July 6, 1954 E. L. BARCUS 2,683,193

SWITCH

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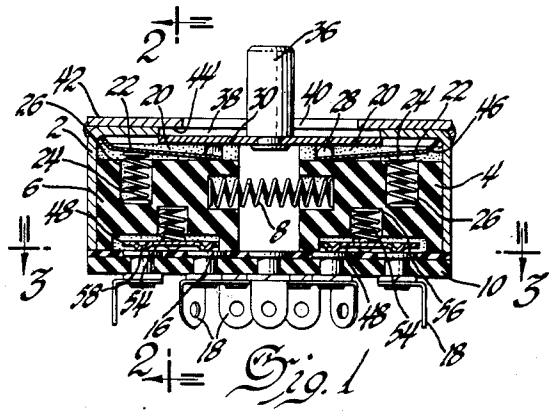


Fig. 1

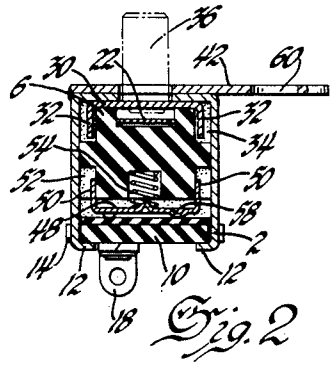


Fig. 2

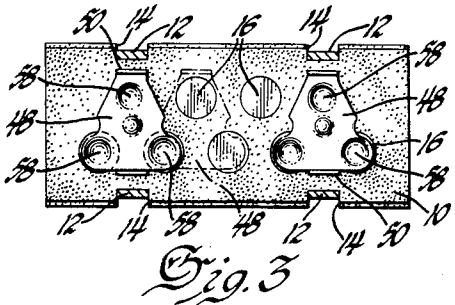


Fig. 3

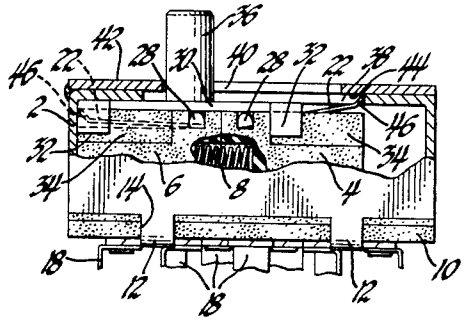


Fig. 4

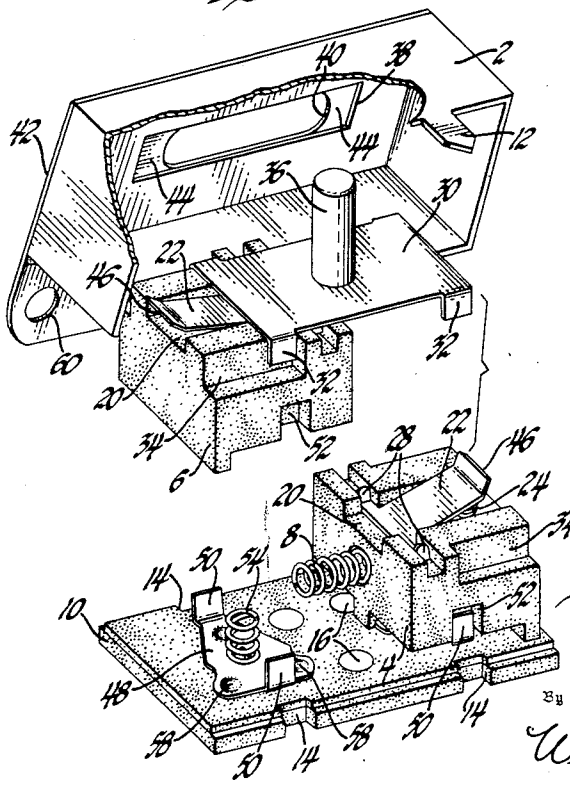


Fig. 5

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SWITCH

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11 Claims. (Cl. 200—16)

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The present invention relates to electrical switching devices and more particularly to switching devices of the snap acting type.

In direction signalling systems employed on automotive vehicles for providing the operator with a convenient means of indicating his intention to turn either to the right or left at traffic intersections, a manually operable mechanism provides the means for actuating a switch bridging device capable of energizing a circuit indicating the operator's intention. For greater convenience to the operator, many of the systems are also provided with mechanism which cooperates with the steering wheel to automatically reset the switch to a neutral position when the vehicle is returned to a straight directional path. In such systems the unbridging of the circuit providing direction indication is brought about substantially after the vehicle has partially made a turn and substantially instantaneously after the rotary direction of the steering wheel of the vehicle is reversed to return the vehicle to a straight directional path. With such systems the indicating signal is deenergized while the vehicle is midway in its turn. Such systems are not entirely satisfactory as a warning system for the indicating signal is deenergized at a point substantially half-way through the turn of the vehicle.

It is therefore an object of the present invention to provide a switch particularly adapted for operation in a vehicle direction signalling system of the automatic reset type to delay the deenergization of the signal indicating circuits throughout a substantial portion of the return of the steering wheel to a straight directional path. This and other objects are attained in accordance with the present invention by providing a switch of the sliding bridge type with means adapted to lock the bridging member in an operative position and unlock the bridging member after a substantial return movement of the switch operating member to permit its return to a neutral position with a snap acting movement.

For a better understanding of the invention reference may be had to the drawing in which: Figure 1 is an elevation view in cross section of the switch of the present invention; Figure 2 is a view taken along the line 2—2 of Figure 1; Figure 3 is a view taken along the line 3—3 of Figure 1; Figure 4 is an elevation view partly in cross section illustrating the switch in one of its operative positions; Figure 5 is an exploded perspective view of the switch illustrated in Figures 1, 2, 3 and 4.

Referring now to the drawing, the switch is

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illustrated as comprising a metal housing 2 enclosing a pair of switching blocks 4 and 6 of suitable dielectric material urged to the extreme ends of the housing by a spring 8. The switching blocks are confined in the housing by a terminal plate 10 of suitable dielectric material which covers the open side of the housing and is held in position by lugs 12. The lugs extend from the sides of the housing and are spaced to cooperate with slots 14 in the edges of the terminal plate. The terminal plate 10 has mounted therein a plurality of contact terminals 16 aligned in two rows as illustrated in Figures 3 and 5. Connecting lugs 18 are provided for attaching conductor leads to the contact terminals.

The switching blocks 4 and 6 are provided on their upper sides with a generally T-shaped recess 20 for receiving a similarly shaped ratchet arm 22 as shown in Figure 5. Positioned between the ratchet arm and the switching block is a spring 24 recessed in a bore 26 in the switching block and adapted to yieldingly urge the end of the ratchet arm upwardly into engagement with the inner surface of the enclosing housing 2. At opposite ends of the cross member of ratchet arm 22 there are provided upwardly extending ears 28 which act as spacing members to position the cross member of the ratchet arm in contact with the floor of the recess. A bridging member 30 having downwardly extending lugs 32 bridges the outwardly urged switching blocks 4 and 6. The lugs 32 are slidably recessed in slots 34 formed at opposite sides of the switching blocks. The bridging member carries an upwardly extending stud 36 which passes through a rectangular aperture 38 in the top of the housing 2 and an oblong aperture 40 coinciding therewith and formed in a bracket plate 42 attached to the housing 2 as, for example, by soldering or welding. As shown, the oblong aperture 40 is of substantially less length than the rectangular aperture 38 to provide recessed ledges or slots 44 adapted to receive the upwardly inclined end 46 of the ratchet arm 22. Positioned on the under side of the switching blocks 4 and 6 are the triangularly shaped contact terminal bridging members 48. The bridging members 48 are provided with upwardly extending lugs 50 which extend into slots 52 formed in the opposite sides of the switching blocks 4 and 6, and are spring urged outwardly from the switching blocks into engagement with the contact terminals 16 by a spring 54 positioned between the bridging members 48 and the switching blocks and recessed in a bore 56 in the under side of the switching blocks. Each of the bridging members 48 car-

ries a plurality of cup-shaped projections 58 for engagement with the contact terminals 16. To provide means for attaching the switch to a mounting base the bracket member 42 has an overhanging portion which carries a plurality of apertures 60 for receiving attaching bolts.

In operation the switch operating arm or upwardly extending stud 36 may be shifted to the right or left in the aperture 40. In a direction signalling system the switch of the present invention may be enclosed in a housing attached to the vehicle steering column adjacent the steering wheel with the operating arm operatively engaged by a lever under the control of the vehicle operator. If the movement of the stud 36 is to the left to one of the operating positions as illustrated in Figure 4, the lugs 32 engage the end of the recessed slots 34 in switching block 4 urging the switching block to the left against the pressure of the spring 8. As the switching block shifts to the left in the housing with the movement of bridging member 30 and stud 36, the ratchet arm 22 and contact terminal bridging member 48 carried thereby move to the left until the upwardly inclined end 46 of the ratchet arm 22 is spring urged upwardly into engagement with the recessed ledge 44. With the release of pressure on the stud 36, the spring 8 urges the switching block 4 to the right carrying with it the ratchet arm 22 until the upwardly inclined end 46 of the ratchet arm engages the end of the rectangular slot 38 stopping further movement of the switching block assembly. With the switching block in this position its contact terminal bridging member 48 is in position to bridge three of the contact terminals instead of two in its normal position. To return the switching block 4 to its normal position, the stud 36 is moved to the right toward its mid or neutral position carrying with it its connected bridging member 30. As the bridging member 30 moves to the right, the bridging member slides along the leg of the T-shaped ratchet arm 22 gradually forcing its inclined end downwardly against the pressure of spring 24 until the end is cleared of the end of the rectangular slot 38 whereupon the switching block 4 and its assembly snaps to its extreme position in the housing. In a like manner the switching block 6 and its assembly may be moved to the right to its operative position where it is held by its ratchet arm and returned to its neutral position after the ratchet arm is depressed sufficiently to clear the end of the rectangular slot 38.

As has been herein indicated the switch of the present invention is particularly adapted to use in turn signal systems where it is desirable to delay the deenergization of an indicating circuit until the vehicle has substantially reached a straight directional path. With the particular mechanism that has been described it has been found that upon reversal of the rotary direction of the vehicle steering wheel after a turn has been made the wheel will rotate substantially 95° in angular movement before the operative switching block of the switch is released to assume its normal non-operating position.

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 I claim as new and desire to secure by Letters Patent of the United States is:

1. In an electric switch in combination, a housing having an aperture therein providing communication with the interior of said housing, a closure for said housing carrying stationary contact terminals, a positioning stop formed in an inner wall of said housing, a contact slidably mounted in said housing, a spring yieldingly urging said contact to one contact terminal position, an operating arm extending through said aperture and engaging said contact, said operating arm being adapted for moving said contact to a second contact terminal position, and means attached to said contact for engaging said stop to lock said contact in its second contact terminal position, said means being releasable by movement of said operating arm prior to movement of said contact out of said second contact terminal position.

2. In an electrical switch, an enclosed housing having a plurality of contract terminals disposed in one wall and an aperture providing communication with the interior of said housing, a pair of switching blocks slidably mounted in said housing, a spring yieldingly urging said blocks to extreme positions in said housing, bridge members operatively engaging each of said switching blocks and movable therewith to provide a plurality of bridging arrangements with said contact terminals, an operating member extending through said aperture and movable laterally therein, said member having means attached thereto for slidably engaging said switching blocks to move said switching blocks in opposite directions in said housing against the pressure of said spring and locking means operatively engaging said switching blocks and said housing to lock one of said switching blocks in a temporary switching position removed from its extreme position in said housing.

3. In an electrical switch, an enclosed housing having a plurality of contact terminals disposed in one wall and an oblong aperture providing communication with the interior of said housing, a pair of switching blocks slidably mounted in said housing, a spring yieldingly urging said switching blocks to extreme positions in said housing, bridge members operatively engaging said switching blocks and movable therewith to provide a plurality of bridging arrangements with said contact terminals, an operating member extending through said aperture and movable laterally therein, said member having attached thereto means for slidably engaging said switching blocks to move said blocks in opposite directions in said housing against the pressure of said spring, ratchet arms recessed in said switching blocks and slidably engaging said housing and means in said housing for engaging said ratchet arms to temporarily lock either of said switching blocks in a switching position removed from its extreme position in said housing.

4. In an electrical switch, an enclosed housing having a plurality of contact terminals disposed in one wall and an oblong aperture providing communication with the interior of said housing, a pair of switching blocks slidably mounted in said housing, a spring yieldingly urging said switching blocks to extreme positions in said housing, bridge members operatively engaging said switching blocks and movable therewith to provide a plurality of bridging arrangements with said contact terminals, said bridge members being yieldingly urged into engagement with said terminals, an operating member extending through said aperture and movable laterally therein, said member having attached

thereto a bridge for slidably engaging said switching blocks for movement in opposite directions in said housing against the pressure of said spring, ratchet arms recessed in said switching blocks and movable therewith, one end of said ratchet arms being in sliding engagement with said housing and stops in said housing for engaging the ends of said ratchet arms to temporarily lock said switching blocks in a switching position other than their extreme positions in said housing.

5. In an electric switch in combination, a housing having an oblong aperture therein providing communication with the interior of said housing, a closure for said housing, said closure carrying stationary contact terminals, a movable contact slidable in said housing to provide a plurality of contact bridging arrangements with said contact terminals, spring means for yieldingly urging said contact to a normal bridging position in said housing, an operating arm extending through said oblong aperture and engaging said contact to provide movement of said contact in one direction against the pressure of said spring means to a second contact bridging position, a ratchet arm operatively engaging said contact member with one end yieldingly urged into sliding engagement with said housing, means in the inner wall of said housing for receiving the end of said ratchet arm to lock said contact in its second bridging position and means actuated by said operating arm for releasing said contact from its second bridging position to permit said spring means to return said contact to its normal bridging position with a snap action.

6. In an electric switch in combination, a housing having an oblong aperture therein providing communication with the interior of said housing, a closure for said housing carrying stationary contact terminals, a pair of contacts slidably mounted in said housing to provide a plurality of contact bridging arrangements with said contact terminals, a spring yieldingly urging said contacts to extreme opposed positions in said housing for one contact bridging arrangement, an operating arm extending through said oblong aperture, a bridge attached to said arm and slidably engaging said contacts to move one or the other of said contacts in opposite directions to a second contact bridging position, a ratchet arm carried by each of said contacts and yieldingly urged into sliding engagement with said housing, stops in said housing to receive the end of said ratchet arms to hold said contacts in said second contact terminal bridging position, said bridge being adapted upon movement of said operating arm to its mid position to depress the ends of said ratchet arms from said stops to cause the respective contact to return to its extreme contact bridging position with a snap action.

7. In a switch, a housing, an operated member mounted to move back and forth within the housing, a spring which urges the operated member in one direction, an operating member for moving the operated member in the other direction against the resistance of the spring and which is movable with respect to the operated member in the direction in which it is urged by the spring, means for holding the operated member in a position to which it is moved by the operating member against the resistance of the spring and means on said operating member engaging said first-mentioned means for rendering said first-mentioned means ineffective upon movement of the operating member in the direction in which the operated member is urged by the spring.

8. In a switch, a housing, an operated member mounted to move back and forth within the housing, a spring which urges the operated member in one direction, an operating member for moving the operated member in the other direction against the resistance of the spring and which is movable with respect to the operated member in the direction in which it is urged by the spring, a detent carried by the operated member and engageable with a wall of the housing to hold the operated member into a position in which it is moved by the operating member against the resistance of the spring, the operating member including a part interposed between the operated member and said wall of the housing which releases the detent upon movement of the operating member in the direction in which the operated member is urged by the spring.

9. In a switch, a housing, operated members mounted to move back and forth within the housing independently of each other, a spring interposed between the operated members for urging them in opposite directions, an operating member for moving the operated members in the other directions against the resistance of the spring, the operating member being movable with respect to each of the operated members in the direction to which it is urged by the spring, means on each of said operated members for holding it in a position to which it is moved by the operating member and means on said operating member engaging said first-mentioned means to render said first-mentioned means ineffective when said operating member is moved in a direction in which the operated member is urged by said spring.

10. Detent means of the character described for use with a switch housing in which are mounted a pair of relatively movable carrier block members having spring means interposed between adjacent opposed ends thereof for normally biasing the same into separated first positions, comprising in combination, carrier means slidingly mounted within said housing for selectively shifting either of said block members toward said other block member and into a second position wherein said opposed ends of said two block members are in approximate relation and said spring means is compressed therebetween, and a pair of spring actuated detent latching members, one associated with each of said block members and movable therewith; each of said latching members being adapted to lockingly engage one wall of said housing to hold its associated block member in said second position, with said carrier means serving to disengage said detent members from locking engagement with said housing as desired.

11. In an electric switch in combination, a housing having an oblong aperture therein providing communication with the interior of said housing, a closure for said housing, said closure carrying stationary contact terminals, a movable contact slidable in said housing to provide a plurality of contact bridging arrangements with said contact terminals, spring means for yieldingly urging said contact to a normal bridging position in said housing, an operating arm extending through said oblong aperture and engaging said contact to provide movement of said contact in one direction against the pressure of said spring means to a second contact bridging position, a ratchet arm operatively engaging said

contact member, a spring interposed between said contact member and said ratchet arm resiliently urging one end of said ratchet arm into sliding engagement with said housing, means in the inner wall of said housing for receiving the end of said ratchet arm to lock said contact in its second bridging position, and means actuated by said operating arm for releasing said contact from its second bridging position to permit said spring means to return said contact to its normal bridging position with a snap action.

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