

April 16, 1929.

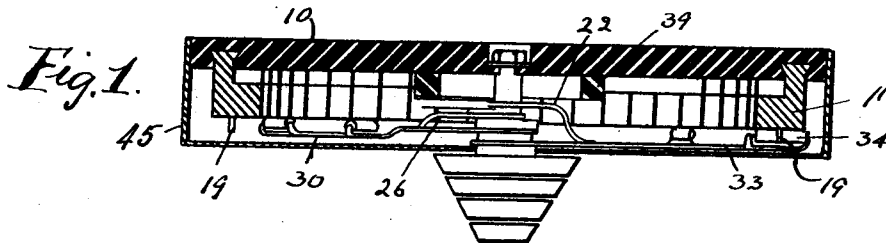
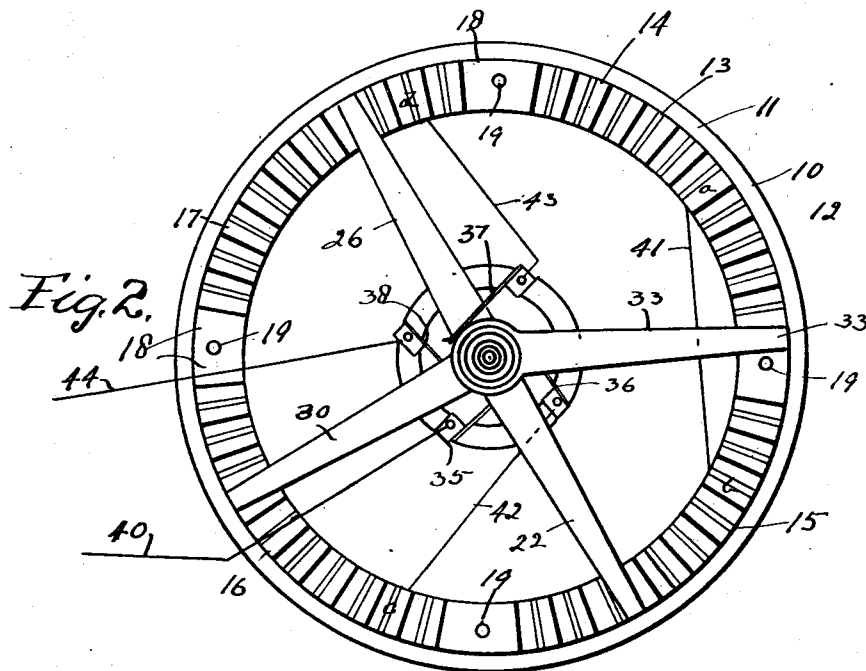
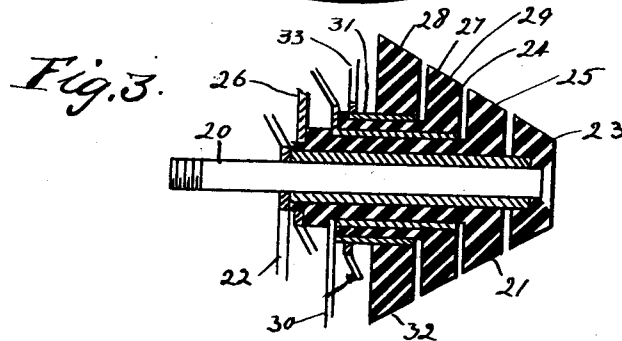
J. C. CLINTON

1,709,775

ELECTRIC SWITCH

Filed July 20, 1927

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

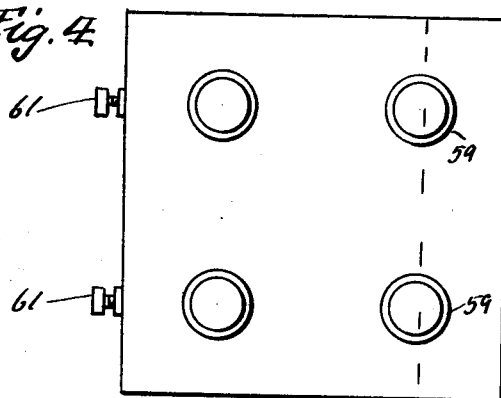


Fig. 5.

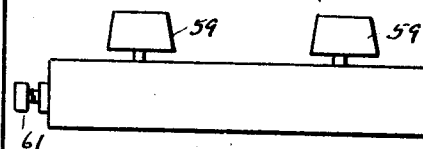
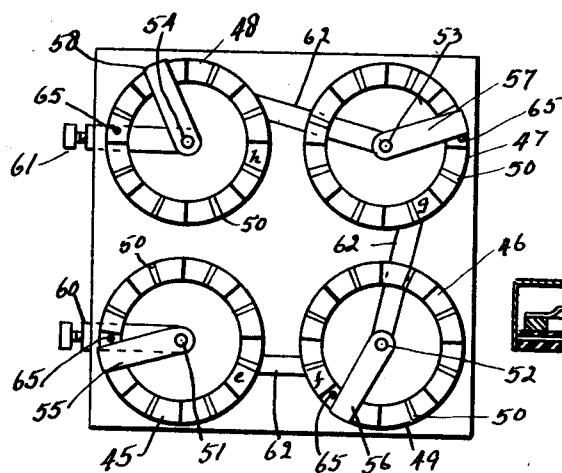


Fig. 6.

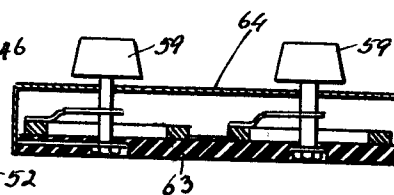


Fig. 7.

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UNITED STATES PATENT OFFICE.

JAMES C. CLINTON, OF CHILLICOTHE, OHIO.

ELECTRIC SWITCH.

Application filed July 20, 1927. Serial No. 207,087.

My invention relates to new and useful improvements in an electric switch, and more particularly to a permutation lock switch whereby an electrical circuit may be completed only by the person knowing the specific combination, which combination may be changed when desired.

Another object of the invention is to provide a switch of this character including a dial of electrical contacts insulated from each other and arranged in a plurality of series, a plurality of spring contact arms, each of which carries a roller coacting with one series of contact blocks. Said arms being operated by suitable knobs for bringing the roller on any arm in engagement with a predetermined contact block, through the medium of the sense of feeling effected by the roller dropping into notches in the contact blocks, means for limiting the movements of the several arms, and means for providing several circuit sections.

A further object of the invention is to provide a similar device in a slightly different arrangement wherein a separate dial of contact blocks is provided for each arm, the said dials being located at different points on a suitable supporting element.

While this invention is applicable to an electric circuit for whatever said circuit may be used, it is particularly adapted for use on automobiles, and more particularly to the ignition system of automobiles, whereby the owner of the automobile may break the circuit and thus lock the automobile against unauthorized use. A person or persons knowing the combination may readily manipulate the mechanism to complete the ignition system circuit.

With these and other ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains, may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:

Fig. 1, is a diametrical sectional view of the permutation electric switch constructed in accordance with my invention.

Fig. 2, is a plan view thereof with the

several operating knobs and cover removed, and portions of the circuit illustrated diagrammatically.

Fig. 3, is an enlarged sectional view of the knobs which operate the contact arms.

Fig. 4, is an outside front elevation of another form of the invention.

Fig. 5, is an edge view thereof.

Fig. 6, is a plan view of the same with the cover and knobs removed.

Fig. 7, is a section on the line 7—7 of Fig. 4.

In carrying out the invention as herein embodied, in Figs. 1 to 3 inclusive, 10 represents a base board or supporting member for the switch mechanism, and is preferably of suitable insulating material so that the several parts connected therewith will be insulated from each other. On the base 10 is mounted a dial or ring 11 of contact blocks 12, each insulated from the others in any suitable and well-known manner, and in the working face of each of these blocks is formed a notch or groove 13 for a purpose to be presently described. The ring or dial of contact blocks is divided into a number of sections, and for purposes of illustration I have shown these sections as being four in number and designated by the numerals 14, 15, 16 and 17. Each of these sections includes a series of the contact blocks, for instance, ten of such contact blocks may make up the series of each section with a block 18 of non-conducting material at each end of each section. These sections are further divided by posts 19.

In the center of the ring or dial of contact blocks is mounted a bearing post 20, on which are journaled a plurality of sleeve shafts, each insulated from the others, and revolved by a separate knob. For convenience of illustration, I have shown a sleeve shaft 21 surrounding the bearing post 20 and carrying an arm 22 at its inner end, which arm contacts with one section of the ring or dial of contact blocks; while at the outer end of the sleeve shaft 21 is a knob 23 for rotating said shaft and through it the arm 22. About the shaft 21 is another sleeve shaft 24 which is insulated from the first mentioned one, and may be itself of insulating material, and said second shaft 24 is rotated by means of a knob 25, preferably just inside of the knob 23, while on the inner end

of the shaft 24 is mounted an arm 26 for engagement with another section of the ring or dial of contact blocks. Another sleeve shaft 27 is mounted to rotate about, but insulated from the shaft 23, and said shaft 27 may be of insulating material, in which case it is preferable that a metal bushing 28 be mounted between the two shafts 24 and 27. About the shaft 27 is rotated a knob 29, and carries an arm 30 on its inner end for coaction with another section of the dial or ring contact blocks. About the last named shaft 27, is rotatably mounted and insulated therefrom another sleeve shaft 31 which is rotated by a knob 32 on its outer end, while on the inner end is an arm 33 for engagement with still another section of the dial or ring of contact blocks.

Each of the arms 22, 26, 30 and 33 is of suitable spring material, or may be of any other material backed up by a spring to keep their outer ends in engagement with the several contact blocks, and instead of having said outer ends engaging directly with the contact blocks, rollers 34 may be journaled on said outer ends, so as to run over said contact blocks, and as the rollers drop into the notches 13 in the contact blocks, it will indicate to the operator the number of blocks passed over by the arms.

The heel of each arm is of arcuate formation so as to provide a collector ring for coaction with its respective brush, of which there is one for each arm, and in the present instance, these are designated by the numerals 35, 36, 37 and 38. The brush 35 coacts with the collector ring or heel of the arm 33, the brush 36 coacts with the collector ring of the arm 22, the brush 37 coacts with the arm 30, and the brush 38 coacts with the arm 26. While this is a convenient method of illustrating one way of transferring the electric current from a movable element to a stationary element, it will be obvious to those skilled in this art that other means may be utilized. In the present instance, the brushes are shown as mounted on a holder 39 of suitable insulating material.

The conductor or wire 40 has one end connected with one side of an electric circuit including a source of electrical energy, such as a battery, and this circuit may be the ignition system of an automobile, while the other end is connected with the brush 35. A selected one of the series of contact blocks in section 14 is connected with a selected one of the contact blocks in section 15 by a conductor 41 which may be moved about and connected with any of the others of the contact blocks in sections 14 and 15 when it is desired to change the combination, and in the present instance the conductor 41 has one end connected with block *a* in section 14 and with block *b* in section 15. To the brush 36 is connected one end of a conductor

42, the other end of which is connected to a selected block *c* in section 16, it being understood that said conductor may be connected with any of the blocks in said section. A conductor 43 has one of its ends connected with the brush 37, and the other end with a selected block in section 17, and like the conductors 41 and 42 may be connected with any of the blocks in said section 17. One end of a conductor or wire 44 is connected with the brush 38 and with the other side of the electric circuit. The wires 40 and 44 leading from the permutation electric switch may be encased in suitable tubes or shields to prevent tampering therewith and to prevent their unauthorized disconnection for some ulterior purpose.

The contact blocks, the contact arms and associated parts, except the knobs are enclosed to prevent unauthorized access thereto by means of a casing or cover 45 which is held in place by some suitable means that cannot be opened without considerable damage thereto except by the owner or authorized operator.

When the device is used in connection with the ignition system of an automobile it is located at some convenient place, such as on the dash-board or instrument board, the same as an ammeter. The parts being properly connected, when the operator of the automobile desires to complete the ignition circuit, he first turns the knob 32 in either direction, but preferably clockwise from the insulated rest block 18 on which it is resting, counting the number of blocks the arm passes over by the sense of feel as the arm drops into notches in the succeeding contact blocks until he has counted the proper number to bring the arm into engagement with the block *a*, and this process is carried out with all of the arms until the arm 22 rests on block *b*, the arm 30 rests on block *c*, and the arm 26 rests on block *d*. The circuit thus completed with other conductor 40, brush 35, arm 33, block *a* in section 14, conductor 41, block *b* in section 15, arm 24, brush 26, conductor 42, block *c* in section 16, arm 30, brush 37, conductor 43, block *d* in section 17, arm 26, brush 38 and conductor 44.

From the foregoing it will be obvious that the correct combination must be known to the person desiring to complete the electric circuit, therefore when the operator leaves the automobile and turns all of the arms into neutral positions so that they overlies the rest blocks 18, the circuit will be broken at a number of points.

In Figs. 4 to 7 inclusive, I have shown a modification of my invention wherein four separate dials or rings of contact blocks 45, 46, 47 and 48 are utilized, each of the dials comprising a plurality of contact blocks 49, having grooves therein for the same

purpose as described relative to my preferred form. Associated with the dials are shafts 51, 52, 53 and 54, and on these are mounted arms 55, 56, 57 and 58, for co-
 5 action with the contact blocks of the respective dials. On each shaft is a knob 59 for revolving the arms.

The shafts 51 and 54 may be connected with suitable terminals 60 and 61 respectively, whereby the wires of an electric circuit
 10 may be connected to the switch, and a selected contact block *e* of the dial 45 is connected with a selected contact block *f* of the dial 46, and in turn the shaft 52 is connected with a
 15 selected contact block *g* of the dial 47, while the shaft 53 is connected with a selected contact block *h* of the dial 48 by suitable electrical conductors, all of which are designated by the numeral 62.

Similar to the preferred form of my invention, the parts are mounted on or embedded in the base plate or supporting element
 20 63, and then enclosed by a housing or cover 64 to prevent unauthorized access to the parts.

In this form of the invention when the arms 55, 56, 57 and 58 are turned into engagement with their respective contact
 25 blocks, *e*, *f*, *g* and *h*, the circuit is completed through the terminal 60, shaft 51, arm 55, contact block *e*, conductor 62 connected therewith, contact block *f*, arm 56, shaft 52, con-
 30 ductor 62 connected with said shaft, contact block *g*, arm 57, shaft 53, conductor 62 connected with the last mentioned shaft, block *h*,
 35 arm 58, shaft 54, and terminal 61, and it is essential that the person desiring to complete the circuit knows the selected blocks to which the arms must be moved. Said selected
 40 blocks are determined by the number of notches 50, over which the arms pass from their neutral or stop positions determined by the pins 65.

Of course I do not wish to be limited to the exact details of construction as herein shown as these may be varied within the
 45 limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is: 50

1. A permutation electric switch comprising a ring of contact blocks, means to divide
 said blocks in sections, a plurality of arms rotatably mounted coaxial of the ring of
 contact blocks, and each coacting with a
 55 separate section of said blocks, means to connect selected blocks of two sections, means to electrically connect a selected block of
 another section with one of the arms that
 coacts with a different section, means to
 60 electrically connect a contact block of still another section with still another arm which
 coacts with some other section, and means to electrically connect two of the arms with
 the leads of an electric circuit. 65

2. A switch of the class described comprising a supporting member, a ring of
 contact blocks insulated from each other and divided into a plurality of sections, a bearing
 post mounted on the supporting member,
 70 a plurality of sleeve shafts arranged to rotate about the bearing post and each other,
 knobs for rotating said shafts, arms of electrical conductivity carried by the shafts and
 each coacting with a separate section of the
 75 ring of contact blocks, the positions of said arms in their respective sections being indicated by their coaction with slots in the
 contact blocks crosswise of the path of travel of the arms, means to connect one of
 80 the arms with the lead of an electric circuit, means to electrically connect a selected block in the section with which said arm
 coacts with a selected block in another section, means to electrically connect the second
 85 mentioned arm with a selected block in a third section, means to electrically connect the arm coacting with the third mentioned
 section with a selected block of a fourth section, means to electrically connect the
 90 arm coacting with the fourth section with a lead from the electric circuit, and means to enclose the operating parts of the switch.

In testimony whereof, I have hereunto affixed my signature.

JAMES C. CLINTON.