Aug. 3, 1965 C. G. STARRANTINO 3,198,925

MINIATURE SWITCH ACTUATOR WITH ADJUSTABLE MOUNTING MEANS

Filed Aug. 27, 1962

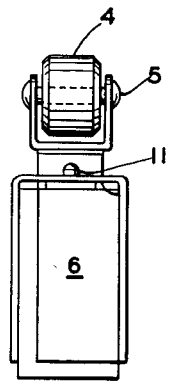


FIG. 1

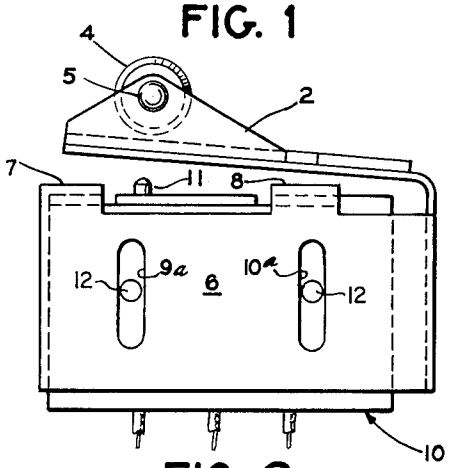


FIG. 2

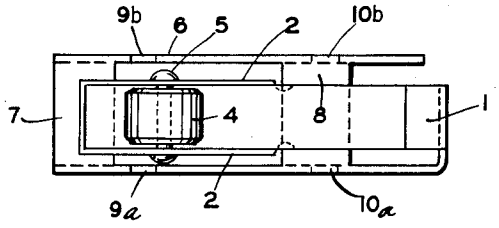


FIG. 3

INVENTOR.
CHARLES GUY STARRANTINO
BY
ATTORNEY

United States Patent Office 3,198,925 Patented Aug. 3, 1965

3,198,925

MINIATURE SWITCH ACTUATOR WITH ADJUSTABLE MOUNTING MEANS

Charles G. Starrantino, Fair Lawn, N.J., assignor to The Bendix Corporation, Teterboro, N.J., a corporation of Delaware

Filed Aug. 27, 1962, Ser. No. 219,684
5 Claims. (Cl. 200—172)

This invention relates to switches and switch actuators of the miniature type, and more particularly to a novel miniature switch actuator for limiting switch plunger movement.

Presently available switch actuators for miniature pushbutton type switches are designed merely to actuate the switch plunger. This is true whether the actuator is of a straight leaf, roller leaf, or formed leaf type of actuator. Since leaf travel is not limited on presently available actuators, the switch plunger can be depressed beyond its overtravel resulting in damage to the switch contact blade. In many electrical systems requiring use of switches, depression of the plunger beyond its overtravel has been a major cause of switch failure.

One object of this invention is to provide a switch actuator having limited leaf travel for prolonging life of the switch.

Another object of this invention is to provide a rugged, long-lasting switch actuator which is simple in construction and compact in design.

Another object of this invention is to provide a switch actuator having a leaf which engages stops to prevent overtravel.

The invention contemplates an actuating mechanism for a switch comprising a body, resilient means fixed to the body and swinging toward and away from the body, and means integral with the body for limiting movement of the resilient means.

The foregoing and other objects and advantages of the invention will appear more fully hereinafter from a consideration of the detailed description which follows, taken together with the accompanying drawing wherein one embodiment of the invention is illustrated by way of example. It is to be expressly understood, however, that the drawing is for illustrative purposes only and is not to be construed as defining the limits of the invention.

In the drawing:

FIGURE 1 is a front elevation of a novel miniature switch actuator constructed in accordance with the invention.

FIGURE 2 is a side elevation thereof.

FIGURE 3 is a top plan view of the miniature switch actuator.

Referring now to the drawing for a more detailed description of the novel switch actuator, the actuator is shown in the drawings as including a body **6** having fixed thereto a flexible, resilient leaf spring portion **1** on which is mounted a bracket **2**. The bracket and leaf spring are joined together preferably by spot welding. A roller **4** is rotatably mounted on a rivet **5** secured to bracket **2**.

The actuator body **6**, which mounts leaf spring **1**, is made of a stamping formed from a single piece of corrosion resistant steel, so that the leaf spring may be formed integral with the body. The spring is free to swing toward and away from the body. The body is bent to a substantially hollow shape having a U-cross section from a single stamping, and is constructed so that the base of the U is bifurcated and provides a pair of stops **7** and **8** integral with the body. The purpose of stops **7** and **8** is to limit downward movement of the leaf spring **1** toward body **6**. Leaf spring **1** is formed

integral with the body by bending the stamping as shown so the leaf spring extends along the base of the U. A pair of elongated slots or holes **9***a* and **10***a* are cut in one side of body **6** and a second pair of elongated slots or holes **9***b* and **10***b* are cut in the other side of body **6**. Each hole on one side of the body is cut so as to line up with a corresponding hole on the other side of the body.

Preparation of the actuator for operation of a switch is achieved in the following manner:

Leaf **1** is depressed against stops **7** and **8**. A pushbutton type switch **10** is then positioned within the actuator body so that its plunger **11** is pressed against leaf **1**. The switch is moved toward leaf **1** until the switch is energized, and is moved further toward the leaf using up all or any portion of the switch overtravel. Screws **12** for mounting the switch in the body of the actuator extend through holes **9***a*, **10***a*, **9***b*, and **10***b* so as to maintain the physical relationship between switch and actuator.

In operation, leaf spring **1** assumes its normal unactuated position above the plunger of the switch until roller **4** is depressed. When the roller is depressed, leaf spring **1** is also depressed against the plunger of the pushbutton switch. As the leaf spring is forced downward, it forces the plunger of the switch downward until the switch is actuated. With the switch mounted in the proper position with respect to the actuator body **6**, the leaf engages stops **7** and **8** so that the plunger of the switch is not depressed beyond its overtravel limits.

The invention provides a switch actuator having limited leaf travel for prolonging life of the switch. The actuator leaf will strike stops prior to or at the time that the switch plunger is depressed beyond its overtravel limits. The actuator is rugged, long lasting, simple in construction, and compact in design.

Although but one embodiment of the invention has been illustrated and described in detail, it is to be expressly understood that the invention is not limited thereto. Various changes can be made in design and arrangement of the parts without departing from the spirit and scope of the invention at the same will now be understood by those skilled in the art.

What is claimed is:

1. An actuating mechanism for operating a switch by moving a plunger with limited travel, comprising a U-shaped body, a leaf spring secured to the body for engaging the plunger to operate the switch and having a portion extending along the base of the U, stop means formed by the base of the U for limiting movement of the leaf spring toward the body, and means for adjustably mounting the switch within the body with the leaf spring engaging the stop means and the plunger and operating the switch without plunger overtravel.

2. An actuating mechanism for operating a switch by moving a plunger with limited travel, comprising a body made from a single piece of material bent to substantially U-cross section, a leaf spring for engaging the plunger to operate the switch and formed integral with the body by bending the material so that a portion extends along the base of the U, stop means formed by the base of the U for limiting movement of the leaf spring toward the body, and means for adjustably mounting the switch within the body with the leaf spring engaging the stop means and the plunger and operating the switch without plunger overtravel.

3. An actuating mechanism for operating a switch by moving a plunger with limited travel, comprising a body made of a stamping formed from a single piece of corrosion resistant steel and bent to substantially U-cross section and having slots therein, a leaf spring for en-

gaging the plunger to operate the switch and formed integral with the body by bending the stamping so that a portion extends along the base of the U, stop means formed by the base of the U for limiting movement of the leaf spring toward the body, and means secured in the slots in the body for adjustably mounting the switch within the body with the leaf spring engaging the stop means and the plunger and operating the switch without plunger overtravel.

4. An actuating mechanism for operating a switch by moving a plunger with limited travel, comprising a U-shaped body having slots therein, a leaf spring for engaging the plunger to operate the switch and formed integral with the body so that a portion extends along the base of the U, stop means formed by the base of the U for limiting movement of the leaf spring toward the body, and means secured in the slots in the body for adjustably mounting the switch within the body with the leaf spring engaging the stop means and the plunger and operating the switch without plunger overtravel.

5. The actuating mechanism of claim 4 having roller means mounted on the leaf spring.

References Cited by the Examiner

UNITED STATES PATENTS

2,911,509	11/59	Millerwise	200—172
3,030,465	4/62	Roeser	200—153
3,040,152	6/62	Besemer	200—172

BERNARD A. GILHEANY, *Primary Examiner.*