June 7, 1960 R. P. SWEGER 2,939,337

OVERTRAVEL MECHANISM FOR CAM ACTUATED SWITCH

Filed March 26, 1958

FIG. 1.

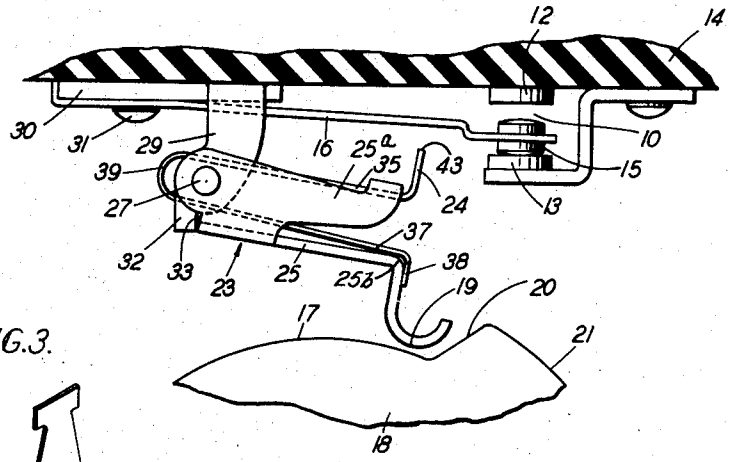


FIG. 3.

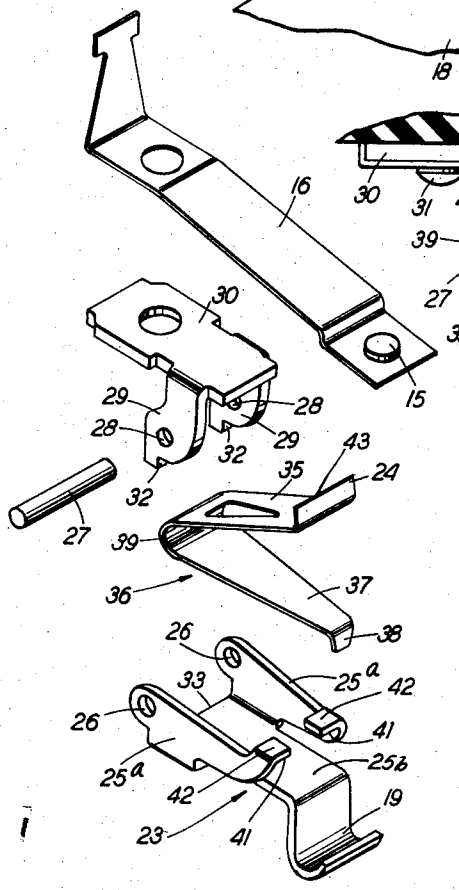
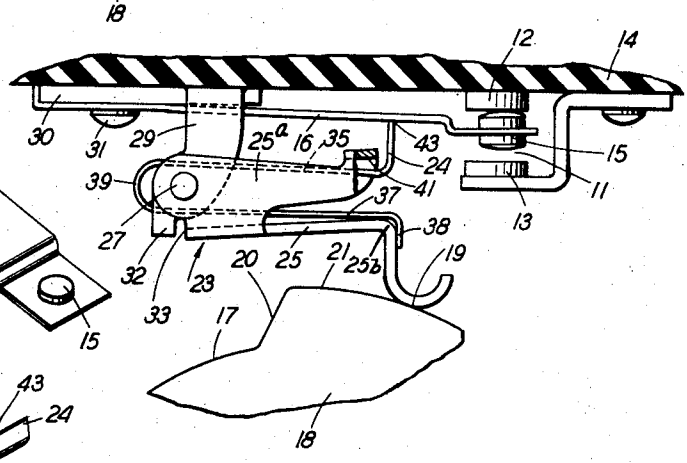


FIG. 2.



INVENTOR.
RUSSELL P. SWEGER
BY
Carlson, Peltzer, Hutton & Wolfe
ATTORNEYS

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OVERTRAVEL MECHANISM FOR CAM ACTUATED SWITCH

Russell P. Sweger, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill., a corporation of Illinois

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This invention relates to a mechanism for permitting the cam actuated follower of a switching device to overtravel after the movable control of the switch reaches its limit position.

One object is to provide an overtravel mechanism which, as compared to other prior mechanisms, is simpler in construction and more reliable in operation.

A more detailed object is to form an overtravel switch actuator from a pivoted arm and a spring acting thereon.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

Fig. 1 is a fragmentary side elevation view of a switch mechanism embodying the novel features of the present invention.

Fig. 2 is a view similar to Fig. 1 with the parts in different positions.

Fig. 3 is an exploded perspective view of the parts.

In the exemplary embodiment shown in the drawings, the improved overtravel mechanism is incorporated in the actuator for two switches 10 and 11 formed by opposed spaced contacts 12 and 13 fixed to a suitable support 14 and cooperating with an intervening contact 15. The latter is fixed to the free end of a resilient tongue 16 preferably mounted cantilever fashion on the support 14 and stressed to bias the contact against the fixed contact 13 (Fig. 1) when a depressed portion 17 of a rotary cam 18 is presented to its follower 19. In response to engagement of the follower by a rise 20 on the cam, the follower is moved away from the cam axis until it encounters a swell 21.

In accordance with the present invention, the motion of the follower is transmitted to the tongue 16 through a rigid arm 23 swingable toward and away from the tongue and carrying a member 24 which, after engaging the tongue and moving the contact 15 against the stop formed by the contact 12, is adapted to yield and permit continued movement of the arm 23 by the cam 18. In the present instance, the arm is a stamping formed of sheet metal and comprising an elongated relatively flat strip 25 bent laterally at its free end to form the cam follower 19 and an abutment 25^b.

Near its other end and along opposite side edges of the strip 25 are bent up flanges 25^a having alined holes 26 punched in one end for receiving a pin 27 extending through holes 28 in bent down flanges 29 of a plate 30 straddled by the flanges 25^a. The plate 30 underlies the anchored end of the tongue 16 and, together with the tongue, is clamped against the support 14 by a fastener 31 spaced along the support from the switches. Movement of the arm 23 away from the tongue is limited by lugs 32 formed on the free edges of the flanges 29 in position to engage the end 33 of the strip 25 as shown in Fig. 1, the follower 19 then being spaced from the depressed part of the cam.

In the present instance, the member 24 for transmitting the motion of the arm 23 to switch element 16 comprises the laterally bent end portion of one leg 36 of

a spring 36 of the hair-pin type having laterally spaced legs the other of which as indicated at 37 lies alongside the strip 25 and is bent outwardly and around the bend in the latter as indicated at 38. The bend 39 of the hairpin surrounds the pivot 27 and the first leg 35 lies against an abutment 41 on the arm 23 facing inwardly or away from the switch tongue 16. This abutment is spaced from and opposes the abutment 25^b and may be formed conveniently by lugs 42 bent inwardly from the flanges 25^a.

The spring 36 is compressed laterally between the strip 25 and the abutment 41 which then limits the outward movement of the switch actuating member 24. As a result, the projecting end 43 of the member is usually spaced short of the tongue 16 when the depressed part of the cam is opposite the follower 19 as shown in Fig. 1. Now, as the cam is turned counterclockwise, the rise 20 thereon engages the follower 19 and raises the arm 23 to bring the end 43 of the member 24 into engagement with the tongue 16. In the continued turning of the cam, the member 24, because the spring 36 is stiffer than the tongue 16, remains against the abutment 41 and then moves the contact 15 away from the contact 13 to open the switch 11.

Closure of the switch 10 occurs when the contact 15 reaches the stop or contact 12. Then, as the follower continues to ride up the rise 20 and the arm 23 continues to swing, the tongue 16 forms a stop for preventing further movement of the member 24. The spring 36 thus is forced to yield as permitted by separation of the spring leg 35 from the abutment 41 as shown in Fig. 2. As a result, the cam and its follower are permitted to overtravel the closure of the switch 10 thereby preventing damage of the switch actuating mechanism.

I claim as my invention:

1. In a switching device, the combination of, an elongated arm having laterally spaced opposed abutments at one end, a support mounting said arm at its other end to swing about an axis paralleling said abutments, a spring compressed between said abutments, a member attached to one end of said spring and projecting laterally from said arm beyond the abutment engaged by such spring end, a cam actuated follower on said arm, a switch element normally biased in one direction to a predetermined position adjacent the projecting end of said member, said element being engaged and moved by said member upon movement of said arm in the opposite direction, and a stop limiting the movement of said element by said arm whereby to compress said spring and permit some degree of overtravel of said arm.

2. A switching device as defined by claim 1 including an abutment on said support engageable with a part of said arm to limit the swinging of the arm away from said switch element in said predetermined position.

3. A switching device as defined by claim 1 in which said spring is of hair-pin shape with the free ends of its legs engaging said abutments.

4. A switching device as defined by claim 3 in which the bend of the hair-pin spring extends around the axis of said arm.

5. A switching device as defined by claim 3 in which one leg of the hair-pin spring extends beyond the end of said arm and is bent laterally and outwardly to form said projecting member.

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