This invention relates to a coincidental vehicle door lock and engine 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 a vehicle operating cycle.

The present invention overcomes the objections mentioned by providing means whereby only one unlocking of a vehicle lock is required to permit a complete vehicle operating cycle to be performed, and the invention provides means whereby the unlocking of a secret door lock by a key or by a dial will render the ignition switch of the vehicle operative to cause the engine to operate without unlocking the ignition switch lock.

More specifically, one embodiment of 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 the aid of a key and may lock all the vehicle doors by keyless locking.

Thus it will be seen that with the present invention one use of a single key, or the operation of a single dial, 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 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 automobile vehicle including an ignition circuit which is rendered operable by actuation of either one of two outside secret means which unlocks the door latches of the vehicle.

A more specific object of the invention is to provide means for use in an automotive vehicle having a door and having an ignition means for the engine thereof, and a locking device for the door whereby unauthorized entry into the vehicle will be prohibited and wherein operation of the door lock to unlocked position may be performed by secret means such as a key or a dial combination and wherein the unlocking will render an ignition lock operative to start the vehicle engine.

Another object of the invention is to provide an automobile including an ignition controlled engine and having coincidentally locked doors which may be released by secret means and wherein operation of any one of the door locks by the secret means to unlocked position will render the ignition system operative to run the engine.

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 of an automobile with parts broken away showing the invention.

Fig. 2 is a sectional view showing the inside combined engine control lock and the coincidental door lock.

Fig. 3 is a section taken on line 3—3, Fig. 2.

Fig. 4 is a fragmentary elevation showing the outside door lock strike member.

Fig. 5 is an elevation with parts in section showing the outside door handle and secret lock.

Fig. 6 is a wiring diagram; and

Fig. 7 is an isometric view showing the coincidental and speed controlled mechanism for the outside door locks.

Referring to the drawing by reference characters, the invention is shown as embodied in a lock construction which is indicated generally at 10. The construction is shown as mounted on a vehicle body 11 which has doors 12 which are held in shut position by lock members 13. The vehicle is driven by an engine 14 through the usual ignition circuit indicated generally at 15.
The ignition circuit shown includes a battery 16 which may be grounded at 17 and is connected by a lead 18 to an ignition switch 19 which closes the circuit to a lead 20 whence current flows to the coil 21, distributor 22 and spark plugs 23. The construction is such that when the switch 19 is closed the engine may be started by means of the usual starter (not shown).

The ignition switch 19 is shown as closed by a circuit closer 25 (Fig. 2) which is mounted on a disk 26 which latter is rotatable in an end member 27 mounted in a lock body 28. The disk 26 carries a switch element 29, which engages contacts 30 connected to leads 18 and 20. The disk 26 is engaged by an eccentric pin 29 arranged in a rotatable core 30 of a lock barrel 31.

The lock barrel 31 is of conventional construction and when a key 32 is inserted the core 30 may be turned by the key to thus rotate the disk 26 to open or close the switch 19. The lock barrel 31 is normally held against rotation in a sleeve 34 by a ball clutch 35. The sleeve 34 is secured to a closure 36 mounted to rotate in the lock body 28 but normally held against rotation by a plunger 37 which engages in a slot 37' in the lock body. The barrel 31 has a slot 34' which receives the ball 35. The sleeve 34 has a slot 34" in which the ball 35 is movable.

In order to provide a keyless operation of the lock, a dial member 38 is mounted to rotate in the body 28 and is provided with tumblers 39 which, when tumblers 39 having pins 40 therein, have been correctly positioned, will cause the tongues 38' to enter gatins 41. A key 42 slidable in a slot 43 permits rotation of the innermost tumbler 39 by the dial 38 to normally position the tumblers and permits a sliding movement of the dial after the tumblers have been correctly positioned.

After the tumblers have been correctly positioned and the dial 38 has been pushed inwardly the ball clutch 35 will enter a groove 44 in the dial 38 to declutch the lock barrel 31 from the sleeve 34 and this will permit the lock barrel 31 to be turned. As the lock barrel is turned it will turn the core 30 and thus move the switch element 25 to close the circuit.

From the foregoing description it will be apparent that the switch 19 may be closed by inserting the key 32 and turning the core 30, or the switch may be closed by operating the dial 38 to correctly position the tumblers 39 whereby the clutch ball 35 will be freed to move out of its slot 34" so that the lock body 31 may be rotated and will carry the core 30 therewith to close the switch 19.

On the doors 12 the lock member 13 may be of the type shown in Fig. 2. This lock member, as well as the lock carried by the lock body 28, is like that shown in the applicant's co-pending application Serial No. 185,411, filed September 18, 1950, now Patent No. 2,687,032, granted August 24, 1954.

The lock includes a latch bolt 50 which engages an inclined strike member 51 and moves to a position wherein a dog 52 holds the latch bolt 50 in place. The latch bolt is shown as released by a lock barrel push button member 53 which has a core 53' therein. The core is released by a key 52 which may be turned to turn the barret. The core 53' has an end member 53" therein and the end member has a tongue 54 thereon. The tongue rocks a dog 55 which moves an actuating member 56 to cause a pin 57 thereon to move the dog 52 to bolt releasing position.

From inside the vehicle the inside release member (not shown) moves a member 58 which rocks an arm 59 and the arm 59 moves the pin 57 to release the dog 52.

The actuating member 56 is slidable mounted on a locking member 60 which is pivoted at 61 to the lock base 62. The sliding member may be moved to and from locked position by an inside member 62 or by the end portion 53" on the rotary core member 53'.

The core member 53' is like the core member 30, previously described and the push button 53 is like the member 31. The body of the latch 13 indicated at 65 is similar to the lock body 28 previously described.

The locks 28 and 65 are operated both in the same manner, either by the same key 32 or by rotating a dial 38 in Fig. 2 or a dial 66 in Fig. 5. The dials 38 and 66 are each released by the same combination.

The locks 13 are arranged for coincidental locking by means of a locking member indicated generally at 70, in Fig. 7, wherein ears 72 cooperate with the extensions 73 on the locking members 60. The ears 72 are mounted on arms 74 which are pivoted at 75 and are coincidentally moved by a moving handle 76 which projects into the vehicle through the body pillar 77. Bowden wires 78 connect the locking handles 76 for coincidental operation.

To prevent accidental door opening while the vehicle is running, a solenoid plunger 80 (Fig. 7) in a solenoid 81 is operated by a circuit 82, which circuit is closed by a switch member 83 which is part of a speedometer 84. When the vehicle speed approaches zero the switch member 83 will engage a contact 85 to energize the solenoid 81 and move the plunger 80. The plunger then enters between resilient arms 86 which are pivoted at 87 and have ears 88 engaged by feelers 89 on the actuating members 56. When the plunger is between the arms 80 a heavy force is required to operate the latch release.

The latch and details of the latch locking member and coincidental locking and speed controlled details are fully described in the applicant's aforesaid co-pending application and a further explanation thereof in the present application is believed to be unnecessary.

In order to allow the engine to be started without actuating any inside lock members, that is, without need to use the key 32 nor the dial 38 to unlock the inside ignition switch, I provide means for withdrawing the plunger 37 so that the closure 36 may be rotated to close the ignition circuit by grasping and rotating either the lock barrel 31 or the dial 38.

This withdrawing means, as shown, includes a rod 90 which, on its upper end, has a thread thereon and 90 which engages a threaded rod 90'. The rod 90' has a sliding cap 91 from which the plunger 37 projects. A pin 92 on the rod 90 working in a slot 93 in the cap 91, allows a spring 94 seated in a recess 95 in the rod 90 and in a recess 96 in the plunger 37 to normally urge the plunger forward so that a shoulder 97 on the plunger engages the outer wall of the lock body 28, as shown in Fig. 2.

The rod 90 has a piston 100 thereon which works in a cylinder 101 secured by a bracket 102 to the instrument panel 103. The cylinder 101 has a closure 104 thereon through which is a plunger 105. Openings in the cylinder 101 for spring 104' normally urges the piston upwardly in Fig. 2.

The piston has a small hole 105 therethrough and the cylinder 101 has a spring-pressed one-way valve 106 which allows air to pass from the cylinder but which prevents air from passing into the cylinder. The piston 90 passes through the head of the cylinder 101 and is made leak proof by a packing nut 108 and a gasket 109. The packing nut carries a guide sleeve 110 which serves as a guide for a tube 111 which at one end has a flange 112 which engages a head 113 of the plunger 90.

The lower end of the tube 111 is closed by a solid block of metal 114 which is fixed therein and which serves as the core of a solenoid 115. The solenoid 115 is energized by a circuit 116 which includes a source of current such as the automobile storage battery 16 which is grounded as at 17. The circuit includes a terminal 119 which is engaged by a circuit closer 120. There is one of these circuit closers on each of the cores 53' of each outside door handle lock and when either one of the members 64 is operated by the key 32 or the dial 53 to unlock the lock member 60, this act will cause the circuit to be closed and the solenoid 115 energized.

When the solenoid is energized it will move the core 114 which will move the tube 111 and the piston rod 90 will pull down the piston 100 and the pin 92 to pull down the plunger 37 so that the closure 36 is free to be rotated by turning the dial 38. When the closure is so
rotated, it will close the switch to close the circuit through the leads 18 and 20.

In order to limit the movement of the closure 36 when it is rotated by the dial 38, the closure 36 has a slot 36' through which a pin 37' fixed in the end member 27, is arranged. When the closure 36 is rotated by the dial its limit of movement will be determined by the end of the slot 36', as shown in Fig. 3.

After the plunger 37 has been depressed by operation of the outside secret lock, either by means of the outside key or by the dial 36, to unlock the lock, the piston 100 will slowly move upwardly in Fig. 2 with the rate of flow determined by the size of the small hole 105. It will be some interval of time before the plunger again enters the slot 37' and this interval of time will give the vehicle operator an opportunity to open the door, enter the vehicle and turn the dial 38 to close the ignition switch. As soon as the dial 38 is turned, the slot 37' is removed from the path of the plunger 37, and as the spring 104 continues to move the piston upwardly, the end of the plunger 37 will merely engage the outer cylindrical wall of the closure 36 while the spring 94, which is weaker than the spring 104', is being compressed.

Should the vehicle operator unlock the door and fail to turn on the ignition by rotating the dial 38, the plunger 37 will, by operation of the time mechanism, move into the slot 37'.

When the ignition switch is turned on by rotating the dial 38 in one direction, it may be turned off by rotating the dial in the reverse direction so that the plunger 37 may enter the slot 37'.

Having thus described the invention, I claim:

1. An automobile including a body having a door and having a driving engine, said engine including an ignition circuit, a door latch locking member movable to locked and to unlocked positions, manual means operable within the body to move the door locking member to unlocked position, key operated means operable without the body to move the door locking member to unlocked position, switch means for controlling the ignition circuit, means including a circuit and a circuit closer operated by actuation of the key operated means when the latter moves the door lock to unlocked position to condition the switch means so that it may be moved to ignition circuit closing position.

2. An automotive vehicle construction including a body, an engine for driving said body, said engine including an operating electrical circuit, a normally open switch in said circuit, a door for said body, a lock for said door, secret means for unlocking the said door, a second circuit including a switch, means operable when the door lock is moved from locked to unlocked position to simultaneously close said second circuit switch and means operated by the second circuit to condition the first circuit switch to close the ignition circuit.

3. An automobile including a body having a door and having a driving engine, said engine having an ignition circuit, a door locking member movable to locked and to unlocked positions, manual means operable within the body to move the door locking member to unlocked position, key means operable without the body to move the door locking member to unlocked position, switch means for controlling the ignition circuit, means including a second circuit and a switch operated by actuation of the key operable means when the latter moves the door locking member to unlocked position to condition the switch means so that it may be moved to ignition circuit closing position, and time controlled means operable thereafter to condition the switch means against movement to ignition circuit closing position.

4. An automobile including a body having a door and having a driving engine which includes an ignition circuit having a switch, for a door, a lock for the ignition circuit switch, key controlled unlocking means for the door lock, key controlled unlocking means for the ignition circuit switch lock, permutation controlled unlocking means for the ignition circuit switch lock, and means operable when the door unlocking means is operated to unlock the door lock while the ignition circuit lock remains locked to condition the ignition circuit switch to close the ignition circuit, the same key being operable to unlock both key locks, and the same dial combination being operable to unlock both dial combination locks.

5. An automobile including a body having a door and having a driving engine which includes an ignition circuit having a switch, a lock for the door, a lock for the ignition circuit switch, said lock including key controlled unlocking means therefor, the door lock also including permutation controlled unlocking means therefor, the ignition lock including key controlled means operable to condition the ignition circuit switch for movement to closed position, the ignition lock also including permutation controlled means operable to condition the ignition circuit switch for movement to closed position, and means operable by either the key controlled door lock unlocking means or by the permutation controlled door lock unlocking means, while the ignition circuit switch lock remains locked, to condition the ignition circuit switch for movement to close the ignition circuit, the same key being operable to unlock both key locks, the same combination being operable to unlock both permutation locks.

6. In a vehicle having a door and having an engine with an ignition circuit and an ignition switch and having a bolt for the door and a locking member for the bolt, a fixed lock body, a closure rotatable in the lock body, means normally preventing rotation of the closure in the lock body, a lock barrel in the lock body and rotatable with the closure, means to normally hold the core against rotation in the lock barrel, key released means operable to free the holding means to permit rotation of the lock barrel in the lock body, a core in the lock barrel, means to normally hold the core against rotation in the lock barrel, key released means operable to free the core holding means to permit rotation of the core in the lock barrel, means operated by the core for moving the ignition switch to "on" position when the core member is rotated in one direction, and means operated when the lock locking member is moved to unlocking position to release means to thereby permit simultaneous rotation of the core in the lock barrel and the core to thereby move the ignition switch to "on" position.

7. In a lock for an ignition circuit switch, a lock body, a closure rotatable in the lock body, means normally preventing rotation of the closure in the lock body, a lock barrel in the lock body and rotatable with the closure, means to normally hold the lock barrel against rotation relative to the closure, secret means operable to free the holding means to permit rotation of the lock barrel in the lock body, a core in the lock barrel, means to normally hold the core against rotation in the lock barrel, secret means operable to free the core holding means to permit rotation of the core in the lock barrel, means operated by the core for moving the ignition switch to "on" position when the core member is rotated in one direction, and means to release the preventing means to thereby permit simultaneous rotation of the core in the lock barrel and the core to thereby move the ignition switch to "on" position.

8. In a lock for an ignition circuit switch, a fixed lock body, a closure rotatable in the lock body, means normally preventing rotation of the closure in the lock body, a lock barrel in the lock body and rotatable with the closure, means to normally hold the lock barrel against rotation relative to the closure, gated tumbler controlled means operable to free the holding means to permit rotation of the lock barrel in the lock body, a core in the lock barrel, means to hold the core against rotation in the lock barrel, key released means operable to free the core holding means to permit rotation of the core in the lock barrel, means operated by the core for moving the ignition switch to "on" position when the core member is rotated in one direction, and means to release the preventing means to thereby permit simultaneous rotation of the core in the lock barrel and the core to thereby move the ignition switch to "on" position.
holding means to permit rotation of the core in the lock barrel, means actuated by the core for moving the ignition switch to "on" position when the core member is rotated in one direction, and means to release the preventing means to thereby permit simultaneous rotation of the closure, the lock barrel and the core to thereby move the ignition switch to "on" position.

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

10. A motor vehicle including a body having doors and having a driving-engine which includes an engine control means, a secret lock which is accessible from within the vehicle for preventing operation of the engine control means, a latch for each door, a lock for each door latch, coincidental means operable to simultaneously lock or unlock the door locks, door lock locking and unlocking which is accessible from within the vehicle and operable at all times to actuate the coincidental means to locked or unlocked position, secret door lock unlocking means which is accessible from without the vehicle and operable to actuate the coincidental means to unlocked position, and means actuated upon movement of the secret door lock unlocking means which is accessible from without the vehicle to unlocked position to free the engine control operation while the engine control lock remains locked, movement of the door locking and unlocking means to a position to unlock the coincidental means being ineffective to free the engine control means.

11. A motor vehicle including a body having an engine, a control member for the engine, said control member being accessible from within the vehicle and means preventing operating of the engine control member, the body having a door and having a secret locking member for the door, in combination with means actuated upon movement of the door locking member to unlocked position to free the engine control member preventing means, and manually operated means which is accessible from within the vehicle to restore the preventing means to preventing position.

12. A motor vehicle including a body having an ignition circuit controlled internal combustion engine and having a switch for the ignition circuit, said switch being accessible from within the vehicle and a lock for the ignition switch, said lock being accessible from within the vehicle, the body including a door, a latch for the door and a secret locking member for the door latch, and which also has door latch lock unlocking means which is accessible from within the vehicle and door latch lock unlocking means which is accessible from without the vehicle, in combination with means actuated by movement of the door latch lock unlocking means which is accessible from without the vehicle to unlocked position to release the ignition switch lock, movement of the door latch lock unlocking means which is accessible from within the vehicle to unlocked position being ineffective to free the ignition switch lock.

13. A motor vehicle including a body having a door and having a driving engine which includes a control member, a secret lock for the control member, said lock being accessible from within the vehicle, a latch for the door, a lock for the door latch, door lock locking and unlocking means which is accessible from without the vehicle and operable at all times to actuate the door lock to locked or unlocked position, means which is accessible from without the vehicle and operable to release the door latch, secret door lock unlocking means which is accessible from without the vehicle and operable to actuate the door lock to unlocked position, and means operated upon movement of the secret unlocking means which is accessible from without the vehicle to unlocked position to free the control member while the control member lock which is accessible from within the vehicle remains locked, movement of the door locking and unlocking means which is accessible from within the vehicle to a position to unlock the door lock being ineffective to free the control member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,948,913 Gilpin 27 Feb., 1934
2,265,572 Olinger 9 Dec., 1941
2,661,621 Stern 8 Dec., 1952