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(71) Applicant
Wilmot Breeden Limited (United Kingdom),
Fordhouse Lane, Birmingham B30 3BW

(72) Inventor
Francis Leon Vilain

(74) Agent and/or Address for Service
Shaw Bowker & Folkes, 23 Colmore Row, Birmingham
B3 2BL

(54) Seat slides

(57) A seat slide comprises an inner slide element 15 of top hat section received in an outer slide element 16 having inwardly facing channels which receive plastics liners 23. The liners 23 are formed with slots in which flanges of the inner element slidingly engage to afford a quiet smooth sliding action without rattle.

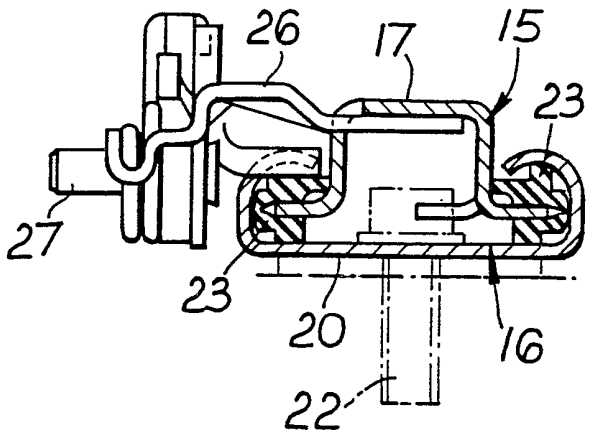


Fig. 4

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.
The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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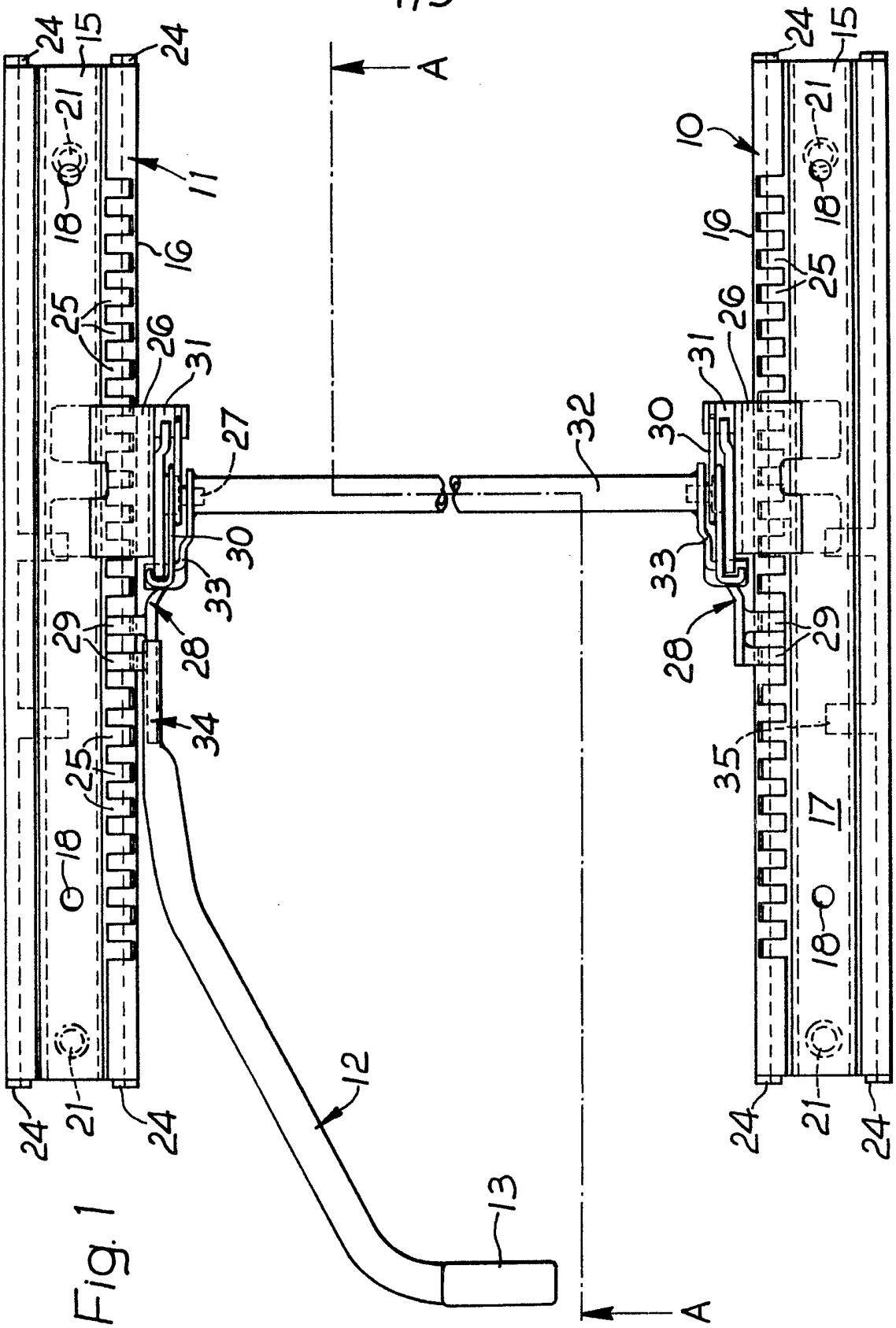


Fig. 1

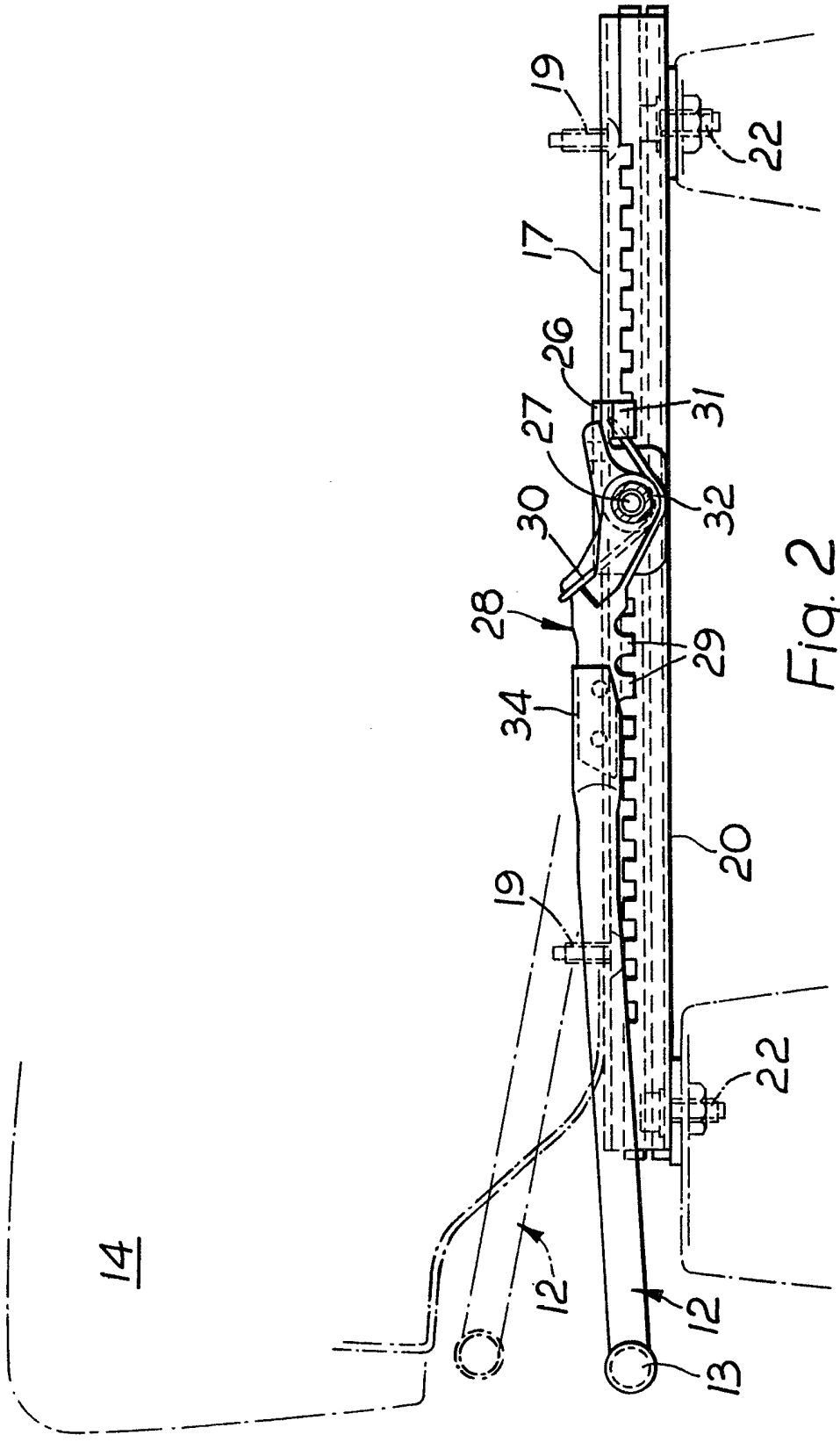


Fig. 2

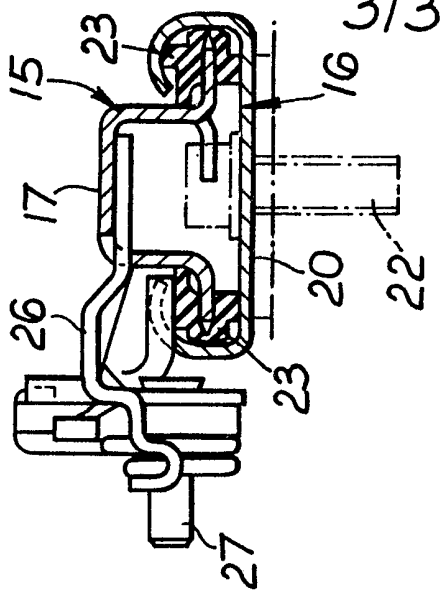


Fig. 4

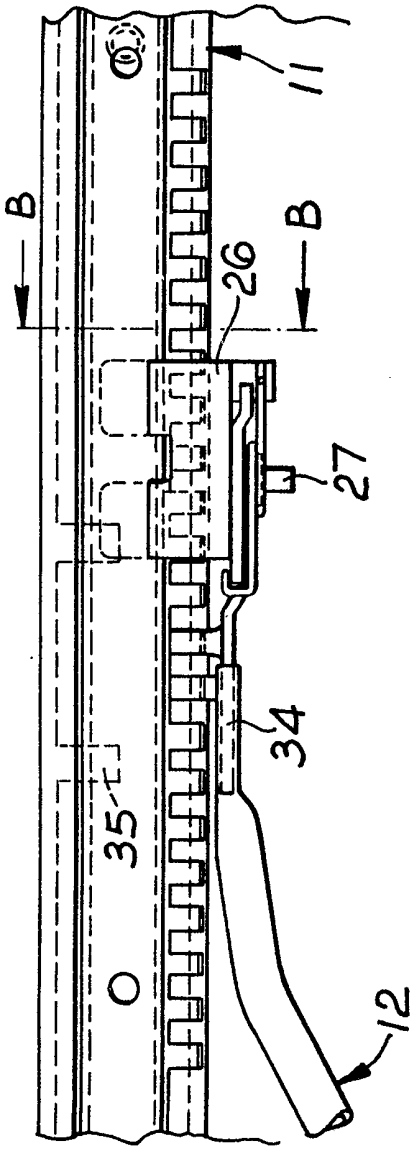
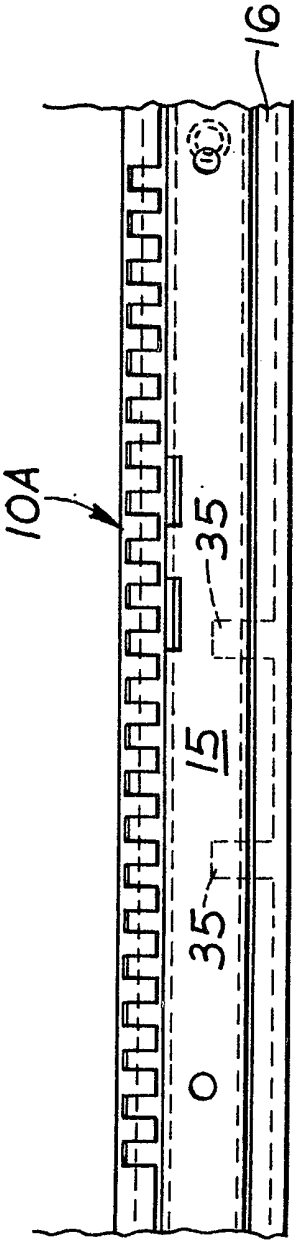


Fig. 3



SPECIFICATION

Seat slides

This invention relates to seat slides for effecting forward and rearward adjustment of motor vehicle seats, and is concerned with that kind of seat slide which includes inner and outer elongated elements arranged to fit one within the other for relative sliding movement therebetween. A pair of slides are provided for each seat so as to avoid twisting or other distortion of the seat frame and releasable locking means are provided, either on each seat slide or on one of a pair of seat slides, the releasable locking means being movable between a release position in which relative sliding movement is permitted so that, in use, adjustment of the position of the vehicle seat can be effected and a locking position in which such relative sliding movement is prevented. A seat slide of the above kind is hereinafter referred to as a seat slide of the kind specified.

In one form of seat slide of the kind specified, roller bearings are carried by the inner member for engagement with a flat bearing surface of the outer member, the roller bearings facilitating relative sliding movement between the slide elements. Such roller bearing arrangements have a disadvantage in that, unless all components of the slide are made to very close manufacturing tolerances, there may be either an uneven sliding action or rattling of the bearings. Proposals have accordingly been made to utilise plastic bearing surfaces and, in one such proposal, a plastic liner has been moulded on to the inner slide element. Although this arrangement has avoided the problems of rattling and uneven sliding action, the cost of providing the moulded plastic liner has been significantly greater than the cost of the roller bearings.

It is accordingly an object of the present invention to provide an improved form of seat slide of the kind specified which enables the problems referred to above to be avoided without incurring any cost penalties.

According to the present invention there is provided a seat slide of the kind specified in which the outer slide element has inwardly facing channel portions which receive outwardly extending flanges of the inner slide element, and in which a plastic liner is fitted in each of these channel portions, each plastic liner itself including a channel within which the respective flange is a sliding fit.

The inner slide element is preferably of top-hat shape in cross-section and carries, intermediate its ends, the releasable locking means when provided, the locking means being in the form of a spring loaded pawl arranged for selective engagement in cut-outs formed in one of the walls of one of the channel portions of the outer slide element. The pawl is preferably pivotally mounted on a bracket attached to the inner slide element and may have two tooth formations whereby interlocking engagement is effected with two of the cut-outs of said channel wall.

In the case of a slide and seat combination in which each of the pair of slides has releasable locking means, an operating handle is preferably attached to the locking pawl of one of the slides and a cross-shaft mechanism interconnects the pawls of the two slides whereby the pawls are moved in unison between their locking and release positions, the pawls being individually spring-loaded into their locking positions.

The invention will now be described by way of example with reference to embodiments thereof illustrated in the accompanying drawing which shows slide constructions providing for single-side locking and for double-side locking. In the drawing:—

Figure 1 is a plan view of a seat slide construction including a double-side locking facility.

Figure 2 is a sectional view along the line A—A of Figure 1, illustrating the manner in which the slide is mounted in a vehicle,

Figure 3 is a plan view, partly broken away, of a seat slide construction having a single-side locking facility, and

Figure 4 is a sectional view along the line B—B of Figure 3.

The seat slides shown in the drawings are produced from common components and the same reference numerals appropriate to the parts of the embodiment of Figures 1 and 2 are used for corresponding parts of the embodiment of Figures 3 and 4.

The construction shown in Figures 1 and 2 includes two slides 10 and 11, the slide 10 functioning as a slave unit and the slide 11 being provided with an operating handle 12 positioned so that a hand-grip portion 13 at the free end thereof is manually accessible, being disposed just beneath the forward edge of the seat squab 14 (as shown in Figure 2). The hand-grip portion 13 is normally disposed in the position shown in full lines in Figure 2 but can be moved upwardly into the position shown in broken lines in Figure 2 to release the locking action of the slides as described in detail below and permit fore and aft adjustment of the position of the vehicle seat.

Each slide 10, 11 includes an inner slide element 15 and an outer slide element 16, the cross-sectional configurations of which are illustrated in Figure 4. Each inner slide element 15 is of top-hat form in cross-section and is positioned, in use, so that the top portion 17 of the section is disposed horizontally facing upwardly towards the seat squab 14. A pair of circular apertures 18 are formed in the top portion 17 to receive fixing bolts 19 for attachment of the slide to the seat squab 14. Each outer slide element 16 includes a base 20 which, in use, is disposed horizontally facing downwardly towards the floor of the vehicle. A pair of circular apertures 21 are formed in the base of the outer slide to receive fixing bolts 22 for attachment of the slide to the vehicle floor.

Each outer slide element 16 has side walls which are bent over whereby a pair of inwardly

facing channels are provided. A plastic liner 23 is fitted in each of these channels, the cross-sectional configurations of the liners being identical and as shown in Figure 4. The plastic liners 23 are formed as mouldings and include end formations 24 which overlap the end of the outer slide elements 16 so as to ensure that the liners 23 are retained within the channels. The plastic material from which the liners 23 are moulded is such as to ensure that frictional loads are minimised and so that relative movement of the slide elements is kept within prescribed limits; the plastic material may be, for example, a polyacetal impregnated with a suitable lubricant such as molybdenum disulphide. The liners 23 are shaped to receive the flanges of the top-hat sections of the inner slide elements 15 with each liner 23 having a slot of such depth that the free edges of the flanges cannot contact the bases of the slots. Effective sliding of the inner slide element 15 within the outer slide element 16 is thus ensured.

One of the side walls of each outer slide element 16 is formed with a series of equi-spaced cut-outs 25 which are illustrated as slots which open on to the side wall edges but which could be in the form of apertures spaced from the side wall edges. Two slots are formed in the inner slide element 16 generally centrally thereof to receive limbs of a mounting bracket 26, the ends of the limbs being disposed beneath the top of the top-hat section of the inner slide element 15 and welded thereto. The dimensions of the limbs and slots are such that the limbs are close sliding fits in the slots so that a mechanical interlocking engagement is provided in addition to the welded connection between the bracket 26 and slide element 15. The bracket 26 includes a stepped spigot 27, having a larger diameter portion on which a locking pawl 28 is pivotally mounted. The locking pawl 28 has two tooth formations 29 which enter adjacent cut-outs 25 to provide a locking action, the pawl 28 being acted upon by a spring 30 which serves to bias the pawl 28 into its locking position and has a reaction leg which bears against a stop 31 on the bracket 26.

The two seat slides 10 and 11 of Figures 1 and 2 are interconnected by a cross-shaft 32 which includes a tube fitting over the smaller diameter portions of the spigots 27. A coupling element 33 is provided at each end of the tube and the two coupling elements 33 interlock with cooperating formations on the locking pawls 28 whereby the pawls 28 rotate in unison either under the action of the respective springs 30 or against the action of such springs 30. Rotation of the pawls 28 is effected by means of the operating handle 12 attached to the pawl 28 of slide 11, the operating handle 12 including a sleeve 34 which fits over a portion of the respective pawl 28 and is then crimped into interlocking engagement therewith. Because the two slides 10 and 11 are interconnected by the cross-shaft 32 only one operating handle 12 is, of course, required.

The heads of the bolts 22 used to attach each outer slide element 16 to the floor of the vehicle function as stops and cooperate with tabs 35 formed by making cut-outs in one of the flanges of the associated inner slide element 15 and then bending the tabs inwardly. In operation, the inner slide element 15 of each slide is free to move within the outer slide element 16 between two limiting positions in the first of which one of the tabs 35 abuts one of the bolts 22 and in the second of which the other tab 35 abuts the other bolt 22.

In production of the slides, the slide elements 15 and 16 are produced as metal pressings using appropriate multi-stage tooling and the inner slide element 15 may be given a suitable surface treatment to reduce the coefficient of sliding friction between the flanges of the inner slide element 15 and the moulded plastic liners 23. The bracket 26 is attached to the inner slide element 15 and the locking pawl 28 and spring 30 are then mounted on the bracket 26. For slide 11, the handle 12 is attached to the locking pawl 28. After insertion of the moulded plastic liners 23 in the inwardly facing channels of the outer slide elements 16, the inner and outer slide elements 15 and 16 are assembled together.

As supplied to a vehicle manufacturer, the two slides 10 and 11 and the cross-shaft 32 are delivered as separate sub-units to reduce packing costs and facilitate mounting of the slides within the vehicle. The inner slide elements 15 are attached to the seat frame 14, the cross-shaft 32 is connected to the locking pawls 28 and then, in installation of the seat in the vehicle, the outer slide element 16 is attached to the floor of the vehicle.

The form of seat slide arrangement shown in Figures 1 and 2 is intended to be used with a seat having a tubular metal frame, the double locking action ensuring that distortion of the frame under load is prevented. The particular arrangement shown in Figures 3 and 4, in which the two slides are not interconnected, is intended for use on a seat having a pressed metal frame such that, in view of the increased resistance of the frame to distortion, a single-sided locking action is permissible. The construction of slide 11 is as described above in relation to the embodiment of Figures 1 and 2 whereas the slide 10A differs from slide 10 in that it does not incorporate the bracket 26 and associated locking means, i.e. it consists of an inner slide element 15, an outer slide element 16 and two moulded plastic liners 23 fitted within the inwardly facing channels of the outer slide element 16 for sliding engagement with the flanges of the inner slide element 15.

With either of the embodiments referred to above, the locking pawl or pawls 38 is or are spring-loaded into locking engagement with the cut-outs 25 to lock the slide elements against relative sliding movement. To release the locking action, the driver or front passenger puts his hand down to take hold of the handle 12 and moves the handle 12 upwardly. This causes the locking pawl or pawls 28 to become disengaged and enables the seat to be slid either rearwardly or forwardly

into an alternative adjustment position.

An important advantage of the use of plastic liners 23 is that, not only does it ensure a quieter, smoother sliding action, but it also enables an overall reduction in the height of the seat slide to be obtained. The use of a locking system in which the movable locking element is mounted on the inner slide element and engages with a wall of the outer slide element is of assistance in enabling this overall height reduction to be obtained.

Each moulded plastic liner 23 may be of constant cross-section throughout its length. However, the cross-sectional configuration indicated may be present only at the ends of each liner and, possibly, at the centre of each liner with the surfaces of each liner 23 engaged by the flanges of the inner slide element 15 appropriately relieved to reduce the contact surface areas by 50%.

CLAIMS

1. A seat slide of the kind specified in which the outer slide element has inwardly facing channel portions which receive outwardly extending flanges of the inner slide element, and in which a plastic liner is fitted in each of these channel portions, each plastic liner itself including a channel within which the respective flange is a sliding fit.

2. A seat slide as claimed in Claim 1 in which the inner slide element is of top-hat shape in cross-section.

3. A seat slide as claimed in Claim 1 or 2 in which the inner slide element carries, intermediate its ends, the releasable locking means, the locking means being in the form of a spring loaded pawl arranged for selective engagement in cut-outs formed in one of the walls of one of the channel portions of the outer slide element.

4. A seat slide as claimed in Claim 3 in which the pawl is pivotally mounted on a bracket attached to the inner slide element and has two tooth formations whereby interlocking engagement is effected with two of the cut-outs of said channel wall.

5. A seat slide as claimed in any one of Claims 1—4 in which the plastic material is impregnated with a lubricant.

6. A seat slide as claimed in any one of Claims 1—5 in which the depth of each channel in each liner is such that the free edge of the respective flange does not contact the bottom of the channel.

7. A seat slide as claimed in any one of Claims 1—6 in which those surfaces of the liners which are presented towards the inner surfaces of the channel portions are relieved at positions along their lengths so as to reduce the areas of contact with said channel portion inner surfaces.

8. A seat slide substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

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