Dec. 13, 1955 B. J. CRAIG 2,726,535

COMBINED VEHICLE DOOR LOCK AND ENGINE CONTROL

Filed April 9, 1953

FIG. 1.

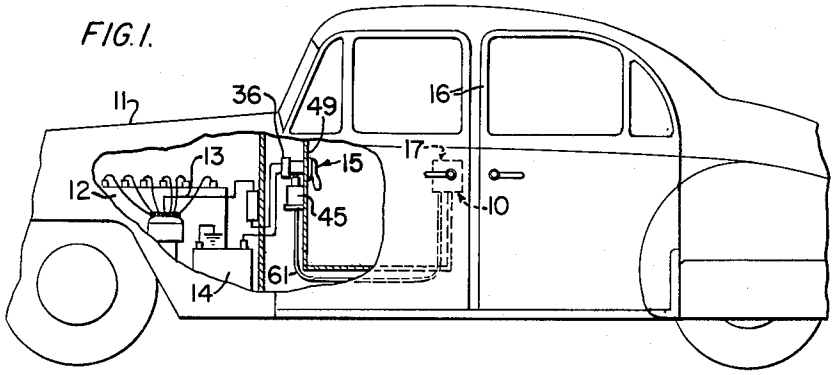


FIG. 4.

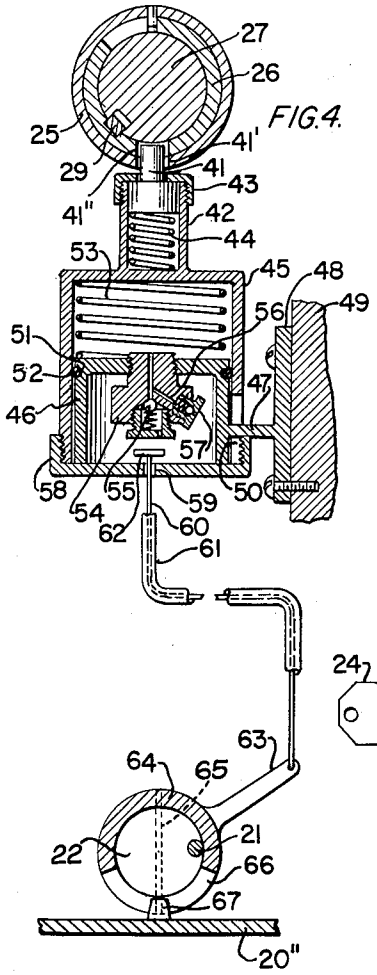


FIG. 2.

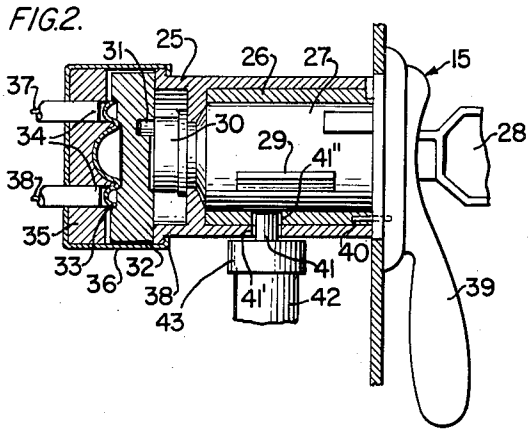
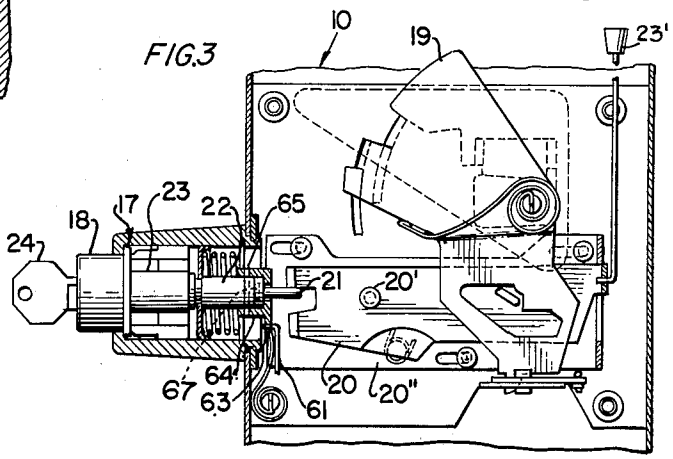


FIG. 3



INVENTOR.

B. J. Craig

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COMBINED VEHICLE DOOR LOCK AND ENGINE CONTROL

Burnie J. Craig, Los Angeles, Calif.

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23 Claims. (Cl. 70—265)

This invention relates to a combined 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 operating a vehicle through a cycle.

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 as by a key will render the ignition switch 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, turn on the ignition 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 as by keyless locking.

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 the vehicle door, unlocking the ignition switch, turning off the ignition switch and locking 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 rendered operable to close the circuit 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 switch 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 closed position is thereafter operated to circuit open position.

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 sectional view with parts in elevation showing the latch member; and

Fig. 4 is a central sectional view showing the switch and associated parts.

Referring to the drawing by reference characters, the invention is shown as embodied in a combined vehicle door lock and engine control, which is indicated generally at **10**. As shown, the construction is mounted on a vehicle **11**, which is driven by an engine **12**. The engine includes an ignition circuit **13**, which includes a battery **14** and a switch **15** and the construction, except for switch details to be later described, is conventional.

The body is provided with doors **16** which have latches **17** operated by push buttons **18** to release bolts **19**. The latch device shown includes a pivoted locking member **20** pivoted at **20'** on a reciprocating member **20''** and which is moved about its pivot **20'** from locked to unlocked position by engagement with a stem **21** eccentrically arranged on a core **22** disposed within a lock barrel **23** which is carried by the push button **18**. A member **23'** disposed within the vehicle and connected to the pivoted locking member **20** may be employed to move the locking member to and from locked position. A secret unlocking member shown as a key **24**, when turned, moves the core **22** and causes the stem **21** to move the locking member **20** to and from unlocked position and vice versa to thus render the push button **18** operable or inoperable to release the bolt **19**.

The particular type of latch construction shown is more fully disclosed in applicant's prior application Serial No. 336,844 filed February 13, 1953. The showing of the latch details is for the purpose of disclosing one type of latch with which the present invention may be used. The present invention is usable with any type of latch wherein an outside secretly operated lock member is provided.

In the disclosure the ignition switch shown in Fig. 2 includes a housing **25** in which a lock body **26** may ro-

tate between certain angular limits. Within the lock body **26** a core **27** is free to rotate between limits when a key **28** has moved a dog device **29** from engagement with the body **26**. The core **27**, lock body **26** and dog **29** are conventional construction.

The core **27** includes a projecting portion **30** which has an eccentric pin **31** thereon. The pin **31** rotates a disc **32** which carries a circuit closing member **33** into and out of engagement with contacts **34**, which are arranged in a disc **35**. The discs **32** and **35** are held on the housing **25** by a cap **36**. The contacts **34** are connected to leads **37** and **38** of the ignition circuit previously mentioned. An arm **39** is connected to the body **26** by a pin **40** so that the body **26** may, after it has been freed to rotate, as will be presently described, be turned by the arm **39**.

In order normally to prevent rotation of the body **26** in housing **25**, a plunger **41** is provided. The plunger **41** passes through a slot **41'** in the housing **25** and enters a slot **41''** in the body **26**. The plunger is mounted in a sleeve **42** which has a cap **43** thereon through which the plunger extends. A spring **44** normally urges the plunger **41** to engaged position.

The sleeve **42** is disposed on a cylinder **45** which reciprocates upon a piston **46**. The piston **46** is fixedly mounted by an integral bracket **47** which includes a base **48** on the support **49** upon which the switch **15** is mounted. A slot **50** in the wall of the cylinder **45** receives the bracket **47** to permit reciprocation of the cylinder. The piston **46** has a groove **51** which receives a resilient O ring **52** which serves as a packing. A compression spring **53** normally urges the cylinder upwardly so that the plunger **41** is normally urged to the position shown in Figs. 2 and 4.

The piston 46 is provided with a valve member **54** which includes a spring pressed ball valve **55**. When the cylinder is moved downwardly compressed air in the cylinder will pass out through the ball valve **55** but the valve will prevent entrance of air to the cylinder. A bleed aperture **56** provides passage into the cylinder. An adjustable threaded valve **57** regulates the rate of flow through the passage **56**.

The cylinder **45** has a threaded closure **58** thereon, which has a hole **59** through which a traction wire **60** of a Bowden wire **61** slides. A head **62** on the Bowden wire engages the inner surface of the cap **58**. The Bowden wire **61** is connected to a crank arm **63** on a sleeve **64** which is secured on the core member **22** by a pin **65**. In operation when the driver inserts the key **24** in the push member **18** and turns the key he will rotate the core **22** causing the sleeve **64** to be rotated clockwise in Fig. 4, thus rocking the crank arm **63** and pulling the wire **60** downwardly. This will cause the cylinder **45** to be moved downwardly against the tension of the spring **53** and air will pass around the ball valve **55**. This action will cause the plunger **41** to move out of the slot **41''** in the lock body **26** so that the lock body **26** is free to rotate.

The driver will then withdraw the key **24** and will enter the vehicle and will turn the arm **39** so that the circuit closer **33** will close the circuit through the contacts **34** and leads **37** and **38** so that the engine may be operated. The key **28** which is a duplicate of the key **24**, previously described, may be used to withdraw the dog **29** and permit closing of the ignition circuit should this be desired.

Assuming that the key **24** has been employed to condition the switch **33** and that the plunger **41** has been withdrawn from the slot **41'**. The key **24** is returned to normal position before it is withdrawn and this restores the crank arm **63** to the normal position of Fig. 4. The spring **53** has been compressed and the volume of the interior of the cylinder **45** has been decreased. Air passes into the cylinder **45** through the hole **59** and then enters the upper portion of the cylinder **45** through

the bleed aperture **56**. This causes the spring **53** to slowly raise the cylinder **45**.

If the switch has not been turned on by the member **39** the plunger **41** will slowly enter the slot **41''** to thus again lock the ignition lock. Thus, if the driver unlocks the door with the key **24** and fails to turn on the switch, the switch will again become locked.

However, should the driver turn on the switch and more the slot **41''** from the path of the plunger **41**, the plunger **41** would then engage the outside of the body **26** of the lock and as the cylinder **45** is pushed upwardly by the spring **53** the plunger **41** would compress the spring **44** which is much lighter than the spring **53** and thus the time device would be returned to normal position with the plunger **41** engaging the outer wall of the body **26**.

When in this condition movement of the member **39** to circuit opening position would rotate the body **26** and would move the slot **41''** into the path of the plunger **41** whereupon the plunger **41** would move into the slot **41''** and the ignition switch would be locked.

The time device, therefore, would enable the operator to unlock the door, enter the vehicle and start the engine. However, if the operator should thoughtlessly unlock the door and leave the vehicle, the switch would be returned to normal locked position after a brief interval of time so that likelihood of theft would be overcome.

Having thus described the invention, I claim:

1. A motor vehicle having an ignition circuit controlled internal combustion engine and a lock controlled switch for the ignition circuit, and which has a body provided with a door and has a secret locking member for the door, in combination with means actuated by movement of the door locking member to unlocked position to release the ignition switch lock.

2. A motor vehicle having an internal combustion engine and an ignition circuit associated therewith and which is provided with an ignition control member, and which has a body provided with a door and with a secret lock for the door, in combination with mechanically actuated means actuated upon movement of the secret door lock from locked to unlocked position for conditioning the ignition control member so that it may be operated to permit the engine to run.

3. An automotive vehicle construction including a body and an engine for driving said body, control means operable to cause said engine to function, a lock normally preventing operation of said control means, a door for said body, a lock for the door, secret means to move the door lock to unlocked position and means including a part movable by the door lock and operable when the door lock is moved from locked to unlocked position by the secret means to place said engine control means in condition so that it may be operated to permit the engine to function.

4. An automobile including a body having a door with a door lock and having a driving engine which includes an engine control member operable to cause the engine to function, a lock normally preventing operation of the control member, the door lock including an unlocking member, and means operated by movement of the door lock unlocking member to unlocked position to release the control member lock so that the control member may be operated to permit the engine to function.

5. An automobile including a body having a door with a door lock and having a driving engine which includes an engine control member, a lock normally preventing operation of the control member, the door lock including an unlocking member, and means actuated upon movement of the door lock unlocking member from locked to unlocked position for releasing the control member lock.

6. An automobile including a body having a door with a door lock and having a driving engine which includes a normally open circuit, circuit closing means operable

to close the circuit, means normally preventing movement of the circuit closing means to circuit closing position, the door lock including an unlocking member, and actuating means extending from the unlocking member to the circuit closing means and operable when the door lock is unlocked to render the preventing means ineffective to prevent movement of the circuit closing means to circuit closing position.

7. A vehicle including a door, a latch for the door, means inside the vehicle for locking and unlocking the latch, 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, a lock controlled member within the vehicle for moving the switch to "on" and "off" positions and manual means including an actuating member operated by the secret locking and unlocking means and independent of the lock controlled member and operable to render the circuit closable while the inside lock controlled switch moving member remains locked.

8. An automobile including a body having a door with a lock therefor and having a driving engine which includes an ignition circuit, an ignition circuit switch and an ignition switch lock, an outside operated unlocking member for the door lock, an actuating member extending from the door lock to the ignition circuit switch lock and operable to a position to release the switch lock and means operated by movement of the door lock unlocking member to unlocked position for moving the actuating member to switch lock releasing position.

9. A vehicle including a body having a driving engine which includes an ignition circuit and a control member for the circuit, means normally holding the control member in "off" position, a door for the body, a latch for the door, a lock for the door latch, and means including an actuating member extending from the door lock to the circuit control member and operable upon movement of the door lock to unlocked position to free the holding means.

10. An automobile including a body having a door and having a driving engine which includes an ignition circuit, a lock for the door, a lock controlled switch for the ignition circuit, secret means operable from without the body for unlocking the door lock, and actuating means extending from the door lock to the ignition lock and operable when the door lock is moved to unlocked position by the secret means to free the ignition switch lock.

11. An automobile including a body having a door and having a driving engine which includes an ignition circuit, a secret lock for the door, secret releasing means operative from without the body to unlock the door lock, circuit closing means operative from within the body to close the ignition circuit, means normally holding the circuit closing means in open position, and means extending from the door lock releasing means to the ignition circuit closing means and operated by movement of the secret door lock releasing means to unlocked position to free the circuit closing means holding means.

12. 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 operated means operable from without the body to move the door locking member to unlocked position, switch means for controlling the ignition circuit and means including an actuating member operated by actuation of the key means when the latter moves the door lock to unlocked position to condition the switch means for movement to ignition circuit closing position.

13. An automobile including a body having a door with a door lock for the door and having a driving engine which includes an ignition circuit having a normally inoperative switch therein, secret locking means for unlocking the door lock, and actuating means including a portion extending from the unlocking member to the ignition circuit switch to simultaneously render the ignition circuit switch operative when the secret locking means is actuated to unlock the door.

14. An automobile including a body having a door and having a driving engine which includes an ignition circuit, a lock for the door, an inside lock for the ignition circuit, secret releasing means operative from without the body to unlock the door lock, inside means operable to unlock the door lock, actuating means extending from the secret door lock releasing means to the ignition lock, and means operated by movement of the secret door lock releasing means to unlocked position for simultaneously operating the actuating means to render the ignition lock operable to close the ignition circuit, movement of said inside means to position to unlock the door lock being ineffective to render the ignition lock operable to close the ignition circuit.

15. In an ignition circuit for a motor vehicle which includes a body and an engine, an ignition switch, key controlled means normally preventing closing of the switch and operable by the key to close the switch, means operable independently of the key controlled means to free the preventing means, means normally preventing operation of the last means, secret lock operated means operative to move the last mentioned preventing means to non-preventing position and means to thereafter return the preventing means to preventing position.

16. An automotive vehicle construction including a body, an engine for driving said body, said engine including an operating electrical circuit, a switch controlling said circuit, key controlled means normally preventing closing of said switch and operable by the key to close the switch, a door for the body, a lock for the door, secret means for locking the door lock, means operable independent of the key to close the switch, means normally preventing operation of the last mentioned means and means operable when the secret door lock is moved from locked to unlocked position to move the last mentioned preventing means to non-preventing position.

17. An automobile including a body having a door with a door lock and having a driving engine which includes a normally open circuit, circuit closing means operable to close the circuit, means normally preventing movement of the circuit closing means to circuit closing position, means extending from the door lock to the circuit closing means and operable when the door lock is unlocked to render the preventing means ineffective to prevent movement of the circuit closing means to circuit closing position and time controlled means to return the preventing means to preventing position after it has been moved to non-preventing position.

18. 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 normally preventing movement of the switch means to circuit closing position, means including an actuating member operated by actuation of the key 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, and time controlled means operable to return the preventing means to non-preventing position after it has been moved to preventing position.

19. In an ignition system for a motor vehicle engine, a member movably mounted and having ignition switch closing means thereon, means normally preventing movement of said member to closing position, a locking member, means operable by the movement of the locking member to unlocked position to shift the preventing means to non-

preventing position and time controlled means to return the preventing means to preventing position after it has moved to non-preventing position.

20. In an ignition circuit for a motor vehicle which includes a body and an engine, an ignition switch, key controlled means normally preventing closing the switch and operable by the key to close the switch, means movable independently of the key controlled means and operable to close the switch, means normally preventing operation of the last means, secret lock operated means operative to move the preventing means to non-preventing position and time controlled means to thereafter move the preventing means to preventing position.

21. An automobile including a body having a door and having a driving engine and having a control member to be moved to one position when the engine is running and to another position when the engine is standing idle, a latch for the door, a lock for the door latch and a lock for said control member to lock said control member when it is adjusted in the other position for the engine to stand idle, in combination with means interconnecting the door lock and control member and acting when said door lock is unlocked to condition the control member for movement to the said one position.

22. An automobile including a body having a door and having a driving engine and having a control member to be moved to one position when the engine is running and to another position when the engine is not running, a latch for the door, a lock for the door latch, and a lock for said control member to lock said control member when it is adjusted in the other position for the engine to stand idle, in combination with means interconnecting the door lock and control member and acting when said door lock is unlocked to release said control member lock.

23. An automobile including a body having a door, a latch for the door, a lock for the door latch and having a driving engine and an engine control member movable to an operative and to an inoperative position, a lock for releasably holding the control member in inoperative position and means for actuating said door lock to an unlocked position, in combination with means operative when the actuating means moves said door lock to unlocked position, while the control member is held in inoperative position to release the control member lock and to thereby free the control member for movement to operative position.

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