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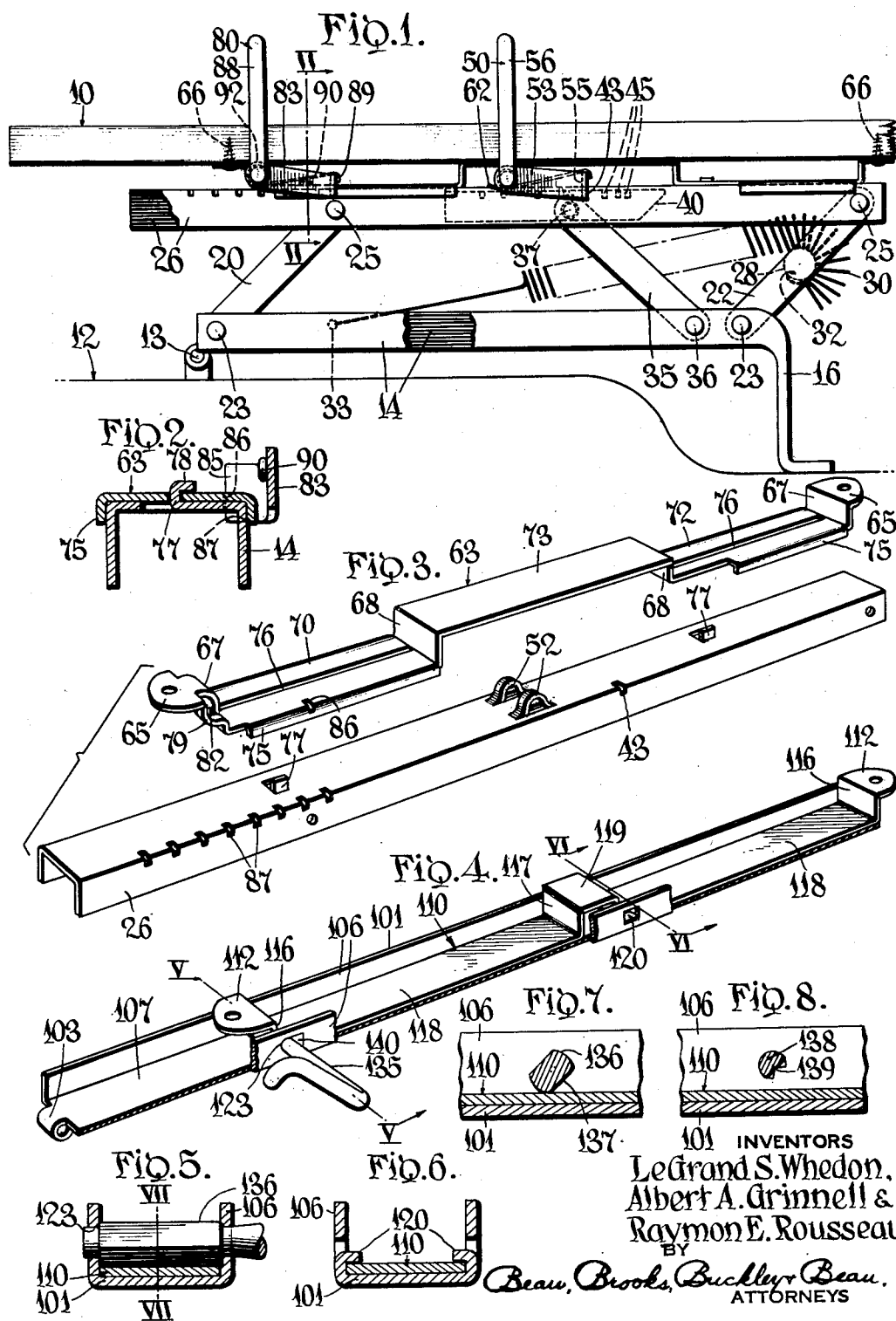
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2,149,946

SLIDE AND GUIDE SUPPORT FOR SEAT STRUCTURES

Filed Aug. 27, 1935

2 Sheets-Sheet 1



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FIG. 9.

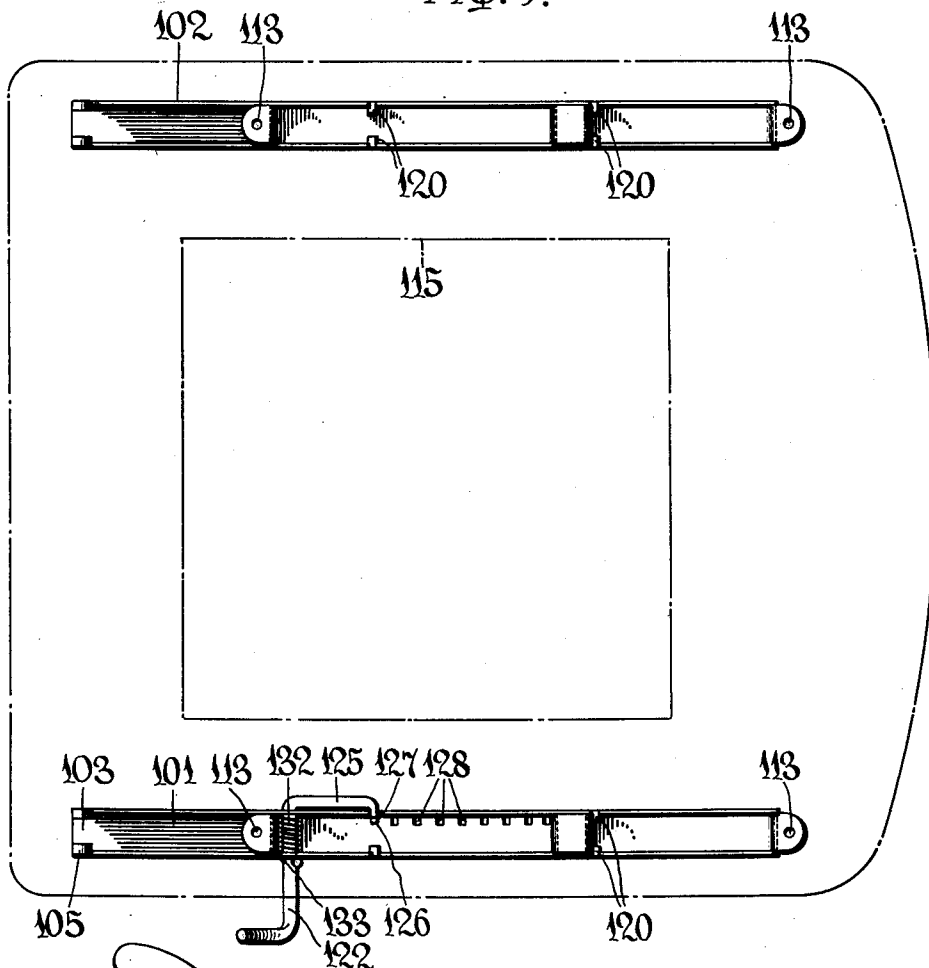
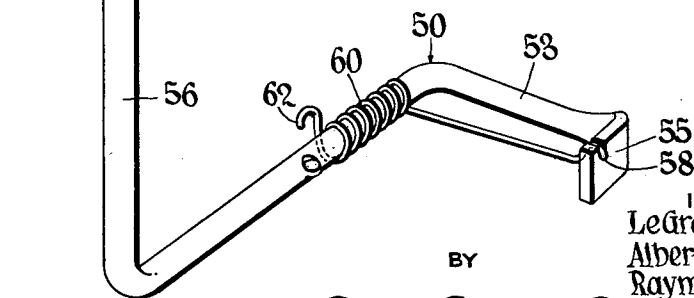


FIG. 10.



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SLIDE AND GUIDE SUPPORT FOR SEAT
STRUCTURES

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Application August 27, 1935, Serial No. 38,108

4 Claims. (Cl. 155—14)

This invention relates to an adjustable seat installation for vehicles, or other structures, and it has particular relation to an improved supporting and operating mechanism for a seat installation wherein seat supporting members, including the seat bottom, can be relatively moved to conform readily to various positions desired by persons having various heights, weights, or other physical characteristics or preferences that might require either average or special seating arrangements.

The improved adjusting and supporting mechanism to which the invention is directed involves an improvement over the type of seat installation wherein an occupant while seated can adjust the elements of the seat supporting structure to provide bodily movement of the seat in upward or downward swinging movements, and further the invention provides for substantially direct forward and rearward adjustment with respect to the changing of the horizontal position of the seat.

One of the principal features of the invention is exemplified in an improved arrangement of guiding and adjusting mechanism for supporting the seat structure, and is further exemplified in means for preventing binding influences that might tend to interfere with uniform action of the mechanical parts of the installation.

The invention is also concerned with an arrangement of channel-like guides for receiving slides at each side of the seat structure whereby any tendency toward binding of the guiding and sliding parts is compensated on each side of the structure.

In the drawings:

Fig. 1 is an elevation of a seat supporting and adjusting installation constructed according to the invention;

Fig. 2 is a vertical section, on a larger scale, taken substantially along the line II—II of Fig. 1;

Fig. 3 is a two part exploded perspective of co-operating slide and guide elements of a seat supporting structure;

Fig. 4 is a fragmentary perspective of another form of a seat supporting and adjusting unit in which the invention has been incorporated;

Fig. 5 is a vertical section, on a larger scale, taken substantially along the line V—V of Fig. 4;

Fig. 6 is a vertical section, on a larger scale, taken substantially along the line VI—VI of Fig. 4;

Fig. 7 is a fragmentary longitudinal section

taken substantially along the line VII—VII of Fig. 5;

Fig. 8 is a fragmentary longitudinal section similar to Fig. 7 and illustrating a stop device for a locking element;

Fig. 9 is a plan of another form of seat supporting structure; and

Fig. 10 is a perspective of a locking lever incorporated in the structure.

In practicing the invention a seat structure including a seat bottom frame 10 is installed upon a suitable base 12 which can be in the form of a vehicle floor, or the like, and is provided at each side with a pivotal support 13 connected to a lower frame member 14 arranged in substantially the same manner as that illustrated in copending application Serial No. 34,272, filed August 1, 1935. Each of these members 14 has a rear angular extension 16 resting upon the base 12 and the entire seat structure can be tilted forwardly about the pivotal connections 13.

Front and rear links 20 and 22 at each side of the seat structure have lower pivotal connections 23 securing them to the lower frame members 14 and upper pivotal connections 25 securing them in channels 26 which are identical and receive the upper ends of the links 20 and 22 in the downwardly opening channels thereof. A rigid brace 28 rigidly connecting the rear links is provided with a resilient member 30, such as a coil spring, wound thereabout and having one of its end portions connected, as indicated at 32, to the brace. The resilient member is connected under tension at its other end portion, as indicated at 33, to the lower frame member 14, and hence, the resilient member constantly tends to pivot the links 20, 22 upwardly about their lower pivotal connections 23. This kind of resilient member, one or more of which can be employed, is arranged in substantially the same manner as that described in the copending application referred to above.

An adjusting link 35 is pivotally secured at its lower end by means of the pivotal connection 36 adjacent the rear link 22 upon the lower supporting frame 14 at one side of the seat structure, and the upper end of the adjusting link is secured by means of a pivot pin 37 in a downwardly opening channel slide 40 which is slidable longitudinally in the upper channel 26 between the pivotal connections 25.

One of the upper corners of the channel 26 receiving the slide 40 has a notch or slot 43 cut therethrough and the channel slide 40 has a series of notches or slots 45 in one corner thereof,

any one of which can register with the notch 43, depending upon the position of the slide as it is moved longitudinally in the channel.

A locking lever 50 is rotatably mounted in straps 52 stamped integrally from the upper side of the channel 26 to form bearings, and the lever 50 is provided with a rigid arm 53 having an end finger 55 for engagement with registering notches 43 and 45 in various positions of adjustment. A handle portion 56 of the lever is provided to facilitate manual operation thereof. As best shown in Fig. 10, a lever similar to the lever 50 is shown and parts thereof are designated by numerals corresponding to those applied to the lever in Fig. 1. This lever (Fig. 10) can be formed of a rod which is bent into proper shape and the finger 55 is shaped to fit into the notches 43, 45. It is to be understood that the notches for receiving the end of the adjusting lever arm can be formed either at the inner or outer side of the sliding members (Figs. 1 and 9). One end 58 of a spring 60 wound about an intermediate portion of the lever 50 rests upon the finger 55 and the other end 62 of the spring rests upon the upper surface of the channel 26. Thus the spring constantly urges the finger 55 in the direction of engagement with the notches 43 and 45.

At each side of the seat structure the channel 26 carries and guides a slide 63 which has connecting ears 65 at opposite ends connected in rigid assembly by means of suitable fasteners 66, such as screws, or the like, with a seat bottom frame 10. This slide is provided with upright transverse walls 67 and 68 at its ends and intermediate portions to provide front and rear sliding sections 70 and 72, together with an intermediate seat frame supporting section 73. That is, the seat frame is conjointly supported by the end ears 65 and the intermediate section 73 over which the weight of the seat structure is distributed.

The sliding sections 70, 72 of each slide are provided with downwardly extending flanges 75 which embrace the upper sides of the channel 26 in sliding relation while ample sliding area is provided by the sliding sections 70 and 72 engaging directly upon the upper surfaces of the channel. In this arrangement both the front and rear portions of each slide 63 contact the upper surface of the channel and maintain proper sliding contact at all times. The flanges 75 of each slide maintain proper sliding alignment thereof on the channel 26, and hence, there is no possibility of the sliding surfaces binding. Each slide located upon the respective sides of the seat structure is thus individually supported and guided against such binding. Since the slide is duplicated on opposite sides of the seat structure each combination of slide and guide constitutes a non-binding unit to carry the seat structure in forward and rearward movement, and all forces tending to disalign such structure will be compensated by the individual units, and there is no appreciable binding action that might be transferred from one side of the structure to the other.

Longitudinal openings or slots 76 are formed in the sliding sections and tongues 77 are stamped from the body or web of each channel for disposition through the slots. After positioning the elements of the supporting structure, the tongues 77 are bent over, as indicated in Fig. 2, to provide flanges 78 for preventing separation of the slide 63 from the channel 26 and insures proper assembly of the seat structure under all

conditions of operation. It is to be understood that the tongues 77 slide loosely in the slots and that the guiding surfaces of the sections 70 and 72, together with their flanges 75, engage contiguous surfaces of the channel 26 without any interference by the tongues. The ends of the slots 76 also serve as stops together with the tongues to limit movement of the slide upon the channel.

One end of the slide 63, for example, the front end portion, is stamped during its formation to form straps 79 adjacent the ear 65 and wall 67, and an adjusting lever 80; which can be constructed in exactly the same manner as the adjusting lever 50, is rotatably mounted in a bearing opening 82 formed by the straps. One end portion of the lever has an arm 83 thereon formed with a locking finger 85 that is insertable into a slot 86 formed in one side portion of the sliding section 70 of the slide. Other similar slots 87, are formed in the adjacent corner portion of the channel 26 and are arranged to register with the first slot 86, depending upon the position of the slide upon the channel. The lever is operated by a handle portion 88. One end 89 of a spring 90 engages the finger 85 and has its intermediate portion disposed about an intermediate portion of the lever. Its other end 92 engages the lower side of the ear 65, and hence, the spring always urges the finger 85 in a direction of engagement with the slot 86 and one of the registering slots 87. It is to be understood that this lever 80 can be constructed in the manner shown in Fig. 10.

Referring to the construction shown in Figs. 4 to 8, a pair of upwardly opening channels 101 and 102 are provided with connecting eyes 103 that are pivotally connected to supports 105 adapted to be secured to the floor of a vehicle. Each channel includes upwardly extending flanges 106 and a bottom or web 107, and a slide 110 somewhat similar to the slide 63, is slidably disposed in the channel wherein its sides are maintained against lateral displacement by the channel flanges 106.

Each slide 110 is provided with connecting ears 112 at opposite ends secured in rigid assembly, by means of suitable fasteners 113, such as screws, or the like, to the lower surface of a seat bottom frame 115. This slide is provided with upright transverse walls 116 and 117 at its end portions and intermediate portions to provide front and rear sliding sections 118, together with an intermediate seat frame supporting section 119. That is, the seat frame is conjointly supported by the end ears 112 and the intermediate section 119 over which the weight of the seat structure is distributed. It is, of course, to be understood that the intermediate section 119 is adapted to be screwed or bolted to the seat frame in the same manner as the ears 112.

Since the sides of the slide 110 are prevented from lateral displacement by the flanges 106 on each side of the seat structure and throughout its sliding movement in the channel, the possibility of binding of any of the parts is reduced to a minimum. Like the structure already described any tendency toward disalignment of the slide and guide is compensated on each side of the seat structure and there can be no appreciable binding action that might be transferred from one side of the structure to the other.

In order to guard against upward displacement of the slide 110 from the guide channel, the flanges 106 are provided with inwardly struck

tongues 120 which overlap the upper surfaces of the sections 118 and serve also as stops to limit the forward and rearward sliding movement of the slides. The entire channel, as well as the slide, can be stamped from sheet metal, and thus manufacturing operations greatly minimized.

An adjusting lever 122 which can be constructed in the same manner as the levers 50 and 80 previously described, is rotatably mounted in bearing openings 123 formed transversely of the channel flanges 106. One end of the lever 122 has an angular arm 125 formed with a locking finger 126 that is insertable into a notch 127 formed in the upper portion of an adjacent channel flange 106 and into one of a series of notches 128 formed in the slide for locking the latter and channel against relative movement. One end of a spring 132 that has its intermediate portions disposed about the intermediate portion of the lever, engages the outer end of the arm 125 (Fig. 9) and the other spring end 133 engages the upper edge of the channel flange 106, and hence, the spring always urges the finger 126 in a direction of engagement with one of the notches 126. This lever is also adapted to be constructed in the manner illustrated in Fig. 10.

Another form of locking lever 135 is illustrated in Figs. 5 to 8 wherein a horizontal cam portion 136 is formed and disposed in close proximity to the upper surface of the slide 110. The cam firmly locks the slide and channel against relative movement and portions of the cam are flattened, as indicated at 137, in order to insure freely sliding relation when the cam is not in locked position. As shown in Fig. 8, one of the bearing portions 138 of the lever can be flattened and a portion of the channel flange 106 defining the opening through which the lever is disposed can be formed with a stop 139 which limits turning motion of the cam. In forming the opening for receiving the cam portion of the lever, a portion 140 of the channel flange is stamped out and then bent back into bearing relation to the lever after the latter has been positioned in its normal relation.

From the foregoing description it will be apparent that the slide and guide construction for supporting seat installations provide for positive guiding action without possibility of binding of parts, that all of the supporting members can be stamped at low cost from sheet metal material; and that the supporting and adjusting installation is adapted to be installed conveniently in any type of seating arrangement without alteration of either the seat frame or upholstery.

Although more than one form of the invention has been shown and described in detail, it will be apparent to those skilled in the art that the invention is not so limited, but that various changes can be made therein without departing from the spirit of the invention or from the scope of the appended claims.

We claim:

1. In a seat structure, channel frame members disposed beneath the seat structure in substantially horizontal relation and opening downwardly, means for supporting the channel members, a slide disposed longitudinally upon each channel member for forward and rearward sliding action thereon, said slide having upper substantially horizontal sections, a seat frame secured rigidly to the upper sections of the slide, said slide having lower substantially horizontal sections resting slidably upon the upper surface of the channel member, said lower sections hav-

ing downwardly extending marginal flanges along opposite sides of the channel member and adjacent opposite ends of the slide for preventing lateral displacement from end to end of the slide from the channel member, said slide having portions connecting the upper and lower sections to space the seat structure from the channel members, means for limiting relative sliding movement of each assembly of slide and channel member, and means passing through the space between said seat structure and channel members for selectively holding the slide against sliding movement on the frame member at various positions within the limits of their relative movement.

2. In a seat structure, a channel frame member disposed beneath and adjacent each side of the seat structure in substantially horizontal relation, means for supporting each channel member, a slide disposed longitudinally upon each channel member for longitudinal sliding action thereon, said slide having longitudinally spaced upper sections, a seat frame secured rigidly to said upper sections of the slide, said slide having lower longitudinally spaced sections slidably resting upon the channel member, said upper and lower sections being integrally connected, each of said lower sections having lateral downward extensions at both sides thereof and slidably embracing the upper side portions of the channel member upon which it is mounted, means for limiting sliding movement of each assembly of slide and channel member, and means for selectively holding the slide against sliding movement on the frame member within the limits of their relative movement.

3. In a seat structure, a channel frame member disposed beneath and adjacent each side of the seat structure in substantially horizontal relation, means for supporting each channel member, a slide disposed longitudinally upon each channel member for longitudinal sliding action thereon, said slide having longitudinally spaced upper sections, a seat frame secured rigidly to said upper sections of the slide, said slide having lower longitudinally spaced sections slidably resting upon the channel member, said upper and lower sections having integral portions connecting them, one of the latter portions of each slide being formed with an opening extending transversely of the seating structure, each of said lower sections having lateral downward extensions at both sides thereof and slidably embracing the side portions of the channel member upon which it is mounted, means for limiting sliding movement of each assembly of slide and channel member, said channel member and slide adjacent one side of the seat structure having registrable recesses therein adjusting means extending through the opening in said one of the said portions and engageable in registrable recesses in the latter channel member and slide for selectively holding the slide against sliding movement on the channel member within limits of their relative movement.

4. In a seat structure, a channel frame member disposed beneath and adjacent each side of the seat structure in substantially horizontal relation, means for supporting each channel member, a slide disposed longitudinally upon each channel member for longitudinal sliding action thereon, said slide having longitudinally spaced upper sections, a seat frame secured rigidly to said upper sections of the slide, said slide having

lower longitudinally spaced sections slidably resting upon the channel member, said upper and lower sections being integrally connected, each of said lower sections having lateral downward extensions at both sides thereof and slidably embracing the upper side portions of the channel member, said slide having a slot disposed longitudinally therein in the region of sliding engagement between the slide and channel member, said channel member having a rigid tongue struck out from the web thereof slidably engag-

ing in the slot and including an angular portion in bent form extending beyond and to one side of the slot for limiting relative separating movement of each assembly of slide and channel member, and means for selectively holding the slide against sliding movement on the channel member at various positions within the limits of their relative movement.

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