An electrical switch comprising a body supporting a first electrical contact. A second electrical contact is spaced from the first contact and a switching element is interposed between the first and second contacts. The switching element is formed from flexible, electrically insulating material and contains discrete particles of electrically conducting material which are brought into contact to define conductive paths through the element when the element is compressed beyond a predetermined amount. Slidably mounted in the body is an operating member, and the operating member and the second contact include a cam arrangement whereby movement of the operating member in one direction causes movement of the second contact towards the first contact to compress the element. The element is compressed by this movement from a rest state wherein the element electrically insulates the first and second contacts from one another, beyond the predetermined amount so that the element electrically interconnects the first and second contacts.

9 Claims, 2 Drawing Figures
This invention relates to an electrical switch.

An electrical switch in accordance with the invention includes a body, a first electrical contact supported by the body, a second electrical contact spaced from the first electrical contact, a switching element interposed between the first and second contacts, the switching element being formed from flexible, electrically insulating material containing discrete particles of electrically conducting material which are brought into contact to define conductive paths through the element when the element is compressed beyond a predetermined amount, an operating member mounted for sliding movement relative to the body, and cam means on the operating member and the second electrical contact whereby movement of the operating member relative to the body in one direction causes movement of the second contact towards the first contact compressing said element from a rest state wherein the element electrically insulates the second contact from the first contact, beyond said predetermined amount so that the element electrically interconnects the first and second contacts.

Preferably said second electrical contact is defined by one end of an elongate flexible conductive member the other end of which is secured to the body, the member extending within the body generally parallel to the direction of movement of the operating member, the flexible conducting member being flexed as a result of movement of the operating member in said one direction to compress the element.

Conveniently said cam means is defined by mating forms integral with the operating member and the second contact respectively.

One example of the invention is illustrated in the accompanying drawings wherein

FIGS. 1 and 2 are sectional views of the same switch in its operative position and its inoperative position respectively.

Referring to the drawings, the switch is a normally closed switch particularly intended as a door operated courtesy light switch for a road vehicle. The switch includes a generally cup-shaped moulded synthetic resin body 11 closed at one end by an integral base 12 and closed at its opposite end by a conductive cover member 13. The cover member 13 is extended beyond the periphery of the body 11 to define a mounting bracket 14 and includes a right angled extension 15 which extends along the inner wall of the casing 11 and defines a first electrical contact 16.

Secured to the base 12 and projecting from both sides thereof is a resilient, conductive blade 17. The portion of the blade 17 which projects from the exterior of the base defines a blade terminal 18 and the inner portion of the blade 17 extends towards, but does not touch the cover 13. Adjacent its free end the inner portion of the blade 17 defines a second electrical contact 19 and positioned between the contacts 16 and 19 is a switching element 21 in the form of a block of flexible, electrically insulating material for example synthetic rubber, containing discrete particles of electrically conductive material which are brought into contact to define conductive paths through the block when the block is compressed beyond a predetermined amount. The conductive paths established through the block are generally aligned in the direction in which the block is compressed. Slidably received by the body 11 and the cover 13 is a moulded synthetic resin operating member 22. The member 22 is slidable in a direction parallel to the blade 17 and includes an integral cam form 23 presented towards the blade 17. The blade 17 is formed at its free end with a cam form 24 which extends towards the operating member 22, and the operating member 22 is urged by a spring 25 to a position wherein the member 22 projects from the cover 23 and the cam forms 23, 24 inter-engage to flex the inner portion of the blade 17 towards the contact 16. The spring 25 is sufficiently strong to overcome the combined resilience of the blade 17 and the element 21 and the combined action of the cam forms 23, 24 moves the contact 19 through sufficient distance towards the contact 16 to compress the element 21 beyond said predetermined amount so that conductive paths are established through the element 21 between the contact 19 and the contact 16. Thus in the rest position of the operating member 22 the element 21 completes an electrical circuit between the bracket 14 and the terminal 18.

Movement of the operating member 22 against the action of the spring 25 to push the operating member 22 into the body 11 disengages the cam form 23 from the cam form 24 permitting the blade 17 and the element 21 to restore by virtue of their inherent resilience to a situation wherein the element 21 is not sufficiently compressed to establish conduction. Thus in order to break this circuit between the terminal 18 and the bracket 14 the operating member 22 is depressed into the body 11.

When the switch is used as a door operated courtesy light switch the body 11 is inserted through an aperture in the fixed frame of the door and the switch is held in position by securing the bracket to the frame of the door. The operating member 22 thus projects from the frame of the door and is engageable with the door so that as the door is closed the operating member 22 is depressed into the body 11. The electrical connection to the bracket 14 is of course made by way of the body of the vehicle to one pole of the vehicle battery, the terminal 18 being connected to the other pole of the vehicle battery by way of the courtesy light of the vehicle.

It will be appreciated that should it be desired to produce a normally closed version of the switch this can be achieved by altering the position of the cam form 23 on the operating member 22.

We claim:

1. An electrical switch including a body, a first electrical contact supported by the body, a second electrical contact spaced from the first electrical contact, a switching element interposed between the first and second contacts, the switching element being formed from flexible, electrically insulating material containing discrete particles of electrically conducting material which are brought into contact to define conductive paths through the element when the element is compressed beyond a predetermined amount, an operating member mounted for sliding movement relative to the body, and cam means on the operating member and the second electrical contact whereby movement of the operating member relative to the body in one direction causes movement of the second contact towards the first contact compressing said element in the direction in which the block is compressed, slidably received by the body and the cover, and the cam forms inter-engage to flex the inner portion of the blade towards the contact.
contact from the first contact, beyond said predetermined amount so that the element electrically interconnects the first and second contacts.

2. A switch as claimed in claim 1 wherein said second electrical contact is defined by one end of an elongate flexible conductive member the other end of which is secured to the body, the member extending within the body generally parallel to the direction of movement of the operating member, the flexible conducting member being flexed as a result of movement of the operating member in said one direction to compress the element.

3. A switch as claimed in claim 1 wherein said cam means is defined by mating forms integral with the operating member and the second contact respectively.

4. A switch as claimed in claim 1 wherein the operating member is resiliently urged to a position wherein said element is compressed beyond said predetermined amount.

5. A switch as claimed in claim 2, wherein said cam means is defined by mating forms integral with the operating member and the second contact respectively.

6. A switch as claimed in claim 2, wherein the operating member is resiliently urged to a position wherein said element is compressed beyond said predetermined amount.

7. A switch as claimed in claim 3, wherein the operating member is resiliently urged to a position wherein said element is compressed beyond said predetermined amount.

8. A switch as claimed in claim 4, wherein the operating member is resiliently urged to a position wherein said element is compressed beyond said predetermined amount.

9. A switch as claimed in claim 5, wherein the operating member is resiliently urged to a position wherein said element is compressed beyond said predetermined amount.

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