Feb. 20, 1962 R. K. HAUSTED 3,021,534

ADJUSTABLE BED RAILS

Filed Dec. 24, 1958 2 Sheets-Sheet 1

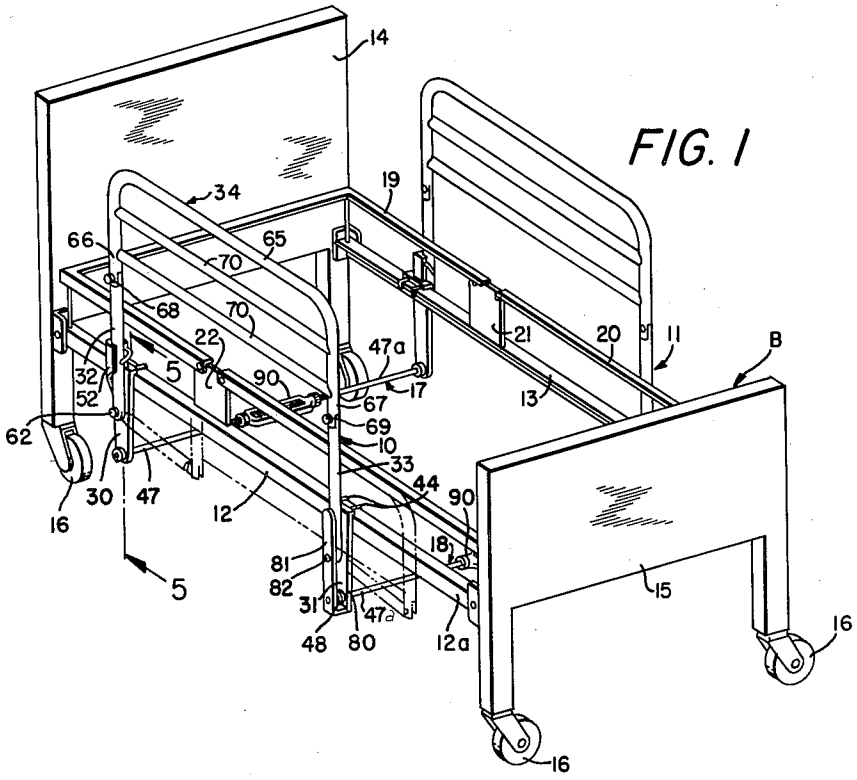


FIG. 1

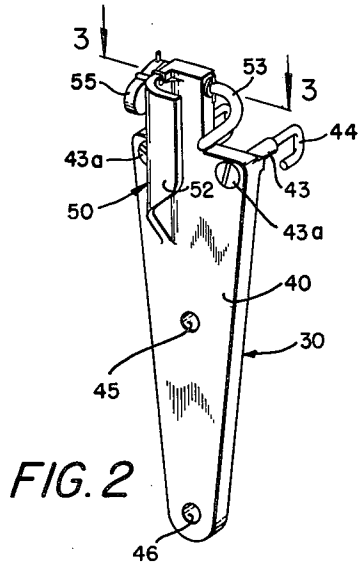


FIG. 2

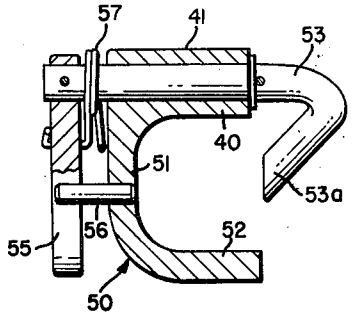


FIG. 3

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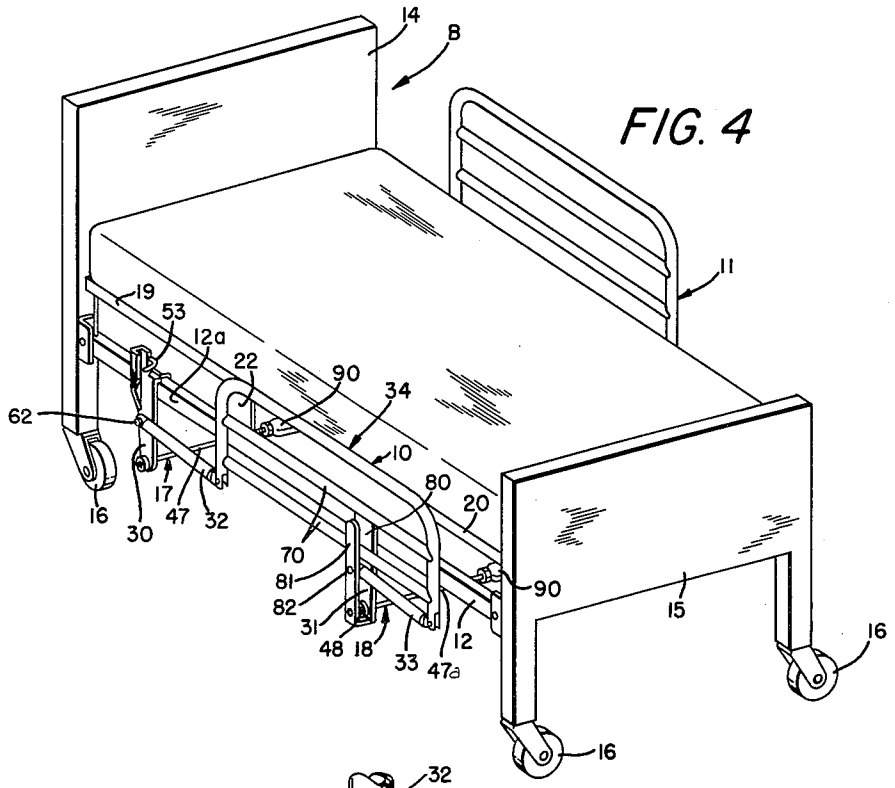


FIG. 4

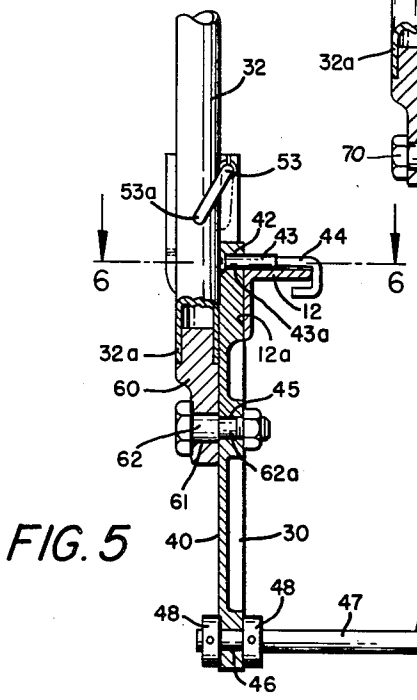


FIG. 5

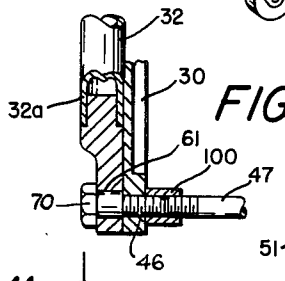


FIG. 7

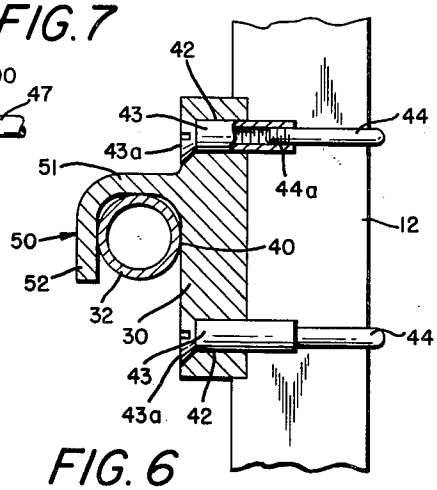


FIG. 6

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ADJUSTABLE BED RAILS

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7 Claims. (Cl. 5—331)

This invention relates to the art of bed construction and in particular has reference to improvements in adjustable bed rails that are used in connection with hospital beds for patient safety.

In the treament of a patient, it has oftentimes been found expedient to provide a fence or bed rail structure along the edges of the bed for the purpose of preventing the patient from falling out of bed.

The early prior art devices that are employed for this purpose features the use of rigid frame members that were clamped, when in use, to the side of the bed. While these devices obviously served the purpose for which the same were intended, the same were disadvantageous in that they made it difficult to treat the patient and also caused considerable difficulty during the changing of the sheets or blankets on the bed.

Accordingly, the art next developed bed rail devices that were, in a sense, retractable so that the same could either be placed in an "up" position or could be moved to a "down" position, wherein the same would render the top surface of the bed easily accessible.

While several types and forms of retractable devices have been provided in this regard, the same have been universally characterized by one or more of the following disadvantages.

First, in several instances of prior art teaching, the bed rail mechanism is not movable through a vertical plane that is parallel to the edge of the bed. In such cases, it is necessary that the bed oftentimes be moved from its position against the wall in order to effectuate retraction of the device.

Secondly, in installing the known prior art devices it has been necessary to drill or cut the frame of the bed to permit bolting of the bed rail assembly thereto. Since the bed rails are subject primarily to occasional use interchangeably, there has been a natural reluctance to alter the bed structure, especially when it is remembered that the prior art bed rail assemblies cannot normally be interchangeably used between different beds in the same hospital.

Third and most important, all of the known prior art devices have been characterized by the fact that the same are unequipped to withstand force applied horizontally thereof. More specifically, it has been found that all prior art devices having retractable features have their use predicated on a pivotal movement of one type or another. While there is adequate support provided against accidental pivoting through the intended plane of movement, there has, in the past, been no adequate provision for withstanding force applied normal to the direction of intended movement.

As a result of this last-mentioned deficiency, the prior art devices have been unsatisfactory in that the same have been bent or deformed out of shape during usage.

It accordingly becomes the principal object of this invention to provide an improved type of bed rail assembly that is devoid of the above described disadvantages.

It is a more specific object of this invention to provide a bed rail assembly that is swingable through a vertical plane between "up" and "down" positions and which is provided with means for effectively withstanding horizontal force applied against the same when positioned in its "up" position.

It is still a further object of this invention to provide

an improved bed rail assembly that can be interchangeably attached to substantially all hospital beds without drilling or otherwise deforming the hospital bed in question.

It is a still further object of this invention to provide an improved type of bed rail assembly that is simple to operate and yet is low in cost.

These and other objects of the invention will become more apparent upon a reading of the following brief specification considered and interpreted in the light of the accompanying drawings.

Of the drawings:

FIGURE 1 is a perspective view of the improved bed rail assembly attached to a hospital bed, with the "down" position of one bed rail being illustrated in chain dotted lines.

FIGURE 2 is a perspective view of one of the adapter brackets employed in the improved bed rail assembly.

FIGURE 3 is a horizontal section taken on the lines 3—3 of FIGURE 2.

FIGURE 4 is a perspective view similar to FIGURE 1 but illustrating in full lines the position of one bed rail assembly in its "down" condition.

FIGURE 5 is a vertical section taken on the lines 5—5 of FIGURE 1.

FIGURE 6 is a horizontal section taken on the lines 6—6 of FIGURE 5.

FIGURE 7 is a horizontal section similar to FIGURE 6, but showing a different method of mounting.

Referring now to the drawings and in particular to FIGURE 1 thereof, opposed bed rail assemblies, generally designated by the numerals **10** and **11** are shown secured to the opposed side rails **12** and **13**, respectively, of a bed member B, with the bed member B including the usual head and foot frames **14** and **15** that are equipped in known manner with casters **16**, **16**, with the opposed bed rail assemblies **10** and **11** being interconnected by transversely extending tie rod assemblies **17** and **18**, as clearly shown in the drawings.

It is to be understood that the hospital bed illustrated includes the usual head frame **19** and thigh frame **20**, each pivoted to opposed standards **21** and **22**. However, these members, as well as the actuating mechanism for the same, forms no part of this invention and, accordingly, the means for moving the head and frame mechanism are omitted for the sake of clarity.

In view of the fact that the bed rail mechanisms **10** and **11** are of identical construction, with the exception that the adaptor brackets thereof are opposite hand, a detailed description will be undertaken only with regard to the bed rail assembly **10**, it being understood that the bed rail assembly **11** will be constructed in similar fashion.

From the standpoint of general description, the bed rail assembly **10** includes longitudinally spaced adaptor brackets **30** and **31**, to which are pivoted link arms **32** and **33**, with a fence **34** being, in turn, pivoted to the free end of the link arms **32** and **33**, as shown in FIGURES 1 and 4 of the drawings.

Referring next to FIGURE 2 for a detailed consideration of the bracket **30**, it will be seen that the same includes an elongate base portion **40** having a flat planar surface **41** (FIGURE 3) that is designed for coplanar engagement with the surface **12***a* of the side rail member **12**, with this condition of coplanar abutment being best illustrated in FIGURE 5 of the drawings.

In the preferred embodiment of the invention shown herein, the side rail **12** is shown as being right angle in configuration and, accordingly, for the purpose of clamping the bracket **30** thereagainst, the base portion of bracket **30** includes a pair of counter-sunk apertures **42**, **42** through which cylindrical members **43**, **43** may be

received, with each member **43** being internally threaded as shown in FIGURE 6 for reception therein of the threaded end **44***a* of a hook member **44**. In this fashion, upon rotation of the head **43***a*, the hook **44** can be drawn over one leg of the rail **12** and tightened thereagainst so as to firmly affix the bracket **30** with respect to rail **12** without the necessity of drilling the same.

In addition to the aforementioned component parts, the base **40** also includes apertures **45** and **46**, with aperture **45** being shown being preferably disposed adjacent the central portion of base **40** for pivotally mounting the arm **32**, while aperture **46** is preferably disposed adjacent the lower opposed longitudinal edge of the member **40** for the purpose of receiving the tie rod **47**, with bolts **48, 48** serving to fix the member **47** against axial shifting relatively of bracket **30**.

Referring next to FIGURES 2 and 3, it will be seen that the upper longitudinal end of base **40** further defines a U-shaped pocket that is indicated generally by the numeral **50**, with base **40** serving to define one side wall of the bracket **50**, while the bottom wall **51** and opposed sidewall **52** thereof are defined by an integral projection from the base **40**, as clearly shown in FIGURE 3 of the drawings. A pin **53** is shown rotatably journaled in an extended portion of base **40**, with the pin **53** being secured at one end thereof to an actuating lever **55** that is urged against a pin **56** by spring **57**. In this fashion, the spring **57** will normally urge the contoured end **53***a* of pin **53** across the opening of pocket **50**. However, upon rotation of pin **53**, as by movement of handle **55** downwardly (FIGURE 2), the offset portion **53***a* will be pivoted out of the conditon shown in FIGURE 3, whereby access to the pocket **50** may be had for the purpose of receiving or releasing the link arm **32**.

It has been previously indicated that the link arm **32** is pivoted with respect to the bracket **30** so as to be movable into and out of the pocket **50**. Accordingly, the lower end **32***a* of link arm **32** is shown fitted over a bracket **60**, with bracket **60** being apertured, as at **61**, for reception around a bolt **62**, with the reduced diameter portion **62***a* of the bolt being received in aperture **45** as clearly shown in FIGURE 5 of the drawings.

Turning next to the consideration of the frame member **34**, it will be seen that the same includes a base **65**, that is of generally U-shaped configuration so as to define opposed legs **66** and **67** that are respectively pivotally connected to arms **32** and **33** by pin members **68** and **69**, with the usual type of pivotal connection being illustrated at this point. Rails **70, 70** are illustrated as extending transversely of the member **34** for connection with the opposed legs **66, 67**, as shown in FIGURES 1 and 4 of the drawings.

Turning next to the consideration of the construction of the bracket **31**, it will be first noted that the same includes a base **80** that is of generally the same outline configuration of the previously described base **40** of the bracket **30**, with base **80** thereof serving to seat another set of hook arms **44, 44** in the same fashion as was previously described. The lower portion of the base **80** is provided with an appropriate aperture for receiving the rod member **47***a* of tie rod assembly **18**.

The construction of the bracket **31** differs from the construction of bracket **30**, however, with regard to the provisions of an elongate frame member **81** that longitudinally overlies the base **80** and projects therefrom as shown in FIGURE 1 of the drawings. In this regard, the lower end of link arm **33** is pinned through the frame member **81** and the base **80** by use of a pin **82** as shown in FIGURE 1.

In this manner and when the arms **32** and **33** are locked in the vertical position shown in full lines in FIGURE 1, the surfaces **52** and **81** of brackets **30** and **31**, respectively, provide support against horizontal force applied against either the frame **34**, or arms **32** and **33**. Similarly, when the device is retracted, as shown in FIGURE 4,

support against horizontal distortion is provided for by the positioning of lower rail member **70** between the frame member **81** and the base **80**.

With regard to the construction of the tie rod assembly it is believed obvious that turn buckles **90, 90** are employed to draw the ends of rod members, such as rods **47** and **47***a*, axially of each other, whereby the brackets may be drawn towards each other due to the provision of the bolts **48, 48**.

In assembly of the device for operation, it is preferable to first loosely position the brackets **30** and **31** on the side rail **12**, for example, with such preliminary positioning first being effectuated by axially extending the hooks **44, 44** so that the same may be passed over the rail **12**. At this time, the links **32** and **33** may be pivotally secured to the legs **66** and **67**, whereupon the ends of the link arms **32** and **33** may be respectively positioned on brackets **30** and **32** by merely inserting pins **62** and **82** through the ends of the same, as has been explained. When this condition has been achieved, the head **43***a* of the cylinder may be turned, for example, with a screw driver to draw the hooks tightly over the bed rail **12** and upon insertion of the rods **47, 47** and **47***a*, **47***a* into turn buckles **90, 90**, the opposed members **30, 30**, for example, may be drawn together upon operation of the turn buckle.

With the device ready for use and assuming the same to be in the "down" position of FIGURE 4, it is merely necessary that the operator exert a vertical lifting force on member **65**, at which time the arms **32** and **33** will pivot in unison about the brackets **30** and **31**, respectively. As the link arm **32** approaches vertical, the same will strike the inclined edge of the contoured end **53***a* and, as further movement towards vertical continues, the pin **53** will be cammed around its axis against the force of spring **57**, whereupon the arm **32** can pass into the pocket **50**. Upon passing into the pocket **50**, it is believed apparent that the device will be in the "up" position of FIGURE 1, with the spring **57** having returned the hook end **53***a* to a position over the mouth of pocket **50** so that the link arm **32** is, in effect, locked within the pocket **50**.

During the just-described movement, the arm **33** will also have been moved into a position between the frame member **81** and the base **80**, with the result that the members **52** and **81** will serve to withstand horizontal force applied thereagainst, with pivoting around pin **62** being resisted by the hook end **53***a*.

When it is desired to release the bed rail assembly, it is merely necessary that the lever **55** be pushed so that the arm **53***a* is pivoted out of its position of restriction over the opening of pocket **50**, at which time the arms **32** and **33** may pivot about the brackets **30** and **31**, respectively, to cause lowering of the unit to the position of FIGURE 4.

In FIGURE 7 of the drawings, the component parts have been assembled so that both the tie rod **47** and the link arm **32** are secured and pivoted with respect to the common lower aperture **46**. To facilitate this, the end of the tie rod **47** is threaded as is the pin **62**, with coupling **100** interconnecting these parts as shown in FIGURE 5.

In this fashion, the overall height of the rail assembly above the bed frame will be decreasing. It follows that if it were desired to increase the amount of projection of the bed rail assembly over the mattress, that the arm **32** and tie rod **47** could both be positioned with respect to the upper aperture **45** in the same fashion.

Likewise, the invention contemplates a lower type of mounting of the arm **32**, for example, with respect to either bracket. This condition is shown to some extent in FIGURE 7 where a bolt **70** is shown passing through both the opening **61** of the bracket **60** and the opening **46** that appears in the lower end of the member **30**. The bolt is shown as being of sufficient length to enter and threadingly engage the internal wall of a threaded

boss 100 that projects from the rear side of the member 30 as shown in FIGURE 7, with the extreme end of the tie rod 47 also being received therein in close adjacency with the inserted end of the bolt 70 as shown in FIGURE 7.

It will be seen from the foregoing that there has been provided a new and improved type of bed rail assembly, having particular utility and use in connection with hospital beds. It has been shown how the device is simple in operation and yet is durable due to the provision of means that resist, at all times, horizontal displacement of the unit.

While a full and complete description of the invention has been set forth in accordance with the dictates of the patent statutes, it is to be understood that the invention is not intended to be so limited.

Accordingly, where appropriate modifications of the invention may be resorted to without departing from the spirit hereof or the scope of the appended claims.

What is claimed is:

1. A swingable bed rail assembly for use on the side rails of a bed structure, comprising; first and second adaptor brackets secured to said side rails; a pair of link arms pivoted to said brackets and being swingable through a vertical plane; and a rigid frame of generally quadrilateral configuration; said frame having adjacent corner portions that are pivoted to the free ends of said link arms whereby said opposed sides of said frame may be moved into and out of position in alignment with said link members upon relative pivotal movement therebetween; at least one said bracket having a U-shaped pocket within which said link arm pivoted thereto may be received when the same is in alignment with an opposed side of said frame.

2. The device of claim 1 further characterized by the presence of means that are tensionally urged across the opening of said U-shaped bracket to restrict removal of said link arm from said condition therein.

3. A swingable bed rail assembly for use on the side rails of a bed structure, comprising; first and second adaptor brackets secured to said side rails; a pair of link arms pivoted to said brackets and being swingable through a vertical plane; and a rigid frame of generally quadrilateral configuration; said frame having adjacent corner portions that are pivoted to the free ends of said link arms whereby said opposed sides of said frame may be moved into and out of position of longitudinal alignment with said link members upon relative pivotal movement therebetween; at least one said bracket having a U-shaped pocket within which a portion of said frame may be received when an opposed side thereof is out of longitudinal alignment with one said link arm.

4. A swingable bed rail assembly for use on the side rails of a bed structure, comprising; first and second adaptor brackets secured to said side rails; a pair of link arms pivoted to said brackets and being swingable through a vertical plane; and a rigid frame of generally quadrilateral configuration and having opposed sides; said frame having adjacent corner portions that are pivoted to the free ends of said link arms, whereby said opposed sides of said frame may be moved into and out of a position of longitudinal alignment with said link members upon relative pivotal movement therebetween; at least one said bracket including a support surface that overlies a portion of said frame during the period that said opposed side portion of said frame is out of longitudinal alignment with one said link arm; said support surface supporting said frame against lateral forces during the period that the same overlies said frame.

5. A swingable bed rail assembly for use on the side rails of a bed structure, comprising; first and second brackets secured to one said side rail in longitudinally spaced relationship; first and second link arms respectively pivoted to said brackets and being swingable through a vertical plane; a rigid frame of generally quadrilateral configuration; said frame having corner portions that are respectively pivoted to the free ends of said first and second link arms, whereby said frame may be moved between elevated and lowered positions upon pivoting of said arms relatively of said brackets; first support means carried by one said bracket and overlying one said link arm when said frame is in said elevated condition; second support means carried by one said bracket and overlying said frame when the same is in lowered position, whereby said first and second support means respectively support said bed rail assembly against lateral forces while the same is in its elevated and lowered positions.

6. An adaptor bracket for mounting bed rail assemblies on a bed that has opposed side rails, comprising; an elongate flat plate having opposed longitudinal ends and being apertured substantially intermediate said longitudinal ends; a link arm pivotally secured with respect to said aperture and being swingable through the plane of said flat plate; an elongate auxiliary support plate fixed with respect to said flat plate in longitudinally coextensive relationship therewith; said support plate being in spaced substantially parallel relationship to said base plate and longitudinally overlying said link arm when the same is in coextensive alignment with said flat plate, whereby opposed portions of said link arm will be disposed adjacent said base plate and said auxiliary support plate during the period that said link arm is longitudinally coextensive with said base plate and said support plate; and spring loaded locking means coacting between said link arm and one said plate member; said spring loaded locking means permitting pivotal movement of said link arm into coextensive alignment with said base and support plates; said spring loaded locking means retaining said link arm in said coextensive alignment and being releasable to permit pivotal movement of said link arm out of said position of coextensive alignment.

7. A bed structure of the character described, comprising; a head portion; a base portion; opposed side rails disposed in substantially parallel relationship and interconnecting said head and base portions; a pair of brackets respectively secured to said opposed side rails in transversely aligned relationship; at least one arm member having its end pivoted to a central portion of at least one said bracket and being pivotal through a vertical plane between elevated and lowered positions; at least one support means carried by at least one said bracket and overlying said link arm at a point above said point of pivotal connection thereof, with said bracket, when said link arm is in said elevated position, whereby said support means support said link arm against forces applied transversely of said side rails; first and second tie rods respectively rigidly connected to said brackets at a point beneath said point of pivotal connection thereof with said link arm, with said tie rods projecting towards each other; and connecting means connecting the projecting ends of said tie rods and being operable to draw the same towards each other, whereby a rigid connection between said brackets is effectuated by said tie rods and said connecting means.

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