O. H. STOLBERG.

ELECTRIC SAFETY LOCK.

APPLICATION FILED MAY 28, 1918.

1,378,200.

Patented May 17, 1921.

2 SHEETS—SHEET 1.

Fig 1

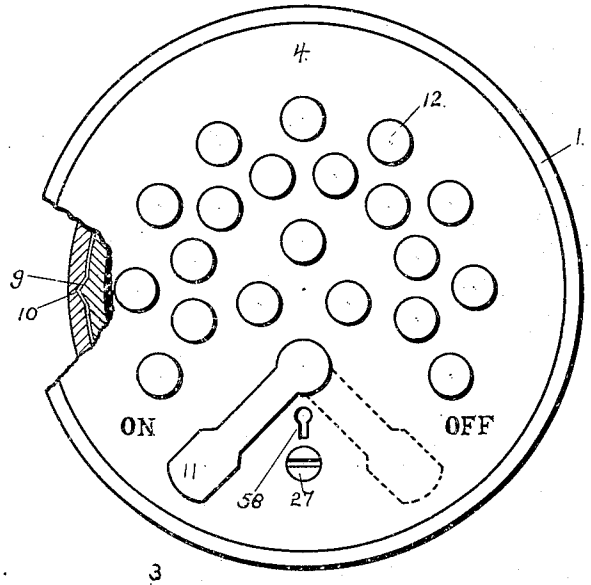


Fig 2

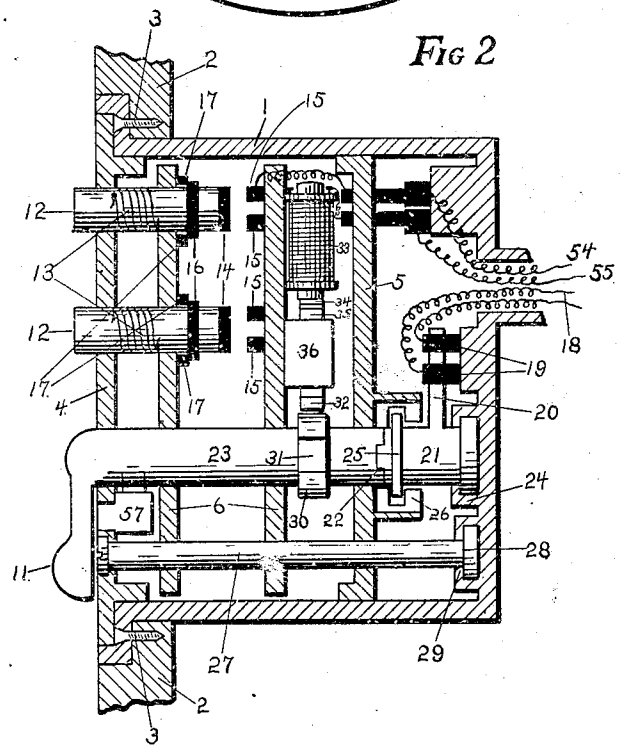


Fig 3

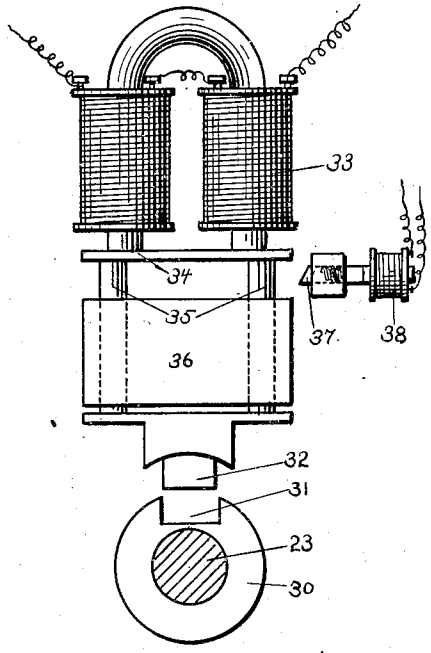
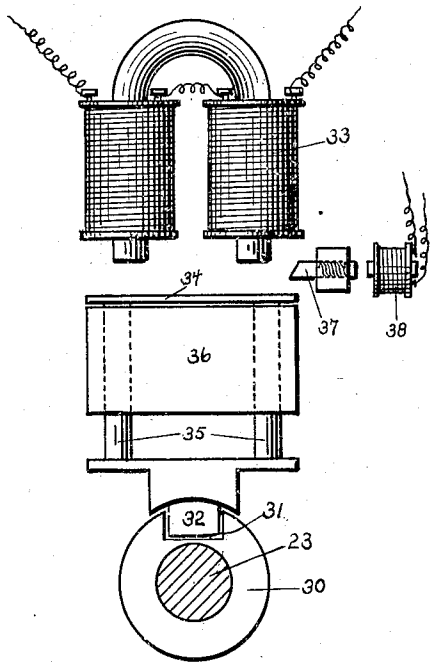


Fig 4



INVENTOR

OTTO H. STOLBERG

BY C. S. Paré

ATTORNEY

O. H. STOLBERG.

ELECTRIC SAFETY LOCK.

APPLICATION FILED MAY 28, 1918.

1,378,200.

Patented May 17, 1921.

2 SHEETS—SHEET 2.

FIG 5

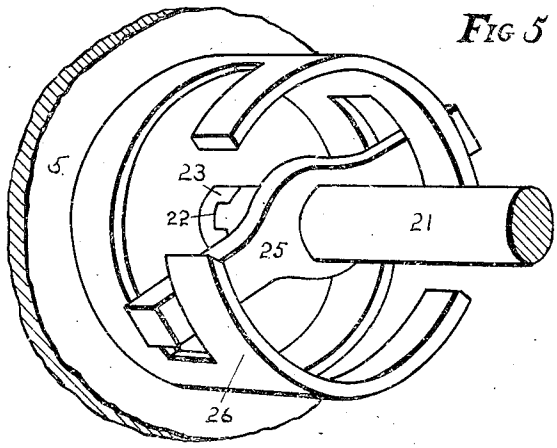


FIG 6

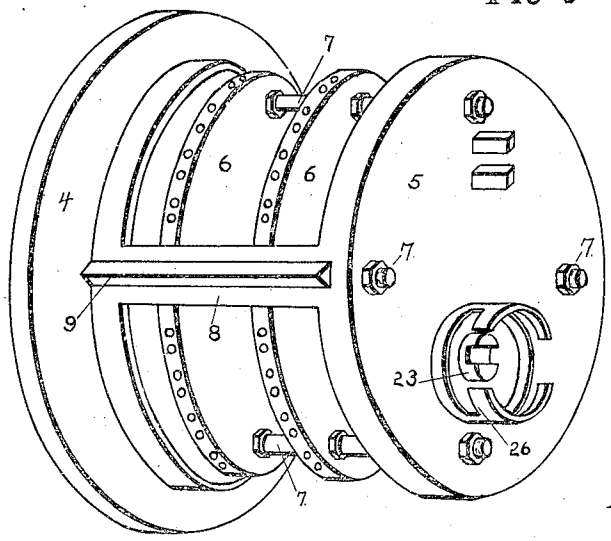
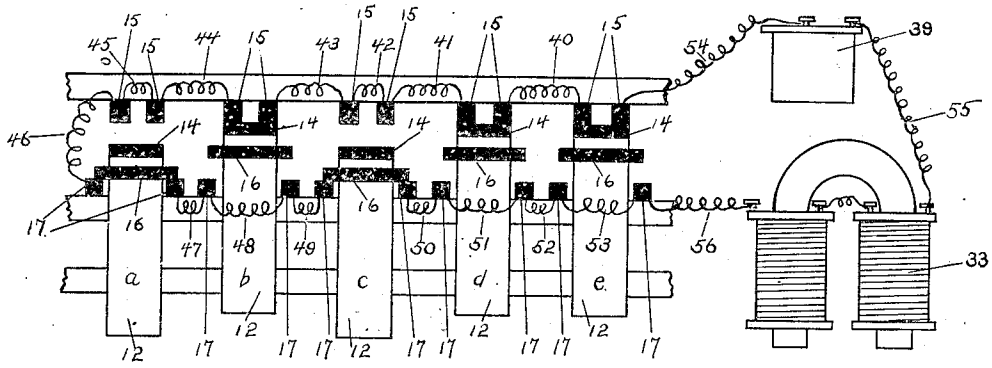


FIG 7



INVENTOR

OTTO H. STOLBERG

BY A. S. Paré

ATTORNEY

UNITED STATES PATENT OFFICE.

OTTO H. STOLBERG, OF SAN FRANCISCO, CALIFORNIA.

ELECTRIC SAFETY-LOCK.

1,378,200. Specification of Letters Patent. Patented May 17, 1921.

Application filed May 28, 1918. Serial No. 237,358.

To all whom it may concern:

Be it known that I, OTTO H. STOLBERG, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Saftey-Locks, whereof the following is a specification.

This invention is an electric permutation lock. I have designed the invention more particularly for use with ignition of automobiles, though it is applicable for a variety of other uses, hence I will describe it as applied to controlling the ignition of an automobile.

In carrying out the invention for the purpose mentioned, I provide a dial on which is the handle of the ignition switch, and a number of buttons or pushes, each of which controls two contacts. The combination and arrangement is such that the ignition switch is locked in its "off" position by an electrically controlled lock, whose circuit includes the contacts of the several buttons. By a predetermined connection of the contacts, the locking circuit is closed only when certain predetermined buttons are pushed and held until the ignition handle has been moved. The handle may then be swung to its "on" position and the ignition circuit closed. The movement of any one or more of the wrong buttons, or the omitted movement of any of the right buttons, leaves the locking circuit open, and the ignition handle remains locked in its "off" position.

The construction and arrangement by which the above results are secured may be best understood by the illustration and description of an embodiment of the invention which I have made. This I will now give by the accompanying two sheets of drawings and subjoined description thereof.

Figure 1 is a face view of the dial, broken away at one side for a purpose which will appear hereinafter.

Fig. 2 is a cross-section, taken vertically through Fig. 1, but showing only two push buttons, other buttons being omitted to avoid complication.

Fig. 3 is a view of the ignition locking mechanism, in its unlocked position.

Fig. 4 is the same in the locked position.

Fig. 5 is an enlarged perspective view of a means for preventing the withdrawal of the mechanism casing from the instrument board unless the ignition handle is in a particular position.

Fig. 6 is a perspective view of the mechanism casing.

Fig. 7 is a diagrammatic view to show the connections of the push buttons whereby they act as above set forth.

In the figures:—The box 1 is set into the instrument board 2 and fastened by any convenient means, as by the screws 3. Into the box 1, is set a casing, shown in Fig. 6, which comprises the face plate or dial 4, the back plate 5, and intermediate plates 6, all connected together by the bolts 7 and one or more side bars 8 as shown particularly in Fig. 6. The casing also comprises a rib or lug 9, which engages a notch 10 in box 1 (Fig. 1), to insure the proper register of the casing in the box.

The dial 4 carries thereon the ignition handle 11, and a number of push buttons 12, also the words "on" and "off" to indicate those positions of the handle 11. Each of the push buttons 12 has a spring 13, as shown in Fig. 2, to return it to its outermost position after it has been pushed in and released, and to hold it there. Each of the buttons 12 is provided, also, with two contact bars or rings, one, 14, on its inner end, which connects the switch points 15, when the button is pushed in, and closes the circuit there, and one, 16, back from the end, which connects the switch points 17, when the button is in its outermost position, and closes the circuit there. The parts 16 and 17 may serve also as stops to limit the outward movement of the buttons.

The ignition circuit 18 terminates in the switch points 19, as shown only in Fig. 2, which are electrically connected by the arm 20 on the stub shaft 21. The latter member is clutched at 22 to the shank 23 of handle 11. Thus the movement of handle 11 to its "on" or "off" position, closes or opens the ignition circuit.

The stub shaft 21 is rotatably mounted in the back plate 24 of box 1, and carries a cross bar 25. This bar engages a mutilated ring 26, which is secured to back plate 5, and prevents removal of said plate 5, and

other parts of the casing connected thereto, except when the stub and cross bar 25 are turned so that the bar registers with the openings in the ring 26. By preference this position is attained only when handle 11 hangs vertically, or about half way between its extreme position. The casing is still further held to the box by a screw headed rod 27 as shown exclusively in Fig. 2, whose head appears on the dial 4, and whose other end carries a bar 28 engaging a mutilated ring 29, similar to the ring 26.

Upon shank 23 of the ignition handle is a ring 30 having a notch 31 therein. This notch is engaged by a bolt 32 when handle 11 is in its "off" position, and the handle is thereby locked in that position. In other positions of the handle, the bolt may ride on the circumference of the ring, and will not then interfere with its movement. The bolt is retracted by an electromagnet 33, which is in circuit with the switch points of the buttons 12, as will be presently described. When the magnet 33 is energized its armature 34 is attracted to it and moves the bolt which is connected to the armature by the rods 35 passing through the guide block 36. A latch 37 prevents the retraction of the bolt until the former has been withdrawn by magnet 38. A sufficient amount of play may be allowed between the latch and the engaging member to permit the movement of the latch before the engaging member contacts it.

In the diagrammatic view, Fig. 7, I show the electric connection of the ignition lock. The same reference numerals are applied as in the other figures. 12 are the push buttons, having the contact bars 14 and 16 for engaging respectively the switch points 15 and 17. 33 is the lock magnet and 39 a battery. The five buttons shown are marked "a, b, c, d, e". Suppose, it is desired that the lock be released only when buttons b, d, and e are pushed in, then the electric connections are made as follows. Points e^{15} are connected by the bar e^{14} when button e is pushed in; one point e^{15} is connected to battery 39 by wire 54 and the other to one of the points d^{15} by the wire 40. The two points d^{15} are connected by bar d^{14}, button d being pushed in. The points 15 from d to b are connected by the wires 41, 42 and 43. The two points b^{15} are connected by the bar b^{14}, b, being pushed in. The left hand point b^{15} is connected to points a^{15} and left hand points a^{17} by the wires 44, 45 and 46. The two points a^{17} are connected by the bar a^{16} and the other connections are made, as shown, by wires 47 to 53, and bar 16^c. Thus when the buttons b, d and e are pushed in, and other buttons remain in their outermost position, the current will flow from battery 39 through wire 54, points and bar e^{15} and e^{14}, wire 40, d^{15} and d^{14}, wires 41, 42, 43, points and bar b^{15} and b^{14}, wires 44, 45 and 46, points and bar a^{17} and a^{16}, wires 47, 48, 49, points and bar c^{17} and c^{16}, wires 50, 51, 52, 53 and 56 to magnet 33, through the magnet coils, and wire 55 back to the battery. If any one or more of the active buttons, b, d and e, be not pushed in, the circuit will be broken between bar 14 and points 15, and no current will pass. Similarly if any one or more of the idle buttons, a and c, be pushed in the circuit will be broken between bar 16 and points 17 and no current will pass. Hence ignition handle 11 will be locked, except when all the active buttons are pushed in and all the idle buttons remain in their outermost position. The particular combinations required to unlock handle 11, may be changed by shifting one or more of the connections 40 to 52, as will be readily understood by any electrician.

The key-hole 58 may give access to a key lock 57, independent of the electric lock, when so desired.

While I have used the term "button" and "push", I have done so merely for brevity, as it is obvious that other forms of switch may be used, and the same is true of the ignition handle. Also the permutation switches, or buttons, and the device controlled may be widely separated, instead of in the same case, where it is convenient to do so, and numerous other structural changes may be made.

What I claim and desire to secure by Letters-Patent of the United States, is the following, to wit:—

1. An electric permutation lock comprising a source of current, an electromagnet and a lock operated thereby, and a number of buttons in series in the circuit and connections bridging one or more of the buttons, whereby the circuit will be closed only by operating certain of the buttons and leaving the others untouched.

2. An electric permutation lock, comprising a switch and means for operating the same, a bolt adapted to lock said switch in a definite position, a magnet to operate said bolt, a number of push buttons in circuit in series with said magnet, and means for bridging one or more of said buttons, whereby the lock will be released only by operating certain predetermined buttons.

3. An electric permutation lock, comprising a number of buttons in series in a circuit, a bolt, a magnet to operate said bolt, said magnet in said circuit, said buttons each having two contacts, one closing the circuit when the button is pushed in and one when it is withdrawn, and connections adapted to bridge one or more of said contacts, whereby the bolt will be released only by operating certain predetermined buttons.

4. An electric permutation lock, compris-

ing a switch and means for operating the same, means for locking said switch in a definite position, a magnet to operate said means, push buttons in circuit in series with said magnet and means for bridging one or more of said buttons.

In testimony, that I claim the foregoing I have hereto set my hand in the presence of two witnesses, this 23 day of May, 1918.

OTTO H. STOLBERG.

Witnesses:
NICHOLAS KORNGOLD,
FLORENCE L. WOLFE.