S. TIDEMAN AND J. W. ANDERSON.

ELECTRIC SWITCH LOCK.

APPLICATION FILED JULY 12 1918.

1,310,514.

Patented July 22, 1919.

2 SHEETS—SHEET 1.

Fig. 1

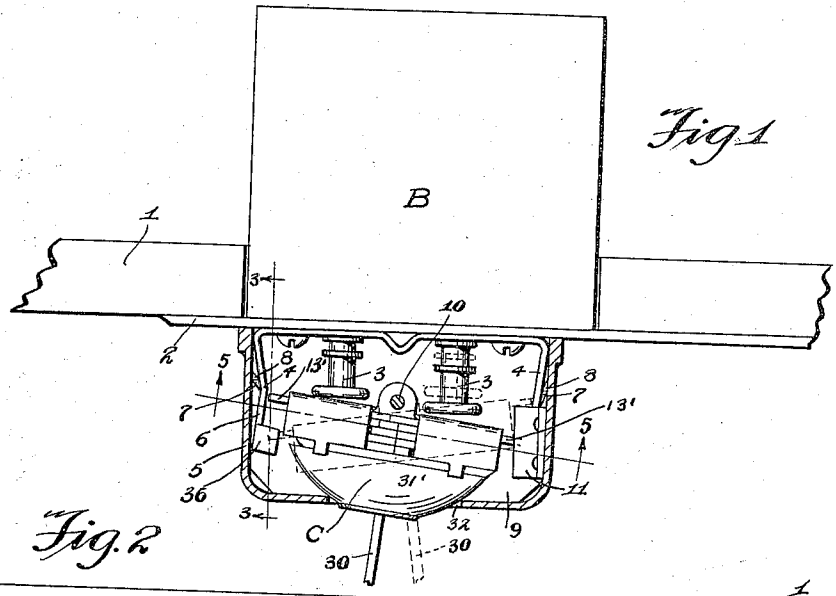


Fig. 2

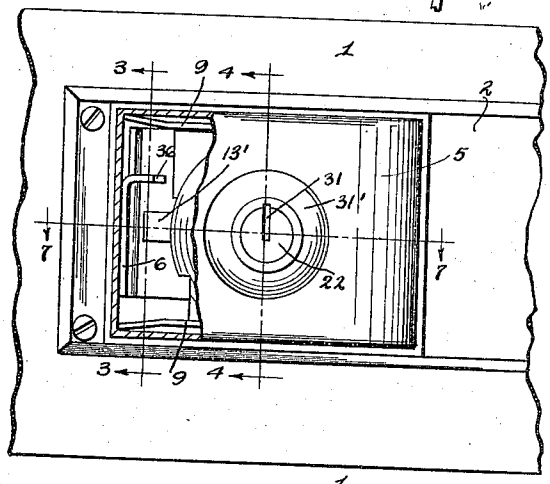


Fig. 3

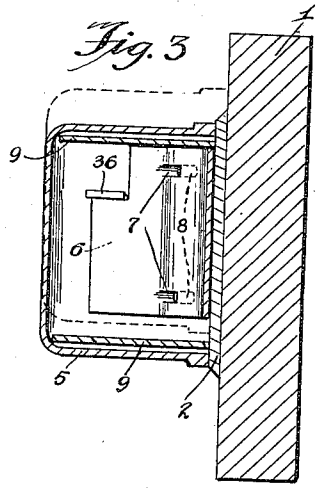


Fig. 9

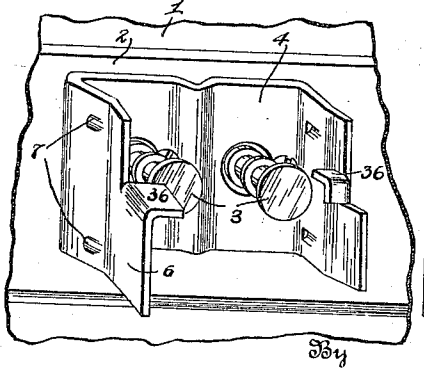
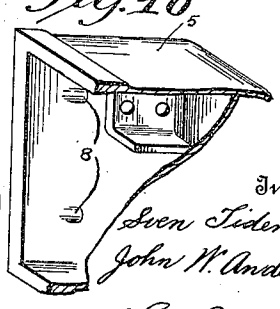


Fig. 10



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ELECTRIC SWITCH LOCK.

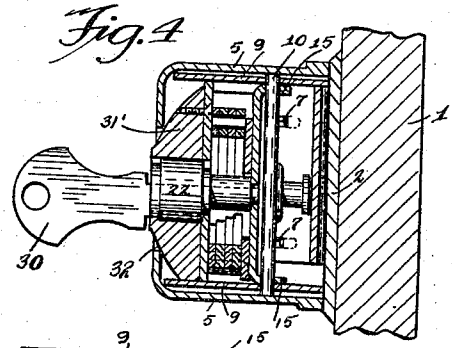
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2 SHEETS—SHEET 2.

Fig. 4



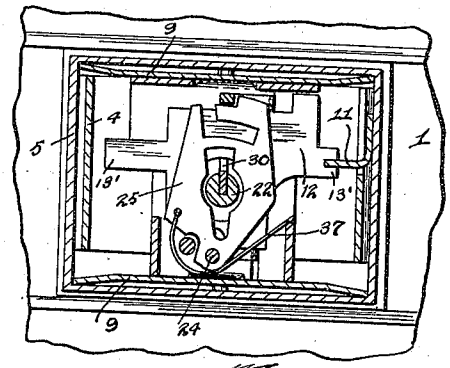


Fig. 5

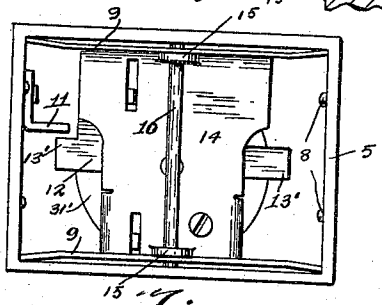


Fig. 6

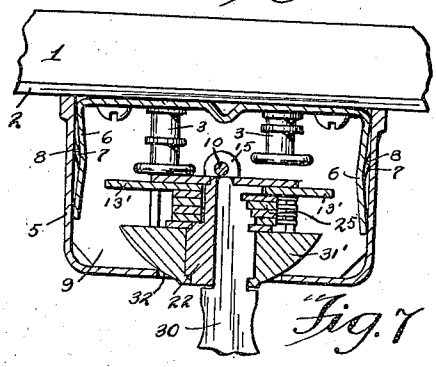
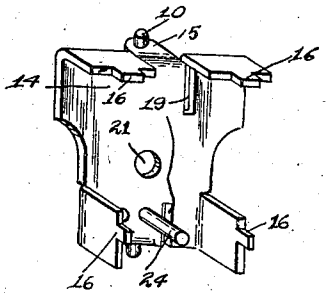
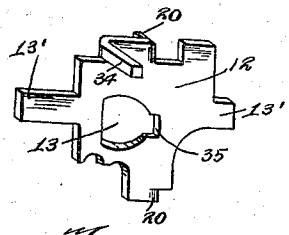


Fig. 7





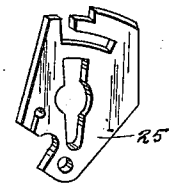
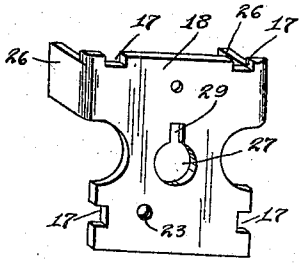
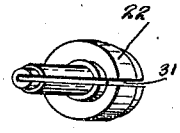
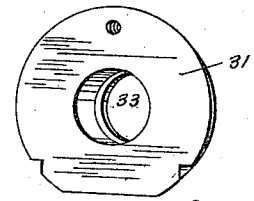


Fig. 8







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SVEN TIDEMAN AND JOHN W. ANDERSON, OF COLUMBUS, OHIO.

ELECTRIC-SWITCH LOCK.

1,310,514. Specification of Letters Patent. Patented July 22, 1919.

Application filed July 12, 1918. Serial No. 244,668.

To all whom it may concern:

Be it known that we, SVEN TIDEMAN and JOHN W. ANDERSON, citizens of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Electric-Switch Locks, of which the following is a specification.

This invention relates to switch locks, and has for its primary object to provide a novel and improved structure for preventing the operation of a switch, or other similar controlling device, by unauthorized or unscrupulous persons.

One special object of the invention is to provide a locking structure in connection with the circuit controlling mechanism of an automobile, whereby during the absence of the vehicle owner or operator said mechanism, through the application of this locking structure, may be locked and maintained in a circuit opening position, and to thereby prevent theft or illegal use of the vehicle consequent to the absence of its respective owner or operator.

The invention consists in the features of construction, combination of elements and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereunto appended.

In the drawings:

Figure 1 is a horizontal sectional view taken through the switch locking structure comprising the present invention, and illustrating the same as applied to an automobile switch board.

Fig. 2 is a front elevation of the locking structure.

Fig. 3 is a transverse, vertical sectional view taken along the line 3—3 of Fig. 1, and disclosing more particularly the means for locking the casing of the structure to a switch-board.

Fig. 4 is a similar view taken along the line 4—4 of Fig. 2.

Fig. 5 is a vertical longitudinal section taken along the line 5—5 of Fig. 1.

Fig. 6 is a rear view of the locking structure.

Fig. 7 is a horizontal sectional view, the plane of which being disclosed by the line 7—7 of Fig. 2.

The remaining figures are detailed views of the locking structure.

Similar characters of reference denote corresponding parts throughout all the views of the drawings.

Referring more particularly to the drawings, the numeral 1 represents the visible parts of a switchboard, the latter being one of the kinds to which this invention is applicable. To the inside of a base plate 2, connected with the switchboard, there is usually applied any preferred type of switching mechanism B, which is actuated, in this instance, by the use of switch buttons 3, the mechanism is not fully represented in the drawings chiefly because it is a marketable device of various makes and designs and it is no part of this invention in a strict sense, but only becomes connected with it by application and through the medium of the base plate 2 and the push buttons 3, which are here shown.

A U shaped bracket 4 is intended to be securely fastened to the switchboard or base plate 2 by screws or other suitable means, and has for its purpose to hold the casing 5 with its contents securely fastened to the said base plate, and which latter carries the electric or switch operating push buttons 3, whose operation, guarding and protection is the object of this invention, and to do this in a manner that does not admit of the removal of the structure from the said base plate without the use of a proper key.

To this end the forwardly projecting arms 6 of the bracket 4 are provided with outwardly projecting lips 7, which engage with similar oppositely positioned lips 8 formed within the casing 5. For the purpose of effecting the engagement of said lips, after the bracket 4 has been fastened to the base plate 2, the vertical size of the said bracket is reduced at its lower end to less than the corresponding size of the casing, by an amount equal to the width of the lips 7 and 8, while each of the engaging pair of lips on said bracket engagement are at an equal distance from the upper line of contact between the bracket and casing. From this it results that the casing 5 can be fastened to the base plate 2 by slipping it over the projecting arms of the bracket 4 in such elevated position that its lips 8 pass by and above those of the bracket 4 until they are in alinement, when a sliding movement downward on part of the casing brings the parts into interlocking engagement, as best shown

in Figs. 3 and 7. The locking of the casing in this position is described farther on in this specification.

The numeral 9 represents a pair of fulcrum plates, made to fit the inside of the casing 5, and having holes pierced in their center line for the reception of the pivot 10, on which the lock C oscillates. While the pivoting might be directly accomplished in the walls of the casing itself, the use of the fulcrum plates aforementioned is deemed preferable because this allows the casing to become a protection for the pivots from outside violence, thus conducing to greater safety, and because of this arrangement it is possible and convenient to insert the lock in the casing or remove it for inspection or other reasons, thus facilitating both its manufacture and use.

The outer casing 5 serves to protect the interior parts thereof in their positions and functions, and is designed to interlock with the bracket 4, as has been already described. To the inside of the casing there is fastened an L shaped bracket 11, positioned to be engaged by a lock bolt 12 and fashioned to secure the lock, as will be presently explained. The purpose of the aperture 13 therein is to provide place for the entrance and movement of a key.

The lock proper, a key operated lock, is provided with the linear fulcrum 10 on which it oscillates and has the flat bolt 12 thereof provided with sideway extensions or wings 13′ to function in the locking, and the bolt 12 as a whole is movable in parallel with the vertical line of the lock. With these provisions preserved, the inner mechanism of the lock might be either one of several types, the one chosen being in conformity with a system well known for its effectiveness, and to serve the purpose here set forth is especially designed as follows:

The numeral 14 represents the back plate, on the center line at the ends of which there are provided ears 15, which are bent backward to receive the pivot pin 10, on which the lock operates. The extending parts of the plate 14 at the upper end and at the sides thereof are bent forward at right angles to its plan, and are provided with tongues 16 fitting into notches 17 provided in a front plate 18, whereby the two plates are held firmly in alinement with each other. Guide slots 19 are provided in the plate 14 to receive guide lugs 20 formed with the bolt 12; a circular hole 21 is further provided in the back plate to receive the pivoted end of a key barrel 22 and another hole 23 is formed in the front plate to receive the pintle 24 for the tumblers 25.

The front plate 18, which covers the interior part of the lock, has the notches 17 in its edges for the reception of the tongues 16 on the plate 14, and is provided with wings 26, bent at right angles, and which serve as guides for the movable bolt 12. The circular aperture 27, formed in the front plate, receives the key barrel 22 and the notch 29 at the edge of said aperture allows and governs the insertion and withdrawal of the key 30, inasmuch as this can be done only when the web of said key is in alinement with this notch, through which it must pass, and this is of consequence, as will be seen presently. The key barrel 22 is provided with a guide slot 31 throughout its length for the reception of the key 30.

A curved shield 31′ is fastened in any suitable manner to the front plate 18 and covers, on the inside, the aperture 32 in the casing 5; it holds the barrel 22 in position, allowing it rotary motion; it is provided with a circular opening 33 large enough to allow the insertion and movement of the key 30, and its exterior curve is centered in the line of the pivot 10. The numeral 25 represents one of the tumblers, of which the lock may contain any convenient or suitable number. Guide lugs 20 are fitted into the guide slots 19 in the back plate 14, whereby the direction and limit of movement of the bolt 12 is governed. The numeral 34 represents a projecting stud, carried by the bolt, and on which the tumblers 25 effect the locking and release of the bolt. 35 is the aperture in which the key 30 is inserted to effect the movements of said bolt, and this latter effects the locking conjunctions of the projections 13′ with the catch bracket 11 and the stop lugs 20.

The working of the assemblage, above described, is as follows:

With the key inserted and the lock in an open state, a pressure on the key toward the right brings the lock structure C, or back plate, to bear on one of the push buttons 3 until, consequent to the button's depression, the circuit is broken; then a half circular left hand turn of the key brings the bolt 12 upward into locked position, by forcing one of its wings 13′ to the side of the catch bracket 11, whereby the lock and with it the push button 3 becomes held firmly in this position, and by the same movement the other wing of the bolt 12 comes up against the stop lug 36, whereby the casing 5, with lock and all, becomes held in position and cannot be removed. The key is now in alinement with the notch 29 in the plate 18 and may be removed. The tumblers, actuated by their springs 37, lock the bolt at its projecting stud 34, and thereby holding it in position until released by the proper key.

By again inserting the key and giving it one-half of a circular turn, right hand, the bolt moves downwardly to an unlocked position, then by a sideward pressure on the key the lock structure can now be swung over to the left, thereby depressing the other of said

buttons 3 and releasing the coöperative button, by which operation the switch closes the circuit, and allows an electrical current to pass therethrough and to perform its function.

As may be seen in the drawing, the shape of the apertures in the bolt 12 and the tumblers 25 is such as not to allow the key to turn a complete circle; after insertion the key can be turned only about one-half of a right hand turn, necessary to unlock the structure, when it becomes held in the lock until by an equal left hand turn, bringing the bolt back again into position of locking, the key regains alinement with the notch 29 and may then be removed. Also, that the catch bracket 11 is so designed and positioned as to prevent the bolt from being moved upward into position of locking until the lock structure is oscillated so far to the right as to allow the bolt passing under said bracket and there held, when, by the same movement of the bolt structure, the push button 3 has been brought down to the position of open circuit, whereby the electric current is shut off. By this combination, two related and joined objects are obtained, to-wit: When the lock is open, the electric current working, and the owner's or operator's attention directed elsewhere, the key cannot be lost or stolen, and when the locking is to be performed, this can only be done after the lock structure has been swung its full predetermined distance to the right. Thus it cannot be left accidentally unlocked or in the wrong position when the key is removed, but must be locked, with the current shut off, before the key can be removed.

It may be observed that the bolt performs two distinct functions simultaneously: By its hold on the catch bracket 11, it holds the switch locked in an open condition, and by its pressure against the stop lug 36 it locks the casing 5 with all its contents in an immovable position. Also that the casing leaves no access to screws or other fastenings by the removal of which access to the switch button might be gained by persons not intrusted with the proper key.

It will be understood that the invention is not limited in its scope to the precise details above described, such as its use in connection with automobiles, or the peculiar method employed for constructing its several parts, but that the same is equally applicable to other forms of switches or power governing devices and may be constructed in such manner as will fall within the ambit of the following claims.

We claim:

1. In locking mechanism of the class described, the combination with an electric switch structure, an interlocking bracket carried by said switch structure, a casing adapted to be connected with said bracket, and an oscillatory switch operating lock mounted within said casing and adapted to engage with the manipulating portions of said switch structure, and means for preventing the oscillation of said lock and the removal of said casing from said bracket when said operating lock assumes a predetermined position within said casing.

2. In mechanism of the class described, the combination with a circuit controlling structure and its spaced slidable actuating members, of means for operating and locking said members, comprising a pair of supporting elements protruding from said structure, a casing having an open side arranged to fit over and to be supported by said elements so as to enhouse said members, a lock structure pivotally mounted within said casing and having its operating extremity located within an opening formed in the front of said casing, the fulcrum of said lock structure being substantially situated between and at a right angle to the axes of said members, whereby upon the oscillation of said lock structure said members may be selectively actuated to open or close their associated circuit, and means for locking said lock structure in a circuit opening position and to simultaneously lock the casing in secured relation, when in said latter position, with its supporting arms.

3. In mechanism of the class described, the combination with a circuit governing switch and its slidable operating members, of means for operating and locking said members, comprising a pair of spaced and shouldered arms protruding outwardly from said switch, a casing supported by said arms and arranged to enhouse said members, a fixed abutment formed interiorly of said casing, an oscillatory lock structure pivotally mounted within said casing and arranged to selectively engage with said members to control their sliding actuation, and a locking plate coöperatively carried by said structure and arranged to engage with said casing abutment to lock said structure in a circuit opening position and to simultaneously cooperate with a shoulder of said arms to lock the casing in connection therewith.

4. In mechanism of the class described, the combination with a circuit governing switch and its spaced and slidable operating members, of means for operating and locking said members, comprising a pair of spaced arms protruding outwardly from said switch, locking projections formed with said arms, a casing arranged to enhouse said members and supported by said arms, offset lips formed upon said casing for engagement with certain of said projections to secure the casing to said arms, an oscillatory lock structure mounted within said casing on a vertical fulcrum substantially located between said members, whereby said struc-

ture upon oscillation will selectively bear upon one or the other of said members to open or close their associated circuit, a fixed abutment situated interiorly of said casing, and a plate slidably operated by said lock structure and serving, when said structure assumes a circuit opening position, to engage with said casing abutment to lock said members in their circuit opening position and to simultaneously coöperate with one of said arm projections to lock the casing in connection with said arms.

5. In mechanism of the class described, the combination with a circuit governing switch and its spaced and slidable operating members, of means for operating and locking said members, comprising a pair of spaced arms protruding outwardly from said switch, locking projections formed with said arms, a casing arranged to enhouse said members and supported by said arms, offset lips formed upon said casing for engagement with certain of said projections to secure the casing to said arms, an oscillatory lock structure mounted within said casing on a vertical fulcrum substantially located between said members, whereby said structure upon oscillation will selectively bear upon one or the other of said members to open or close their associated circuit, a fixed abutment situated interiorly of said casing, a plate slidably operated by said lock structure and serving, when said structure assumes a circuit opening position, to engage with said casing abutment to lock said members in their circuit opening position and to simultaneously coöperate with one of said arm projections to lock the casing in connection with said arms, and a key for operating said structure and means provided with the latter to permit of the withdrawal of said key from its position within said structure only when the latter assumes a circuit opening position.

In testimony whereof we affix our signatures.

SVEN TIDEMAN.
JOHN W. ANDERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."