Dec. 12, 1961 J. L. DIEHL 3,012,255

GUARD FENCE ASSEMBLY

Filed May 5, 1958

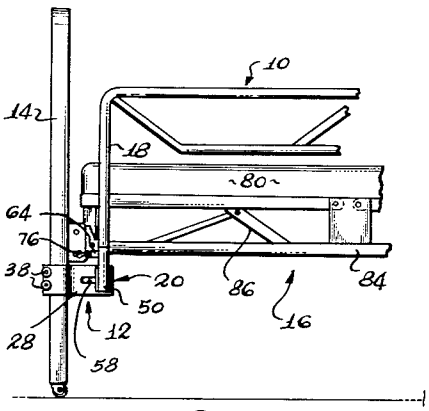

Fig. 1

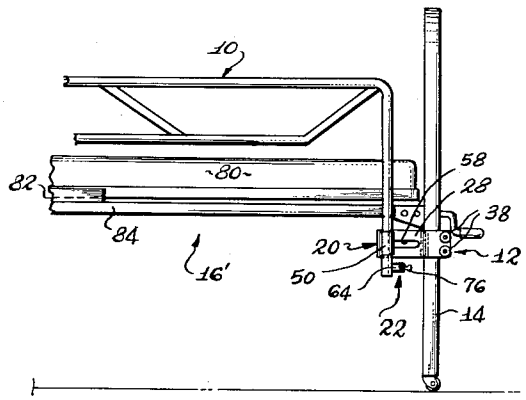

Fig. 2

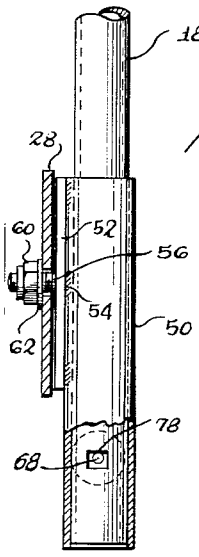

Fig. 4

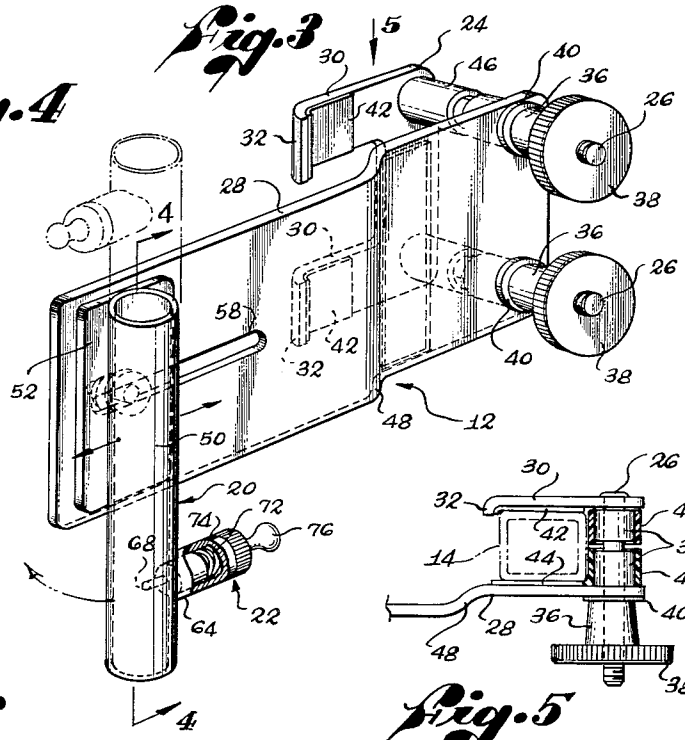

Fig. 3

Fig. 5

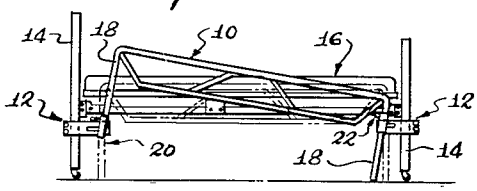

Fig. 6

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GUARD FENCE ASSEMBLY

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12 Claims. (Cl. 5—331)

The present invention relates generally to guard fence attachments for beds and particularly to a guard fence assembly including an improved bracket whereby a guard fence of a given size can be adjustably attached to beds of different sizes.

A wide variety of guard fence attachments have heretofore been devised and marketed, particularly for use with hospital beds to keep patients from falling out of bed. Such attachments are sometimes integrally incorporated with the basic bed structure. However, since not all patients require the restraint of guard fences, it is generally more economical to utilize detachable guard fence assemblies which can be attached and removed from the basic bed frame at will. The present invention has to do with such detachable guard fence assemblies, although it is also very readily adaptable to inclusion in the basic framework of a hospital bed.

Although hospital beds generally vary in many details of construction, they can roughly be classified in accordance with their length and the vertical distance between the sills or longitudinally extending side rails of the frame and the top of the mattress. In order to achieve economy, it is highly desirable that a detachable guard fence assembly be usable with beds of all sizes despite the varying details of construction such as are found in the beds of different manufacturers. An important object of my invention is to provide a guard fence assembly of a universally adaptable nature so that it can be detachably mounted on different sizes of beds.

Another object of my invention is to provide a guard fence assembly utilizing an improved bracket support which is adapted to mount a guard fence of a given size on beds of different lengths and of different vertical depths.

A further object of my invention is to provide a supporting bracket of this type which can be detachably mounted on any side of a bed frame at either end of the bed so that identical brackets can be used for supporting any end of the guard fence at any corner of the bed.

Yet another object of my invention is to provide a guard fence assembly utilizing opposite end supporting brackets adapted to permit lowering of one end of the guard fence independently of vertical movement of the other end of the guard fence. With this arrangement of supporting means for the guard fence, there is no danger of entanglement of the bedding with the guard fence or with the guard fence supports, whereby wear and tear on the bedding is avoided. With this arrangement the bedding is also readily accessible whether the guard fence is raised or lowered so that change or alteration of the bedding is more easily achieved.

It is also an object of the invention to provide a guard fence assembly that can be used with variable height beds so that when one end of the bed is elevated, the guard fence assumes the same inclination as the mattress to protect the patient.

A still further object of my invention is to provide a guard fence assembly in which the opposite end members of the guard fence are vertically movably mounted in a guide member, the guide member being pivotally and longitudinally movably mounted in a supporting bracket. With this arrangement the guard fence can be lowered at one end while the other end remains raised to confine

a patient to bed while a nurse or doctor attends him over the lowered end of the fence.

The invention also has for an object the provision of a guard fence assembly that can be mounted on a bed for movement of the fence between raised and lowered positions without imposing any stresses on the sills or side rails of the bed frame so that the necessity of adding any cross-bracing between the sills is avoided.

Yet another object of my invention is to provide a guard fence assembly adapted to give a long service life and in which a guard fence of a given size is supported on identical brackets, the whole being made with a minimum number of parts readily fabricated from commercially available materials.

These and other objects and advantages of my invention will be apparent from the following description of a presently preferred embodiment thereof when taken in conjunction with the annexed drawing in which:

FIGURE 1 is a partial elevational side view of a hospital bed of a first size provided with a presently preferred embodiment of a guard fence assembly incorporating my invention;

FIGURE 2 is a partial elevational side view of a second size of hospital bed utilizing the guard fence assembly;

FIGURE 3 is a perspective view on an enlarged scale of a presently preferred embodiment of a universal guard fence support bracket;

FIGURE 4 is a vertical end view, partly in section, taken on the line 4—4 of FIGURE 3;

FIGURE 5 is a partial top plan view, partly in section, taken in the direction 5 of FIGURE 3; and

FIGURE 6 is a side elevational view, on a reduced scale, of a hospital bed equipped with the guard fence assembly and particularly demonstrating the manner of raising or lowering the guard fence.

Referring now to the drawing for the general arrangement of my invention, and in particular to FIGURE 6, each guard fence **10** of a bed **16** is supported at opposite ends by a pair of identical support brackets **12**. Anyone of the brackets can be detachably connected to any of the upright legs **14** of bed **16** to vertically movably support one of the end members **18** of the fence **10** in a guide means **20**. A latch means **22** is mounted on each of the guide means **20** to releasably lock the fence **10** in a raised position.

Each guide means **20** is pivotally and longitudinally movably mounted on its support bracket **12** so that when the latch means **22** thereof is released, the corresponding end of fence **10** can be lowered independently of vertical movement of the other end of the fence, the other end of the fence undergoing corresponding angular movement. When one end of a fence **10** has thus been lowered, the other end of the fence can be lowered by release of the latch means **22** associated therewith.

Specifically, the support bracket **12** is adapted to be detachably mounted upon the side of a bed frame adjacent one end thereof and preferably on one of the bed legs **14**. For this purpose, a clamping structure is provided such as is best seen in FIGURE 3. A flat generally U-shaped backing plate **24** at its closed end rigidly mounts a pair of stud bolts **26** which are slidably received in suitable holes formed in the confronting end of a longer plate or support member **28**. The backing plate **24** is adapted to abut the inside of a bed leg **14** with a pair of arms **30**, the free ends of arms **30** having flanges **32** extending towards the confronting support member **28** to embrace the bed leg.

Both the backing plate **24** and support member **28** on the confronting sides thereof rigidly mount cylindrical spacers **34** through which the pair of stud bolts **26** are slidably receivable. The free ends of the bolts **26**

are threaded to receive adjusting nuts **36**, each of which has an enlarged head **38** which is peripherally knurled to facilitate manual adjustment of the nuts. Suitable washers **40** are placed under each of the nuts **36** against the outer face of support member **28**.

As is apparent, the nuts **36** can be appropriately manipulated to clamp a bed leg **14** of either round or rectangular tubular configuration between the confronting surfaces of the backing plate **30** and support member **28**. In order to prevent marring or scratching of the bed leg, each of the backing plate arms **30** on the inside is provided with a piece **42** of a suitable plastic or other cushioning material confronting a piece **44** of similar material adhesively or otherwise secured to the inside of support member **28**. For the same purpose each of the spacers **34** is wrapped in a tubular piece **46** of the padding material.

The support member **28** is mounted to extend longitudinally inwardly from the bed leg **14**. In order to provide a suitable clearance space between the guard fence **10** and the mattress and bedding, the support member **28** is stepped outwardly or bent as indicated at **48** whereby the guide means **20** is positioned sidewardly away from the bed for supporting the guard fence in a cleared position.

The guide means **20** comprises a short length of tube **50** having a bearing plate **52** rigidly secured as by welding **54** alongside one end portion of the tube. The plate **52** on the side opposite to the tube **50** rigidly mounts a pivot pin **56** that is slidable in a slot **58** extending longitudinally of the support member **28**. A lock nut **60** is threadedly mounted on the end of the pin **56** and beneath it has a suitable washer **62** for sliding engagement with the inside of the support member **28**. As is apparent the lock nut **60** can be adjusted to provide more or less freedom of slidable and pivotal movement of the guide means **20** relative to the support member **28**.

The tube **50** is adapted to slidably receive either of the tubular end members **18** of guard fence **10**. The guard fence **10** is supported in lowered position merely by the engagement of the lower ends of the members **18** with the floor. In order to support the fence **10** in a raised position, the tube **50** is provided with the latch means **22** best seen in FIGURE 3.

The latch means **22** includes a cylindrical housing **64** affixed to the tube **50** near the end of the tube opposite from the bearing plate **52** and parallel to support member **28**. A piston member **66** is slidable in the housing **64** and at its inner end is formed with a latch pin portion **68** adapted to move inwardly and outwardly through an aligned bore formed in the wall of the tube **50**. The outer end of the housing **64** threadedly receives an annular cap **70** to provide a seat for a compression spring **72** biased against a shoulder **74** formed on the piston member to yieldably urge the latch pin **68** into the tube **50**. The outer end of piston member **56** is formed with a finger engageable head portion **76** by means of which the latch pin **60** is selectively withdrawn and released to operate the latch means. The end members **18** of the guard fence adjacent the lower ends thereof are each formed with a pair of diametrically opposite square latch holes **78**, such as are shown in phantom outline in FIGURE 4. The guard fence **10** is supported in raised position by engagement of the latch pins **68** with the holes **78**.

It should particularly be noted that the guide means **20** is mounted on the support member **28** for angular movement and for simultaneous rectilinear movement in a direction generally longitudinal of the bed. It should also be observed that the latch means **22** is offset from the axis of angular movement, i.e. offset from the pivot pin **56** of the guide means **20**. The reasons for this arrangement can best be understood from an examination of FIGURES 1 and 2.

FIGURE 1 illustrates a currently popular type of hospital bed **16** while FIGURE 2 illustrates an older style of hospital bed **16'**. Either of these beds is commonly available in sizes to accommodate 72 inch or 80 inch lengths of mattress and the guard fence attachment of my invention is adapted to be mounted on beds of these and other lengths. Additionally, it will be observed that in the bed **16'** of FIGURE 2 a mattress **80** and an adjusting mechanism **82** are rested directly on the side rails or sills **84** of the bed. In the bed **16** of FIGURE 1, the vertical dimension between the bottom of the mattress **80** and the sills **84** is considerably greater than the corresponding dimension in the bed **16'** due to the greater depth of the adjusting mechanism **86** of the bed **16**. The guard fence assembly of my invention can be detachably mounted on either of the beds **16** or **16'** irrespective of the length of the bed, as will be apparent from the following description of the use of my invention.

A pair of the identical support brackets **12** is used for each guard fence **10** which it is desired to mount on a bed. These brackets are clamped on the bed legs **14** immediately beneath a sill **84** in the manner previously described so that in each case the support member **28** extends longitudinally inwardly of the bed. Assuming that the bed is of the older style **16'**, the latch means **22** is disposed under or lower than the pivot pin **56**, as in FIGURE 2. The end members **18** of the fence **10** are then inserted into the tube **50** and the latch pin **68** manually withdrawn from within the tube **50** to permit the guard fence **10** to be moved to lowered position, with the lower end of each end member **18** resting on the floor.

When the bed is occupied by a patient and it is desired to utilize the guard fence **10**, each end of the fence can be moved to raised position independently of the other end. When one end of the fence **10** has been moved to the raised position, the one of the pair of latch holes **78** which is formed in the side of member **18** facing the end of the bed will automatically receive the spring loaded latch pin **68**. The guard fence **10** will then be in the position indicated in FIGURE 6 in which the right hand end member **18** still rests on the floor. This end can then be raised in the same manner as the first end and it will be noted that during such raising either or both of the guide means **22** will be shifted in brackets **12** in a direction longitudinal of the bed by virtue of play provided by the slots **58**. During any vertical movement of the guard fence **10** between raised and lowered positions, both of the guide means **20** may undergo simultaneous angular and rectilinear movement. Thus the slots **58** formed in support members **28** not only serve to permit longitudinal play of the guide means **20** in their support brackets **12** during vertical movement of the fence **10**, but also provide a means for automatically adjusting the guard fence assembly to the particular length of the bed.

If it is desired to mount the guard fence assembly on the bed **16** of FIGURE 1, the support brackets **12** are connected to the bed legs **14** in the same manner as before. However, prior to insertion of the end members **18** within the guide means **20**, each of the guide tubes **50** is rotated to the position shown in phantom outline in FIGURE 3 so that the latch means **22** is higher than the pivot pin **56** and on the opposite side of the guide tube **50** relative to the position shown in full outline. End members **18** of the guard fence are then inserted into the guide tubes in the same manner as before. Since the latch pin **68** will now engage the opposite one of the pair of latch holes **78** (i.e. the hole **78** formed on the longitudinally inwardly facing side of member **18**) above rather than below the pivot pin **56**, a greater vertical dimension is achieved between the top of the guard fence **10** and the support bracket **12** than with the bed **16'**. The guard fence **10** is thus disposed in the correct position relative to the top surface of the mattress **80**.

Hospital beds are commonly provided with a mechanism for elevating either end of the bed so that the mattress **80** assumes a correspondingly inclined position. This

elevating mechanism usually comprises crank-actuated telescopically engaged tubular leg members including a screw jack. For example, in certain cases in which it might be desirable to apply a traction device to the feet or legs of a patient, the foot of the bed would be elevated by utilizing such a mechanism. My guard fence assembly is particularly advantageous in such situations since it will assume an inclination corresponding to the inclination of the mattress so that the patient is protected in any attitude of the bed. As is apparent, this is achieved through the angular and rectilinear movability of the guide means **20** relative to the support member **28**.

It will be apparent to those skilled in the art that various modifications may be made in the construction heretofore illustrated and described. However, it is to be understood that I do not wish to be limited to the particular details of construction shown and described above except as limited by the spirit and scope of the following claims.

I claim:

1. In a guard fence attachment for beds the improvement comprising the combination of: at least one support member adapted for mounting on an end of a bed adjacent one end of a fence on said bed; a means on said support member to guide said one end of said fence for movement between raised and lowered positions in a substantially vertical plane, said guide means being mounted on said support member for angular movement about a substantially horizontal axis; and a latch means on said guide means in a position offset from the axis of angular movement of said guide means whereby said latch means is selectively movable to positions above and below said axis to releasably lock said fence in either of two raised positions.

2. In a guard fence attachment for beds having a fence the combination of: at least one support adapted to be affixed upon a side of a bed frame adjacent one end of said fence; a guide on said support adapted to constrain said one end of said fence for movement between raised and lowered positions, said guide adjacent one end being pivotally mounted on said support for movement about a substantially horizontal axis and for concurrent movement longitudinally of said support; and a latch means adjacent the other end of said guide for selective positioning above and below said pivotal axis upon angular movement of said guide when said guide is free of said end member whereby said latch means can releasably engage said one end to releasably lock said one end of said fence in either of two raised positions corresponding to the selected position of said latch means.

3. A bracket for attaching a guard fence of a given length on beds of different sizes, comprising: a support member adapted for mounting upon a side of a bed frame adjacent one end thereof; a means on said support member to guide one end of said fence for movement between raised and lowered positions, said guide means being mounted on said support member for limited movement in a direction longitudinally of said bed, whereby said guide means cooperates with a means supporting said fence at the other end of said bed for adjustment of the spacing therebetween into correspondence with the fixed length of said fence; and a latching means for locking said fence in raised position.

4. A bracket for a guard fence, comprising: a support member adapted for mounting on a side of a bed frame adjacent one end of said fence; a vertically immobile means on said support member to guide said one end of said fence for movement between raised and lowered positions, said guide means being mounted on said support member for simultaneous angular and generally longitudinal movement to permit raising and lowering of said one end of said fence independently of any vertical movement of the other end of said fence; and a latch means on said guide means to lock said fence in a raised position.

5. A bracket for attaching a guard fence, comprising: a support member adapted for mounting upon a bed frame; a means on said support member to guide one end of said fence for movement between raised and lowered positions, said guide means being mounted on said support member for angular movement about a substantially horizontal axis and for simultaneous limited movement in a direction longitudinally of said bed and raising and lowering of said one end of said fence is permitted independently of any vertical movement of the other end of said fence; and a latch means on said guide means in a position offset from the axis of angular movement of said guide means whereby said latch means is selectively movable to positions above and below said axis to releasably lock said fence in either of two raised positions corresponding to the selected position of said latch means.

6. A guard fence assembly comprising: a guard fence; a pair of brackets adapted to be mounted upon one side of a bed frame at opposite ends thereof adjacent opposite ends of said fence; a guide means on each of said brackets engageable with one of said fence ends to guide said fence ends for movement of the corresponding ends of said fence between raised and lowered positions of said fence, each of said guide members being mounted on said brackets for angular movement and at least one of said guide means being simultaneously rectilinearly movable in a direction generally longitudinal of said bed whereby either end of said fence can be raised or lowered independently of vertical movement of the other end of said bed; and a latching means on each of said guide means for locking corresponding ends of said fence in a raised position, each of said latching means being selectively disengageable and engageable with the corresponding end of said fence independently of engagement of the other of said latching means with the other end of said fence.

7. A universal bracket for use in mounting on a bed either end of a rigid guard fence having opposite end members comprising: a clamp adapted for detachable mounting on an upright leg of said bed and having a support member extending longitudinally inwardly from said leg; a vertically immobile guide mounted on said support member for simultaneous angular and generally longitudinal rectilinear movement in substantially the same vertical plane with said guard fence and adapted to guide one of said end members for raising and lowering of the corresponding end of said fence independently of vertical movement of the other end of said fence; and latch means on said guide for releasably locking said fence in a raised position.

8. A bracket for use in mounting on a bed one end of a rigid guard fence having opposite end members, comprising: a clamp adapted for detachable mounting on an upright leg of said bed and having a support member extending longitudinally inwardly from said leg; a guide means on said support member slidably engageable with one of said end members of said fence to guide said end member for movement of the corresponding end of said fence in a substantially vertical plane between raised and lowered positions of said fence, said guide means being mounted on said support member for angular movement about a substantially horizontal axis normal to the plane of said fence and also being simultaneously rectilinearly movable in a direction generally longitudinal of said bed whereby one end of said fence can be moved vertically independently of vertical movement of the other end of said bed; and a latch means on said guide means in a position offset from the axis of angular movement of said guide means, said fence being removable from said guide means to permit free movement of said guide means to selected positions of said latch means above and below said axis to releasably lock said fence in either of two raised positions.

9. A bracket for use in mounting on a bed one end of a rigid guard fence having tubular opposite end members,

comprising: a clamp adapted for detachable mounting on an upright leg of said bed and having a support member extending longitudinally inwardly from said leg; a guide means comprising a tube having a flat plate affixed alongside one end thereof for slidable engagement with said support member, said plate having rigidly affixed thereto on the side opposite said tube, a pin that is slidably and rotatably mounted in a longitudinally extending slot formed in said support member whereby said tube is mounted on said support member for simultaneous angular and rectilinear movement in the same vertical plane with said guard fence, and said tube being adapted to slidably receive one of said tubular end members of said fence for raising and lowering of the corresponding end of said fence independently of vertical movement of the other end of said fence; and a latch means mounted adjacent the end of said tube opposite from said pin, said fence being removable from said tube to permit free angular movement of said tube whereby said latch means is movable to selected positions thereof above and below said pin to releasably lock said fence in either of two raised positions.

10. A bracket for use in mounting on a bed one end of a rigid guide fence having tubular opposite end members, comprising: a clamp comprising a backing plate and a parallel support member in confronting relationship and interconnected at one end of said support member by adjustable means for clamping an upright bed leg therebetween with said support member extending longitudinally inwardly from said leg, the inwardly extending portion of said support member being sidewardly offset away from said bed to support a guard fence guide in substantially the same vertical plane with said fence; a guide means comprising a tube having a flat plate affixed alongside one end portion thereof for slidable engagement with the outside of said support member, said plate having rigidly affixed thereto on the side opposite said tube, a pin that is slidably and rotatably mounted in a slot extending longitudinally of said support member whereby said tube is mounted on said support member for simultaneous angular and rectilinear movement in the same vertical plane with said guard fence, and said tube being adapted to slidably receive one of said tubular end members of said fence for raising and lowering of the corresponding end of said fence independently of vertical movement of the other end of said fence; and a latch member mounted on the end of said tube opposite to said pin and yieldably biased into said tube through a confronting opening formed in said tube for releasable engagement with one of a pair of complementary latching portions on diametrically opposite sides of said tubular end member, said fence being removable from said tube to permit free angular movement of said tube to selected positions of said latch to positions above and below said pin whereby said latch is engageable with one or the other of said complementary latching portions of said end member to releasably lock said fence in either of two raised positions.

11. A guard fence assembly, comprising: a guard fence; a pair of brackets for opposite ends of a side of a bed; a pair of guide means each of which is pivotally mounted on one of said brackets to support one end of said fence for movement through said guide means between raised and lowered positions of said fence, at least one of said guide means being bodily movable on its bracket longitudinally of said bed whereby one end of said fence can be moved vertically independently of vertical movement of the other end of said fence; and a latching means on each of said guide means offset from the pivotal axis of said guide means and movable to selected positions of said latching means above and below said axis, said latching means releasably locking the corresponding end of said fence in either of two raised positions.

12. A guard fence assembly, comprising: a guard fence; a pair of brackets for opposite ends of a side of a bed; a pair of guide means each of which is pivotally mounted on one of said brackets to support one end of said fence for movement through said guide means between raised and lowered positions of said fence, at least one of said guide means being bodily movable on its bracket longitudinally of said bed whereby one end of said fence can be moved vertically independently of vertical movement of the other end of said fence; and a latch on each of said guide means, offset from the pivotal axis of said guide means, and yieldably biased for engagement with one of a pair of diametrically opposite complementary portions of one end of said fence, said latch being engageable with one of said complementary portions when said guide means is pivoted to a position of said latch above said pivotal axis and being engageable with the other of said complementary portions when said guide means is pivoted to a position of said latch below said pivotal axis.

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