

W. R. COX.
AUTOMATIC LOCK SWITCH.
APPLICATION FILED AUG. 4, 1910.

1,015,300.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 1.

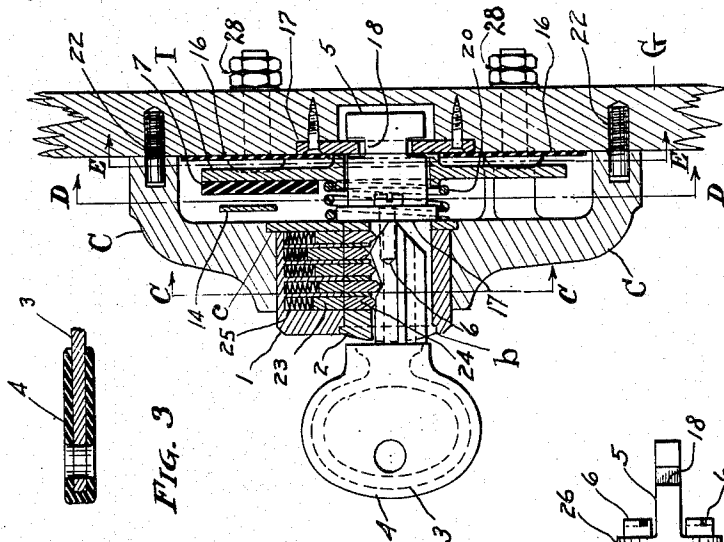


FIG. 3

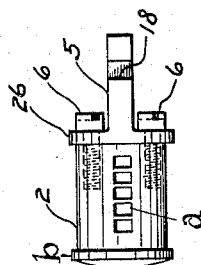


FIG. 4

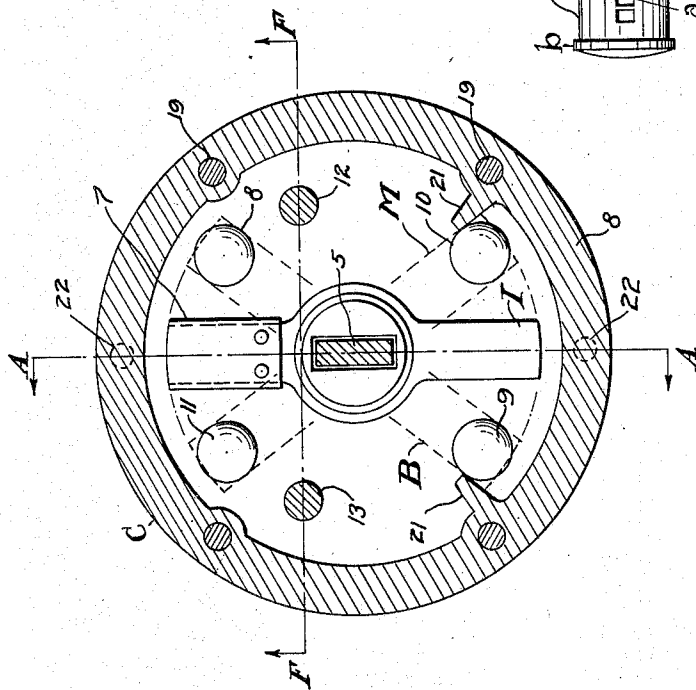


FIG. 1

Witnesses
E. M. Fisher
J. C. Munn.

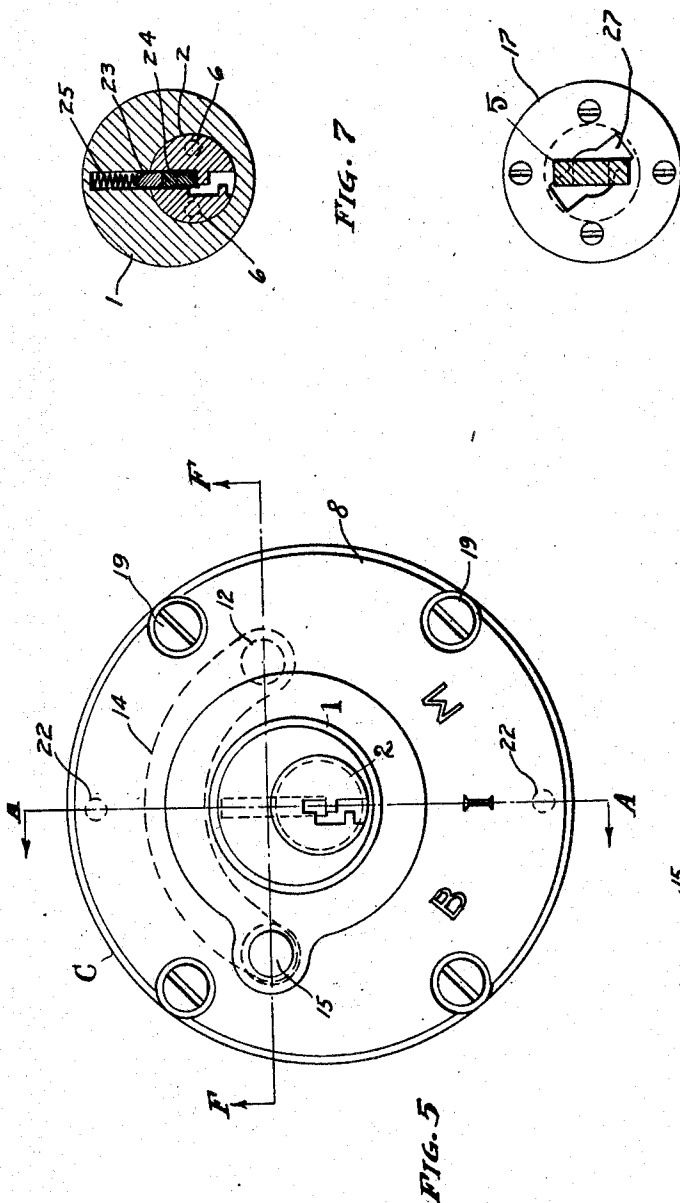
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By Fisher & Munn
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 WARREN R. COX
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UNITED STATES PATENT OFFICE.

WARREN R. COX, OF CLEVELAND, OHIO.

AUTOMATIC LOCK-SWITCH.

1,015,300.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed August 4, 1910. Serial No. 575,451.

To all whom it may concern:

Be it known that I, WARREN R. COX, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Automatic Lock-Switches, of which the following is a specification.

My invention relates to an automatic lock switch for spark coils in automobile engines, and the object of the invention is to provide means in and through the usual switch which will effectually lock the same out of possible circuit with either the battery or the magneto, and wherein the operator has exclusive control of the device by means of a key by which the locking is effected and which he can remove and take away with him, thus locking the electric circuit open. In this connection it is to be understood that I come to the usual electrical devices employed in automobiles for sparking purposes and in which there generally is a battery and a magneto and a switch for making contact with either in the spark circuit. My invention is an adaptation to these instrumentalities and is planned to make the least possible change in such devices consistent with the practical incorporation therewith of the safety locking mechanism in which my invention consists.

In the accompanying drawings, Figure 1 is a cross section of the device corresponding substantially to line D—D, Fig. 2, and Fig. 2 is a cross section corresponding to line A—A, Fig. 1. Fig. 3 is a section of the insulated portion of the key and Fig. 4 is a side elevation of the part or member described as the barrel in which the key operates. Fig. 5 is a front elevation of the device, and Fig. 6 is a cross section corresponding in the main to line F—F, Figs. 1 and 5. Fig. 7 is a cross section of the housing and barrel corresponding to line C—C, Fig. 2, and Fig. 8 is a cross section corresponding to line E—E, Fig. 2, excepting that this section relates particularly to the two inner portions of the device indicated by 5 and 17 respectively as hereinafter fully described.

To these ends the construction shown comprises a so-called cap or case C adapted to be secured by bolts or screws or other means to the base G, which, presumably, is a vertical portion in front of the operator's seat and where the switching mechanism is with-

in convenient reach, as usual. The screws 19 serve this purpose. The said case or cap is provided with a relatively large opening through its center in which a housing 1 is located and which carries a rotatable barrel 2. Said housing and barrel are locked together in said casing so that neither can be removed from the outside without first removing the case C and while this locking together of said parts may be effected in any practical way I have for the present provided the said barrel with an annular rib or flange *b* about its outer end seated in a corresponding recess in said housing or hub, while at the inside the barrel is provided with a head 26 secured thereto by screws 6 and which extends laterally far enough to engage against a flat ring *c* interposed between said head and the case C wherein said ring is recessed. The said housing abuts against this ring, and thus while flange *b* confines the housing the said ring and head 26 confine said barrel and the parts are irremovably locked in the case except by removal of the said case. The nature and purpose of these parts will be more clearly apprehended when it is understood that I employ something of the so-called tumbler lock principle in my switch locking mechanism and in which the key 3 is the controlling factor. That is, I use what is essentially a tumbler lock mechanism and key combined with switch —I— for the current, and which is so arranged in respect to the battery contacts 8 and 9 and the magneto contacts 10 and 11, respectively, that the said switch must occupy a neutral or open position between said contacts and hence be out of circuit when the key is inserted or removed. And, having a tumbler key for this purpose with tumblers and plungers to correspond, no other key will answer to open the device and hence absolute security is obtained against operation of the machine by others and the common experience of having machines stolen on the streets and elsewhere is prevented. To these ends the said barrel is provided with an opening through its center adapted to receive the key and with a series of holes *a* in a row through its wall entering said key opening. These holes are preferably square or angular in cross section so as to always keep the tumblers 24 in the same working relation therein, but the tumblers may be round and pointed and work in round holes. The housing 1 has

bores matching the holes *a*, in which are inserted plungers 23 having spiral springs 25 behind the same in said bores. The meeting ends of both plungers and tumblers conform to the rounded surfaces of the barrel and housing where they meet, so that when the said parts are in position and the key 3 is entered the said plungers and tumblers are directly opposite each other and flush with the surfaces of the parts in which they are housed, thus leaving the barrel 2 free to be rotated so that the key can operate the current switch or contact member —I— and which can occur only as said parts are thus operatively related and as shown in Fig. 2. Otherwise the position of the said locking parts is shown in section Fig. 7. In this case, however, the key is removed and the plungers 23 have been pressed inward by springs 25 across the meeting line between barrel and housing and the barrel is locked against rotation. This position can only be relieved by the key which will force the tumblers 24 up in such measure as to release all the plungers from the barrel and free the barrel for rotation. The said plungers and tumblers are of different lengths according to the construction of the key as is now common in tumbler locks and well known.

Operating connection through key 3 with the switch —I— is through a flat sided extension 5 on the inner end of barrel 2 entering a slot in or through the center of the switch and adapted to rotate the switch when the barrel is rotated. Said extension 5 has a substantially T shaped end which enters a recess in base G and passes through a disk 17, Fig. 8, which has a slot 27 at an inclination to a vertical plane through which said head is projected and against the inside of which it is adapted to lock when the barrel 2 is rotated to removing position for the key. Said disk is firmly fixed by screws to said base G and thus makes another effectual means of locking the barrel in place and keeping the switch open even if efforts to gain entrance by releasing the screws for fastening the case C were more or less successful. Further security for said case in any such attempts is provided in or by the blind dowel pin 22 between said case and base G, and still other precautionary means may be employed if found desirable. A spiral spring 20 is interposed between the plate *c* and the switch —I— to hold the switch in right working relations on its support and in respect to the electrical contacts therefor. The key 3 has insulation 4 laid upon its sides as a means of safety to the user.

To start the engine insert key and turn to the right for battery connection and to the left for magneto connection. The key cannot be removed while either connection

is on and the engine is running. When the key is removed the barrel must be rotated to the only position wherein this is possible, and this throws the switch off of all contacts into neutral position.

A push button 15 and an auxiliary spring switch 14 are shown, and the main switch —I— has insulation on its top to prevent contact therewith. The said auxiliary switch is adapted to be depressed by push button 15 and make contact with stud 13 and thus establish the usual short circuit in the battery connections to or with the sparking device (not shown) and cause sparking when the said circuit is broken. The lock housing 1 may have more than one set of plungers 23, so that the key may be also removed at some other predetermined angle so as to be able to remove the key with all circuits open in one case and one particular circuit closed in the other. For instance, the operator may wish to leave the machine standing with engine running, in which case he turns the key to a second battery or magneto position and then withdraws the key. We then have this advantage:—in the ordinary battery or magneto positions the key cannot be withdrawn or rattle out, but in the second or auxiliary circuit the key may be withdrawn. This last mentioned circuit is so arranged that it is closed only when the brake is set and upon release of brake will open or break circuit and stop the engine.

What I claim is:

1. In devices as described, a suitable base and casing, an electrical switch adapted to be oscillated in said casing, a barrel having a flat sided extension operatively engaged with said switch and projecting through the same, a key removably engaged in said barrel and means engaging said barrel adapted to be liberated by the insertion of said key and release the barrel for operation, and means to lock said flat sided extension to said base.

2. In electric switches, a suitable base and a casing fixed thereon, an electric switch in said casing, a barrel adapted to be turned axially having operative engagement at its inner end with said switch and means adapted to lock the said casing securely to the said base when the key to said barrel is withdrawn.

3. An electric switch mechanism comprising a base, a casing fixed on said base, a barrel in said casing adapted to receive a key, a switch engaged between its ends with the said barrel, and means adapted to lock the said casing securely to the said base when the key is withdrawn and to be unlocked only when the key for said lock is set at a certain predetermined position.

4. An electric switch, a casing therefor and a base supporting said parts, a barrel

set in said casing operatively engaging said switch, means to lock the casing securely to the base when the key is withdrawn and dōwels in said casing and base to prevent
5 turning of the casing to release the same from the base.

5. A base and an electric switch and a casing covering the switch, screws securing the casing to the base, a barrel set in said
10 casing to operate said switch and means to

lock the casing to the base when the key is withdrawn comprising an extension rigid with said barrel and adapted to be turned into engagement with said base.

In testimony whereof I affix my signature 15
in the presence of two witnesses.

WARREN R. COX.

Witnesses:

E. M. FISHER,
F. C. MUSSIM.