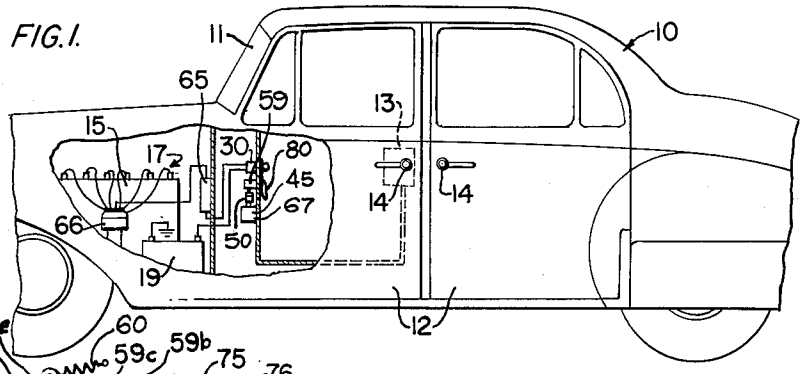
Dec. 13, 1955 B. J. CRAIG 2,726,537

VEHICLE DOOR LOCK AND ENGINE IGNITION CONTROL

Filed April 9, 1953

FIG. 1.



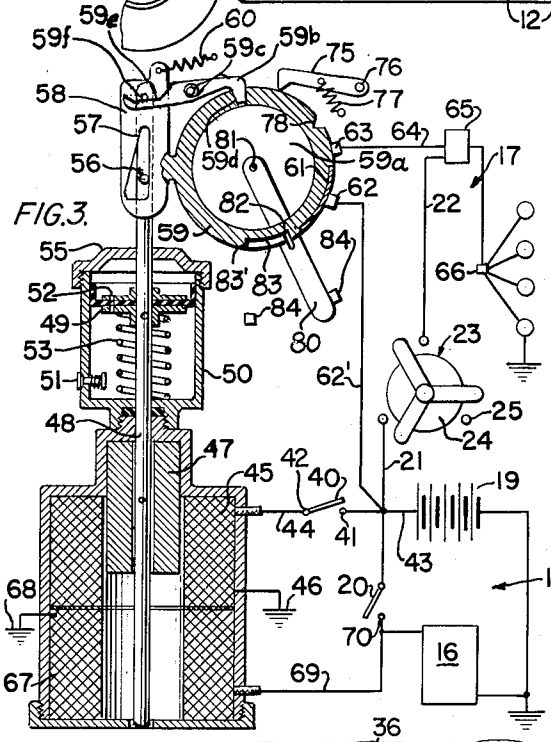


FIG. 3.

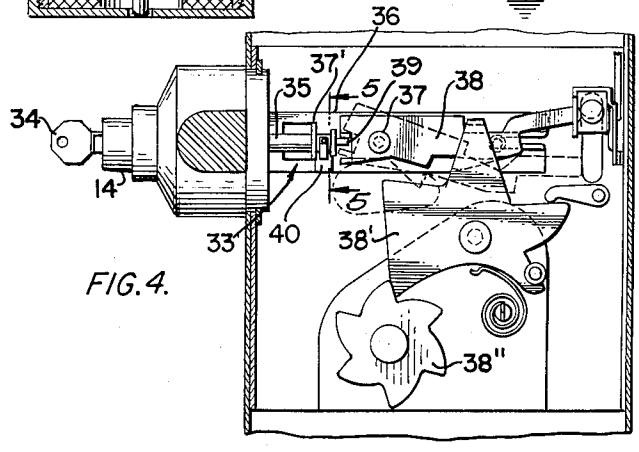
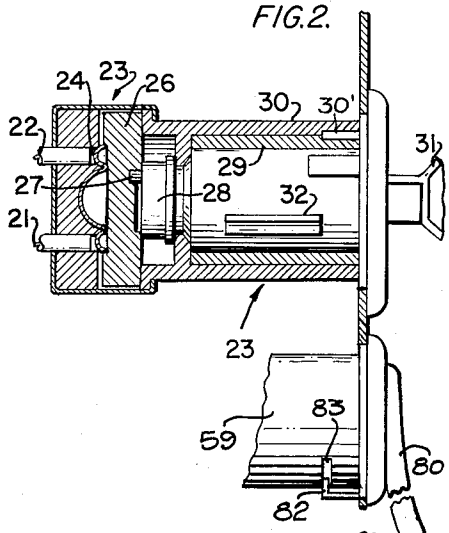


FIG. 4.

FIG. 2.



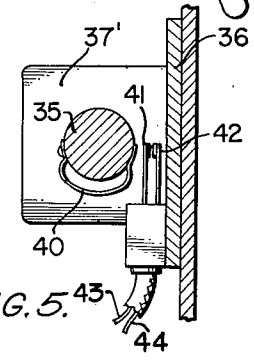


FIG. 5.

INVENTOR.

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VEHICLE DOOR LOCK AND ENGINE IGNITION CONTROL

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13 Claims. (Cl. 70—265)

This invention relates to a vehicle door lock and engine ignition control.

In operating an automobile the person driving will first unlock one of the doors of the vehicle by means of a key. He will then remove the key from the door, enter the vehicle with the key in his hand, insert the key in the ignition lock and will turn on the ignition switch. He will then start the engine and operate the vehicle. At his destination he will turn off the ignition switch, remove the key from the ignition lock and place it in his pocket. Sometimes he will forget to remove the key from the lock and the vehicle may be stolen. It is a source of annoyance that the driver must twice move locks to unlocked position and must twice remove a key from its lock in operating a vehicle.

The present invention overcomes the objections mentioned by providing means whereby only one unlocking of a vehicle lock is required, and provides means whereby the unlocking of a secret door lock by a key will render an ignition circuit of the vehicle operative to cause the engine to operate without unlocking the ignition switch lock.

More specifically, the present invention provides a construction wherein the unlocking of the vehicle door by secret means will condition the engine so that it may be operated and wherein should the operator so condition the engine and fail to start the engine, the engine will after a time be rendered ineffective to be operated. With this last mentioned construction any likelihood of the vehicle being thoughtlessly left in operative condition, so that it may be readily stolen, will be overcome.

In other words, the invention provides means whereby the operator of a vehicle may simply remove the key from his pocket, unlock the door, replace the key in his pocket, enter the vehicle and drive away. At his destination he may turn off the ignition switch without aid of a key.

Thus it will be seen that with the present invention one use of a single key, in a single lock permits completion of the cycle of unlocking all of the vehicle doors, turning on the ignition switch, turning off the ignition switch and locking all of the vehicle doors.

The general object of the invention is therefore to provide an automotive vehicle which has a door and a latch for the door and has a lock for the door latch and wherein operation of the door lock controls operation of the vehicle engine.

Another object of the invention is to provide a secret unlocking means, the operation of which coincidentally permits operation of the door latch to open a door and renders the control means of an automotive vehicle engine operable to cause the engine to run.

A more specific object of the invention is to provide an automotive vehicle which includes a driving engine and a door having a lock which may be unlocked from without the vehicle by a secret lock with means whereby when the secret door lock is unlocked, the engine will be conditioned for operation.

Another object of the invention is to provide novel means for controlling the ignition circuit of a motor vehicle.

Another object of the invention is to provide novel means for controlling the ignition switch of a motor vehicle.

Another object of the invention is to provide means for rendering the ignition switch of a motor vehicle operative to start the engine when the vehicle door lock is unlocked by secret unlocking means.

A further object of the invention is to provide an improved ignition switch for a motor vehicle circuit wherein the switch may be operated to circuit closing position by secret lock means operable from within or without the vehicle.

Another object of the invention is to provide a time controlled switch for the ignition circuit of an automobile engine.

A further object of the invention is to provide a novel time controlled means for controlling the ignition circuit of an automobile engine.

A further object of the invention is to provide an improved secret door lock controlled ignition switch for a motor vehicle circuit wherein the switch when first operated to circuit closing position is thereafter operated to circuit open position.

Another object of the invention is to provide an automotive vehicle including a principal ignition circuit and an auxiliary ignition circuit which latter is rendered operable by actuation of the outside means which unlocks the door latch of the vehicle.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a side elevation with parts broken away showing a motor vehicle equipped with the invention;

Fig. 2 is a central sectional view showing the ignition switch;

Fig. 3 is a central sectional view showing the auxiliary switch and circuit;

Fig. 4 is a section with parts in elevation showing the latch; and

Fig. 5 is an enlarged section taken on line 5—5, Fig. 4.

Referring to the drawing by reference characters the invention is shown as embodied in an automotive vehicle which is indicated generally at **10**. The vehicle includes a body **11** having doors **12** and door latches **13** which are shown as released by push buttons **14**. The vehicle is suitably driven by an engine **15** which includes a starter **16**, Fig. 3, an ignition circuit **17** and a starter circuit indicated generally at **18**. The starter and the ignition may be suitably actuated by a battery **19**.

The starter circuit includes a switch **20**. The ignition circuit includes leads **21** and **22** of an instrument panel key operated switch **23** which includes a rotating contact **24**. The switch **23** may also include a third contact **25** which may include the accessories such as the instrument panel lights which are thereby turned on by the ignition switch. The contact **24** is mounted on a rotary member **26** (Fig. 2) which is driven by an eccentric pin **27** mounted on the core **28** which is arranged to rotate in a lock barrel **29**. The lock barrel **29** is arranged in a lock body or housing **30**. A pin **30'** prevents rotation between the lock barrel and body.

The ignition switch **23** is of conventional type and includes a key operated structure. When a key **31** is rotated, a locking member **32** will be withdrawn permitting the core **28** to rotate within the barrel **29** and thus turn the core **28** and pin **27** to move the switch **23** to "on" and "off" position, depending upon the direction in which the key is turned.

In Fig. 4 I show details of the push button operated

lock. This push button lock and latch construction is like that described fully in applicant's co-pending application Serial No. 201,283 filed December 18, 1950, now Patent No. 2,705,884, granted April 12, 1955. The particular details of the construction are of no particular moment except that it shows a lock member 33 which is operated by a key 34 to rotate a core member 35 about the axis of the member 14 when the key is inserted and turned. When the push button 14 is pushed inwardly, it moves an operating member 36 inwardly. The operating member has a tongue 37' which supports the end portion of the core 35 and also pivotally at 37 supports an actuating member 38.

When the operating member 36 is moved to the right in Fig. 4 it moves the actuating member 38 to the right to rock a dog 38' and release the ratchet 38'' which is disposed on a latch bolt (not shown).

When the core member 35 is rotated about its axis by the key an eccentric tip 39 thereon swings the actuating member 38 about the axis of its pivot 37 to and from locked position. When the core member 35 swings to unlocked position with the eccentric pin 39 moving downwardly in Fig. 4 it swings a switch member 40 thereon causing the member to close contacts 41 and 42.

The contact 41 is in circuit with a lead 43 to the battery 19 and the contact 42 is in circuit with a lead 44 to a solenoid 45, which is grounded at 46. Thus the solenoid 45 is energized and causes an armature 47 to be moved downwardly in Fig. 3.

The armature carries a plunger 48 of a timing device with it and moves a piston member 49 in a cylinder 50 downwardly forcing air from the cylinder through a valve 51 which is spring pressed to allow air to pass from the cylinder and to prevent air from entering the cylinder. The piston has a bleed aperture 52 and is normally urged upwardly in Fig. 4 by a spring 53.

The rod 48 extends through a cap 55 on the cylinder and its upper end has a pin 56 arranged at right angles to the axis of the piston. The pin 56 operates in a slot 57 in an arm 58 which is secured to a rotary switch 59 supported on a body 59^a. A spring 60 normally urges the switch 59 to the open position of Fig. 4. An insulated circuit closer 61 on the switch engages a contact 62 which is connected to the battery 19 by a lead 62' and also engages a contact 63 connected to a lead 64 which extends through the coil 65 to the distributor 66 and thence to the spark plugs of the engine 15.

A catch 59^b pivoted at 59^c has one spring pressed end normally engaged in a slot 59^d in the switch body 59^a. The catch has a slot 59^e in which a pin 59^f on upper end of the rod 48 moves.

Thus it will be noted that when the inside key 31 is operated the ignition will be turned on by the switch 23. It will also be noted that when the outside secret door lock is operated by the key 34 this act will cause the circuit closer 40 to energize the solenoid 45 whereupon the solenoid will move the rod 48 downwardly causing the pin 59^f to first move the catch 59^b from slot 59^d. At this time the pin 56 will engage the lower end of the slot 57 and will rock the arm 58 to cause the switch 59 to be moved to closed position thereby closing the circuit through the lead 64 to the engine ignition circuit.

Thus it will be noted that one circuit operated by the inside ignition key lock may be employed to control the engine and that an auxiliary circuit closed by the outside door secret lock may also be used to control the ignition circuit.

The operation of the solenoid by using the outside secret door lock causes the plunger 48 to move downwardly and thus the portion 56 on the plunger carries the arm 58 downwardly to close the circuit through the circuit closer 61. After this occurs and when the key 34 has been returned to normal position, the spring 53 will slowly return the piston 49 to its initial position in Fig. 4. The spring 60 turns the switch 59 as the rod 48 rises until

the rod returns to normal position whereupon the switch 59 will be returned to normal "off" position.

The timing device which includes the piston 49 and cylinder 50 operates through the contact 61 which remains in contact with the contact 63 sufficiently long to allow the operator time to enter the vehicle and start the engine after he has activated the auxiliary ignition circuit by the act of unlocking the secret door lock.

In order to retain the switch 59 in closed position and render the time controlled piston 49 inoperative to move the switch 59 to open position, the disclosure includes another solenoid 67. This solenoid 67 is effective when the armature 47 has been moved downwardly by the first solenoid 45 to pull the armature 47 and its rod 48 and the switch 59 a short distance further than the parts are moved by the solenoid 45.

The solenoid 67 in the disclosure is grounded at 68 and has a lead 69 to a terminal 70 which is contacted by the starter switch 20, when the latter is operated to close the circuit through the starter circuit 18 to the battery 19. Thus, when the starter switch is operated the solenoid 67 will be energized, this will cause the rod 48 to rotate the switch 59 sufficiently far to allow a dog 75, pivoted at 76 to be urged to engaged position by a spring 77 so that the dog engages in a notch 78 in the switch 59 and releasably holds the switch in "on" position.

The spring 60 is not sufficiently strong to pull the dog 75 out of the notch 78 so that the parts remain with the switch 59 held closed by the dog 75 after the two solenoids are de-energized. The rod 48 then slowly returns to a normal position and the head 56 on the rod 48 moves freely in the slot 57 without rotating the switch 59.

To close the switch 59 and thus open the ignition circuit so that the engine, when it is operating on the auxiliary circuit, may be stopped, the construction includes an arm 80 pivoted to swing about the axis of a pivot 81 which is coaxial with the switch 59. The arm 80 has a pin 82 thereon which moves in an arcuate slot 83 in the switch 59. Stop members 84 limit movement of the arm 80 in each direction. When the switch 59 is closed, movement of the arm 80 clockwise will cause the pin 82 to engage the end 83' of the slot 83 and will move the switch 59. When the switch 59 is "on" movement of the arm 80 in a clockwise direction in Fig. 4 will turn the switch to "off" position. When the switch is in "off" position, movement of the arm 80 will not move the switch to "on" position.

Having thus described the invention, I claim:

1. For use in an automobile which includes a body having a door with a secret lock for the door and having a driving engine which includes an inside lock controlled ignition circuit, a second ignition circuit, said second ignition circuit including a switch, and a secret door lock unlocking member including an actuating member extending to the second ignition circuit switch and operable to render the second ignition circuit operable to permit the engine to run when the door unlocking member is moved to door unlocking position.

2. For use in an automobile which includes a body having a door and having a driving engine which includes an ignition circuit, a lock for the door, secret means for unlocking the lock, and a lock controlled switch for closing the ignition circuit, an auxiliary ignition circuit, said auxiliary ignition circuit being independent of the first ignition circuit and being normally inoperable to permit the engine to run, and means operable when the secret means for unlocking the door lock is moved to unlocked position to render the auxiliary ignition circuit operable to permit the engine to run.

3. For use in a vehicle which includes a door, a latch for the door, secret means outside the vehicle for locking and unlocking the latch, an engine for driving the vehicle, an ignition circuit for the engine, a switch for the circuit, and a lock controlled member accessible from within the vehicle for moving the switch to "on" and "off" positions,

an auxiliary ignition system, said auxiliary ignition system including a circuit having a switch and an actuating member operated by the secret latch unlocking means and entirely independent of the inside lock controlled member and its switch for closing the auxiliary circuit switch while the inside lock controlled switch moving member remains locked.

4. For use in an automotive vehicle construction which includes a body and an engine for driving said body, said engine including an operating electrical circuit, a switch controlling said circuit, a lock controlling said switch, a door for said body, a lock for said door, and secret means for unlocking the door lock, an auxiliary ignition system, said auxiliary ignition system including a circuit, a switch for said auxiliary circuit, and actuating means connecting the door lock and said auxiliary circuit switch and operable when the secret door lock is moved from locked to unlocked position to close said auxiliary circuit switch, said actuating means including time controlled means operable to return said auxiliary circuit switch to open position and means to render the time controlled means inoperable to return said auxiliary circuit switch to open position.

5. For use in an automotive vehicle construction which includes a body and an engine for driving said body, said engine including a starter and an operating circuit, a switch controlling said circuit, lock controlled means for operating said switch, a door for said body, a secret lock for the door, and means for operating said secret door lock to unlocked position, an auxiliary ignition system, said auxiliary ignition system including a circuit, a switch for said auxiliary circuit, actuating means operable when the secret door lock operating means is moved from locked to unlocked position to close said auxiliary circuit switch, time controlled means to thereafter open said auxiliary circuit switch, and means operable upon starter actuation to render said time controlled means inoperative to open the auxiliary circuit switch.

6. For use in an automobile including a body having a door with a lock for the door and having a driving engine which includes an ignition circuit, lock controlled means accessible from within the vehicle for closing the ignition circuit and a secret door lock unlocking member, an auxiliary ignition system, said auxiliary ignition system including a circuit, a switch for said auxiliary circuit and an actuatng member for rendering the auxiliary ignition circuit switch operable to permit the engine to run when the door unlocking member is moved to door unlocking position, and a manually operable member for the auxiliary circuit switch operable to open the auxiliary circuit switch.

7. For use in an automobile including a body having a door with a lock for the door and having a driving engine which includes an ignition circuit, lock controlled means accessible from within the vehicle for closing the ignition circuit and a secret door lock unlocking member, an auxiliary ignition system, said auxiliary ignition system including a circuit, a switch for said auxiliary circuit and an actuating member and operable to render the auxiliary circuit switch operable to permit the engine to run when the door unlocking member is moved to door unlocking position, a manually operable member for actuating the auxiliary circuit switch to render the auxiliary circuit inoperable to operate the engine, said manually operable member being ineffective to render the auxiliary circuit switch operable to permit the engine to run.

8. A motor vehicle having an internal combustion engine with an ignition circuit and a lock controlled switch accessible from within the vehicle for the ignition circuit, and which has a body provided with a door and has a secret unlocking member for the door, in combination with an independent auxiliary ignition circuit which has a switch therein and which includes means actuated by

movement of the door unlocking member to unlocked position to render the auxiliary circuit switch operable to cause the engine to run while the lock controlled switch which is accessible from within the vehicle remains open.

9. A motor vehicle including an internal combustion engine having an ignition circuit and an ignition circuit switch associated therewith and which has a body provided with a door and with a secret lock for the door, in combination with electrically actuated means actuated by the secret door lock for closing the ignition circuit switch.

10. A motor vehicle having an internal combustion engine with a control member and a lock accessible from within the vehicle for the control member, and which has a body provided with a door, a lock for the door and a secret unlocking member for the door lock, in combination with an auxiliary control member for the engine, means normally preventing movement of the auxiliary control member to operative position to permit the engine to operate, and means, actuated upon movement of thee door unlocking member to unlocked position, to render the auxiliary control member preventing means ineffective and to render the auxiliary control member operable to operative position while the control member lock which is accessible from within the vehicle remains locked.

11. A motor vehicle having an internal combustion engine with a principal ignition circuit and a lock controlled switch for the principal ignition circuit, and which has a body provided with a door, a lock for the door and a secret unlocking member for the door lock, in combination with an auxiliary ignition circuit which includes a part of the principal ignition circuit and which has a switch therein and which includes means actuated upon movement of the door unlocking member to unlocked position to close the auxiliary ignition circuit switch while the lock of the principal ignition circuit remains locked.

12. A motor vehicle which includes a body and an engine, and a control member for the engine, means normally preventing operation of the control member, secret lock operated means operative to move the preventing means to non-preventing position, means operable thereafter and tending to return the preventing means to preventing position, means actuated upon engine operation and repelling the tendency of the last mentioned means to return the preventing means to preventing position, a manually operable member, and means operated by the manually operable member to render the preventing means effective to prevent operation of the control member, operation of the manually operable member being ineffective to render the preventing means ineffective to prevent operation of the control member.

13. An automobile including a body having a door, a lock for the door and having a driving engine and an engine control member movable to an operative and to an inoperative position, a lock holding the control member in inoperative position, means for locking and unlocking said door lock and means operative when the said door lock unlocking means unlocks the door lock, while the control member is held in inoperative position to move the control member to operative position, power operated means tending thereafter while the engine is idle to move the control member to inoperative position and means actuated upon engine operation and repelling the tendency of the last mentioned means to move the preventing means to preventing position.

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