Feb. 12, 1929. 1,701,584

A. MOORHOUSE

MOTOR VEHICLE

Filed May 31, 1923

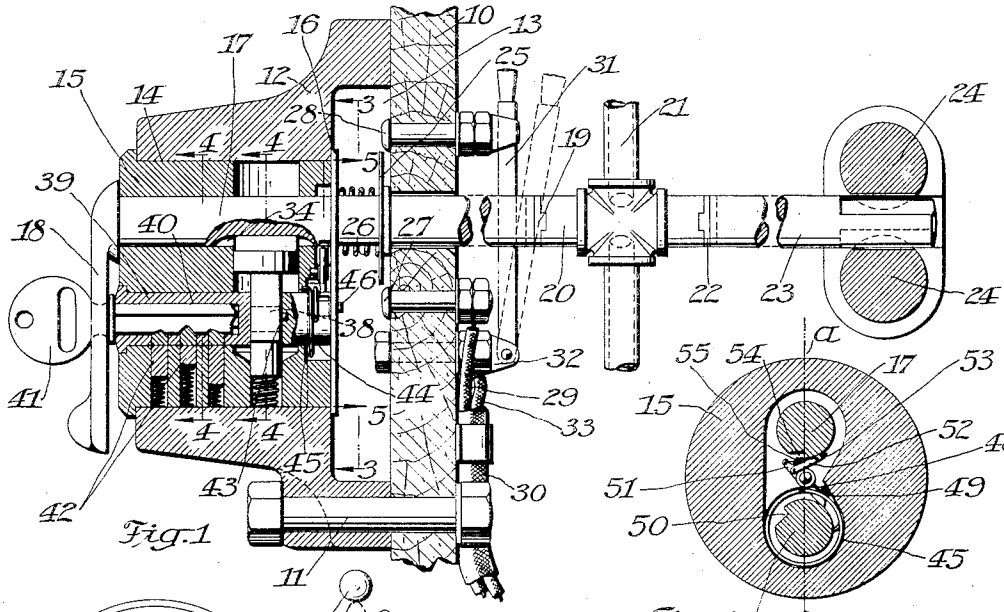


Fig. 1

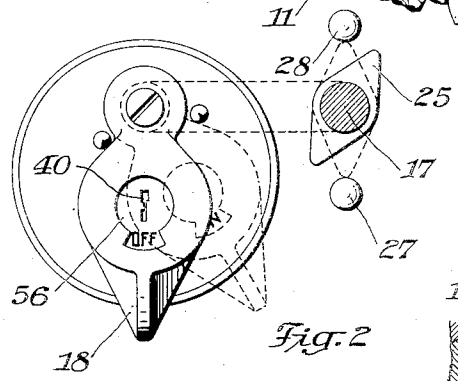


Fig. 2

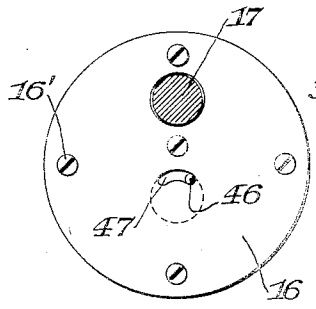


Fig. 3

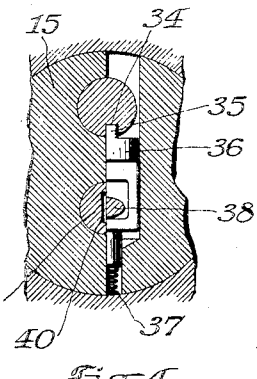


Fig. 4

Fig. 5

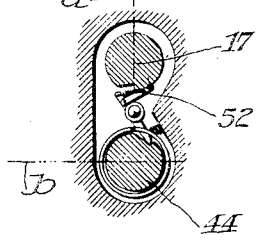


Fig. 6

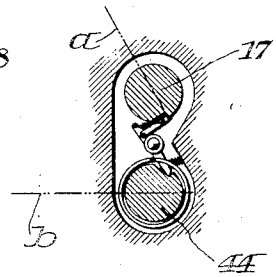


Fig. 7

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UNITED STATES PATENT OFFICE.

ALFRED MOORHOUSE, OF DETROIT, MICHIGAN, ASSIGNOR TO PACKARD MOTOR CAR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

MOTOR VEHICLE.

Application filed May 31, 1923. Serial No. 642,447.

This invention relates to motor vehicles and particularly to means for locking its operating parts.

Heretofore, where locks have been provided for any part of a motor vehicle, whether the ignition, the fuel line, or the transmission mechanism, it has been found that a driver or operator, will more frequently than otherwise leave the key in the lock when leaving the car at the curb. Under these circumstances, of course, locks are of little value.

One of the objects of the present invention is to provide a locking mechanism which will make it more difficult for the driver to leave the key in the lock than to take it with him.

Another object of the invention is to provide a locking mechanism which will require the removal of the key from the lock before the vehicle or the motor can be started.

Another object of the invention is to provide a locking mechanism which will prevent the insertion of the key in the lock when the switch or other device to be locked is in its "on" or operative position.

Another object of the invention is to provide a locking mechanism of the form above referred to in combination with a test switch mounted to be accessible near the engine so that the engine may be stopped and started without the use of the key.

With such a locking mechanism it is believed that the operator will be encouraged to keep his key in his pocket and use it only for unlocking the car because he must remove the key from the lock before he can start the car and it is hardly conceivable that he would take the key out of his pocket and leave it in the lock after he had stopped the car. The mechanism is such that the vehicle or the engine may be stopped without the use of the key, but after the switch or other device has been thrown to its "off" position, it cannot be thrown to its "on" position until the key is inserted and the lock turned and the key removed.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the drawings which form a part of this specification, and in which:

Fig. 1, is a vertical section through the dash or cowl board of a motor vehicle with one form of my locking mechanism mounted thereon;

Fig. 2 is a front elevation of the locking device shown in Fig. 1 with the switch and contacts shown at the side of the figure;

Fig. 3 is a rear view of the locking device taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a transverse section substantially on the two lines 4—4 of Fig. 1; and

Figs. 5, 6 and 7 are sectional views substantially on the line 5—5 of Fig. 1, the parts being shown in different positions in the different views.

Referring to the drawings, 10 represents the dash or cowl board of the motor vehicle upon which is mounted, as by one or a series of bolts 11, the casing 12 of my locking mechanism. The casing is formed to provide a compartment 13 between its end and the dash 10, and with a large bore 14 in which is mounted a cylindrical block 15. This block is retained in positon in the bore 14 by a plate 16 secured to the block as by a series of screws 16′, shown particularly in Fig. 3.

Mounted in the block 15 is the device to be locked, or which controls the starting or operation of the engine. This device is shown in the form of an oscillating shaft or member 17 which has a handle 18 on its front end and which extends through the dash 10 to an Oldham coupling 19 which connects it with a valve 20 in the fuel or gasoline line 21 of the vehicle, and this valve 20 is in turn connected, as by an Oldham coupling 22 with a locking bar 23 arranged between two sliding shafts 24 which may be the gear shifting shafts of the transmission or gear mechanism of the vehicle.

Mounted upon the member 17 within the compartment 13 is a switch 25 and in the position of the device 17 shown in Fig. 1 of the drawings, the switch 25 is in its "off" or inoperative position, the valve 20 is in its closed position, and the locking bar 23 is in its locked position. When the device 17 therefore, is in the position shown in Fig. 1, that is, its inoperative or "off" position the engine ignition is off, the fuel line is closed so that the motor cannot get any fuel, and the transmission is locked in neutral position so that the gears cannot be shifted to operate the vehicle. The device 17 may be turned as by turning the handle 18 to the position shown in dotted lines in Fig. 2 in which position the switch 25

will be operative, that is, "on", the valve 20 will be open, and the locking bar 23 will be in its unlocked position so that the shafts 24 may be moved to mesh the gears of the transmission. One or all of these devices 25, 20 or 23, may be connected to the device 17, or other similar devices may be connected to it.

The switch 25 is of course insulated from the shaft 17 upon which it is mounted and a spring 26 surrounding the shaft presses the switch toward the two contacts 27 and 28 mounted on the dash 10. The switch rubs against these contacts when it is in its "on" position as shown in dotted lines in Fig. 2. The contact 27 connects through the dash to an ignition or other wire 29 which is preferably housed in a casing 30 secured to the dash. The other contact 28 also extends through the dash 10 and is adapted to engage a knife switch 31 pivotally mounted on a terminal 32, which terminal is connected to a wire 33 also housed in the casing 30. Therefore, when the switches 25 and 31 are both closed, the switches being in series, a complete circuit is made from the wire 29 to the wire 33. Thus it is necessary that both switches be closed in order to complete the circuit and either of them may be used to break the circuit.

The purpose of this double switch arrangement is that since the locking mechanism for the device 17 is such that the key must be removed before the device can be turned and the key cannot be inserted again when the device is in its "on" position, it would be extremely difficult to do work on the engine which requires frequent starting and stopping of the engine. Under these conditions, the switch 25 may be left in its "on" position and the switch 31 may be used by the mechanic to start and stop the engine. This knife switch 31 is preferably arranged adjacent the engine and in a protected position where it is accessible when the engine bonnet has been raised, and this bonnet may be locked so that the switch 31 is inaccessible to thieves. But even if accessible, the switch 31 will not start the engine when the switch 25 is "off". When the mechanic has finished testing the engine he will of course close the switch 31 and finally stop the engine by throwing the switch 25.

The shaft or device 17 is provided with a locking notch or recess 34 into which the tongue 35 of a locking bolt 36 is adapted to extend for positively retaining the device 17 in locked position. These are particularly illustrated in Figs. 1 and 4. A spring 37 mounted between the lower end of the locking bolt 36 and the bore of the casing 12 continually presses the locking bolt towards the shaft 17 so that it will snap into the recess 34 when the device is turned to its "off" position.

The locking bolt 36 is moved from its locked to its unlocked position by a cam 38 mounted on the end of a locking barrel 39, which barrel has a suitable key slot 40 for a key 41. Several pairs of tumblers 42 are provided in the locking barrel 39 and the block 15, as shown particularly in Fig. 1, and the key 41 is of course suitably formed to bring these tumblers to the desired position as shown in Fig. 1 so that the barrel 39 may then be turned in the block, and when the key is removed these tumblers will lock the barrel against being turned.

The end of the cam 38 is squared as shown at 43 in Fig. 1 and it enters a squared hole in the end of a block 44 mounted at the end of the cam. Thus the block 44 turns with and forms a part of the barrel 39. A spring 45 coiled around this block 44 tends to turn the block, and with it the locking barrel 39 to the locked position thereof. A stop 46 acting in a slot 47 as shown in Fig. 3, limits the movement of the block 44.

Mounted upon the rear end of block 15 and between the block 44 and the member 17 is a pivoted latch 48 and a spring 49 for pressing it toward the block 44. Said latter block is formed with a notch 50 for the latch 48 to drop into when the locking barrel is turned from its locked to its unlocked position.

The latch 48 is also formed with an arm 51 upon which a pawl 52 is pivoted, said pawl having a lip 53 at its free end to limit the movement of the pawl into a notch 54 cut in the surface of the shaft or device 17. A spring 55 yieldingly presses the pawl 52 towards the shaft 17.

In Figs. 5, 6 and 7 the operation of the interlocking mechanism between the lock barrel and the device 17 are illustrated. In these figures dot-and-dash lines *a* and *b* are used to indicate the angular positions of the shaft 17 and the lock barrel 39 respectively.

In Fig. 5 the device 17 is shown locked in its "off" position, as it is also shown in Figs. 1, 2 and 4. In this position the device 17 is locked by the locking bolt 36 and cannot be manually turned until it is unlocked.

In Fig. 6 the locking barrel 39 and consequently the block 44 has been turned 90° (as indicated by line *b*) this being done by inserting the key in the slot and turning the barrel by means of the key. This turning action was against the action of the spring 45 thus coiling the spring more tightly around the block 44, as shown in Fig. 6. When the block 44 reached this position, the latch 48 dropped into the notch 50, by reason of the spring 49, and the lock barrel will be so held until the latch is released.

It will be seen that this 90° rotation of the lock barrel 39 will, through the cam 38, withdraw the locking bolt 36 from the slot 34 in the device 17 and, so far as said locking bolt is concerned, the device 17 may be moved from its "off" to its "on" position. But the key 41 still prevents the movement of the device 17 because it extends through an opening 56 in

the handle 18, this opening registering with the key slot 40 in the locking barrel 39 when the handle is in its "off" position.

Therefore, the key must be removed before the device 17 can be moved from its "off" to its "on" position.

After the key has been removed, the handle 18 may be used to oscillate the shaft 17 to the position shown in Fig. 7 and in this position of the shaft the switch 25 connects the contacts 27 and 28, opens the valve 20 in the fuel line, and unlocks the sliding shafts 24 in the transmission mechanism, so that the engine may be started and the vehicle operated in the usual way. The key cannot be returned to the slot because the latter is covered by the handle 18.

In this position of the device 17 it will also be seen that the pawl 52 has dropped into the notch 54 and yieldingly retains the shaft 17 in that position. This is the running position of the engine and vehicle.

When it is desired to stop the engine as by throwing the switch 25, the handle 18 is used to manually return the device 17 to its original position, that is, from the position shown in Fig. 7 to that shown in Fig. 5. Referring to Fig. 7 it will be seen that this reverse movement of the shaft 17 will carry the pawl 52 with it through the initial movement and the endwise movement of this pawl will move the latch 48 against its spring 49 so that the latch will clear the notch 50 thus releasing the block 44. The spring 45 will then uncoil and the block 44 and the locking barrel 39 will return to their original position so that the cam 38 will release the locking bolt 36 and the latter, by reason of its spring 37, will move upwardly into the recess 34 after the shaft 17 arrives at its first position. In this return movement of the shaft 17, after it has moved the pawl 52 sufficiently to withdraw the latch 48, the lip 53 will ride on the edge of the notch 54 and free the pawl from the notch. The spring 49 will then return the catch and pawl to their original positions, as shown in Fig. 5.

It will be seen that the device 17 is thus automatically locked in its "off" or inoperative position and it cannot be turned to its "on" position until the key is inserted, the lock barrel rotated 90°, and the key withdrawn. It will be seen also that after the device 17 has been so unlocked, and turned to the position in which the handle 18 is shown in dotted lines in Fig. 2, the key cannot again be inserted in the slot 40 because that slot is covered by part of the handle 18. The key must therefore be returned to the operator's pocket until such time as he requires it again to unlock the device 17.

While I have herein described in some detail a specific embodiment of my invention, which I deem to be new and advantageous and may specifically claim, I do not desire it to be understood that my invention is limited to the exact details of the construction, as it will be apparent that changes may be made therein without departing from the spirit or scope of my invention.

I claim—

1. In a locking mechanism, the combination of a manually operated device to be locked, a key operated lock for said device, means to prevent the movement of said device when it is unlocked as long as the key remains in the lock, and means operative without moving said device for retaining said lock in unlocked position.

2. In a locking mechanism, the combination of a manually operated device to be locked, said device having operative and inoperative positions, a key operated lock for said device, a key for said lock, means for mechanically retaining the device in its inoperative position by both the lock and the key, and means operated by the lock itself for temporarily retaining said lock in unlocked position for movement of said device.

3. In a locking mechanism, the combination of a manually operated device to be locked, said device having "off" and "on" positions, a positive lock for said device, a removable key for said lock, means making it necessary to remove the key from the lock before the device can be moved from "off" to "on" position, and means independent of the manually operated device for temporarily retaining the lock in unlocked position.

4. In a locking mechanism, the combination of a manually operated device to be locked, said device having "off" and "on" positions, a handle for moving said device, a lock for said device in its "off" position, and a key for said lock, said handle, key and lock being so arranged that after the lock is turned to unlocked position by the key the lock will be so retained and the device can then be moved with the handle only after the key has been removed from the lock.

5. In a locking mechanism, the combination of a manually operated device to be locked, said device having "off" and "on" positions, a locking bolt adapted to positively lock said device in its "off" position, means including a removable key for withdrawing and holding said locking bolt independently of said device, and means preventing insertion of the key when the device is in its "on" position.

6. In a locking mechanism, the combination of a manually operated device to be locked, said device having "off" and "on" positions, a locking bolt adapted to positively lock said device in its "off" position, means including a removable key for withdrawing said locking bolt and holding it independently of said device, and means preventing insertion of the key when the device is in its "on" position, said means also preventing the

device from being moved from "off" to "on" position when the key is in the locking means.

7. In a locking mechanism the combination of a device to be locked, a spring pressed locking bolt therefor, a lock barrel having means to move said bolt to unlocked position when the barrel is turned, a device for retaining said barrel in its unlocked position, and means whereby movement of the device to be locked will unlatch said barrel retaining device.

8. In a locking device, the combination of a switch device, a spring pressed locking bolt therefor, a spring rotated lock barrel for moving said bolt, a catch to retain the lock barrel against turning, and means to release said catch operated by the turning movement of said switch.

9. In a locking mechanism the combination of a switch device, a spring pressed locking bolt for said device, a locking barrel adapted to be rotated to move said bolt to unlocked position, a pivoted catch for retaining the barrel against the action of its spring, and a pivoted device on said latch adapted to cooperate with the switch so that the locking barrel is unlatched when the switch is turned to its "off" position.

10. In a locking mechanism, the combination of a manually operated device to be locked, means for locking said device so that it cannot be moved to its operative position until the key has been turned and removed form the lock, said means being self-retaining in unlocked position so that the key may be removed and the locking means retained in unlocked position without movement of the manually operated device.

11. In a locking mechanism, the combination of a manually operated device to be locked, a key operated lock for said device, means to prevent the movement of said device when it is unlocked as long as the key remains in the lock, and means to temporarily hold the key operated lock in unlocked position so that the key may be removed to permit movement of said manually operated device.

12. In locking mechanism, the combination of a device to be locked, a spring pressed locking bolt for said device adapted to snap into locking position when said device is moved to its inoperative position, key operated mechanism to withdraw said bolt, means to retain said bolt in withdrawn position, means making it necessary to remove the key from the lock before said device can be moved from inoperative to operative position, and means for releasing said bolt from its retaining means.

13. In locking mechanism, the combination of a device to be locked, a spring pressed locking bolt for said device adapted to snap into locking position when said device is moved to its inoperative position, key operated mechanism to withdraw said bolt, means to retain said bolt in withdrawn position, means making it necessary to remove the key from the lock before said device can be moved from inoperative to operative position, and means for releasing said bolt from its retaining means when said device is moved from operative to inoperative position.

14. In locking mechanism, the combination of a device to be locked, a spring pressed locking bolt for said device adapted to snap into locking position when said device is moved to its inoperative position, key operated mechanism to withdraw said bolt, means to retain said bolt in withdrawn position, means making it necessary to remove the key from the lock before said device can be moved from inoperative to operative position, and means operated by said device for releasing said bolt from its retaining means.

15. In locking mechanism, the combination of a manually operated device to be locked, an ignition switch connected to said device to be removed thereby from "on" to "off" position and vice versa, a spring operated locking bolt adapted to snap into locking position and positively lock said device in the "off" position of the switch, means for automatically retaining said locking bolt in its unlocked position as it is retracted from said device, and means operated through the movement of said device for releasing said retaining means.

16. In a locking mechanism, the combination of a manually operated device to be locked, an ignition switch connected to said device to be moved thereby from "on" to "off" position and vice versa, a key operated locking bolt adapted to snap into locking position and positively lock said device in the "off" position of the switch, automatic means for retaining said locking bolt when the latter is moved to unlocked position, and means operated by the movement of said device for releasing said retaining means.

In testimony whereof I affix my signature.

ALFRED MOORHOUSE.