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BEDFRAME SUPPORT LEG

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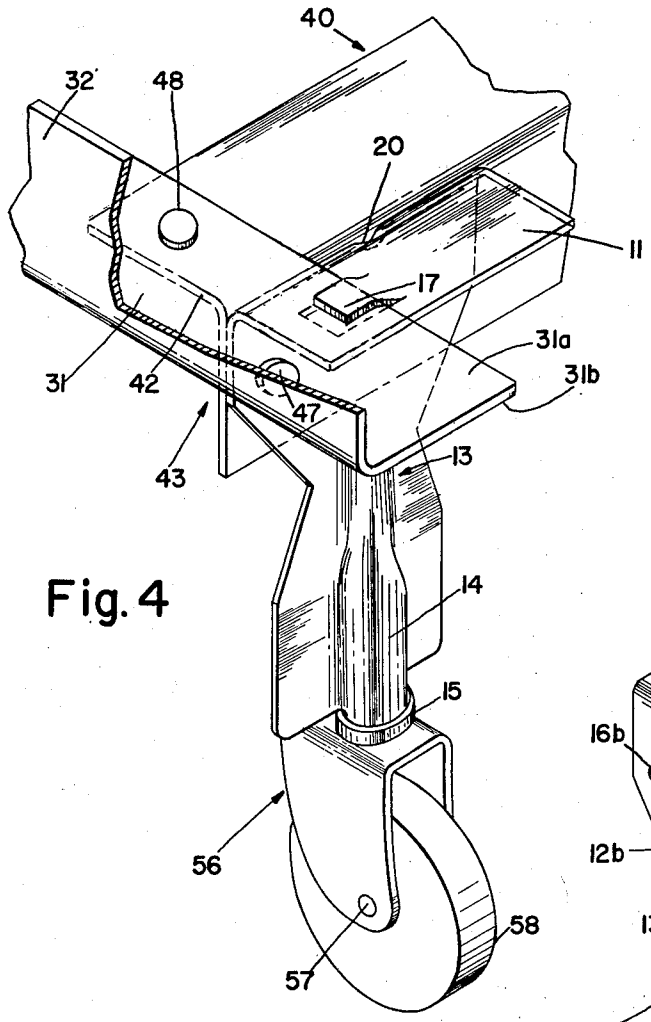


Fig. 4

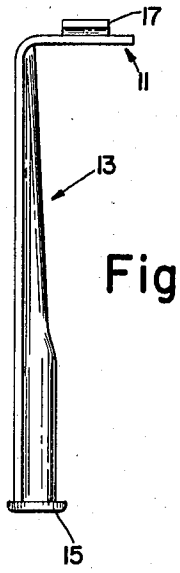


Fig. 3

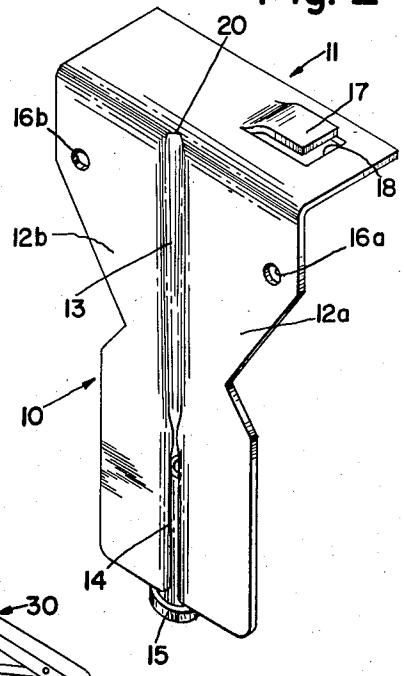


Fig. 2

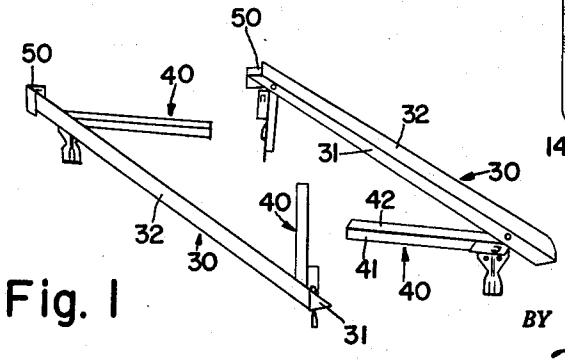


Fig. 1

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BEDFRAME SUPPORT LEG

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4 Claims. (Cl. 5—310)

This invention, relating as indicated to a bedframe support leg, is a continuation-in-part of our application Serial No. 462,264, now Patent No. 2,772,424, filed October 14, 1954, entitled "Bedframe Support Leg."

This invention relates to bedframes, and more particularly to support legs and bedframe constructions adapted for partial disassembly for transport, which frames are normally made from metal rails of right angle shape in cross section.

A principal object of this invention is to provide an improved and simplified combined brace and supporting leg structure in the vicinity of the intersection of the longitudinal and transverse frame elements.

Another object is to provide an integral brace and leg structure adapted, in combination with a transverse frame element, for co-active interlocking perpendicular relationship with a longitudinal frame element at either end of the transverse element to eliminate the need for separate right and left units.

Still another object of the invention is to provide an improved brace and leg structure adapted, in combination with the transverse frame element, to support the frame at a point recessed inwardly from the longitudinal frame element.

A further object of our invention is to provide a bedframe having an inexpensive but sturdy pivotal connection between the longitudinal and transverse frame elements so that these elements may be shipped compactly partially unassembled in longitudinal alignment and still may be readily assembled in locked operative right angle relationship with minimum effort by inexperienced users.

Another object is to provide in an integrally formed brace and leg construction a vertically extending reinforcing rib or channel conformation.

To the accomplishment of the foregoing and related ends, said invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certain illustrative embodiment of the invention, these being indicative, however, of but one of the various ways in which the principles of the invention may be employed.

In said annexed drawings:

Fig. 1 is a perspective view of the frame elements of a collapsible bedframe form with the transverse members in the process of being opened;

Fig. 2 is a view in perspective of the rear or inner surface of our brace and leg;

Fig. 3 is a side elevation of the brace and leg shown in Fig. 2; and

Fig. 4 is a front perspective view with the vertically extending leg of the longitudinal rail being broken away to show the relationship of the brace and leg to the transverse and longitudinal rails when in operative position.

A principal problem in the structural design of bedframes sometimes referred to as the Hollywood type, i.e., box spring support frames normally used without a footboard and frequently used without a headboard, is the

provision of sufficient rigidity in the frame and strength in the leg structure to accept the severe end, oblique and twisting forces to which bedframes are subjected in use. Transportation costs necessitate that frames be as light as possible consistent with strength requirements and that they be capable of being shipped in knockdown condition with the ultimate user having to complete the assembly. In addition to these requirements, experience has shown that it is highly desirable from a user's safety and convenience standpoint to recess the support legs inwardly of the sides and ends of the frame to reduce foot stubbing and tripping accidents when the bed is being made. Location of the support legs inwardly of the frame periphery, together with the use of casters, requires exceptional strength in the frame supporting structure and heretofore it has been difficult to achieve this economically with light gauge angle iron members because of their inability to withstand deformation in the absence of cumbersome bracing arrangements.

To overcome the structural difficulties referred to above and the disadvantages of the prior art in bedframes of this type, we have invented a compact, simple and reliable, integral brace and support structure involving a novel co-operative interaction of longitudinal, transverse and leg elements.

Referring now more particularly to the drawings we have shown in Fig. 1 a bedframe of the Hollywood type in the process of being opened from its closed or shipping condition. The frame comprises a pair of longitudinally extending side rails 30 which have horizontally extending legs 31 and vertically extending legs 32. Shown pivotally attached to the longitudinal side rails are transversely extending cross rails 40 which are in the process of being brought to an open condition as indicated by the arrows. These cross rails 40 have a horizontally extending upper leg 42 and a vertically depending leg 41. At the end of the frame are shown a pair of end plates 50 to which a headboard, not shown, may be attached. Adjacent the intersection of the transverse and longitudinal rails are shown our new integral brace and leg structure. It will be apparent from Fig. 1 that the cross rails are adapted in the closed condition of the frame to be brought into alignment with the longitudinal rails 30 so that the frame elements can be brought together compactly for shipment. In the fully assembled form (not shown) the rails are secured together, that is, the transverse or cross rails 40 are secured together as by suitable tension clasps or other means to provide for a unitary but transversely adjustable structure.

As indicated in this figure, preferably each of the rail elements 30 and 40 will have horizontally and vertically directed legs hereinabove referred to. The vertically extending legs or runners 32 of the longitudinal elements 30 are adapted snugly to contain the edge of a box spring or the like and the horizontally extending legs or portions 31 normally will be the load carrying surfaces of the bed frame. The transverse or cross rails 40 will ordinarily be inverted, i.e., in comparison to the longitudinal rails, and the horizontal leg 42 is uppermost so that it may act as a load carrying surface. In the form of the invention illustrated transverse rail 40 is pivotally attached to the longitudinal rail 30 by means of a rivet or similar element 48 as shown in Figs. 1 and 4 with the horizontally extending surface 42 of the cross rail 40 being operative beneath the horizontal leg 31 of the longitudinal rail 30 and it may be spaced therefrom as by a washer or the like (not shown).

To the outer surface of the depending leg 41 of the cross rail 40 is secured an integral brace and leg structure generally identified at 10. This leg element comprises a horizontally extending shoulder or flange 11 as more particularly brought out in Figs. 2 and 3, and a web-

like vertically depending portion having lateral wings **12***a* and **12***b* on each side of a centrally disposed channel or rib formation **13**. The reinforcing channel portion **13** extends into the horizontally extending flange **11** as at **20** to give additional rigidity to the structure. At the lower end of the channel in the portion generally indicated by the numeral **14** the wings **12***a* and **12***b* are brought more closely together as by means of a crimping die to provide a cavity for a caster spindle socket **15**.

The brace and leg member **10** is adapted to be secured to a depending leg of the transverse element of the frame through apertures **16***a* and **16***b* by means of rivets **47** or by other suitable means such as welding or the like. It is perhaps appropriate here to point out that the attachment of the support leg **10** to the depending leg **41** of the transverse member provides, as may be observed in Fig. 4, a sturdy T-like section. The formation of the T section adjacent the contacting end of the transverse member **40** with the longitudinal rail **30** provides a reactive force against torsional effects on the transverse member resulting from offset loading characteristics of tracking casters. It should also be emphasized that the amount of strength in the combination of the web or wing portions **12***a* and **12***b* of the leg to the dependent leg **41** of the transverse member is further increased by the brace of the channel formation intermediate the wings. The generally arcuate shape of the reinforcing channel **13** is apparent from the views shown in Figs. 2–4 and the depth of the channel will ordinarily be least at the upper end and greatest at the lower end.

In the form of the invention illustrated in the upper surface **11** of the brace and leg structure there is provided a lance-like element cut from the surface, leaving aperture **18** therebelow. The lance element **17** is adapted to fit above the horizontally extending leg **31** of the longitudinal rail. When the transverse rail with the leg attached thereto is swung into operative position it will be apparent that the lance is adapted to hold the transverse rail perpendicular to the longitudinal rail. It may also be observed that the portion of the flange **11** forward of the lance, i.e., extending toward the longitudinal rail, will fit beneath and support the surface **31** of the horizontally extending leg **31** of the longitudinal rail **30**. The lower surface of the lance will also fit upon and grasp the upper surface **31***a* of the longitudinal rail.

When the longitudinal and transverse elements are in assembled form and are perpendicular one to the other as is shown in the relationship apparent in Fig. 4, the coactive relationship of the members may be clearly understood. The transverse rail **40** will be pivoted by appropriate means as about a rivet **49** into a position perpendicular to the longitudinal rail **30**. As the transverse rail is swung in this position the lance on the brace and leg element fits over the top of the longitudinal rail. Thus the transverse rail is in effect secured to or braced with respect to the longitudinal rail both at the pivot **48** and at the lance area. We found it desirable to space these contacting areas longitudinally along the rail surface **31** for greater rigidity.

In Fig. 4 in the fragmentary view given we have broken away part of the vertically extending leg **32** of the rail **30** to illustrate the pivotal relationship of the transverse element. We have also shown the relationship of the horizontal leg surface **31** positioned under the lance element **17** and over that portion of the horizontally extending shoulder or flange **11** as shown in broken lines.

In Fig. 4 we have also illustrated the relationship of a caster arrangement with the brace and leg element. A caster fork as at **56** has at its lower portion a pin **57** adapted to carry a caster wheel **58**. It will be understood that a glide or other lower floor contact means may be substituted for the caster arrangement shown.

We wish it to be understood that while we have shown the use of a lance struck from the surface **11** of the brace and leg element as an abutment and support means for

maintaining the perpendicular relationship illustrated in Fig. 4, other abutment or support means may be substituted without departing from the nature of the invention. For example, rivets projecting downwardly from the surface **31***b* of the rail **30** could be adapted to fit into a prepared recess cut into an end of the horizontal flange **11**. Similarly a lance could be struck from the surface **31***b* adapted to receive and hold a portion of the leg flange **11**. The flange and longitudinal rail may also be detachably secured together as by a nut and bolt or by other suitable means known in the art.

Under certain conditions we may also reverse the operative relationship illustrated in Fig. 4. Thus the flange **11** may be pivotally connected to the leg **31** with the transverse element containing in the leg **42** appropriate means for coactive abutting and/or support relationship with leg **31**. It will also be appreciated that with appropriate modifications the flange **11** may carry a lance at the opposite end or at both ends for reversible position in the frame.

In view of the foregoing, it is submitted that the objects of the invention have been achieved and that a novel frame assembly and support means have been provided having a sturdy reinforced construction lending rigidity to the frame and having an attractive, simple structure and appearance.

Since the invention may be embodied in other specific forms, without departing from the spirit or essential characteristics thereof, the present embodiments are to be considered as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are intended to be embraced therein.

We claim:

1. A collapsible bedframe which includes longitudinal and transverse frame members pivotally connected one to another for relative angular displacement about the pivots such that the transverse members can lie alongside the longitudinal members when the frame is in a collapsed compact condition, each longitudinal member having a cross section which provides a horizontal flange or support surface for a boxspring and each transverse member having a cross section which provides at at least its end portion a right angle configuration with a horizontal upper flange and a vertical depending flange, and a supporting leg structure being of inverted substantially L-shaped form and having a horizontal flange portion and a vertical web portion with said web portion having a vertical channel extending the entire length thereof and extending into said horizontal flange portion of the leg, and with the edges of the vertical portion of the leg surrounding the said channel being crimped inwardly to form said channel at the lower end thereof into a socket-like cavity, and with said leg structure being rigidly secured to one of said frame members, said vertical portion of the leg structure being secured to the vertical depending flange of said frame member, and with the horizontal flange of the said frame member and the horizontal portion of the leg structure extending in opposed divergent relationship.

2. A collapsible bedframe which includes longitudinal and transverse frame members pivotally connected one to another for relative angular displacement about the pivots such that the transverse members can lie alongside the longitudinal members when the frame is in a collapsed compact condition, each longitudinal member having a cross section which provides a horizontal flange or support surface for a boxspring and each transverse member having a cross section which provides at at least its end portion a right angle configuration with a horizontal upper flange and a vertical depending flange, and a supporting leg structure at at least two opposed corners of the frame, said leg structure being of inverted substantially L-shaped form and having a horizontal flange por-

tion and a vertical web portion with said web portion having a vertical channel extending the entire length thereof and extending into said horizontal flange portion of the leg, and with the edges of the vertical portion of the leg surrounding the said channel being crimped inwardly to form said channel at the lower end thereof into a socket-like cavity, said leg structure being rigidly secured to one of said frame members adjacent to its pivotal connection with an adjoining frame member and being formed or provided with an abutment portion disposed for interengagement with a co-operating abutment element provided on said adjoining frame member at a position spaced from the pivotal connection thereof, whereby to limit the relative angular displacement of said members when the frame is opened out from its collapsed condition, and with said vertical portion of the leg structure being secured to the vertical depending flange of said frame member and with the horizontal flange of the said frame member and the horizontal portion of the leg structure extending in opposed divergent relationship.

3. In a collapsible bedframe the combination comprising longitudinal and transverse frame members coactively associated for relative angular displacement such that the transverse members can lie alongside the longitudinal members when the frame is in a collapsed compact condition, and with said frame members being disposed substantially at an end of one of the members and somewhat spaced from the end of the other member, and with said transverse frame member having in at least an end portion thereof a right angle structure with a horizontally extending flange and a vertically depending flange, an integral brace and leg member having a vertical web portion abutting against and rigidly secured to said vertically depending flange of the transverse frame member near an end thereof and said brace and leg member having a horizontal top flange parallel to and facing oppositely to the horizontal flange of said transverse frame member, said leg member having substantially throughout its entire length a vertically extending

reinforcing channel through said vertical web portion and with the edges of said vertical web portion of the leg adjacent the lower part of said channel being crimped inwardly to form therebetween a socket-like cavity, and with the said vertical web portion of the leg extending from the horizontal flange of the leg substantially to the lower end of said channel, and with pivot means interconnecting said longitudinal frame member with one of said adjacent horizontal end portions of the combination of said transverse frame member and integral brace and leg member.

4. A collapsible bedframe which includes longitudinal and transverse frame members pivotally connected one to another for relative angular displacement about the pivots such that the transverse members can lie alongside the longitudinal members when the frame is in a collapsed compact condition, each longitudinal member having a cross section which provides a horizontal flange or support surface for a boxspring and each transverse member having a cross section which provides at at least its end portion a right angle configuration with a horizontal upper flange and a vertical depending flange, and a supporting leg structure at at least two opposed corners of the frame, said leg structure being of inverted substantially L-shaped form and having a horizontal flange portion and a vertical web portion with said web portion having a vertical channel extending the entire length thereof and extending into said horizontal flange portion of the leg, and with the edges of the vertical portion of the leg surrounding the said channel being crimped inwardly to form said channel at the lower end thereof into a socket-like cavity, and with said leg structure being rigidly secured to one of said frame members.

References Cited in the file of this patent

UNITED STATES PATENTS

2,607,051	Jackson	Aug. 19, 1952
2,683,266	Baldwin	July 13, 1954
2,772,424	Roche et al.	Dec. 4, 1956