

Jan. 9, 1940.

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2,186,546

TELLTALE DEVICE FOR AN ELECTRICAL COINCIDENTAL DOOR LOCKING SYSTEM

Filed Oct. 25, 1937

2 Sheets-Sheet 1

Fig. 1.

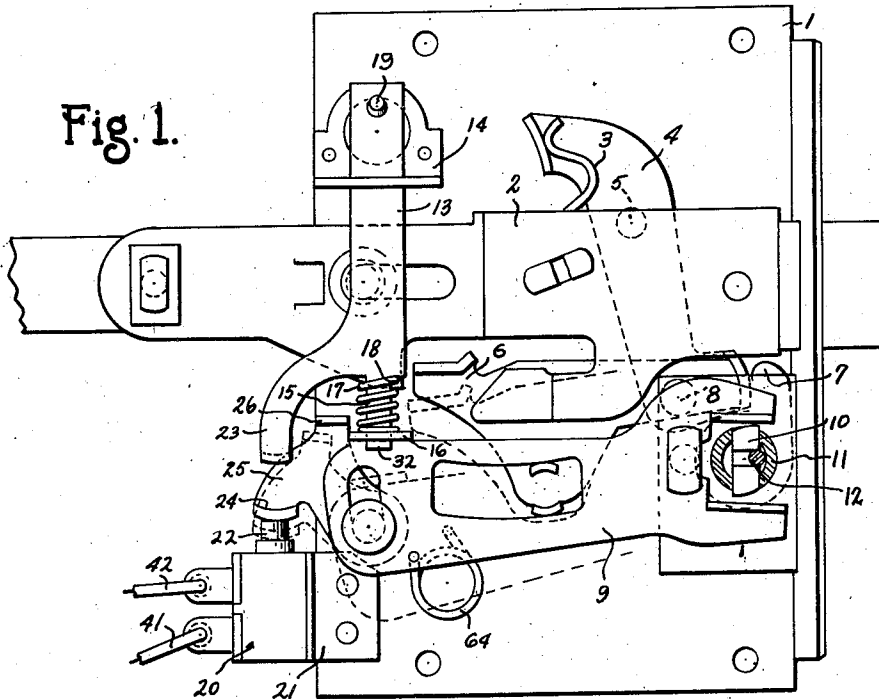
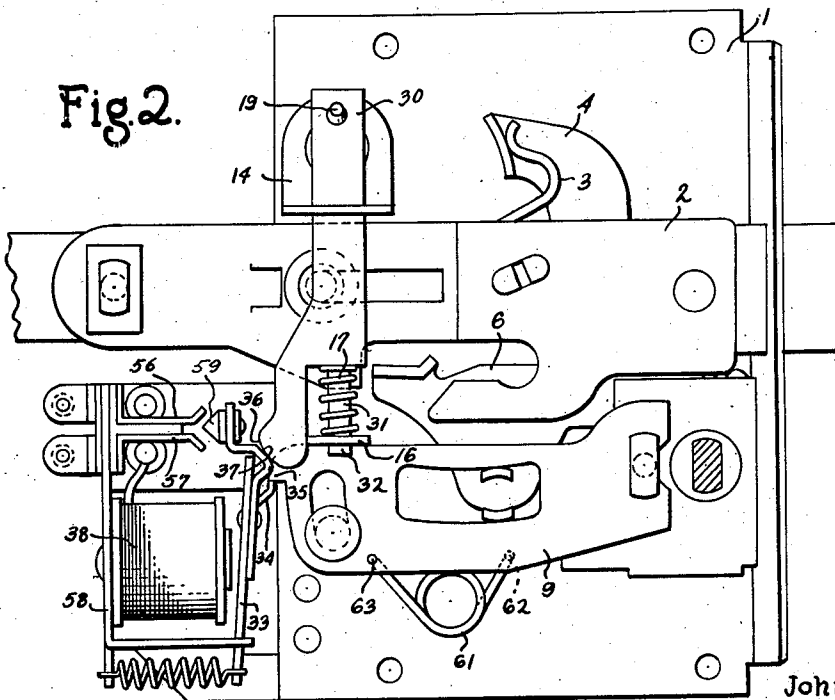


Fig.2.



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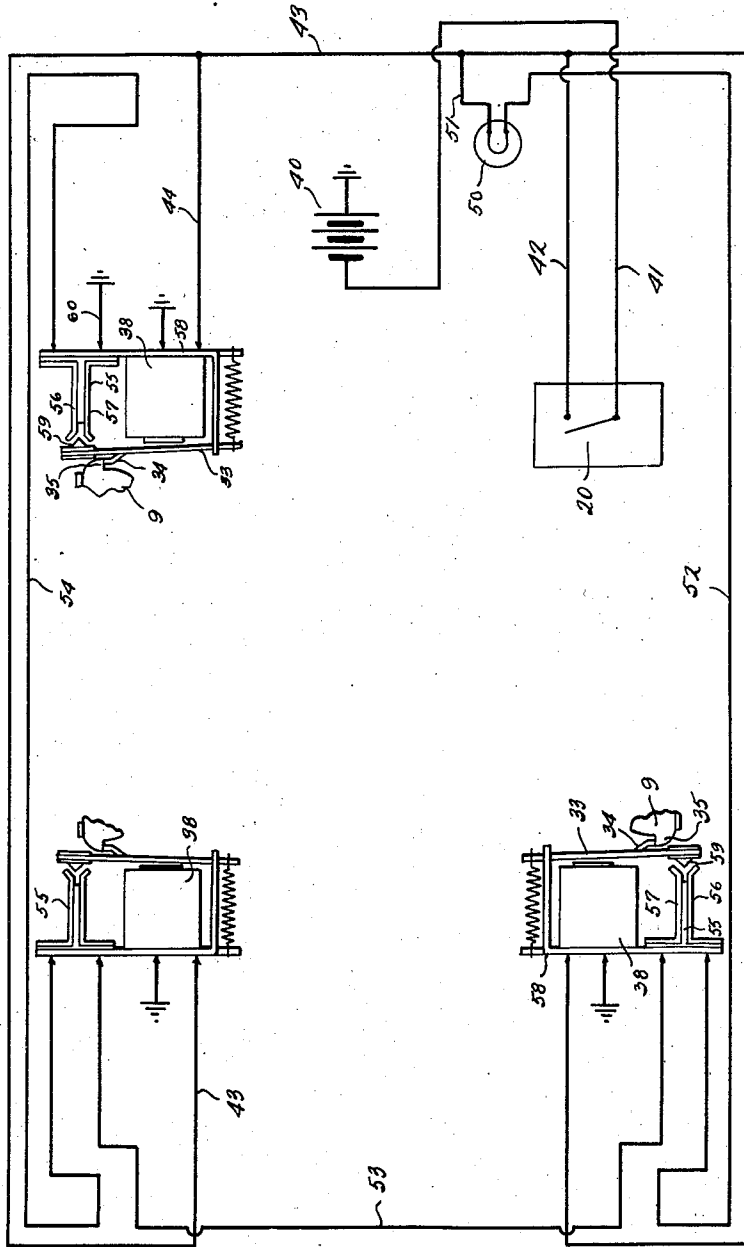
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2,186,546

TELLTALE DEVICE FOR AN ELECTRICAL
COINCIDENTAL DOOR LOCKING SYSTEMJohn W. Lakin, Detroit, Mich., assignor to Tern-
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Application October 25, 1937, Serial No. 170,797

2 Claims. (Cl. 70-264)

This invention relates to a telltale device for an electrical coincidental door locking system.

This invention contemplates an electrical coincidental door locking system for an automotive vehicle with a visible telltale arrangement for indicating to the operator when all of the locks in the system have worked as well as when any one or more of the locks has failed to work. In particular it is the object of the invention to provide such an electrical coincidental door locking system which requires only a momentary flow of electrical current to operate the same and is therefore economical in operation.

In the drawings:

Fig. 1 is an elevation of the master door lock preferably for the right front curb door.

Fig. 2 is an elevation of one of the auxiliary locks used on the remaining doors of the vehicle body.

Fig. 3 is a schematic showing of the electrical coincidental door locking system and telltale arrangement.

The coincidental electric door locking system and telltale arrangement which is the subject of this invention can be applied to any of the well-known types of door locks but for descriptive purposes it is shown applied to a lock shown, described and claimed in the Andersen et al. Patent 2,039,873.

This lock comprises a frame 1 upon which is slidably mounted a reciprocating latch bolt 2. The latch bolt 2 carries the bolt spring 3 which acts against a lever 4 pivotally mounted as at 5 on the frame 1 to project the bolt. A connector 6 between the outside rollback 7 and the bolt is pivotally mounted as at 8 on the lever 4. The pivoted connector 6 is arranged to be swung into set and released positions by means of a lever 9. When the connector 6 is set, as shown in the full lines of Fig. 1, the outside rollback is operatively connected with the bolt 2 and rotation of the outside rollback will retract the bolt. When the connector 6 is released, as shown in the dotted lines of Fig. 1, the outside rollback is disconnected from the bolt and rotation of the outside rollback is ineffective to retract the bolt.

The lever 9 can be swung to either set or release the connector 6 from the outside of the vehicle body by means of a bolt 10 slidably mounted in the outside door handle spindle 11 and operated by the eccentric pin 12 on the end of a key operated cylinder lock shaft. The construction and the mode of operation of the lock thus

far described is identical with that shown in the above-mentioned Andersen et al. patent.

The lever 9 can be operated from the inside of the car to set and release the connector 6 by means of a vertically slidable plate 13 slidably mounted at its upper end in the bracket 14 fixed to the latch frame 1. The lower end 15 of the slide plate 13 has a sliding fit in an opening in the horizontal flange 16 of the lever 9. A coil spring 17 is mounted over the end 15 of the slide plate and between the horizontal flange 16 and the shoulder 18 on the slide plate 13. The slide plate 13 can be raised and lowered from the inside of the body by a small lever 19. When the slide plate 13 is slid downwardly the driving force is transmitted from the slide 13 through the coil spring 17 to the lever 9 to swing the same downwardly and release the connector 6. As the lever 9 in the master lock moves downwardly the over center spring 64 which is connected at one end to the latch frame 1 and at the other end to the lever 9, swings over center and assists in swinging the lever 9 downwardly. This locks the front curb door lock, that is, releases the connector 6 and makes the outside rollback ineffective to retract the bolt 2.

A spring plunger or push button type of switch generally designated 20 is carried by the plate 21 which is fixed to the latch frame 1. The push button switch 20 comprises the plunger 22 which is normally held in projected position (full lines, Fig. 1) by means of a spring and in such case the switch 21 is open. When the plunger 22 is depressed against the force of the usual spring, the switch contacts come together and the switch is closed. After the front curb door lock is locked from the inside, as above described, the slide 13 is slid downwardly still further which compresses spring 17 and brings the arm 23 into contact with the flange 24 of the lever 25. This swings the lever 25 downwardly and depresses the spring plunger 22 to close the switch 20. As soon as the slide 13 is released the spring 17 again projects it upwardly to release the plunger 22 which opens the switch 20.

The switch 22 can also be closed from the outside of the door by rotating the rollback 7 in bolt retracting direction when the connector 6 is released. This causes the connector 6 as it travels to the left, Fig. 1, to engage the lug 26 on the lever 25 which rotates the lever 25 counterclockwise to in turn depress the plunger 22 which closes the switch contacts. As soon as the outside door handle or rollback 7 is released the bolt spring 3 turns the rollback 7 clockwise

to the full line position and slides the connector 6 to the right which releases the pressure on the spring plunger 22 and permits the switch 20 to again open.

In Fig. 2 there is shown the secondary lock which is used on the other three doors of the vehicle body. This lock is similar to the master lock and the corresponding parts bear the same reference numerals. However, this secondary lock is arranged to be manually locked and unlocked from inside the door and electrically locked whenever the master lock, shown in Fig. 1, is operated as above described to close the switch 20.

For manual locking of the secondary lock this lock is provided with a slide plate 30 operated by the usual snap-tight lever 19 on the inside of the door. The plate 30 is slidably guided on the latch frame 1 also by a bracket 14 and has its lower end portion 31 slidably mounted in an opening in the flange 16 of the lever 9. The plate 30 in the secondary lock and the plate 13 in the primary lock are each provided with an outwardly turned lug 32 which engages the flange 16 to raise the lever 9 as the plates 13 and 30 are slid upwardly. In the secondary lock the spring 61 whenever the connector 6 is set is compressed. However, the lever 9 is held in raised position by a pivoted detent 33 having a lug 34 which engages the end 35 of the lever 9. The slide plate 30 is provided with a cam portion 36 which engages an inclined portion 37 of the detent lever 33. When the plate 30 is slid downwardly, it swings the detent 33 counterclockwise, releasing the lug 34 from the end 35 of the lever 9. This permits the spring 61 which is normally under tension to swing the lever 9 downwardly thus releasing the connector 6. The coil spring 61, one end of which is secured to the latch frame 1 as at 62 and the other end to the lever 9 as at 63, is normally under tension both when the lever 9 is in raised position and in lowered position and tends at all times to swing the lever 9 downwardly.

The detent 33 can also be released by means of the electromagnet 38. When the magnet 38 is energized, the detent lever 33 serves as an armature which is drawn to the magnet 38 and the lug 34 is withdrawn from the end 35 of the lever 9 which also permits the spring 61 to release the connector 6.

The wiring diagram for the coincidental locking system is shown in Fig. 3. The switch 20 on the master lock is connected to the battery 40 by the wire 41. The switch 20 is also connected to the electromagnets 38 by means of the wires 42, 43 and 44 as shown. Thus it will be seen that the several magnets 38 are connected in parallel.

To notify the operator when all of the doors are locked or failure of any door to lock, there is provided a telltale preferably in the form of an electric light bulb 50 which is connected by wire 51 with the wire 43 of the circuit for the electromagnets. The telltale lamp 50 is connected in series with switches generally designated 55 on each of the three secondary locks by wires 52, 53 and 54. The switches 55 are all the same and comprise a pair of contacts 56 and 57 which are insulated from each other and from the frame 58 which is mounted on the lock frame 1 and supports the electromagnet 38 and the contacts 56 and 57. The contacts 56 and 57 are arranged to be closed by the metal bridge contact 59 carried by, and insulated from, the detent lever 33. The three switches 55, as shown, are connected in series relation with the telltale lamp 50 by the wires 52, 53 and 54 and finally grounded as at 60.

It is evident from the above that in each lock the electromagnet 38, armature detent 33 and the switch 55 constitutes a relay whereby the flow of current through the telltale circuit 50, 52, 53, 54 is controlled.

Whenever the plunger 22 is depressed, either by the finger 23 on the slide 13 or by the leftward movement of the connector 6 as it swings the lever 25 counterclockwise, Fig. 1, this closes the switch 20 to energize the electromagnets 38 and release the connectors 6. If all of the magnets 38 are energized and all of the detent armatures 33 attracted to the magnets 38 so that the contacts 59 bridge the several pairs of contacts 56 and 57, then current will flow from the battery 40 through the telltale lamp 50 and the several switches 55 in series with the lamp. This will notify the operator that all of the connectors 6 on the secondary locks have been released so that the outside rollbacks of these locks are ineffective to retract the latch bolts. Obviously when the bridging contact 59 on each lock bridges the gap between contacts 56 and 57, then the detent armature will be in such position that the lug 34 will be removed from the end 35 of the lever 9 and the spring 61 will expand and release the connector 6. If in any secondary lock the detent armature 33 is not disengaged to permit releasing of the connector 6 for such lock, then the contacts 56 and 57 of such secondary lock will not be bridged. No current will flow through the series circuit comprising the lamp 50 and switches 55. In such case the lamp 50 will not glow and the operator will be warned that one of the locks has not been locked. In such case the operator can manually release the connector 6 for the lock which failed to lock.

It is evident from the above description that current flows through this telltale lamp only momentarily and simultaneously with the flow of current through the electromagnets 38. Thus very little current is required for the operation of this telltale arrangement and no substantial burden is placed upon the automobile battery 40.

If for any reason the car driver desires to check from without the car to satisfy himself that all the doors are locked, he can very easily do this by turning the curb door outside handle downwardly as described in the above-mentioned Andersen, et al. patent. This rotates the outside rollback 7 counterclockwise, Fig. 1, which moves the released connector 6 leftward. As the released connector 6 moves leftward, it swings the lever 25 which depresses the plunger 22 and closes switch 20. This, as above described, energizes all of the magnets 38 and closes the series switches 55 which again causes the lamp 50 to glow. The glowing of lamp 50 indicates that all the locks are locked.

I claim:

1. An electrical coincidental locking system for the doors of an automotive vehicle body comprising a primary lock and a secondary lock, each of said locks having a retractable latch bolt and an outside retractor for said latch bolt, said secondary lock having means actuatable to render its retractor ineffective to retract its bolt, and said primary lock having a shiftable connector between said retractor and said latch bolt and which connector is shiftable by said retractor when set as well as released, said connector when set adapted to connect the outside retractor to the latch bolt and thereby render the retractor effective to retract the latch bolt, said connector when released from the latch bolt rendering the outside retractor ineffective to retract the bolt, a

source of electric current, an electrically operated telltale means for indicating when all said retractors are ineffective to retract said bolts, a switch for each secondary lock, said secondary lock switches in series circuit with each other and said telltale means, electromagnets for controlling said means on said secondary locks to render each of said secondary lock retractors ineffective to retract its respective bolt and for controlling said telltale switches, said electromagnets being in circuit with said source of electrical current, a switch for controlling the flow of current through the said circuit between the electromagnets and the source of electricity, said switch adapted to be actuated by the connector of said primary lock only when released and when the outside retractor shifts the said released connector whereby the telltale switches are closed and the telltale circuit completed only when current flows through said electromagnetic circuit and the electromagnets function to control said means to render said retractors ineffective to retract the bolts.

2. An electrical coincidental locking system for the doors of an automotive vehicle body comprising a primary lock and a secondary lock, each of said locks having a retractable latch bolt and a rotatable outside rollback for retracting said latch bolt, said secondary lock having means actuable to render its rollback ineffective to retract its bolt, said primary lock having a shiftable connector between said rollback and said latch bolt,

the said connector being shiftable by said rollback when set as well as released, said connector when set adapted to connect the outside rollback to the latch bolt and thereby render the outside rollback effective to shift the connector and retract the latch bolt, said connector when released from the latch bolt rendering the outside rollback ineffective to retract the bolt, a source of electric current, an electrically operated telltale means for indicating when all said outside rollbacks are ineffective to retract said bolts, a switch for each secondary lock in series circuit with each other and said telltale means, electromagnets for controlling said means on said secondary lock to render each of said secondary lock outside rollbacks ineffective to retract its respective bolt and for controlling said telltale switches, said electromagnets being in circuit with said source of electrical current, a switch for controlling the flow of current through the said circuit between the electromagnets and the source of electricity, said switch adapted to be actuated by the connector of said primary lock only when released and when the outside rollback is turned to shift the said released connector whereby the telltale switches are closed and the telltale circuit completed only when current flows through said electromagnetic circuit and the electromagnets function to control said means to render said retractors ineffective to retract the bolts.

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