

[54] **LINEAR SWITCH**

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[58] Field of Search **200/86 R, 86 A; 340/272**

[56] **References Cited**

UNITED STATES PATENTS

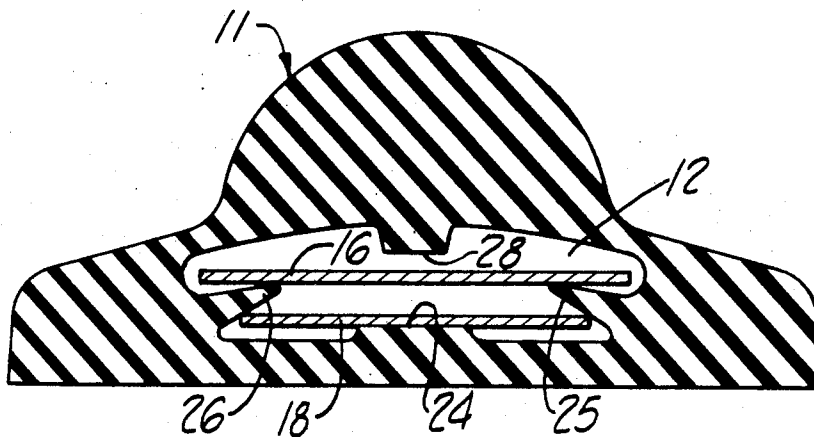
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[57] **ABSTRACT**

A linear switch having a pair of elongated superposed metal strip conductors positioned within a centrally located cavity formed within a resilient nonconductive casing. The lower conductor strip is supported within the cavity by a longitudinally extending rib or anvil-like portion which is integral with the casing. The upper conductor strip is supported within the cavity in a normally spaced relationship with the lower conductor strip by a pair of yieldable flanges which are integral with the casing and which protrude into the cavity a limited distance.

1 Claim, 3 Drawing Figures



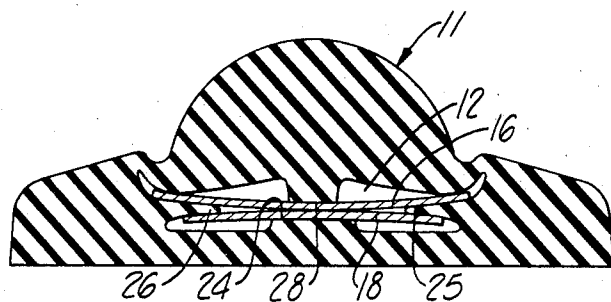
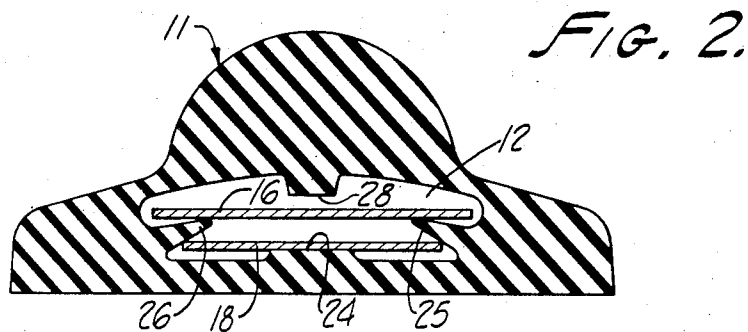
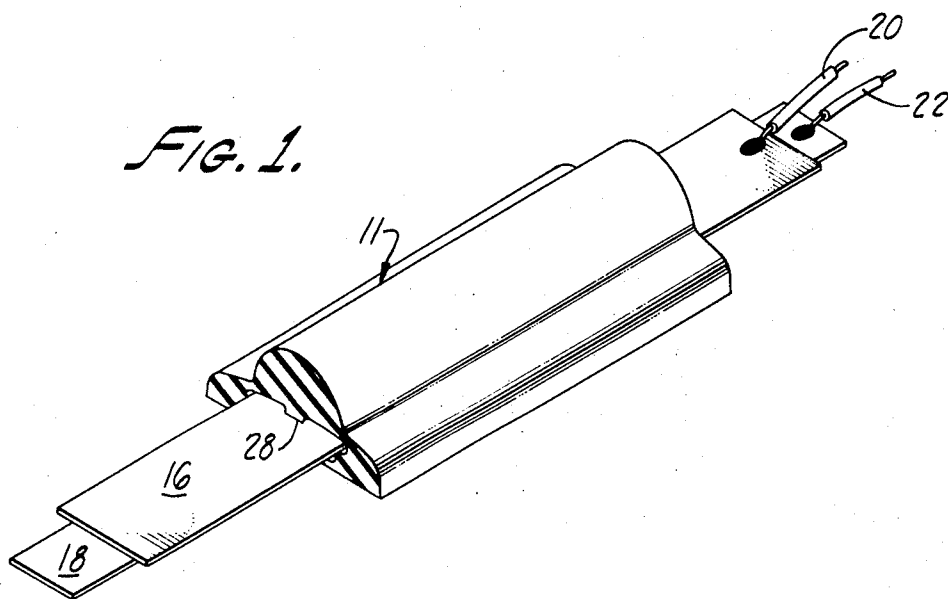


FIG. 3.

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LINEAR SWITCH

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to linear switches and more particularly to normally open linear switches which are closed as a result of pressure being exerted thereon.

2. Description of the Prior Art

Linear switches are used in a wide variety of applications, many of which require that the switch be exposed to adverse environmental conditions. For example, linear switches are often used as detectors for highway vehicle traffic. In such applications it is necessary that the switch be durable, highly reliable and generally impervious to adverse weather conditions.

One of the most useful and reliable linear switches known in the prior art is the switch disclosed in my copending application, Ser. No. 5,027. One of the improvements over my previously disclosed switch relates to the way in which contact is made between the conductor strips when the switch body is compressed. Another relates to the means used to hold the conductor strip in a normally spaced apart relationship.

SUMMARY OF THE INVENTION

My invention as disclosed herein relates to a significantly improved linear switch, and has as one of its objects the provision of a new and improved linear switch having a switch contact assembly in which novel means is provided for normally holding the conductor strips thereof in a spaced relationship.

Another object of my invention is to provide a switch contact assembly for a normally open-type linear switch in which novel means is provided for reliably bringing the conductor strips into positive electrical contact.

A further object of my invention is to provide a switch as described in the previous paragraph in which opposing ribs integral with the casing of the switch are provided to securely clamp the conductor strips together when the body of the switch is deformed in a manner as to close the switch.

In summary, the linear switch of my invention comprises a body formed of nonconductive material having a central cavity therein, upper and lower opposing longitudinally extending ribs protruding into the cavity, a first conductor strip disposed within the cavity and supported by the lower rib, a second conductor strip disposed within the cavity in a spaced relationship with the first conductor strip, and a pair of opposing marginal flanges integral with the body protruding into the cavity and extending between the conductor strips for a limited distance for holding the conductor strips in a spaced relationship.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional isometric view of a portion of a linear switch embodying the invention.

FIG. 2 is a cross-sectional view of the switch of FIG. 1 but on a larger scale with the parts in a normal position.

FIG. 3 is a cross-sectional view of the switch similar to FIG. 2 but showing the parts as they appear when the switch is closed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

More particularly describing the invention, numeral 11 generally designates the casing of a linear switch that can be made of any length. The casing or body is normally made of rubber, synthetic rubber, neoprene or the like, and is non-conductive and resilient, although only the upper portion thereof need be. The casing is provided with a cavity or interior compartment 12 which houses a pair of conductor strips designated 16 and 18 respectively. As can be seen in FIG. 1, each of the conductor strips is provided with an insulated conductor at one end which leads through the casing to the exterior, the conductors being designated 20 and 22. The conductor strips may be made of brass or some other suitable electrically conductive metal and each is preferably flat or planar.

At the bottom of cavity 12, as seen in FIG. 2, there is formed an integral longitudinally extending rib or anvil 24 which protrudes from the bottom wall and serves to support the lower conductor strip. The upper conductor strip is supported in a normally spaced relationship with the bottom conductor strip by a pair of flanges 25 and 26 which are integral with the casing and which protrude into cavity 12 a limited distance. The flanges form acute angles with the bottom of the cavity and extend inwardly in between the two conductor strips 16 and 18, thereby normally serving to hold them spaced apart, as shown in FIG. 2, so that the switch is normally open. This novel construction minimizes the number of separate parts which are required to make up the switch of my invention, thereby increasing reliability and ease of manufacture.

In order to facilitate closing of the switch when a weight or force is applied downwardly against the upper portion of the casing, the latter is provided with an internal rib or ridge, designated 28, which extends longitudinally of the case substantially over the center of the lower rib or anvil 24. When sufficient downward force is applied to the casing to deform it downwardly as shown in FIG. 3, rib 28 depresses and deflects the upper conductor strip into intimate contact with the lower strip along the area supported by anvil 24, thereby closing the switch.

Because of the novel construction of the switch body as the body is deformed, the conductor strips are securely clamped between the upper rib 28 and the lower rib or anvil 24. This clamping action serves to ensure that a highly effective and reliable electrical contact is made between the conductor plates as the switch is closed.

The sensitivity of the switch is determined by the flexibility of the casing material, the dimensions of cavity 12, and the angle made between the bottom of the cavity and the support flanges 24 and 26. By varying the angle formed between each flange and the bottom of the cavity during forming of the casing, the spacing of the two conductor strips, and hence the sensitivity of the switch, may be varied.

I claim:

1. A linear switch contact assembly comprising:
 - a. a body formed of nonconductive, yieldably deformable material having a central cavity therein;

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- b. upper and lower opposing, longitudinally extending ribs integral with said body and protruding into the cavity formed within said body, said ribs being normally spaced apart when said body is in a relaxed state and movable into close proximity when said body is deformed by forces exerted normal to the longitudinal axis of the body; 5
- c. a first conductor strip disposed within said cavity and supported by said lower rib along its central portion; 10
- d. a second conductor strip disposed within said cavity in a normally spaced relationship with said first conductor strip; and
- e. a single pair of yieldable opposing marginal flanges integral with said body extending between said 15

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conductor strips, said flanges engaging said first conductor strip, forming an acute angle with said second conductor strip and being adapted to hold said conductor strips in a spaced relationship when said body is in a relaxed state, said yieldable flanges being constructed and arranged so as to urge the central portions of said conductor strips into mating juxtaposition when said ribs are moved into proximity due to deformation of said body whereby said conductor strips will be securely clamped together along their central portions between said upper and lower opposing ribs when forces are exerted on said body normal to the longitudinal axis thereof.

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