

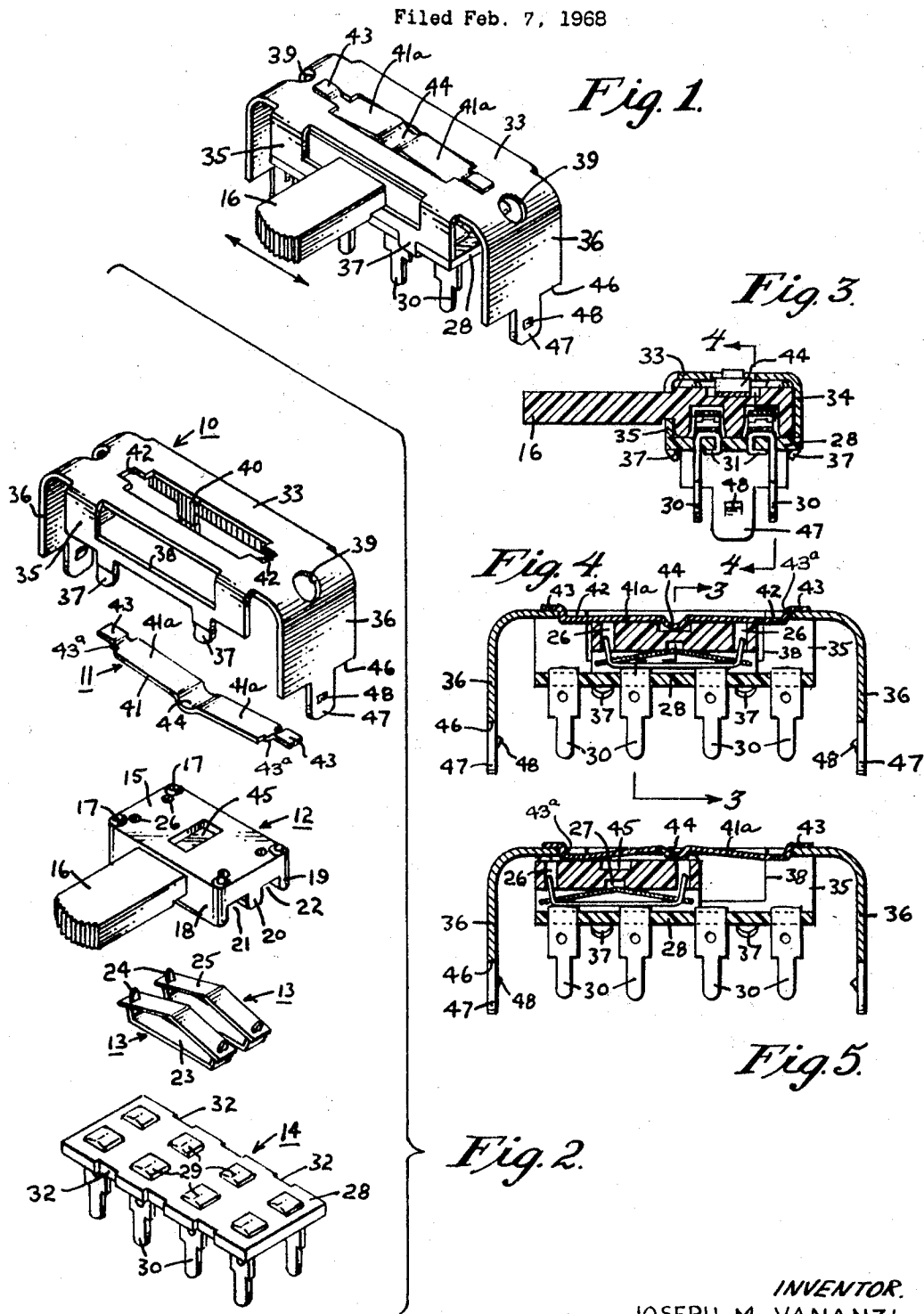
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MULTIPOSITION SLIDE SWITCH

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MULTIPOSITION SLIDE SWITCH

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ABSTRACT OF THE DISCLOSURE

A multiposition, multicircuit slide switch having a contact assembly, contact bridges held captive within and shiftable with a slider made of insulating material, a switch housing and a depending detent pressure spring held captive thereto. The spring is disposed in a slot through the housing top wall, and the depending detent of the spring seats in a detent receiving depression formed in the slider body top wall when the slider is in particular position between other possible left shifted and right shifted switch positions, the detent being cammed up and out of the slider depression and bearing on the slider top wall when the slider is shifted to any other position to frictionally hold the slider at such other position.

This invention relates generally to slide switches, and more particularly relates to a multicircuit, multiposition slide switch so constructed that the actuating arm or button extends laterally through the side of the switch casework and is of sufficient length that it may be projected directly through an appropriate cut-out in the control panel of apparatus for direct actuation. Additionally, the ends of the casework are turned down as support legs in the same direction as the legs of the switch contacts and configured for detented insertion into circuit boards. The switch slider is resiliently center position detented.

When used in applications requiring direct contact mounting to a printed circuit board, reasonable servicing requirements do not permit the printed circuit board to be mounted parallel to and very close to the front panel through which the operating arm for the slide switch would have to pass in order to be actuatable. Consequently, with the printed circuit boards positioned in normal fashion substantially perpendicular to the panel of the apparatus, it has been necessary to employ auxiliary mechanical devices to actuate from the panel surface such a slide switch, which is of course mounted with its operating arm or button behind the panel. The casework legs mechanically support the switch from the circuit board and remove the mechanical strain on the contact legs.

A principal object of my invention is to provide a novel center position detented slide switch as aforesaid wherein the length of the slide switch downturned casework legs is sufficiently long to project directly through a circuit board of the apparatus in which the switch is utilized to thereby eliminate the need for supplemental mechanical devices otherwise required to mechanically support the switch.

Another object of my invention is to provide a novel slide switch having an extended slider arm projecting through a wall of the switch case substantially at right angles to the normal downward projection direction of the external parts of the switch contacts.

The foregoing and other objects of the invention will appear more fully hereinafter from a reading of the following specification in conjunction with an examination of the appended drawing, wherein:

FIGURE 1 is a perspective view of the assembled slide switch according to the invention;

FIGURE 2 is an exploded perspective view of the switch shown in FIGURE 1 illustrating structural features of the interior parts of the switch not visible in FIGURE 1;

FIGURE 3 is a vertical cross sectional jump view on an enlarged scale through the switch of FIGURE 1 as would be seen when viewed along the line 3—3 of FIGURE 4;

FIGURE 4 is a vertical longitudinal sectional jump view through the slide switch taken at right angles to the showing of FIGURE 3 and as would be seen when viewed along the line 4—4 of FIGURE 3; and

FIGURE 5 is a view similar to that of FIGURE 4 but with the switch slider shifted from central position to an end position.

In the several figures, like elements are denoted by like reference characters.

Referring now to the drawing, it is seen that the switch includes a case 10, a detent pressure spring 11 held captive to the case top wall immediately above the below lying switch slider element 12, a pair of electrically conductive slider contact bridges 13 shiftable with the slider 12 and held captive between the latter and the below lying contact assembly 14.

The slider 12 is made of electrical insulating material and has a generally rectangular body portion 15 from one side of which projects an elongated slider actuating arm 16. Projecting upward from each of the four corners of the upper face of the slider body 15 is a boss 17. Depending from the side edge of the slider body from which extends the slider arm 16 is a skirt 18, a similar skirt 19 depending from the slider body 15 at the opposite parallel extending edge thereof. Depending from the underside of the slider body 15 parallel to the front and rear skirts 18 and 19 and midway therebetween is a central barrier rib 20 which defines with the front skirt 18 the side edges of a channel 21, and which defines with the rear skirt 19 a channel 22. Within these channels the slider contact bridges 13 are disposed as most clearly seen in FIGURES 3, 4 and 5.

The contact bridges 13 are each formed from a U-shaped metal conductor having a flat base wall 23 and upturned side arms reduced at the upper ends thereof as at 24 so that the latter are projectable through opposite end apertures cut or punched through the ends of an inverted V-shaped resilient biasing element 25. The slider contact bridges 13 are held captive in the slider body channels 21 and 22 by projecting of the reduced side arm upper ends 24 into apertures 26 formed in the slider body 15 at opposite ends thereof and opening into each of the channels 21 and 22 as is most clearly seen from FIGURES 2, 4 and 5. The upper upwardly facing vertex of the inverted V resilient biasing elements 25 are each disposed in a slot 27 formed in the undersurface of the slider body 15 and extending transversely of each of the channels 21 and 22 at their mid points.

The contact assembly 14 is formed from a rectangular piece of insulating material 28, such as phenolic board, suitably apertured to have projected therethrough a plurality of electrical contacts each having a head surface portion 29, a depending tail 30 and a contact locking tab 31, best seen in FIGURE 3, which locks the contact to the insulator baseboard 28. As best seen in FIGURES 3 and 4, the bases 23 of the contact bridges 13 seat downward upon the heads 29 of the contacts and are resiliently biased downward thereagainst by means of the resilient biasing elements 25. The front and rear edges of the contact assembly insulation baseboard 28 are provided with notches 32 to receive locking ears carried by the case 10.

The case 10 includes a top wall 33, rear wall 34, front wall 35 and end walls 36. The front and rear walls depend from the top wall and are each provided at their lower edges with a pair of locking ears 37 positionable in the notches 32 of the contact assembly, as best seen in FIGURES 3, 4 and 5. The case front wall 35 is rectangularly apertured as at 38 to permit passage therethrough of the slider actuator arm 16. The case top wall 33 is provided with apertures at opposite ends thereof to function as optional mounting holes 39 for the switch assembly. The top wall is also centrally rectangularly apertured as at 40 to receive the rectangular main body portion 41 of the detent pressure spring 11, the opposite ends of the aperture 40 being respectively provided with outwardly extending auxiliary slots 42. The pressure spring 11 is provided with a centrally located transversely extending tabs 43 upwardly offset from the main body portion 41 of the spring by interconnecting neck portions 43a which are respectively received in the auxiliary slots 42.

The pressure spring body 41 is in the general form of a resilient rectangular flat strap provided at its opposite ends as aforesaid with the upwardly offset tabs 43, and also provided with a centrally located transversely extending depressed detent 44 which seats into detented depression 45 formed centrally in the top wall of slider body 15 when the slider 12 is in its center switch position as shown in FIGURE 4, the detent 44 dividing the body 41 into two segments 41a. The width of the main body portion of the spring 41 is greater than the width of the auxiliary slots 42 in the case top wall, while the width of the interconnecting neck portions 43a of the offset tabs 43 is just less than the width of the slots 42 so that when said neck portions are slipped into their respective auxiliary slots 42, the tabs 43 overlie the top surface of the casing wall 33, while the ends of the main body portion 41 of the spring 11 underlie said case wall 33. Thus, the pressure spring 11 is securely held within the top wall rectangular aperture 40, all as best seen in the showing of FIGURE 4, with its opposite ends in limited free-floating engagement with the case top wall 23.

As also best seen from FIGURE 4, when the depressed detent 44 of the detent pressure spring 11 is seated within the slider body detent depression 45, the slider contact bridge 13 electrically connects the two center contacts 30 of the contact assembly 14. When the slider 12 is shifted endwise from its center detented position to an end position, as shown in FIGURE 5, the depressed detent 44 of the detent pressure spring 11 is cammed up out of the slider body detent depression 45 and is resiliently deflected upward so that the depressed detent 44 bears upon the upper surface of the slider body 15 and frictionally holds the slider 12 in its shifted position to thereby electrically connect an end pair of contacts 30.

It will be noted that the pressure spring 11 is so disposed relatively to the slide 12 that irrespective of the position of the slider lengthwise of the spring 11 the latter, through the intervention of its U-shaped detent 44, exerts a downward pressure upon the slider to insure positive engagement of the contact bridges 13 with the heads 29 of the electrical contacts in the insulator base board 28. This downward pressure of the spring 11 against the slider 12 is additive to that which is normally exerted by the slider 12 and contact bridges resilient biasing elements 25 against the contact bridges conductors 23 to thereby insure the aforesaid positive electrical engagement of the bridging members conductors with the selected contacts of the insulating base.

The case end walls 36 depend from the top wall 33 and are provided at their lower edges 46 with legs 47 of substantially narrower front to back width than that of the end walls 36, the legs 47 each having a detent 48 turned inward out of the plane of the leg 47 below the end wall lower edges 46 by a distance substantially equal to or slightly greater than the thickness of the circuit board or panel to which the switch is to be mounted. In use, the

legs 47 are of course projected through appropriately sized slots in the circuit board or panel until the lower edges 46 of the end walls 36 seat upon the board and the detents 48 snap through on the other side of the board to thereby mechanically secure the switch in its desired position.

Having now described my invention in connection with a particularly illustrated embodiment thereof it will be appreciated that variations and modifications of my invention may now occur from time to time to those persons normally skilled in the art without departing from the essential scope or spirit of the invention, and accordingly, it is intended to claim the same broadly as well as specifically as indicated by the appended claims.

What is claimed to be new and useful is:

1. A multiposition slide switch, comprising in combination, a contact assembly including an insulating base member and a plurality of electrically conductive contact elements carried by said base member, a slider element overlying said contact assembly having a body portion made of electrical insulating material and an actuating arm extending laterally therefrom with at least one electrically conductive contact bridge held captive to the underpart of said slider body so as to move therewith and mechanically engage an adjacent pair of contact elements of said contact assembly, a housing enclosing said slider element and having a top wall and depending front and rear and opposite end walls, said housing top wall overlying said slider body and said front and rear walls extending downward immediately in front of and behind said slider element body to the insulating base member of said contact assembly and being locked to the latter, and a detent pressure spring overlying said slider and disposed in a slot through the said housing top wall, said spring having a depending detent and said slider element having a detent receiving depression formed therein extending downward from the top wall thereof and the depending detent of said pressure spring being seated in said depression when said slider is in a particular position, said detent being cammed against its normal downward bias up and out of said slider depression and bearing on said slider topwall when said slider is shifted to any other than its detented position to thereby frictionally hold said slider at such other position, at least one wall of said housing being apertured for projection therethrough of said slider element actuating arm.

2. A slide switch as described in claim 1 wherein said housing top wall slot is a longitudinally extending rectangular aperture from the opposite short sides of which extend retainer slots of narrower width, and wherein said pressure spring is in the general form of a resilient rectangular flat strap having a main body portion provided at opposite ends with upwardly offset tabs to support the same in overlying substantially parallel relation to said slider element, the width of the main body portion of said spring being greater than the width of said housing top wall retainer slots while the width of said offset tabs is slightly less than the width of said retainer slots, said offset tabs being disposed in said retainer slots with the outer ends of said spring main body portion disposed under the side edges of said retainer slots to thereby hold said pressure spring securely within the said top wall rectangular aperture.

3. A slide switch as described in claim 1 wherein said housing opposite end walls extend downward from said housing top wall and are provided with legs extending in plane with and from the lower edges of said end walls, said legs being of narrower front-to-back width than said end walls and each having a detent projecting at a distance from the end walls lower edges at least equal to the thickness of a circuit board or panel to which the switch is to be mounted.

4. A slide switch as described in claim 3 wherein said base member contact elements have tails extending parallel to each other and to said legs extending from the lower

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edges of said housing end walls, said contact tails extending longitudinally from said base member for a distance beyond said detents of said housing end walls legs, whereby said contact tails project through a circuit board to which said switch is secured by said end walls legs.

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2,880,284	3/1959	Laete	200—1
3,270,149	8/1966	O'Shea et al.	200—1
3,271,535	9/1966	Vananzi	200—1
3,311,719	3/1967	Vananzi	200—1

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References Cited

UNITED STATES PATENTS

2,441,614	5/1948	Baumer	200—16
2,725,432	11/1955	Brown	200—16 10 200—166, 168

U.S. Cl. X.R.