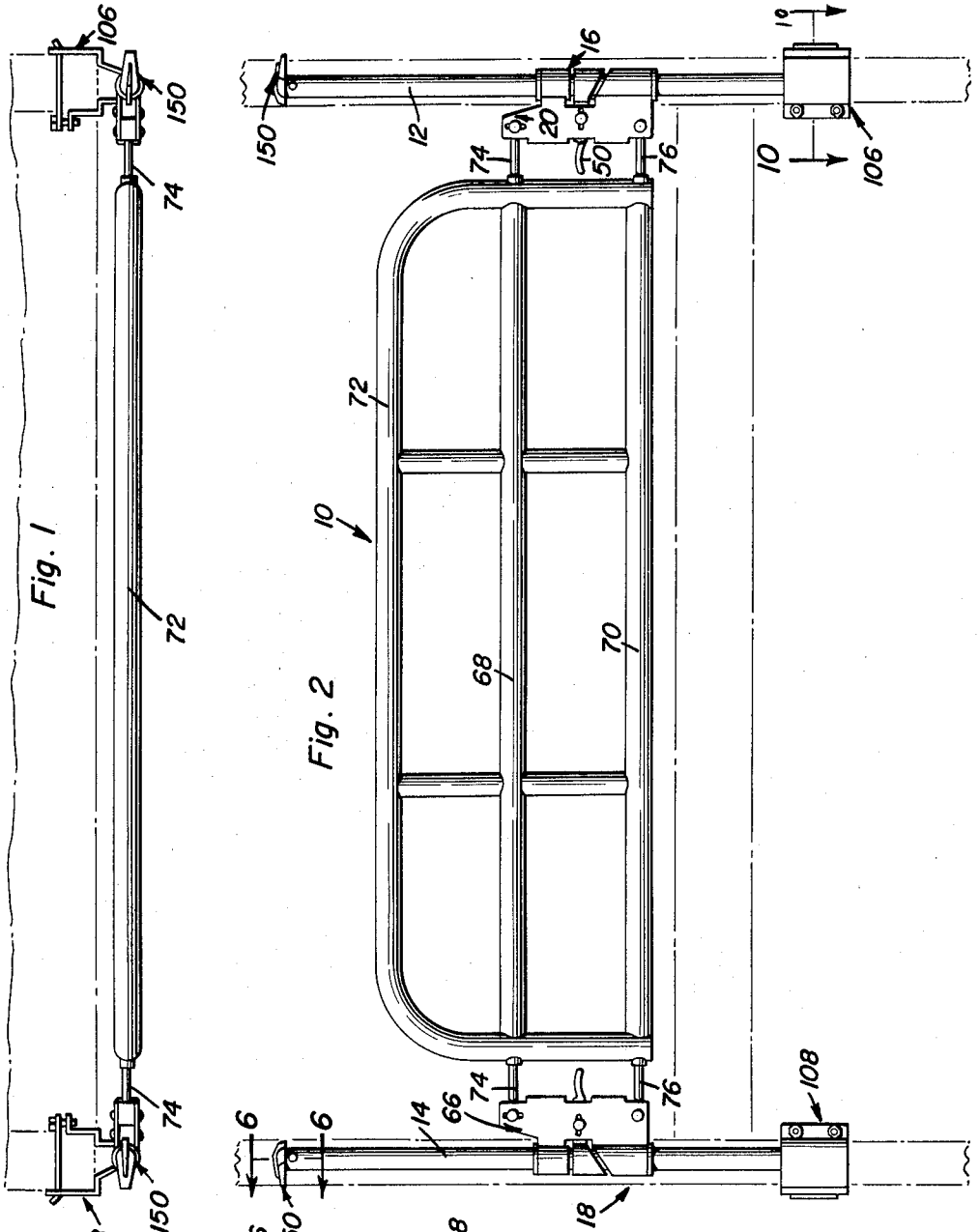
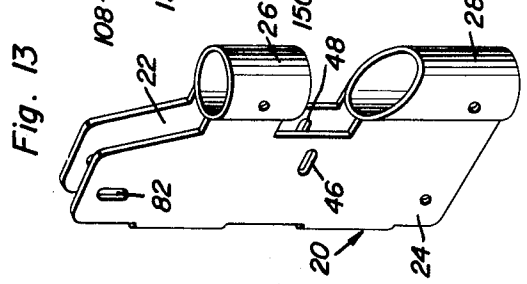
Nov. 30, 1965 R. D. DEWEY 3,220,023

HOSPITAL BED SAFETY SIDE RAILS

Filed June 25, 1963 3 Sheets-Sheet 1




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HOSPITAL BED SAFETY SIDE RAILS

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Fig. 3

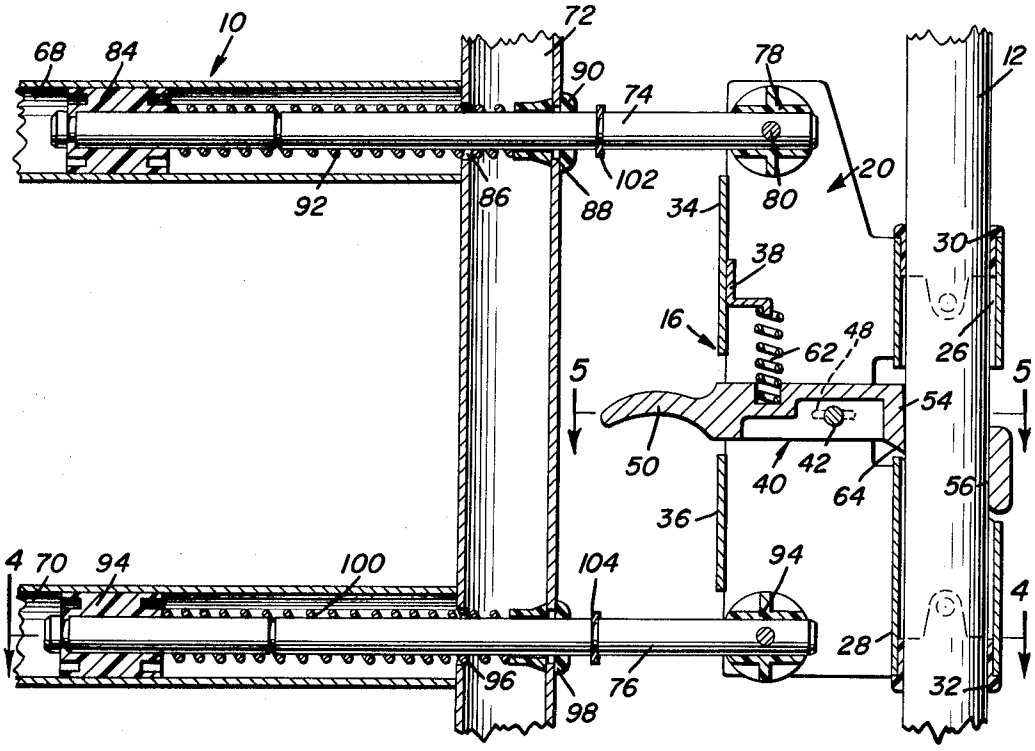



Fig. 4

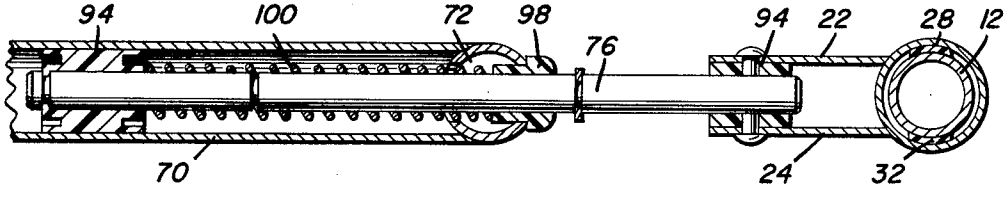
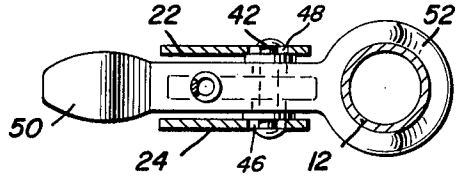



Fig. 5




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Fig. 6

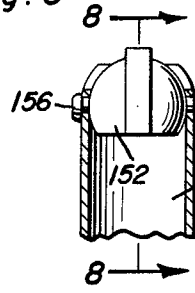



Fig. 3A

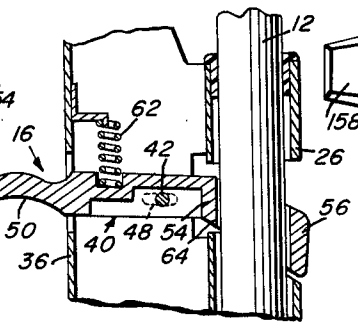



Fig. 7

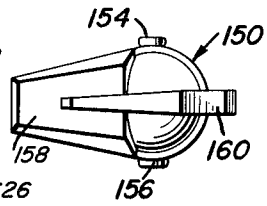



Fig. 8

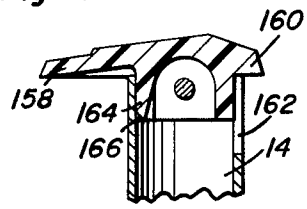



Fig. 9

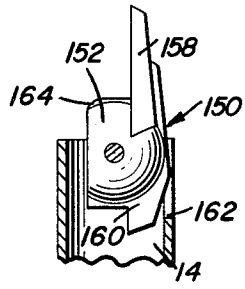



Fig. 10

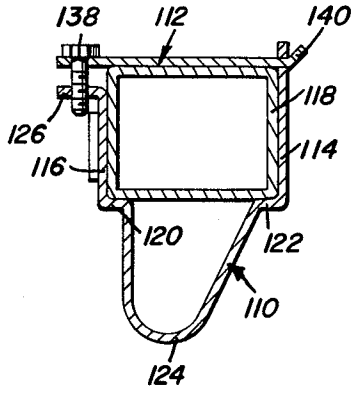



Fig. 11

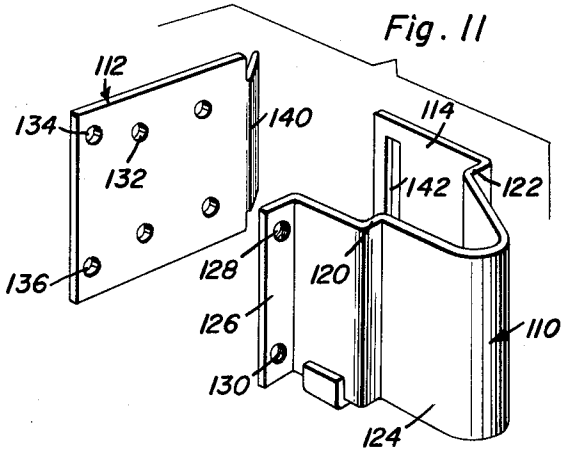
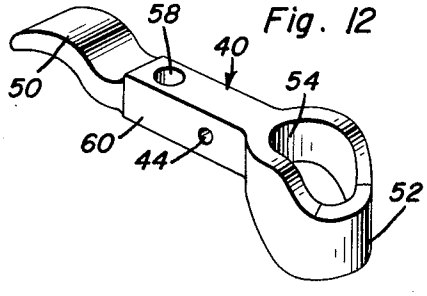



Fig. 12




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3,220,023

# HOSPITAL BED SAFETY SIDE RAILS

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8 Claims. (Cl. 5—331)

This invention primarily relates to a side rail attachment for hospital beds whereby the rail is readily and easily adapted to be adjusted or removed with respect to the bed.

It is an object of this invention to provide a safety side rail for a hospital bed wherein each end of the rail may be adjusted independently with respect to the bed.

A further object of this invention resides in the provision of a novel friction lock for ensuring that the rail is held in its adjusted position. This provides a safety factor built into the rail in that the rail cannot be dropped accidentally upon release of the friction lock.

Still another object of this invention resides in a safety rail of the character indicated wherein the length of the rail may be adjusted within limits.

Yet another object of this invention resides in the provision of a mounting bracket for mounting the side rail supports upon the bed wherein the complete rail assembly may be removed from the bed and relocated if desired.

Still another object of this invention resides in the provision of means on top of the rail supports for preventing removal of the rail from the supports but which may be moved to such a position so as to allow the rail to be removed without its support.

A final object of this invention resides in the fact that all movement of the safety side rail with respect to the bed has been rendered noiseless wherein the patient in the bed will not be disturbed.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part thereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a top plan view of the safety side rail attachment and supports therefor comprising the subject matter of the instant invention.

FIGURE 2 is a side view in elevation of the safety side rail shown in FIGURE 1 and further illustrating its mounting upon the vertical bed posts of a hospital bed.

FIGURE 3 is a fragmentary sectional view through the center of the side rail shown in FIGURE 2.

FIGURE 3A is a partial sectional view similar to a portion of FIGURE 3 showing the lock means in a release position.

FIGURE 4 is a fragmentary sectional view taken substantially along the plane indicated by the line 4—4 of FIGURE 3.

FIGURE 5 is a sectional view taken substantially along the plane indicated by the line 5—5 of FIGURE 3.

FIGURE 6 is a view partially in section taken along the plane indicated by the line 6—6 of FIGURE 2 and partially in end elevation to illustrate the spherical stop pivoted in the top of the rail support.

FIGURE 7 is a top plan view of the stop illustrated in FIGURE 6.

FIGURE 8 is a fragmentary sectional view taken substantially along the plane indicated by the line 8—8 of FIGURE 6.

FIGURE 9 is a view similar to FIGURE 8 but showing the stop in side elevation and in a position whereby the side rail may be removed from its support.



FIGURE 10 is a sectional view taken substantially along the plane indicated by the line 10—10 of FIGURE 2 and illustrating the means for mounting the rail support upon the bed posts of the bed.

FIGURE 11 is an exploded perspective view of the components of the mounting means shown in FIGURE 10.

FIGURE 12 is a perspective view of the friction lock used to retain the side rail upon its support.

FIGURE 13 is a perspective view of one of the mounting brackets for use in mounting the side rail upon its support.

Referring now to the drawings in detail, a safety side rail **10** is shown mounted for vertical sliding movement upon a pair of supporting posts **12** and **14** mounted upon the bed posts of a hospital bed indicated in phantom in FIGURES 1 and 2. Each end of the side rail **10** is adapted to be slid upon its supporting post independent of any movement of the other end. To accomplish this purpose, each end of the rail **10** is mounted upon its supporting post by means of a mounting assembly generally indicated by the numerals **16** and **18**. Since the construction of the mounting assemblies **16** and **18** is identical, a description of the assembly **16** will suffice to indicate the operation of the device.

The assembly **16** comprises a bracket **20** which constitutes one link of a linkage system for raising and lowering each end of the side rail **10** independently. The bracket **20** comprises a pair of side plates **22** and **24** which are joined at one end by a pair of spaced cylindrical sleeves **26** and **28**. The sleeves **26** and **28** are adapted to encircle the support post **12** and have a sliding connection therewith. A pair of nylon bushings **30** and **32** cap each of the sleeves **26** and **28** respectively and render the sliding connection of the bracket **20** with the post **12** self-lubricating and noiseless. On the side opposite the sleeves **28** and **30**, the side plates **22** and **24** of the bracket **20** are joined by a pair of spaced web members **34** and **36**. Attached to the web member **34** and extending into the area between the side plates **22** and **24** is an L-shaped lug **38**. A friction lock which is generally designated by the numeral **40** is mounted by means of a pin **42** for pivotal movement between the side plates **22** and **24**. The pin **42** passes through an aperture **44** in the friction lock **40** and through a pair of slots **46** and **48** formed in the side plates of the bracket **20** so as to accommodate slight movement of the lock **40** transversely of the post as it is pivoted about the pin **42** between the positions shown in FIGURES 3 and 3A. The lock **40** comprises a friction-retaining means **52** at its other end. The friction-gripping portion is formed with oppositely facing friction-gripping surfaces **54** and **56** resepctively. A recess **58** formed in the central or connecting portion **60** of the friction lock **40** is adapted to receive a spring **62** whose other end is retained by the L-shaped lug **38** for biasing the friction-gripping surfaces **54** and **56** into engagement with the supporting post **12**. The friction-gripping surface **56** is formed by coring out a portion of the friction lock to provide a flat circular edge which may bite into the tubular post **12** tending to rock the lock **40** in a counterclockwise direction as viewed in FIGURE 3 in response to any downward movement of the bracket **20** with the pivot pin **42**. This biting action initiates the stopping, but the main holding power is carried out by the friction-gripping surface **54** which comprises a partially cylindrical hole cut on an angle just out from the centerline of the friction-retaining portion **52** of the lock **40**. Therefore, as the friction lock rocks counterclockwise as viewed in FIGURE 3 under the urging of the spring **62**, an angled edge **64** on the lower portion of the friction surface **54** causes the lock **40** to wedge around the supporting post **12**

while in the released position shown in FIGURE 3A, sliding clearance is established between the gripping surfaces and the post. Therefore, it will be appreciated that the friction lock **40** controls the motion of one end of the rail **10**. Lifting upwardly on the actuating trigger **50** connected to the lock **40** will compress the spring **62** to release the end of the rail being actuated so that it may be adjusted to any position. Release of the trigger **50** causes the rail to stop where desired. This provides an added safety feature in that the rail cannot be dropped accidentally upon its release for upon the release of the trigger **50** friction stops the rail's downward motion immediately.

As pointed out above, the bracket **20** of the mounting assembly **16** and the identical bracket **66** of the mounting assembly **18** constitute a pair of parallel links of the linkage system. The tubular components **68** and **70** of the rail **10** constitute the other pair of parallel links in the system. The tubular components **68** and **70** of the rail **10** are held in parallel relationship by means of a U-shaped tubular component **72**, rigidly attached to the ends of the components **68** and **70**. Extension rods **74** extend from each end of the tubular component **68** and are pivoted to the brackets **20** and **66** by means of nylon trunnions **78** journaled between the side plates of the brackets **20** and **66**. The trunnions **78** are carried by rivets such as **80** which also extend through the rods **74** and slots **82** in the side plates of the bracket. The other ends of the rods **74** are telescopically received within the ends of the rail components **68** and form a sliding connection therewith through means of nylon bushings such as **84**. The rods **74** extend through apertures **86** and **88** in the U-shaped component **72** of the rail **10**. A nylon guide cap **90** contained within the aperture **88** renders any movement of the rod **74** substantially noiseless. A coil sprnig **92** is adapted to encircle the rod **74** between the nylon bushings **84** and the guide cap **90** for urging the rail to a centered position between the support posts **12** and **14** at all times and further serves to align the adjusted ends of the rail **10**.

Similarly, a pair of rod extensions **76** are adapted to extend from the ends of the rail components **70** and are mounted between the side plates of the brackets **20** and **66** for pivotal movement by a pair of nylon trunnions such as **94**. As the rod **74**, the rod **76** at its end remote from its pivotal connection with the brackets **20** and **66** is telescopically received within the side rail component **70** and has a sliding connection therewith by means of a nylon bushing such as **94**. The rod **76** extends through apertures **96** and **98** in the U-shaped component **72** of the rail **10** and a spring such as **100** disposed between the bushing **94** and guide cap **98** tends to retain the rail **10** in a centered position.

It should be apparent that the pivotal connection of the extensions **74** and **76** between the side plates of the brackets **20** and **66** permit the brackets **20** and **66** to be moved vertically along the guide posts **12** and **14** respectively. The rail components **68** and **70** as well as the brackets **20** and **66** are maintained in parallel relation throughout their movement due to the fact that the length variations of the rail components **68** and **70** during the vertical movement of either the bracket **20** or **66** are taken up by rod extensions **74** and **76**. It should also be apparent, that due to the rod extensions **74** and **76**, the length of different hospital beds may be compensated for within adjustment limits defined by washers such as **102** and **104** carried by the rods **74** and **76** respectively.

The posts **12** and **14** are adapted to be mounted upon the vertical bed posts of a hospital bed by means of a pair of mounting brackets generally designated by the numeral **106** and **108** respectively. Referring specifically to FIGURES 10 and 11, it will be seen that each of the mounting brackets comprises a portion **110** and a clamping plate **112**. The portion **110** comprises a pair of arms **114** and **116** adapted to embrace the sides of a bed post such as **118**. Inturned shoulders **120** and **122** snugly abut against a third side of the bed post **118**. The offset portion **124** is adapted to receive the post **12** or **14**, as may be the case, and this connection may be made rigid by welding or the like. The arm **116** has an outturned flange portion **126** which has a pair of threaded apertures **128** and **130**. The plate **112** comprises a plurality of spaced apertures such as **132** by which said plate may be fastened to a fourth side of the bed post **118**. Apertures **134** and **136** formed adjacent an edge of the plate **112** are adapted to be aligned with the apertures **128** and **130** in the flange **126** and fasteners such as **138** are adapted to be threaded therethrough. At its end opposite the apertures **134** and **136**, the plate **112** has an offset camming tongue **140**. This tongue is adapted to extend through a slot **142** formed in the arm **114** of the portion of the bracket **110**. When the portions **112** and **110** of the bracket are placed about the bed post, and the fasteners **138** are tightened in an obvious manner, the camming tongue **140** will form an interference fit with the slot **142** which will cause extreme clamping pressure to be applied at the corner where the bracket is being secured. This method of securing gives exceptional holding power with only two bolts. The use of only two bolts and the simple clamping means just described allows the brackets to be removed and placed on another bed quite readily and simply. This contributes to the great flexibility of the rail.

Due to the great holding power exerted at the bottom of the support posts **12** and **14**, it should be appreciated that the tops of the supporting posts **12** and **14** are maintained free of any attachment means to the bed posts whereby the side rail attachment **10** may thus be removed completely from the supporting posts **12** and **14** and repositioned on another bed having the similar supporting posts already mounted thereon. However, to preclude accidental disengagement of either of the brackets **20** and **66** from the supporting posts **12** and **14**, a stop such as generally indicated by the numeral **150** is provided on the top of each of the tubular posts **12** and **14**. Referring to FIGURES 6–9, it will be seen that the stop **150** comprises a spherical body portion of molded plastic **152** which is disposed within the top end of said supporting posts and pivoted thereto by means of projecting rivets such as **154** and **156**. Projecting from each side of the spherical body portion **152** are a pair of lateral projections **158** and **160** adapted to overlie the top of the post and thereby prevent removal of one of the brackets **20** or **66**. The stop is adapted to be pivoted from the removal position shown in FIGURE 8 wherein the projections **158** and **160** overlie and close the top of the supporting post to a position as shown in FIGURE 9 wherein the brackets **20** and **65** may readily be removed from the supporting posts. In order to allow the requisite pivotal motion of the stop **150**, a groove such as **162** is formed in the top of the post to enable the projection **160** to pass through the post during its pivotal movement. It should also be noted that the spherical shape of the body portion **152** of the stop **150** provides for a minimum of interference of the stop with the interior of the tubular post. Furthermore, a resilient projection **164** is formed on the rear of the spherical body portion **152** for preventing accidental pivotal motion of the stop to the position shown in FIGURE 9. That is, the resilient projection **164** normally will bear against the inner surface of the tubular post and prevent pivotal motion. However, due to the resiliency of the projection **164**, that is, the flexibility of the plastic from which the stop is formed, upon the requisite pivotal motion the projection **164** may be compressed inwardly to clear the inner wall of the post. A camming surface such as **166** is also formed on the bottom of the projection **164** whereby upon the pivotal return of the stop from a position as shown in FIGURE 9, the projection is cammed inwardly to the position as shown

in FIGURE 8. It should also be noted that when the stop **150** is in the position as shown in FIGURE 8, dust is precluded from entering the interior of the posts **12** and **14**. Thus, when the side rail is slid up against this stop it will strike the projections **158** and **160** simultaneously and cause a direct upward pressure which the pins **154** and **156** will absorb. Upon pivoting of the stop **150** to a position as shown in FIGURE 9, the rail **10** can be readily removed from its supports and relocated on another bed.

To recapitulate the operation of the device, it should now be apparent, that each end of the hospital bed safety rail **10** may be independently adjusted by sliding it upon its supporting posts **12** or **14** by merely manually pressing upon the trigger **50** of the friction stop and manually moving the bracket **20** or **66** upwardly. Upon release of the trigger the bracket will be properly positioned upon the supports. Due to the linkage system incorporated in the assembly, the brackets **20** and **66** may be moved vertically at all times. Also, the rail is adapted to be adjusted in total length to fit various sized beds. The rail may be removed along with its supports and relocated quickly and easily upon a different bed by merely removing two of the bolts **138** on each of the mounting bracket assemblies. If desired, beds may be provided with the supporting post installations and the rail **10** alone may be relocated in the manner specified. It should thus be apparent that a safety side rail for a hospital bed has been provided which comprises a great degree of flexibility.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

**1.** A guard rail assembly for a bed having end posts comprising a pair of vertical supports secured to the end posts, a pair of brackets slidably mounted on said supports, friction lock means mounted by each bracket for engagement with the supports to independently lock each of said brackets in any vertical position on the supports, a rigid rail member, two pair of link elements slidably mounted by the rail member and extending therefrom, means pivotally connecting each pair of link elements to one of the brackets, centering means engageable with each of said link elements for urging the rail member to a centered position between the supports, actuating means mounted by said brackets and connected to the lock means for simultaneously releasing the lock means and displacing each bracket relative to the other against the bias of the centering means.

**2.** The combination of claim **1** wherein each of said supports is provided with a limit stop member, means pivotally mounting said stop member adjacent an upper end of the support for displacement between a stop position and a removal position, said stop member having a cap body portion closing said upper end of the support in the stop position of the stop member and a pair of oppositely directed projections extending from the cap body portion above the upper end of the support in the stop position of the stop member to prevent removal of the bracket from the support, said support being provided with a slot through which one of said projections passes when the stop member is displaced to the removal position.

**3.** The combination of claim **2** wherein said lock means comprises a lever element having a gripping portion engageable with the support, means movably mounting said lever element on the bracket for displacement between positions engaging and releasing the support and means biasing said lever element to the engaging position, said actuating means including a trigger element connected to the lever element for displacement thereof to the releasing position and exerting an upward force on the bracket.

**4.** The combination of claim **3** including means for securing the support to the end post comprising a plate member fastened to the support, a clamping member having an offset portion encircling the end post, a tongue projecting from one of said plate and clamping members, the other of said members having a slot receiving the tongue, and bolt means interconnecting said members for establishing a binding fit between the tongue and slot to augment clamping of the post and support between the plate and clamping members.

**5.** The combination of claim **1** wherein said lock means comprises a lever element having a gripping portion engageable with the support, means movably mounting said lever element on the bracket for displacement between positions engaging and releasing the support and means biasing said lever element to the engaging position, said actuating means including a trigger element connected to the lever element for displacement thereof to the releasing position and exerting an upward force on the bracket.

**6.** In combination with an end post and a guard rail assembly having a vertical support and a supporting bracket mounted thereon, closure means for an upper end of the support comprising means pivotally mounting said stop member adjacent said upper end of the support for displacement between a stop position and a removal position, said stop member having a cap body portion closing said upper end of the support in the stop position of the stop member and a pair of oppositely directed projections extending from the cap body portion above the upper end of the support in the stop position of the stop member to prevent removal of the bracket from the support, said support being provided with a slot through which one of said projections passes when the stop member is displaced to the removal position.

**7.** The combination of claim **6** including means for securing the support to the end post comprising a plate member fastened to the support, a clamping member having an offset portion encircling the end post comprising a plate member fastened to the support, a clamping member having an offset portion encircling the end post, a tongue projecting from one of said plate and clamping members, the other of said members having a slot receiving the tongue, and bolt means interconnecting said members for establishing a binding fit between the tongue and slot to augment clamping of the post and support between the plate and clamping members.

**8.** In a guard rail assembly movably supported between vertical post members, a rigid rail, a pair of supporting brackets slidably mounted by said post members, yieldable linkage means interconnecting the brackets with the rail for support of the rail between the post members, lock means mounted on the brackets for supporting the brackets on the post members in any position and release means connected to the lock means for exerting an upward displacing force on the brackets for controlling movement of the rail before releasing the lock means whereby accidental and abrupt lowering of the rail is avoided.

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