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ADJUSTABLE BED RAIL UNIT

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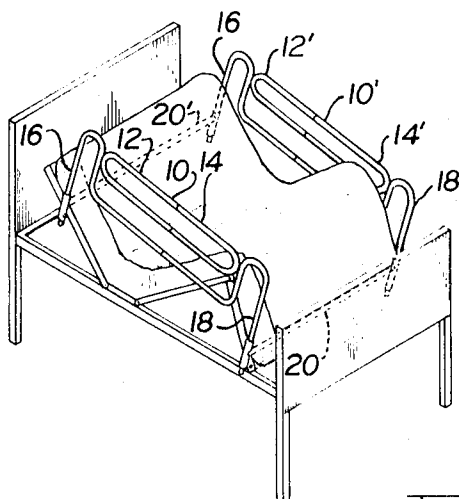


Fig. 1

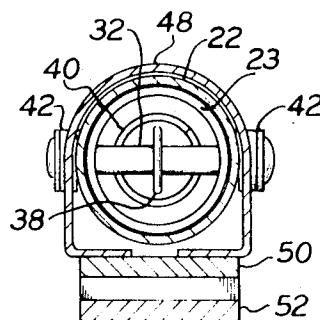


Fig. 5

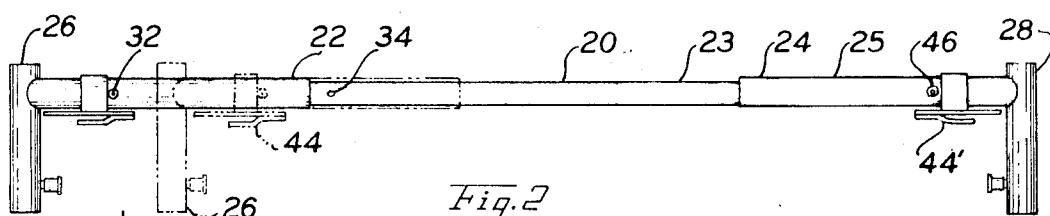


Fig. 2

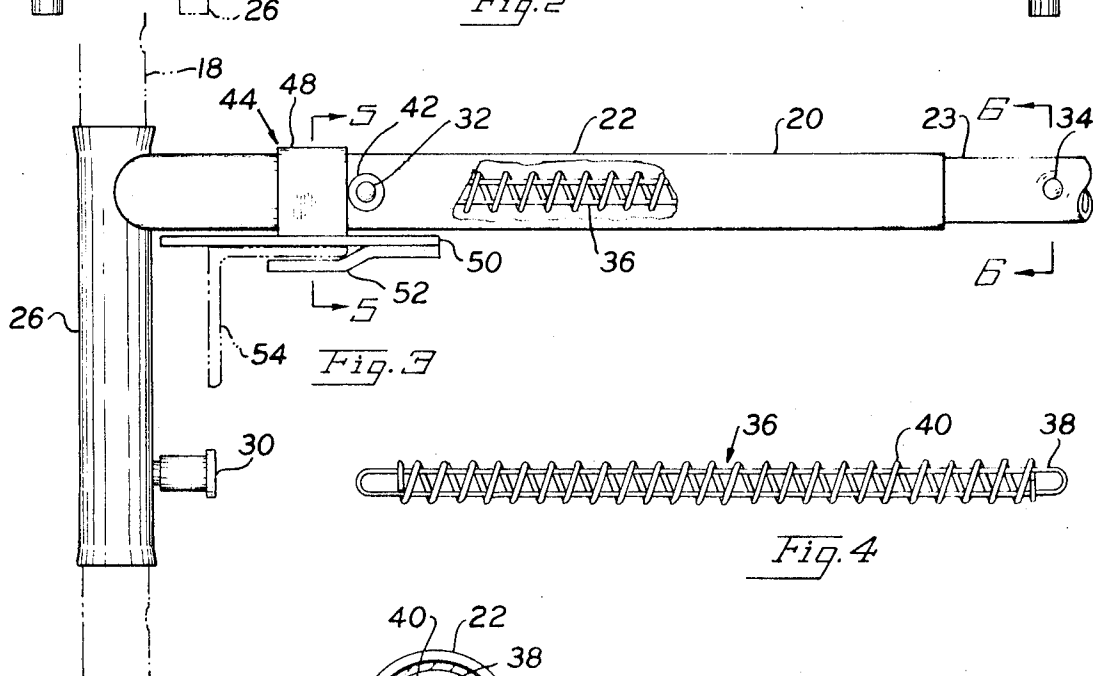


Fig. 3



Fig. 4

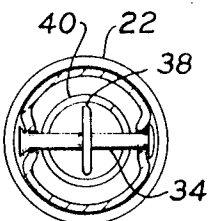


Fig. 6

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ADJUSTABLE BED RAIL UNIT

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8 Claims

ABSTRACT OF THE DISCLOSURE

A guard rail unit for hospital beds or the like including an adjustable spring-loaded frame assembly for mounting on differently sized bed frames. The frame assembly includes a guide and clamping device for quick assembly and release from the bed.

This invention relates to guard rails for use in connection with hospital or other beds for retaining an occupant of the bed against accidental displacement. More particularly, the present invention relates to guard rails of the character described including a telescoping frame construction adapted to secure the guard rails and frame to the mattress support frame of a bed in an adjustable and readily releasable manner.

Adjustable guard rails and frames for securing the rails to hospital beds or the like are widely known and used in hospitals, nursing and private homes. For example, in Patent 3,089,152, the guard rail and frame units consist of a pair of telescoping guard rails which are adapted to be adjustably positioned along the edges of the bed. The guard rails are connected or fastened to crossheads which form part of telescoping frame structural members adapted to secure the guard rails to the bed or mattress supporting frame. The telescoping frame structural members are longitudinally adjustable through the use of a plurality of spaced apertures in one of the members, which are selectively engaged by a spring actuated button or pin located in the other telescoping member. The telescoping members incorporate suitable clamping devices in order to secure the guard rail and frame unit to the bed or mattress support frame.

Although the aforementioned guard rail constructions have been proven to be generally satisfactory, they are subject to limitations and disadvantages, which to a considerable extent, affect their use in their intended field of application. Thus, for example, the prior art guard rail units are generally difficult to adjust when mounted on different width or size bed frames. That is, the guard rail units of the type described in Pat. 3,089,152 do not readily clamp onto the bed or mattress supporting frames without extensive manipulation of the guard rail frames, and in addition, require cumbersome fastener devices to retain them in mounted position on the bed frames. In essence, the presently used guard rail units are relatively difficult to adjust, mount and dismount from variously dimensioned bed frames without extensive movement or manipulation.

The guard rail unit, according to the present invention, obviates the disadvantages and drawbacks encountered in the prior art by providing a novel and unique guard rail and telescoping frame assembly adapted to be installed on and secured in a simple manner to a bed frame or mattress support frame. Essentially, the novel frame, according to the invention, contemplates the use of telescoping frame members which incorporate a tension spring adapted to exert a continuous longitudinal expansive force on the frame members. The telescoping members also include novel guide plates and clamping plates adjacent to their spaced ends which, under the urging of the

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tension spring, will readily clamp and secure the frame and guard rail unit onto a bed or mattress supporting frame by means of a simple manipulation, and without the need for extensive adjustment of the frame. The frame also includes a pin arrangement for mounting the tension spring, whereby one of the guide plates, during dismounting of the frame members from a bed, is adapted to contact one of the pins so as to exert a compressive force on the spring and on the frame members. Another feature of the present invention lies in that the telescoping frame members, and the guard rail supporting crossheads at their ends, are rotatable relative to one another so as to facilitate almost unlimited movement or adjustment of the guard rail installation.

Accordingly, it is a primary object of the present invention to provide for a novel and improved bed guard rail and frame assembly.

Another object of the present invention is to provide for a novel spring-loaded telescoping frame arrangement for bed guard rails.

A further and more specific object of the present invention is to provide a novel spring-loaded guard rail telescoping frame incorporating guide plate and clamping plate means for readily securing and dismounting the guard rail unit on a bed frame or mattress supporting frame.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, in which:

FIG. 1 is a diagrammatic perspective view of a hospital bed, illustrating the mounting of a guard rail unit according to the present invention;

FIG. 2 is a front elevational view of the guard rail frame according to the present invention;

FIG. 3 is an enlarged detail view, partially in section, of the frame showing the connection of one of the frame members with a guard rail and the clamping engagement with a bed mattress supporting frame;

FIG. 4 is a detailed view of the tension spring of the frame;

FIG. 5 is a sectional view along line 5—5 in FIG. 3; and

FIG. 6 is a sectional view along line 6—6 in FIG. 3.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is illustrated a bed guard rail assembly, shown mounted on a hospital bed, which includes a pair of side rails 10, 10'. Each rail has a telescoping small diameter end 12, 12' and a large diameter end 14, 14' which are formed, respectively into depending apertured posts 16 and 18.

The rails 10, 10' are adapted to be supported by a pair of frames 20, 20'. The frames 20 each comprise, as shown in FIGS. 2 and 3 of the drawings, frame members 22 and 24 which have, at their ends, tubular crossheads 26 and 28 respectively. Adjustably positioned within the crossheads 26 and 28 are the guard rail apertured posts 16 and 18. All of the crossheads may have the usual standard pull-out spring-pin key members 30 adapted to selectively engage the longitudinally spaced apertures in the posts 16, 18. The frames 20, 20' may be substantially identical, except that the crossheads of one may be dimensioned smaller to receive snugly the smaller diameter posts 16, and the other frame crossheads are dimensioned larger to snugly receive the larger diameter posts 18.

The frame member 24 is comprised of a tubular member 23 which is secured to an outer telescoping tubular member 25 by means of a pin 46 which also acts as a stop in a manner to be hereinafter more fully described.

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The frame member 22 telescopes over member 23 and is of tubular construction and substantially the same as member 25. As shown in FIGS. 3, 5 and 6, a pin 32 extends through frame member 22, and a pin 34 extends through member 23. A tension spring assembly 36 extends longitudinally through the members 22, 23 between pins 32, 34. The tension spring assembly 36, as illustrated in FIG. 4, includes an elongate closed loop 38 having one end looped about pin 32 and the other end looped about pin 34. This, in effect, will limit the expansion of the frames 20, 20' to the extent defined by the maximum distance between pins 32, 34 in the loop 38. A coiled tension spring 40 is positioned about loop 38 for substantially its full longitudinal length so as to exert a continuous separating force on pins 32, 34 and thereby maintain the frames 20, 20' in their widest extended position.

The pin 32 in frame member 22 extends radially outwardly of the frame member so as to form a stop or limiting contact 42 for a guide assembly 44 mounted on the frame member 22 between the pin 32 and crosshead 26. The pin 46 which secures the members 23 and 25 together also extends through the outer telescoping member 25 in order to form a stop for a guide assembly 44'.

As shown, each of the guide assemblies 44 or 44' includes a U-shaped clamp or bracket 48 adapted to loosely slide on the member (22 or 25) between the pin and crosshead. A flat guide plate 50 is welded, or suitably fastened, to the leg portions of bracket 48. A bent clamp-plate 52 is fastened to the plate 50 so as to form essentially a clevis or clamping fixture between plates 50 and 52.

When it is desired to position the frames 20 or 20' on a typical bed, the guide assembly 44' may first be installed to a frame or mattress supporting frame 54. That is, the frame 54 is wedged between plates 50 and 52 of the guide assembly 44'. The frame member 22 is then longitudinally compressed until the frame 54 may be wedged between the plates 50 and 52 of the guide assembly 44. At this time the lower surface of guide plate 50 of each of the guide assemblies 44, 44' is permitted to rest upon the bed frame 54. As the compressive pressure on telescoping members 22 is released, the force of tension spring 40 will cause the frame members 22, 24 to expand relative to each other. The pins 32, 46 will now contact the brackets 48 on guide assemblies 44, 44' and push them apart as the frame members 22, 24 expand. This, in effect, will cause the bed frame 54 on each side of the bed to be firmly clamped between guide plate 50 and clamp-plate 52, since the spring 40 will maintain a continuous expanding force on the guide assemblies 44, 44'. From the foregoing, it becomes evident that the frame 20, 20' and the guide rails may be assembled on a bed frame and locked thereto by means of a simple sliding motion.

In order to readjust or dismount the frame 20, 20' from the bed frame 54, it is only necessary to impart a force to the crossheads in opposition to the force of tension spring 40. This will cause the frame members 22, 24 to telescope. The crosshead will then contact the end of guide plate 50 (which is prevented from moving longitudinally by the bracket 48 contacting the respective stop pin 32 or 46) and slide the latter off the bed frame 54, thereby dismounting the frame from the bed.

Since the frame members 22, 24 are interconnected by a flexible loop 38, it becomes evident that the frame members and their crossheads are rotatable relative to each other. This will afford the guide rail assembly an extremely large latitude in adjustment when mounted on a bed frame.

Although the telescoping frame member 24 is here illustrated as being composed of a large tubular frame member 25 which is fastened to a smaller diameter tubular member 23 for telescoping into frame member 22, it is apparent that the frame member 24 may be formed from a single tubular member.

The foregoing disclosure relates to only a preferred

embodiment of the invention, and is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of disclosure which do not constitute departures from the spirit and scope of the invention.

The invention claimed is:

1. In an adjustable bed guard rail apparatus of the type adapted to be secured to a mattress or spring frame of a bed and having a pair of side guard rails, the rail ends each include depending posts, and a pair of frame members each comprising movable tubular telescoping members having a crosshead at each end of said frame member, which is adapted to receive one of said depending posts, the improvement comprising:

15 biasing means coupled between said movable telescoping members to exert a longitudinal expansive force thereon,

a stop means extending transversely and exteriorally on each of said movable telescoping members,

20 a guide clamping means slidably mounted on each end of said frame members adjacent said cross head, whereby each of said external stop means transmits said longitudinal expansive force of said biasing means to a respective one of said guide clamping means to cause each of said guide clamping means to secure to said frame when said guard rail apparatus and guide clamps are placed on said frame.

2. The bed guard rail apparatus as recited in claim 1 wherein said guide clamping means comprises:

a support clamp loosely surrounding at least a portion of the circumference of said moveable telescoping member,

a generally flat guide plate fastened to said support clamp, the lower surface of said guide plate being adapted to contact the upper surface of said mattress frame and

a clamp plate mounted on the lower surface of said guide plate in a closely spaced relationship whereby the upper surface of said clamp plate is adapted to engage the lower surface of said mattress frame.

3. The bed guard rail apparatus as recited in claim 2 wherein said spaced relationship between said guide plate and said clamp plate is wedge-shaped.

4. The bed guard rail apparatus as recited in claim 1 wherein said biasing means comprises:

a first pin secured to the outer moveable telescoping member,

a second pin secured to the inner moveable telescoping member and

50 a spring means interconnecting said pins thereby exerting said longitudinal expansive force on said moveable telescoping members.

5. The bed guard rail apparatus as recited in claim 4 wherein said first pin has end portions extending exteriorally of said outer moveable telescoping member thereby forming a portion of said stop means.

6. The bed guard rail apparatus as recited in claim 4 wherein said spring means includes an elongated closed loop member, the ends of said loop member each engaging respectively one of said pins so as to restrict the expansive motion of said moveable telescoping members, and

a tension spring comprising a coiled spring extending about said loop member and being adapted to exert a longitudinally expansive force on said pins and on said moveable telescoping members.

7. The bed guard rail apparatus as recited in claim 4 wherein said inner telescoping member is comprised of two telescoping tubes permanently fastened together at one end, the outer one of said tubes being substantially identical to said outer telescoping member and the inner one of said tubes having said second pin secured at a point remote from the fastening of said tubes.

8. The bed guard rail apparatus as recited in claim 7 wherein said tubes are fastened together with a third pin

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extending through said outer tube and having end portions extending exteriorally of said outer tube thereby providing a portion of said stop means for said guide clamping means.

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