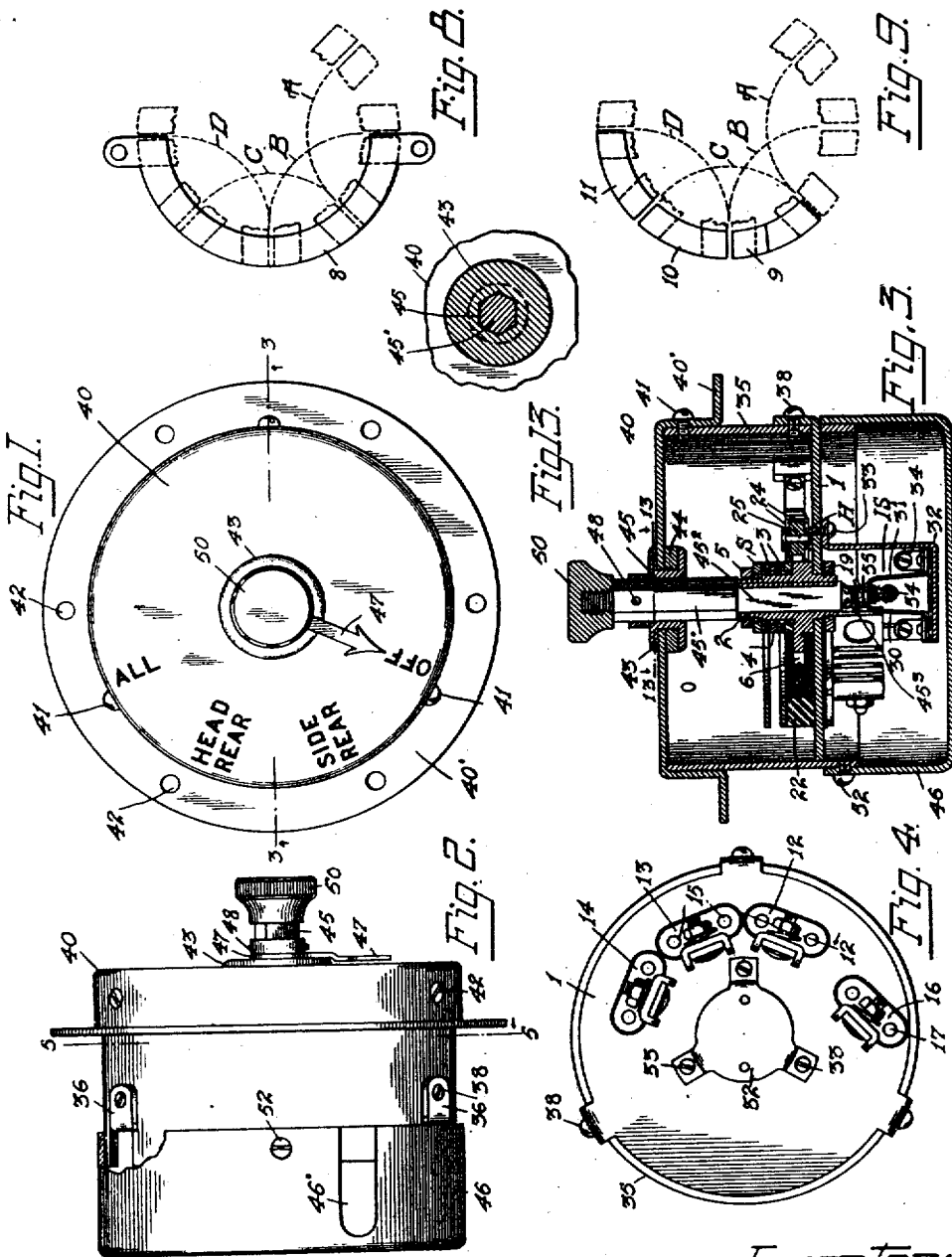


L. D. KELLOGG.
IGNITION AND LIGHTING SWITCH.
APPLICATION FILED APR. 5, 1916.

1,421,493.

Patented July 4, 1922.

2 SHEETS—SHEET 1.

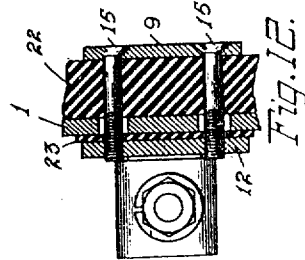
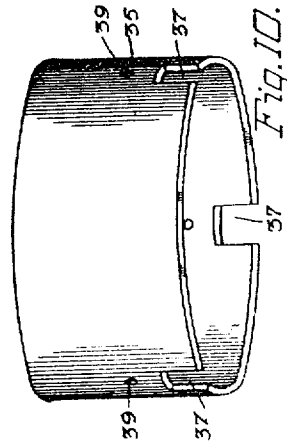
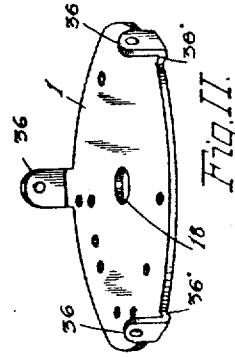
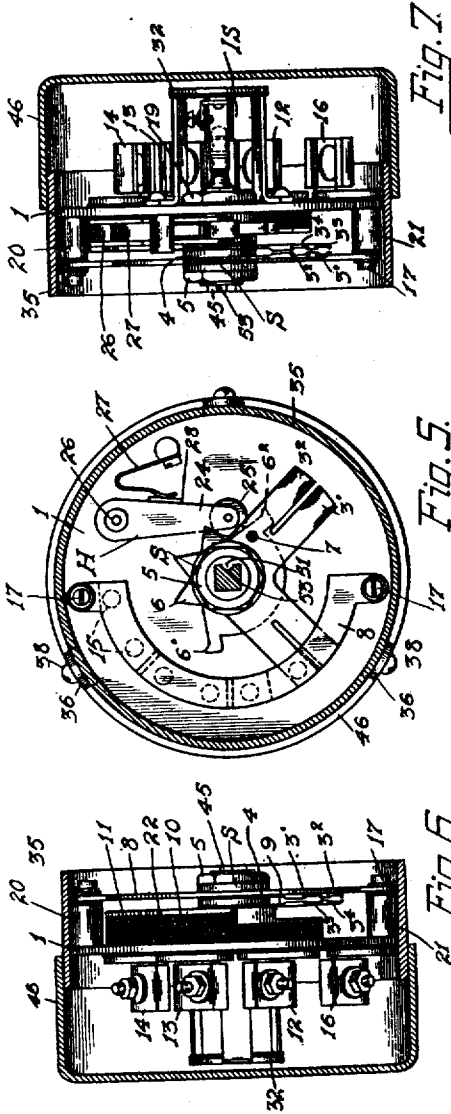


Witnesses:
S. A. Janochowski.
W. Berghahn

Inventor:
Leroy D. Kellogg
By Curtis B. Bland
Attorney.

Patented July 4, 1922.
2 SHEETS—SHEET 2.

1,421,493.



Witnesses:
S. A. Yarnochowski.
Wm. Berghahn

Inventor:
Leroy D. Kellogg.
By Curtis B. Camp.
Attorney.

UNITED STATES PATENT OFFICE.

LEROY D. KELLOGG, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

IGNITION AND LIGHTING SWITCH.

1,421,493.

Specification of Letters Patent.

Patented July 4, 1922.

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To all whom it may concern:

Be it known that I, LEROY D. KELLOGG, 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 Ignition and Lighting Switches, of which the following is a specification.

My invention relates to electrical switches and has more particularly to do with combination lighting and ignition switches for automobiles, such as are generally provided for control by the operator. The general object of my invention is to provide a unitary structure including both a lighting and an ignition control switch which embodies desirable features and advantages all in a simple, compact, efficient and economical manner. Lighting and ignition switches of the type now commonly used, have two separate actuating members for operating the switches; one for controlling the lighting circuit and the other for controlling the ignition circuit, and they are generally provided with more or less complicated locking means for locking the switches in their different desired positions. A special object of my invention is the provision of a switch of the above type which eliminates this more or less complicated locking mechanism, but which is so arranged as to prevent its switches from being moved from one position to another unless the operator is provided with the necessary operating means for performing this function. There are other features of my invention which will be more particularly pointed out in the ensuing specification and in the appended claims.

I have illustrated my invention in the accompanying drawings in which like parts in the different views bear like reference characters and in which—

Fig. 1 is a face view of my invention;

Fig. 2 is a left side elevation of Fig. 1;

Fig. 3 is a sectional view along line 3, 3 of Fig. 1;

Fig. 4 is an end view of Fig. 1 with the end cap removed;

Fig. 5 is a sectional view along line 5, 5 of Fig. 2 to show the interior mechanism;

Fig. 6 is a left side elevation of Fig. 5 with the casing broken away;

Fig. 7 is a right side elevation of Fig. 5 with the casing broken away;

Figs. 8 and 9 diagrammatically illustrate the contact blades or segments of the light switch to show the normal and operating positions of the wipers, the said wipers being shown in dotted lines;

Fig. 10 is a perspective view of the casing member;

Fig. 11 is a perspective view of the mounting plate;

Fig. 12 is a sectional view along line 12, 12 of Fig. 4 showing the connection extending from the switch contact segments to the terminals and the method of holding these parts together; and

Fig. 13 is a sectional view along line 13, 13 of Fig. 3 showing part of the front cap broken away.

Referring now more in general to the device as illustrated, it comprises a light switch S having a normal and three operating positions whereby three combinations of lights may be connected in circuit, the preferred arrangement being such that when the light switch is moved to its position B, the side and rear lights are lighted, when the light switch is moved to its position C, the head and rear lights are lighted, and when the light switch is moved to its position D, all of the lights are thrown in circuit. It is to be understood that my invention is not limited to this particular combination of lights or to the four positions of the switch.

I also provide an ignition switch in the form of a pair of resilient spring members which when connected by means of suitable conducting apparatus brings the ignition apparatus in circuit as will be more fully hereinafter described. The lighting switch is so arranged that it may be left in any one of its plurality of operating positions and the ignition circuit interrupted without affecting the position of the lighting switch as will also be more fully hereinafter described in the ensuing specification.

With this general understanding of my invention as illustrated, I will now describe it more in detail. A mounting plate 1 is provided for carrying a rotatable switch supporting member S as shown in Fig. 13, which member comprises a shaft 2 which carries a pair of insulatingly mounted wipers 3 which are held apart although electrically connected by a washer 4, the said wipers and washer being clamped upon the

shaft 2 by means of a nut 5 which has screw threaded engagement with the upper portion of the shaft 2.

I provide a device for yieldingly holding the light switch S in its different operating positions, this device including a notched or serrated disk 6 which is preferably integral with the shaft 2, and an arm 24 provided with a roller 25 for co-operating with the member 6 in a manner to be more fully hereinafter described. To insure that the relation between the disk 6 and wipers 3 remains the same, a pin 7 is provided which is pressed through an insulating bushing in the disk 6, the pin and bushing then extending through the wipers 3. The wipers are preferably constructed of two parts electrically united by the washer 4 as before mentioned, the upper wiper comprising parts 3¹ and 3² and the lower wiper comprising parts 3³ and 3⁴, the upper blades 3¹, 3² co-operating with a common segment 8 most clearly shown in Fig. 8, while the lower or inner blades 3³ and 3⁴ co-operate with the segments 9, 10 and 11, most clearly shown in Fig. 9. The segments 9, 10 and 11 are connected to the terminals 12, 13 and 14 by means of screws 15, while the common segment 8 connects to the terminal 16 by means of a clamping screw 17. The light switch S, as a whole, is rotatably supported in an annular orifice 18 in the mounting plate 1 and held against longitudinal motion by means of a nut 19 which has screw threaded engagement with the lower portion of the shaft 2. The segments 9, 10 and 11 are insulatingly mounted on the plate 1 by means of the screws 15, and the common segment 8 is supported by studs 20, 21 and held in place by means of the insulated clamping screws 17. In Fig. 12, I have illustrated the manner in which a segment as 9, is connected to its rear terminal, this figure being a section along line 12, 12 of Fig. 4. The segment 9 is insulated from the plate 1 by means of the insulation block 22 and connected to the terminal 12 by means of the screws 15. The said terminal 12 is also insulated from the mounting plate 1 by means of the insulation strip 23. With the light switch wipers in their normal position A, there is no effective connection between the contact segments of the switch, but when it is moved to the position B, segments 8, 9 and 10 are connected as indicated in Figs. 8 and 9 giving one combination of lights. Now, if the light switch is moved to its position C, contact segments 8, 10 and 11 are connected as indicated in Figs. 8 and 9 giving a second combination of lights, the segment 9 has its right end position cut away so that when the light switch is in position C the wipers rest over segment 9 but do not make contact therewith, as is clearly shown in Fig. 6, if the light switch

is moved to its position D the wipers will engage the raised portion of segment 9 thus making contact therewith and the segments 8, 9, 10 and 11 are connected thus obtaining a third combination of lights. As the circuit arrangement necessary for use in connection with this device does not form a part of my present invention, and as such circuit arrangements are well known in the art, I deem it unnecessary to here show a circuit of this kind.

In order to yieldingly hold the light switch in any of its plurality of operative positions, I provide a holding device H comprising an arm 24 carrying a rotatable roller 25 adapted to co-operate with the serrated disk 6, the said arm being pivotally supported at its other end by means of the stud 26 carried by the plate 1. A spring member 27 rests upon the connecting bridge 28 of the arm 24 and this spring presses the roller 25 against the disk 6 so that when the light switch is operated a tooth of the notched disk 6 presses against the roller 25 forcing it outwardly against the action of the spring 27, and as the disk advances, the roller acts upon the opposite face of the tooth to give a quick snap action to the switch, and thereafter operates to maintain the switch in its operated position.

Referring now to the ignition switch IS, it comprises resilient spring members 30 and 31 insulatingly mounted upon a tripod 32 which is fastened to the mounting plate 1 in any suitable manner as by means of the screws 33. Suitable terminals 34 are provided for the resilient spring members 30 and 31. I provide a casing 35 in the form of a cylindrical tube for enclosing the switch apparatus, the said casing 35 also forming the supporting means for the mounting plate 1. The plate 1 has a plurality of ears 36 struck up at right angles to the face of said plate 1, the said ears 36 aligning with suitable slots 37 cut in the casing 35 so that when the mounting plate 1 is inserted into the casing 35, the portion 36 of the ears 36 enter the slots 37 in the casing 35. Suitable holes are provided in the ears 36 to receive screws 38 which have screw threaded engagement with tapped and threaded holes 39 in the casing 35, thus securely holding the lighting and ignition switches as a unit in the casing 35. A cap 40 is provided for enclosing the lower portion of the switch structure and is held in place upon the casing 35 by means of screws 52. The cap is also provided with an opening 40' through which leads are extended from the terminals of the switches. A front mounting plate 40 is provided which fits over the opposite end of casing 35 and is provided with an integrally formed flange 40' for securing the device as a unit to any desirable mounting member. The cap 40 is fastened to the casing by means of the screws

41, and encloses the upper portion of the switch as a whole. The cap 40 is also provided with a collar 43 whose central orifice is preferably hexagonal in shape, the said collar 43 being rotatably mounted in an annular orifice in the cap in any suitable manner, as most clearly illustrated in Fig. 3 by having one end spun over the cover of the cap and its other end spun over a washer 44 which is inserted between the cap and the spun portion of the collar 43. This collar receives an actuating shaft or key 45 which is used to operate the light switch and also used to control the ignition switch as will be described.

The actuating plunger 45 is divided into three portions, the upper portion 45¹ being preferably hexagonal in shape co-operating with the collar 43 which is rotatably secured to the cap 40, the central portion 45² being square in shape and co-operating with a rectangular orifice in the shaft of the light switch while its opposite end 45³ is adapted to co-operate with the ignition springs 30 and 31. The hexagonal portion 45¹ of the key 45 has an indicating arrow 47 fastened thereto in any suitable manner as by means of a pin 48, the arrow serving the purpose of indicating the different operative positions of the light switch, namely off, side and rear, etc., thus enabling the operator to see at a glance which combination of lights is in use. The end of the hexagonal portion of the key is threaded to receive a knob 50 which facilitates the turning of the key to rotate the light switch to its different operative positions. The shaft 2 of the light switch S has a square orifice extending the length of the said shaft one side of which is provided with a bead or rib 51 extending the length of the opening, the square portion 45² of the key 45 having a groove or slot 53 of a size and shape to receive the bead 51 of the square opening of the light switch shaft. The opposite end of the key 45 has an insulating annular button 54 attached to it and next to it a metallic ring 55 suitably insulated from the key, which co-operates with the ignition springs 30 and 31.

Referring now to Fig. 3, the key 45 is shown in its operative position, that is, the metallic ring 55 is in contact with the ignition springs 30 and 31 thus closing the circuit of the ignition apparatus. The light switch is so arranged that it may be moved to any of its positions without affecting the ignition circuit.

To move the said lighting switch S into any one of its plurality of positions the operator grasps the knob 50 and rotates it in the direction to light any particular combination of lights, that is desired. The movement of the key 45 rotates the wipers 3 into engagement with the different segments to close circuit arrangements to give the

combination of lights desired. The light switch S is held in its operated position by means of the yielding holding device H as before described. To limit the movement of the switch in a clockwise direction or a counterclockwise direction beyond the "all" or "off" position, I provide the stops 6¹ and 6² upon the notched disk 6 and preferably integral with the same which engage the roller 25 to prevent further movement in either direction.

Now, should the operator wish to open the ignition circuit and still keep any combination of lights, all that is necessary is to longitudinally move the key 45 until the portion 54 is brought between the springs 30 and 31. The ignition circuit is thus opened but the light switch S will be held in its position due to the yielding holding device H. Should the operator desire to leave his car stand at any place for any length of time, he disassociates the actuating member or key 45 from its casing by entirely removing it therefrom, thereby opening the ignition switch while permitting the lighting switch to remain in any desired position. When the plug is removed the ignition switch is inaccessible to any person other than the one provided with the proper combination key. The lighting switch is also rendered inaccessible to any other than the operator provided with the proper key. The bead 51 and groove 53 in the shaft 2 and the portion 45¹ of the key 45 respectively provide means so that upon the reinsertion of the key the operator will always be able to place the key back into the light switch in the same position as it was at the time of withdrawal, and the arrow will point to the combination that is lighted. When the key is inserted into the collar 43, the operator rotates the key, due to the rotatable collar 43 until the groove 53 in the portion 45¹ of the key 45 coincides with the bead 51 in the shaft 2 of the light switch and when the key is in this position it may be further longitudinally operated to bring the portion 54 of the key into operative relation with the springs 30 and 31. The grooves in the members 54 and 55 co-operate with the rounded end portion of the springs 30 and 31 to provide means for yieldingly holding the actuating member against longitudinal movement, thereby holding the ignition switch in its "on" or "off" position.

From the above it may be seen that the lights of the car may remain in circuit and at the same time the circuit of the ignition apparatus may be opened and the actuating members disassociated from the rest of the switch so as to prevent tampering with the same. With my improved switch, I do away with many complicated parts, thus producing a switch simple in construction and most efficient as a lighting and ignition

switch, cheap in its construction and at the same time a positive lock against operation by other than the operator. It is of course understood that many different sizes and shaped actuating members may be used thereby giving an infinite number of combinations without departing from the scope of my invention. It is also apparent that the actuating member may be provided with a greater number of irregularly shaped sections for co-operation with an equal number of similarly shaped apertures respectively.

In illustrating my invention I have chosen a preferred form but it is to be understood that many changes and modifications will readily suggest themselves, and I therefore do not desire to be limited to the exact structure as shown but aim to cover all such changes and modifications as come within the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by United States Letters Patent, is:

1. An ignition switch and a lighting switch for automobiles, an enclosing casing therefor, and a removable common actuating means for said switches, said means being required to register in irregularly shaped apertures in said casing and said lighting switch before said lighting switch can be effectively operated by said actuating means.

2. An ignition switch and a lighting switch for automobiles, a removable common actuating member therefor, an enclosing casing for said switches, said casing and lighting switch having combination openings which render said switches inaccessible when the operating member is withdrawn therefrom.

3. An ignition switch and a lighting switch for automobiles, said ignition switch having an on and an off position and the lighting switch a plurality of positions, a removable common operating member for effecting the various movements of said switches, an escutcheon for said switches, said escutcheon and switches having combination openings with which said actuating member registers whereby said switches are rendered inoperative when said actuating member is withdrawn.

4. An ignition switch and a lighting switch for automobiles, said lighting switch having a plurality of positions, a removable common key for operating said switches, said key operating said ignition switch by a longitudinal movement and said lighting switch by a rotary movement, an escutcheon protecting said switches, said key being required to register with differently shaped orifices in said escutcheon and said lighting switch to render the ignition switch accessible.

5. In a switching mechanism, the combination with a rotatable member for controlling an electrical circuit and a contact member that is reciprocable for controlling a second electrical circuit, of an actuating member that is reciprocable relatively to said rotatable member but rotatable therewith and is rigidly connected to said contact member, said rotatable member and said contact member each being freely movable, irrespective of the position of the other.

6. In a switching mechanism, the combination with a plurality of stationary contact members, a plurality of movable members for electrically connecting said contact members and a rotatable member secured to said movable members, of a stationary contact finger, a movable contact member of circular cross-section coacting therewith and an actuating member that is rigidly connected to said movable contact member and is reciprocable relatively to but rotatable with said rotatable member.

7. In a switching mechanism, a rotatable and reciprocable actuating member, a non-reciprocable switch member rotated by said actuating member, and a second switch member carried by said actuating member and reciprocated therewith, either switch member being operable in any position of the other.

8. In a switching mechanism, the combination with a rotatable switch mechanism, and a member of substantially ring shape secured thereto, of an actuating member slidably connected to said member of ring shape for rotation therewith and a reciprocable switching mechanism carried by said actuating member.

9. In a switching mechanism, a rotatable and reciprocable actuating member, a non-reciprocable switch member rotated by said actuating member, a second switch member carried by said actuating member and reciprocated therewith, and a base member for supporting the stationary members of both of said switching mechanisms, either switch member being fully operable in any position of the other switch member.

10. In a switching mechanism, the combination with a casing member, and a reciprocable and rotatable actuating member mounted therein, of a reciprocable switching mechanism carried by said actuating member, a rotatable switching mechanism connected to said actuating member, a plurality of contact fingers for coacting with said reciprocable mechanism, a plurality of contact elements for coacting with said rotatable mechanism and a base member for supporting said contact fingers and said contact elements.

11. A device of the character described including a lighting switch having a plurality of operative positions, an auxiliary switch,

an enclosing casing for said switches, a removable member when in position adapted to actuate said auxiliary switch when moved longitudinally and adapted to operate said first switch when rotated, means for limiting the rotary movement of said removable member, and means for indicating the position the lighting switch is in.

12. A device of the character described including a lighting switch having a plurality of operative positions and an ignition switch for automobiles or the like, a mounting member which supports said switches, a removable actuating member when in position adapted to be moved longitudinally to control said ignition switch and adapted to be rotated to operate said lighting switch.

13. A device of the character described including a lighting switch having a plurality of operative positions and an ignition switch for automobiles or the like, a mounting member which supports said switches, a removable actuating member when in position adapted to be moved longitudinally to control said ignition switch and adapted to be rotated to operate said lighting switch, combination openings for receiving said actuating member, said openings and actuating member cooperating to indicate the position that the lighting switch is in when the actuating member is inserted.

14. An ignition switch and a lighting switch for automobiles or the like, said lighting switch having a plurality of operative positions, a supporting member for said switches, an enclosing casing, a common actuating member for operating said switches, an opening in said enclosing casing adapted to receive said actuating member, a second differently shaped opening in said lighting switch adapted to receive said actuating member, said openings and actuating member cooperating so that said actuating member can be inserted in said openings

only in one manner, and when inserted indicating the position that the lighting switch is in.

15. An ignition and a lighting switch for automobiles, said lighting switch having a plurality of operative positions, a mounting member supporting said switches, projecting ears for said mounting member, a casing member forming part of an enclosing casing, openings in said casing member adapted to receive the said ears of said mounting member, whereby said mounting member is supported in position, and a cup-shaped mounting plate adapted to fit over said casing member and to be secured thereto whereby the switch may be mounted as a unitary structure.

16. An ignition switch and a lighting switch for automobiles, said ignition switch having an "on" and an "off" position, said lighting switch having a plurality of "on" positions, an enclosing casing for said switches, a removable operating member for effecting the various movements of said switches, a rotatable escutcheon supported by said enclosing casing having an opening adapted to receive said operating member, an opening in said lighting switch adapted to receive said operating member, said operating member being adapted to be inserted in said openings no matter in what position said lighting switch may be, but adapted to be inserted in an opening in said lighting switch in only one manner, whereby when said actuating member is inserted it will visualize the position that said lighting switch is in.

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

LEROY D. KELLOGG.

Witnesses:

G. A. YANOSCHOWSKI,
B. O'BRIEN.