Feb. 18, 1958 W. BOLEK 2,824,197

TOGGLE SWITCHES

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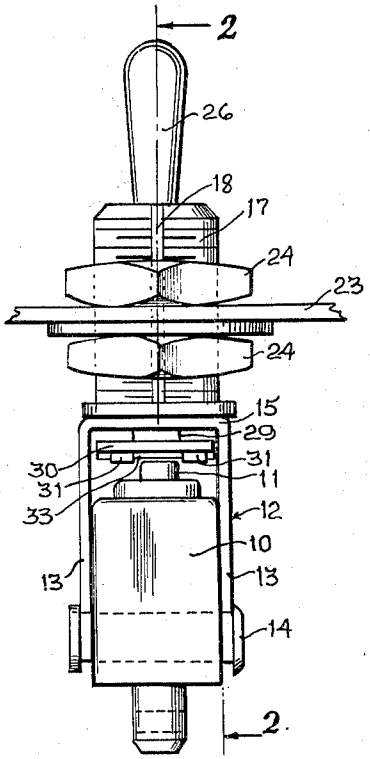


Fig. 1.

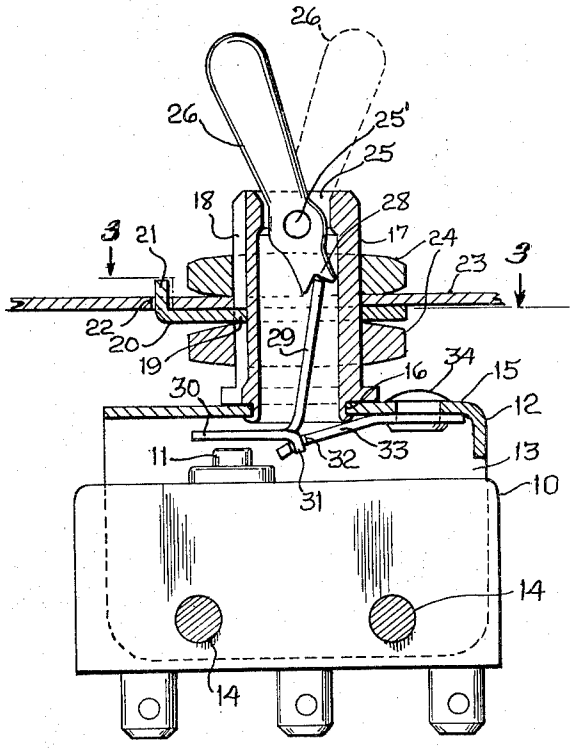


Fig. 2.

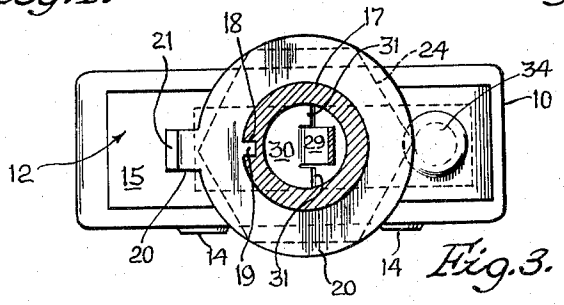


Fig. 3.

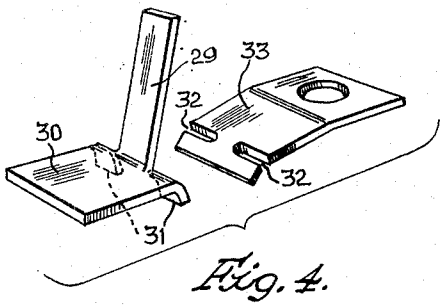


Fig. 4.

INVENTOR.
WALTER BOLEK
BY Clarence E. Threedy.
HIS ATTORNEY.

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TOGGLE SWITCHES

Walter Bolek, Downers Grove, Ill., assignor to Electro-Snap Switch & Mfg. Co., Chicago, Ill., a corporation of Illinois

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2 Claims. (Cl. 200—172)

My invention relates to certain new and useful improvements in toggle switches.

The invention has as its principal object the provision of a toggle switch having a simplified form of construction over similar switches now on the market.

Yet another object of the invention is to provide a toggle switch which is positive and effective in operation and one which can be manufactured at an economical cost by reason of comprising relatively few parts which are easy of assembly.

A still further object of the invention is to provide a toggle switch in which the switch unit may be of the construction normally referred to as an electric switch of the snap-action type, such as is illustrated in Letters Patent No. 2,594,216, in which switch unit there is a plunger or button employed to bias the contacts thereof from and into closed position.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a typical end view of the toggle switch embodying my invention;

Fig. 2 is a sectional detail view of the same, taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a sectional detail view taken substantially on line 3—3 of Fig. 2; and

Fig. 4 is a perspective view of switch actuating members embodied in the invention.

The several objects of my invention are preferably accomplished by the preferred form of construction shown in the accompanying drawings, in which drawings a snap action switch is indicated at 10. As before stated this snap action switch may be of the construction shown in Patent No. 2,594,216 or it may be of any approved standard construction now on the market and in which there is employed for biasing the switch elements, a button or plunger 11. Such snap action switches are preassembled prior to incorporation as a part of my toggle switch.

The toggle switch embodying my invention preferably comprises a mounting bracket 12 in substantially the form of a U-shaped yoke with the arms 13 of the yoke embracing the snap action switch 10 secured thereto by means of rivets 14 or the like. The intermediate or bight portion 15 of the mounting bracket 12 is provided with an opening 16, in which is fixedly secured one end portion of a hollow bushing 17. This bushing 17 along one side thereof is provided with a keyway 18 into which slidably fits a key 19 of a lock washer 20. The lock washer 20 has an upstanding lug 21 which projects through an opening 22 formed in a mounting plate 23. The washer and plate 20 and 23 respectively are fixedly secured between nuts 24 threaded upon the bushing 17 as shown. This arrangement securely fixes the mounting

bracket 12 to the mounting plate 23 and the lock washer 20 restrains relative movement between the bushing 17 and the plate 23.

Pivoted adjacent the outer open end 25 of the bushing 17, as at 25', is a toggle lever 26. The end 27 of the toggle lever 26 has a V-shaped seat 28 formed therein. Into this seat 28 projects the end portion of an arm 29 having an angular projection 30 disposed to engage the plunger 11. The length of the arm 29 plus the distance between the point of pivotal connection 25' and the seat 28 of the toggle 26 is greater than a straight line from the center of the pivot 25' to the point of junction between the arm 29 and the angular portion 30 for reasons hereinafter made apparent.

On opposite sides of the arm 29 at its point of junction with angular portion 30 are depending lugs 31 which fit into oppositely disposed aligned notches 32 of a spring plate 33. This plate 33 is connected to the bight portion 15 by a rivet 34.

The spring plate 33 normally exerts a yieldable pressure against the arm 29 to yieldably bear the end portion thereof in the seat 28. When toggle lever 26 is pivoted to the dotted line position, shown in Fig. 2, angular portion 30 by reason of the yieldable pressure of the spring plate 33 against the arm 29 will be biased against the plunger 11 to effect operation of the contact elements of the switch unit 10. By reason of this yieldable pressure transmitted to the arm 29, the toggle lever will be effectively retained in the dotted line position shown in Fig. 2. Inasmuch as the line of force is eccentric with respect to the pivot point 25', for the same reason the toggle lever is maintained in its position shown in full line.

One of the principal features of my invention resides in its simplicity. It will be noted that the toggle switch comprises relatively few parts, thus assuring its economical manufacture and longevity.

In addition, the construction of my toggle switch is such that it may be associated with a preconstructed switch unit, the only requirement being that such unit employs a button or plunger such as shown at 11 for the operation of the switch mechanism thereof.

Other objects are apparent from the foregoing description.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A toggle switch comprising a mounting yoke adapted to receive and support a switch unit having a movable plunger, a hollow bushing carried by the yoke, means for connecting said bushing to a mounting plate, a toggle lever pivoted to said bushing adjacent the outer open end thereof, an arm having one end portion yieldably bearing against an end portion of the toggle lever at a point eccentric with respect to its pivot point and having an opposite end portion disposed in an angular direction for engagement with said plunger, a spring plate in the plane of said angularly extending portion, said spring plate having a pair of oppositely disposed slots formed in one end portion thereof and said arm having a pair of spaced lugs at the point of junction with said angularly extending portion and said lugs fitted into said slots to provide hinge connection between the spring plate and said arm, and means for connecting said spring plate to said mounting plate.

2. A toggle switch comprising a mounting yoke adapted to receive and support a switch unit having a movable plunger, a hollow bushing carried by the yoke, means for connecting said bushing to a mounting plate, a toggle lever pivoted to said bushing adjacent the outer open end thereof, an arm having one end portion yieldably bearing against an end portion of the toggle lever at a point eccentric with respect to its pivot point and having an opposite end portion disposed in an angular direction for engagement with said plunger, a spring plate in the plane of said angularly extending portion, said spring plate having a pair of oppositely disposed slots formed in one end portion thereof and said arm having a pair of spaced lugs at the point of junction with the said angularly extending portion and said lugs fitted into said slots to provide hinge connection between the spring plate and said arm; and means for connecting said spring plate to said mounting plate, said spring plate effecting said yieldable bearing of said arm against said toggle lever and effective to yieldably hold said toggle lever in either of its two adjusted positions about said pivot point.

References Cited in the file of this patent

UNITED STATES PATENTS

2,146,811	Frank et al.	Feb. 14, 1939
2,650,964	Razdow	Sept. 1, 1953

FOREIGN PATENTS

266,748	Switzerland	May 1, 1950