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HINGE BRACKETS

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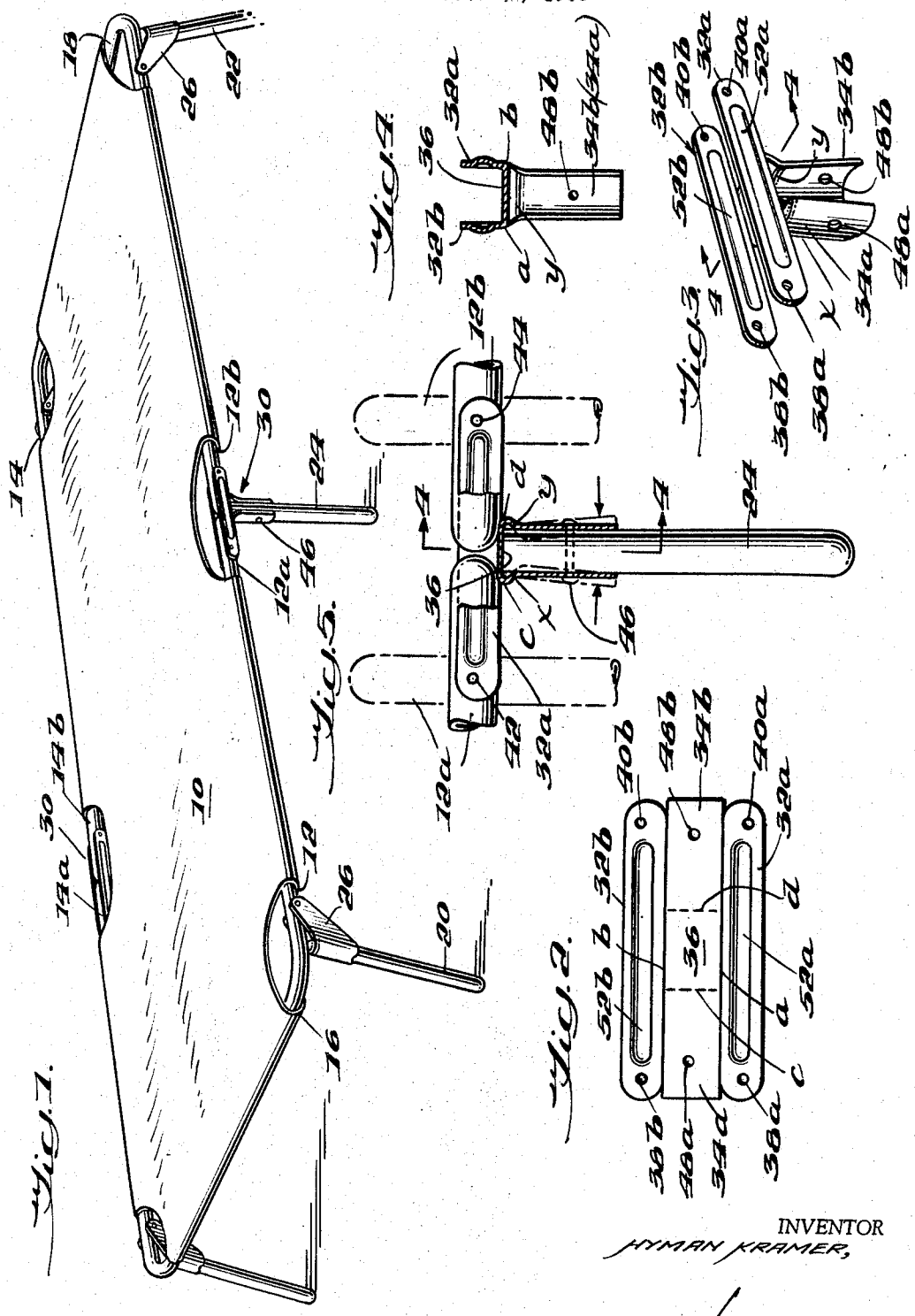


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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HINGE BRACKETS

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This invention relates to improvements in hinge brackets, and more particularly to an improved hinge bracket for hingedly connecting together the adjacent ends of three structural members in manner as enables them to assume rigid T-formation when set up for use, while permitting said members to fold into substantial parallelism.

Although having utility in folding frame constructions generally, a hinge bracket according to the present invention was designed for and will be hereinafter disclosed in its application to folding cots of the type wherein the side rails of the top frame are made up in sections whose adjacent ends are hingedly connected to one another and to the upper end of a normally upright frame supporting leg, and wherein the hinge means employed is required to provide for the side rail sections normally extending in horizontal continuation of one another and being supported substantially at their point of connection by said leg, and optionally to permit said sections to fold towards one another into substantial parallelism both with one another and with said supporting leg.

While hinge means functioning as aforesaid are known, such have not proved entirely satisfactory for one or more reasons. More particularly, a prime objection to the conventional hinge means was that, being made up in a plurality of parts, it was difficult and expensive to assemble the parts thereof to one another and to the rail sections and the supporting leg to be connected thereby.

Stated generally, an important object of the present invention is the provision of a hinge means for securing the adjacent ends of the side rail sections of a folding cot frame to one another and to the upper end of a frame supporting leg, which is characterized by simple one-piece construction and which thus may be assembled to the adjacent ends of the side rail and supporting leg at a fraction of the cost involved in the assembly of the prior multipart hinge means used for this purpose.

A more particular object of the invention is the provision of a one-piece hinge bracket for securing together the adjacent ends of any two side rail sections of a cot frame to the upper end of a frame-supporting leg, which is so constructed and arranged as to perform its intended function in dependable manner while at the same time being relatively inexpensive to manufacture and simple to assemble.

Yet another object of the invention is the provision of a one-piece hinge bracket as aforesaid which, in addition to providing an integral, rigid, flat abutment surface serving both to prevent the terminal ends of the connected rail sections from moving past horizontal position under the load of a person or persons sitting or lying on the cot and to transmit said load to the upper end of the upright supporting leg, is also so constructed and arranged as, when assembled to said leg, to frictionally grip the upper end portion of said supporting leg therebetween in manner as insures a firm and immovable connection of the hinge bracket as a unit to the upper end of the supporting leg.

The above and other objects and features of advantage of a hinge bracket according to the present invention will become apparent from the following more detailed description thereof, in which reference is had to the accompanying drawings, in which:

FIG. 1 is a perspective view of a folding cot whose side rail sections and center leg are connected by a hinge bracket according to the invention;

FIG. 2 is a plan view illustrating the blank from which such a hinge bracket may be fashioned;

FIG. 3 is a perspective view of the one-piece hinge bracket of the invention prior to its being assembled to the adjacent ends of the side rail sections of the cot framework and a center leg;

FIG. 4 is a section taken through the hinge bracket along line 4—4 of FIG. 3; and

FIG. 5 is an enlarged broken-away section of a hinge bracket according to FIG. 3 assembled to the side rail sections and supporting center leg of a folding cot as in FIG. 1, the view being intended to illustrate the functioning of the bracket as such and of the various individual parts making up same.

A folding cot generally designated **10** in FIG. 1 illustrates one example of a folding frame construction to which a hinge bracket according to the invention is well suited. More particularly, such a cot comprises parallel side rails **12** and **14** extending between frame-end portions **16** and **18**, said side rails and end portions being normally supported in a horizontal position and raised above the floor as by pairs of end legs generally designated **20** and **22**, and intermediate legs (which in the illustrated cot structure constitutes the so-called center legs), of which the right-side leg designated **24** is visible. The end legs are hingedly connected to the side rails as by hinge brackets designated **26** which may be of the type disclosed and claimed in my application Serial No. 458,148, filed May 24, 1965, now Patent No. 3,310,268 so that they may fold relatively inwardly beneath the cot frame.

The aforesaid side rails are comprised by the normally aligned sections **12***a*, **12***b* and **14***a*, **14***b*, the adjacent ends of which sections are shown to be connected to one another and to the upper ends of the center legs associated therewith by means of a bracket generally designated **30**, which latter forms the subject-matter of the present invention.

Referring to FIG. 3 illustrating the bracket of the invention prior to its assembly to the side-rail sections and supporting leg which it serves to connect, such is characterized by one-piece construction and by modified T-configuration when viewed in side elevation. More particularly, said bracket **30** comprises a normally horizontal top-bar portion defined by elongate, spaced apart and parallel upright flanges **32***a*, **32***b* and a depending vertical stem portion defined by two arcuately formed leg portions **34***a*, **34***b*.

By reference to FIGS. 2 and 4 in particular, it will be seen that said elongate upright flanges **32***a*, **32***b* extend integrally from a flat connecting web portion **36**, being bent upwardly therefrom along parallel lines of bend designated *a* and *b* which define the side edges of said web portion. FIGS. 2 and 5 show that the leg portions **34***a*, **34***b* are also integral with said flat web portion **36** and that they are bent downwardly therefrom along transverse lines of bend designated *c* and *d* which define the end edges of said web portion.

It will also be apparent from FIGS. 2 and 3 that the flat connecting web portion **36** is disposed longitudinally-centrally between the ends of the elongate upright flanges and that it is rectangular in plan view, with its greater dimension being in the direction of the length of said upright flanges.

By design, the spacing between the lines of bend *a* and *b*, and thereby between the elongated upright flanges **32***a*, **32***b*, is substantially equal to the width dimension of the side-rail sections of the cot frame to be connected thereby, which dimension is the outside diameter if said sections are made of round tubular stock, as is customary. Thus, said flanges are adapted to receive between them the adjacent end portions of two side rail sections to be hingedly connected by the bracket **30** of which they form a part.

By virtue of the somewhat rectangular configuration of the connecting web portion **36** of the bracket, the spacing

between the lines of bend *c* and *d*, and thereby between the upper ends of the leg portions **34***a*, **34***b* making up the vertical stem portion of the bracket **30**, is somewhat greater than the aforesaid spacing between the bend lines *a*, *b* whereby initially said leg portions are spaced apart a distance greater than the width dimension, i.e. diameter in case of a round leg, of the supporting center to whose upper portion the bracket as a whole is to be immovably connected. However, it is an important feature of the invention that the upper ends of the bracket legs are, just below their lines of connection with the connecting web portion **34** of the bracket, constricted inwardly as at *x* and *y* to a diameter slightly less than the diameter of the supporting center leg **24** to be received between them, and that said legs are flared outwardly from one another in the direction of their length to a diameter slightly in excess of that of said center leg, as enables ready reception of the center leg into the space between said leg portions.

To enable the side rail sections connected by a bracket **30** to swing or fold from their normal horizontally aligned position to folded positions in which they extend substantially parallel to one another and to the center leg to which the bracket is immovably affixed in manner to be described, the outer ends of each of the bracket flanges **32***a*, **32***b* are provided with aligned pivot-pin receiving apertures designated **38***a*, **38***b* and **40***a*, **40***b* for the reception of pivot pins **42**, **44** which extend therebetween and in so doing also pass through apertures therein provided in the end portions of the side rail sections connected by the bracket. By reference to FIG. 5, it will be noted that the apertures provided in the adjacent ends of the side rail section end portions through which the pivot pins pass are spaced from the ends proper of the rail sections a distance such that when the side rail sections are horizontally aligned, said ends proper rest on the upper face or side of the flat connecting-web portion **36** of the bracket. Thus, the bracket and more particularly said web portion **36** itself provides positive means for preventing the side rail sections of the cot frame from swinging past center under load such as that of the weight of a person sitting or lying on the cot, while also permitting said side rail sections to fold into parallelism with one another, as indicated in broken lines, FIG. 5. The fact that the bracket end portions are devoid of bottoms, consequent to the leg portions **36***a*, **36***b* which define the vertical stem of the bracket being struck from what would otherwise form the bottoms for said end portions, of course enables the side rail end portions to fold freely as aforesaid when such is desired.

According to an important feature of the invention, the depending leg portions **34***a*, **34***b* which together define the vertical stem of the T-bracket are formed in their zones, just below their lines of connection with the aforesaid integral connecting web portions **36** of the bracket, with inwardly directed constrictions designated **50***a*, **50***b*, from whence the leg portions flare outwardly toward their lower free end portions. By design, the amount of constriction imparted to the constricted zones of the leg portions is such that the upper ends of the leg portions are spaced apart a distance somewhat less than the corresponding width dimension of the center leg to be received therebetween, and the amount of flare imparted to the lower free ends of the leg portions is such that said lower free ends are spaced apart a distance greater than said width dimension. The constrictions, in addition to reducing the width of the opening provided by said leg portions adjacent their upper ends, also act to stiffen the upper ends of the leg portions and to provide "swing points" about which the flared free lower ends of the leg portions may move when forcibly drawn together.

As indicated above, the upper end of the center leg **24** is receivable in the space between the specially formed leg portions **34***a*, **34***b* of the bracket stem, which portions are preferably also formed along arcs of radius corresponding generally to that of the center diameter of said center leg. While due to the constriction imparted to the upper zones of said leg portions, free movement of the center leg upwardly until its upper end edge engages against the under face of the connecting web portion **36** may be slightly impeded, any difficulty in this respect can be resolved by manually spreading said leg portions apart, which operation may be readily performed. Upon the upper end of the center leg **24** engaging against the under face of the bracket web portion **36**, the leg portions **34***a*, **34***b* of the bracket stem are drawn tight against said center leg and secured by passing a rivet or bolt **46** (FIG. 1) through aligned openings designated **48***a*, **48***b* provided therefor in said leg portions, the diametrically aligned openings also provided therefor in the opposite peripheral wall portions of the center leg being spaced from the upper end edge of said leg the same distance that said openings **48***a*, **48***b* are spaced from the under surface of the connecting web portion **36** of the bracket. By design, the riveting or bolting of the leg portions **34***a*, **34***b* of the bracket stem will draw said leg portions together, particularly in the upper constricted zones thereof, to a degree which results in the bracket **30** being immovably connected as a unit to the upper end of the side rail supporting leg **24**, and this by the use of but a single bolt or rivet.

As is indicated in FIG. 2, a hinge bracket of the invention may be blanked out of a rectangular piece of sheet stock such as sheet steel of the proper gauge with a minimum of scrap. To provide the upright flanges **32***a*, **32***b* of the final sheet steel bracket with the requisite strength and resistance to bending, they may be provided with longitudinal reinforcing ribs **52***a*, **52***b*, the provision of which permits the bracket as a whole being fashioned from lighter gauge sheet stock than would otherwise be possible.

In case the center legs (or intermediate legs) are bolted to the center stem of their hinge brackets **10**, rather than being riveted thereto (it being observed that both forms of leg-to-bracket securement have been described in the foregoing), such permits ready removal of the legs from the hinge brackets and hence from the cot side rails if and when such is desired, for example, for shipping or when the cot is being stored.

Without further analysis, it will be appreciated that a hinge bracket as described and illustrated fully achieves the objects of the invention as set forth above and does so in a simple yet effective and thoroughly dependable manner. However, as many changes could be made in carrying out the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A hinge bracket for connecting the adjacent ends of two longitudinal frame members together and to an end of a third member while permitting swinging movement of said two members with respect to said third member between a first position in which they extend in longitudinal alignment and at a right angle to said third member and a second position in which they are disposed substantially parallel to one another and to said third member then disposed intermediate them, said bracket being of one-piece construction and having T-configuration when viewed in side elevation and comprising a horizontal top bar and a vertical stem depending from said top bar midway of the ends of the latter, said top bar being defined by a pair of elongate, parallel, upright flanges secured to one another in laterally spaced relation at their mid portions by a short-length flat connecting web, said vertical stem being defined by spaced-apart leg portions disposed transversely of said upright flanges and depending from the end edges of said connecting flange, said upright flanges adapted to receive between them the adjacent end portions of said two members and being provided with means adjacent their outer ends for receiving pivot means for pivotally connecting said adjacent end portions of the two members thereto and thereby to the outer ends of the bracket top bar, the

leg portions defining the vertical stem being shaped to the cross-sectional configuration of the third member and being spaced apart a distance as to receive at least the upper portion of said third member with tight fit, and said leg portions being provided intermediate their length with means for receiving a rivet for fixedly securing the third member in place between said leg portions, the connecting web providing a rest surface for the immediately adjacent ends of said two members when the latter are in their first position aforesaid and further providing an abutment surface against which the end edge of the secured third member is adapted to engage.

2. A hinge bracket according to claim 1, wherein the leg portions which define the vertical stem of the bracket are constricted adjacent their zones of connection with said connecting web thereby providing an opening for the third member having lesser width adjacent said web than the width of said opening at the free ends of said leg portions.

3. A hinge bracket according to claim 2, wherein said vertical leg portions flare outwardly from their constricted zones to their free ends, whereby tightening of the flared free ends of the leg portions against said third member causes their constricted zone portions firmly to clamp between them the end of the third member disposed immediately adjacent said connecting web.

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