

United States Patent [19]

Nevett

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[45] Oct. 16, 1973

[54] ELECTRIC SWITCHES

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[21] Appl. No.: **240,753**

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Primary Examiner—David Smith, Jr.
Attorney—Holman & Stern

[30] Foreign Application Priority Data

Apr. 13, 1971 Great Britain 9,267/71

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[51] Int. Cl. **H01h 3/14**

[58] Field of Search 200/85 R, 61.38 B,
200/16 B, 84 A, 161; 340/278

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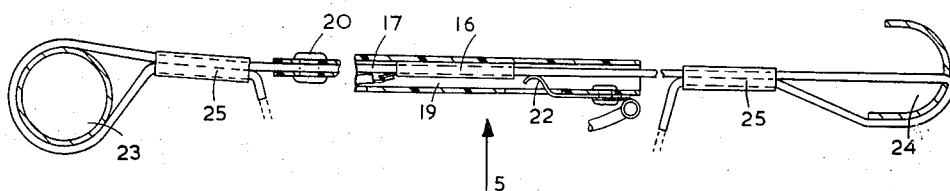
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[57] ABSTRACT

An electric switch, for incorporation in a seat which includes an elastically extensible web on which a weight on the seat is supported, includes contacts on the web engageable with contacts on a relatively fixed part of the seat, whereby stretching of the web by a weight on the seat operates the switch.

13 Claims, 12 Drawing Figures



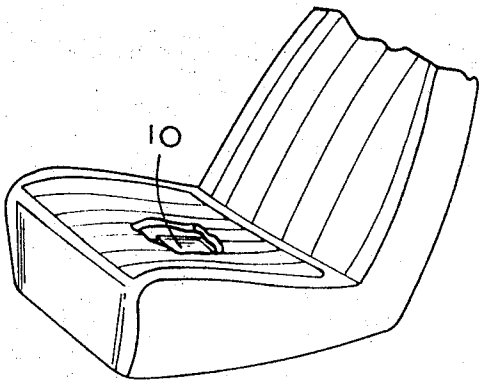


FIG. 1

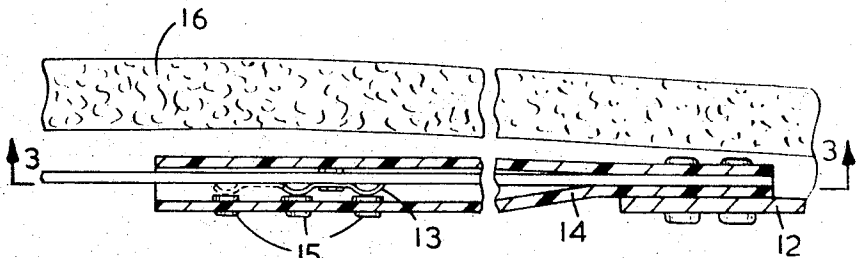


FIG. 2

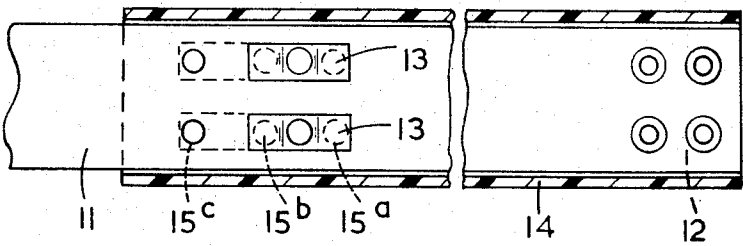


FIG. 3

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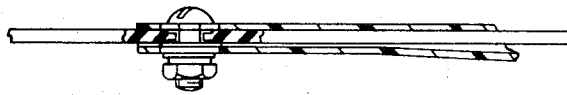


FIG. 6

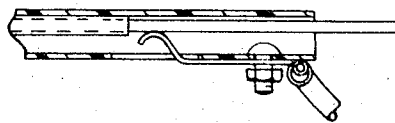


FIG. 7

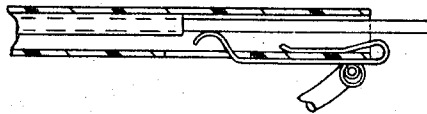
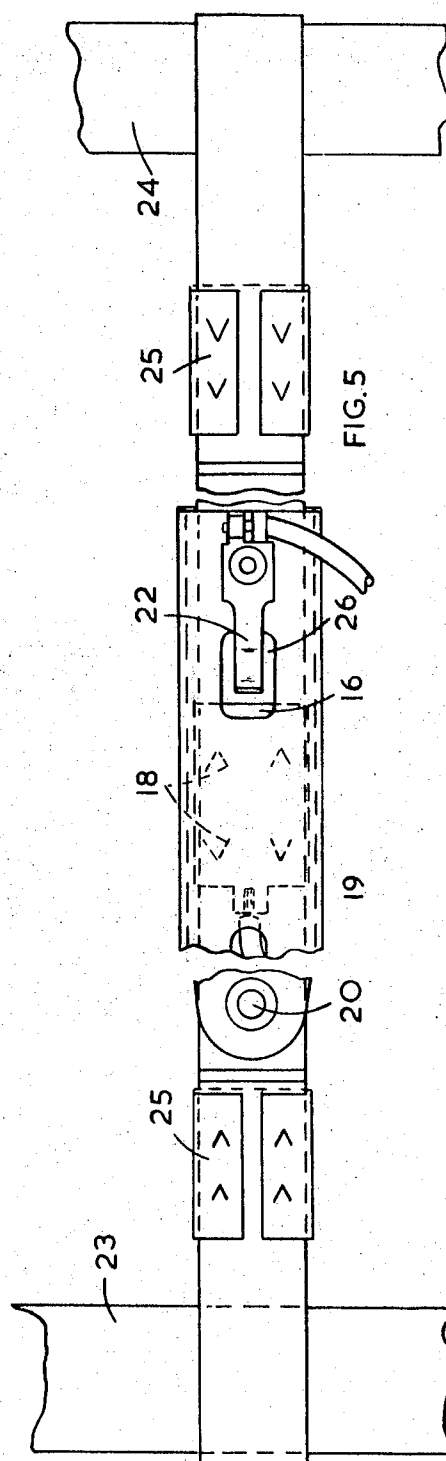
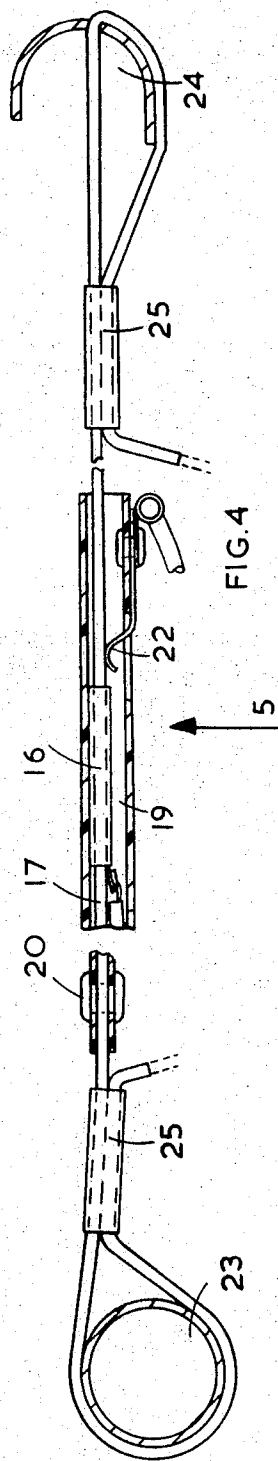
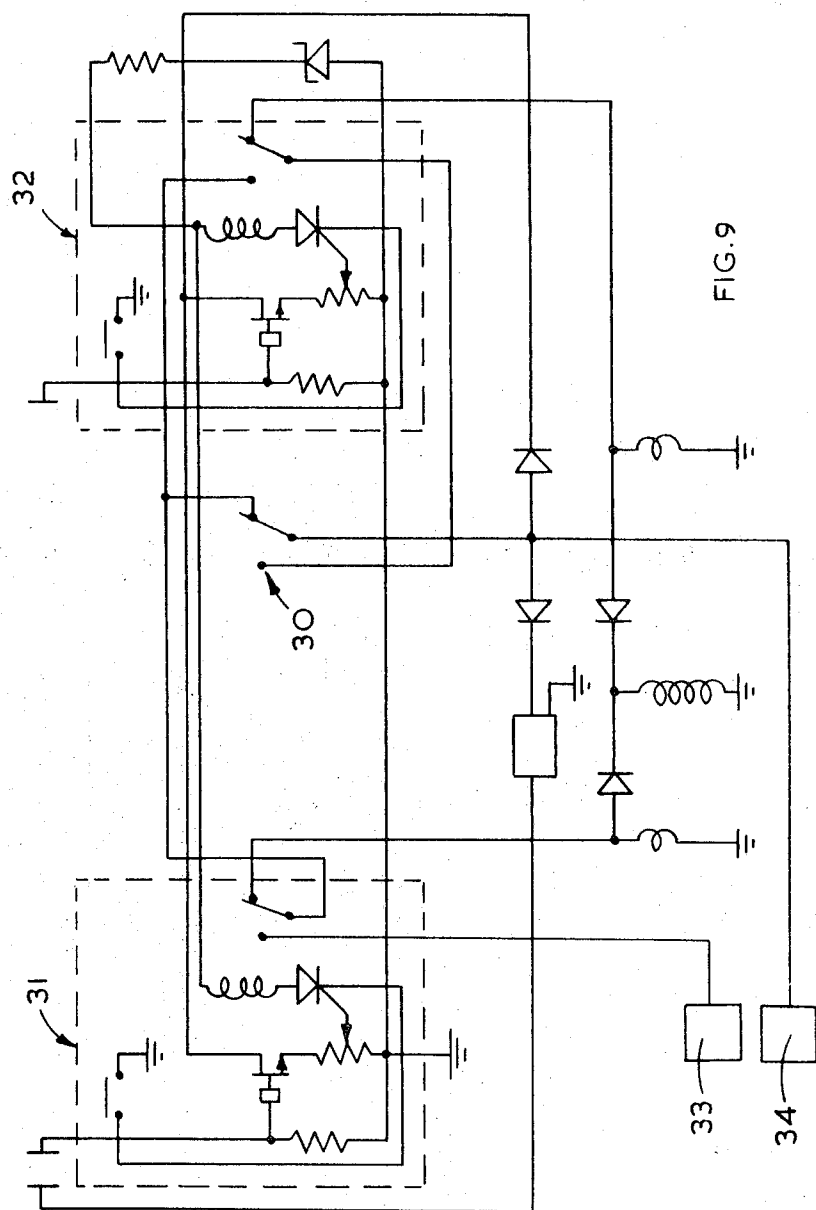
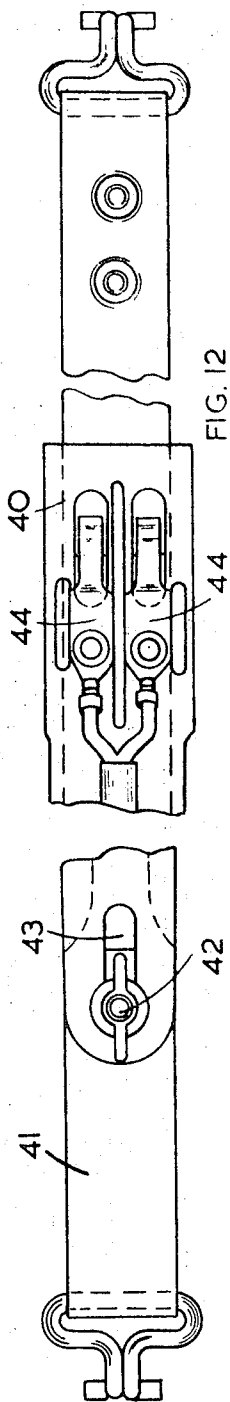
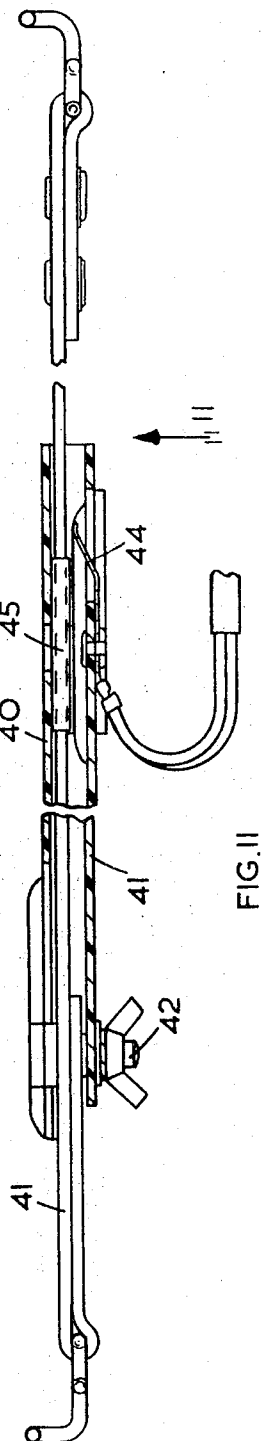
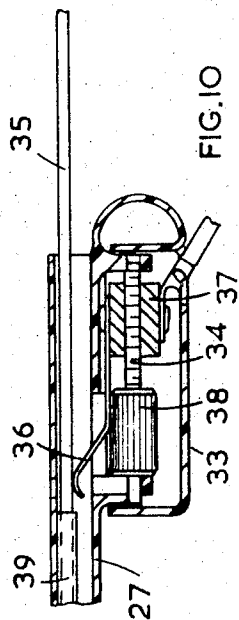


FIG. 8







ELECTRIC SWITCHES

This invention relates to electric switches for incorporation in seats of the kind which include an elastically extensible web for supporting a weight applied to the seat.

According to the invention an electric switch for incorporation in a seat of the foregoing kind comprises a first contact secured to the web and second contact mounted on a relatively fixed part of the seat so that a weight applied to the seat extends said web to cause relative movement between said contacts to operate the switch.

Examples of the invention will now be described with reference to the accompanying drawings, in which:

FIG. 1 is a general view of a seat incorporating a switch according to the invention,

FIG. 2 is a section through a part of the seat of FIG. 1,

FIG. 3 is a view on arrows 3—3 in FIG. 2,

FIG. 4 shows a section through an alternative form of switch,

FIG. 5 is a view on arrow 5 in FIG. 4,

FIGS. 6, 7 and 8 show methods of adjusting the relative positions of the switch contacts,

FIG. 9 shows a circuit to which a switch according to the invention is applied,

FIG. 10 shows a further method of adjusting the relative positions of the switch contacts,

FIG. 11 is a section through a further alternative form of switch, and

FIG. 12 is a view on arrow 12 in FIG. 11.

The seat shown in FIG. 1 has a plurality of elastically extensible webs secured between rails or tubes which extend along the back and front of the horizontal portion of the seat. Associated with one of these webs is a switch 10 located so as to be substantially central in the said horizontal portion.

As shown in FIGS. 2 and 3 the web 11 is secured to a rail 12 at the rear of the seat and carries a pair of resiliently deformable contact elements 13. Also secured to the rail 12 is a semi-rigid plastics sleeve 14 which surrounds the web 11 for approximately half its length. Sleeve 14 carries contacts 15 arranged in two rows of three, each row being associated with one of the contact elements 13. Leads 14a are embedded in sleeve 14 and extend from contacts 15 to an external circuit. The web 11 and sleeve 14 are overlaid by the padding 16 of the seat.

When there is no weight on the seat the contact elements 13 are in the right hand position, shown in full lines on the drawing. When a weight is applied to the seat the web 11 stretches and moves the contact element 13 to the left to complete connections between the centre contacts 15b and the left hand contacts 15c.

In the switches shown in FIGS. 2 and 3 contact elements 13 and contacts 15 are secured to the web 11 and sleeve 14 respectively by rivets or eyelets. In the alternative form of switch shown in FIGS. 4 and 5 there is a single contact element 16 secured to an associated web 17 by means of barbs 18. Sleeve 19 is secured by a rivet or eyelet 20 to the web 17 adjacent one end thereof. Sleeve 19 carries a resilient contact 22. Web 17 is secured at its respective ends to front and rear frame members 23, 24 respectively of the seat. Each end of web 17 is passed round or through the associated frame member and secured back on itself by means of

a barbed buckle 25. Buckles 25 are such that they permit the web to be tightened between members 23, 24 but will not permit the web ends to run back. One end of web 17 is therefore secured and the other end is then pulled through its associated buckle 25 until the required spacing between contacts 16, 22 as viewed through aperture 26 in sleeve 19, is obtained.

In use a weight applied to the seat stretches the web 17 as before, to engage contact 22 with element 16. It will be understood that element 16 and contact 22 may be replaced by a plurality of co-operating contact parts spaced across the widths of web 17 and sleeve 19.

FIGS. 6, 7, 8 and 10 show alternative arrangements whereby the relative positions of the switch contacts may be adjusted after the ends of the associated web have been secured to the seat frame. In FIG. 6 the sleeve 27 has a slot through which a nut and bolt passes to secure sleeve 27 to the web. In FIG. 7 the sleeve is formed with a slot to which the resilient contact is secured. In FIG. 8 the resilient contact is secured to the sleeve by crimping and includes barbs which, after crimping prevent movement of the contact relative to the sleeve. In FIG. 10 the sleeve 27 includes a portion 33 in which a threaded stem 34 is mounted for rotation about an axis parallel to the longer axis of the associated web 35. A resilient contact 36 is carried by a conductive block 37 threaded on stem 34 and prevented from rotating therewith. Stem 34 includes a knurled portion 38 of increased diameter by means of which stem 34 can be rotated. Portion 38 is also engaged by contact 36 to act as a detent for stem 34. Rotation of stem 34 moves contact 36 towards or away from a contact 39 on the web 35.

The further alternative form of switch shown in FIGS. 11 and 12 is generally similar to that previously described with reference to FIGS. 4 and 5, and includes a sleeve 40 secured to the associated web 41 by means of a wing-nutted bolt 42 which passes through a slot 43 in sleeve 40. Sleeve 40 carries a pair of resiliently deformable contacts 44. A contact 45 surrounds web 41 and is crimped or staked in a position so that extension of web 40 causes contact 45 to interconnect contacts 44.

The circuit shown in FIG. 9 is identical with a circuit shown and described in our co-pending application Ser. No. 6798/71 and includes a switch 30 with contacts arranged for "double throw" action. Switch 30 is in the passenger seat of a road vehicle and in the position shown corresponds to the absence of a weight on the seat. Identical switching circuits 31, 32 are respectively associated with the driver's and passenger's safety harness, the arrangement being such that unless a harness is in position and secured the corresponding switching circuit 31, 32 will not connect an engine starter 33 with a supply 34. Switching circuit 32 is, however, bypassed unless switch 30 indicates that the passenger's seat is occupied.

I claim:

1. A combined weight-supporting elastically deformable web and electric switch for incorporation into the structure of a vehicle seat, said electric switch comprising a first contact secured to the web at a first position and a second contact engageable by the first contact and mounted on the web at a second position remote from said first position whereby application of a weight to a seat in which the web is incorporated effects exten-

sion of that portion of the web between said first and second positions to operate the switch.

2. The combined web and switch claimed in claim 1 further comprising an insulating sleeve surrounding said extensible web, said second contact being mounted on said sleeve at one end and said sleeve being connected to the web at its other end

3. The combined web and switch claimed in claim 2 in which second contact comprises a plurality of contact elements selectively interconnectible by said first contact.

4. The combined web and switch claimed in claim 3 which comprises a plurality of first contacts and a plurality of associated sets of contact elements the elements in a set being selectively interconnectible by a corresponding one of said first contacts.

5. The combined web and switch claimed in claim 2 which includes a plurality of second contacts, said first contact being operable to interconnect said second contacts.

6. The combined web and switch claimed in claim 3 in which said first contact is resiliently deformable.

7. The combined web and switch claimed in claim 2 further comprising leads for said second contacts said

leads being embedded in said sleeve.

8. The combined web and switch claimed in claim 2 in which said sleeve is adapted to be secured to a frame part of the seat.

9. The combined web and switch claimed in claim 2 which said sleeve is secured to said web adjacent one end thereof.

10. The combined web and switch claimed in claim 9 in which said second contact is resiliently deformable.

11. The combined web and switch claimed in claim 9 further comprising a barbed buckle for securing the web to frame members of the seat through which buckle the web is passed permitting the web to be tightened, whereby the relative positions of the first and second contacts may be adjusted.

12. The combined web and switch claimed in claim 9 in which the relative positions of said sleeve and said one end of the web are adjustable.

13. The combined web and switch claimed in claim 9 in which the position of said second contact on said sleeve is adjustable.

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