on the outside. If the switch and mechanical shifter of the upper or curb front door is turned clockwise, the switch arm contacts contact 12. As will be apparent, current flows from battery B through wire 13 to solenoid 8, thence to ground through the switch arm 11 and contact 12. Current also goes through the line 14 to solenoid 8 in the upper rear lock, thence back through line 15 and switch arm 11 to ground. Current also goes through line 16 to the other two solenoids 8 of the lower or left hand locks, from the front lock solenoid through lines 18 and 17, switch arm 11 back to ground and from the rear right lock solenoid through wire 19, line 17, contact 12, switch arm 11 back to ground.

Likewise, when the upper front door switch is swung counterclockwise into contact with contact 20, all the solenoids 9 will be energized. The current will flow from battery B through line 13 to the solenoid 9 on the right front door, thence through wire 21, wire 22 and wire 23, contact 20 and switch arm 11 to ground. Current will flow from battery B by the line 16 and the line 14 to the other solenoids 9 and then back through lines 24 and 25 back to line 23, contact 20, switch arm 11 to ground.

The same counterclockwise and clockwise movements of the switch 28 of the left front lock will operate to disengage all the thrust links 4 or engage all the thrust links 4 with the abutment of all the locks. It seems unnecessary to trace the circuits as these are obvious from the drawing.

The springs 29 connected with each lever 7 serves to hold the lever in either one position or the other. This can be an over-center spring so when the lever shifts past the centerline thrust it stays either in one position or the other. There is enough lost motion in the slot 30 of each combined switch and mechanical shifter so that the lever can move one way or the other without moving the combined switch and mechanical shifter. It is very desirable to combine this switch and mechanical shifter in one instrument for in case the current fails the mechanical shifter will serve to physically shift the lever of the particular lock in which the key is inserted and, consequently, one is not locked out of the car.

The several locks may also be controlled from the instrument board or any other convenient spot by a neutrally biased switch S. By swinging this switch into contact with the upper contact 43 it will be seen that battery B will be connected with ground through the upper curb door solenoid 8 via line 13. Also, battery B will be connected with ground through the line 14, the upper rear solenoid 8 and line 15. The lower rear solenoid 8 via lines 16 and 44 and lines 19 and 17 will be

connected with ground and the front lower solenoid 8 will be connected between battery B, line 16, lines 18 and 17 and contact 43 and ground. In an obvious manner, if the switch S is swung onto contact 46, the solenoids 9 may all be energized by being connected between the battery and ground.

What is claimed is:

1. In an electrical coincidental locking system for an automobile or other vehicle having a plurality of doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, a lever and a link to control said last mentioned means and to shift said last mentioned means to maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said lever and link on each lock including a source of electrical energy and suitable circuits and solenoids, the lever arranged to be an armature for the solenoids, and a combined switch and mechanical shifter for said lever and link on each front door lock.

2. In an electrical coincidental locking system for an automobile or other vehicle having a plurality of doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, lever and link means to control said last mentioned means and to shift said last mentioned means to maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said control means on each lock including a source of electrical energy and suitable circuits and solenoids, the lever acting as an armature for the solenoids, a combined switch and mechanical shifter for the control means on each front door lock, key operated means and manually operated means inside for operating said combined switch and mechanical shifter.

3. In an electrical coincidental locking system for an automobile or other vehicle having a plurality of doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, lever means to control said last mentioned means and to shift said last mentioned means to spring maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said control means on each lock including a source of electrical energy and suitable circuits and solenoids, the lever acting as an armature for said solenoids, and a combined switch and mechanical shifter for the control means on each front door lock.

4. In an electrical coincidental locking system for an automobile or other vehicle having a plurality or doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, means including an armature to control said last mentioned means and to shift said last mentioned means to maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said control means on each lock including a source of electrical energy and suitable circuits and solenoids, the last operating upon said armature, and a combined switch and mechanical shifter for the control means on each front door lock, said switch and mechanical shifter at all times biased to neutral position.

5. In an electrical coincidental locking system for an automobile or other vehicle having a plurality of doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, means including an armature to control said last mentioned means and to shift said last mentioned means to maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said control means on each lock including a source of electrical energy and suitable circuits and solenoids, the last operating said armature, a combined switch and mechanical shifter for the control means on each front door lock, key operated means and manually operated means inside for operating said combined switch and mechanical shifter, said switch and mechanical shifter biased toward neutral position.

6. In an electrical coincidental locking system for an automobile or other vehicle having a plurality of doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, means including an armature to control said last mentioned means and to shift said last mentioned means to maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said control means on each lock including a source of electrical energy and suitable circuits and solenoids, the last operating said armature, and a plurality of switches biased to neutral positions and each of which can control said electromagnetic actuating system.

7. In an electrical coincidental locking system for an automobile or other vehicle having a plurality of doors each provided with a lock and including two front doors, the combination of a plurality of locks each provided with a retractable bolt and means for retracting said bolt from the outside of the door, means to make said retracting means ineffective to retract the bolt, means including an armature to control said last mentioned means and to shift said last mentioned means to maintained positions to make the outside retractor ineffective to retract the bolt or effective to retract the bolt, an electromagnetic actuating system for said control means on each lock including a source of electrical energy and suitable circuits and solenoids, the last operating said armature, and a plurality of switches biased to neutral position and each of which can control said electromagnetic actuating system.

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