Dec. 16, 1941. A. A. BLUEMLE 2,266,153

ELECTRIC SWITCH

Filed Nov. 9, 1938.

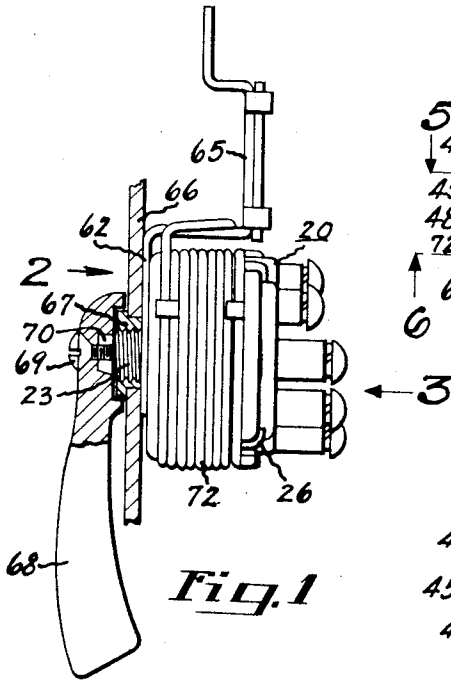


Fig. 1

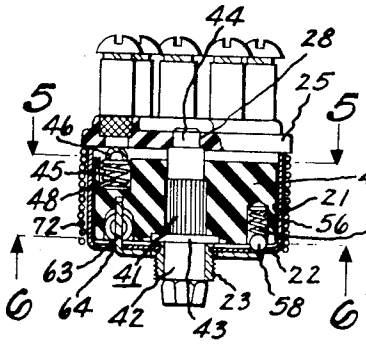


Fig. 4

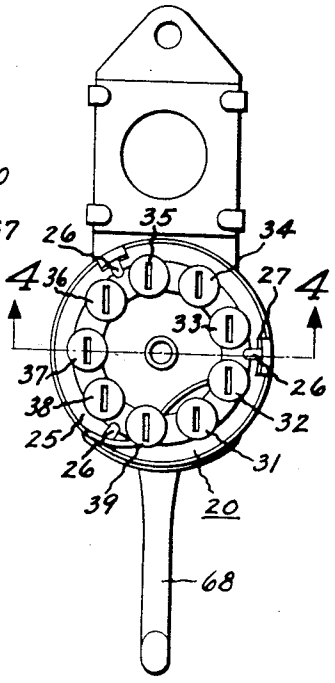


Fig. 3

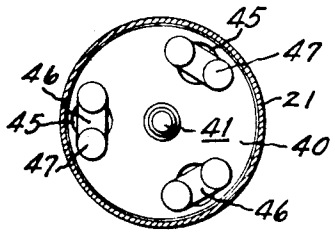


Fig. 5

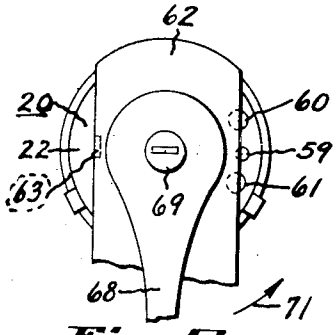


Fig. 2

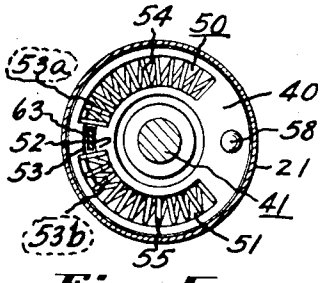


Fig. 6

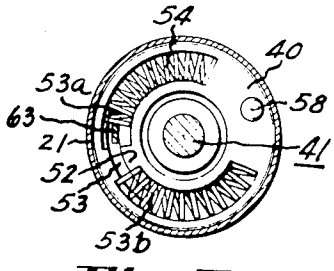


Fig. 7

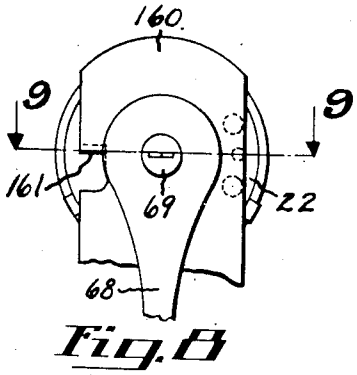


Fig. 8

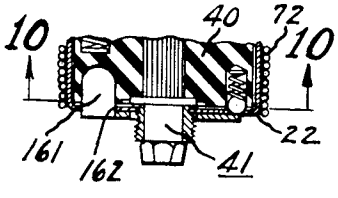


Fig. 9

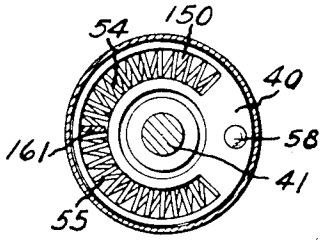


Fig. 10

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ELECTRIC SWITCH

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Application November 9, 1938, Serial No. 239,647

7 Claims. (Cl. 200—11)

This invention relates to electrical switch devices for controlling the flow of current to signalling devices and the like.

The general object of the present invention is to provide an improved control switch which is particularly adapted for use upon automotive vehicles for controlling a plurality of circuits to indicate intended changes of direction of movement of the vehicle.

Another object of the present invention is to provide a switch construction which is adapted to be manually moved to a plurality of operating positions wherein it is retained until manually released whereupon it will automatically return to its normal position.

In the disclosed embodiments of the invention these objects are accomplished by providing a two-way switch having a neutral or "off" position and two "on" positions attained by moving bridging means in either direction of rotation from the "off" position. The movable bridging means is maintained normally in "off" position by resilient means. The movable bridging means is retained by detent means in either of its "on" positions against the energy stored in the resilient means when the switch is operated to either of its "on" positions. The detent means is released manually thereby causing the stored energy in the resilient means to expand and automatically return the bridging means to the "off" position of the switch.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a side elevational view of a switch structure embodying the present invention, partly in section to illustrate the mounting of the switch to a support.

Fig. 2 is a top plan view of the switch looking in the direction of arrow 2 in Fig. 1.

Fig. 3 is a bottom plan view of the switch shown in Fig. 1.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is a sectional view similar to Fig. 6 showing the relative positions of certain switch elements when the switch is actuated to one of its "on" positions.

Fig. 8 is a top plan view of a modified form of the present invention.

Fig. 9 is a fragmentary sectional view taken on the line 9—9 of Fig. 8.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 9.

Referring to Figs. 1 to 7 inclusive, 20 designates a two-way rotary type switch in its entirety. The switch comprises a cup-shaped housing 21 having a bottom wall 22 provided with a central opening adapted to receive the reduced end of a bearing sleeve 23. The reduced end is spun over and against the inner surface of the bottom wall 22 to rigidly secure the sleeve to the housing as clearly shown in Fig. 4.

A closure 25 of non-conducting material is rigidly secured to the housing 21 in a well-known manner as by integral tangs or ears 26 adapted to register with suitable notches 27 in the periphery of the closure and bent inwardly over the outer surface of the latter. The closure is provided with an opening 28 having its axis in alignment with the axis of the sleeve 23. The closure carries a plurality of stationary terminal contacts 31, 32, 33, 34, 35, 36, 37, 38 and 39 arranged in an arcuate row and equally spaced. The inner surfaces of the terminal are flush with the inner face of the block. The outer ends of contact terminals 31, 34, 36 and 38 carry screws to which the wires leading to direction-indicating lights (not shown) are connected.

A movable contact carrier comprising a body or block 40 of insulating material is preferably molded about a shaft 41. The shaft is provided at one end thereof with a smooth surface 42 which is rotatably supported in the bearing sleeve 23, and a collar 43 which is adapted to bear against the spun-over portion of the sleeve 23. The other end of the shaft is reduced at 44 to fit into the opening 28 of the closure 25 whereby the shaft is properly centered with respect to the housing.

The block 40 has one face thereof provided with a plurality of spaced recesses 45, each recess adapted to receive a U-shaped contact member 46 having bosses or contact surfaces 47 which are spaced so that the bosses will rest upon adjacent stationary contact terminals on the closure 25 when the switch is actuated to either of the circuit closed positions. The central portion of each recess in this instance is enlarged so as to receive a coil spring 48, said spring being normally compressed to a predetermined degree by the assembly of switch parts to urge the contacts against the closure 25. The other face of the block 40, adjacent the bottom wall 22, is provided with spaced arcuate recesses 50 and 51 separated by a web portion 52. An arcuate notch 53 is also provided in the block which extends across the web portion 52 and a considerable distance into each of the recesses 50 and 51 as shown in Figs. 6 and 7 to form shoulders 53a and 53b. With this arrangement it will be seen that the block 40 may be rotated in either a

clockwise or a counterclockwise direction from its "off" or neutral positions. A coil spring 54 is located within the recess 50 and having one end thereof bearing against one shoulder provided by the web portion 52 while the other end of each spring engages a shoulder formed at the other end of the recess. A coil spring 55 is located in the recess 51 which has one end bearing against the other shoulder provided by web and the other end engaging the shoulder formed by recess 51.

A recess 56 is also provided in the block 40 which is diametrically opposite the web 52. This recess receives a spring 57 which is adapted to urge a ball 58 into spaced detents or openings 59, 60 and 61 provided in the bottom wall 22 of the housing 20 to yieldingly hold the block 40 in its neutral position or one of the "on" positions of the switch.

One end of a bracket 62 is suitably attached to the outer surface of the bottom wall 22 of the housing, as by spot welding. The bracket 62 is provided with an ear or projection 63 which extends through an opening 64 in the wall 22 and into the notch 53 between the ends of the springs which bear against the shoulders of the web 52. The width of the ear 63 is slightly less than the cross dimension of the web 52. Since the ear 63 extends into the notch 53 the degree of rotary movement of the block 40 is limited in either direction of rotation by the shoulders formed at each end of the recess 53. The other end of the bracket is deformed at 65 to form a suitable support for a tell-tale lamp assembly the purpose of which is to inform the operator whether or not the direction indicating signal is operating.

The switch structure 20 is suitably attached to a support 66 by a flanged sleeve 67 having internal threads which cooperate with external threads on the sleeve 23 to draw the flange portion of the sleeve 67 firmly against the support 66 as clearly shown in Fig. 1. A handle 68 for actuating the shaft 41, to move the block 40 in either direction of rotation from the neutral position, is attached to the shaft 41 by a screw 69. The handle 68 is provided with a recess 70 of irregular formation which registers with a similar formation on the end of the shaft 41. By this arrangement relative rotative movement of the handle with respect to the shaft is prevented. The handle 68 is adapted to move the shaft and the block 40 in either direction of rotation so as to close a circuit to one or the other of the direction indicating signals.

When it is desired to operate the switch to connect a direction indicating signal in a circuit, the handle is operated in a clockwise or a counterclockwise direction. The operation of the switch shown in Figs. 1 to 7 inclusive will now be described with particular reference to Figs. 2, 6 and 7. When the operator wishes to indicate that a turn is to be made he will move the lever 68 for instance, in a counterclockwise direction as indicated by arrow 71, see Fig. 2. When this occurs the block 40 is rotated until the ball 58 registers with the detent 60. During the movement of the block in the counterclockwise direction the ear 63 will cause the end of the spring 54 to engage the ear 63 and be compressed. The spring 57 which urges the ball 58 into the recess 60, in this instance, is stiffer than the spring 50 therefore the spring 57 will maintain the ball in the recess 60 to hold the block in that selected position until the ball is manually released from the detent 60 by the operator. As soon as the ball is removed from registry with detent 60 the spring 54 will immediately expand to return the block to its neutral position. The spring 55 will cushion the return of the block to its neutral position in case there is an over-travel on the part of the block.

It is apparent that should the operator turn the lever or handle 68 in a clockwise direction as shown in Fig. 2, the ball 58 will in this instance register with the detent 61 to hold the block in that selected position and the spring 55 will be compressed which will react to return the block to its neutral or "off" position of the switch upon manual operation of the lever in the reverse direction to move the ball from registry with the detent 61.

The switch structure described is adapted to be used with direction indicating signals that are mounted on the front and rear of the vehicle. This switch can be equally used where only the rear signals are contemplated by providing the switch with a resistance wire 72 suitably connected to the terminals that would connect the front signals with the switch.

Figs. 8, 9 and 10 illustrate a modification of certain switch elements, the modifications merely involving the change of one side of the block 40 and the angular position of the ear on the bracket 62 is adapted to project through the bottom wall 22 and into the housing 21.

As shown in Figs. 8, 9 and 10 the face of the block 40 adjacent the bottom wall 22 of the housing 21, the modified form of the block 40 is provided with a continuous recess 150 adapted to receive both springs 54 and 55. A bracket 160, in the modified structure, is provided with an ear 161 which projects through an opening 162 in the wall 22 and into the recess 150. The ear divides the recess into two portions. It will be noted that the ear extends crosswise with respect to the recess so that the ear will be between the two springs, thus one end of each spring will bear against opposite sides of the ear 161, the other end of each spring will bear against their respective shoulders provided by the recess. In this construction, when the lever is moved to one of the selected positions, one of the springs will be compressed while the other spring will expand slightly. The action of the springs in this arrangement is substantially the same as that described for the preferred form.

In the modified form of the block 40 the recess 150 could receive a single coil spring that will extend the full length of the recess 150 so that the ear 161 will enter between the intermediate convolutions of the spring so that one-half of the spring will be on each side of the ear.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A switch comprising in combination; a cup-shaped housing; a closure for the housing carrying a plurality of stationary contacts; a carrier pivotally supported by the housing and closure, said carrier supporting a plurality of yieldable contacts on one side thereof for engagement with the stationary contacts and having spaced recesses and a notch communicating with the recesses on the other side thereof; a coil spring located in each recess; means carried by the housing extending into the notch of the carrier

and between the springs; and manual operating means for rotating the carrier in either direction from the neutral position toward a circuit closed position of the switch, the rotation of the carrier causing the extending means to enter one or the other of the recesses to compress the spring therein which reacts to return the carrier and actuator to their normal position upon release of the actuator.

2. A switch comprising in combination; a cup-shaped housing; a closure for the housing carrying a plurality of stationary contacts; a carrier pivotally supported by the housing and closure, said carrier supporting a plurality of contacts on one side thereof for engagement with the stationary contacts and having spaced recesses and a notch communicating with the recesses on the other side thereof; a coil spring located in each recess; means carried by the housing extending into the notch of the carrier and between the springs; an actuator for rotating the carrier in either direction from the neutral position to a circuit closed position of the switch, the rotation of the carrier causing the extending means to progress into one or the other recesses and compress the spring therein; and detent means for holding the carrier in the selected position against the energy stored in the spring compressed, said spring reacting upon release of the detent means to return the carrier actuator to their normal positions.

3. A switching device comprising in combination; a plurality of stationary contacts; a carrier pivotally supported relative to the stationary contacts, said carrier supporting a plurality of contacts for engagement with the stationary contacts and having a notch therein; a stationary part extending into the notch; a coil spring located on each side of the stationary part and carried by the carrier, said springs being supported in such a manner that the springs cooperate with the stationary part to hold normally the carrier in a neutral position; an actuator for rotating the carrier in either direction from the neutral position to a circuit closed position of the switching device, the rotation of the carrier causing one of the springs to engage the stationary part and be compressed, said compressed spring reacting to return the carrier and actuator to their normal positions upon release of the actuator.

4. A switching device comprising in combination; a plurality of stationary contacts; a carrier pivotally supported relative to the stationary contacts, said carrier supporting a plurality of contacts for engagement with the stationary contacts and having a notch therein; a stationary part extending into the notch; resilient means located on each side of the stationary part and carried by the carrier, said resilient means being supported in such a manner that the adjacent ends of the resilient means cooperates with the stationary part to hold the carrier in a predetermined position; an actuator for rotating the carrier in either direction from the predetermined position to a circuit closed position of the switching device, the rotation of the carrier causing one or the other of the resilient means to engage the stationary part and be compressed, said compressed resilient means reacting to return the carrier and the actuator to their predetermined position upon release of the actuator, said other resilient means cushioning the return movement of the carrier when same is moved past the predetermined position.

5. A switch comprising in combination; a housing; stationary contact supported by the housing; a carrier rotatably supported within the housing and carrying a plurality of contacts for engagement with the stationary contact, said carrier having a notch; a pair of spaced springs carried by the carrier, each spring having one end exposed in the notch; a stationary part supported within the housing and extending into the notch between the ends of the springs exposed in the notch, said spring ends adapted to cooperate with the stationary part to hold normally the carrier in a neutral position; an actuator for rotating the carrier in either direction from the neutral position to a circuit closed position of the switch, the rotation of the carrier causing one of the spring ends to engage the stationary part so that said spring will be compressed, said compressed spring reacting to return the carrier and the actuator to their neutral position the non-compressed spring cushioning the return movement of the carrier when the carrier moves past the neutral position.

6. A switching device comprising in combination; stationary terminal contacts; a carrier rotatably supported relative to the stationary contacts, said carrier supporting a plurality of contacts for engagement with the stationary contacts; a fixed member supported relative to the carrier; resilient means carried by the carrier on opposite sides of the fixed member, said resilient means cooperating with the fixed member to position the carrier in a neutral position of the switching device; and a manual operated member for rotating the carrier in either direction from the neutral position toward a circuit closed position, the movement of the carrier in one direction of rotation causing the resilient means on one side to be compressed by the fixed member which reacts to return the carrier and the operated member to their neutral position upon release of the operating member, the other resilient means operating to cushion the return movement of the carrier when the carrier is moved beyond its neutral position.

7. A switching device comprising in combination; stationary terminal contacts; a carrier rotatably supported relative to the stationary contacts, said carrier supporting a plurality of contacts for engagement with the stationary contacts; a fixed member supported relative to the carrier; resilient means carried by the carrier on opposite sides of the fixed member, said resilient means cooperating with the fixed member to position the carrier in a neutral position of the switching device; and a manually operated member for rotating the carrier in either direction from the neutral position toward a circuit closed position, the movement of the carrier in one direction of rotation causing the resilient means to be compressed on one side by the fixed member which reacts to return the carrier and the operated member to their neutral position upon release of the operating member, said resilient means operating on the other side of the fixed member to cushion the return movement of the carrier when the carrier is moved beyond its neutral position.

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