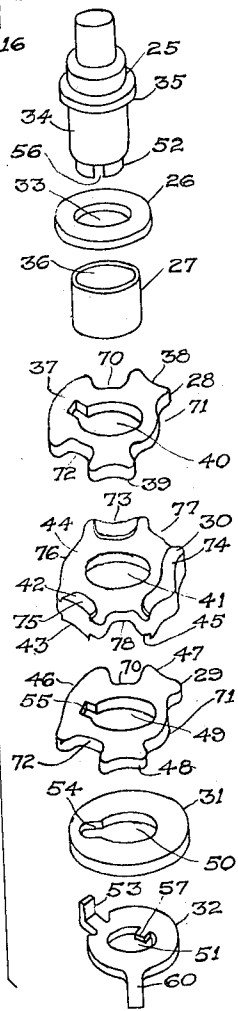
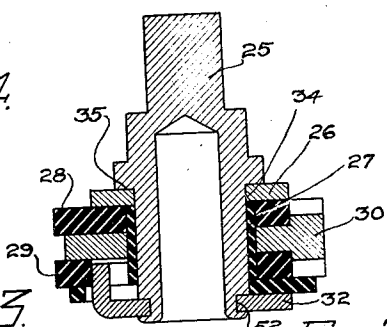
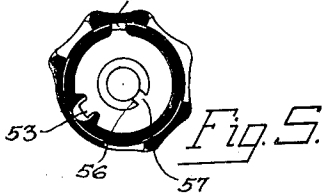
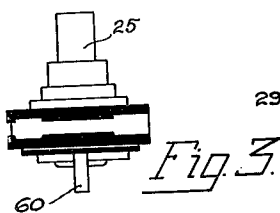
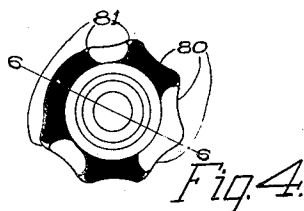
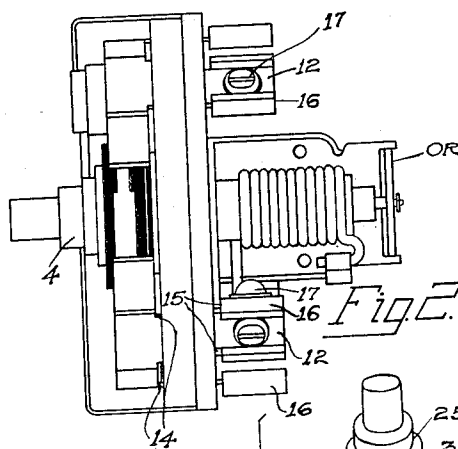
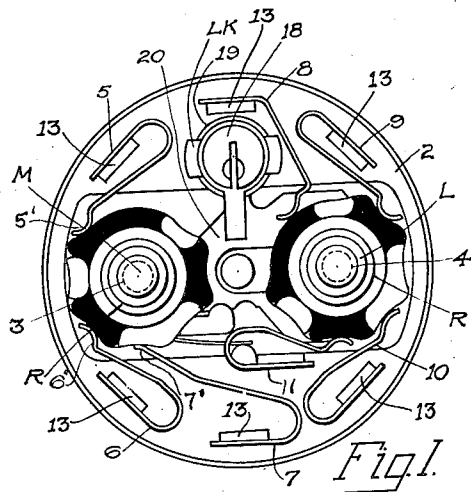


Jan. 30, 1923.

1,443,404

A. H. WEISS.
IGNITION AND LIGHTING SWITCH.
FILED AUG. 27 1919.



Inventor:
Alfred H. Weiss.
By Curtis B. Camp.
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UNITED STATES PATENT OFFICE.

ALFRED H. WEISS, OF WILMETTE, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

IGNITION AND LIGHTING SWITCH.

Application filed August 27, 1919. Serial No. 320,130.

To all whom it may concern:

Be it known that I, ALFRED H. WEISS, a citizen of the United States of America, residing in Wilmette, 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 in general and has to do more particularly with switches for controlling a plurality of circuits. The present embodiment of my invention is particularly adapted for use in connection with ignition and light circuits for automobiles or the like. It is an object of my invention to produce an improved device of the class described which embodies desirable features and advantages, all in a simple, efficient and economical manner.

A feature of my invention is an improved construction of the rotor element of the switch, which rotor element is operatively associated with contact springs to establish different circuit combinations as the rotor element is actuated, and which rotor construction will be more particularly described and pointed out in the ensuing specification and appended claims.

For a more complete understanding of my invention, reference may be had to the accompanying drawing in which like reference characters in the several views denote like parts, and in which

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

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

Fig. 3 is a view of the rotor element of my invention in elevation;

Fig. 4 is a plan view of Fig. 3;

Fig. 5 is a bottom view of Fig. 3;

Fig. 6 is an enlarged sectional view of the rotor element on the line 6—6 of Fig. 4;

Fig. 7 is a perspective view of the parts of the rotor element detached.

Referring now in general to my invention as illustrated, I show the rotor element in association with a certain type of combined lighting and ignition switch of a construction similar to that illustrated and described in co-pending application, Serial Number 173,084, filed June 6, 1917, but it is to be

understood that the rotor element of my invention may be used with other types of switches.

The switch as illustrated in the accompanying drawing comprises a lighting switch unit L and an ignition switch unit M, each being provided with a rotor element R of my invention. A locking mechanism LK is provided and comprises a standard tumbler lock and a sliding locking plate so arranged that it operates only when the ignition switch unit M is in its normal or inoperative position and the lighting switch unit L is in any of its different positions.

Referring now more in detail to my invention as illustrated, the switch with which the rotor of my invention is associated comprises preferably a mounting base or plate 2, made of any suitable material such as bakelite, and having studs 3 and 4, shown dotted in Fig. 1, fastened to the base in any suitable manner, and I preferably have the studs set in the plate 2 during the moulding of the said plate 2. The stud 3 is provided for the ignition unit M and the stud 4 is provided for the lighting unit L. Springs 5, 6 and 7 are associated with the ignition switch unit M and springs 8, 9, 10 and 11 are associated with the lighting switch unit L. The springs 5, 6, 7, etc. are formed out of spring metal and have tongue portions 12, which tongues 12 are forced into suitable openings 13 in the plate 2, which openings are slightly smaller than the tongues 12 to provide a force fit. The tongues 12 of the springs 5, 6, 7, etc. are provided with shoulders 14 and 15, the shoulders 14 resting against the top surface of the plate 2, while the shoulders 15 extend slightly beyond the bottom of the plate 2 and these extensions are upset to hold the springs 5, 6, 7, etc. against movement in the openings 13 of the plate 2. The free ends 5', 6', 7' etc. of the springs 5, 6, 7, etc. are provided with rounded or curved end portions which form contacting ends which engage the ignition and light units M and L, respectively, as will be more fully hereinafter described. The tongues 12 of the springs 5, 6, 7, etc. which extend beyond the bottom surface of the plate 2 form connecting terminals for their respective springs 5, 6, 7, etc. and are pro-

vided with saddles or clamping members 16 which provide means for securing electrical conductors to the terminals formed by the tongues 12. Screws 17 are provided with washers, which screws 17 have screw-threaded engagement with the clamping members 16 for securely holding the electrical conductors between the tongues 12 of the springs 5, 6, 7, etc. and the said clamping members 16.

A standard tumbler lock 18 is provided and is set in a suitable recess 19 in the mounting plate 2 and a sliding locking plate 20 is also provided and is operatively associated with the lock 18. The lock 18 in association with the sliding locking plate 20 locks the ignition unit M and lighting unit L as already described, but as this locking mechanism does not form a part of my invention, a detailed description will not be given.

Also associated with the combination lighting and ignition switch, as illustrated, I show an overload relay OR which is used for purposes well understood, the said relay OR being secured to the mounting plate 2 in any suitable manner.

The lighting switch unit L and the ignition switch unit M are each provided with a rotor element of my invention, and as both are similar in construction, a description of one of them will suffice.

The rotor element associated with the lighting switch unit L comprises a supporting stud 25, a washer 26, a bushing 27 of suitable insulation material, cams 28 and 29 similar in shape and of suitable insulation material, a cam 30 of suitable conducting material and a plate 32 all of which are supported upon the stud 25, as will now be described. The washer 26 is provided with an orifice 33 of a size to permit it being slipped over the body portion 34 of the stud 25. The said washer when in place rests against the shoulder 35 on the stud 25. The bushing 27 is provided with an orifice 36 of a size to permit it being slipped over the body portion 34 of the stud 25. The cam 28 is provided with wings or extended portions 37, 38 and 39, and is also provided with an orifice 40 of a size to permit it being slipped over bushing 27 and supported upon the body portion 34 of the stud 25. The cam 30 is provided with a suitable orifice 41 of a size to permit it being slipped over the bushing 27 which bushing insulates the cam 30 from the stud 25. A portion of the top and bottom faces 42 and 43 of the cam 30 are depressed by means of a swaging operation, as is well understood, to form depressed portions 44 and 45. The contour of the depressed portion 44 on the face 42 of the cam 30 is the same as the contour or outline of the cam 28 so that when the cams 28 and 30 are in position on the stud 25, the cam 28 rests in

the depressed portion 44 on cam 30, so as to align the said cam 28 and cam 30 in relation to each other.

The cam 29 is provided with wing or extended portions 46, 47 and 48, and is also provided with an orifice 49 of a size to permit it being slipped over the bushing 27 on stud 25. The shape of cam 29 is similar to that of 28 and the contour of the depressed portion 45 of cam 30 is the same as the contour or outline of the cam 29, so that when the cam 29 is in place it sets in the depressed portion 45 of cam 30 to align itself in relation to the cams 28 and 30. An insulation washer 31 is provided with an orifice 50 of a size to permit it being slipped over the body portion 34 of the stud 25. The washer 32 is provided with an orifice 51 of a size to permit it being slipped over the reduced portion 52 of the body portion 34 of the stud 25. The washer 32 is provided with a lug 53 which is bent at right angles to the plane of the washer proper and this lug 53 extends through a notch 54 in the washer 31 and a notch 55 in the cam 29 to hold the cams in position.

A key way or notch 56 is cut in the reduced portion 52 of the stud 25 and is of a size to receive the key or lug 57 of the washer 32. The parts thus described are supported upon the stud 25 and the cams 28 and 29, which set in the depressions 44 and 45 of the cam 30, align themselves with each other and with the cam 30. The lug 53, which rests in the notch 55 of the cam 29, and the key 57 which fits in the key way 56 in the stud 25, align the cams 28, 29 and 30 as a whole in proper position upon the stud 25. The reduced portion 52 of the stud 25 protrudes slightly through the opening 51 in the washer 32 and this protruding portion is staked or spun over, as illustrated clearly in Fig. 6, to securely hold the parts upon the stud 25 to form the improved rotor element of my invention. The washer 32 is provided with an arm 60 in the form of a stop, which stop 60 is operatively associated with the sliding locking plate 20 for locking purposes.

The cams 28 and 29 have notches or cut-away portions 70, 71 and 72, and the cam 30 is provided with upwardly and downwardly extended portions 73, 74 and 75 upon the faces 44 and 45 of the said cam 30. The contour of the notches 70, 71 and 72 and the raised portions 73, 74 and 75 is similar so that the extended portions 73, 74 and 75 fit into the notches 70, 71 and 72 a short distance, as clearly illustrated in Figs. 3 and 6, to prevent the said cams 28 and 29 from turning upon the stud 25 when in position to form a rotor element as a whole. The cam 30 is provided with notches 76, 77 and 78, which are in alignment with the wings 37, 38 and 39 of cam 28 and wings 46, 47

and 48 of the cam 29, so that the edges of the wings of the cams 28 and 29 protrude and form insulating segments which are engaged by the springs 5, 6, 7, etc., when the units L and M are in their normal position. The notches 76, 77 and 78 are placed therein to prevent the free ends of the springs 5, 6, 7, etc. from engaging the cam 30. The conducting segments are formed by the edges of the cam 30 which set in the notches 70, 71 and 72 of the cams 28 and 29 and are adapted to be engaged by the springs 5, 6, 7, etc. to close the electrical circuits, as is well understood.

From the foregoing it is at once apparent that the cams 28 and 29 fitting into the depressed portions of cam 30 hold cam 30 in position, and cam 29 is in turn held in position by the lug 53 of washer 32, which latter washer is held in position by stud 57, which fits into slot 56 of stud 25.

The edges of the cams 28, 29 and 30 are formed with concave portions to produce a snap action when the switching units L and M are moved to their different positions so that the free ends of the springs 5, 6, 7, etc. rest in the concave portions. Now when the switching unit L is moved from one position to another, the free ends of the springs leave the furrows 80 of the concave portions and ride upon ridges 81, and due to the springs being under tension when the springs leave the apexes of the ridges 81, they tend to turn the switching unit, thus producing a snap action for the unit and at the same time the springs hold the said unit in its new position.

While the invention has been described in association with a certain type of switch, it is to be understood that my invention is adapted for other uses and I also do not wish to be limited to the exact structure as shown, as many changes and modifications may be made therein without departing therefrom, and I, therefore, wish 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. A device of the character described including a mounting member, a pair of insulating members and a conducting member associated with said mounting member, extensions on said insulating members, and depressions in said conducting member for receiving said extended portions whereby the said members fit together to prevent movement relative to each other.

2. A device of the character described including a mounting member, a pair of insulating members and a conducting member adapted to be connected to said mounting members, said insulating members being

provided with portions cut away, and raised portions on said conducting member adapted to fit into the cut-away portions of said insulating members whereby the insulating members and conducting member form a unitary structure.

3. A device of the character described including a mounting member, a pair of insulating members and a conducting member adapted to be connected to said mounting members, said insulating members being provided with portions cut away, and raised portions on said conducting member adapted to fit into the cut-away portions of said insulating members, and an auxiliary member secured to said mounting member and associated with one of said insulating members to prevent the insulating members and the conducting member from moving relative to said mounting member.

4. A switch of the character described including relatively stationary passive contacts and an active contact, said active contact comprising cams of insulating and conducting materials, raised portions of said cams for cooperation with cut-away portions of others of said cams for preventing rotation of said cams relative to each other, and means for locking said stationary passive contacts and said active contact in cooperative position.

5. A switch of the character described including relatively stationary passive contacts and an active contact, said active contact comprising cams of insulating and conducting materials, said cams of insulating material being adapted to hold said cam of conducting material in position, a stud for supporting said cams, and means for securing said cams to said stud and for preventing rotation of said cams relative to said stud, and locking means for locking said stationary passive contacts and said active contact in cooperative position.

6. A switch of the character described including relatively stationary passive contacts and an active contact, said active contact comprising cams of insulating and conducting materials, said cams of insulating material being adapted to hold said cam of conducting material in position, a stud supporting said cams, means insulating said cam of conducting material from said stud and a member for preventing rotation of said cams relative to said stud and for preventing endwise movement of said cams.

7. A switch of the character described including passive contacts and an active contact for co-operation with the passive contacts, said active contact being formed of cams of insulating and conducting material, said cam of insulating material being provided with an extended portion for engaging one of said stationary contacts when the switch is in normal position, said cam of

conducting material being provided with an extended portion for conductively engaging said passive contact when the active contact is in an off-normal position, said cams being provided with means formed integrally with the cams for preventing rotation of said cams relative to each other.

8. A device of the character described including a mounting stud, a cam of insulating material and a cam of conducting material provided with orifices adapted to receive said stud, said cams being provided with receding and extended portions whereby one of said cams maintains the other of said cams in position, a bushing of insulating material for insulating said cam of operating material from said stud, and a member secured to said stud and prevented from rotating relative to said stud for preventing rotation of said cams relative to said stud.

9. A device of the character described including a mounting stud, a cam of insulating material and a cam of conducting material provided with orifices adapted to receive said stud, said cams being provided with receding and extended portions whereby one of said cams maintains the other of said cams in position, an auxiliary member secured to said mounting stud and provided with a portion that fits into an orifice in said cam of insulating material to prevent the said conducting cam and said insulating cam from rotating relative to said mounting stud, and means formed integrally with said stud for maintaining said auxiliary member in position.

10. A device of the character described including a mounting member, a cam of insulating material and a cam of conducting material adapted to be secured to said mounting member, said cam of insulating material being provided with cut-away portions adapted to receive raised portions of said cam of conducting material to prevent one cam from rotating relatively to the other, a bushing insulating said cam of conducting material from said mounting member, a plate member provided with an extended portion adapted to fit into an orifice in said mounting member to prevent rotation of said plate member relative to said mounting member, and an extended portion for said plate member for preventing rotation of said cam relative to said mounting member.

11. A device of the character described including a mounting member, a cam of insulating material and a cam of conducting material adapted to be secured to said mounting member, said cam of insulating material being provided with cut-away portions adapted to receive raised portions of said cam of conducting material, and depressed portions for said conducting cam

adapted to receive extended portions of said cam of insulating material to prevent one cam from rotating relatively to the other.

12. A switch of the character described including a rotary member comprising a mounting member, an insulating cam and a conducting cam adapted to be secured to said mounting member, an extended portion for said insulating cam adapted to cooperate with a passive contact when said switch is in normal position, an extended portion for said conducting cam adapted to co-operate with said active contact when the switch is in an off-normal position, said cams being provided with portions adapted to fit into each other to prevent rotary movement of one cam relative to the other, a stud insulating said cam of conducting material from said rotary member, and an auxiliary member secured to said rotary member for preventing rotation of said cams relative to said rotary member.

13. A switch of the character described including a rotary member comprising a mounting member, an insulating cam and a conducting cam adapted to be secured to said mounting member, an extended portion for said insulating cam adapted to co-operate with a passive contact when said switch is in normal position, and an extended portion for said conducting cam adapted to co-operate with said passive contact when the switch is in an off-normal position, said cams being provided with portions adapted to fit into each other to prevent rotary movement of one cam relative to the other, said cams being provided with apexes adapted to co-operate with said passive contact to maintain said rotary member in position, and an auxiliary member adapted to be secured to said rotary member for cooperation with said cams to prevent rotation of said cams relative to said rotary member.

14. A device of the character described including a mounting stud provided with an annular shoulder, a washer adapted to fit against said shoulder, a cylindrical sleeve of insulating material for placement on said mounting stud, a pair of insulating cams and a conducting cam provided with orifices adapted to receive said sleeve, and means for preventing movement between said stud and said cams.

15. A device of the character described including a mounting stud provided with an annular shoulder, a washer adapted to fit against said shoulder, a cylindrical sleeve of insulating material for placement on said mounting stud, a pair of insulating cams and a conducting cam provided with orifices adapted to receive said sleeve, and a washer provided with an extended portion adapted to extend into an orifice in one of said insulating cams to prevent movement of said insulating cam.

16. A device of the character described including a mounting stud provided with an annular shoulder, a washer adapted to fit against said shoulder, a cylindrical sleeve of insulating material for placement on said mounting stud, a pair of insulating cams and a conducting cam provided with orifices adapted to receive said sleeve, a washer provided with an extended portion adapted to extend into an orifice in one of said insulating cams to prevent movement of said insulating cam, and co-operating means between said cams of insulating material and said cam of conducting material to prevent said cams from moving relative to each other.

17. A device of the character described including a mounting stud provided with an annular shoulder, a washer adapted to fit against said shoulder, a cylindrical sleeve of insulating material for placement on said mounting stud, a pair of insulating cams and a conducting cam provided with orifices adapted to receive said sleeve, a washer provided with an extended portion adapted to extend into an orifice in one of said insulating cams to prevent movement of said insulating cam, a mounting plate to which said mounting stud is secured, a slidable locking plate supported by said mounting plate, and an extended portion for said washer adapted to cooperate with said mounting plate to prevent actuation of the mounting stud and cams.

18. A device of the character described including a mounting stud provided with an annular shoulder, a washer adapted to fit against said shoulder, a cylindrical sleeve of insulating material for placement on said mounting stud, a pair of insulating cams and a conducting cam provided with orifices adapted to receive said sleeve, a washer provided with an extended portion adapted to extend into an orifice in one of said insulating cams to prevent movement of said insulating cam, cooperating means between said cam of insulating material and said cam

of conducting material to prevent said cams from moving relative to each other, a mounting plate to which said mounting stud is secured, a slidable locking plate supported by said mounting plate, and an extended portion for said washer adapted to cooperate with said mounting plate to prevent actuation of the mounting stud and cams.

19. A switch of the character described including relatively stationary passive contacts and an active contact, said active contact comprising cams of insulating and conducting materials, said cams of insulating material being adapted to hold said cam of conducting material in position, a stud supporting said cams, means insulating said cam of conducting material from said stud, a member for preventing rotation of said cams relative to said stud and for preventing endwise movement of said cams, a plate supporting said stud, a slidable locking plate supported by said plate, and means formed integrally with said member for preventing rotation of said cams relative to said plate.

20. A device of the character described including a mounting stud, a cam of insulating material and a cam of conducting material provided with orifices adapted to receive said stud, said cams being provided with receding and extended portions whereby one of said cams maintains the other of said cams in position, a bushing of insulating material for insulating said cam of conducting material from said stud, a member secured to said stud and prevented from rotating relative to said stud for preventing rotation of said cams relative to said stud, a plate supporting said stud, a slidable locking plate supported by said plate, and means formed integrally with said member for preventing rotation of said cams relative to said plate.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 25th day of August, 1919.

ALFRED H. WEISS.