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ELECTRIC SWITCH LOCK

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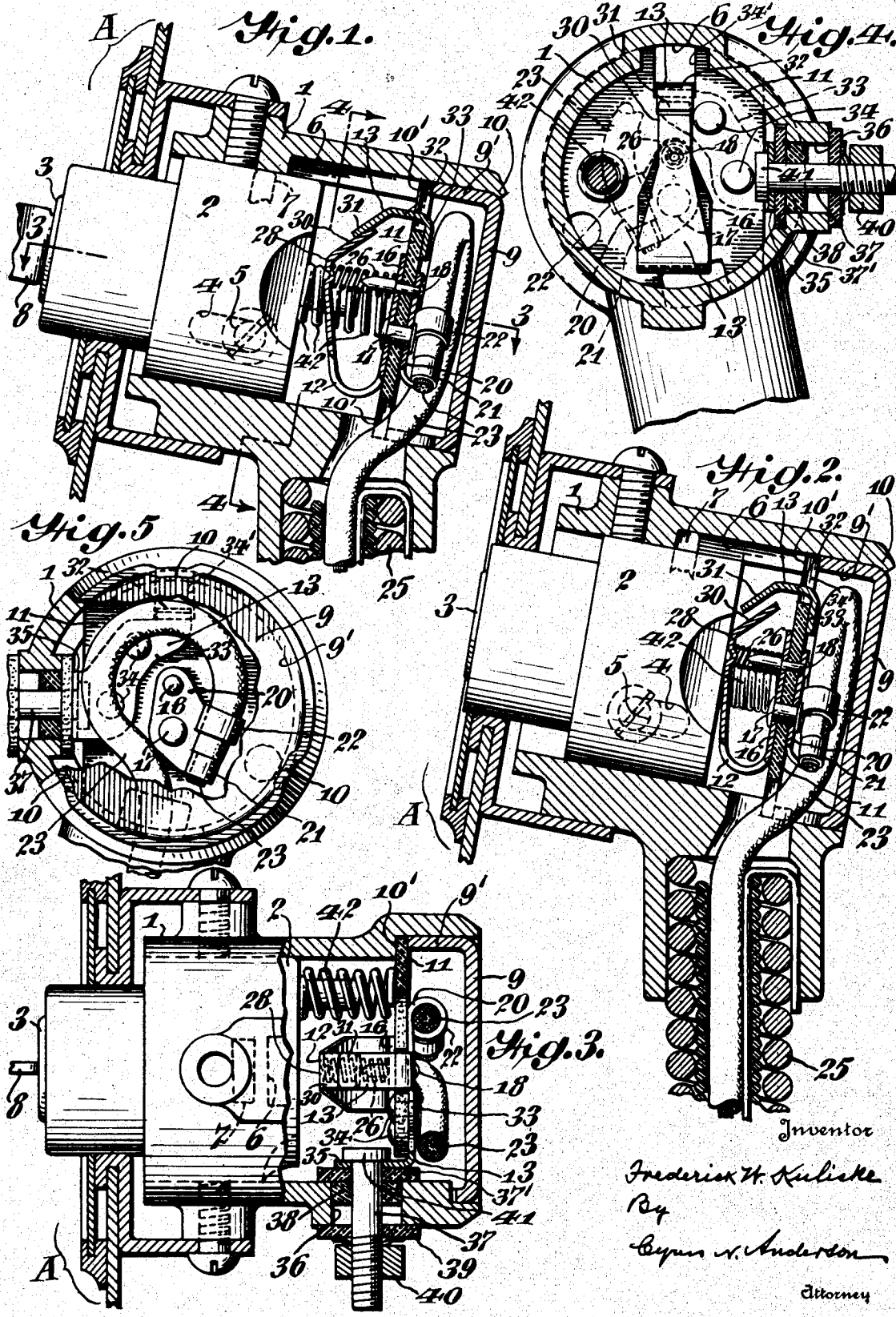

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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH LOCK

Application filed March 1, 1930. Serial No. 432,347.

My invention relates to electric switch locks and it has for its general object to provide a novel construction wherein the switch contacts are so related to a movable part of a lock structure that movement of the said part into and from locking position operates to open and close the said switch.

It also is an object of the invention to provide a novel but simplified construction of electric switch lock in order that the cost of construction may be reduced to a minimum without, however, detracting from the efficiency of the same.

To the foregoing and other ends my invention comprehends the construction and arrangement of parts as hereinafter described in detail, particularly pointed out in the claims and as illustrated in the drawing, wherein is shown a preferred embodiment of construction embodying the invention. However, it will be understood that the invention may be embodied in other forms of construction than that shown and that changes in the details of construction within the scope of the claims may be made without departing from the invention.

In the drawing:

Fig. 1 is a view in central vertical longitudinal sectional elevation of an electric switch lock embodying the invention and also showing an adjoining portion of a support therefor;

Fig. 2 is a similar view with the locking means in different position from that in which it is shown in Fig. 1;

Fig. 3 is a longitudinal view in sectional elevation, the sectional portions being taken along the line 3—3 of Fig. 1;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 1; and

Fig. 5 is a view partly in bottom plan and partly in transverse section.

In the drawing I have shown a lock casing 1 within which is slidably mounted a lock cylinder 2 within which is mounted the usual barrel 3. The movement of the lock cylinder 2 within the casing 1 is limited by means of a slot 4 in the side of the said cylinder, with which engages the inner end of a screw 5. The casing 1 is provided with a slot or elongated notch 6 upon its inner side with which the locking bolt 7 is adapted to engage when the lock is pushed into its innermost locking position as indicated in Fig. 2 of the drawing. The locking bolt is adapted to be withdrawn from the slot or notch 6 by means of a key 8 as usual. The casing 1 is adapted to be mounted by any suitable means and in any known manner upon a support A, such for example as the instrument board of an automobile. While the device of the invention has been designed primarily as a locking means for automobiles it is apparent that it may be utilized as a lock for machines or apparatus of other types.

The inner or bottom end of the casing 1 is closed by means of a plate 9, the outer edges of which are flanged as indicated at 9′. The plate 9 and its flange 9′ are inserted into the open inner end or bottom of the casing 1, after which the edges of the said casing are crimped or indented as shown at 10. The projections thus formed engage the outer edge of the plate 9 and retain it permanently in place. Interposed between the inner edge of the flange 9′ and an annular shoulder 10′ upon the inner side of the casing 1 is a disc 11 of insulating material upon which are mounted the contacts 12 and 13 for opening and closing an electric circuit. One of these contacts comprises a strip of suitable resilient metal bent to yoke shape as shown, one side of which constitutes a base 16 which is secured by means of metal rivets 17 and 18 to the top or inner side of the disc 11 of insulating material. The said rivets also operate to secure or fasten to the opposite or bottom side of the disc 11 a metal strip 20 having spaced projections which are bent into loops or eye portions 21 and 22 within which one end of a conductor 23 is mounted and secured. The said conductor 23 may extend to the timer-distributor mechanism (not shown) of an ignition system for automobiles. The portion of the said conductor between the lock switch casing 1 and the time distributor of such a

system should be protected by an armor 25 of suitable tough metal.

The inner end of the rivet 18 is extended as indicated to form a support for a coiled spring 26, the inner end of which is seated upon the base 16 and the outer end of which is seated against the inner or under side of the portion 28 of the contact 12. The normal tendency of said spring is to expand so as to hold or tend to hold the portion 28 of the yoke-shaped contact 12 in its outermost or closed position. The free and movable end of the portion 28 of the said contact is provided with a projection 30 which extends inwardly toward the bottom of the casing 1 of the switch lock and in outwardly inclined relation or direction with respect to the axis of the structure. The said inclined portion 30 constitutes the contacting portion of the yoke-shaped contact member 12 and is located in co-operative relation with respect to a portion 31 of the contact 13 similarly inclined in the opposite direction. The contacting part 31 terminates inwardly of or below the portion 28 so that the lock cylinder 2 may contact with the said portion 28 to depress the same without contacting with the part 31 of the contact 13. The portion 31 projects toward the top or outer end of the switch lock structure from a projection 32 which springs from a base portion 33 which is secured by means of rivets 34 upon the bottom or inner side of the disc 11. The projection 32 extends through a notch 34′ in the edge of the disc 11. The base portion 33 is provided with a lug or projection 35 which extends outwardly in adjoining co-operative relation to the inner end of an opening 36 through the casing 1 through which a binding post 37 extends. The binding post extends through an opening through the lug or projection 35 and through openings provided in an inside washer 37′, a bushing 38 located in the opening 36, and an outside washer 39, all three consisting of insulating material. A conducting wire is adapted to be fastened to the outer end portion of the binding post 37 and held thereon by means of a clamping nut 40 which also clamps and holds the head 41 of the binding post 37 against the projection 35 as shown.

Normally the portion 28 of the yoke-shaped contact 12 tends to occupy its outermost position in which the inclined extension 30 thereof will contact with the contact portion 31 of the other of the said contacts 13. The presence of the spring 36 insures that the portion 28, when permitted to do so, will move outwardly so as to cause the portion 30 to contact with the portion 31.

When the locking bolt 7 is disengaged from the shoulder at the outer end of the notch 6 a coiled spring 42 causes outward or forward movement of the lock cylinder 2 into the position in which it is shown in Fig. 1 of the drawing. The tendency of the spring 42 normally is to expand, and when the lock is in locked position, as shown in Fig. 2, the said spring is compressed so that upon release of the locking bolt 7 the lock cylinder is moved quickly forward or toward the front of the device. Such movement permits similar or like movement of the portion 28 of the yoke-shaped contact 12 so that the inclined extension 30 thereof contacts with the portion 31 of the contact 13 to close the circuit of which the contact elements constitute a part.

When the lock is in unlocked position the bottoms or inner ends of the cylinder and of the barrel within the cylinder are held outwardly or toward the front of the device in spaced relation to the member 28, so that when the circuit is closed by contact of the contacts 12 and 13 it may not be grounded by the contact of the member 28 with the lock. When, however, the movable part of the lock structure has been moved into locking position it contacts with the portion 28 and remains in contact therewith until released. When in such position the conductor 23 (which may have connection, as stated, with the timer distributor of an ignition means) is grounded through the lock structure and the support upon which it may be mounted.

It will be seen that by my invention I have provided an electric switch lock of extreme simplicity and of a character such that it may be manufactured at a minimum of expense or cost; and also it will be seen that I have provided a structure in which a high degree of protection is afforded because of the protection of the conductor 23 by means of a protecting element 25. When the locking means is in locked position, and assuming the device is employed as an automobile switch lock, it will be apparent that the switch cannot be closed to close the circuit to operate the automobile except by a person having a key for withdrawing the bolt 7 from the notch 6 to permit the spring 42 to shift the lock cylinder to its outermost position.

It will be apparent that the contacts 12 and 13 may be of other shapes or constructions than as shown; it being essential only that one of the contacts shall be moved out of and into contact with the other by the action of the movable part of the lock thereon upon its movement into and out of locking position.

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. In an electric switch lock having a casing and a lock cylinder mounted therein movable longitudinally thereof from an un-

locked position to a locked position and vice versa, the combination in a switch, of a closure for said casing mounted in the rear end thereof and two contact arms mounted on said closure and insulated from said casing, one of said arms being relatively rigid and the other of said arms being relatively flexible and normally being in circuit closing contact at its free end with the free end of said rigid arm, said rigid arm being at all times out of the path of the movement of said cylinder and said flexible arm being offset toward said cylinder and in the path of the movement of said cylinder and engaged by said cylinder as the latter nears its locked position and moved by said cylinder and held out of contact with said rigid arm by said cylinder and grounded by its contact with said cylinder and so long as said cylinder is in its locked position.

2. In an electric switch lock having a casing and a lock cylinder mounted therein and movable longitudinally thereof from an unlocked position to a locked position and vice versa, the combination in a switch, of a closure for said casing irremovably mounted in the rear end thereof and two contact arms mounted on said closure and insulated from said casing, one of said arms being relatively rigid and the other relatively flexible, the free ends of said flexible arm being inclined inwardly toward the axis of said cylinder and being normally in circuit closing contact with the free end of said relatively rigid arm, said ends of said arms being parallel, lying flat against each other in closed position, said rigid arm being at all times out of the path of the movement of said cylinder and said flexible arm being offset toward said cylinder and lying in the path of the movement of said cylinder for engagement by said cylinder as the latter nears its locked position and moved out of contact with said rigid arm by said cylinder when and so long as said cylinder is in its locked position.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 27th day of February, A. D. 1930.

FREDERICK W. KULICKE.