

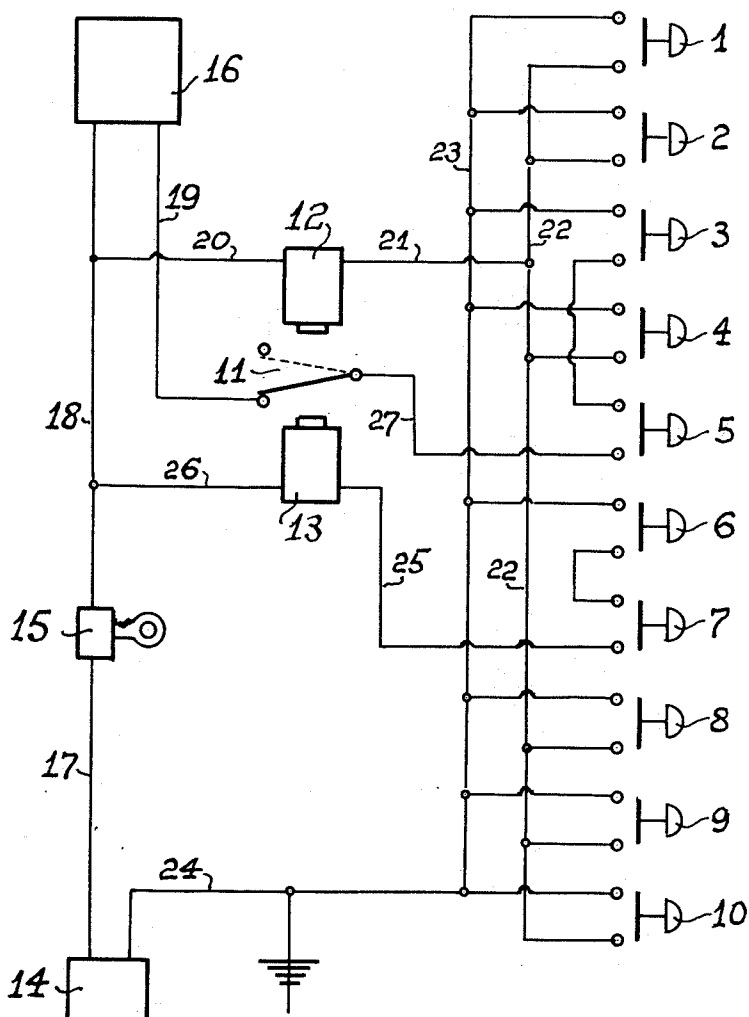
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ELECTRIC COMBINATION LOCK

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**ELECTRIC COMBINATION LOCK**  
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My invention relates to electric combination locks, and more particularly to electric combination locks applied to the ignition system of automobiles for preventing the starting of the engine by a person who is under the influence of alcohol to an extent sufficient to make his driving a source of danger for himself and for others.

It has been established by medical research that an alcohol content of 0.1% in the blood stream, which is considered a mild intoxication, is sufficient to impair the power of perception and the control of the movements of a person so as to make him totally unfit to drive an automobile in traffic. Unfortunately, this mild intoxication is usually accompanied by an exaggerated sense of self confidence and enthusiasm which induces such person to disregard his temporary shortcomings caused by alcohol and to undertake the journey adding another case to the many thousands of highway fatalities due to alcohol. In view of this optimistic state of mind of such intoxicated person these highway fatalities can be prevented only by having a device in his automobile which makes it physically impossible for him to start the engine when he is under the influence of alcohol.

The principal object of my invention is to provide such a safety device which, when applied to the customary ignition system of the automobile, will effectively prevent the starting of the automobile engine by a person exhibiting the typical symptoms of intoxication. According to medical research there are two typical symptoms caused by alcohol, which can be considered as indications that the intoxication has reached the degree at which a person is unfit to drive an automobile in traffic. The first symptom is the imperfect control of the movements of the hands and fingers. The fumbling of the alcoholic when trying to unlock a door is a well known picture. The second typical symptom is the temporary impairment of the memory under the influence of alcohol. These two typical symptoms usually appear simultaneously when the intoxication reaches the degree dangerous from the automobile driving's standpoint. One of them, however, will be entirely sufficient to actuate my safety device so as to prevent the starting of the engine of the automobile.

Another object of my invention is to provide a safety device for the prevention of drunken driving which is so economical to produce and easy to install in the automobile that the authorities will find it justified and reasonable to require its application in cases of persons convicted for driving under the influence of alcohol.

A further object of my invention is to provide a safety device for the prevention of drunken driving which also prevents the starting of the automobile engine by strangers who do not know the starting combination and thereby may prevent the theft of the automobile.

Other objects and advantages of my invention will be apparent during the course of the following description.

The accompanying drawing, forming a part of the present application, shows a diagrammatic view illustrating a preferred form of my invention.

Referring to the drawing, the numerals 1 to 10 incl. designate push button switches, which move into the closed position when depressed, and are returned by spring pressure into their open position when the pressure is relieved.

The other important element of my device is the relay 11, which has open and closed positions and is operated by the solenoids 12 and 13 in the following manner.

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When the opening solenoid 12 is energized the relay 11 will move into the open position, shown by the dotted line in the drawing, and will remain in this position after the solenoid 12 is deenergized. Similarly, when the closing solenoid 13 is energized the relay 11 will return into the closed position, shown by the full line in the drawing, and will remain in this position after the solenoid 13 is deenergized.

The other elements shown in the drawing are the customary parts of the electrical system of the automobile, and are as follows: The numeral 14 designates the storage battery; 15 represents the ignition lock and starting switch which, in this form is combined in one unit, as found in many cars, and is so constructed that the turning of the key closes first the ignition and the continued turning of the key actuates the starting motor. In alternative cases this same function is performed by two separate units, a key operated ignition lock and a separate starting switch which, however will not alter or hinder the application and the proper functioning of my device. The numeral 16 designates the customary magnetic switch controlling the starting motor of the automobile. This is a solenoid operated heavy current switch which closes the motor circuit when its solenoid is energized through the ignition lock and starting switch 15, and opens the motor circuit when the energization of its solenoid is discontinued.

It is fundamental in my invention that the push button switches 1 to 10 are arranged in three groups, each group having a specific and essential function.

In the form illustrated in the drawing, the first group consists of push button switches 3 and 5, which are connected in series and joined to the relay 11 by the conductor 27, which is connected to the magnetic switch 16. The free terminal of the push button switch 3 is connected, through the conductors 23 and 24 to one terminal of the storage battery 14, and the circuit is completed from the other terminal of the battery 14, through the conductor 17, ignition switch 15 and conductor 18 to the other terminal of the magnetic switch 16. This is the starting circuit and it will start the engine if the following conditions are present: the relay 11 and the starting switch 15 are closed and the push buttons 3 and 5 are simultaneously depressed. Thus, 3 and 5 constitute the starting combination, the knowledge of which is necessary for the starting of the automobile engine.

The second group is formed of push button switches 1, 2, 4, 8, 9, and 10. These are connected parallel; one terminal of each being connected through the conductors 23 and 24 to one of the terminals of the storage battery 14; the other terminal of each being connected through the conductors 22 and 21 to the opening solenoid 12 of the relay 11 and the circuit is completed through the conductors 20 and 18, the starting switch 15 and conductor 17 to the other terminal of the battery 14. This is the preventive circuit and has the function of preventing the energizing of the magnetic switch 16, hence, the starting of the engine, by the opening of the relay 11, when any of the push buttons of this second group is depressed. The opening of the relay 11 renders the starting combination of the push buttons ineffective, hence, the starting of the engine impossible.

The third group consists of push button switches 6 and 7. These are connected in series, with one free terminal joined through the conductors 23 and 24 to one terminal of the storage battery 14, and the other, free, terminal of push button switch 7 is connected through conductor 25 to the closing solenoid 13 of the relay 11. From here the circuit is continued through the conductors 26 and 18, the starting switch 15, and conductor 17 to the other terminal of the battery 14. This is the resetting circuit and has the function to reset the relay 11 into the closed

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position, and thereby make the starting of the engine possible by the use of the starting combination, when the push buttons 6 and 7 are simultaneously depressed. Thus, in this case the push buttons 6 and 7 constitute the resetting combination.

In alternative forms of my invention the number of the push buttons and the selection of the starting and resetting combinations will be different from the case illustrated. It is generally desirable to locate the push buttons of the second group adjacent and around the push buttons of the starting combination (first group) so that the slightest fumbling of the fingers of the operator will cause the depression of a push button of the second group.

As another alternative, the starting switch 15 may be omitted from the three circuits described and the push button switches of the starting combination may serve as starting switches for the automobile.

In the application of my device in an automobile the push buttons are mounted on a panel, forming the front wall of a box containing also the relay 11 and the terminals necessary for the connection of my device into the electrical system of the automobile. The device is preferably mounted under the dash board so as to be out of sight and at the same time easily and conveniently accessible to the driver of the automobile.

The operation of my device is as follows: The customary way of starting a car is to turn on the ignition by means of a key, and close the starting switch, either by the continued turning of the ignition key or by means of a separate starting switch, mounted on the dash board or mechanically connected to the gas-pedal. With my safety device installed, in addition to these, it will be necessary to depress simultaneously the push buttons corresponding to the starting combination in order to start the engine. Unless the driver remembers the starting combination and his hands are steady enough to depress the corresponding push buttons, he will surely depress at least one of the adjacent push buttons of the second group, causing the opening of the relay 11. This will make the starting operation still more difficult, as now he must remember and use two combinations, first the resetting combination and then again the starting combination, in order to start his engine. If a person is sufficiently intoxicated to be unfit for driving, the successful handling of two combinations will be beyond his capacity, so the possibility of another highway fatality is eliminated.

I claim:

1. A device for the prevention of the starting of an automobile engine by a person under the influence of alcohol, to be applied in conjunction with the electrical system of an automobile, having a magnetic switch for controlling the starting motor, a storage battery for supplying said magnetic switch, and a starting switch interposed between said magnetic switch and storage battery, and comprising a relay, having open and closed positions, and being provided with an opening solenoid and with a closing solenoid, said relay being adapted to move into the open position when said opening solenoid is energized, and to move into the closed position when said closing solenoid is energized, and to remain in position after said solenoids are deenergized; a multiplicity of push button switches, having open and closed positions, and moving

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into the closed position when depressed, and returning by spring pressure into the, normal, open position when the pressure is relieved, said push button switches are arranged in the following three groups: the first group, consisting of push button switches connected in series and inserted in a circuit including said relay, storage battery, starting switch and magnetic switch, so as to permit the energizing said magnetic switch from said storage battery when said starting switch is closed and simultaneously all push button switches of this first group are depressed; the second group, consisting of push button switches located in the vicinity of the push button switches of said first group, and connected parallel and inserted in a circuit including said battery, starting switch, and the opening solenoid of the relay, so as to open said relay when any of the push button switches of this second group is depressed; the third group, consisting of push button switches disposed separately from said first and second group and connected in series and inserted in a circuit including said battery, starting switch, and the closing solenoid of the relay, so as to close said relay when said starting switch is closed and all push button switches of this third group are depressed.

2. In conjunction with the electrical system of an automobile, having a starting motor, a magnetic switch controlling said starting motor, a storage battery for energizing said magnetic switch, a device for the prevention of the starting of an automobile engine by a person under the influence of alcohol, comprising a relay, having open and closed positions, and being provided with an opening solenoid and a closing solenoid, so constructed that said relay will move into its open position when said opening solenoid is energized, and will move into its closed position when said closing solenoid is energized, and will remain in position when said solenoids are deenergized; a multiplicity of push button switches, with open and closed positions, moving into the closed position when depressed and returning into the open position when the pressure is relieved, said push button switches are arranged in the following groups: the first group, consisting of push button switches connected in series and inserted in a circuit including said storage battery, magnetic switch and relay, so as to permit the energizing said magnetic switch from said battery when said relay is closed and all push button switches of the first group are depressed; the second group consisting of push button switches located in the vicinity of the push button switches of the said first group, and connected parallel and inserted in a circuit including said battery and said opening solenoid of the relay, so as to open said relay when any of the push button switches of the second group is depressed; the third group consisting of push button switches disposed separately from said first and second group and connected in series and inserted in a circuit including said battery and said closing solenoid of the relay, so as to close said relay when all push button switches of the third group are depressed.

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