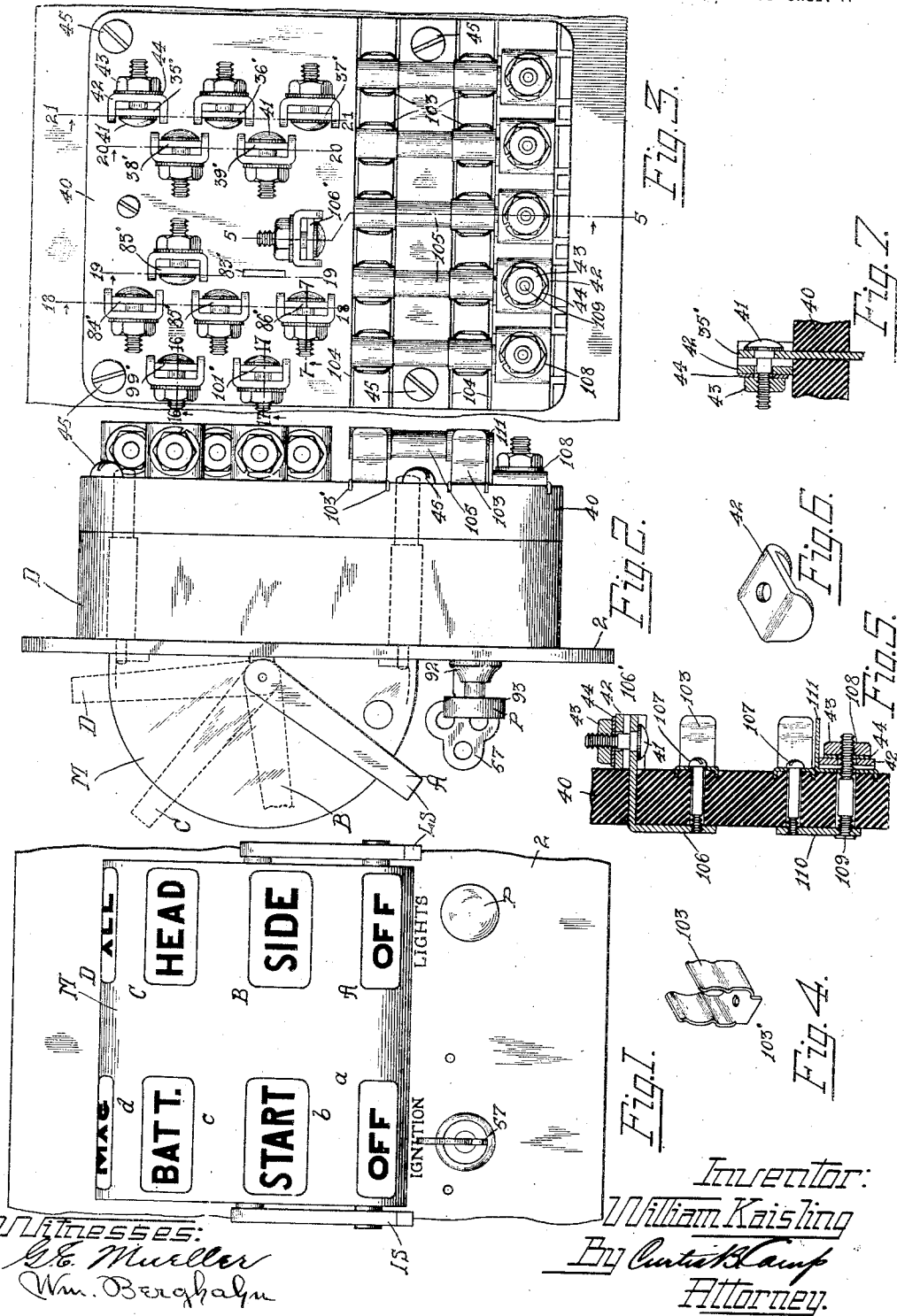


W. KAISLING.
COMBINATION LIGHTING AND IGNITION SWITCH.
APPLICATION FILED FEB. 3, 1913.

1,172,364.

Patented Feb. 22, 1916.

4 SHEETS—SHEET 1.



Witnesses:
C. E. Muller
Wm. Berghahn

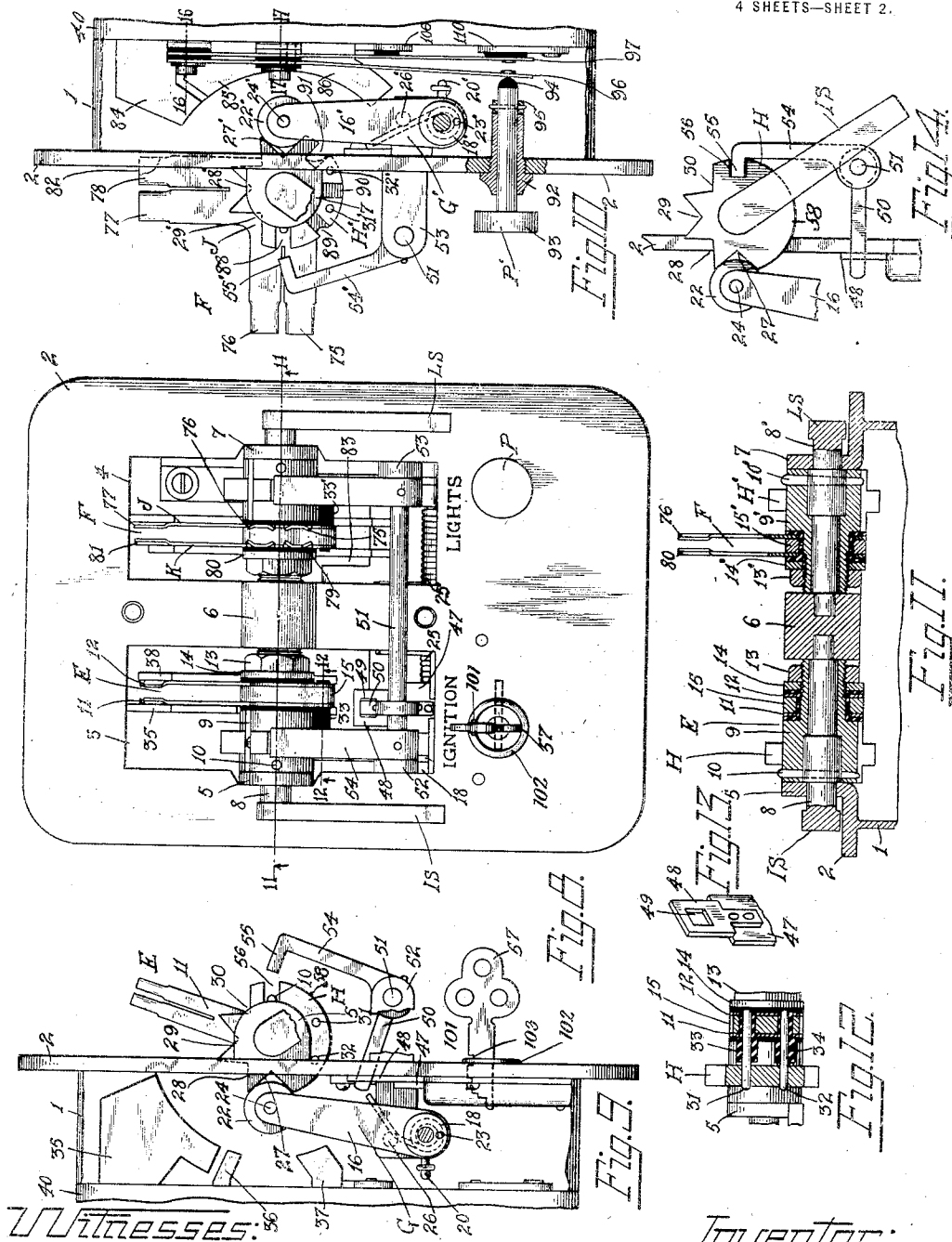
Inventor:
William Kaisling
By Curtis Kamp
Attorney.

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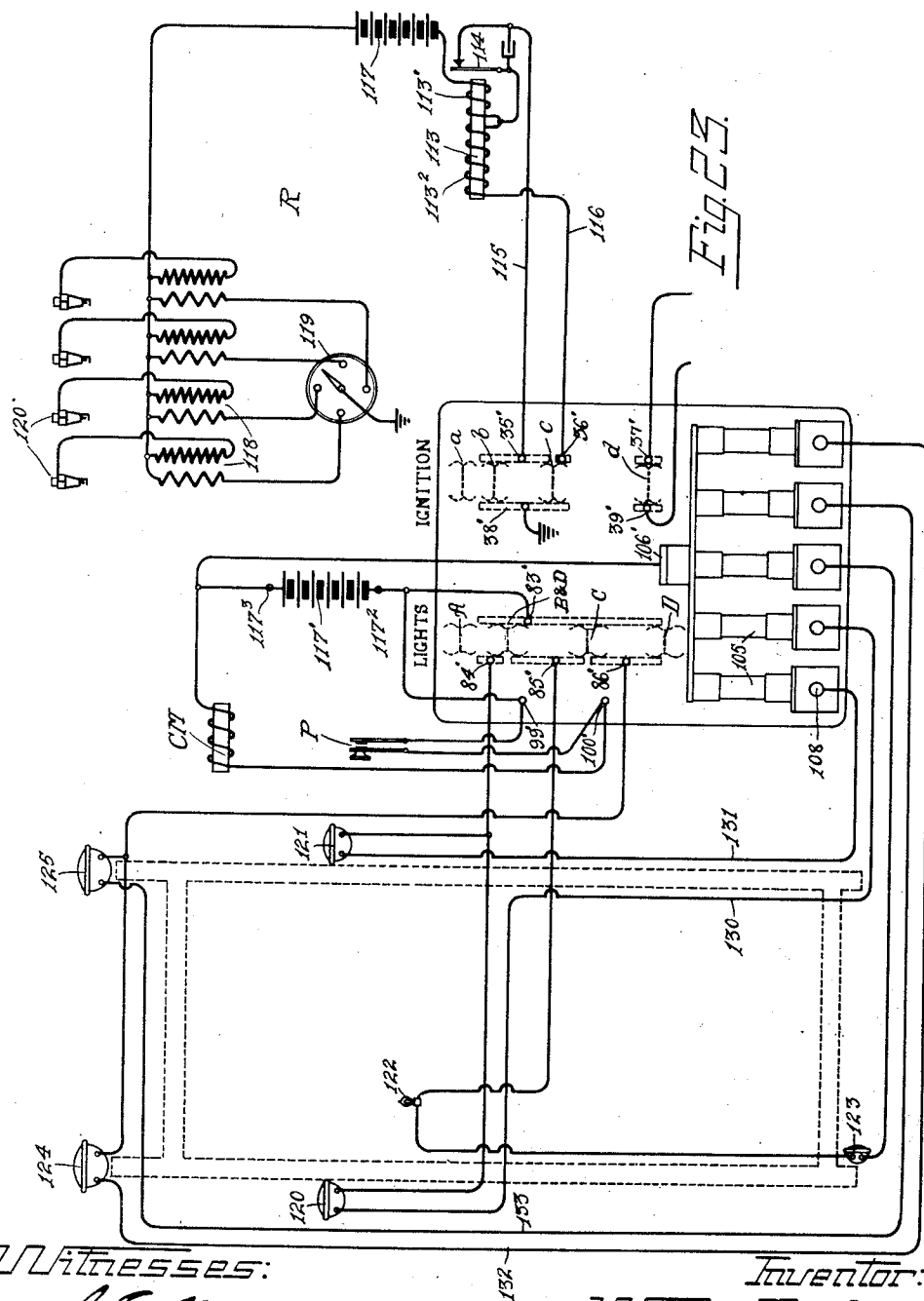
G. E. Mueller.
Wm. Berghahn.

Inventor:
William Kaising
By Curtis R. Camp
Attorney.

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Wm. Bergahn

Inventor:

William Kaisling
By Curtis R. Camp
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM KAISLING, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

COMBINATION LIGHTING AND IGNITION SWITCH.

1,172,364.

Specification of Letters Patent.

Patented Feb. 22, 1916.

Application filed February 3, 1913. Serial No. 745,797.

To all whom it may concern:

Be it known that I, WILLIAM KAISLING, 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 Lighting and Ignition Switches, of which the following is a specification.

My invention relates to automobile switches in general and has to do more particularly with combined lighting and ignition switches. The general object of my invention being to provide a unitary structure including both lighting and ignition control switches which is simple and compact in construction and arrangement, and positive in operation. Also a single locking device common to the two switches is provided for locking them in different relative positions. There are other features of my invention which will be more particularly referred to in the ensuing specification and claims.

I have illustrated my invention in the accompanying drawings, the like parts in the different views being indicated by like reference characters and in which—

Figure 1 is a face view of my invention with a portion of the face plate broken away; Fig. 2 is a right side elevation of the device of Fig. 1; Fig. 3 is a rear elevation of the switch of my invention; Fig. 4 is a detail view of a fuse holding clip; Fig. 5 is a section along the line 5, 5, of Fig. 3 looking in the direction of the arrows indicated thereon but with the fuse removed; Fig. 6 illustrates a clamping plate used on the switch terminals; Fig. 7 is a sectional view along the line 7, 7, of Fig. 3; Fig. 8 is a face view of my invention with the switch cover M removed; Fig. 9 is a left side view of the device of Fig. 8 with a portion of the casing broken away and illustrating the ignition switch more particularly; Fig. 10 is a right side view of Fig. 8 with a portion of the casing broken away and illustrating more particularly the light switch; Fig. 11 is a partial sectional view along the line 11, 11, of Fig. 8 showing more particularly the main shafts and parts carried thereby, of the two switches; Fig. 12 is a sectional view along the line 12, 12, of Fig. 8; Fig. 13 illustrates in perspective a portion of the lock bolt;

Fig. 14 shows the lock in an operated position illustrating more particularly the method of locking the ignition switch; Fig. 15 is a rear view of the device with the back cap 40 removed; Fig. 16 is a sectional view along the line 16, 16, (referring to Figs. 3 and 10) illustrating the manner in which the rear connecting terminal is connected to one of the contact springs of the push button switch P of Fig. 10; Fig. 17 is a sectional view along the line 17, 17, (referring to Figs. 3 and 10) showing the manner in which a rear terminal is connected to the other of the contact springs of the push button switch P just referred to; Figs. 18, 19, 20, 21, are sectional views along the lines indicated by like numerals in Fig. 3, showing the manner in which the switch blades extend through the rear plate or cap to the connecting terminals; Fig. 22 is a sectional view along the line 22, 22, of Fig. 15 showing the yielding switch-holding means; and Fig. 23 illustrates diagrammatically the ignition and light control switches connected in circuit with the lights and ignition system of an automobile.

Before describing in detail the construction of my invention I will refer briefly to some of the general characteristics and its operation.

In general the device is preferably arranged for controlling two types of circuits, preferably an ignition circuit and a light circuit, and to this end I provide an ignition switch controlled by the lever IS and a light switch controlled by a lever LS. Referring now to Fig. 1, these levers are shown in a normal or inoperative position, lever IS having three off-normal or operative positions marked Start, Batt., (meaning battery) and a last position marked (Mag., meaning magneto). The lever may be moved to any of these positions referred to whereby different circuit combinations are established by the switch contacts controlled by the lever. Now as to the light switch lever LS, this also has three operative positions exclusive of its normal position, these operative positions being marked Side, Head, and All. Of course these markings as indicated in the drawing are preferred markings to conform to the preferred cir-

cuit arrangement and operation of my invention. The lever LS when moved to the Side position is adapted to connect the side lights in circuit. When said lever LS is moved to the Head position the head and tail lights are cut in circuit while with the lever LS in the All position, all of the lights on the machine are preferably cut in circuit.

I have also preferably arranged the locking feature of my invention so that the ignition switch IS can only be locked in an off-normal or inoperative position, but the light switch may be locked in any of its positions, either the normal or operating positions. Thus a party in leaving his car may be able to lock the ignition switch in a normal or inoperative position but leave any combination of lights burning. I have preferably arranged the locking feature of my invention so that the lock can be operated and the key removed only when the ignition switch is in an inoperative position. Thus it will be impossible for a person to make a mistake and lock the device with the switch in an operative position as the key can only be removed when the switch is in such position.

Referring now more in detail to the mechanical structure of my invention, it comprises an outer casing D preferably composed of sides 1 and a face portion 2. Rectangular openings 3, 4, are provided in the face plate 2 so as to clear the wipers or movable elements and other parts E and F of the switches. Three forwardly extending lugs 5, 6, 7 are also provided which have bearings for the shafts of said switches E, F. Each of the switches E, F, is an independently operated device, the preferred manner of mounting the wipers upon the shaft being shown in cross section in Fig. 11.

Referring now to the ignition switch, the movable element E preferably comprises a main shaft 8 carrying a rigidly attached operating lever IS, said shaft 8 being journaled in the lugs 5, 6. A main hub member 9 is rigidly attached to shaft 8, preferably by means of a pin 10 and a pair of wiper members 11, 12 are insulatingly supported by the hub 9 as is shown in cross section in Fig. 11. The hub 9 is threaded so as to receive a clamping nut 13 to rigidly hold the wipers 11, 12 in position, a washer 14 being positioned under the clamping nut 13. A spacing collar 15 is placed between the wipers 11, 12, this collar being preferably of a conducting material so as to hold the wipers 11, 12 in electrical contact. Thus it will be seen that although the wipers 11, 12, are in electrical contact they are insulated from the rest of the device.

As already referred to the wipers or movable contact elements are adapted to be moved to any one of a plurality of positions, and therefore I provide a yielding holding device G for the switch E, said means G be-

ing preferably in the form of a lever 16 which is supported between collars 17, 18, and held thereto by means of a pin 23 shown in Fig. 9. The lever is then rigidly attached to a shaft 19 by means of a pin 20. Shaft 19 is pivotally supported at one end in a bracket member 74 which is attached to the rear of the face plate 2 as shown in Fig. 15, while the other end of the shaft 19 is pivotally supported in a boss 21 preferably integral with the side of casing D. A roller 22 is carried at the end of the arm 16, being rotatably supported by a shaft 24. In order to hold the roller 22 of the holding device G in yielding relation with its switch, a helical spring 25 is provided, being held at one end by a pin 20 and at the other end by an escutcheon pin 26. Spring 25 is so placed that the tendency is to press the roller toward the switch E. Having preferably arranged my invention, and referring now to the ignition switch member E, with four positions, therefore I provide means whereby the switch may be yieldingly held in its four positions and to this end the notched member H is provided with notches 27, 28, 29, 30, each of which is engaged by the roller 22 of the holding device G according to the position in which the switch is moved. For instance, when the switch is in the normal or off position, roller 22 is resting in notch 27, when the switch is in the *b* or starting position, roller 22 rests in notch 28, when the switch is in position *c* the roller 22 rests in notch 29 and when the switch is in the last position *d* the roller 22 rests in notch 30.

The member H is preferably integral with the hub 9 as is illustrated in Fig. 11 and in order to positively hold the wipers 11, 12 in definite relation to the holding means, I provide additional securing means which are shown in cross section in Fig. 12. This additional holding means is preferably in the form of pins 31, 32, which are driven into member H and extend through insulating bushing 33, 34, which bushing extends through the wipers 11, 12, and supporting collar 15. Thus the wipers are rigidly held in a definite relation to the holding means and operating lever. Of course it should be understood that this is but a detail of construction and a preferred method of accomplishing this, and that other means are just as well within the scope of my invention.

Still referring to the ignition switch, the stationary contact members which cooperate with the wipers 11, 12, are preferably in the form of blades 35, 36, 37, for the wiper 11 and blades 38, 39, for the wiper 12. These blades are supported in a plate 40, said plate being preferably of an insulating material through which the extensions 35¹, 36¹, 37¹, 38¹ and 39¹ pass, said blades being thus securely held in position in the plate 40. Each of these extensions or terminals 35¹ to 39¹ is

provided with a binding post arrangement, and as these binding posts are preferably all alike, I will describe but one of them. In Fig. 7, one of these binding post arrangements is shown in cross section and it comprises a screw 41 which extends through the terminal portion 35¹ and has a saddle shaped clamping plate 42 held by means of a nut 43. A well-known form of split washer is inserted between nut 43 and clamp 42 so as to prevent the nut 43 from readily coming off. In securing a conductor to the terminal device, such conductor is passed between the terminal 35¹ and the clamp 42 and thereafter the nut 43 is moved to clamp the conductor between the members 35¹, 42. The mounting plate 40 also serves as a rear cover for the device, being secured to the casing by means of screws 45 which extend through the plate 40 and into the threaded bosses 21. Still referring to the ignition switch, with the lever in its Off or normal position, which we are referring to as the position *a* the wipers 11, 12, carried thereby are in a position free of the stationary contacts as indicated by dotted lines and reference character *a* in Fig. 20, and when the lever IS is moved to its position *b* the wipers assume the position *b* as indicated by the dotted lines in Figs. 20, 21. Now when the lever IS is moved to the position *c* its wipers assume the position indicated by the dotted lines *c* in Figs. 20, 21, and when the lever is moved to its position *d* the wipers controlled thereby assume the position indicated by *d* in Figs. 20, 21. Thus due to the preferred construction of my invention, when the lever IS is in its position *b*, blades 35, 38, are in electrical contact, when the lever IS is moved to its *c* position its wipers contact the blades 38 in electrical contact with blades 35, 36, and when said lever is moved to its position *d* its wipers connect blades 37, 39 in electrical contact.

Now as to the locking feature of my invention as applied to the ignition switch just described, I preferably provide a key-lock in which a bolt 47 is provided which is adapted to receive a reciprocating movement by the operation of the key and in which the key cannot be withdrawn except when the bolt is in either substantially a locked or unlocked position. In other words I prefer to use a lock in which the key cannot be withdrawn when the bolt is in an intermediate position.

An extension 48 is provided for the bolt 47 having an orifice 49 which connects with a locking lever 50, said lever being attached to a shaft 51 journaled in the lugs 52, 53. The locking arm 54 is securely attached to shaft 51 and has a locking portion 55 which coöperates with the movable elements E to lock the switch, this coöperation being preferably with the member H. To this end a slot 56 is provided preferably in member H which when the switch is in an inoperative

position, registers with the portion 55 so that when the key 57 is turned in the lock the bolt 47 and extension 48 carried thereby move downward thereby actuating the locking lever 50 and moving the locking arm into locking engagement with the movable part E of the ignition switch as shown in Fig. 14. Key 57 may then be removed from the lock.

As already outlined, I preferably arrange the locking device for the ignition switch in such a manner that the locking mechanism can be operated and the key withdrawn only when the switch is in an inoperative or normal position and to this end I have provided the cam portion 58 of the member H, so that when switch E is in any other position the cam portion 58 will prevent a sufficient movement of the lock and key to allow the withdrawal of the key.

Now as to the light switch, its operation is similar to that of the ignition switch, the operating lever LS being preferably adapted to be moved to the same number of positions as the ignition switch, these positions being indicated as Off meaning the normal or inoperative position and marked position A, position B or the Side position in which the switch is adapted to close a circuit for the side lights, position C or Head position in which the head lights only are connected in circuit and position D or the All position in which all of the lights are connected in circuit.

Except for the wipers or movable contacts and the blades or stationary contacts with which they coöperate, the light switch is similar in construction to the ignition switch and therefore the elements of the light switch which correspond to the elements of the ignition switch are indicated by like reference characters except for the addition of the exponent prime. Another distinction which exists in the light switch is in the locking arrangement, that is the light switch may be locked in any of its positions as distinguishing from the ignition switch which it will be remembered can only be locked in an inoperative position. With this exception it is thought that the similarity of these two switches will be apparent without a detailed description of the like parts.

Now as to the wiper or movable contact elements F of the light switch, these are mounted on the supporting shaft and hub similar to the wipers of the switch E, but the wipers F comprise radially disposed members 75, 76, 77, 78, forming preferably one integral member J, and the members 79, 80, 81, and 82 (82 shown back of 78 of Fig. 10) also preferably forming an integral element K. I preferably arrange a single blade 83 adapted for coöperating with the wipers K, this blade 83 serving as a common contact or terminal which may

be connected by the wipers J and K to the blades 84, 85, 86.

In Figs. 18, 19, I have indicated by dotted lines the position which the wipers assume when the light switch is in its different positions, these positions of the wipers being indicated by reference characters A, B, C, and D to correspond with the positions A, B, C, and D of the light switch lever. When the lever LS is in its Off or inoperative position the wipers carried thereby are in a position indicated by A. When lever LS is in its Side or B position, the wipers carried thereby are in the position indicated by B, when said lever is in its Head or C position its wipers are in the position indicated by C and when the light lever is in its All position D, its wipers are in position D as indicated in Figs. 18 and 19. Thus, referring now to the connections which exist in the different positions of the lever LS, when the lever is in B position, blades 83, 84, 85, are in electrical contact. And with the lever in the C position, blades 83, 85, 86, are in electrical contact. Now when the light switch lever LS is moved to its D or last position, the blades 83, 84, 85, 86 are connected.

As in the case of ignition switch, the blades of the light switch have extensions 83¹, 84¹, 85¹ and 86¹ which carry connectors as already described. The coöperation between the movable elements of the light switch and the yielding holding device G¹ are also the same as that described in the ignition switch and therefore no further reference to this coöperation is deemed necessary.

Now as to the locking feature of the light switch, I preferably arrange this switch so that it may be locked in any of its positions and to this end I provide the member H¹ with a plurality of slots 88, 89, 90 and 91. Thus when a switch is in its normal or inoperative position the end 55¹ of the locking arm 54¹ coöperates with slot 88 and when the switch is in its B or side position said arm coöperates with slot 89. Now when the switch is moved to its third or C position, said arm coöperates with the slot 90 and with the switch in its last position the arm engages the slot 91. It will be apparent from this that although the ignition switch must be in an inoperative position to allow the operation of the lock and withdrawal of the key, the light switch may be placed in any of its positions and still allow the common lock to operate and the key thereof to be withdrawn. It will be noted in this connection that considerable accuracy of adjustment is required so that in the various operated positions of the switch the respective slots 88, 89, 90 and 91 will be alined properly with the lock operated element 54¹. The lever or rocker arm

16¹ operating on the star wheel in the manner already described serves this purpose, the roller of said arm acting to snap the switch into predetermined positions and preventing its being accidentally left in a position between contact position.

I have provided the push button switch P which may be used for various purposes, the use made thereof in the present embodiment of my invention being for the control of a foot pedal clutch magnet such as is used in the well-known Delco automobile starting device. This switch comprises a bushing 92 preferably threaded into the face plate 2 and supporting the shank of the push button 93. An insulated buffer 94 is secured to the shank of button 93 and a collar 95 is also attached to the shank of 93 to limit the movement thereof. A pair of contact springs 96, 97, are adapted to be operated by button 93, said springs being attached to block 40 as shown in Figs. 16, 17. Thus by the use of insulating bushings and separators the contact springs are so arranged that contact spring 96 is connected through the screw 98 to the terminal piece 99 as shown in Fig. 16 and contact spring 97 is clamped in electrical contact with its terminal 100 by the use of screw 101. In this manner contact spring 96 is in electrical connection with its terminal 99, while the other spring 97 is insulated from terminal 99, and contact spring 97 is in electrical connection with its terminal 100 while the contact spring 96 is insulated from said terminal 100. Extensions 99¹ and 100¹ are provided for the terminal pieces 99 and 100 and connectors are provided for these extensions similar to those already described.

Fuses.—I have preferably provided a fuse arrangement in carrying out the preferred form of my invention and to this end a number of spring clips 103, shown in perspective in Fig. 4, are mounted upon the rear face of the plate 40. Clip 103 is provided with downwardly extending portions 103¹ which fit into slots 104 cut into said block 40, this slotted arrangement being provided to prevent the rotation of spring clips. A small standard fuse such as 105 may be readily inserted into these spring clips. I also preferably provide a common connecting bar 106, as shown in Fig. 5, which extends along beneath the upper row of clips 103 and is adapted to connect all of the upper row of clips 103 through the holding screws 107. An extension terminal 106¹ is provided for this common bar 106, and said extension carries a connecting clamp similar to those already referred to. Thus a conductor being attached to the connector of terminal 106¹, is in electrical connection with all of the fuses connected to the common bar 106. Each fuse 105 is adapted to be used in a separate circuit and therefore individual

terminals 108 are provided for the other end of each of the fuses, each of said terminals being connected through its stud 109 to an individual connecting bar 110 into which the fuse clip screw 107 is threaded. The connector terminal 108 is similar to that used at the other terminals the like parts being indicated by like reference characters. The plate 111 of terminal 108 is adapted to prevent the fuse 105 from jarring downward and out of the spring clips 103. This is clearly shown in Figs. 2 and 3.

Figure 23.—In Fig. 23, I have shown diagrammatically an application of my switch invention to a lighting and ignition circuit of an automobile, the parts shown in Fig. 23 which correspond to parts of the structure described being indicated by like reference characters. In the illustration I have shown one form of an ignition circuit R comprising a control relay 113 having a normally closed contact 114, and connected by conductors 115, 116, to the terminals 35¹, 36¹. In the illustration I have indicated the terminals of the switch structure in the positions they appear when looking at the rear of the device as in Fig. 3. A battery 117 is also provided connected to induction coils 118, said coils being connected to a distributor 119 and spark plugs 120, the arrangement shown being adapted for a four cylinder engine. The terminal 38¹ which is adapted to be connected to terminals 35¹, 36¹, by the operation of the switch, is preferably connected to ground in accordance with the system shown although it is to be understood that these connections are determined according to the circuit arrangement used. Terminals 37¹, 39¹ are adapted for use in connecting the magneto of the automobile in circuit in place of the battery ignition. When the ignition switch is in its *a* position, the circuit is open or inoperative and when the switch is moved to its *b* position, terminals 35¹, 38¹ are connected in circuit so as to provide a vibratory circuit for the control relay 113 and cause its vibratory operation during the time the wiper arm of the distributor 119 is in connection with one of its four contacts. When the switch is in position *c* the terminal 35¹, 36¹, 38¹ are connected and the control relay 113 is connected so as to produce but a single spark for each closure of a timer contact, instead of a profusion of sparks as when the switch is in stationary or *b* position.

Now, as to the lights and the control thereof, a pair of side lights 120, 121, and speedometer and tail lights 122, 123 respectively are adapted to be cut into circuit when the wipers of the light switch are in their Side or B position as indicated by the dotted lines in the Fig. 23. A pair of head lights 124, 125 are also provided which are adapted to be cut in circuit and the side

lights 120, 121, cut out when the light switch is in its Head or C position. With the switch in this last named position the speedometer and tail lights 122, 123 respectively also remain in circuit as is indicated in the diagram by the dotted wipers in position C. In other words I preferably arrange the lights so that the speedometer and tail lights 122, 123 are cut in circuit with either the side or head lights. Now if the switch is moved to its D or All position, the common plate of terminal 83¹ is connected in circuit to the three blades 84, 85, 86 as will be understood from the diagram in which the wipers are shown as connecting all of the blades of the light switch in circuit when the switch is in position D. In this position all of the lights are connected.

The push button switch P is shown with its terminals 99¹, and 100¹ connected in circuit with the clutch magnet CM which in the well-known Delco system is associated with the clutch pedal for controlling the starting operation.

Operation.—Now as to the operation of the structure described, assuming that the levers of the switches are in their normal or inoperative position, and referring now more particularly to the ignition switch, and furthermore assuming the switch device is unlocked, by moving lever IS to its position *b*, the wipers 11, 12 carried thereby are moved into the position *b* diagrammatically illustrated in Figs. 20, 21, 23. This movement causes the holding device G to be moved outward against the tension of its spring 25 so that its roller 22 drops into the notch 28 thereby yieldingly holding the switch in this position. This operation brings blades 35, 38 into electrical contact whereby ground is connected to the contact 114 and the winding 113¹ so that when the contact of the distributor 119 is closed, the control relay 113 has its armature vibrated to interrupt the circuit of its winding 113¹ and therefore cause a plurality of sparks at the connected spark plug 120. With the switch in this starting position the control relay 113 of course rapidly vibrates and thus consumes a comparatively large amount of current and which is only necessary in starting the engine. Therefore the operator now moves switch lever IS to the battery or *c* position, which is the ordinary running position, whereby the wipers 11, 12, are moved into the *c* position as indicated in Figs. 20, 21, 23, thus connecting the three blades 35, 36, 38 in electrical contact. In this position the high resistance winding 113² of the control relay is also brought into operation so that but a single spark is produced for each closure of the timer contact 119. That is with ground connected to conductors 115, 116, leading to the control re-

lay, upon the closing of a timer contact, a circuit is closed through both of the windings of the control relay whereby it attracts its armature and interrupts the initial circuit of the low resistance winding 113¹ so that windings 113¹, 113² are connected in series and maintain the armature attracted and contact 114 interrupted until the timer contact is interrupted. The control relay 113, then deenergizes until a timer contact is again closed. I have also provided magneto control contacts so that the ignition switch may be moved to its magneto or *d* position whereby the battery contacts are disengaged by the wipers and the magneto contacts connected in circuit so as to displace the battery ignition by magneto ignition. When the lever IS is restored to normal the ignition system is of course rendered inoperative.

Now as to the operation of the light switch, when the lever LS is at normal the wipers carried thereby are in their A position, in which position the lights are of course cut out of circuit. Now assuming the operator desires to connect the side lights 120, 121 in circuit and thereby also the speedometer and tail lights 122, 123 respectively, the lever LS is moved to the Side or B position whereby the wipers controlled by lever LS are moved into the position B as indicated in the drawing thus connecting the common blade 83 with the blades 84, 85. In this position a circuit is established from pole 117² of the battery 117¹ to the terminal and blade 83 through the wipers to the blades 84, 85. The circuit for side lamps 120 and 121 is then extended from terminal 84¹ in multiple through said lamps 120, 121, conductors 130, 131, fuses 105 and terminal 106¹ thereof to the other pole 117³ of the battery. Now as to the connection from terminal 85¹, this extends through lamps 122, 123 in series, a fuse 105 to terminal 106¹ and the other pole 117³ of battery 117¹. Thus it will be seen that with the switch in its Side position its side lamps and speedometer and tail lamps are put in circuit. The lamps 122, 123, are preferably connected in series so as to indicate to the operator by 122 should anything go wrong with the tail light 123.

Should the operator desire to run on the head lights in place of the side lights, the lever LS is moved into its Head or C position whereby the wipers controlled thereby connect the blade 83 in circuit with the blades 85, 86, and disconnects the blade 84 which controls the side lights. Therefore the circuit is maintained over the speedometer and tail lights, but in place of the side lights 120, 121, the head lights 124, 125 are connected in circuit, the circuit for these lights being traced from blade and terminal

86¹, through lamps 124, 125, in multiple, conductors 132, 133 and fuses 105 and the terminal 106¹ to battery.

Should the operator desire to include all of the lamps in circuit, control lever LS is moved to its All or D position whereby the wipers carried thereby connect the common blade 83 in circuit with the three blades 84, 85, 86. With all of the blades in electrical contact, all of the lamps are of course included in circuit as described and are thus lighted.

Locking operation.—As already outlined I have preferably arranged the locking features of my invention so that the ignition switch can be locked and the key withdrawn only when the switch is in an inoperative position. In this way, the operator must positively move the ignition switch to an inoperative position before he can lock it and remove the key. But as to the lighting switch, I have preferably arranged this switch so that it may be locked in any of its positions. Thus an operator may lock his car and leave any of the lights burning if he desires.

Assuming now that the switch is in a normal or inoperative position, and the operator desires to lock it in this position, the key 57 is given one complete revolution whereby its bolt 47 is drawn inwardly and due to the connection from its extension 48 to the locking lever 50, said lever 50 is moved downwardly rotating shaft 51 and thereby causing the ends 55, 55¹ of the locking arms 54, 54¹ to move into locking engagement with the slots 56, 88. The key 57 may then be withdrawn from the lock and the device is maintained in an inoperative position. To unlock the device and restore it to an operative condition, the key is again inserted and given one complete revolution whereby lock-bolt 47 is moved outwardly and thus moves the locking ends 55, 55¹ out of locking engagement with the slots 56, 88 and the switches are free to be operated.

Should the operator desire to leave the side lights on and lock the switch, the light lever LS is moved to its B position whereby the slot 89 is moved opposite the locking end 55¹ so that when the key 57 is rotated the light switch is locked in its side position and the ignition switch in its inoperative position. In a like manner, the light switch may be moved to the Head or All positions whereby the slots 90 or 91 are brought into operative relation with the locking end 55¹ so that the light switch may be locked in either of these positions.

Assuming now that the ignition switch has been left in an operative position and the operator attempts to lock the device, upon rotating the key 57 the bolt 47 carried thereby is moved only until the locking end

55 comes into engagement with the cam portion 58, but as this movement is not sufficient to allow a complete revolution of the bolt and the bringing of the key around to a position in which it may be withdrawn from the lock (unless the key is turned back) the operator will immediately be informed of the fact that the ignition switch is off normal and will therefore restore it to allow the effective operation of the key.

The lock may be of the usual Yale type in which the bolt must be at a particular point to permit the key being inserted or withdrawn, or any lock having this feature such as an ordinary lock in which an escutcheon plate serves this purpose. As shown the escutcheon plate 102 has a groove 101 cut in it, to admit the insertion of a key 57. The key 57 is provided with a notch 103 adapted to cooperate with the escutcheon plate 102 to prevent its withdrawal from the lock unless the key is in the position as shown in Figs. 8 and 9.

In carrying out my invention I have used a preferred contact arrangement of the switches to bring about certain switching relations but I contemplate using other contact arrangements according to the combination desired both as to the light and ignition switches. Furthermore in working my invention into commercial form I have chosen a preferred mechanical construction but I do not desire to be limited to the exact structure as described and neither do I desire to be limited to the exact circuit arrangements shown as I contemplate applying my switch device in various ways and I aim to cover all such changes and modifications as come 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 switch and a lock to lock the same, said lock being operable only when the switch is in Off position, and a second switch, said lock also serving when operated to lock said second switch in either On or Off position.

2. An electrical switch combination having two switch contacts each having an idle and on operated relation, and a lock operable only when one of said contacts is in its idle relation, but when said other contact is in either relation, said lock when actuated serving to prevent changing the relation of either contact.

3. A lighting switch and an ignition switch for automobiles or the like, provided with a common locking means adapted to lock the lighting switch in either On or Off position, and the ignition switch in Off position only, said locking means being inoperable unless the ignition switch is in Off position.

4. A lighting switch and an ignition switch for automobiles or the like, and means for locking the lighting switch, said means being inoperable unless the ignition switch is in Off position.

5. An electrical switch having a movable wiper for controlling the ignition circuits and a second movable wiper for controlling the lighting circuits, a lock common to both of said wipers, and means for preventing the operation of said lock unless the ignition wiper is in its Off position.

6. In an electrical switching device, a movable wiper for controlling the ignition circuits, and a movable wiper for controlling the lighting circuits, both said wipers having Off and On positions, a lock common to said wipers, and mechanism permitting said lock to operate only when the ignition wiper is in its Off position, but when the lighting wiper is in either its Off or its On position.

7. A switch device comprising a lighting switch and an ignition switch each of said switches having a normal and an off-normal position, a locking device common to said switches, means for operating said device to lock said lighting switch in any one of its positions, the said means being rendered ineffective except when said ignition switch is in its normal position.

8. The combination of a lighting and an ignition switch, each of said switches having a normal and an off-normal position, locking mechanism including a key lock common to said switches, means for operating said locking mechanism to lock said switches in their normal positions, in which positions the lock may be operated, and means to prevent the operation of the lock if said ignition switch is in an off-normal position, which notifies the operator of that fact.

9. The combination with a lighting switch and an ignition switch, a normal and an off-normal position for each of said switches, a key lock common to said switches, means responsive to said key lock when its key is operated for locking said ignition switch in its normal position and said lighting switch in either its normal or its off normal position, and means to prevent the operation of said lock, if said ignition switch is in its off normal position, said failure of the lock to operate notifying the operator that the ignition switch is not in its normal position.

10. A switching device comprising a movable wiper for controlling the ignition circuit, a movable wiper for controlling the lighting circuit, each of said wipers having a normal position and an off normal position, a key lock common to said wipers, and means associated with said wipers to pre-

vent the operation of said lock unless said ignition wiper is in its normal position, whereby the inability of the operator to lock said wipers will notify the operator that the ignition wiper is not in its normal position.

Signed by me at Chicago, county of Cook

and State of Illinois, in the presence of two witnesses.

WILLIAM KAISLING.

Witnesses:

G. E. MUELLER,
B. O'BRIEN.