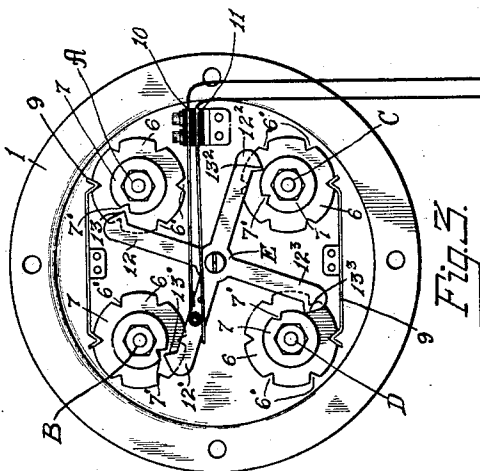


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Inventor:
George E. Mueller:
By Curtis Blauf
Attorney

UNITED STATES PATENT OFFICE.

GEORGE E. MUELLER, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

COMBINATION ELECTRICAL SWITCH FOR AUTOMOBILES.

1,119,527.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE E. MUELLER, a citizen of the United States of America, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Combination Electrical Switches for Automobiles, of which the following is a specification.

My invention relates to combination electrical switches for automobiles such as are adapted to be included in vital parts of the ignition circuit for rendering such circuit inoperative, an object being to provide an improved structure of a combination switch having a plurality of setting members and a common set of contacts.

In providing switches of the above character for use in connection with ignition circuits, or in fact for any electrical circuit, it is an advantage to have the least number of contacts for rendering such a circuit inoperative and to this end I have provided a device in which a single pair of platinum pointed contact springs are provided which are controlled by a number of setting members, that is this common set of contact springs will operate to perform their function only when these setting members are in predetermined positions. Or in other words when the setting members form a certain combination.

For a better understanding of my invention reference is to be had to the accompanying drawing in which like parts are indicated by like reference characters and in which—

Figure 1 is a face view of the preferred embodiment of my invention; Fig. 2 is a side elevation of Fig. 1; Fig. 3 is a rear elevation of Fig. 1 with an ignition circuit connected to the contact spring of the device; Fig. 4 is a face view of my invention with the contact springs and their common actuating member shown in dotted lines and in an operated position; Fig. 5 is a section along the line 5, 5, of Fig. 1; Fig. 6 is a view similar to Fig. 5 but with its setting member withdrawn to allow adjustment of the indicating pointer and Fig. 7 is a detail view of the indicating pointer.

In the preferred embodiment of my invention I employ a casing 1 which supports a plurality of setting members preferably

four in number and marked A, B, C, D, although as will presently appear my invention is not limited to any particular number of setting members as either more or less than four such members may be employed. Each of the setting members is freely rotatable and comprises a setting knob 2 having a firmly secured shaft 3 which supports a collar 4, which collar is rotatable within the bearing 1¹ of the casing. A pointer 5, 5¹, etc., is also carried by each setting member for indicating when its setting member is in an operating position. I preferably arrange the shaft member hexagonally shaped at 3¹ and 3², so that the pointer 5 may be held on the shaft in any one of six positions. A notched disk 6 is also carried upon the shaft 3, and I provide as many notches 6¹ in the disk 6 as the number of positions of the setting member, these being preferably six in number. A cam member 7 is also carried by each setting member and having a notch 7¹ therein. A nut 8 is threaded on to the shaft 3 to firmly hold the parts 7, 6, 4 and 5 upon the shaft. A resilient holding member preferably in the form of a spring 9 rides upon the peripheral edge of the notched disk 6 and is adapted to drop into any of the notches 6¹ to yieldingly hold the setting member in any of its positions. On the face of the casing 1, indicating numerals may be stamped corresponding to the positions of the setting members.

A single set of contact members preferably in the form of springs 10, 11, are provided being insulatively mounted upon the casing 1. As already referred to, these contact springs 10, 11, are common to the setting members of the device, that is these contacts are operated only when the setting members as A, B., etc., are moved into predetermined positions. Therefore I provide an actuating device for these contact springs preferably in the form of a single member E having a plurality of arms 12 12¹, etc., corresponding to the number of setting members which in the preferred embodiment of my invention are four in number. Member E is rotatably secured to the casing 1 in a suitable manner and each of its arms 12 has a portion 13 which is adapted to register with the notch 7¹ of the corresponding setting member so that when the four set-

ting members have been moved into predetermined positions with the notches 7¹ registering with the portions 13, 13¹, etc., the member E is free to rotate and allow the contacts 10, 11 to engage and close the circuit in which they are included.

In Fig. 1 the setting members A, B, C, D, are shown with their pointers 5, 5¹, 5², 5³, respectively on the indicating numerals 1, 2, 4, 5, respectively and in this position the cam members 7 are in the positions shown in Fig. 3. In Fig. 4, the setting members are shown in their operative positions with the pointers at the indicating numerals 1, 2, 3, 4, in which positions the notches 7¹ register with the projections 13, 13¹, 13², 13³, of the contact operating member E.

I have preferably arranged my invention so that the setting members may be varied so as to produce different operating combinations and to this end I have preferably arranged the setting members so that the pointers 5 may be moved into a number of different positions relative to the notch 7¹ of their corresponding disk 7 and therefore I have provided a peripheral groove 3² in the shaft 3. In order to adjust a pointer 5 into any of its positions the lock nut 8 is unscrewed and the shaft 3 withdrawn into the position shown in Fig. 6, at which time the pointer 5 may be freely rotated in the groove 3² of the shaft into any desired position upon the portion 3³. Thereafter the nut 8 is threaded on to the shaft again to firmly hold the parts in position. In this way each setting member may have its indicating and operating portions relatively adjusted so that a great many different combinations are possible.

In Fig. 3, I have shown my improved switch connected in circuit with an ignition system G, but it is to be understood that the system shown is for illustration only and that my invention is not limited to use in particular circuit arrangements. The system G shown is what is known as a uni-spark system; that is a system in which but a single spark is produced for each cylinder explosion. In the system illustrated a distributor H is shown adapted for a four-cylinder engine together with a common induction coil I. A contact maker J is provided which is adapted to close a circuit through the relay K for each cylinder explosion, and to this end a battery L is provided for operating the relay K and also producing a circuit through the medium of induction coil I and therefore a spark at the spark plug M. I have shown the contacts 10 and 11 connected in circuit between the relay K and contact maker J at the terminals T but it will be apparent that the switch may be included in any vital part of the circuit such as at the terminals T¹, T², etc.

Operation.—Now as to the operation of

the device, assuming the setting members A, B, C, D, are in the position shown in Figs. 1 and 3, and that they are so adjusted that to bring them into operative relation with the spring actuating member E, the pointers 5, 5¹, 5², 5³, of the members A, B, C, D, must be in the positions indicated by the numerals 1, 2, 3, 4, respectively. Therefore the setting members A, and B are already in their operative positions as will be clear from Fig. 3 but members C, D, must be moved. Setting member C is shown with its pointer 5² on the indicating numeral 4 in which position its notch 7¹ is out of operative relation with the projection 13² so that by grasping the knob 2 and turning the pointer 5² of member C to the position 3, the notch 7¹ is in operative relation with the projection 13². Now when the knob D is adjusted so that its pointer 5³ is at the position indicated by numeral 4, its notch 7¹ is in operative relation with the projection 13³, and all of the setting members now being in their operative relation with the contact operating member E, this member E is free to rotate and allow the operation or closure of contacts 10, 11. Should the operator now desire to render the circuit inoperative, which in the preferred embodiment of my invention means to interrupt the contacts 10, 11, any or all of the setting members may be moved into any of their positions where they are held by a yielding holding member 9. As soon as any one of the setting members is moved out of its operative position the member E is of course rotated by the action of the cam 7, this rotation of member E being effective to interrupt the contacts 10, 11. It will be apparent from this that in order to render the circuit inoperative but a single setting member need be moved, but it will also be apparent that all of the setting members may be moved out of their operative position and thus render the device less easily operated.

By the use of the yielding holding member 9, a distinct click is felt each time a setting member is moved from one position to another and in this way it will be impossible for a person not knowing the combination to operate the device by attempting to feel or hear when the spring operating member E is in operative relation with the setting members.

In embodying my invention for commercial purposes I contemplate other uses than that shown and also contemplate different structures, for example such as a more or less number of actuating members or a different contact spring arrangement. Furthermore any desired number of positions for the setting members may be used the number shown being simply the preferred arrangement. Therefore I do not desire to be limited to the exact structure as shown

and described but by the appended claims aim to cover all that which comes within the spirit and scope of my invention.

What I claim as new and desire to secure by United States Letters Patent is:

1. A combination switch device comprising a casing, a plurality of radially disposed setting members, a spring member acting upon each setting member for holding it in an operative or inoperative position, a contact operating member centrally pivoted with relation to said setting members and having an arm for each of said setting members, a contact spring acting upon said contact operating member normally tending to press each arm against its associated setting member whereby when all of said setting members are in an operative position said contact operating member is rotated to allow movement of said contact spring, said setting members when again moved to inoperative positions effecting a restoration of said arms and contact spring.

2. A combination switch device comprising a casing, a plurality of radially disposed setting members each having a setting knob outside of said casing and notched and cam disks inside of said casing, a spring member acting upon each notched disk for holding its setting member in an operative or inoperative position, a contact operating member centrally pivoted with relation to said setting members wholly within said casing, said operating member having an arm for the

cam of each of said setting members, a contact spring acting upon said contact operating member and normally tending to press each arm against its associated cam disk whereby when all of said setting members are in an operative position said contact operating member is rotated to allow movement of said contact springs, said setting members when again moved to inoperative positions being effective to restore said arms and contact spring.

3. A combination switch device comprising a casing, a shaft extending through said casing, a setting knob and pointer carried by said shaft outside of said casing, cam and notched disks carried by said shaft inside said casing, means for holding said pointer and cam in definite angular relation on said shaft, a nut threaded upon the inside end of said shaft for holding said disks and pointer immovable upon the shaft, and means whereby when said nut is moved toward its end of the shaft and said shaft is drawn through said casing relative angular adjustment of said cam and pointer is permitted without removing said shaft from the casing.

Signed by me at Chicago, county of Cook and State of Illinois, in the presence of two witnesses.

GEORGE E. MUELLER.

Witnesses:

M. R. ROCHFORD,
B. O'BRIEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."