I. B. SIMMS.

COMBINATION LOCK AND SWITCH.

APPLICATION FILED DEC. 30, 1918.

1,396,667.

Patented Nov. 8, 1921.

2 SHEETS—SHEET 1.

*Fig. 1.*

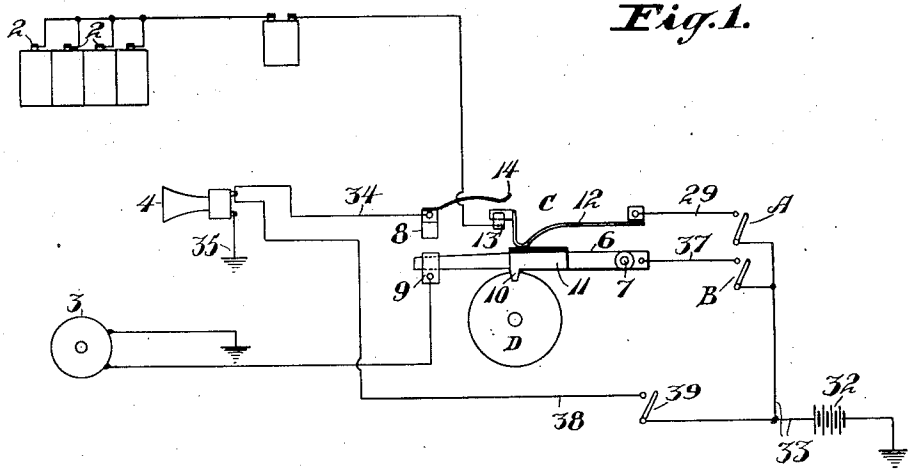
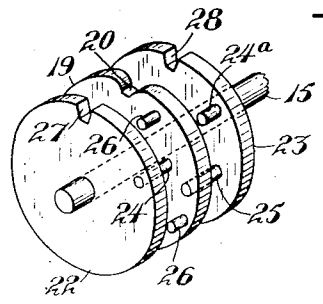



*Fig. 2.*




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2 SHEETS—SHEET 2.

*Fig. 3.*

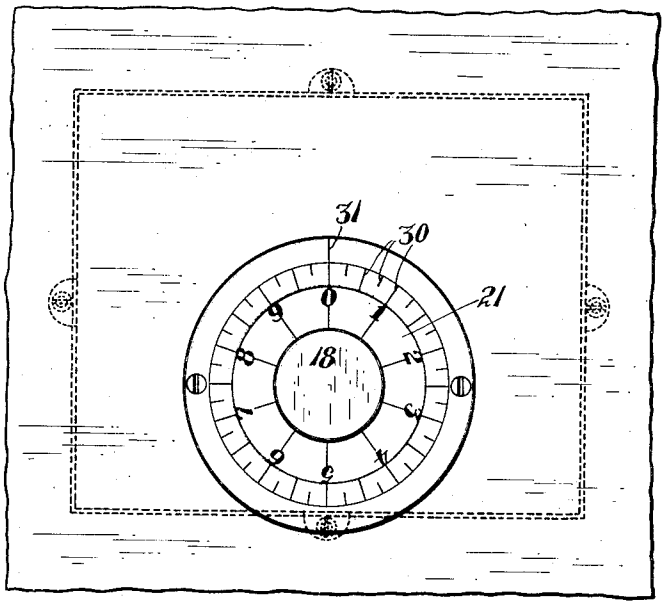



*Fig. 4.*

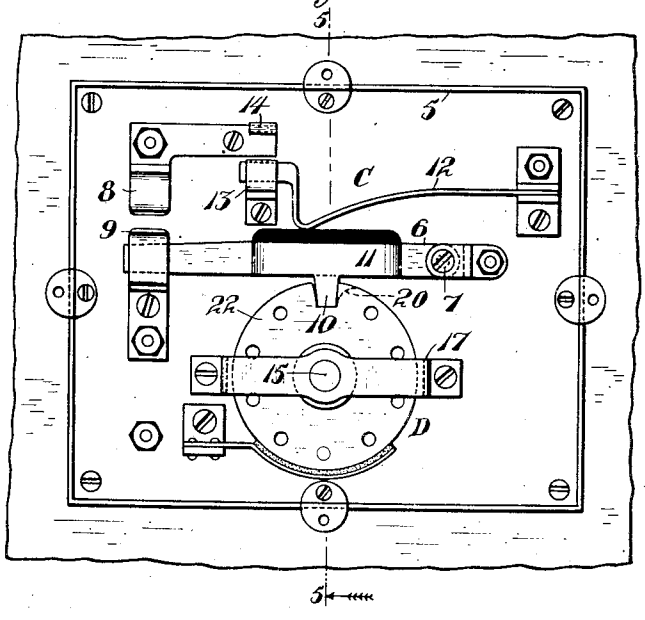
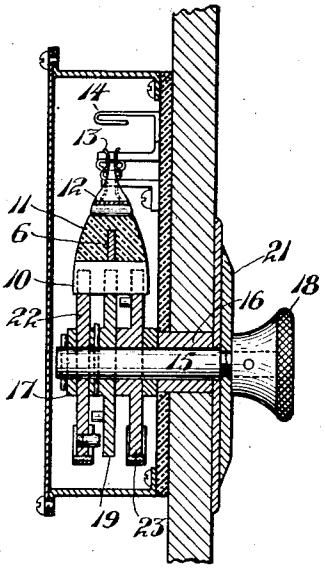



*Fig. 5.*




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# UNITED STATES PATENT OFFICE.

IRWIN B. SIMMS, OF STOCKTON, CALIFORNIA.

## COMBINATION LOCK AND SWITCH.

1,396,667. Specification of Letters Patent. Patented Nov. 8, 1921.

Application filed December 30, 1918. Serial No. 268,800.

*To all whom it may concern:*

Be it known that I, IRWIN B. SIMMS, citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented new and useful Improvements in Combination Locks and Switches, of which the following is a specification.

This invention relates to a permutation lock and switch.

One of the objects of the present invention is to provide a simple, compact switch for automobiles and the like and particularly a switch operable in conjunction with the ignition and starting switches on an automobile, for making or breaking a circuit therethrough.

Another object of the invention is to provide a permutation lock for opening or closing the switch that will prevent the electric current being turned on by a person who has not the knowledge of the right combination.

Another object of the invention is to provide means for sounding an audible alarm if either the ignition or the starting switch is tampered with.

Another object of the invention is to provide means for sounding an audible alarm if the permutation lock is set by the owner of the automobile before leaving the same and the ignition switch is inadvertently left in a closed position, this being provided for the purpose of reminding the owner that the ignition switch should be turned off.

Further objects will hereinafter appear.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic view showing the position of the several switches and also the position of the permutation lock by which they are operated.

Fig. 2 is a perspective view of a portion of the mechanism employed in the permutation lock.

Fig. 3 is a front view of the permutation lock.

Fig. 4 is a similar view showing the cover plate removed.

Fig. 5 is a cross section on line 5—5 of Fig. 4 showing the permutation lock and connection switch mechanism in end view.

Referring to the drawings in detail, and particularly to Fig. 1: A indicates the ignition switch; B the starter switch; 2 the spark plugs on the engine; 3 the starter proper and 4 the horn. Interposed in the circuit between the ignition switch and the plugs 2 and also between the starting switch and the starter 3 is a switch mechanism generally indicated at C. This switch is provided for the purpose of making or breaking the circuit through the ignition and starter switches and is in this instance opened or closed by means of a permutation lock generally indicated at D. The switch C is mounted in a casing 5 and consists of an arm 6 which is pivotally mounted as at 7. The arm 6 serves as a knife switch and is in this instance movable between a pair of contacts shown at 8 and 9. Formed on the arm 6 is a projecting lug 10 and secured on the arm 6 rearwardly of lug 10 is an insulating plate 11. Engageable with the insulating plate is a spring arm 12 which is permanently secured at one end to the casing. The opposite end of the arm also serves as a knife switch and is in this instance movable between a pair of contacts 13 and 14. The switch arm 12 when in engagement with the contact 13 is interposed in the circuit between the ignition switch and the spark plug 2, it is therefore adapted to make or break a circuit therethrough, when the ignition switch is closed. The switch arm 6 is interposed in the circuit between the starter and the starting switch and is therefore adapted to make or break the circuit through the starter when the starting switch is closed. The switch arms 6 and 12 are also provided for the purpose of closing an auxiliary circuit through the horn 4 which will hereinafter be known as the alarm circuit, said circuit being established when the ignition and starter circuits are broken by the switch arms and when either the ignition or the starting switch is tampered with, as will hereinafter be described.

The switch arms 6 and 12 are adapted to operate in unison, that is, they will simultaneously close the ignition and starter circuits or they will simultaneously break said circuits. This is accomplished by means of the permutation lock generally indicated at D. The lock consists of a stem 15 extending through the front of the casing, the stem being journaled at one end of the casing, as at 16, and at the opposite end in a bracket 17. Secured on the outer end of the stem is a knob 18 by which it may be turned, and

secured on the stem, interior of the casing, is a disk 19 in which is formed a cam-shaped notch 20. Also secured on the stem is an indicating dial 21 which is graduated and numbered from 1 to 10. Turnably mounted on the stem, interior of the casing, is a pair of disks 22 and 23 and secured on each of said disks is an inwardly projecting pin 24 and 24ª, there being one pin on each disk. These disks are arranged one on each side of the central disk 19 and are adapted to be turned by said disk. This is accomplished by securing one pin 25 on one side of the disk which is engageable with pin 24ª and a pair of pins 26 on the other side of the disk which are adapted to engage with pin 24.

The disks 22 and 23 are also notched as shown at 27 and 28 and it is necessary that the notches in the several disks register as shown in Figs. 1 and 4 if it is desired to close the circuits through the ignition and starter switches. This is due to the fact that the lug 10 on the switch arm 6 engages the periphery of the disks 19, 22 and 23 and will therefore hold the switch arms 6 and 12 out of engagement with the contacts 9 and 13 unless a register is made with the notches previously described. It is therefore necessary for a person operating the car to know the combination before it is possible to set the permutation lock where the notches will register and the switch arms can engage the contacts 9 and 13.

In actual operation if the circuit is broken through the contacts 9 and 13 and it is desired to close the circuits through the same it is accomplished by turning the knob 18 first in a right hand direction until a certain number on a dial 21 registers with one of the graduations shown at 30, for instance the extended central graduation 31. It is then necessary to reverse the movement of the knob until another number registers with the graduation 31, and then again to reverse the direction of the knob to permit a third number to register with the graduation 31. These operations will bring the several disks into such a position that the notches will register, this being due to the fact that the pins 25 and 26 on the central disk alternately engage the pins 24 and 24ª on the outer disks, said engagement transmitting a turning movement to the said outer disks which brings the notches into alinement, thus permitting the lug 10 to drop into the same and the switch arms 6 and 12 to engage with the contacts. It then will only be necessary for the operator to close the ignition switch A and depress the starter B, or in other words to start the engines in the usual manner.

The operator when leaving the car and desiring to temporarily break the circuits through the ignition and starting switches to prevent the electric current being turned on by a person who has not the knowledge of the right combination, will only have to turn the knob. This causes the cam-shaped notch 20 in the central disk to engage the lug 10 and raise the switch arms 6 and 12 out of engagement with the respective contacts 9 and 13 and it will simultaneously raise said arms to a point where they will engage with the contacts 8 and 14. A circuit through the horn 4 and the ignition and starting switches is thus prepared which is closed if either the ignition or starting switch is closed. This is of considerable importance as it provides an audible alarm which is thrown into operation if either the ignition or starting switch is closed. For instance, after the owner leaves the car and opens the circuit which is controlled by the permutation lock it can readily be seen that an unauthorized person or thief entering the car will most likely first close the ignition switch and then depress the starter switch. Such person would however not be able to accomplish anything as the closing of the ignition switch would not close a circuit through the spark plugs but would only close a circuit through the horn, thus causing the same to sound and attract the attention of by-standers. The circuit through said horn would be closed whether the ignition switch was first operated or the starter switch.

These circuits may be traced as follows:

Current from any suitable source, as the battery 32 here shown passes through wire 33, ignition switch A, wire 29, arm 12, contact 14, contact 8 and wire 34 which is connected with one of the terminals of the horn. The current will then pass through the horn and operate same and the circuit would be completed by passing it to ground connection 35 shown. Therefore the circuit through the horn is controlled by the ignition switch. A similar circuit is also controlled by the starting switch. For instance, a current passing through wire 33 and switch B would pass through wire 37, switch arm 6, contact 8, and wire 34. It will thus pass through the horn to the ground connection, thereby also forming a circuit which would operate the horn if the starter switch B is closed. The horn is in this instance also provided with a permanent connection consisting of wires 33 and 38. Switch 39 interposed on this circuit is normally employed to operate the horn. The circuit through the horn established through the ignition switch, the wire 34, arm 12, contact 14, contact 8 and wire 34 is also employed as a warning for the operator. For instance, if he should leave the car and merely turn the permutation lock and should happen to forget to break the circuit through the ignition switch, then it is obvious that the circuit

through the horn would be established and this would immediately commence operating, the owner would therefore know that either the ignition or starting switch had not been turned off and would thus be reminded, to this extent rendering it impossible to run down the batteries by leaving any circuit closed.

The permutation lock here shown may be changed from time to time on different cars so it would be impossible for one owner to operate another car. Many combinations can be obtained, as it is only necessary to change the position of the dial 21 or to change the position of one or more of the pins 24, 24ª or 26. Again the combination may be changed by varying the position of the notches formed in the disks, or by increasing or decreasing the number of disks employed. I therefore do not wish to limit myself to the specific arrangement and construction shown as it is obvious that many changes may be made without departing from the spirit of the invention.

Similarly, while the switch as here shown is employed in connection with an automobile, it is obvious that it may be interposed on any electric circuit for the purpose of making or breaking said circuit, whether said circuit controls the operation of a motor, a lock mechanism, a signal circuit, burglar alarm or other device.

Furthermore I wish it understood that the materials and finish of the several parts employed may be such as experience and judgment of the manufacturer may dictate.

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

1. The combination with the ignition and starting switches on an automobile of a pair of switches, one connected in the ignition circuit and one in the starting circuit, a permutation lock, means actuated by said lock for opening said switches in unison to break the circuits through the ignition and starting mechanism, and means also controlled by the permutation lock for locking the switches in said open position.

2. The combination with the ignition and starting switches on an automobile of a pair of switches, one connected in the ignition circuit and one in the starting circuit, a permutation lock, means actuated by said lock for opening said switches in unison to break the circuits through the ignition and starting mechanism, means also controlled by the permutation lock for locking the switches in said open position, an electrically operated horn and means carried by each of said last named switches for establishing an electric circuit through the horn, which may be closed, either by the ignition switch or the starting switch.

3. The combination with the ignition and starting switches on an automobile of a second pair of switches adapted to make or break the circuit through the first named switches, means for opening the second named pair of switches in unison, said means also adapted to lock said switches in the open position, and electrically operated audible alarm mechanism connected with an electric circuit, and a pair of contacts in said circuit with which the second pair of switches are adapted to engage when in the open position.

4. The combination with the ignition and starting switches on an automobile of a second pair of switches adapted to make or break the circuit through the first named switches, means for opening the second named pair of switches in unison, said means also adapted to lock said switches in the open position, an electrically operated audible alarm mechanism connected with an electric circuit, and a pair of contacts in said circuit with which the second pair of switches are adapted to engage when in the open position, said second pair of switches when engaging the contacts adapted to prepare a circuit through the alarm mechanism which may be closed or opened by either the ignition or the starting switch.

5. In a wiring system of the class described, an electric source of supply, an ignition circuit and a starter circuit having common returns, a switch in each circuit, a circuit breaker interposed in a lead of each circuit between the switch and place of ignition, and starting motor respectively, said circuit breakers each substantially representing a single pole, double throw switch including means for simultaneous operation and adapted to open the starting circuit and ignition circuit simultaneously, an electrically actuated signal having a return in common with the ignition circuit and starter circuit, said circuit breakers including a pair of contacts disposed so that the free ends of each circuit breaker will engage one of said contacts and a common connection between said contacts and the other side of the signal.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

IRWIN B. SIMMS.

Witnesses:
ALICE HAGERTY,
ROBERT W. BLAIR.