

March 24, 1942.

W. S. SAUNDERS

2,277,357

ADJUSTABLE SEAT SUPPORT

Filed Jan. 17, 1935

3 Sheets-Sheet 1

Fig. 1

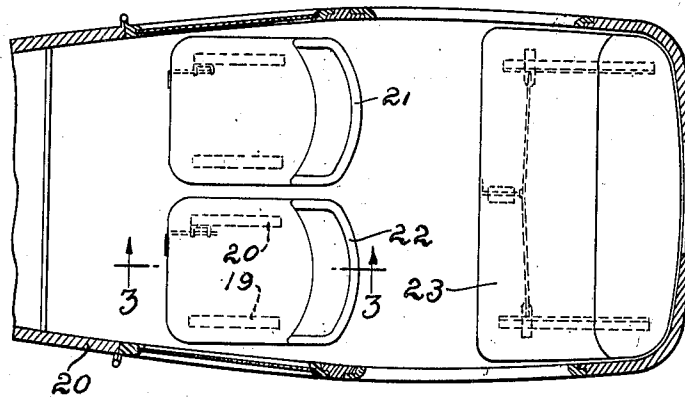


Fig. 2

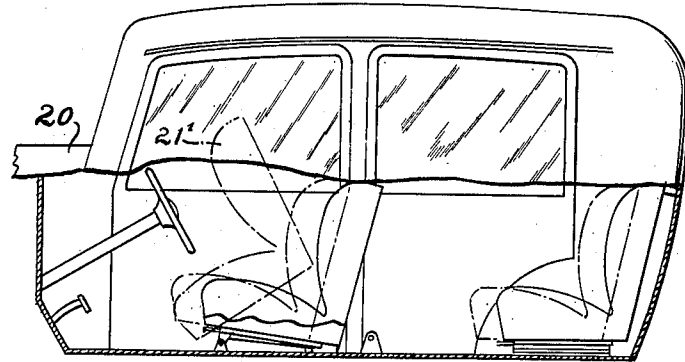


Fig. 3

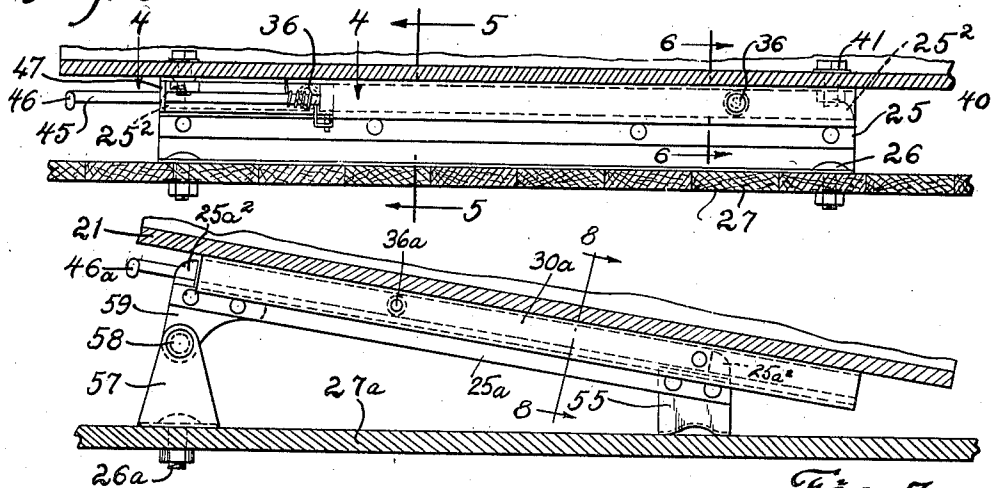


Fig. 7

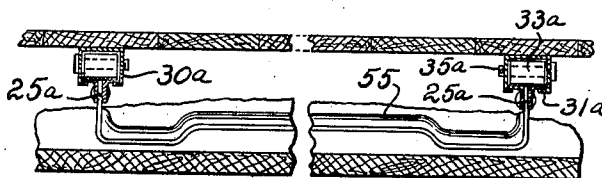


Fig. 8

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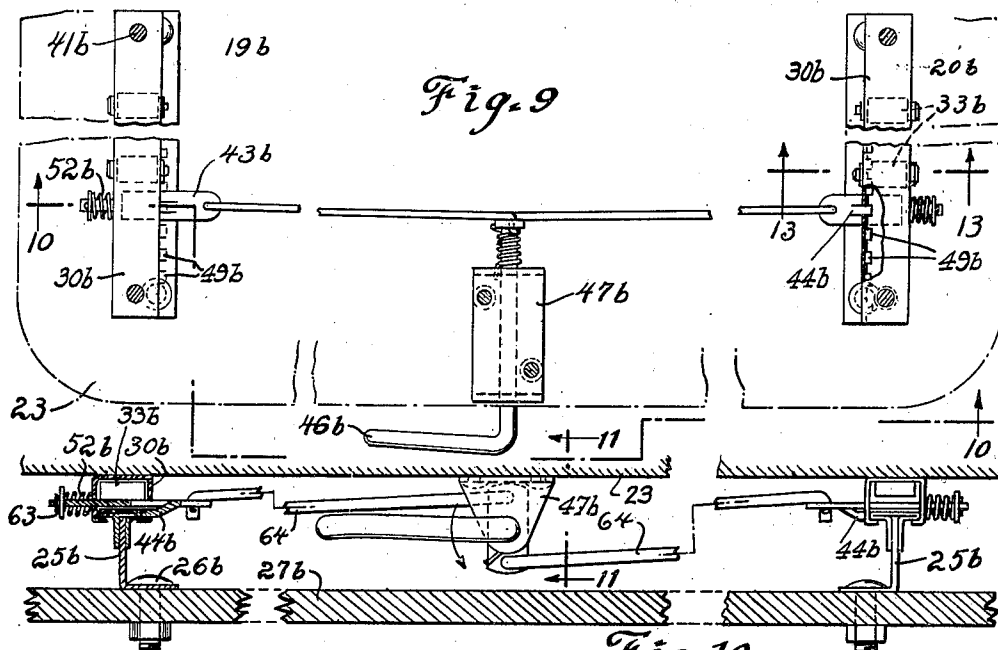
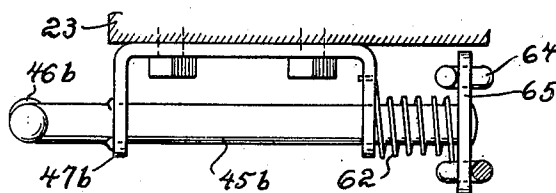
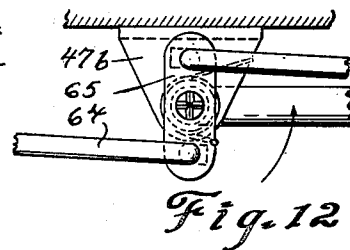
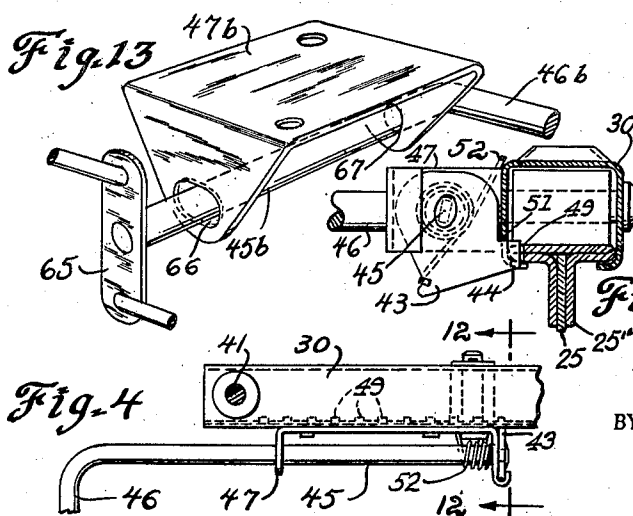
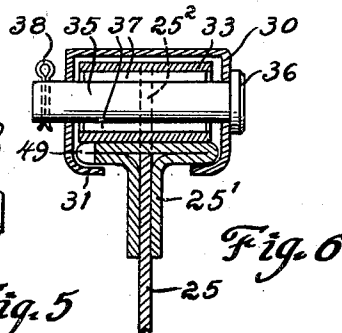
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ADJUSTABLE SEAT SUPPORT

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3 Sheets-Sheet 2



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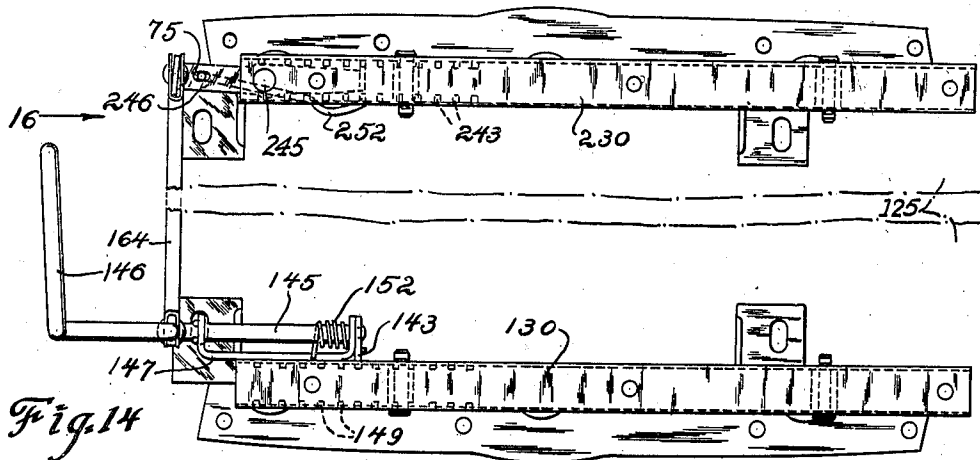
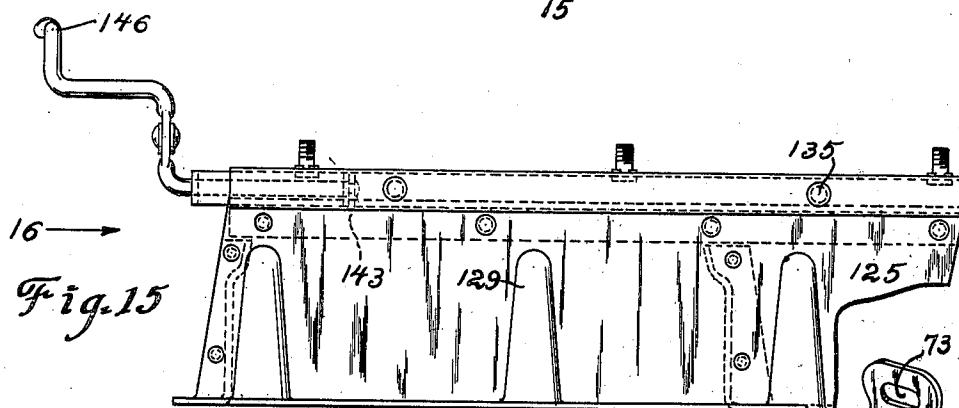
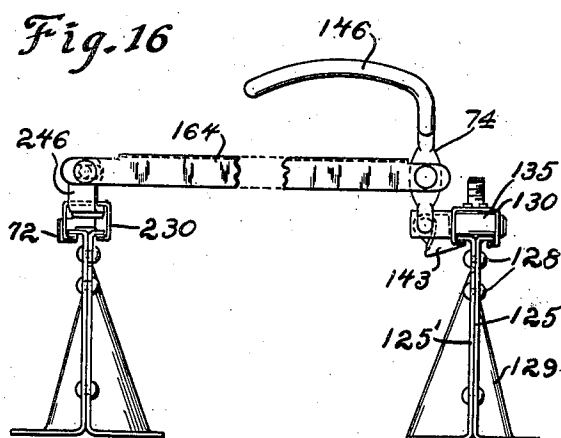
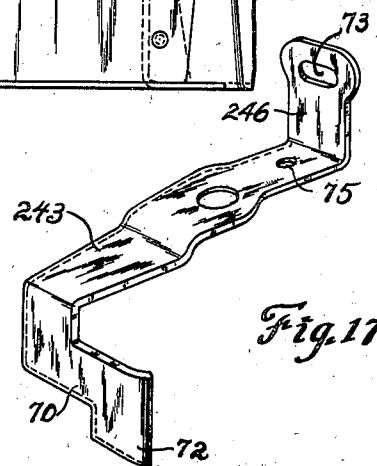
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ADJUSTABLE SEAT SUPPORT

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3 Sheets-Sheet 3



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2,277,357

ADJUSTABLE SEAT SUPPORT

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Application January 17, 1935, Serial No. 2,249

9 Claims. (Cl. 155—14)

This invention relates to adjustable supporting devices for seats and the like, and is particularly directed to the provision of improved supports for the seats of vehicles, although it will be recognized as readily applicable to other and various uses where quick and convenient means are desired for adjusting the position of a supported object.

An important aim of the invention is the provision of an adjustable vehicle seat support of simpler and less expensive construction than those heretofore used, yet quickly and easily operable and of great strength.

A further object is the incorporation in such a device of improved latching means for holding the seat in desired positions, so constructed that its operation is not interfered with by any disalignment of the two ends of the seat which may result from the (frequently unavoidable) turning or cocking thereof. Such disalignment or cocking of the seat ends has been found in many constructions now in use to prevent or hamper operation of the latching means.

It is an object, also, to incorporate in such a seat support a latch construction possessing the aforementioned and other advantages, and constituting an advancement in the art by virtue of its simplicity of structure and operation.

Among important objects should also be mentioned the provision of improved means for controlling the operation of a plurality of such latches by means of a single operating agency of novel construction, so designed that if one of the latches controlled thereby works materially harder than another, the easier operating latch is first released, after which the entire working force is applied to releasing the more resistant latch, thereby reducing the manual effort necessary to release it to so great an extent as to permit easy operation thereof even if stuck by reason of turning or jamming of the seat as in the way above mentioned.

A still further object is the provision, in combination with unitary controlling means for a plurality of such latches, of means permitting independent reengagement of the latches, so that in event one latch is for any reason held from engaging, the other may nevertheless close to lock the seat in position.

Other objects and advantages will be apparent from the following description wherein reference is made to the accompanying drawings illustrating preferred embodiments of my invention and wherein similar reference numerals designate similar parts throughout the several views.

In the drawings:

Figure 1 is a somewhat diagrammatic horizontal section of an automobile body of the so-called "coach" type, showing the seats and their arrangement in plan and indicating the positioning and manner of use of the improved adjustable supporting members constituting the subject matter of this invention;

Figure 2 is a side elevational view of the automobile body, partly broken away, also indicating the manner in which the seats are movable;

Figure 3 is a vertical section taken substantially on the line 3—3 of Figure 1 and looking in the direction of the arrows, showing one form of my improved adjustable supporting device in side elevation;

Figure 4 is a fragmentary plan view corresponding to a horizontal section taken substantially on the line 4—4 of Figure 3, showing the latching means used in conjunction with this form of the invention, partly broken away;

Figure 5 is a detailed vertical section taken substantially on the line 5—5 of Figure 3 and looking in the direction of the arrows;

Figure 6 is a detailed vertical section taken substantially on the line 6—6 of Figure 3 and looking in the direction of the arrows;

Figure 7 is a view similar to Figure 3, showing in side elevation an adjustable support of somewhat modified construction for a tiltable seat;

Figure 8 is a section taken substantially on the line 8—8 of Figure 7 and looking in the direction of the arrows;

Figure 9 is a plan view, partly broken away, of another modified construction particularly adapted for use in conjunction with longer or sedan type seats;

Figure 10 is a sectional elevational view of the same corresponding to a vertical section taken substantially on the line 10—10 of Figure 9 and looking in the direction of the arrows, showing fragmentarily and in section the relative positioning of the seat and floorboards;

Figure 11 is a detailed section taken substantially on the line 11—11 of Figure 10 and looking in the direction of the arrows, showing the latch-controlling means in side elevation;

Figure 12 is a rear elevational view of the latch-controlling means fragmentarily showing appurtenant parts in section;

Figure 13 is a perspective view of the latch-controlling element removed from the seat, partly broken away and fragmentarily showing connecting means.

Figure 14 is a plan view similar to Figure 9 of

another somewhat modified structural embodiment of the invention;

Figure 15 is a side elevation taken looking in the direction indicated by the arrow 15 of Figure 14;

Figure 16 is front elevation of the assembly taken looking in the direction indicated by the arrow 16 of Figure 14; and

Figure 17 is a perspective view of the remote-controlled latching element.

Referring now to the drawings, reference character 20 designates the body of an automobile, which is shown only conventionally since it forms no part of this invention and might obviously be of any type or style of construction. Within the body are arranged seats which, in the illustrative instance, since the body is of the coach type, comprise individual front seats 21, 22, and a single larger rear seat 23 extending entirely across the back. This will be recognized as a conventional arrangement. In order to facilitate ingress and egress of passengers the front right seat 21 is preferably tiltable, as indicated in dotted lines in Figure 2 (at 21'). The driver's seat 22 may or may not be similarly tiltable, as desired. In the present instance a non-tiltable driver's seat is shown in order to illustrate another application of my invention, but it will be understood that identical seats of either type might be used in front.

If tiltable mounting of the driver's seat is not desired, its supporting means may be of the construction best shown in Figures 3 to 6 inclusive. As there indicated the support is furnished by two track and slide assemblies, generally designated 19—20 in Figure 1, and each comprising two main portions, a fixed supporting or track section 25—25' secured to and upstanding from the floor 27 and a carriage section 30 slidable on the track and secured to the seat. As best shown in Figure 6 the track may be of T-section, the cross-head forming the top portion of the rail comprising a folded sheet metal portion 25' fitted over the vertical portion forming its support, to which it is secured by welding or any other suitable manner, while the base portion is of angle form with one plate secured to the floor, as by bolts 26.

The carriage comprises a channel member 30 of inverted U-form, having inbent bottom flanges 31 which underhang the head of the T-shaped rail to prevent vertical displacement of the channel, in the manner shown in Figure 6.

The carriage is preferably supported for free sliding movement upon anti-friction bearings, which may be of the construction also clearly shown in Figure 6. As there indicated each bearing may comprise a sleeve 33 forming a cylindrical outer race and of proper external diameter to hold the carriage channel member 30 in the desired shown position, between which and the supporting axle pin 35 may be arranged a plurality of rollers 37 rendering the sleeve 33 freely rotatable on the pin. The supporting pin extends through the channel 30 and is held in place by means of its head 36 and suitable co-operating means such as a cotterpin 38, both located outside the channel.

The carriage channel member 30 is secured to the bottom of the seat 40 in any suitable manner, as by bolts 41. Two of the roller bearing members just described may be employed to support each carriage channel, one near the forward and the other near the rear extremity thereof, as is indicated in Figure 3 by the positioning of the

roller pin heads (36) visible in that view. The sliding movement of the seat may be restricted to desired limits by stops, as 25² formed integrally with the central vertical web 25 of the track assembly and projecting through and above the flat top flange portion in suitable positions to block the travel of the carriage at selected extreme positions (Figures 3 and 6).

In conjunction with at least one of the units 19—20, in the present instance the unit 19, suitable latching means is also preferably provided for locking the carriage channel with relation to its supporting track member to enable securing the seat in desired positions. A dog or detent member 43 is fast upon the rear extremity of a shaft 45 journaled in a bracket 47 secured to and projecting from the side of channel member 30, and a forwardly extending laterally bent portion 46 of the shaft forms an operating handle by means of which the dog 43 may be turned to swing its nose portion 44 into and out of engagement with any one of a plurality of notches 49 formed in the edge of the top flange of track portion 25', a slot 51 being provided in the channel member through which the nose portion 44 of the dog may be projected into engagement with the notches 49. The dog is yieldably held in such engagement with the notches by means of a torsion spring 52 wrapped around the shaft 45 and bearing against the channel at one end while hooked over the dog at the other to force it toward the notches. It will be seen that by simply swinging the handle 46 upwardly the dog may be turned to retract the nose portion 44 from the notches 49, thereby freeing the carriage for sliding movement, while when the handle is released the spring 52 relocks the device by forcing the portion 44 of the dog into the nearest notch. The other track assembly, generally designated 40, may be similar except for the latching means, which may be eliminated.

In Figures 7 and 8 a somewhat modified construction is shown which enables tilting the seat as well as its adjustment by longitudinal movement. In these figures equivalent portions have been given like reference numerals to those used in the description of the first embodiment of Figures 1 to 6, differentiated by the addition of the letter *a* to each. As shown, the track elements 25a are joined at their rear extremities by a combined support and cross-bar 55, while at their front extremities the track elements are pivotally connected to upstanding brackets 57 secured to the floor 27a, as by bolts 26a, thus forming with the cross-bar a swinging frame which is free to tilt with the seat 21 as the latter is swung forwardly in the manner indicated at 21' in Figure 2, about the pin 53 by which the track elements are hinged to brackets 57. The cooperating hinge element 59 provides the mechanical connection between the track and pintle 56 at this extremity of the frame.

Carriage channel members 30a are slidably carried by swingable track elements 25a, and anti-friction rollers generally designated 32a are interposed between the last mentioned elements. The rollers may be of similar construction to those previously described in connection with the first embodiment, their supporting and positioning pins being extended through the sides of the channel members 30a to hold them in place.

The overhanging flange portions 31a which project beneath the track elements 25a similarly prevent separation of the carriage and track elements, and by securing these members together

against vertical separation provide means whereby when the seat is tilted the track elements and cross-bar 55 swing with the seat, leaving the floor unobstructed. It will of course be understood that similar latching means to that described in the first embodiment may also be provided for latching one or both carriage members against sliding movement to hold the seat in desired positions. Of the latching means only the operating handle 46a appears in the drawings of this embodiment, detailed description thereof being deemed unnecessarily repetitive.

It is frequently desirable, especially in connection with longer seats such as that shown at 23 in Figure 1, to provide separate latching means for each carriage or other support, so that both ends of the seat are rigidly held against sliding movement. This prevents the cocking and jamming which commonly occur when a lock is provided at one end only. It is also desirable that, even though two latches be thus used, a single operating means be so arranged as to enable simultaneous operation of both latches by means of a single handle. Such arrangements whereby one handle operates two or more seat latches are not broadly new, but it has been found that where two latches are operated by a single control handle in conjunction with such adjustable seat supporting mechanisms, difficulties arise by reason of the fact that the loads upon the two latches are often unequal, and that the seat is often, if not usually, moved by force applied at or near one end. Such unequal forces not only tend to turn the seat slightly, to the extent permitted by whatever play may exist in the mechanism, thereby frequently causing the seat to jam and so interfering with its free slidability, but proper operation of the latches is prevented by reason of the fact that if one is held too tightly by such jamming or force, releasing the other also becomes impossible. It has also been found that if by such disalignment one is prevented from latching, both latches are held in released position, which is manifestly undesirable.

I have therefore provided in conjunction with the modifications shown in Figures 9 to 13 inclusive, improved latch-operating means so designed that whichever of the two latches is most easily retractable is first released, and thereafter the full force applied to the handle acts upon the other more tightly held latch to release it, while when the handle is freed the separate units may relatch independently, so that one cannot be held unlatched by the other.

In the drawings and description of this modification of my invention portions of the apparatus analogous to features already disclosed have been given similar reference characters distinguished by the addition of the character *b* to each. As shown in somewhat diagrammatic plan view Figure 9, two supporting element assemblies may be used. They are generally designated 19b-20b and arranged beneath and near opposite ends of the seat 23, while a single latch controlling element for controlling the operation of both is affixed by means of its supporting bracket 47b centrally to the bottom of the seat in such manner that the operating handle 45b projects to a position enabling its convenient manipulation by occupants of the seat. The supporting track elements 25b may be of similar construction to those disclosed in connection with the first described embodiment, and secured to and extending longitudinally of the floor 27b. Similarly, the box

like carriage channel elements 30b are freely rollable along the tracks on anti-friction rollers 33b. The track elements are shown secured to the floor by bolts 26b, and the carriage elements to the seat by bolts 41b.

The detent notches 49b are similarly arranged along an edge of the flat, top portion of each track element, preferably along the opposite inwardly projecting edges of the two units, as shown in Figure 9. A latching dog as 43b is in this embodiment used for each carriage, the dogs being formed of sheet metal and transversely slidable in transversely aligned slots (undesigned) in channel members 30b. A downwardly offset portion 44b constitutes the locking portion of the dog and is arranged in horizontal alignment with the notched edge of the track, as shown in Figure 10, while the permissible movement of the dog is such that the portion 44b thereof may be slid into and out of engagement with the notches by horizontal movement. The outer end of each dog projects beyond the channel and carries a compression spring 52b trapped between an abutment carried by the end of the dog and comprised in this instance by a pin 63, and the outer face of the channel. Since similar latching means is provided in conjunction with each supporting element releasable by inward sliding movement of the dogs, it will be seen that the central provision of means for drawing upon the connecting rods 64 attached to the dogs enables simultaneous operation of the two latches.

The latch-operating connecting rods or links 64 are hooked into suitable apertures (undesigned) in the projecting inner extremities of the dogs 43b and at their inner ends are pivotally connected, as by being hooked into suitable laterally extending apertures in, a rotatable crank element 65 formed of a sheet metal plate fast upon the inner end of shaft 45b. Such shaft is rotatable by the handle 46b to enable drawing upon the connecting rods to release the dogs, while when the handle is freed the springs 52b, assisted by the torsion spring 62 which acts upon the crank plate 65 to turn it in the same direction as the springs 52b tend to draw it, again force the dogs into engagement with the notches to lock the seat. It will be observed (Fig. 13) that the bracket 47b in which the operating shaft 45b is hung is not merely apertured to rotatably support the shaft, but slotted in such manner that at the crank end, as at 66, the crank element 65 is free to move bodily toward and from either of the dog elements, the aperture 66 in the rear flange of the bracket being laterally elongated in the form of a slot to permit such lateral movement of the shaft 45b, while the front aperture 67 may be substantially round but of sufficient size to permit the shaft to rock in this manner during floating movement of the crank end.

It will be seen that as a result of this arrangement an equalizing action is provided, so that when the handle 46b is turned and the crank rocked, it tends to draw with equal force upon both connecting links, but that if either dog resists releasing movement excessively, the crank plate may rock about the inner end of the rod connected thereto until it strikes the end of the slot 66 nearest that dog, continued turning of the crank releases the opposite dog, after which the full force applied to the handle is effective to draw upon the more resistant dog, thereby enabling easy releasing thereof under all circumstances. If after the seat has been slid to a

new position and handle 46b released to allow relocking of the seat, the latter is turned to any extent, as a result of which one dog is out of line with the next notch and so cannot enter it, the other dog is nevertheless free to enter the notch with which it is aligned, by virtue of the lost motion provided for the crank plate by the slot 66. The seat is thus immediately locked in position by the one dog, while the next slight movement given the seat which moves it sufficiently to align the other dog with one of the notches, such as is occasioned by any disturbance of the seat's position caused by movement or the occupant of the vehicle, permits such dog to move into the notch without disturbing the already locked opposite dog.

In the modified construction shown in Figures 14-17 inclusive, the fixed supporting track of both the right and left units is formed of channeled sheet metal elements, as 125, 125', having their web portions secured together as by rivets 128, and formed with relatively narrow oppositely bent and aligned top flanges, providing the track portion, while similar but wider flanges at the bottom of the assembly constitute feet by which it may be secured to the floor or other support (unshown). The central web portions may be reenforced as by ribs 129.

Carried upon each such track portion is a carriage 130, 230, of analogous construction to those previously described, similarly mounted as on anti-friction rollers generally designated 135. Latching notches as 149 may also be formed along the edges of the track flanges of both units in like fashion, and the latching of the carriage of the control or master unit, shown in the bottom or left hand position in Figure 14, may be effected in similar fashion to the latching of such unit in the embodiment first described, by means of a latching dog 143 swingable into and out of engagement with the latching notches by means of a rockable shaft 145 by which the dog is carried, the shaft being mounted in a bracket 147 on the side of the carriage, and the shaft and dog being urged toward latched position by a torsion spring 152. The operating handle 146, formed integrally with the shaft 145, projects forwardly in stepped elevations and then laterally, as best shown in Figures 15 and 16, to a convenient position in front and near one corner of the rest, which is diagrammatically indicated at 123.

The latching of the remote controlled unit is in this embodiment effected by means of an elongated dog 243 largely housed within the carriage 230, to the top web of which it is pivoted as on pivot pin 245, being limitedly swingable within because narrower than the distance between the side webs of the carriage. At its rear extremity the dog is provided with a downwardly and laterally bent end portion 70 carrying a toothed extremity 72 and projecting through a slot (undesignated) in the carriage into releasable engagement with the latching notches in the track flange, the toothed extremity 72 and its supporting arm 70 being of course so proportioned that the tooth may be swung clear of the notches by swinging the dog element. The forward end of the dog element projects from the carriage and is provided with an upwardly bent coupling portion 246 in which is punched or otherwise suitably formed an elongated connecting slot 73.

A link element 164, shown as formed of folded sheet metal, couples a flattened and apertured portion 74 of control handle 146 to the coupling

portion 246 of the remote end by the slot 73. Either dog may thus seat independently of the other in event of cocking of the seat or other interference with proper movement of one. A spring as 252 urges dog 243 toward latched position, being shown formed of spring wire and substantially straight, but bent at one end into an aperture 75 in the projecting forward end of the dog element, and at the other end sufficiently to project laterally through an aperture (undesignated) in the side of carriage 230 and continue beyond such aperture to abut the outside of the carriage. The tensioning of spring 252 of course urges dog 243 toward released position, while the connection with the handle 146 is such that full movement of the handle is operative to retract this as well as dog 143.

While it will be apparent that the illustrated embodiments of my invention herein disclosed are calculated to adequately fulfill the objects and advantages of the invention primarily stated, it is to be understood that the invention is susceptible to variation, modification and change within the spirit and scope of the subjoined claims.

What I claim is:

1. In combination with a seat, means for adjustably supporting the same, comprising a pair of laterally spaced substantially parallel track elements, a pair of carriage elements, one slidably supported on each track, movable in substantially simultaneous and parallel relation and adapted to support the seat, independent latching means for locking each carriage, the latching means for the two carriages being movable in definitely related paths, a handle, a crank assembly having divergent crank portions rigid with relation to one another and actuable as a unit by said handle, means connecting each of said crank portions with one of said actuating portions, means supporting said crank assembly with respect to the seat and permitting limited lateral movement of said crank assembly with respect to said seat, whereby in event of sticking of either of the latching means, that one which is easier to release may be freed first, whereafter the full effort applied to the handle is directed to freeing the other latching means, and whereby either of said latching means may move to locked position independently of the other.

2. In combination with a seat, means for adjustably supporting the same comprising a pair of spaced substantially parallel track elements, a carriage element slidably supported on each track and movable with and adapted to carry the seat, a pair of independent latching means, one for locking each carriage element, said latching means moving transversely of the tracks, means connected to both latching means for actuating the same, said actuating means being carried by said seat and having portions movable transversely to operate said latching means, and lost motion connection between said operating means and seat.

3. Adjustable supporting means for a seat or the like comprising a track having a laterally flanged head portion serrated to provide a plurality of latching keeper portions, a carriage of inverted channel form movably carried by and projecting above the track, and latching means including a dog pivoted inside and to the top web of the carriage channel and having a portion swingable through the side of said channel and into and out of engagement with said latching keeper portions and a handle portion connected

to said dog and extending from and beyond one end of the carriage channel.

4. Adjustable supporting means for a seat or the like comprising a pair of substantially parallel track elements, having a portion contoured to provide a plurality of latching keeper means, a carriage movably carried by each track, latching means for locking each carriage with respect to its supporting track including a dogging member appurtenant each carriage and movable into and out of engagement with said latching keeper means, a common actuating member for both dogs, means supporting the actuating member with respect to the seat and permitting a limited bodily movement of the actuating member with at least one of said dogging members to enable movement of one dogging member independently of the other, and to enable limited movement of the actuating member independently of either of said dogs which may happen to clog or bind.

5. Adjustable supporting means for a seat or the like comprising a rail having a lateral top flange, a carriage of inverted channel form adapted to serve as a seat support movably carried by the rail and having overbent free edge portions underhanging said flanged portion of the rail to prevent vertical separation of said rail and carriage members, said top flange of the rail being also serrated to provide latching keeper means, and latching means for securing the carriage against movement along the rail including a dogging member carried by and having a portion movable laterally of the carriage between the top flange of the rail and the top web of the carriage channel, said dogging member also having a laterally bent portion engageable with said serrated keeper portions.

6. Adjustable supporting means for a seat or the like comprising a rail having a top flange provided with latching irregularities forming a plurality of keeper portions along one edge thereof, a carriage of inverted channel form movably supported on and projecting above the top flange of the rail, and means for latching said carriage with respect to the rail comprising a dogging member carried by that portion of the carriage projecting above the rail head and having a portion movable laterally through at least one side web of the carriage channel and into and out of engagement with the latching irregularities.

7. Adjustable supporting means for a seat or the like comprising a rail having a top flange pro-

vided along one edge with a plurality of keeper abutment portions, a carriage of inverted channel form movably supported on and projected above the top flange of the rail, and means for latching said carriage with respect to the rail comprising a dogging member carried by and laterally slidable through the side webs of the carriage channel below the top edge thereof and above the track, said dogging member having a down bent lug portion movable through one such side web and into and out of engagement with said abutment portions.

8. A sliding seat mounting comprising a track member adapted to be secured to a floor and a slide member adapted to be secured to the bottom of a seat, said track being formed at its top with oppositely directed longitudinal flanges providing a bearing and guiding surface, one of said flanges having a longitudinal row of notches, said slide being of inverted channel-shaped cross-section and having inturned guide portions on the side walls engaging the flanges of said track, bearing means between said track and slide spacing the same from each other, a pair of registering openings in the side walls of said slide aligned transversely of the space between said track and said slide, a latch bar extending across the space and movably supported in said openings and manually operated means for moving said latch bar into and out of engagement with selected ones of said notches.

9. In an adjustable seat including a supporting structure and a seat structure, means movably mounting said seat structure on said supporting structure including spaced downwardly opening channel-shaped members secured to said seat structure, each having registering openings in the opposite side walls thereof, and spaced rails secured to said supporting structure and having portions thereof projecting into a respective channel member, said portions having latch engaging means therein, anti-friction means for slidably supporting said channel shaped members on said rails, and latch mechanism extending across the space between said channel members and mounted in said registering openings for movement transversely of said seat structure to engage with the latch engaging means of said rails for latching said seat in selected positions of relative sliding adjustment.

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