O. F. CONKLIN.

LOCK FOR SWITCHES AND THE LIKE.

APPLICATION FILED NOV. 29, 1916.

1,391,940.

Patented Sept. 27, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

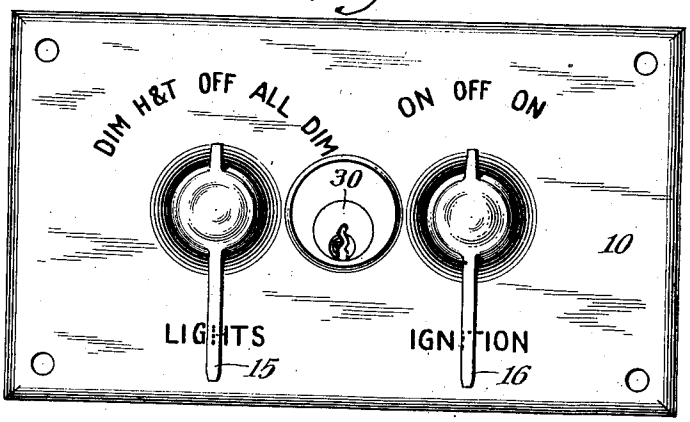


Fig. 2.

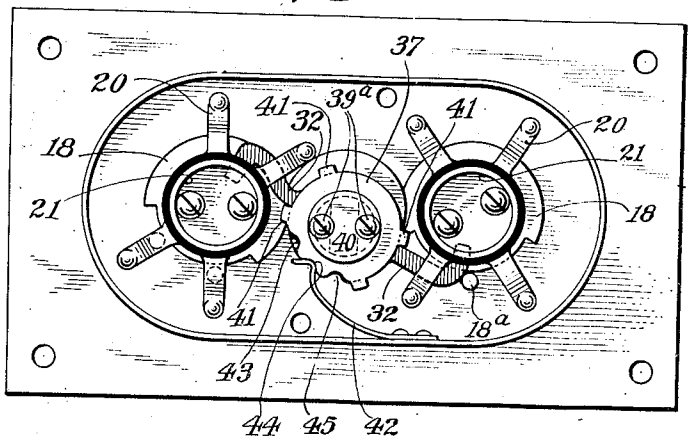
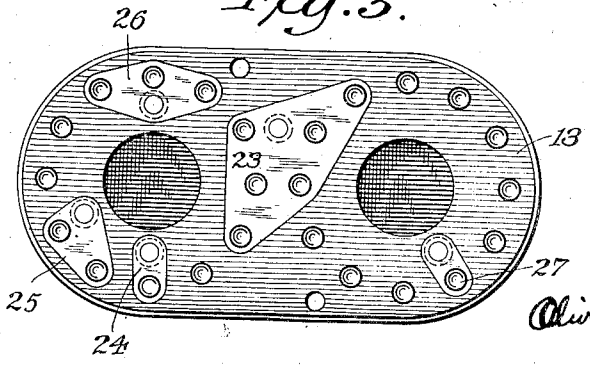


Fig. 3.



Inventor

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2 SHEETS—SHEET 2.

Fig. 4.

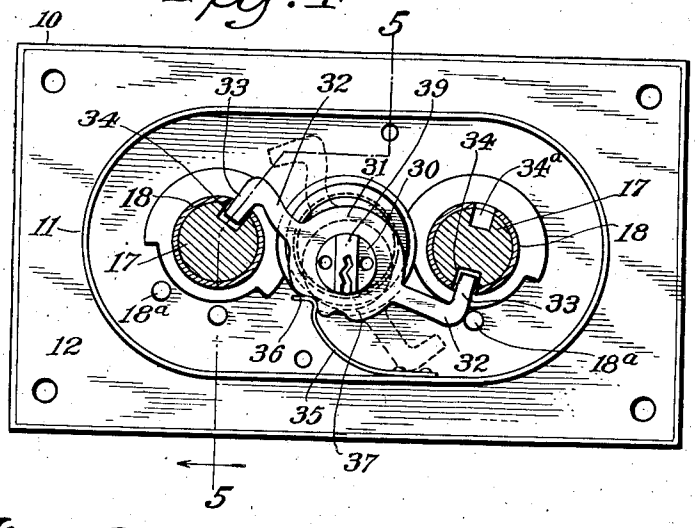


Fig. 5.

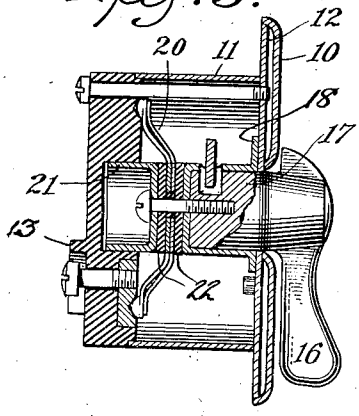


Fig. 6.

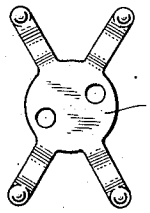


Fig. 7.

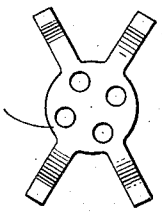


Fig. 9.

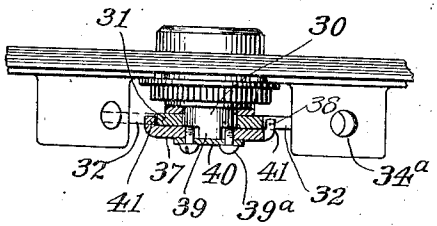
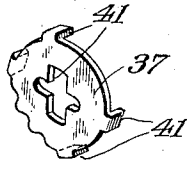


Fig. 8.



Inventor

Oliver F. Conklin

UNITED STATES PATENT OFFICE.

OLIVER F. CONKLIN, OF DETROIT, MICHIGAN, ASSIGNOR TO REMY ELECTRIC COMPANY, OF ANDERSON, INDIANA, A CORPORATION OF INDIANA.

LOCK FOR SWITCHES AND THE LIKE.

1,391,940. Specification of Letters Patent. Patented Sept. 27, 1921.

Application filed November 29, 1916. Serial No. 134,000.

To all whom it may concern:

Be it known that I, OLIVER F. CONKLIN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Locks for Switches and the like, of which the following is a full, clear, and exact description.

This invention relates to certain new and useful improvements in devices for locking controlling devices, as for example the ignition and lighting switches, such as are used on automobiles.

With many of the previous locking devices, such as have been used on automobiles to lock electric switches, it has been the practice to use a construction in which it was necessary to leave the key in the lock when the switch was unlocked. This has been found to be a disadvantage for various reasons. A car is frequently driven for considerable periods with no locking of the switch, and the fact that it was always necessary in these switches to leave the key in the lock, except when the switch is locked, has caused many to become prejudiced against the use of a lock switch.

Another disadvantage of this form of lock switches has been the fact that the key was very likely to fall out of the lock and become lost when the switch was in unlocked condition.

The object of the present invention resides in the provision of a device for locking controlling devices, having a construction whereby it is possible to lock the controlling device and then remove the key or to unlock the controlling device and remove the key. Or if desired the key may be left in the lock in either locked or unlocked position. When it is desired to so leave the key in the lock means are provided whereby the key may be retained in the lock and prevented from falling out and becoming lost. The key may be so retained in the lock in either locked or unlocked position.

Further objects reside in the provision of a locking device, which is simple in its construction, cheap to manufacture, and not likely to get out of order when in use.

Other objects will be pointed out, in detail, in the accompanying specification, shown in the drawings, and more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a front view of my improved locking device as applied to an electric switch.

Fig. 2 is a rear view with the rear terminal plate removed.

Fig. 3 is a front view of the rear terminal plate.

Fig. 4 is another rear view, similar to Fig. 2, but with one of the operating parts removed.

Fig. 5 is a sectional view through one of the switch devices.

Figs. 6 and 7 are details showing the contact devices.

Fig. 8 is a detail view of one of the operating parts.

Fig. 9 is a sectional view showing the cooperation of the part shown in Fig. 6, with the barrel of the lock and with the arms which lock the switches.

In more detail, the device, as clearly shown in Fig. 1, is provided with two switch levers 15 and 16, 15 is for the ignition and 16 for controlling the various lights upon the machine.

The body of the switch comprises the front face plate 10, casing 11, inner front plate 12, and rear terminal plate 13. The latter plate or block is made of insulating material and is secured to the inner plate 12 by suitable screws (see Figs. 3 and 5).

There are two switches one for lights and the other for ignition, and as they are practically identical only one will be described. There is one switch lever 15 for the lights and another 16 for the ignition. These levers have shank portions 17, which are suitably journaled in plate 12, and which have fastened thereto sleeves 18. These sleeves have a portion cut away to coöperate with pins 18^a and limit the throw of the switches. Attached to the rear of shanks 17 are the multipolar contact pieces 20 and bosses 21. These annular bosses fit in recesses in the rear terminal block 13 and form a rear bearing for the key lever shanks. The bosses and contact pieces are insulated from

each other and form the shanks by insulating washers 22. Embedded in the inner surface of the block 13 are a number of contact plates 23, 24, 25, 26 and 27. Plate 23 is connected to a suitable terminal to which a source of electricity as a battery is attached. The other blocks have corresponding terminals, which lead to the various lighting and ignition circuits. By moving the switch levers the multipolar contact blades are brought into contact with both the common terminal block 23 and the other blocks, and in this way various combinations of circuits may be established. When in mid position, as shown in Fig. 1, all circuits are broken, and both light and ignition are shut off.

Switch lock.

30 represents the barrel of a cylinder lock which constitutes the movable key controlled member. The lock has a double throw so that, after the insertion of the key, while the key slot is vertical, the key can be turned either to the left or to the right, thus disposing the key slot at an angle to the left or right of the vertical. The key can only be removed from the lock when the key slot is in vertical position.

Loosely journaled upon the barrel 30 is a finger plate 31, constituting the locking bolt member, and having projecting fingers 32 extending therefrom. These ends of these fingers are hooked, as shown at 33, and these hooked ends are adapted to swing into or out of recesses 34 in the shank portions 17 of the switch levers. When the hooked ends are swung into the recesses, as shown in full lines in Fig. 4, the switch levers are locked, and when swung to the dotted line position the switches are unlocked, as will be readily understood. In order to retain the finger plate in "in" or "out" position, I provide a blade spring 35, which is adapted to engage one or the other of two notches 36 in the periphery of the finger plate (see Fig. 4).

In order to rock the finger plate or locking bolt member and effect the locking of the switch levers, I provide an intermediate actuating member 37. This intermediate actuating member 37 is provided with a central vertical slot 38, in which fits a rectangular lug 39 on the rear of the cylinder lock barrel. The actuating member is also held in position on the barrel by screws 39ª, which pass through a washer 40 (see Figs. 2 and 9). The actuating member is provided with lugs 41, which project to the side of the actuating member and are in coöperative position with fingers 32 of the finger plate. There is a pair of lugs for each finger, and the two lugs of each pair are so spaced that the actuating member may move without moving the finger plate. In order to retain the actuating member in any one of a number of positions, I provide a blade spring 42, which is adapted to engage in any one of the three notches 43, 44 or 45 in the periphery of the actuating member.

Operation of the lock device.

Assume the parts in the position shown in Fig. 2. The switch levers are now locked and the key can be withdrawn or inserted in the lock barrel as the key slot is vertical. The key is now turned so as to turn the barrel clockwise (as viewed from the rear in Fig. 2). Actuating member 37 is turned clockwise, blade spring 42 dropping into recess 45. The lugs 41, in the meantime, have forced the finger plate clockwise to the dotted line position in Fig. 4 with blade spring 35 in notch 36.

The switch levers are now unlocked, but it is impossible to withdraw the key from the barrel. This is the position in which the key is left if it is desired to leave the key in the lock and yet prevent its falling out and becoming lost. If it is desired to remove the key from the lock and leave the switch unlocked the key is turned back to the center position, and the barrel 30 swings counter-clockwise until blade spring 42 snaps into the center notch 44 of actuating member 37. No movement has been imparted by the actuating member 37 to the finger plate 31 on account of the spacing of lugs 41, and this finger plate is retained in its former position by blade spring 35 resting in notch 36. The switch levers are still unlocked, and it is possible to remove the key from the lock.

If it is desired to again lock the switch levers, barrel 30 is turned by the key counter-clockwise. The lugs 41 again contact with the fingers 32 and rotate the finger plate counterclockwise into locking position, blade spring 35 dropping into notch 36 and retaining the finger plate in locked position. In this position the key is retained in the lock and the switch is locked. To withdraw the key when the switch is locked the key is turned in reverse direction to vertical position. This movement of the key leaves the switch in locked condition and the key may be withdrawn as soon as it is in vertical position.

One of the advantages of the construction shown, is that when one of the switches is not in exact locking position, the key can still be turned to locked position. Then the slightest movement of the switch handle will cause the finger arm to drop in the recess and lock the lever.

I have described but one locking recess in each shank portion. It is apparent, however, that a number of recesses may be desirable for the lighting switch. For example, there could be an extra recess, such as 34ª, in the lighting switch shank, so that

the lights could be locked "off" or "on" with head tail lamps dim.

Or if desired, the finger coöperating with the lighting switch could be eliminated, and the ignition side of switch alone be locked. These and other modifications will occur to those skilled in the art, and it is to be understood that I do not wish to be limited to the precise form shown and described.

While the disclosed embodiment of my invention shows the locking device as applied to an electric switch, it is to be understood that the locking device could be applied as well to other controlling devices.

While the form of mechanism herein shown and described constitutes a preferred form of embodiment of the invention, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

I claim:

1. In a lock for locking controlling devices in switches and the like having movable controlling elements, the combination with a movable key controlled member; of means coöperating therewith for locking or unlocking said elements when the key controlled member is moved to key retaining position, said means having provisions whereby the key controlled member may be restored to position for key removal while the controlling elements remain unlocked; and leaf spring means for yieldingly maintaining the key controlled member in key retaining position.

2. In a lock for locking controlling devices in switches and the like having movable controlling elements, the combination with a bolt member for engaging and locking the controlling elements; key operated means movable upon a partial revolution of the key to key retaining position, whereby to move the bolt member to unlocked position, said means having provisions permitting the same to be restored to key removal position while the bolt member remains in unlocked position; and leaf spring means for yieldingly maintaining the key operated means in key retaining position.

3. In a lock for locking controlling devices in switches and the like having movable controlling elements, the combination with a key operated cylinder lock barrel; of a rotatable locking bolt member loosely mounted on the barrel and adapted to engage and lock the controlling elements; an intermediate member mounted on the barrel and having lugs adapted to engage the bolt member and move the same to locked or unlocked position when the barrel is moved to key retaining position, said lugs being spaced so as to permit restoring the barrel to key removal position without disturbing the locked or unlocked positions of the bolt member; and means for yieldingly maintaining said bolt member in either of its positions.

4. In a lock for locking controlling devices in switches and the like having movable controlling elements the combination with a key operated cylinder lock barrel; of a rotatable locking bolt member loosely mounted on the barrel and adapted to engage and lock the controlling elements; means for yieldingly maintaining the bolt member in either of its locked or unlocked positions; an intermediate member mounted on the barrel and having lugs adapted to engage the bolt member and to move the same to locked or unlocked position when the barrel is turned to key retaining positions, said lugs being spaced so as to permit restoring the barrel to key removal position without disturbing the locked or unlocked positions of the bolt member; and means for yieldingly maintaining the barrel in key retaining positions.

5. In a lock for locking controlling devices in switches and the like having movable controlling elements, the combination with a locking bolt member adapted to engage and lock the controlling elements; of means for yieldingly maintaining said bolt member in either locked or unlocked position; key controlled means movable into key retaining positions whereby to effect the movement of said bolt member into its said positions, said key controlled means having provisions permitting the same to return to position for key removal without disturbing the bolt member; and means for yieldingly maintaining the key controlled means in key retaining position.

6. In a lock for locking controlling devices in switches and the like, the combination with a movable key controlled element and a stationary member permitting the removal of a key from the key controlled element when moved to key removal position and retaining the key when the key controlled element is moved in either direction from key removal position; of means for yieldingly maintaining the key controlled member in key removal position or in key retaining positions slightly displaced in either direction from key removal position; and locking provisions capable of being moved into locked or unlocked positions by the movement of said key controlled member into one or the other of said key retaining positions, said provisions including means permitting the restoring of the key controlled member to key removal position while said locking provisions remain yieldingly maintained in locked or unlocked position.

7. In a lock for locking controlling devices in switches and the like, the combination with a movable key controlled element and a stationary member permitting the removal of a key from the key controlled element

when moved to key removal position and retaining the key when the key controlled element is moved in either direction from key removal position; of means for yieldingly maintaining the key controlled member in key removal position or in key retaining positions slightly displaced in either direction from key removal position; locking provisions capable of being moved into locked or unlocked positions by the movement of said key controlled member into one or the other of said key retaining positions, said provisions including means permitting the restoring of the key controlled member to key removal position while said locking provisions remain yieldingly maintained in locked or unlocked position; and means for yieldingly maintaining said locking provisions in locked or unlocked positions.

8. In a lock for locking controlling devices in switches and the like including a manually operable controlling element movable independently of the lock, the combination with a rotatable bolt member having its axis parallel to the axis of the controlling element but spaced therefrom; of a rotatable key operated member having its axis parallel to the axis of the controlling element but spaced therefrom.

9. In a lock for locking controlling devices in switches and the like including a manually operable controlling element movable independently of the lock, the combination with a rotatable bolt member having its axis parallel to the axis of the controlling element but spaced therefrom; of a rotatable key controlled member supporting for rotation said bolt member.

10. In a lock for locking controlling devices in switches and the like having a rotatable controlling element, the combination with a rotatable bolt member having its axis parallel to the axis of the controlling element; of a key operated cylinder lock barrel upon which said bolt member is loosely journaled; and an intermediate member attached to said barrel and having provisions coöperating with said bolt member for moving said bolt member to locked or to unlocked position when the barrel is moved to key retaining position, said provisions permitting the restoration of the barrel to key removal position while permitting the bolt member to remain in locked or unlocked position.

11. In a lock for locking controlling devices in switches and the like having movable controlling elements, the combination with a locking bolt member adapted to engage and lock the controlling elements; of means for yieldingly maintaining said bolt member in either locked or unlocked position; and key controlled means movable into key retaining positions whereby to effect the movement of said bolt member into its positions, said key controlled means having provisions permitting the same to return to position for key removal without disturbing the bolt member.

In testimony whereof I hereunto affix my signature.

OLIVER F. CONKLIN.