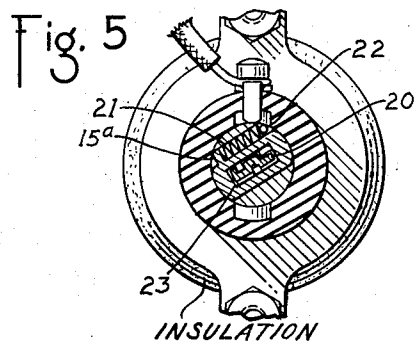
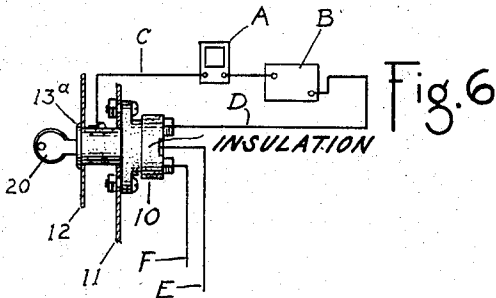
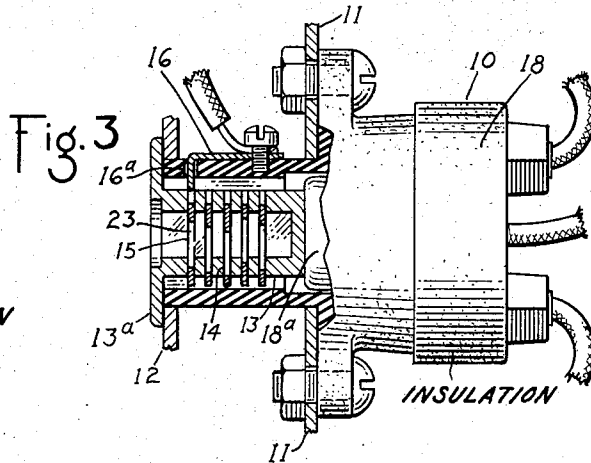
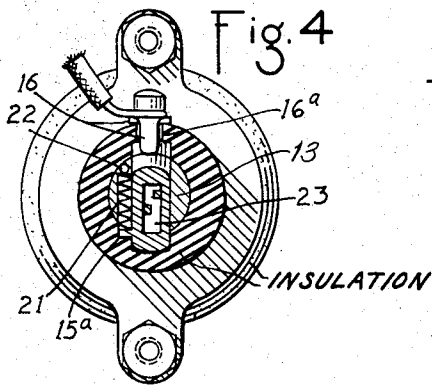
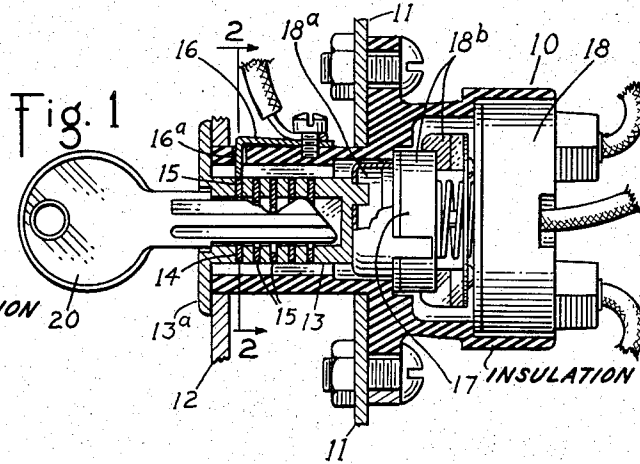
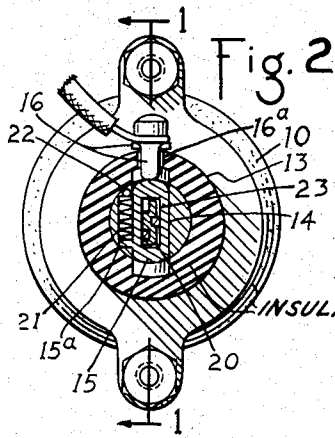


Aug. 22, 1950

J. L. SMITH ET AL
SIGNAL PROVISION FOR LOCKS

2,519,940

Filed Nov. 28, 1947



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2,519,940

SIGNAL PROVISION FOR LOCKS

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Application November 28, 1947, Serial No. 788,334

3 Claims. (Cl. 200—44)

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This invention relates to a signal provision for locks to indicate that the key is not removed after using the lock. It has more particularly to do with the ignition lock of an automobile and other applied locks, unauthorized use of which it is desired to prevent.

An object is to provide generally upon signal provisions of such character and more specifically for locks of the tumbler-cylinder type.

Another object is to provide a signal means which is provided for direct control and operation by a lock tumbler as actuated upon insertion, turning and removal of the key in and from the lock and without appreciable alteration in the lock used.

Other objects and advantages to be attained will hereinafter more fully appear in the following description.

In the drawings, illustrating a practical but non-limiting exemplification of the invention,

Figure 1 is a longitudinal section, taken on the line 1—1 of Figure 2, of a lock and an associated switch it is to control and actuate, the key being inserted in the lock;

Figure 2 is a cross section on the line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 1, but with the key removed;

Figure 4 is a view similar to Figure 2, but with the key removed;

Figure 5 is a view similar to Figures 2 and 4, but with the key inserted and turned clockwise to accordingly rotate the tumbler cylinder so as to close the switch and break the signal circuit; and

Figure 6 is a diagram showing a plan of installation and wiring of the invention for use on an automobile or the like.

Referring now to the drawing in detail (see Figures 1, 3 and 6), the numeral 10 designates the housing of the lock shown as bolted to a portion 11 back of a dashboard 12.

The tumbler cylinder 13 of the lock is fitted rotatably in the bore of a reduced cylindrical portion of the housing 10 which extends between the partition 11 and dashboard 12 (see Figures 1 and 3). This tumbler cylinder 13 has a flange 13a at its outer end abutting the dashboard 12.

Fitted and working in diametrical through-slots 14 in the cylinder 13 are tumblers 15, which latter, in one retracted longitudinal position thereof, engage in a longitudinal groove in the said reduced cylindrical portion of the housing 10 (see Figures 3 and 4) and thus prevent rotation of said tumbler cylinder 13, that is to say, in the normal position of the tumblers 15 and while the key 20 is removed from the lock.

When the key 20 is inserted (see Figures 1 and 2) the tumblers 15 are moved clear of said longitudinal groove in the reduced cylindrical portion of the housing 10 and the tumbler cylin-

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der 13 is free to be rotated in the housing by turning the key. For the rotated position of the tumbler cylinder 13 see Figure 5.

In the particular showing in the drawings, the housing 10 is made of an insulative or electrically non-conductive material, but the tumbler cylinder 13 is electrically conductive. In this case an electrical spring contact member 16 is placed externally on the reduced cylindrical portion of the housing 10 and its free end portion is turned at a right angle and inserted freely movable in a transverse aperture 13a in said housing part and into a position to be engaged by one of the tumblers 15 when the key 20 is inserted to actuate said tumbler (see Figures 1 and 2). However, by the same token, if the housing 10 is made of electrically conductive material, the contact member 16 must be obviously insulated from the housing. In any case, the contact member 16 has a circuit wire C attached thereto.

It is here noted that as far as the present invention is concerned, the lock itself may be of different precise details of construction, but, in any case, the invention is characterized by the actuation and control of the signal means directly by and with at least one of the lock tumblers. In this connection, too, the form and position of the contact member 16 may also be changed in some adaptations of the invention.

Normally, with the key 20 removed from the lock (see Figures 3 and 4) the contact member 16 projects with ample clearance into ample-space opposite the retracted opposed tumbler 15 and free of engagement with the housing 10. Thus, when the key 20 is inserted, the correlated tumbler 15 is moved into contact with the contact member 16, thereby completing an electrical circuit of a signal device which may be an audible one, such as a bell, buzzer or the like, or else a visible one, such as a lamp or an illuminable sign or the like. In the showing, the complete circuit is through the wire C, contact member 16, tumbler 15, cylinder 13, a switch element 18 to be presently described in more detail, a wire D, battery B which may be the regular storage battery on the car or a special one, as may be desired, and a signal device A, which may obviously be audible or visible, back to the wire C. This circuit is illustrated in diagram in Fig. 6.

It is to be understood that when the lock is in normal position, with the key 20 removed, the signal circuit is broken and the signal A will not sound or be seen, as the case may be, but, when the key 20 is inserted, the signal will sound or be observed, and until the tumbler cylinder 13 is rotated to close the ignition switch or for some other useful effect for which the lock is provided.

Obviously, some suitable and approved provi-

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sion must be made so that the contact member 16 is not in electrically conductive contact with the tumbler cylinder 13 when the latter is rotated as indicated in Figure 5 to move the tumbler 15 out of electrically conductive engagement with said contact member 16. This is accomplished by either cutting away or grooving the adjacent peripheral portion of the cylinder 13 and leaving the same open so as not to be engaged by the member 16, or otherwise by filling in this cutaway or grooved portion of the cylinder with a suitable insulation material.

In this connection, it is noted that, in the showing, a restricted open channel or space is provided alongside of the diametrical opening in the cylinder 13 where the tumbler 15 is located and operates. This is for the reception of a spring 21 which is held in place by a longitudinal wire 22 fastened in place on the cylinder. The spring 21 exerts a constant force upon a lug 15a on the adjacent side of the tumbler 15, to normally maintain the tumbler in a downwardly retracted position until it is raised by the insertion of the key 20 in the lock. Therefore, the provision of this spring-accommodating channel or space affords at its top ample clearance to prevent engagement of the contact member 16 with the tumbler cylinder 13 in its rotated position as caused by the turning of key 20 as shown in Figure 5.

Obviously the several tumblers 15 have rectangular openings 23 therethrough for the passage of the key 20 and for permitting operation of the tumblers.

The ignition switch to which the lock is applied in use may be of any conventional or desired type. That shown is of a well-known standard make. Suffice it to say that the tumbler cylinder 13, as shown, has a boss 17 at its inner end engaging the head portion 18a of the switch device 18b which is thus caused to rotate on its base 18 when the key 20 is turned by the hand of the operator.

The details of the switch are not shown in the drawings as the same, per se, are not a part of the present invention. So, too, the ignition system is not shown in the drawings for the same reason. In the drawings (see Figures 1, 3 and 6) only one wire E of the ignition system and another wire F which leads to a panel gage or the like on the dashboard, is shown.

From the foregoing it is apparent that a practical and efficient signal provision is produced to indicate that a key is inserted in a lock and to indicate that the same is not removed after use. This is especially applicable and desirable in connection with an ignition system of an automobile to prevent such oversight as that of leaving

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the key in the lock of a parked automobile and the possible theft of same or other unauthorized use thereof. It is also useful for locks in general to warn one that the key is left in the lock, after the latter has been actuated to a position whereby the key may be withdrawn.

While the illustrated provision and arrangement is a practical exemplification of the invention, the same is not a limitation, as modification and change is contemplated within the spirit and scope of the appended claims.

What is claimed is:

1. In a lock having a housing and a rotatable tumbler cylinder in the housing, an electrical contact member on the housing in opposed relation to the tumbler cylinder as a part of a normally open electrical signal circuit, at least one tumbler of the cylinder, in addition to normally holding the cylinder from rotation in the housing, engaging electrically with said contact member so as to close said signal circuit upon insertion of a key into said cylinder in the normal position of the same and the said engagement continuing until the key is withdrawn while the cylinder is in such position.

2. A lock provision as set forth in claim 1, wherein the cylinder-holding effect of the tumbler is broken and a turning of the key still inserted and the consequent rotation of the cylinder moves the tumbler out of engagement with the contact member, thereby breaking the signal circuit until said cylinder is rotated back to normal position by said key.

3. In association with an electric signal of an electric circuit, a lock having tumblers which respond to key action, one of said tumblers being in correlation to a contact member of said electric circuit for the signal but normally out of engagement with said contact member, a key insertable in the lock in the normal condition of the same and when inserted being effective in releasing the tumblers from holding effect and moving the contact-engaging tumbler into engagement with said contact member, and a turning of the inserted key causes a disengagement of the tumbler from the contact member.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,330,206	McQuarrie	Feb. 10, 1920
2,215,162	Scott	Sept. 17, 1940