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Behnke

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[54] CENTRAL RAIL BED FRAME WITH CONNECTOR ASSEMBLY

[75] Inventor: Wilbert E. Behnke, Chicago, Ill.

[73] Assignee: Harris-Hub Company

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[51] Int. Cl. A47c 19/00
[58] Field of Search ..... 5/200 D, 201, 207, 5/282 R, 200 C; 287/64, 189.36 R, 189.36 A, 189.35

[56] References Cited

UNITED STATES PATENTS

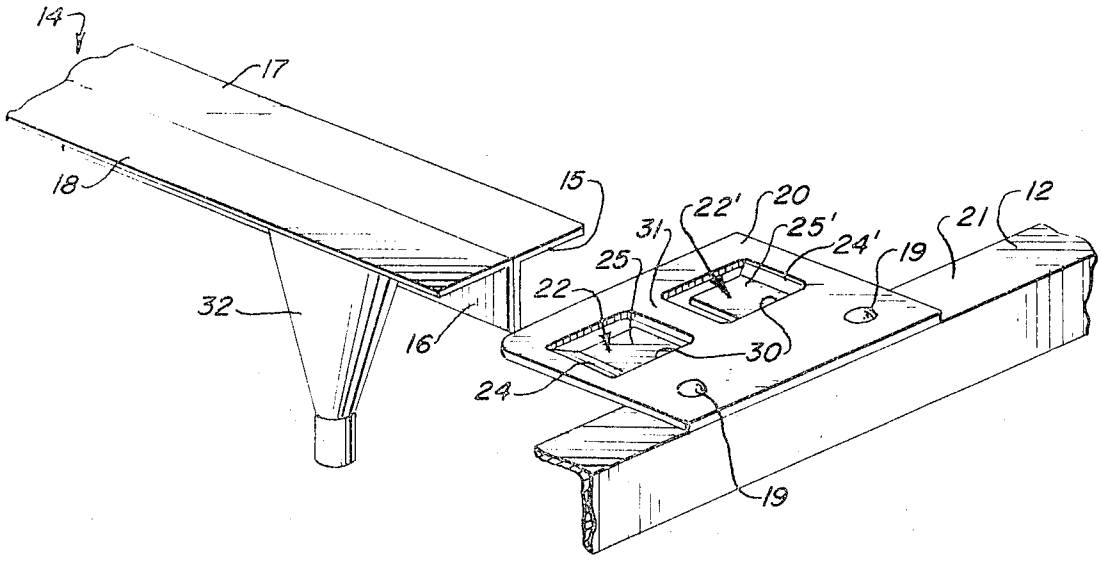
734,275	7/1903	Lyon	287/189.35
950,194	2/1910	Stockwell	5/200 C

Primary Examiner—James C. Mitchell
Attorney—Max Dressler et al.

[57] ABSTRACT

An improved bed frame assembly including a pair of parallel side rails and a pair of end cross rails extending perpendicularly between the side rails also includes a central support rail extending parallel to the side rails and midway of the cross rails. The central rail is T-shaped in cross section, having a vertical leg and a pair of horizontal legs extending outwardly from the top of the vertical leg. At least one end of the central rail is connected to a cross rail by means of a plate secured to the midportion of the cross rail. The plate includes a pair of opposed protruding fingers extending horizontally below the plate, and having opposed ends spaced from each other. The fingers define a T-shaped space into which an end of the central rail is inserted, so that an end of each horizontal leg of the central rail is held between a respective finger and the plate, for a positive connection between the central rail and the cross member.

14 Claims, 4 Drawing Figures



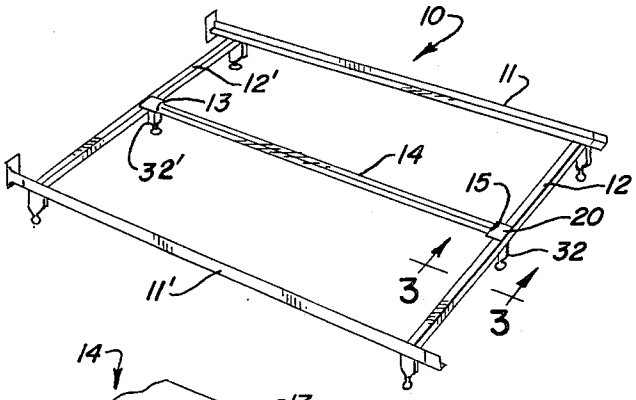


FIG. 1

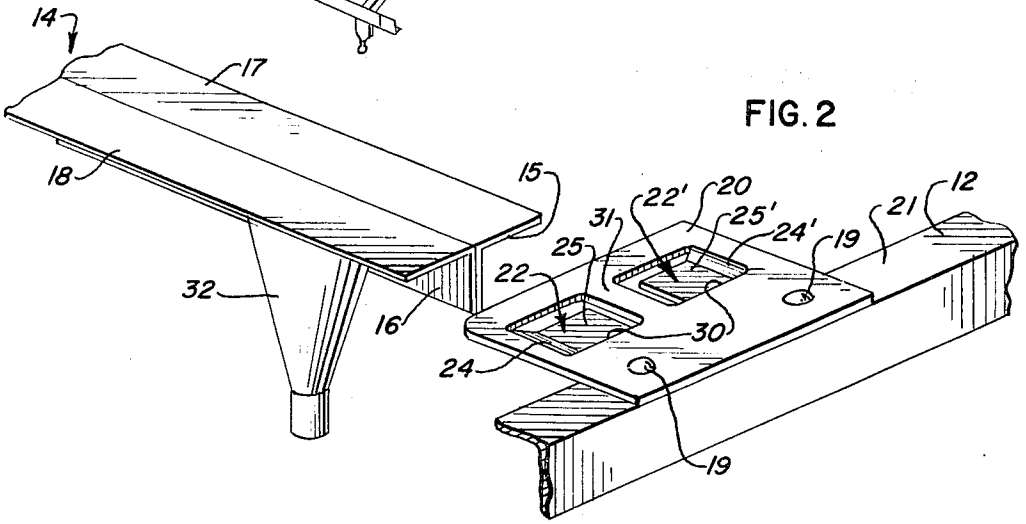


FIG. 2

FIG. 3

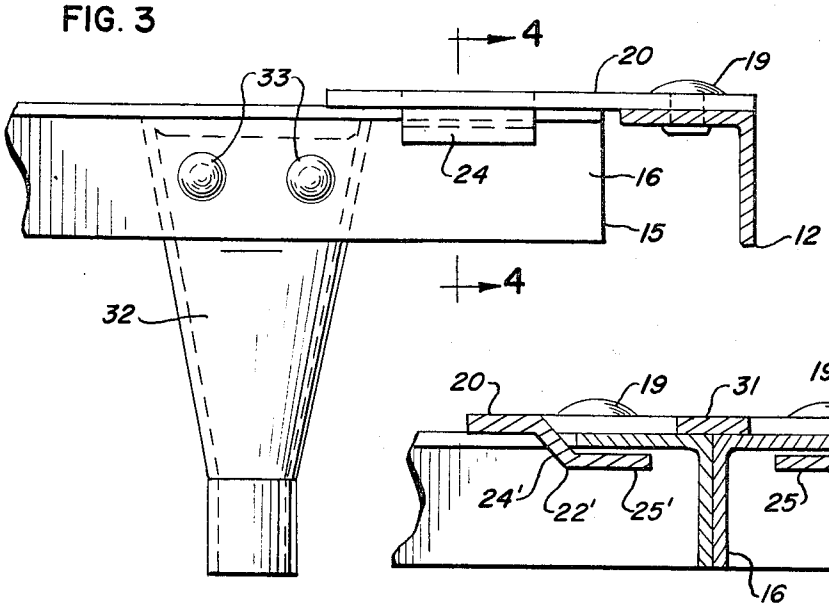


FIG. 4

CENTRAL RAIL BED FRAME WITH CONNECTOR ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates generally to bed frames of the knock-down type, and in particular to bed frames provided with a central support rail. Such bed frames have usually been used for the wider "king size" and "queen size" bedding which require center support, particularly when used in hotels and motels, where they are commonly subjected to greater abuse and stress than frames used in the home. Typical ones of such wider frames have included a pair of spaced side frame members and a pair of spaced cross frame members extending perpendicularly therebetween, with the central support rail secured between the cross frame members by bolts, rivets or other known expedients.

A problem has long existed in the art because of such conventional central support rail design and fastening expedients, which have made it time-consuming and inconvenient to assemble and disassemble the bed frame assembly, and have normally required the use of inconvenient fastener small parts. The need for satisfying the demand for both "king size" and "queen size" bedding has aggravated such lack of such convenient assembly and disassembly, and the space needed for storage by vendors and institutional users such as hotels has been greater than if convenient disassembly were available.

Even where bed frame assemblies of conveniently adjustable width and otherwise superior assembly qualities have been available, the accommodation of the central support rail in the larger "king size" and "queen size" bedding types has not been accomplished in a convenient manner, and has prevented taking full advantage of the qualities of such improved bed frame assemblies.

SUMMARY OF THE INVENTION

Accordingly, the bed frame member of the present invention solves the problems encountered in the prior art by providing a secure but readily assembled and disassembled interlocking relationship between the cross frame elements and the central support rail which allows bed frames requiring such a central support rail to be quickly and easily assembled in an interlocking configuration of superior strength and rigidity compared to prior expedients.

The bed frame assembly of the invention is adapted to support a box spring and mattress and includes a pair of spaced parallel horizontally disposed elongated side rails, a pair of spaced parallel horizontally disposed elongated end cross rails extending perpendicularly between the side rails, and a central T-shaped support rail extending parallel to the side rails generally midway between the side rails. The support rail has a vertically extending flat leg and two horizontal flat legs extending outwardly from the upper end of the vertical leg and on opposite sides thereof, with the horizontal legs extending a first given width.

The assembly is also provided with means for connecting the central support at each end thereof to a respective cross rail. At least one of such connecting means includes a flat plate associated with one of the cross rails and carrying first and second fingers, with each finger having a first generally transversely extending portion, and a second portion extending horizontally toward the other horizontal portion, with the ends thereof in spaced opposed facing relationship. The transversely extending finger portions are horizontally separated by a first predetermined spacing greater than the first given width of the central rail, and the ends of the second finger portions are separated by a second predetermined spacing less than the first given central rail width.

In this manner the fingers define a T-shaped space positioned perpendicularly to the associated cross rail, and adapted to receive an end of the central frame member. Specifically, the horizontal legs of this end of the central rail are positioned within the first predetermined spacing, with the bottom surfaces of the horizontal legs of the central rail adjacent respective horizontal finger portions. At the same time, the vertical leg of the central rail member is positioned within the second predetermined spacing between the opposed finger ends, to thereby complete a positively held connection between the central rail and the associated cross member.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. 1 is a perspective view of a preferred embodiment of the bed frame assembly of the present invention;

FIG. 2 is an exploded perspective view of one end of the central support rail and the connecting portion of the associated cross rail of the assembly of FIG. 1 on an enlarged scale;

FIG. 3 is an enlarged sectional view taken along line 3—3 of FIG. 1; and

FIG. 4 is a sectional view taken along line 4—4 of FIG. 3.

DETAILED DESCRIPTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawing, the bed frame is shown in completely assembled form at 10 in FIG. 1; it comprises a pair of spaced parallel side frame rails 11 and 11' spanned by a pair of perpendicularly extending cross frame rails 12 and 12'. Preferably, the assembly rests on support legs of the type disclosed in the commonly assigned U.S. Pat. No. 3,537,114 to F.J. Mis entitled "Bed Frame Assembly." In the illustrated embodiment, both the side and cross rails are L-shaped and consist of mutually perpendicular legs of similar width. The side and cross rails are secured to each other so that one of the legs of each rail is disposed in a horizontal plane so that a box spring may be supported by the horizontal legs of at least two of the rails. The cross rails 12 and 12' may be either of conventional construction, or preferably are one of the types disclosed and claimed in the commonly assigned application of G.M. Harris entitled "Adjustable Bed Frame Member" filed concurrently herewith, and the commonly assigned U.S. Pat. No. 3,646,623 to A.E. Harris et al., entitled "Bed Frame Assembly." The use of ei-

ther of the cross rail constructions disclosed in the referenced applications will provide a bed frame assembly which is easily adjustable in width.

The bed frame assembly **10** further includes a centrally disposed support rail **14** extending between cross rails **12** and **12'** and positioned midway between their ends. Support rail **14** is secured at each of its ends **13** and **15** to the midpoint of a respective one of cross rails **12** and **12'**. Support rail **14** is T-shaped in cross section, with mutually perpendicular legs. More particularly, this rail **14** includes flat leg **16** and flat legs **17** and **18** extending perpendicularly outwardly from the upper edge of leg **16**. The legs **16, 17** and **18** are of equal width, with legs **17** and **18** together being of a given transverse width and of like thickness. The described construction of the T-shaped support rail **14** may be easily accomplished by, for example, riveting as in the present embodiment, or spot welding two stock angle irons such as would be suitable for the side or cross rails, so that a leg of one rail is in opposed abutting relationship with a leg of the other rail.

Some of the rivets fastening the rail **14** together are shown at **33** (FIG. 3). The configuration of the central supporting rail may best be seen by reference to FIG. 2, which illustrates the orientation of the legs of the rail as used in the bed frame assembly **10**, so that legs **17** and **18** are horizontal, while **16** is vertically oriented.

Vertical leg **16**, when constructed of two rails as just described, is twice the thickness of the remaining legs **17** and **18**, which provides substantial increase in supporting strength and rigidity. Supporting legs **32** and **32'** are affixed respectively adjacent both ends of central rail **14** by some of the same rivets **33** (FIG. 3) as are used to hold together the rail **14**. Preferably, the support legs **32** and **32'** are of a type disclosed in U.S. Pat. No 2,825,073 to C. Harris for "Legs for Hollywood Beds."

At the point where it is intended to join support rail **14** with cross rail **12**, which in this case is the midpoint of the cross rail **12**, the cross rail is provided with a generally flat or planar support or connecting plate **20** that is attached by rivets **19**, or welding or the like, to the top surface of the horizontal leg **21** of the cross rail **12**. Both cross rails **12** and **12'** are provided with identical support plates, but for convenience of description, only the plate **20** which is attached to rail **12** will be considered in detail. The manner in which plate **20** is attached to a cross rail **12** may be seen in FIG. 3, showing plate **20** extending horizontally from leg **21** and inwardly toward the support rail **14**, with its outside edge flush with the plane of the vertical leg of rail **12**. Plate **20**, as may best be seen in FIG. 2, includes a pair of fingers **22** and **22'** extending in opposed sense and horizontally below plate **20**. Both fingers **22** and **22'** have generally transverse first portions **24** and **24'** each extending downwardly from plate **20** and inwardly toward the other at the same acute angle to plate **20**. The fingers **22** and **22'** also include horizontal second portions **25** and **25'** of equal transverse width extending from transverse portions **24** and **24'** horizontally below plate **20** toward each other and in the same plane in the direction of the rail **12**, and terminating with their ends in spaced opposed parallel relationship. Such transverse and elongated portions of each finger are integral with each other and with plate **20**, being formed in the illustrated embodiment by a stamping or punching method which depress a rectangular portion of plate **20** from the plane thereof, leaving slots **30** in the plate and intermediate plate portion **31** between the slots.

The horizontal spacing between the transverse finger portions **24** and **24'** and between the opposed ends of horizontal finger portions **25** and **25'** together define a T-shaped space, as may best be seen in the partial cross sectional view of FIG. 4. The horizontal space between transverse finger portions **24** and **24'** is slightly greater than the given width of the horizontal legs **17** and **18** of cross rail **14**, while the separation between the opposed ends of finger portions **25** and **25'** is substantially less than the given width of the horizontal support rail legs. Also, the vertical spacing between finger portions **25** and **25'** and the plate **20** is slightly larger than the thickness of legs **17** and **18** of support rail **14**.

Such clearances are provided in order to enable ready insertion of the end of support rail within the T-shaped space thereby defined between plate **20** and the various portions of fingers **25** to assemble the support rail **14** with the associated cross rail **12**. More particularly, the lower surfaces of legs **17** and **18** of the inserted support rail end **15** are positioned in opposed relationship under the upper surfaces of fingers **22** and **22'**, while the upper surfaces of legs **17** and **18** of the rail end **15** are positioned in opposed relationship with the lower surface of portion **31** of plate **20**. The opposite end **13** of the support rail **14** is connected to its associated cross member **12'** in the same manner by an identical arrangement to complete the assembly. The central rail is thereby connected in a positive improved manner, as is illustrated in FIGS. 3 and 4.

Plate **20** and portion **31** thereof prevents any upward movement of rail **14** with respect to cross rail **12**, while lateral movement of the central rail **14** is similarly prevented by transverse finger portions **24** and **24'**. Since the support legs **32** and **33** force the central rail **14** upwardly, with its legs **17** and **18** bearing upwardly against plate **20** and portion **31** the upper surfaces of legs **17** and **18** and the lower surface of plate **20** and portion **31** are in strong frictional engagement when the frame assembly is under load, preventing separation of the rail **14** from engagement with cross rail **12**.

The invention provides a bed assembly with a center support rail arrangement having both an unsurpassed ease of assembly and at the same time improved strength. Once the center support rail has been inserted between the fingers **22** and **22'** and plate **20**, the rail is permanently locked into position with cross rail **12** as long as the end **15** is maintained within the T-shaped space. By the same token, the connection may be instantly disassembled by simply withdrawing either support rail **14** or plate **20** longitudinally relative to the other. The connnection may of course be remade and disassembled any number of times in the foregoing manner, and indeed is particularly useful in institutional contexts requiring frequent assembly and disassembly of bedding. The simple and foolproof construction of the invention is at once highly durable and convenient compared to prior expedients, yet affords a significant cost savings in its manufacture.

What is claimed is:

1. A bed frame assembly comprising: a pair of spaced parallel horizontally disposed elongated side rails; a pair of spaced parallel horizontally disposed elongated cross rails extending perpendicularly between the side rails; a central support rail extending parallel to said side rails generally midway between said side rails, said

central rail including a horizontal flat leg extending a first given width; and means for connecting said central rail at each end thereof to a respective cross rail, at least one of said connecting means including support means associated with one of said cross rails carrying first and second fingers adjacent said one cross rail each finger having a first generally transversely extending portion, and a second portion extending horizontally toward the other horizontal portion, with the ends thereof in spaced opposed facing relationship, said transversely extending finger portions being horizontally separated by a first predetermined spacing greater than said first given width of said central rail and the ends of said second finger portions being separated by a second predetermined spacing less than said first given central rail width, said fingers thereby defining a T-shaped space positioned perpendicularly to said associated cross rail, with an end of said central rail being received within said T-shaped space defined by said fingers, said horizontal central rail leg being positioned within said first predetermined spacing over said horizontal elongated finger portions, to thereby complete a positively held connection between said central rail and said associated cross member.

2. A bed frame assembly as in claim 1, in which said central rail is T-shaped.

3. A bed frame assembly as in claim 2, in which said T-shaped rail is comprised of two rails each having mutually perpendicular legs joined to place a leg of one rail in opposed abutting relationship with a leg of the other rail.

4. A bed frame assembly as in claim 3, wherein said two rails comprising said T-shaped rail are joined by means of rivets, and wherein said assembly also includes a pair of supporting legs, at least some of said rivets also joining said leg to said T-shaped rail at points adjacent the ends thereof so that said legs extend downwardly therefrom to support said T-shaped rail.

5. A bed frame assembly as in claim 1, in which said support means includes a horizontally-disposed mounting plate secured to said one cross rail and carrying said first and second fingers beneath said plate.

6. A bed frame assembly as in claim 1, wherein said first and second fingers are formed integrally with said flat plate.

7. A bed frame assembly as in claim 5, wherein said one cross rail is comprised of respective mutually perpendicular horizontal and vertical flat legs, and wherein said mounting plate is secured to said horizontal leg to position said plate so that the outside edge thereof is flush with the plane of said vertical leg.

8. A connector assembly for joining one bed rail to the end of another bed rail having a T-shape, defining outwardly extending legs together having a first given width, and extending perpendicularly from said one bed rail, comprising: a first finger supported by said one bed rail and having a first portion extending transversely to said one bed rail, said finger having a second portion extending from said first portion generally parallel to said one bed rail; and a second opposed finger supported by said one bed rail in alignment with said first finger and having a first portion extending transversely to said one bed rail, said second finger having a second portion extending from said first portion generally parallel to said one bed rail and in an opposite sense from said second portion of said first finger, the ends of said second portions being in spaced opposed facing relationship, said transversely extending first portions being separated by a first predetermined spacing greater than said first given width of said other rail, and the ends of said second finger portions being separated by a second predetermined spacing less than said first given rail width, said fingers thereby defining a T-shpaed space positioned perpendicularly to said one rail to enable an end of said other T-shaped rail to be received therewithin for connection with said one bed rail.

9. A bed frame assembly adapted to support a box spring and mattress comprising: a pair of spaced parallel horizontally disposed elongated side rails; a pair of spaced parallel horizontally disposed elongated cross rails extending perpendicularly between the side rails; a central T-shaped support rail extending parallel to said side rails generally midway between said side rails, said central rail having a vertically extending flat leg and two horizontal flat legs extending outwardly from the upper end of said vertical leg on opposite sides thereof, said horizontal legs extending a first given width; and means for connecting said central support at each end thereof to a respective cross rail, at least one of said connecting means including a flat plate associated with one of said cross rails and carrying first and second fingers, with each finger having a first generally transversely extending portion, and a second portion extending horizontally toward the other horizontal portion, with the ends thereof in spaced opposed facing relationship, said transversely extending finger portions being horizontally separated by a first predetermined spacing greater than said first given width of said central rail and the ends of said second finger portions being separated by a second predetermined spacing less than said first given central rail width, said fingers together with said plate thereby defining a T-shaped space positioned perpendicularly to said associated cross rail, with an end of said central rail being received within said T-shaped space defined by said fingers, said horizontal central rail legs being positioned within said first predetermined spacing so that the ends of each of said horizontal legs is positioned over a respective one of said horizontal elongated finger portions, said vertical leg of said central rail member being positioned within said second predetermined spacing between said opposed finger ends to thereby complete a positively held connection between said central rail and said associated cross member.

10. A bed frame assembly as in claim 8, wherein said fingers extend in a direction parallel with said cross rail associated with said plate.

11. A bed frame assembly as in claim 9, in which said horizontal legs of said central rail are of equal width and said vertical leg is positioned midway therebetween.

12. A bed frame assembly as in claim 9, in which said horizontally extending second finger portions are of equal width, and said first transversely extending portions make equal angles with said flat plate.

13. A bed frame assembly as in claim 9, in which said fingers are spaced from said flat plate by a vertical spacing greater than the thickness of said horizontal legs of said central rail.

14. A bed frame assembly as in claim 9, in which said horizontal legs of said central rail are in frictional engagement with the lower surface of said flat plate.

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