

F. B. HALL.
ELECTRIC CIRCUIT CHANGING MECHANISM.
APPLICATION FILED JUNE 30, 1909.

978,879.

Patented Dec. 20, 1910.

Fig. 1.

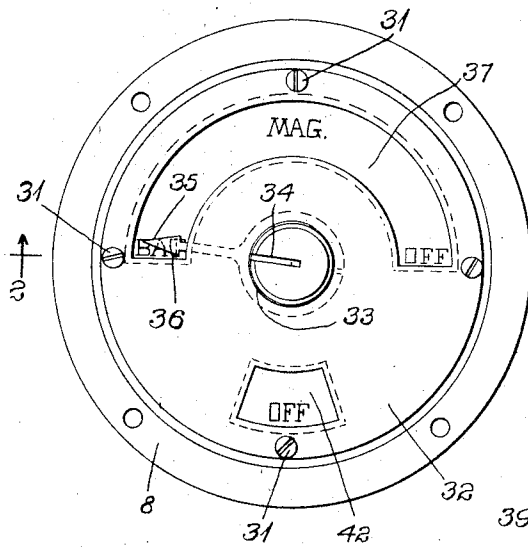


Fig. 3.

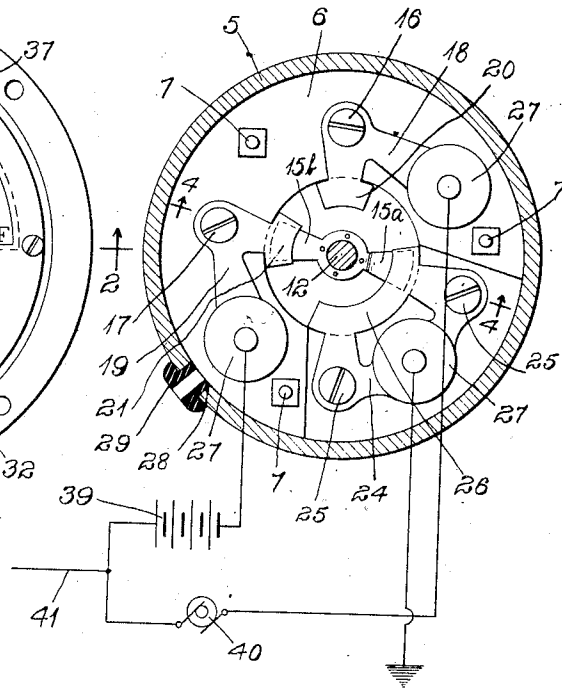


Fig. 4.

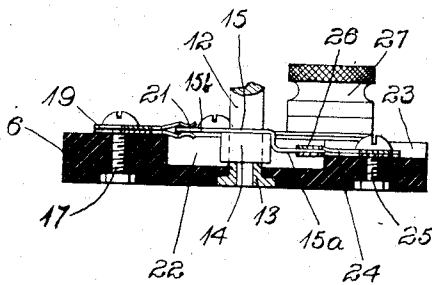
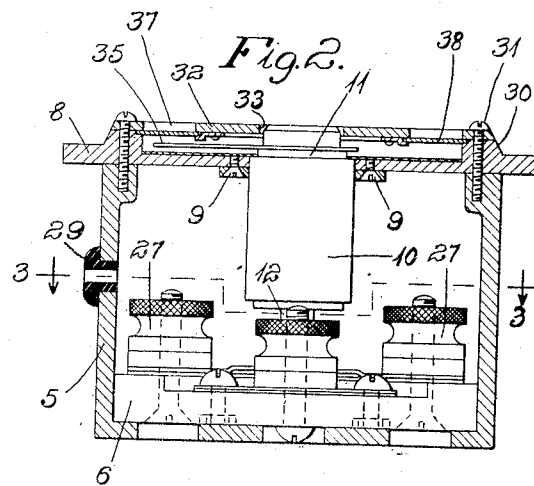


Fig. 2.



Witnesses

George C. Higham.

Arthur H. Boettcher

Inventor
Frank B. Hall

By Brown & Williams
Attorneys

UNITED STATES PATENT OFFICE.

FRANK B. HALL, OF WHEELING, WEST VIRGINIA.

ELECTRIC-CIRCUIT-CHANGING MECHANISM.

978,879.

Specification of Letters Patent.

Patented Dec. 20, 1910.

Application filed June 30, 1909. Serial No. 505,139.

To all whom it may concern:

Be it known that I, FRANK B. HALL, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented a certain new and useful Improvement in Electric-Circuit-Changing Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to electric circuit changing mechanism, and is directed particularly toward the provision of a device of that class which may well be termed a lock switch,—that is, a switch operative only upon the employment of a particular key.

My invention is particularly applicable to any circuit arrangement which is likely to be exposed to the hands of mischievous persons attempting to tamper or meddle with the same, and I therefore contemplate its use particularly in the sparking circuit of a combustion engine in automobiles and similar places.

The device consists broadly of a lock, which has switching mechanism associated therewith in such a way that actuation of the lock will result in the operation of the switching mechanism.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view thereof; Fig. 2 is a sectional view on the plane 2, 2 of Fig. 1; Fig. 3 is a sectional view on the plane 3, 3 of Fig. 2; and Fig. 4 is a detail sectional view on the plane 4, 4 of Fig. 3.

The mechanism is inclosed in a suitable casing 5, which is arranged to receive the insulating block 6 secured therein by means of bolts 7, 7, or in any other desirable manner. This insulating block 6 carries the various contacts as will be described. The casing is provided with a suitable cover 8, upon the under side of which is secured, by means of screws 9, 9, the barrel 10 of a lock of that type which comprises a stationary element, a rotary element and code mechanism in the form of wards or tumblers, as is well known in the art. The particular construction of the lock is not concerned in this invention, and is therefore not shown

in detail. The rotary element of the lock is shown at 11, and extends upwardly through the cover 8. To the lower end of the rotary element 11 a shaft 12 is secured, which shaft carries the movable element of rotary switching mechanism, as shown in the drawings. The shaft 12 is suitably terminated in a metal bushing 13 sunk in the insulating block 6, and has rigidly secured thereon a collar 14, upon which the movable contact element 15 is mounted. This contact element is comprised of contact leaves extending in diametrically opposite directions for the purpose hereinafter set forth.

Mounted upon the insulating block 6, by means of the bolts 16 and 17, are the contact members 18 and 19, respectively, these contact members each comprising a pair of plates terminating in contact springs 20 and 21, respectively, the plates of each member being slightly separated, as clearly shown in Fig. 4, to receive the rotating element 15 therebetween. The spring contacts 20 and 21 extend over a recess 22 in the insulating block, this recess being of such diameter as to accommodate the leaf 15^a of the rotating element 15, this leaf being offset downwardly into the recess, as clearly shown in Fig. 4. The spring contact members 20 and 21 and the leaf 15^b of the rotating element 15 lie in the same plane, and it is apparent that rotation of the element 15 may bring the leaf 15^b into contact either with the contact spring 20 or the spring 21, which are suitably spaced, as shown in Fig. 3.

The insulating block 6 is provided with a depression 23, in which depression is secured the contact member 24 by means of screws 25, 25, this contact member comprising two plates, as in the case of the other contact members, and terminating in the contact springs 26, between which the leaf 15^a of the rotating element is adapted to pass. The spring contacts 20, 21 and 26 lying in suitable circumference about the shaft 12, and the contact member 26 being of sufficient extent, it is clear that the rotating element 15 may bridge either the contacts 21 and 26, or the contacts 20 and 26.

In order to secure the most advantageous disposition of the various parts upon the insulating block, I have shown the contact

spring 26 to be of approximately a quadrant, thus allowing about ninety degrees between the two bridging positions of the rotating element. It is apparent, since the contacts 20 and 21 and the contact 26 lie in different planes, that the leaf 15^a of the rotating element can never come into contact with the contact 26, nor can the leaf 15^a come into contact with either of the contacts 20 or 21. It is thus apparent that the rotating element will, in the greater part of its rotation, escape all contacts, and no bridging will result. The contact members 18, 19 and 24 are each provided with a binding post 27, to which the circuit wires entering the casing through the aperture 28 may be respectively secured. The opening 28 is provided with the bushing 29, for the purposes of proper protection and insulation.

The cover 8 is provided with the annular projection 30, upon which is secured by means of screws 31 passing therethrough and into the casing 5, an auxiliary cover 32, this cover having a central opening 33 through which the rotating cylinder 11 of the lock may extend. The usual key slot in the rotating cylinder is shown at 34. Between the two covers, the rotating cylinder 11 has secured thereon the indicator 35, which extends radially and terminates in a pointer 36 passing under a semi-circular slot 37 in the auxiliary cover 32. This slot may be provided with a sheet 38 of glass or other transparent material, for the purposes of protection, which may be held in place in any suitable manner. A dial may be provided beneath the pointer 36, to indicate the circuit condition at the different positions of the pointer.

In sparking circuits for explosive engines, it is desirable to provide means for switching into circuit either a battery or a magneto, the battery being usually employed in starting the engine. In Fig. 3, I have illustrated diagrammatically a suitable circuit arrangement, wherein a battery 39 is connected with the binding post of the contact member 19, while a magneto 40 is connected with the binding post of the contact member 18, the contact member 24 being grounded to correspond to the grounding of the sparking circuit connected with the lead 41. The rotating cylinder 11 is normally absolutely locked to the barrel 10, and when in this position the pointer indicates the "off" position on the dial. The insertion of a key in the cylinder has the usual effect of releasing the same from the stationary barrel, and the rotating cylinder is free to be rotated by the movement of the key. This rotation may operate the rotary switch to bring the bridging element into contact with either the contacts 20 or 21 and with the contact

26, each position being indicated on the dial by the pointer. The use of the key is necessary for the moving of the switch from its off position, and the lock may be such that the key cannot be extracted until the switch has been returned to its off position. The bridging element being, in the greater part of its rotation, out of contact with any of the contact members, an additional opening 42 may be provided to show the position of the pointer.

I claim as new and desire to secure by Letters Patent:

1. In an electric circuit changing mechanism, in combination, a lock comprising a stationary element and a rotatable element normally locked thereto, a stationary contact in one plane and a stationary contact in another plane, and a contact member carried by said rotatable element, said contact member having a part in each of said planes for engagement with the respective stationary contact, and an indicator carried by said movable element for indicating the position of said rotatable element.

2. In an electric circuit changing mechanism, in combination, a lock comprising a stationary element, a rotatable element normally locked thereto, a stationary contact in one plane and a stationary contact in another plane, and a bridge member carried by said rotatable element, said bridge member having a part in each of said planes to engage the respective stationary contact.

3. In an electric circuit changing mechanism, in combination, a lock comprising a stationary element, a rotatable element normally locked thereto, a switch contact member having a part in each of two planes carried by said rotatable element, two stationary contact members with which one part of said rotatable contact member may engage, and a third stationary contact member with which the other part of said rotatable member may engage simultaneously with the engagement of the first part with either one of the other two.

4. In an electric circuit changing mechanism, in combination, a casing, stationary switch contacts mounted in said casing, a cover for said casing, a lock having a stationary element secured to said cover, a rotatable element for said lock extending through said cover, a contact piece carried by said movable element and arranged for engagement with said stationary contacts, a pointer secured to said movable element above said cover, a dial disposed beneath said pointer, and an auxiliary cover above said pointer having an opening through which a key may be inserted and an opening to disclose said dial.

5. In an electric circuit changing mechanism, in combination, a casing, an insulat-

ing base mounted at the bottom of said casing, switch contacts mounted on said base in two different planes, a cover for said casing, a lock having a stationary element secured to said cover, a rotatable element for
5 said lock extending through said cover, and a contact piece having a part in each of said planes carried by said movable element

and arranged for engagement with said stationary contacts.

In witness whereof, I hereunto subscribe
my name this 19th day of June, A. D. 1909.

FRANK B. HALL.

Witnesses:

LEONARD W. NOVANDER,
ARTHUR H. BOETTCHER.