

Jan. 17, 1967

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3,299,241

ROCKER TYPE SWITCH DETENT CONTACT CONSTRUCTION

Filed Oct. 20, 1965

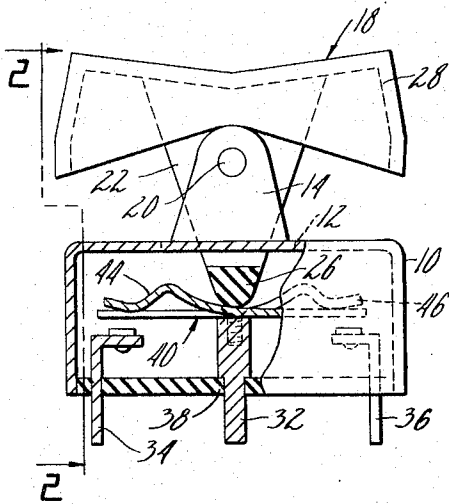


Fig. 1

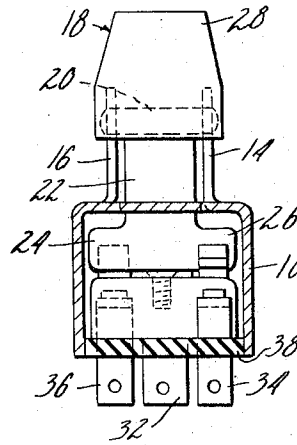


Fig. 2

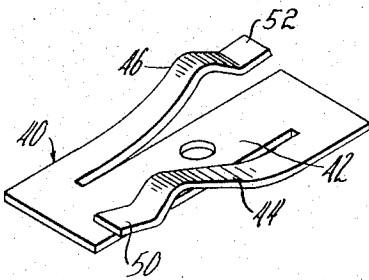


Fig. 3

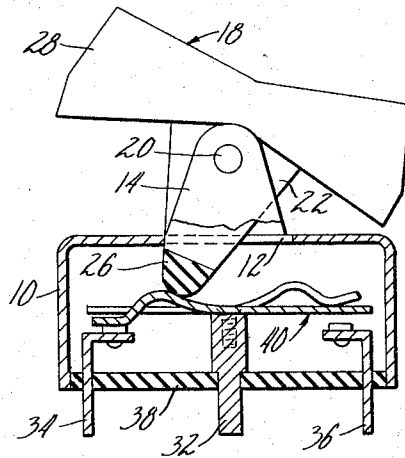


Fig. 4

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3,299,241 ROCKER TYPE SWITCH DETENT CONTACT CONSTRUCTION

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Filed Oct. 20, 1965, Ser. No. 498,522
1 Claim. (Cl. 200-166)

The present invention relates to an improved multi-pole switch, and more particularly to a switch of the general type having a manual controller pivoted to turn on a fixed pivot to close alternatively one or another circuit.

It is a principal object of the invention to provide in a switch of the general type having a manually operable rocker element, the combination of an improved electrical circuit closing element which is of simple construction, and which may be counted upon for trouble-free operation over a very long period of time.

It is a further object of the invention to provide a switch of this general description of which the switch mechanism comprises a fixedly mounted switch element providing a pair of switch arms adapted to be shifted selectively to closed position by a rocking movement of the switch controller, the relationship of the controller and switch arms being such as to cause the controller to be held yieldably in the selected operating or neutral position.

With the above and other objects in view as may hereinafter appear the several features of the invention will be apparent to one skilled in the art from the following description taken in connection with the accompanying drawing in which:

FIG. 1 is a view in side elevation of a rocker switch embodying the several features of the invention, a portion of the switch casing having been broken away and underlying parts sectioned, the switch being shown in an intermediate off position;

FIG. 2 is an end view of the switch shown in FIG. 1 partly in section taken on a line 2-2 of FIG. 1;

FIG. 3 is a perspective view of the plate switch element of the switch; and

FIG. 4 is a view similar to FIG. 1 but with the manual controller rocked to one alternative "on" position.

The rocker type multi-pole switch illustrated in the drawing as embodying in a preferred form the several features of the invention comprises a rectangular housing 10 having formed in the top face thereof a rectangular slot 12, and two upwardly extending ears 14 and 16, one at each side of the slot 12. A manually operable rocker switch controller 18, supported on a pivot pin 20 connected between said ears 14, 16, projects downwardly through said rectangular slot 12 into the housing 10.

The switch controller consists of a solid block 22 of electrically nonconducting material which is generally wedge shaped, the lower edge being formed with two lateral extensions 24, 26 which overlie the two switch contact arms of the switch assembly as hereinafter pointed out. A manual actuator 28 consisting of an elongated hollow member having its under side open and having the outer top face thereof shaped to provide two manual press surfaces is fitted over and attached to the broad upper end of the wedge shaped block 22.

In the illustrated construction an electrical circuit is closed between a central switch terminal element 32 and either of two switch terminals 34 and 36 mounted in a base panel 38 of an electrically nonconducting material closing the under side of said rectangular housing through

electrical connections controlled by the manual switch controller 18. In the illustrated construction connection is made through a rectangularly shaped switch plate 40 formed of a stiff but flexible electrically conducting material which may, for example, be beryllium copper. The plate 40 is slotted from opposite ends along parallel lines providing a central base portion 42 running the full length of the rectangular plate 40, and at opposite sides arms 44 and 46 which are somewhat narrower than the central portion 42 and are attached thereto at opposite ends of the plate. The switch plate is fixedly secured at its mid-point to the central switch terminal element 32, being located in the housing 10 so that the switch arms 44 and 46 pass under the rocker edge extensions 26 and 24 of the rocker switch controller 18 respectively in opposite directions. The switch arm 44 is bent to provide an upwardly curved contact surface adapted to be engaged by the extension 26 of the manual controller 18 when rocked in a clockwise direction to the position of FIG. 4, and a downwardly offset switch terminal engaging tip surface 50. For the "on" position of FIG. 4 the V shaped extension of the rocker switch controller 18 will have passed slightly beyond a perpendicular position with relation to the engaged surface of the switch arm 44 which now acts as a detent to hold the switch in said "on" position.

The switch arm 46 is bent in a manner similar to the arm 44 to provide an upwardly curved switch actuating surface and a downwardly offset contact surface 52. A rocking movement of the rocker switch actuator 18 counterclockwise from the position of FIG. 1 causes the V shaped extension 24 to ride outwardly on the upwardly curved surface of the switch arm 46 to engage the contact surface 52 with the switch terminal 36. The switch is then held in this "on" position by the spring action of the switch arm 46.

The construction of a multi-pole rocker type switch above set forth has the advantage that it is of the simplest possible construction, having as movable parts thereof only the rockable manual controller 18, and the switch plate 40 formed to provide a rigidly mounted center section and two resilient switch arms adapted to be pressed alternatively to close a circuit through one or the other of switch terminals 34 and 36. Since the mid-section of the switch plate 40 may be expected to work slightly with relation to the centrally located switch terminal 32 when either one or the other of the switch arms is pressed the effective length of each switch arm is thus substantially increased thereby making possible a corresponding increase in the resiliency and speed of the switch action within the confines of a small switch housing. The switch action produced by these elements may be expected to continue in trouble-free operation for a very long time. Because of the symmetrical arrangement of the parts the same advantages are obtained in operation regardless of which way the switch controller 18 is tipped.

The invention having been described what is claimed is:

A rocker switch, which comprises a housing, a manual controller supported to turn on a pivotal axis having a switch actuating edge surface disposed radially from and extending parallel to the rotational axis of said controller, a rectangular switch plate disposed in said housing opposite said radially movable actuating edge surface formed of a stiff, resilient electrical conducting material having parallel slots extending from opposite ends of said plate in the direction of movement of said switch actuating edge surface, providing a relatively fixed central area of said

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switch plate, and a pair of switch arms attached at opposite ends of said switch plate and extending beyond said switch edge in opposite directions, each said switch arm having an upwardly bent press surface to be engaged and pressed by movement of said controller about its axis in the direction of said arm, and a switch contact surface adjacent the end thereof, a switch contact terminal attached to and providing a solid support for said contact plate at the mid-point of the central area thereof, and

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contact terminals to be engaged by said switch arms when pressed.

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