

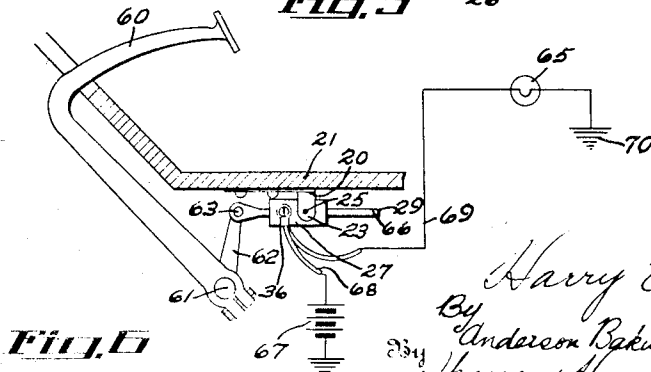
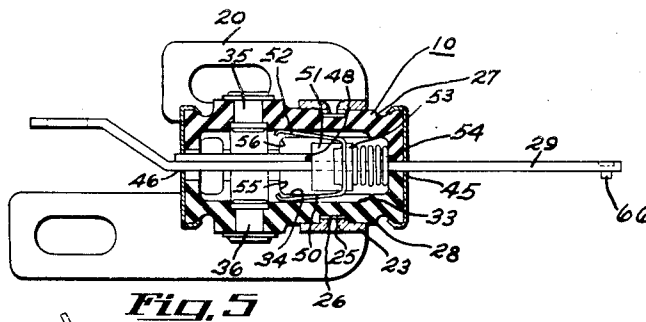
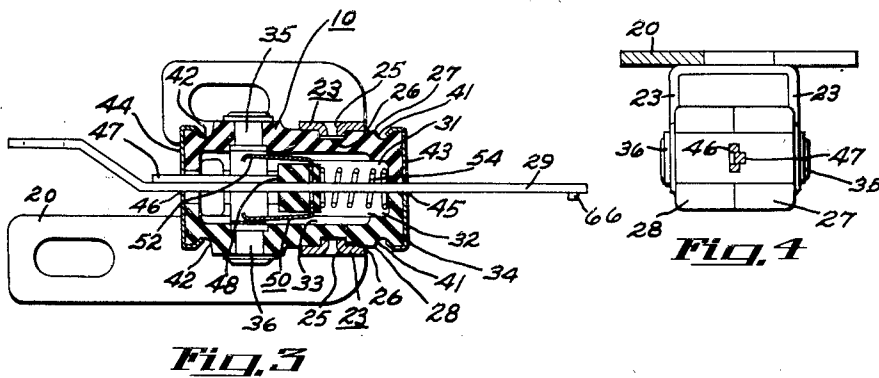
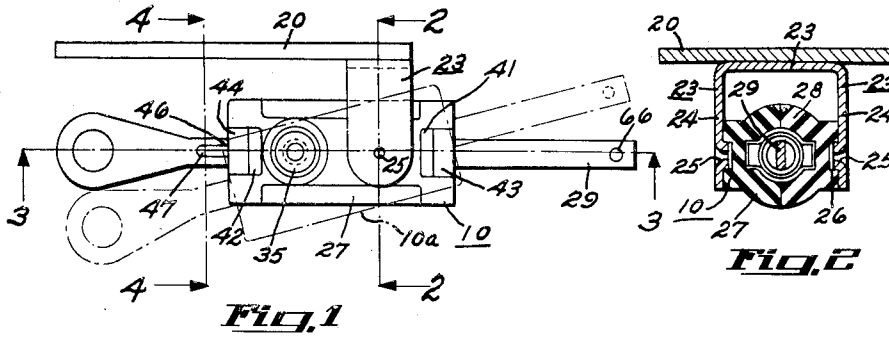
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1,981,064

ELECTRIC SWITCH

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UNITED STATES PATENT OFFICE

1,981,064

ELECTRIC SWITCH

Harry E. Norviel, deceased, late of Anderson, Ind.,
by Anderson Banking Company, executor,
Anderson, Ind., assignor, by mesne assignments,
to General Motors Corporation, Detroit, Mich.,
a corporation of Delaware

Application April 13, 1932, Serial No. 605,092

9 Claims. (Cl. 200—59)

This invention relates to electric switches, and more particularly to that class of switches of the pull-rod type cooperating with a pedal of an automotive vehicle.

One object of the present invention is to provide a simple and compact switch that is easily assembled and installed, and which is highly efficient and satisfactory in practical use.

Another object of the present invention is to provide for the quick closing of a pull-rod type switch that will be readily responsive, and certain of operation upon a slight movement of a pedal control mechanism. This object is accomplished by providing a switch having an operating rod, the rod being connected with a part carried by a pedal of the control mechanism. The rod is so constructed and arranged and so located with respect to the operating pedal, that a movement of the pedal will cause the circuit closing mechanism slidably mounted upon the rod to close an electric circuit on the initial movement of the pedal, the rod will follow the pedal but the circuit closing means is held stationary within the switch housing by stops. The advantage of the stops, is that the contact surfaces of the circuit closing mechanism need be relatively short longitudinally in order to be maintained in contact with the stationary contacts of the switch during the movement of the pedal and rod beyond that required to close the contacts of the switch. In this construction the switch is mounted upon a bracket and the bracket is so arranged with respect to the pedal that the switch is allowed to oscillate upon the bracket allowing the rod and the circuit closing mechanism to slide longitudinally on the axis of the switch housing at all times to eliminate damage to switch parts.

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 one form of the present invention is clearly shown.

In the drawing:

Fig. 1 is a side elevational view of a switch embodying my invention in its "on" position.

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is an end view taken on the line 4—4 of Fig. 1.

Fig. 5 is a sectional view similar to Fig. 3, showing the switch in "circuit open" position.

Fig. 6 is a diagrammatic view illustrating the

switch controlled by a pedal of an automotive vehicle.

Referring to the drawing, a mounting plate 20 is secured to a floor board or other suitable support 21 of an automobile by screws or any other suitable means. A metallic U-shaped bracket 23 is rigidly secured to the plate 20 by spot welding. The two arms 24 of the bracket 23 are provided with inwardly directed extrusions 25 to provide bearings or pivots designed to seat within recesses 26 provided by a housing or casing 10. The housing 10 comprises a pair of blocks or sections 27 and 28 made of insulating material, each block being provided with one of the recesses 26 that are adapted to receive one of the extrusions 25 to permit a certain amount of pivotal or oscillatable mounting of the housing 10 with respect to the bracket 23.

The blocks 27 and 28 are constructed substantially of the same external contour and recessed at 31 and 32 respectively in such a manner, when placed together in mating relation, they will form a switch chamber. Each block is provided with an additional groove or guide 34 extending longitudinally thereof and provided with registering notches on the end wall of the blocks to form openings upon the axis of the housing through which a rod 29 extends when the blocks are assembled. The blocks 27 and 28 support stationary contacts 35 and 36 respectively, each contact having a surface that protrudes within their respective grooves 33 and to form contact points cooperating with a circuit closing assembly 50.

The blocks 27 and 28 are provided with external recesses or depressions 41 and 42 to receive the ends of clamping or clip members 43 and 44. The clip member 43 has its ends clinched over and extend into the notches 41 while the ends of the member 44 extend into the notches 42, thus holding the blocks 27 and 28 together. The member 43 is provided with a rectangular aperture 45 and the member 44 with a T-shaped aperture 46. The apertures 45 and 46 slidably support the rod 29. The rod is deformed as at 47 that fits loosely through the T-shaped aperture 46, and provides a shoulder 48 located within the chamber to limit the movement of a circuit closing assembly 50 in one direction and directs the movement of the assembly in another direction.

The circuit closing assembly 50 comprises a di-electric bushing 51, a flexible U-shaped contact member 52 and a washer 53. The elements 51, 52 and 53 are maintained in their proper relation to each other through the medium of a

compression spring 54 which has one end bearing against the end walls of the blocks 27 and 28 and the other end against the washer 52, see Fig. 3.

5 Within the chamber and on each side of the stationary contacts 35 and 36 are lugs 55 and 56 formed integral with the blocks 27 and 38 respectively. These lugs form a stop to limit the movement of the contact closer in one direction, 10 that is when the contact closer is moved by the spring 54 into a position to bridge the contacts 35 and 36, to complete a circuit.

The operation of the switch mechanism will be readily understood. In Figs. 5 and 6 the 15 switch mechanism is shown in circuit open position while Fig. 3 shows the mechanism in circuit closed position. When it is desired to close a circuit to a lamp 65 shown diagrammatically in Fig. 6, the operator will depress a pedal 60 pivoted at 61. The pedal is provided with a lever 62 connected with the rod 29 as at 63. Thus when the pedal is depressed the lever 62 will be moved about its pivot 61 to move the rod 29 to the left as 20 viewed in Figs. 1, 3, 5 and 6. This movement of the rod 29 will cause the control member 52 of the circuit closing assembly 50 within the grooves 33 to move to the left until the bushing 51 comes in contact with the lugs 55 and 56. These lugs limit the movement of the contact closer assembly 50 after the same is in good electrical contact with the stationary contacts 35 and 36 to close 25 a circuit, but the portion 47 will move away from the bushing 51 as the elements 51, 52 and 53 are mounted loosely upon the rod 29. Thus the rod 29 is free to move to the left while the contact closer assembly is held against the stops. The rod 29 is limited in its movement to the left by a suitable stop 66 formed on the rod 29. It will be noted that the plate 20 is firmly fixed to the floor board 21 and the lever 62 is moved about 30 an arc on the pivot 61. Since the housing 10 is pivotally mounted upon the arms 23, the housing 10 will oscillate on the pivots 25 as illustrated by dot and dash lines in Fig. 1 as indicated by reference character 10a. This oscillating movement of the housing prevents wedging of the arm 29 with respect to the members 43 and 44 in its movement to close or open an electric circuit. 35 Thus, the circuit closing assembly unit 50 is always moved along the axis of the housing 10 regardless of the position of the pedal 60 and the associated elements that cooperate with the unit 50 to close or open an electric circuit.

When the pedal 60 is released to return to its 40 normal position, the shoulder formed by the portion 47 will engage the bushing 51, thus moving the contact closer assembly 50 to the right to open the circuit and compressing the spring 54 which is overcome by a stronger spring (not shown) for returning the pedal 60 to its normal position. 45

When the switch mechanism is in the position shown in Fig. 2, a circuit will be completed to a lamp 65 from the battery as follows; the circuit 50 comprising a battery 67, lead 68, terminal 36, contact 51, terminal 35, lead 69, lamp 65 and back to the battery through ground 70.

While the form of embodiment of the present 55 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:

56 1. An electric switch comprising in combination; a supporting bracket having a pair of pro-

jections of equal length; a housing pivotally supported by said projections, said housing inclosing a circuit closing means in which said housing comprises a pair of insulating blocks, each block 80 pivoted upon an end of said projections; end members for securing said blocks together; and means extending through said housing and slidably supported by said end members for operating said switch structure.

2. A switch comprising in combination; a pair 85 of insulating blocks recessed at their adjacent faces to form a chamber, said blocks having opposed lugs to form a stop within said chamber; stationary contacts disposed in said chamber on each side of the line of division therebetween; end 90 members for securing said blocks in assembled relation; a rod extending through and slidably supported by said end members, said rod having an offset portion slidable in one of said end members; a bridging member insulatingly mounted upon said rod but movable thereon; a spring urging said bridging member against said offset portion during a circuit open position of said switch and against said stop during circuit closed position. 95

3. A switch comprising in combination; a body of insulating material constructed of a pair of sections having recesses, said recesses cooperating to provide a chamber within said body; end 100 means for securing the sections together; a pair of stationary contacts in said chamber but on opposite sides of the line of division therebetween; a rod slidably supported on said end means; a contact member insulatingly carried but slidable upon said rod to connect said stationary contacts; 105 means for actuating said rod; and yieldable means adapted to move the said contact member to a bridging position with said stationary contacts upon movement of said actuating means in one direction. 110

4. A switch comprising in combination; a body of insulating material constructed of a pair of blocks recessed at their adjacent faces to form a 115 chamber, said blocks having diametrically opposed lugs to form a stop within said chamber; stationary contacts arranged in said chamber but on opposite sides of the line of division therebetween; end members for securing said blocks together; a rod extending through said chamber and slidably supported by said end members; a 120 yieldable U-shaped contact member insulatingly carried by said rod; and spring means for normally urging said U-shaped contact toward said stops to bridge said stationary contacts. 125

5. A switch comprising in combination; a housing 130 comprising a pair of blocks recessed at their adjacent faces to form a chamber; stationary terminals located in said chamber but on opposite sides of the line of division therebetween; end members for securing said blocks together; a rod 135 slidably supported by said end members; a movable contact insulatingly and slidably supported by said rod within said housing for engagement with said terminals; means for normally urging said movable contact toward said terminals upon 140 movement of said rod in one direction; and means carried by said rod for moving said movable contact away from said terminals on movement of said rod in opposite direction. 145

6. An electric switch comprising in combination; a supporting bracket having a pair of projections substantially equal in length; a housing 150 pivotally supported by said projections, said housing inclosing a circuit closing means in which said housing comprises a pair of insulating blocks,

each block pivoted upon an end of said projections; means for securing said blocks together; and means extending through said housing and slidably supported thereby for operating said circuit closing means.

7. A switch comprising in combination; a pair of insulating blocks recessed at their adjacent faces to form a chamber, said blocks having opposed lugs forming a stop within said chamber; stationary contacts disposed in said chamber on each side of the line of division therebetween; means for securing said blocks in assembled relation; a rod extending through and slidably supported by said blocks; a bridging member insulatingly mounted upon said rod but movable relative thereto; means for actuating said rod; means carried by said rod holding said bridging member in circuit open position upon movement of said rod into one direction; and resilient means for urging said bridging member against said stop and in circuit closed position upon movement of said rod in the opposite direction.

8. An electric switch comprising, in combination, a housing comprising a pair of insulating blocks recessed at their adjacent faces; end members for holding said blocks together to form a longitudinal bore through said housing, said housing having spaced grooves substantially parallel to the axis of the bore; a terminal mounted on each block forming contact points within said grooves; a rod slidably supported by the end members; a bridging member insulatingly and slidably supported on said rod within said bore, said bridging member having means extending

into said grooves to prevent rotary movement of the bridging member within said casing and to make circuit connection with the terminals; a spring for normally urging said bridging member toward said terminals upon movement of said rod in one direction; and means carried by said rod for moving said bridging member away from said terminals on movement of said rod in an opposite direction.

9. A switch comprising, in combination, a housing comprising a pair of blocks recessed at their adjacent faces to form a chamber, said chamber provided with a plurality of internal grooves; terminals insulatingly supported by the blocks and extending into the grooves; end members for securing said blocks together; a rod slidably supported by said end members; a bridging member provided with resilient tongues, said bridging member insulatingly and slidably supported by said rod within the housing with the tongues extending into and slidable within the grooves for engagement with said terminals; a spring for normally urging said bridging member toward said terminals upon movement of said rod in one direction; and means integral with said rod for moving said bridging member away from said terminals on movement of said rod in an opposite direction.

ANDERSON BANKING COMPANY,
Executor of the Estate of Harry E. Norviel, Deceased,

By LINFIELD MYERS,
President.

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