

Feb. 22, 1927.

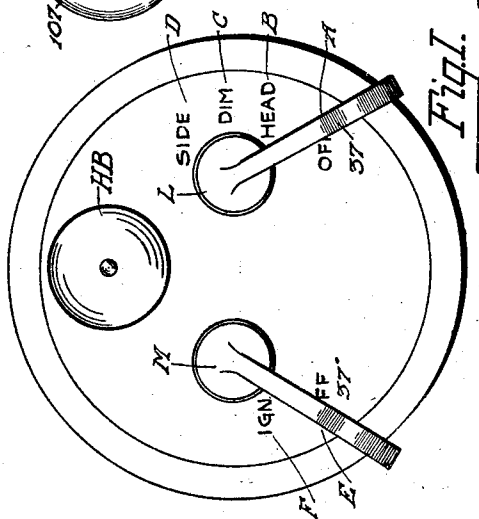
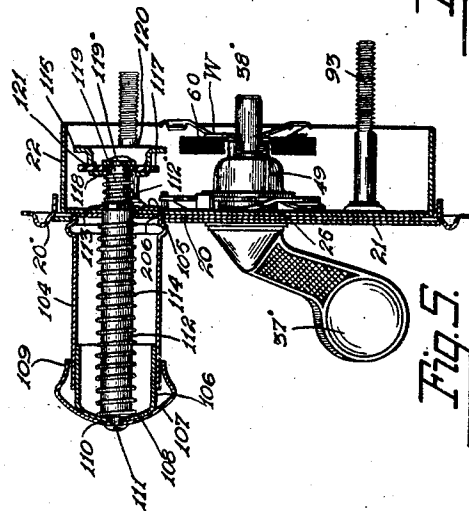
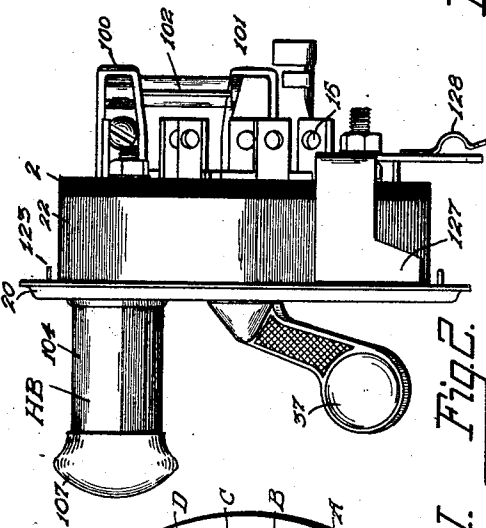
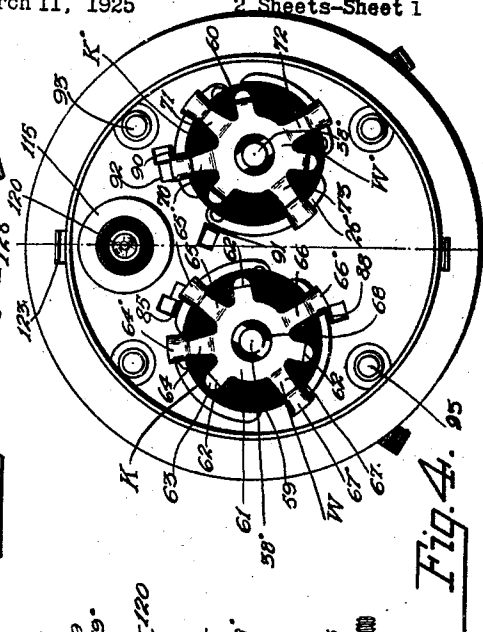
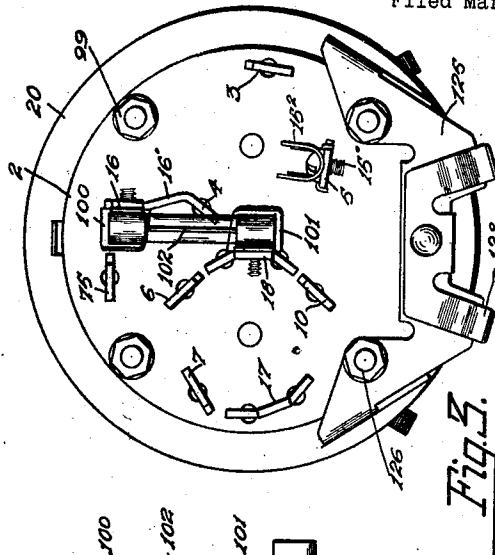
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1,618,802

LIGHTING AND IGNITION SWITCH

Filed March 11, 1925

2 Sheets-Sheet 1



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UNITED STATES PATENT OFFICE.

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LIGHTING AND IGNITION SWITCH.

Application filed March 11, 1925. Serial No. 14,617.

My invention relates to electrical switches in general and has to do more particularly with switches for controlling a plurality of circuits, and the present embodiment of my invention is for use in connection with ignition and lighting circuits for automobiles or the like.

An object of my invention is to produce an improved device of the class described, that embodies desirable features and advantages, all in a simple and efficient manner.

A feature of my invention is the provision of novel means for associating the actuating levers of the lighting and ignition units of the switch with the rotor elements of the lighting and ignition units, and securing the parts, which comprise the rotor elements that form rotatable units, together without the aid of complicated fastening means, such as nuts and threaded members.

Another feature of my invention is the provision of a novel method of holding the rotor elements of the lighting and ignition units in their different operative positions, and the means for producing a snap action of the rotor elements as they are moved to their different operative positions.

Another feature of my invention is the provision of a novel contact arrangement, supported in the base of the ignition and lighting switch, which cooperates with the wipers of the respective rotor elements, which elements when rotated cause said wipers, associated with the rotor elements, to engage the stationary contacts engaged in the base of the switch.

Still another feature of my invention is the provision of a simplified horn button mounted in association with the lighting and ignition units, and also the method I use to secure the switch to the dash of the car.

A still further feature of my invention is the provision of means for carrying the fuses used in the circuits of which the switch is a part.

The above features, as well as others, will be more fully hereinafter described, and for a complete understanding of my invention reference may be had to the accompanying drawings in which like reference characters, in the different views, denote like parts, and in which

Fig. 1 is a face view of the combination switch of my invention;

Fig. 2 is a right side elevation of Fig. 1; 55

Fig. 3 is a rear view of Fig. 1;

Fig. 4 is an interior rear view of the mechanism with the base removed;

Fig. 5 is a sectional view along the line 5—5 of Fig. 4; 60

Fig. 6 is a face view of the base, illustrating the contact arrangement of the ignition and lighting units of the switch;

Fig. 7 is a view of the interior mechanism, part of the apparatus being removed to more clearly show the method and means of holding the lighting and ignition switch units in any of their operative positions; 65

Fig. 8 is a sectional view of the actuation lever of one of the switch units and its associated parts; 70

Fig. 9 is a disassembled perspective view of the lever and its associated parts;

Fig. 10 is a sectional view along the line 10—10 in Fig. 6. 75

Referring now in general to my invention, as illustrated in the accompanying drawings, it comprises a lighting switch unit L, an ignition switch unit M, and a horn button unit HB. The light switch unit L has a normal or off position A, and three operative positions B, C and D. Said switch unit L, when in these different operative positions, will close circuits to effect the lighting of certain lamps on the automobile. The ignition switch unit M has a normal or off position E, in which position the ignition apparatus is rendered inoperative, and an operative position F. When the switch unit M is moved to its operative position F, the ignition circuit is closed and thus rendered operative. 80

I will describe, more in detail, the switch of my invention. First, I will describe the back structure which preferably comprises a flat circular mounting disk, or base 2, made of any suitable insulating material, such as fibre or bakelite. A number of suitable contact members 3', 4', 5', 6', 7', 8', 9', 10', 11' and 12' are provided and are secured in suitable slots 13 provided in the base 2. Contact members 3', 4' and 5' are associated with the ignition unit M and contacts 6', 7', 8', 9', 10', 11' and 12' are associated with the light- 100

ing switch unit L. As each one of the contact members is secured to the base 2 in the same manner, a description of one, which is typical of the others, will suffice to give a clear understanding of the method used. In reference to Fig. 10, assume that the contact member shown is the contact member 5'. It is stamped out of suitable conducting material, such as brass. The base 2, which carries these contact members, is provided with a slot 13 of a size to receive the reduced portion 5² of the contact member 5'. The reduced portion 5² is inserted in its respective slot 13, with the shoulders 14 and 14', formed by the reduced portion 5² when the member 5' is in position in the slot 13 resting against the face 2' of the base 2. The reduced portion 5², protrudes slightly beyond the face 2² of the base 2 and by means of a suitable tool, this protruding portion is shaped by means of a swaging operation. The edges 5³ and 5⁴ are swaged to secure the member 5', in its slot 13 against movement and the intermediate portion is formed to present an arcuate portion 5⁵ which forms the contact 5' adapted to be engaged by the wipers W and W' associated with the contacts as will be more fully described hereinafter. The terminals 3 and 5, which extend up from the face 2' of the base 2, of which the contacts 3' and 5' are a portion, are provided to permit the connection of external conductors for which I provide a suitable tapped orifice 15 and a screw 15' which has a screw threaded engagement with the tapped orifice 15, and holds a clip 15² which is suitable to secure the external conductors to the terminal members 3 and 5. A terminal 16 secured to the base 2, in a manner as already described, is provided with an integrally formed laterally extending portion 16' which is provided with a depending member 4 which fits in a slot 13, and its protruding portion is shaped, as already described, to form the contact 4'. The terminal 16 is connected with the contact 4' by this laterally extending portion 16' which connects the contact 4' associated with the ignition switch unit M to this terminal 16 which is the battery terminal as will be more fully described hereinafter.

The terminals 6, 7 and 10, which are integrally formed with the contacts 6', 7' and 10' extend up from the face 2' of the base 2 and form terminals to which external conductors are secured as already described. The terminal 17 which is integrally formed with the contacts 8' and 9' serves as a terminal for the contacts 8' and 9'. The terminal 18, which is integrally formed with the contacts 11' and 12', serves as a terminal for the contacts 11' and 12'. These two terminals, 17 and 18 form connection means for the external conductors.

An enclosing casing for housing the rotor, circuit closing elements K and K' associated

respectively with the lighting unit L, and the ignition unit M, comprises a plate member 20, provided with a dished portion 20', which is adapted to receive an escutcheon or designating plate 21, which bears the names of the different positions to which the ignition and lighting switch units M and L may be moved. A cup shaped member 22 is also provided. The bottom of which is provided with a pair of orifices, and similar orifices provided in the plate member 20 and the escutcheon plate 21 are in alignment with each other and are adapted to receive ferrules 23 to secure the escutcheon plate 21 to the plate 20. The means for securing the plates 20 and casing 22 together to form a unit structure will be more fully described hereinafter.

The rotor circuit closing elements K and K', which are provided for the ignition and lighting units M and L, are adapted to be rotatably supported in the cup member 22, and as the elements K and K' are of similar construction, and similarly supported, a description of one will suffice. The rotor element K, which is associated with the lighting switch unit L comprises a spider 25 which has integrally formed spring arms 26, 27 and 28 that have dished end portions 26', 27' and 28'. The spider 25 is also provided with a square orifice 34, the side 35 of which is provided with a notch 36 and cooperates with an operating lever 37 which is associated with the rotor circuit closing element K for rotating the same. The lever 37 is provided with an integrally formed lever shaft 38 which comprises a cylindrical portion 39 that, when in position, rests in the opening of the ferrule 23 of its associated unit. The lever shaft 38 is also provided with a square portion 40 next to the cylindrical portion 39, the said square portion 40 being of a size to permit entrance in the square orifice 34 of the disk 25. The side 41 of the square portion 40 of the lever shaft 38 is provided with an integrally formed rib 42 which enters the slot 36 in the side 35 of the square orifice 34 in the spider 25 and this slot 36, in association with the rib 42, permits the lever shaft 38 to be inserted only one way so that the lever 37 will be in its proper position to register with the indications on the escutcheon plate 21.

With the lever 37 and its shaft 38 in position as just described the same may now be locked in position against lateral movement and to accomplish this I provide a novel locking arrangement to prevent the lever shaft 38 from moving laterally in the ferrule 23, and the square orifice 34 in the disk 25. The portion of the lever shaft 38 which protrudes through the spider 25 is provided with a reduced cylindrical portion 43 which is provided with a pair of integrally formed lugs 44 and 45 diametrically opposite. The

faces 46 of the respective lugs 44 and 45 are provided with ribs 47 and 48, that cooperate with a cup shaped locking member 49, to secure the lever shaft 38 against lateral movement. The locking member 49 is cup-shaped in form and has an integrally formed flange or rim 55. The bottom of the locking member 49 is provided with a central orifice 50 and notches 51 and 52 in the orifice 50, diametrically opposite each other which cooperate with the lugs 44 and 45 on the lever shaft 38. Notches 53 and 54, in the orifice 50 in the bottom of the cup-shaped member 49, are at right angles to the notches 51 and 52 and cooperate with the ribs 47 and 48 on the faces 46 of the lugs 44 and 45.

I will next describe the process of assembling the different units to make the switch of my invention. The plate 20, escutcheon 21 and enclosing cup shaped member 22, which forms the enclosing casing supports the levers 37 and 37' of the lighting and ignition switch units L and M and with these levers in position as just described the casing and levers are now supported in a suitable fixture to support the same to facilitate assembly. Now with the lever 37 of the lighting switch unit L in position the cup shaped locking member 49 is slipped over the protruding end of the lever shaft 38 and positioned so the notches 51 and 52 will register with the lugs 44 and 45 on the lever shaft 38. The notches 51 and 52 are of a size to permit the lugs 44 and 45 to enter and to thus permit the cup shaped locking member 49 to slip over the lugs 44 and 45 and permit its rim 55 to rest against the face 56 of the spider 25, with the reduced cylindrical portion 43 of the shaft 38 extending into the orifice 50 in the bottom of the cup shaped locking member 49. The depth of the wall 57 of the cup shaped locking member 49 is substantially equal to the space or distance between the face 56 of the spider 25 and the face 46 of the lugs 44 and 45 on the lever shaft 38. With the cup shaped locking member 49 in this position the same may now be moved to its locking position and for this purpose I provide a suitable socket wrench, provided with a slightly tapered orifice, which is placed over the cup shaped locking member 49. Downward pressure is now applied to the socket wrench and this causes the wrench to grip the cup member 49 and as the rim 55 of the cup member 49 rests against the face 56 of the disk 25 this downward pressure, applied on the wrench forces the spider 25 down on the square portion 40 of the lever shaft 38 and causes the arms 26, 27 and 28 of the spider 25 to be flexed against their normal tension. The cup shaped member 49 is forced down until the face 58 of the cup member 49 is below the ribs 47 and 48 on the lugs 44

and 45 and when in this position the cup member 49 is turned, in either a clockwise or a counterclockwise direction, a quarter of a revolution through the agency of the wrench. The quarter of a turn of the cup shaped locking member 49 places the slots 53 and 54 in the bottom of the locking member 49 in alignment with the ribs 47 and 48 on the lugs 44 and 45. When the locking member 49 is in this position the pressure applied on the wrench is released and the tension of the spring arms 26, 27 and 28 of the spider 25, which were flexed by this pressure, return to their normal position which carries the spider 25 up and this upward movement causes the ribs 47 and 48 on the lugs 44 and 45 to enter the notches 53 and 54 in the bottom face of the cup shaped locking member 49. With the cup shaped locking member 49 in this position the lever 37 is held or locked in position against lateral movement in the orifice in the ferrule 23 and orifice 34 in the spider 25 but the lever 37 and its associated spider 25 may be rotated to its different operative positions as is readily apparent from the above description.

The rotor elements K and K' with which the levers 37 and 37' are associated, are adapted to be rotated through the agency of the levers 37 and 37' to their different operative positions. I provide a contact wiper carrying disks 59 and 60 associated respectively with the lighting and ignition switch units L and M and as both of the wiper carrying disks are of similar construction a description of one will suffice.

The contact wiper carrying disk 59, associated with the lighting switch unit L, is a disk of suitable material such as fibre or bakelite and upon this the wiper element W is supported. The wiper member W comprises a ring shaped member 61 provided with three angularly displaced integrally formed tongue extensions 62 which are adapted to enter aligned orifices 63 in the disk 59 by means of a force fit to secure the same to the disk 59 against displacement or movement. The ring shaped member 61 is provided with radially disposed wiper arms 64, 65, 66 and 67 which are provided with flared end portions 64', 65', 66' and 67' adapted to engage the contacts 6', 7' etc., of the lighting switch unit L. To associate the disk 59 and its supported wiper arms 64, 65, 66 and 67 I provide a slot 68 in the disk 59 which receives the integrally formed lugs 44 and 45 on the lever shaft 38 to support the disk 59 on the lever shaft 38. The slot 68 in association with the lugs 44 and 45 prevents movement of the disk 59 on the lever shaft 38. When the lever 37 is moved to any of its operative positions the disk 59, being supported as just described, is rotated with the lever shaft 38 which causes the

wiper arms 64, 65, 66 and 67, to engage the contacts 6', 7' etc., of the lighting switch unit L in the base 2. The ignition switch unit is also provided with a disk 60 carrying wiper arms 70, 71, 72 and 73. The disk 60, when mounted on the lever shaft 38' in a manner similar to that just described in connection with the switch unit L, is adapted to engage the contacts 3', 4' etc., in the base 2.

In order to maintain the rotor elements K and K' in the positions to which they may be moved I provide the spider 25, associated with the rotor K, and a spider 25' associated with the rotor K' and these spiders 25 and 25' are supported on the lever shafts 38 and 38' of the respective levers 37 and 37' of the rotor elements K and K' as before described. As before described the spider 25 is provided with three spring arms 26, 27 and 28 so formed and shaped as to have spring tension. The ends of these arms are provided with dished portions 26', 27' and 28' which cooperate with a plurality of orifices 200, in the base 29 of the cup member 22 to maintain the rotor element K in any of its adjusted positions which is as follows: The orifices 200 in the base 29 of the cup member 22 are of a size to allow the dished portions 26', 27' and 28', of the arms 26, 27 and 28 to partially rest in said orifices 200 which are so placed that the dished portion of each spring arm is in engagement with an orifice 200 whenever the rotor element K is in any of its adjusted positions. The spring tension in the arms 26, 27 and 28 is sufficient to maintain the dished portions of the spiders 26, 27 and 28 in the said orifices, regardless of any jars or vibrations to which the switch may be subjected. Therefore, the rotor element K will be maintained in any of its adjusted positions but will be easily movable to any other of its adjusted positions by actuating the lever 37 which will cause the dished portions on the arms to leave the orifices in the base 29 of the cup member 22 and slide over the base 29 until the rotor element K reaches its next position when the arms 26, 27 and 28 will, due to the spring tension, drop into the orifices provided for them to produce a snap action.

To limit the degree of rotation of the rotor element K, when moved to its off position A and its extreme advanced position D, a tongue 85 integrally formed, with the casing member 22 extends upward. The spider 25 is provided with a tongue 86 extending outward, this tongue 86 engages the tongue 85 to limit the movement in that direction. To limit the movement of the rotor element K in the opposite direction a tongue 88, similar to 85, is so placed that when the rotor element K has been moved to its fully advanced or D position the tongue 86 of the spider 25, engages the tongue 88 to prevent any

further movement in that direction. The tongues 90 and 91, in the base 29 of the cup member 22, and the tongue 92 of the spider 25' perform a similar function for the rotor element K'.

The plate 20 and the cup shaped enclosing member 22 are secured together by means of studs 93 in any suitable manner and these four studs 93, which secure the casing 22 and the plate 20 together, also provide means for securing the base 2 to the enclosing member 22. The escutcheon 21 is secured in position on the plate 20 by means of the ferrule 23 as already described to form a unit enclosing structure.

The studs 93 extend rearwardly into the casing member 22 and the base 2 is provided with orifices 96 which are in alignment with the studs 93 and permit the studs to pass through these orifices in the base 2 and permit the base 2 to rest against the peripheral edge of the casing 22. A pair of orifices 97 and 98 in the base 2 are adapted to receive the ends of the lever shafts 38 and 38' and serve as bearings when the lever shafts are rotated. Nuts 99 which have screw-threaded engagement with the ends, of the studs 93, which protrude through the orifices 96 in the base 2 are turned down to clamp the base 2 against the edge of the casing 22. With the base 2 clamped in this position the operating levers 37 and 37' of the rotor elements K and K', are rotatable in the bearings formed by the ferrules 23 and the orifices 97 and 98 in the base 2.

The contacts 6', 7', etc., of the rotor element K, are now in position to be engaged by the wiper arms 64, 65, 66 and 67 on the disk 59 supported on the lever shaft 38 of the rotor element K. The contacts 3', 4', etc., of the rotor element K' are in position to be engaged by the wiper arms 70, 71, 72 and 73 on the disk 60 supported on the lever shaft 38' of the rotor elements K and K' when rotated to their different positions cause the wiper arms of the respective elements K and K' to engage certain combinations of contacts in the base 2 to close the circuits of the different lights of an automobile and the ignition system of the engine as is well understood by one familiar with the art.

As illustrated, in Fig. 7 of the accompanying drawings I provide fuse clips 100 and 101 secured respectively to the terminals 16 and 18 by means of suitable screws which have screw threaded engagement with suitable tapped orifices 15 in the said terminals. The terminal 16, to which the fuse clip 100 is secured, is the terminal to which the external battery lead is secured and through the agency of the fuse 102, inserted in the terminals or clips 100 and 101, battery is extended to the terminal 18 of the lighting switch unit L so that battery current, which is extended to the different light circuits by

the manipulation of the switch lever 37, passes through the fuse 102 for the usual protective purposes.

I also provide a horn button unit HB which comprises a cylindrical member 104 provided with integrally formed prongs 105 adapted to be inserted in suitable aligned orifices 206 in plate 20 and casing 22, and then upset so as to hold and secure the cylindrical member 104 in its proper position. The movable member of the horn button unit HB comprises a cup shaped member 106 of a size to fit in the inside of the cylindrical member 104. A member 107 shaped to fit upon the arcuate shaped face 108 of the member 106 extends slightly beyond the sides of said member 106 but with its end 109 tapered down until it is of a size to just fit loosely around the outside of the cylindrical member 104. Suitable orifices 110 are provided in members 106 and 107 and are in the proper alignment to allow a reduced portion 111 of a stem 112 to be inserted in said orifices 110. The protruding portion of 111 is then riveted and serve to support the cap 105 in association with the unit HB. The stem 112 extends through the member 104 and aligned orifices in the plate 20, and enclosing case 22. A coil spring 114 is placed around the stem 112 and rests between the member 106 and the plate 20 and maintains the member 106 in its normal position. A stop 113 in the form of a washer is secured to a reduced portion 112' of the stem 112 and acts as a stop for the button HR in its upward movement to its normal position under the influence of the spring 114. A cup shaped member 115, made of any suitable conducting material such as brass is fastened to an insulating disk 117 by having portions 118 of the brass member 115 inserted into suitable orifices provided in the disk 117 and then upsetting these portions 118 so as to form a unit assembly of the disk 117 and the brass member 115. The disk 117 is provided with suitable central orifices through which the reduced end portion 119 of the stem is inserted and a washer 120 is then placed over the further reduced portion 119' of the stem 112 which protrudes through the orifice in the disk 117 and which is then spun over to maintain the washer 120 on the end of the stem 112 and at the same time slidably maintains the disk 117 and its cup shaped member 115 on the reduced end portion 119 of the stem 112. The orifice provided in the disk 117 is large enough to allow the disk 117 and its supported member 115 to slide on the reduced end portion 119 of the shaft 112. A coil spring 121 is placed around the reduced end portion 119 and rests between the stop 113 and the disk 117 and maintains the disk 117 in its normal position against the washer

120. The circular cup shaped brass 115 is provided to close a circuit for a motor horn through contacts 16 and 75. When it is desired to complete the circuit for the motor horn the operator presses the button 107 which by reason of its construction slides down on the cylindrical member 104 and this movement causes the stem 112 and the disk 117 and brass member 115 to be moved in a downward direction as a whole until the member 115 engages the contacts 16 and 75 to close a circuit between contacts 16 and 75 mounted on the base 2. Any additional pressure of the button 107 after the member 115 has engaged the contacts 16 and 75 will cause the stem to continue its downward movement and due to the fact that the member is engaging the contacts 16 and 75 this additional movement of the stem will cause the stop 113 to compress the spring 121 and permit the reduced portion 119 of the stem 112 to slide through the orifice in the disk 117 which supports the member 115. This movement of the stem 112 after the member 115 has engaged the contacts 16 and 75 will prevent undue pressure being placed upon the member 115 and thus prevent the damage of the contacts 16 and 75 and the member 115. When the pressure is released the spring 121 will again force the disk 117 and its supported member 115 against the stop washer 120 and the depressed spring 114 around the stem 112 will force the button 107 and the stem 112 back to normal position.

The lighting and ignition switch as a whole is adapted to be mounted in the cowl of the automobile and to gain this end the cowl of the automobile is provided with a suitable orifice, in which the body of the switch rests, and a tongue extension 123, integrally formed with the plate 20, registers with a notch in this orifice in the cowl of the automobile to prevent the switch from turning around when in the orifice. A bracket 125, provided with a pair of orifices register with the studs 93 which protrude through the base 2 of the switch and pass through the orifices provided. Nuts 126 which have screw threaded engagement with the studs 93 clamp the bracket 125 in position with the leg extensions 127 of the bracket engaging the rear face of the cowl to thus clamp the switch as a whole in the cowl opening. Spring members 128 are also secured to the bottom of the bracket 125 for holding additional fuses for reserve use.

While I have described and illustrated a preferred embodiment of my invention it is to be understood that I do not wish to be limited to the exact structure as shown and described but aim to cover all such changes and modifications as may 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. A device of the character described including a front plate having orifices and a back plate, a pair of rotatable elements mounted between said plates, operating levers for said elements, a shaft for each of said levers extending through said front plate said elements and said back plate, and a lock member cooperating with a disk supported on said shaft and provided with spring arms for detachably locking said shafts against longitudinal movement and for maintaining the adjusted position of the rotor element by engaging orifices in the said front plate.

2. A device of the character described including a front plate having orifices, a base, a pair of rotatable elements mounted between said plate and base, operating levers for said elements, shafts extending through said front plate said elements and said base, a disk having integrally formed spring arms, and a locking member intermediate of the ends of said shafts cooperating with means including said disk and said spring arms to lock said shaft to prevent the longitudinal movement of the same and for maintaining the adjusted position of the said rotor element by engaging orifices in the said front plate.

3. A switch of the character described including a front plate having orifices and a base, a pair of rotatable circuit controlling elements supported between said plate and base, operating levers for said controlling elements supported between said plate and base, shafts extending through said front plate said controlling elements and said base, a locking member cooperating with means intermediate of the ends of said shafts including a disk supported on said shaft and having integrally formed spring arms for preventing longitudinal movement of said levers and for maintaining the adjusted position of the said rotatable elements by engaging orifices in the said front plate, and circuit closing members for said elements supported on said shafts.

4. A switch of the character described including a front plate having orifices and a base, a pair of rotatable circuit controlling elements supported between said plate and base, contacts in said base associated with said controller elements, operating levers for said elements, a shaft for each of said levers extending through said front plate, said rotatable elements and said base, a lock member cooperating with means intermediate of the ends of said shafts to prevent longitudinal movement of said shafts, said means including a disk having integrally formed spring members which engage orifices in the said front plate for main-

taining said operating levers in any of their adjusted positions.

5. In a switch of the character described including a front plate and a base, a rotor element mounted between said plate and base, an operating lever for said element, a shaft for said lever extending through said front plate, said rotor element and said base, a lug on said lever shaft, a cup member provided with a notch that registers with said lug, a rib on said lug, a notch in said cup which receives said rib to lock said lever against longitudinal movement, and a spring disk supported on said shaft having integrally formed spring arms for holding said cup member in locked position.

6. In a switch of the character described including a front plate and a casing member secured thereto, a base, a pair of rotatable circuit controlling elements supported between the bottom of said casing member and said base, a pair of shafts extending through said front plate said casing member and said base, locking means cooperating with means intermediate of the ends of said shafts for locking said rotatable elements against longitudinal movement and spring spiders supported on said shafts cooperating with means in the front plate for yieldingly maintaining said rotatable elements in adjustable positions.

7. A switch of the character described including a front plate having a plurality of orifices and a base, a pair of rotor elements, each having a plurality of operative positions supported between said plate and base, operating levers for said rotor elements, a spring spider associated with each rotor element, and spring arms of said spiders engaging said orifices to maintain said rotor elements in any of their operative positions.

8. A switch of the character described including a front plate and a base, a pair of rotor elements each having a normal and an operative position, said rotor elements being supported between said plate and base, operating levers for said elements for moving said rotor elements to any of their operative positions, a spring spider associated with each rotor element, said front plate having a plurality of orifices associated with each rotor element, and spring arms for said spiders engaging orifices in the front plate and associated with each rotor element to maintain said rotor elements in their normal or operative positions.

9. A switch of the character described including a front plate and a base, a pair of rotor elements supported between said plate and base, each element having a normal and an operative position, operating levers for said rotor elements, a spider associated with each rotor element, spring arms for said spiders, said front plate having a plurality

of orifices associated with each rotor element, said spring arms engaging orifices in the front plate of the respective rotor elements, a group of contacts for each rotor element in said base, and wiper elements associated with each operating lever to be moved into engagement with said contact groups, said spring arms maintaining the wiper elements of said rotor elements in their adjusted positions.

10. A device of the character described including a plate having depressions, a rotary shaft extending through said plate, a member having flexible arms secured to said shaft, said spring arms adapted to engage the said depressions for positioning said shaft.

11. A device of the character described including a plate, a rotary shaft extending through said plate, a member having flexible arms secured to said shaft, said spring arms adapted to cooperate with the depressions in the said plate for positioning said shaft, and means on said plate cooperating with means on one of said spring members for limiting the movement of said shaft.

12. A device of the character described including a plate having depressions, a

shaft extending through said plate, and a member secured to said shaft having spring arms with formed ends for cooperating with said depressions to maintain the said shaft in its adjusted position.

13. A device of the character described including a plate having depressions, a shaft extending through said plate, a member secured to said shaft having spring arms with formed ends for cooperating with said depressions to maintain the said shaft in its adjusted position, contacts, and a wiper rotatable by said shaft for engagement with said contacts.

14. A device of the character described including a plate member having depressions, an operating member extending through said plate member, and a member secured to said operating member having a plurality of arms with formed ends for cooperating with the depressions in said plate for yieldingly holding said operating member in an adjusted position.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 9th day of March, 1925.

ERNEST A. BOHLMAN.