J. F. CAVANAGH.

SWITCH.

APPLICATION FILED DEC. 1, 1916.

1,238,261. Patented Aug. 28, 1917.

Fig 1

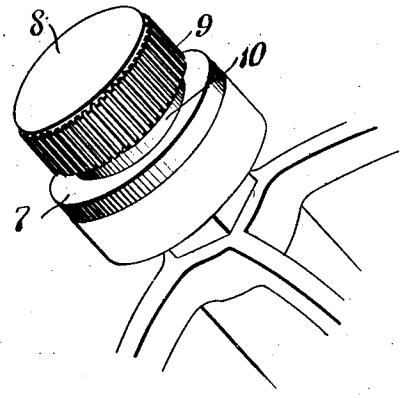


Fig 6

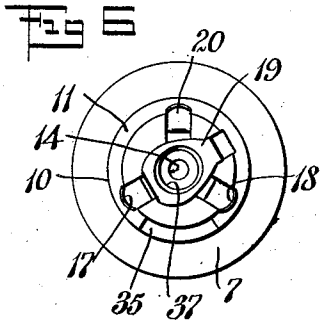


Fig 3

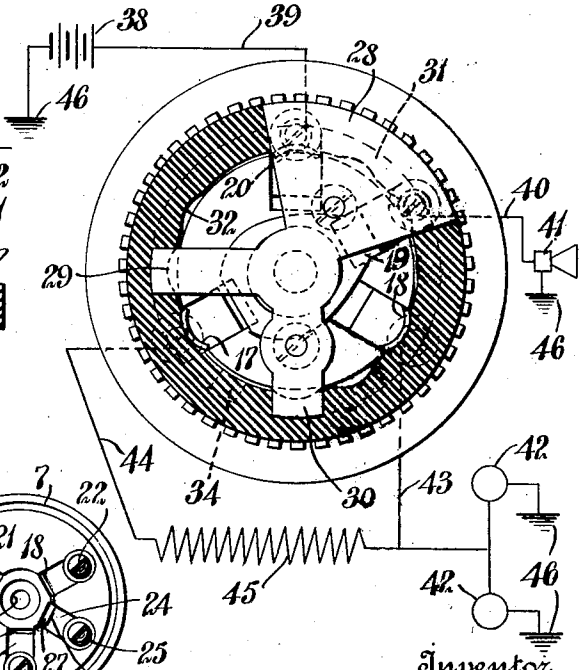


Fig 2

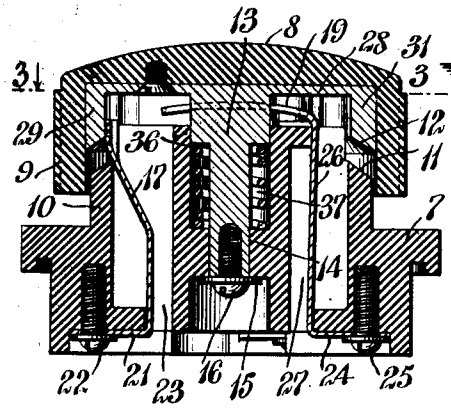


Fig 4

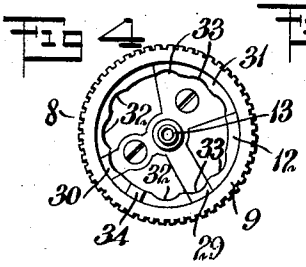
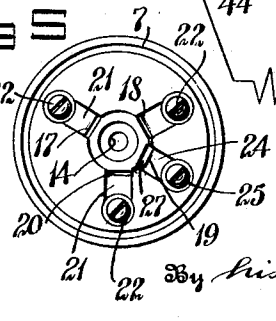


Fig 5



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SWITCH.

1,238,261. Specification of Letters Patent. Patented Aug. 28, 1917.

Application filed December 1, 1916. Serial No. 134,321.

To all whom it may concern:

Be it known that I, JOHN F. CAVANAGH, a citizen of the United States of America, residing at Meriden, Connecticut, have invented a new and useful Switch, of which the following is a specification.

My present invention relates to control switches and particular objects of the invention are to provide a simple and practical switch for controlling the circuits of an automobile, such as the signal and lighting circuits, which, while inconspicuous, may be conveniently and readily operated and which in addition will be relatively inexpensive and easy to install.

Another special object of the invention is to provide a control switch in such form that it may readily be mounted on the steering column of the machine.

Briefly, the invention comprises a base carrying the requisite contacts and a push button rotatably mounted on the base and having also a vertical movement thereon for controlling the various circuits, said push button having a dependent rim portion inclosing the contacts on the base and carrying suitable contact portions for engagement with the contacts on the base.

The details of construction and other features of the invention will appear as the specification proceeds.

In the accompanying drawing I have illustrated the invention embodied in a practical preferred form but I would have it understood that changes and modifications may be made without departure from the true scope and spirit of the invention.

In said drawing:

Figure 1, is a perspective view illustrating the application of the invention to the steering column of an automobile.

Fig. 2, is a vertical sectional view taken through the central portion of the switch.

Fig. 3, is a horizontal sectional view taken substantially on the line 3—3 of Fig. 2 and showing diagrammatically the various circuit connections for this particular switch.

Fig. 4, is an inside view or bottom plan view of the cap or push button element.

Fig. 5 is a bottom plan view of the base member of the switch.

Fig. 6 is a top view of the base member of the switch.

Referring now to the drawing more in detail:

7 designates the base or body of the switch and 8 the rotatable push button or controlling element. This push button is in the form of a cap having a dependent rim 9 overhanging and covering an upstanding annular part or wall 10 on the base. This upstanding wall 10 serves as an abutment to limit the downward thrust of the push button, the upper inclined surface 11 of said wall forming a stop to be engaged by the correspondingly inclined shoulder 12 on the inside of the rim of the cap.

The push button is rotatably confined to the base, in the present disclosure, by a central pivot stud 13 dependent from the head of the cap and working in a bore 14 in the base, a stop washer 15 being secured to the lower end of said stud by a screw 16.

In the particular embodiment herein illustrated, four contacts are provided on the base, the first, 17 constituting a "dimming" contact, the second 18 being a full-power lighting contact, the third 19 being a horn or signal contact and the last 20, being a contact for the current source. The two lighting contacts 17, 18 and the current supply contact 20 are shown as alike in construction and consisting of flat springs bent over and secured at their lower or base ends 21 by screws 22 to the under side of the base and extending upward through passages 23 in the base and thence outwardly into position above the abutment wall 11 (Fig. 2), these upper outwardly bent portions forming the actual contacts and being transversely bowed or arched as more clearly indicated in Figs. 3 and 6.

The signal contact 19, like the other contacts has a flat base 24 secured by a screw 25 to the under side of the supporting base and a shank portion 26 projecting up through a passage 27 in the base and carrying at its upper end, an angularly turned head disposed beneath the top of the cap and forming the contact proper.

Within the cap is mounted a contact segment 28 having dependent contact portions 29, 30, and 31 for engagement with the contacts 17, 18 and 20 respectively on the base. The contact portion 31 which engages the current supplying contact 20 is of a length

sufficient to engage said contact in all positions of the push button and the contact portions 29 and 30 are as indicated in Fig. 3, so disposed that in the first rotary movement of the cap toward the left the contact portion 29 will engage the dimming contact 17 and on the next rotary movement the contact portion 30 will engage the lighting contact 18.

The push button is held in the different positions to which it may be rotated by the engagement of the arched contact portions of the spring contacts in correspondingly shaped notches 32 on the inner wall of the dependent rim 9 and the contact portions 29, 30 and 31 of the segment 28 are also shown as similarly notched as indicated at 33 to provide a firm contact between the parts and to assist in holding the push button in position. The extreme rotary movements of the push button may be controlled by the provision of a stop lug 34 inside the dependent rim working in a segmental cutout 35 in the upstanding wall 10 of the base.

The push button is yieldingly supported with the contact segment thereon normally above the plane of and out of contact with the signal contact 19, as indicated in Fig. 2, by means of a spiral spring 36 surrounding the pivot stud 13 and seated in a concentric chamber 37 in the supporting base around the pivot stud. The upper end of the pivot stud is enlarged so as to have a sliding fit in the spring chamber 37 and this enlargement also provides a head or shoulder against which the upper end of the spring acts.

The current connections may be made as indicated in Fig. 3, the battery or other current source 38 being shown connected with the current supplying contact 20 by a conductor 39, the signal contact 19 being connected by a conductor 40 to the horn or other signaling device 41, the lighting contact 18 being connected with the lamps 42 by a conductor 43, the dimming contact 17 being connected by a conductor 44 with a resistance or other dimming means 45, and the current being returned to the battery by the ground indicated at 46.

From the foregoing it will be apparent that in the position indicated in Fig. 3 with the push button at the end of its right hand movement that there will be no current carried to the lamps because both contacts 29 and 30 are out of the planes of contacts 17 and 18. In this position however the horn or other signaling device may be sounded by merely pressing the cap until the segment on the underside thereof engages the horn contact 19. When dim lights are desired the push button is simply turned one position to the left which brings the dependent contact finger 29 of the segment into engagement with the dimming contact 17, the current flow being now from the battery through the segment and through finger 29 and contact 17 through the dimmer to the lamps. When full power of the lamps is desired the push button is given another turn to the left. This causes contact finger 29 to move away from the dimming contact and brings contact 30 into engagement with the full-power contact 18 whereupon the full current is thrown to the lamps. From this construction it will be noted that the vertical push button movements of the cap do not affect the lighting circuits because during such movements the contact fingers simply slide over the contact portions of the spring contacts.

This has the advantage of maintaining clean contact surfaces. The arrangement described also is practically weatherproof and dust and oil proof and it can be made very compact in size and quite ornamental in appearance.

It will be apparent also that the screws 22 and 25 which secure the contacts to the supporting base may also be utilized as binding screws.

The inclined shoulder 12 assists in the assembling of the device by forcing the spring contacts 17, 18 and 20 inwardly far enough to slide into engagement with the inner wall of the cap and the contact fingers provided therefor, it being apparent that without some such means for contracting the springs inwardly it would be a difficult matter to engage the push button down over the springs.

What I claim is:

1. In a switch of the character described, the combination of an insulating base, upstanding contacts on said base, a cap having a vertical movement on the base and rotatably confined to said base and having a dependent rim covering the upstanding contacts, contacts on the inside of said dependent rim engaging the upstanding contacts on the base, spring means engaged between the base and cap for yieldingly supporting the cap in an elevated position on the base and contacts on the base and cap brought into engagement by the depression of the cap.

2. In a switch of the character described, a base having an upstanding substantially circular wall provided with an arcuate recess therein, a push button rotatably supported and vertically movable upon the base, said push button having a dependent rim inclosing the upstanding circular wall of the base and provided with an internal shoulder for engagement with the upper edge of said wall to limit the downward movement of the push button on the base, a stop lug on the inside of the dependent rim working in the arcuate recess aforesaid and two sets of coöperating contacts on the

push button and base brought into engagement in the rotary and push-button movements respectively of said button.

3. In a switch of the character described, a base, upstanding contacts on said base, a rotatably supported and vertically movable push button on the base having a dependent rim surrounding the upstanding contacts and a contact on the under side of the push button having dependent contact portions disposed in position to engage the upstanding contacts on the base in the rotary and vertical movements of the push button on the base.

4. In a switch of the character described, the combination of a supporting base, a push button rotatably mounted on the base, a contact segment on the inside of and carried by said push button having dependent contact fingers and upstanding spring contacts on the base pressing outwardly into engagement with the contact fingers aforesaid and push-button contacts brought into engagement by the push-button movements of said button on the base.

5. In a control switch of the character described, a supporting base, a push button rotatably mounted on the base and provided with a dependent rim, a contact segment on the under side of said push button having dependent contact fingers seated in the dependent rim aforesaid, said dependent rim and contact fingers having recesses formed therein and spring contacts on the base pressing outwardly into said recesses and push-button contacts brought into engagement by the push-button movements of said button on the base.

6. In a switch of the character described, a supporting base, spring contacts having flat base portions engaging the under side of the supporting base and upstanding shank portions terminating in outwardly projecting transversely arched contacts, binding screws securing the bases of said spring contacts to the supporting base, a push button rotatably mounted on the base and having a dependent rim covering the contacts aforesaid and contact means on said dependent rim for engagement with the contacts aforesaid and push-button contacts brought into engagement by the push-button movements of said button on the base.

7. In a switch of the character described, a supporting base, a push button rotatably engaged on said base and having a vertical movement thereon, dependent contact portions carried by said push button, upstanding contacts on the base having sliding engagement with the dependent portions in the vertical movement of the push button on the base, a contact on the base, a contact for engagement therewith on the push button in the push-button movements of said push-button and a spring normally yieldingly supporting the push button on the base with said latter contacts out of engagement.

8. In a switch of the character described, a supporting base, outwardly pressed spring contacts on the base, a push button rotatably engaged on the base and having a dependent rim for engagement over the spring contacts, contacts on the inside of said rim and an inclined shoulder on said dependent rim for contracting the spring contacts inwardly into position to engage the contacts on the dependent rim.

9. In a switch of the character described, a supporting base provided with a central bore and a concentric chamber surrounding said bore, contacts on the base, a push button provided with a stem having a reduced lower end slidingly and rotatably engaged in the central bore and an enlarged upper end slidingly and rotatably engaged in the concentric chamber aforesaid, a spring seated in said chamber around the reduced lower end of the stem and bearing against the enlarged upper end of the pivot stem and two sets of contact elements on the push button and base for engagement in the rotary and push-button movements respectively of the button.

10. A switch of the character described comprising a base, a rotatably supported and vertically movable push button on the base, a contact on the button, a contact on the base for engagement by said button contact in all the variously rotated positions of the button, spring means for yieldingly supporting the button with said contacts disengaged, a contact on the base, a contact connected with the button and adapted to be carried thereby in the rotation of the button into engagement with the last-mentioned contact on the base and means for maintaining engagement of said last set of contacts irrespective of the push button movements of the button.

11. A switch of the character described comprising a base, a push button, a stem rotatably and reciprocably confining said button to the base, a button sustaining spring coiled about said stem, a contact on the base, a contact on the button for engagement with said contact in the push button movements of the button on the base, a contact member connected with the button and shifted thereby in the rotary movements of the button, and a contact on the base in position to be engaged by said rotary button contact in the rotary movement of the button.

12. A switch of the character described comprising a base, a rotatably supported and vertically movable push button on the base, a contact on the button, a contact on the base for engagement by said button contact in all the variously rotated positions of the button, spring means for yieldingly supporting the button with said contacts disen-

gaged, an upstanding contact on the base, and a dependent contact on the button slidably engaging over the upstanding contact when carried by the rotation of the button into the plane of engagement with such contact.

13. In a switch of the character described, an insulating base having a bore therein, an operating button having a dependent pivot stud rotatably and slidingly engaged in said bore, spring means yieldingly supporting the button in an upraised position, a contact carried by the button at the underside thereof, a contact on the base beneath said button contact and adapted to be engaged thereby upon depression of the button, a second contact beneath the button connected with the button and shifted thereby in the rotary movements thereof, and a series of contacts on the base beneath the button and disposed about the bore in position to be engaged by the second contact on the button and said last named set of contacts adapted to remain in engagement irrespective of the push button movements of the button.

JOHN F. CAVANAGH.