

Nov. 29, 1955

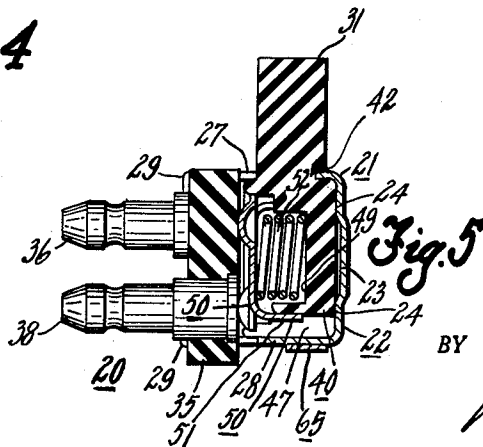
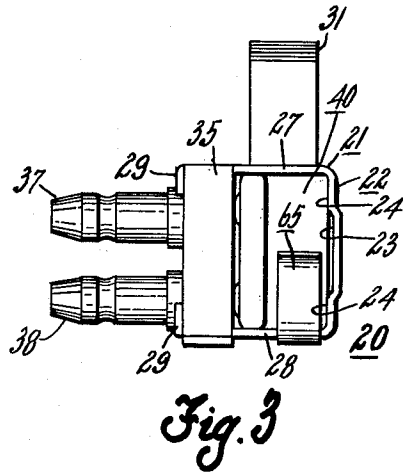
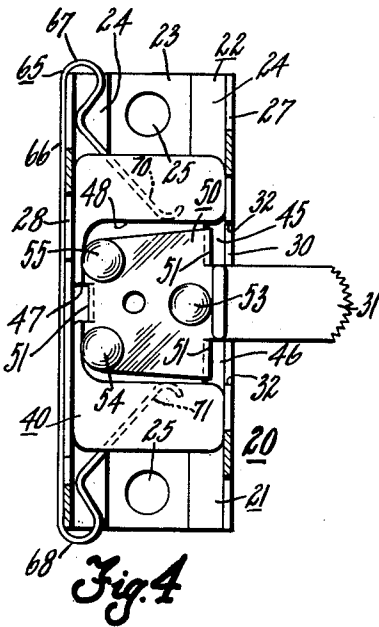
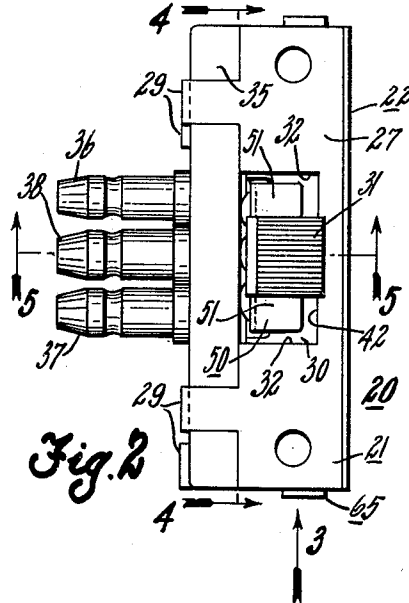
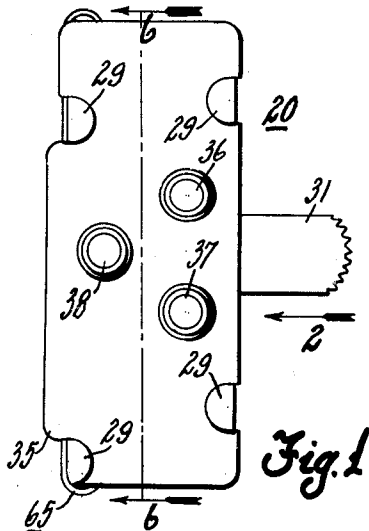
W. E. BROWN

2,725,432

SWITCH

Filed May 25, 1953

2 Sheets-Sheet 1



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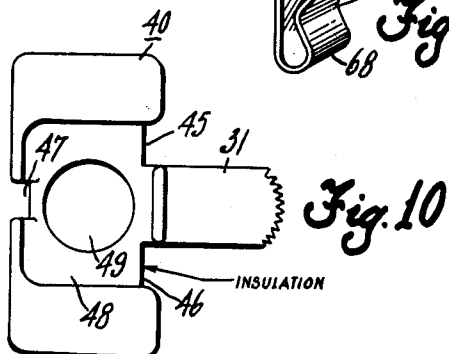
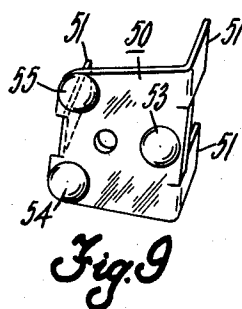
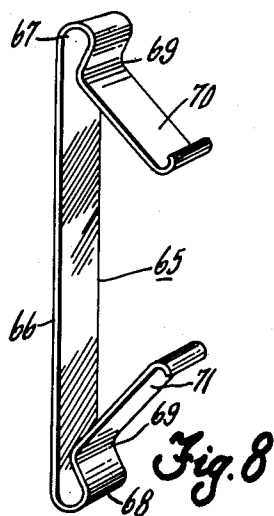
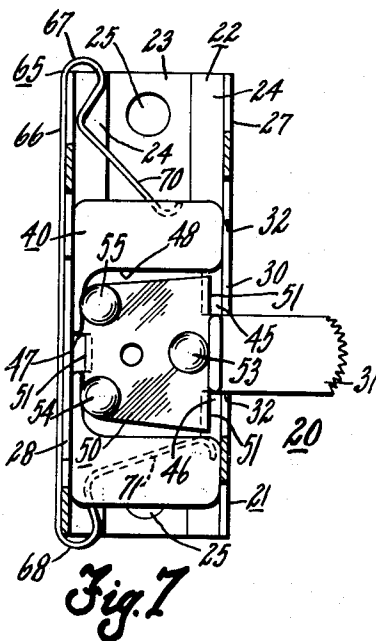
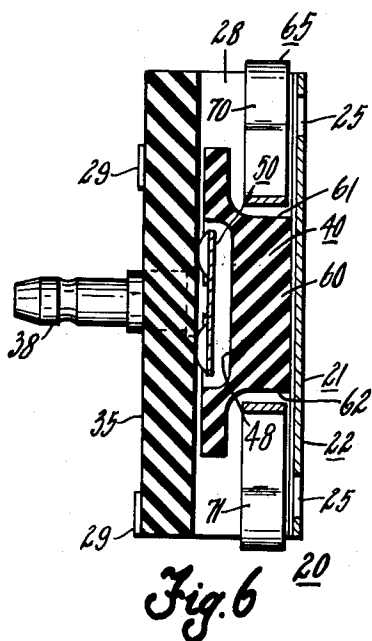
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2,725,432

SWITCH

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2 Sheets-Sheet 2



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2,725,432

SWITCH

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5 Claims. (Cl. 200—16)

This invention relates generally to electrical switches, and particularly to a switch operable in either direction from a neutral position, such as might be employed for controlling an antenna operating system in which a two-way switch button is employed, one for causing the antenna to be elevated and the other for causing it to be lowered.

An object of the present invention is to provide a double acting switch controlled by a reciprocable knob, whereby a suitable circuit for elevating or lowering the antenna may be energized.

Another object of the invention is to provide a double throw switch with simple and efficient means for keeping the control knob thereof in its neutral position and returning it to the neutral position from either of its positions of operation upon release by the operator.

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

In the drawings:

Fig. 1 is a side view of a switch embodying the present invention.

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

Fig. 3 is an end view looking in the direction of arrow 3 in Fig. 2.

Fig. 4 is a view taken on line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 1.

Fig. 7 is a view similar to Fig. 4 but with the reciprocating member in one of the "on" or circuit closing positions.

Fig. 8 is a perspective view of spring member of the switch.

Fig. 9 is a perspective view of the bridging member.

Fig. 10 is a plan view of the carrier to receive the bridging member shown in Fig. 9.

Referring to the drawings, 20 designates a control switch which includes a sheet metal frame or housing 21 of channel shape, said housing including a bottom wall or guide way 22 formed with a groove 23 to provide spaced bearing surfaces 24. The grooved portion of the bottom wall is provided with apertures 25 to provide for the attachment of the housing to a suitable support. A pair of parallel side walls or flanges 27 and 28 are rigidly secured to the bottom wall and each flange includes spaced tangs or fingers 29 which are spaced differently, as indicated in Fig. 1, on each flange the purpose of which will be set forth hereinafter. The wall 27 is provided with a central notch 30 in which a switch operating knob or stem 31 is adapted to slide. Stops 32 are formed at each end of the notch 30 for engagement by the knob 31 to limit its reciprocating movement.

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A terminal plate or base 35 of insulating material completes the housing and the base is provided with notches to receive the tangs 29. These notches are so positioned that the base 35 can be assembled only in one position, thereby avoiding any confusion in the arrangement of terminals carried by the base 35. The base is clamped against the edges of the flange by binding the tangs 29 over the rear face of the base. Mounted on the base 35 are three terminals 36, 37 and 38 of the character shown in Fig. 5. These terminals have contact portions which are flush with the inner face of the base 35 and these terminals are mounted so that they form a triangle as illustrated in Fig. 1.

Slidably mounted within housing formed by the bottom wall 22, its side flanges 27 and 28 and the base, there is a carrier 40 of insulating material. Projecting from the carrier is the stem or knob 31 which is attached upon and desirably integral with the carrier 40. The stem or knob 31 is shorter than the length of the notch thereby allowing space to allow the stem to reciprocate which may be guided by the edge 42 of the slot 30 and the inner face of the base 35 and the stops 32 provided by the notch limit the reciprocating movement of the stem 31 and the carrier 40.

The carrier 40, see Fig. 10, is formed with notches 45 and 46 on one edge and a notch 47 on the opposite edge. The carrier 40 is also formed with a recess 48 and a pocket 49. Positioned in the recess 48 is a bridging member or conducting plate 50, see Fig. 9, having extending arms or lugs 51 which extends into the notches 45, 46 and 47 and is spring urged outwardly from the carrier 40 into engagement with the base 35 by a spring 52 positioned between and within pocket 49 the bridging member 50 and the carrier 40. The conducting plate carries a plurality of cup-shaped projections 53, 54 and 55 for engagement with contact portions provided by the terminals 36, 37 and 38, one of the contact positions provided by the terminals is clearly illustrated in Fig. 5.

The carrier 40 is provided with a boss 60 to provide abutments 61 and 62 on opposite sides of the stem 31. Novel spring means 65 are provided for positively holding the carrier 40 in a neutral or "off" position of the control switch 20. This spring means also yieldably resists movement of the carrier 40 in either direction, and said means automatically returns the carrier to its neutral or "off" position upon release of the moving means. The spring means, in this instance, a single strip of spring metal of suitable size which is bent and shaped to provide a springy clip, as clearly shown in Fig. 8. The spring clip 65 comprises a bar or straight portion 66 and the bar is bent at opposite ends thereof to provide opposed loops 67 and 68. A hump 69 is formed at the termination of the loops so as to provide converging resilient arms 70 and 71 having flared ends.

Before the carrier 40, spring 52, and conducting plate are assembled within the frame 21 the spring clip 65 is mounted on the flange 28. By referring to Fig. 4, it will be seen that the straight portion 66 will be adjacent the outside of the flange 28 and the loop portions 67 and 68 will be disposed over the ends of the flange 28 and the arms 70 and 71 will converge toward each other. When the carrier 40 is mounted within the frame the arms 70 and 71 are spread apart to permit the boss 60 of carrier 40 to be inserted therebetween. Upon release of the arms, the arms 70 and 71 tend to return to their normal state. Obviously, initial tension is placed upon the arms 70 and 71 so that the arms will be maintained in firm contact with the abutments 61 and 62 on opposite sides of the boss, whereby to maintain the carrier 40 in its neutral or circuit open position and

to return it to such position when released by the operator from either position of actuation.

The switch 20 may be used to control remotely a reversible motor, not shown of an antenna operating system. In such a system the terminal 38 is connected by a lead not shown, to a suitable source of electricity, for example a battery. Two leads are connected to terminals 36 and 37 and extend to terminals of the reversible motor, whereby upon suitable operation of the switch the motor will be actuated and the antenna lowered or elevated accordingly.

In operation, the switch stem or operating member 31 may be shifted up or down, as viewed in Fig. 2. If the movement is down, as viewed in Fig. 7, the abutment 62 of the boss 60 moves the arm 71 downwardly thus storing energy in the arm 71. When the stem 31 engages the stop the bridging member moved by the carrier will have the projections 53 and 55 engaging contact portions 37, 38 of the terminal to close a circuit. As soon as the moving force is released from the stem 31, the arm 71 will immediately return the carrier 40 to its neutral position. The spring arm 70 will cushion the return of the carrier to its neutral position in case there is an over-travel on the part of the carrier 40. In a like manner the carrier 40 may be moved upwardly, as viewed in Fig. 2 to another operative position of the control switch to close another circuit and returned to its neutral position after the moving force is released from the stem.

The control switch structure described is adapted to be used with a reversible motor that is mounted in a suitable position to raise and lower an antenna but it is to be understood that this switch can be equally used where a pair of parallel circuits are to be controlled.

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.

What is claimed is as follows:

1. A control switch comprising in combination; a housing comprising a right angle channel member having parallel flanges; a terminal back of nonconducting material disposed against the edge of said flanges and cooperating with said housing to provide guideways; a contact carrier movable along the guideways from a central position to control selectively parallel circuits through said switch; and spring means flexed to react in the housing upon said contact carrier for maintaining the switch normally in circuit open condition, said spring means having its mid-portion disposed exterior to said housing and having its end portions yieldable for opposing movement of the contact carrier selectively in

either direction for completing either of a pair of control circuits and acting upon the release of contact movement to return the contact carrier to a central open circuit position.

2. The combination set forth in claim 1 wherein said spring means comprises a strap member laying against the outside of one of the housing flanges and having loop portions disposed to embrace the ends of said flange with free ends of said spring angularly directed to engage said contact carrier.

3. The combination set forth in claim 1 wherein said spring means comprises a strap with angularly directed free ends joined to a bridging portion by curved loops, said bridging portion and loops embracing one flange of said channel member with the free ends thereof extending inwardly from the ends of the channel member to yieldably engage said contact carrier.

4. A control switch comprising in combination a sheet metal channel member having parallel flange portions; a contact carrier reciprocably movable along the channel member between said flanges, one of said parallel flanges having a notch therein and said contact carrier having a stem portion extending therefrom and cooperating said notch for defining limits of carrier movement in either direction from a central position, spring means embracing the other of said parallel flanges for yieldably maintaining the contact carrier in said central position; a terminal block secured against the edge of said channel and cooperating with said flanges to provide guide means for said contact carrier.

5. An electric switch for selectively controlling either of two circuits with automatic return to circuit open position comprising in combination, a terminal body providing terminal contacts to be selectively engaged; a housing cooperating with said terminal body to provide a side wall with openings at opposite ends of the housing; a contact carrier movable along the side wall in either direction from the central position and having spaced transverse abutments; spring means embracing the said side wall including looped portions extending in said opposite end openings with free ends engaging said abutments, whereby said contact carrier is yieldably movable in either direction to complete one of said circuits and is automatically returned to central position by one of said inwardly directed spring ends.

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