June 24, 1952 C. C. CARPENTER 2,601,365

COMBINATION STRETCHER AND COT

Filed Dec. 29, 1945 2 SHEETS—SHEET 1

Fig. 1

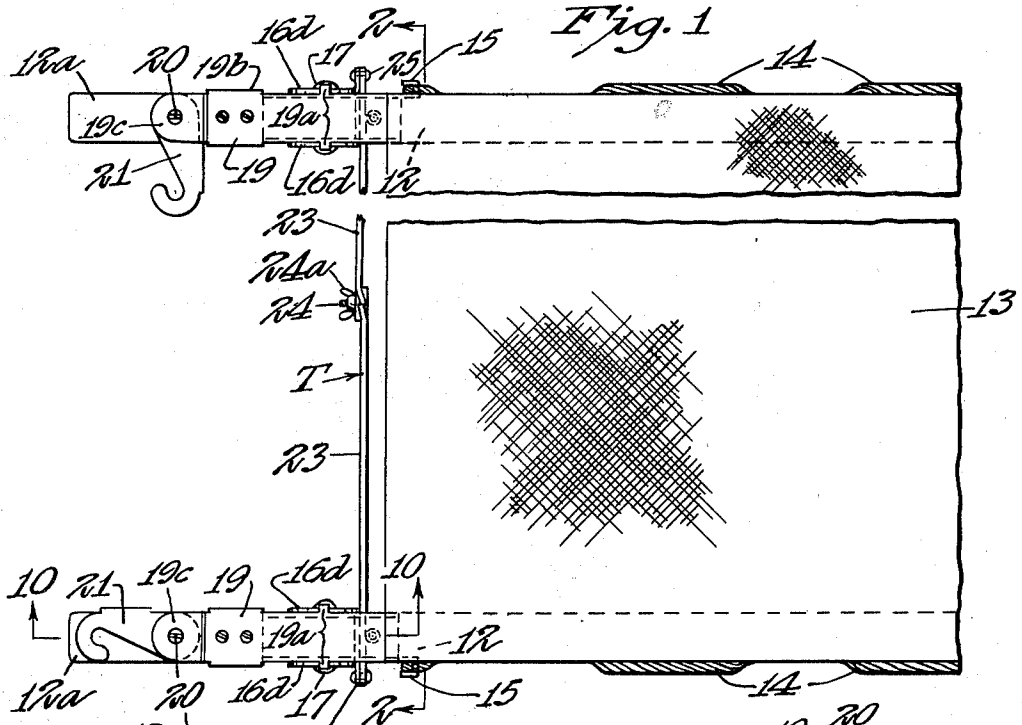


Fig. 2

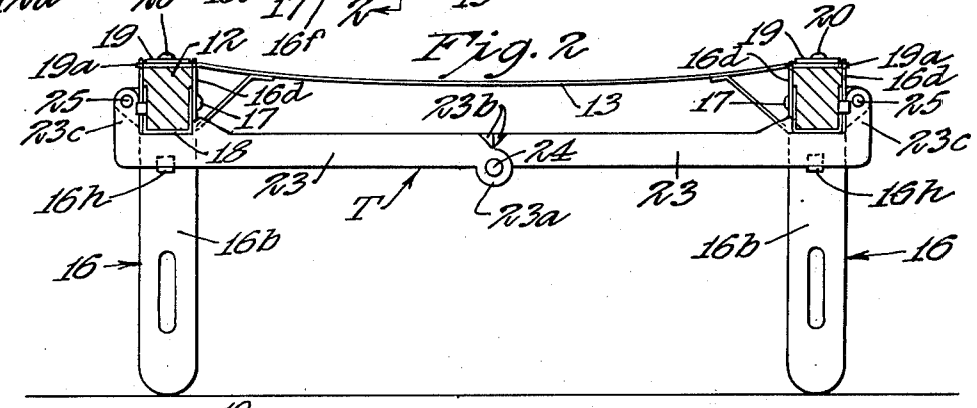
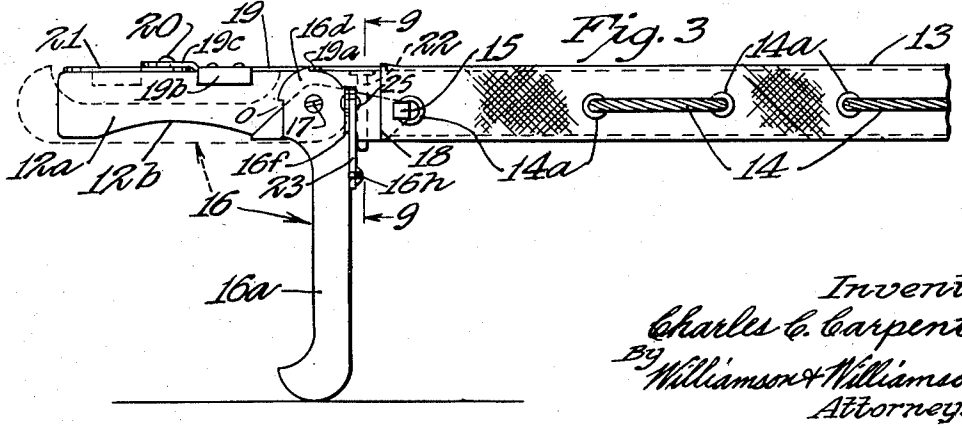


Fig. 3



Inventor
Charles C. Carpenter
By Williamson & Williamson
Attorneys

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Fig. 4

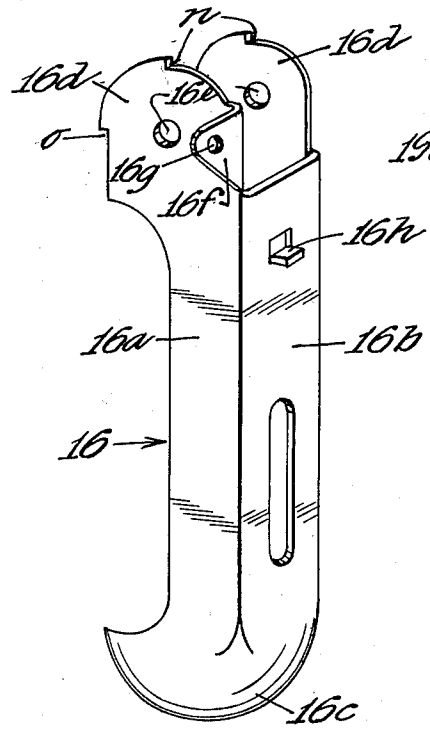


Fig. 5

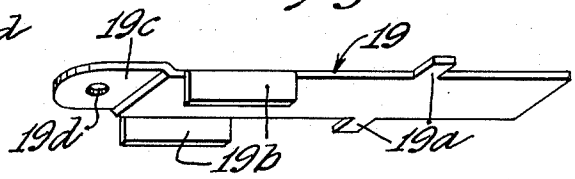


Fig. 6

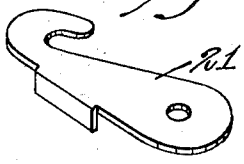


Fig. 7

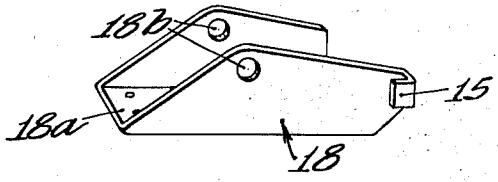


Fig. 8

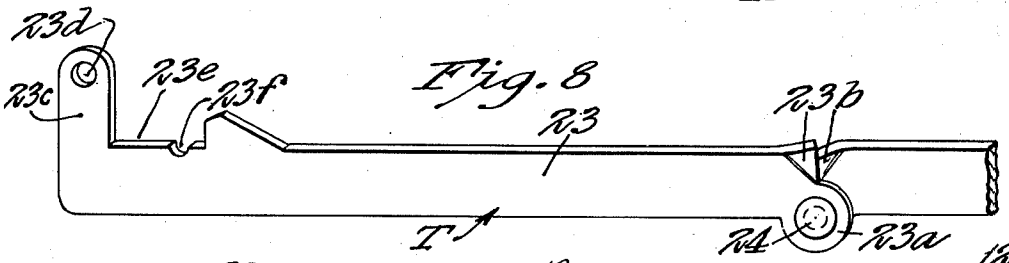


Fig. 9

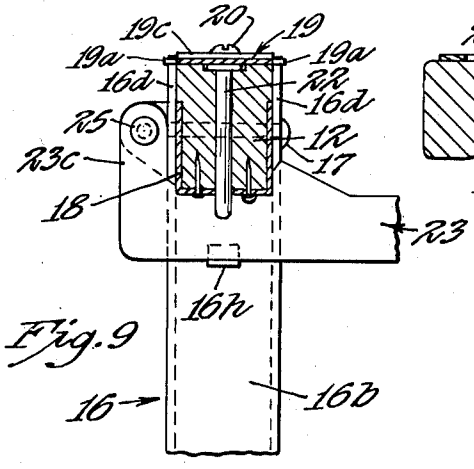
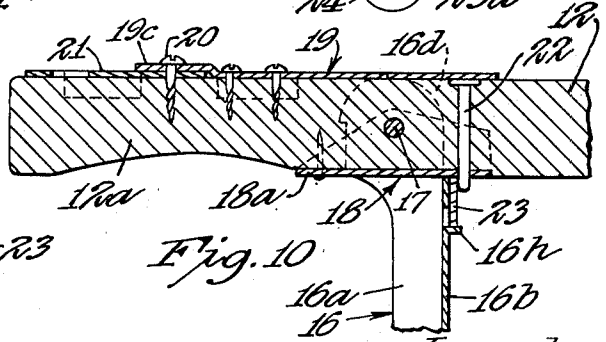


Fig. 10



Inventor
Charles C. Carpenter
By Williamson & Williamson
Attorneys

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UNITED STATES PATENT OFFICE

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COMBINATION STRETCHER AND COT

Charles C. Carpenter, Grand Forks, N. Dak.

Application December 29, 1945, Serial No. 638,043

9 Claims. (Cl. 5—82)

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This invention relates to stretchers and litters adapted to be employed in caring for and transporting the injured or sick and relates more particularly to an improved collapsible structure adapted to be utilized as a cot to comfortably support the patient as well as to be employed in transportation.

It is an object of my present invention to provide certain improvements in the collapsible stretcher constructions, which will increase the efficiency and durability of collapsible stretchers of the type convertible into a cot or bed.

More particularly, it is an object to provide in combination collapsible stretcher and cot construction, improved mechanism for very efficiently bracing the frame construction and supporting legs to substantially rigidly lock the entire leg structure with the frame rails and spreader mechanism, when the device is used as a cot.

Another object is the provision of improved mechanism associated with the legs and leg retaining elements to make more positive and efficient the folding of the legs and the setting up of the legs in supporting position.

Another object is the provision of a combination foldable supporting leg construction and toggle braces and spreaders connected therewith to grip the longitudinal rails of the stretcher and rigidly lock the supporting legs therewith when the device is utilized as a cot.

A still further object is the provision of closely cooperating means for securing the legs in folded or vertically extending positions with simple mechanism for releasing such securing means having also a dual function in the tensioning of the bracing structure.

Another object is the provision of a highly efficient, foldable leg structure with the pivotal connection and locking thereof in folded or supporting positions.

These and other objects and advantages of my invention will be more apparent from the following description made in connection with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

Fig. 1 is a top plan view of one of the longitudinal sections of a combined stretcher and cot embodying my invention, with some portions broken away to foreshorten the width thereof;

Fig. 2 is a cross section taken on the line 2—2 of Fig. 1 showing the stretcher converted into a cot with my improved bracing and locking mechanisms operatively applied;

Fig. 3 is a side elevation of one end of the

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stretcher shown in Figs. 1 and 2, the dotted lines indicating the folded positions of the legs and bracing toggle;

Fig. 4 is a perspective view of one of the legs detached;

Fig. 5 is a perspective view of one of my spring retaining clips for securing the legs either in upright supporting position or folded position;

Fig. 6 is a perspective view of one of my anchoring elements for securing traction ties and straps;

Fig. 7 is a perspective view showing a saddle clip for reinforcing and increasing the efficiency and durability of the pivotal connection of a supporting leg;

Fig. 8 is a fragmentary, perspective view of one of my toggle braces or spreaders detached;

Fig. 9 is a vertical section taken on the line 9—9 of Fig. 3, showing the gripping engagement of one of the arms of the toggle brace with one of the longitudinal rails and the rigid locking relation between the legs, rails and toggle braces when my device is set up as a cot; and

Fig. 10 is a fragmentary, vertical section taken on the line 10—10 of Fig. 1, showing further, the bracing and tensioning mechanisms as well as showing the mechanism for retaining the legs and the releasing means for such mechanism.

Referring now to the structure illustrated in the drawings, I provide a pair of longitudinal side rails 12 which preferably, are of rectangular cross section throughout the greater portion of their length and which may each be integral throughout the length of the structure or, in accordance with my Patent No. 2,367,167, may be constructed of two longitudinal sections hinged together medially of the stretcher and provided with a variable abutment between the pivoted ends for the purposes and according to the structure of said patent. A flexible, rectangular body-supporting sheet 13 constructed of suitable material such as canvas surrounds at its longitudinal edges, the rails 12 and may be connected in any suitable manner with the rails, provided that it is secured to the rails in a substantially fixed relationship to apply tension when the rails are transversely spread apart. The body-supporting sheet 13, as shown in the drawings, is provided on the narrow, marginal portions overlying the outer side face of each rail with longitudinally disposed anchoring loops 14, fashioned if desired, for each side of the stretcher from a continuous cord or flexible element, laced or woven alternately in and out, relative to the fabric, through eyelets 14a and

having each extremity secured, as shown, to a hook 15, all as disclosed in my copending application, Serial No. 608,439, ripening into Patent No. 2,449,767 on September 21, 1948. The end portions of the longitudinal rails 12 are circumferentially rounded to form handle members 12a and preferably such handle members are longitudinally recessed along curved lines at their undersides, as shown, at 12b to facilitate gripping of the rails.

Just inwardly of each of the handle members 12a on each of the rails 12, a foldable leg 16 of efficient structure is pivoted by suitable means such as a transversely extending horizontal pin 17. Each leg 16, as clearly shown in Fig. 4, comprises a preferably integral member suitably pressed if desired, from sheet metal having inner and outer, similarly formed, spaced longitudinal sides 16a adapted to straddle the rail and having an intermediate or connecting web 16b disposed at right angles thereto. The forward, longitudinal edge of each of the sides 16a is recessed between the ends to accommodate certain elements applied to the top portions of the handle members 12a when the legs are swung to a folded position against the respective handle members, as shown in dotted lines in Fig. 3. The sides 16a and the intermediate web 16b converge at their lower ends to an integral, semi-spherical supporting foot 16c which is adapted to rest on a floor or other supporting surface and because of the rounded, exterior surface, to be readily slid over a supporting surface. The length of the legs 16 and of the longitudinal, recessed portions in the forward edges of sides 16a is such that the legs may very compactly embrace the sides and bottom and outer extremities of the handle members 12a, with the feet 16c finishing off the handle members in ornate, and efficient manner. The web 16b terminates some distance short of the upper end of sides 16a leaving in the upper ends of 16a a pair of generally semicircular attachment ears 16d properly spaced apart to straddle a rail and to lie substantially flush against the side walls of a wear resisting and reinforcing saddle clip 18 (see Fig. 7) attached to the connected portion of the rail. Saddle clip 18 is preferably constructed of sheet metal bent into U-shape cross section and has an intermediate connecting web 18a which is adapted to lie flush against the underside of the rail and to be secured thereto by suitable means such as screws or nails. The saddle clip 18 in its side walls, is provided with axially aligned opposing apertures 18b which are adapted to be also aligned with apertures 16e in the attachment ears 16d of the leg for accommodation of the transverse pivot pin 17. The semi circular upstanding edges of the two attachment ears 16d of each leg are provided with two sets of transversely aligned, preferably single-angle notches *n* and *o* respectively which are adapted to be engaged by a pair of outwardly and laterally extending rectangular locking lugs or teeth 19a extending from the longitudinal edges of a resilient locking plate 19, the forward end of which is secured by a pivot screw 20 to the upper side of the appropriate leg. The medial and rear portions of the locking plates 19 are free to be flexed upwardly and the longitudinal edges are preferably provided with depending, spaced guide flanges 19b, overlying the longitudinal side edges of the associated rail to positively retain the plates or clips against displacement through oscillation during engagement or disengagement of the teeth 19a with either of the sets of notches *n* and *o*.

To the upper side of each of the handle members 12, an anchor hook 21 of the structure disclosed in my co-pending application, Serial No. 608,439, above referred to, is pivoted and in accordance with my present invention, is associated with the pivot screw 20 and the attached outer end of resilient locking plate 19. The outer end of resilient plate 19 is offset upwardly relatively to the attachment tongue 19c which overlaps the pivoted end of anchor hook 21 lying flush thereagainst and which is provided with an anchoring aperture 19d to accommodate the common pivot screw 20 which also passes through the anchor hook.

I provide a simple mechanism for releasing the resilient locking plate or clip 19 by upward flexing action. For each of the legs, a vertical headed release pin 22, see Figs. 3 and 9, is slidably mounted in a vertical bore formed in the appropriate, vertical central thickness of the associated rail, the head at the upper end of pin 22 underlying the free portion of resilient plate 19 and retaining the pin against downward displacement and preferably fitting a countersunk portion at the top of the rail. Pin 22 and its drilled socket are disposed in slightly inward, spaced relation of the plane defined by the rear web 16b of two of the transversely disposed legs when the same are set up for supporting and projects downwardly through an aperture in the bottom web 18a of saddle clip 18 normally projecting therebelow for finger manipulation upwardly to retract the free end of plate 19.

Between each of the pairs of transversely opposed, supporting legs and functionally combined with said legs and the longitudinal rails 12 for spreading, tensioning and bracing purposes, I provide a toggle brace and spreader identified as an entirety by the letter T and comprising a pair of toggle arms 23 pivotally connected at their inner overlapping ends by preferably, a detachable pivot means such as the pivot pin 24 having a wing nut or the equivalent 24a threadedly engaged with one end thereof. The toggle arms 23, to facilitate pivoting, may be provided with overlapping pivot bosses 23a apertured to receive the pivot pin. The inner ends of the two toggle arms 23 above the pivot axis are deflected to furnish edge abutment between abutment shoulders 23b, said abutment occurring as shown, when the two arms have been swung from collapsed or partially collapsed position to substantially longitudinal alignment. The outer ends of the two arms of each toggle brace are pivotally connected with the respective rear faces of the two transversely opposed legs 16 with which the particular toggle brace is associated. Out-turned lugs 16f are formed, preferably integrally, with the outer sides 16a of the two opposed legs, said lugs being disposed adjacent the pivoted ends of the legs and having pivot apertures 16g which lie in substantially the same horizontal plane as the leg pivoting apertures 16e when the legs are disposed perpendicularly from the supporting rails. The toggle arms 23 are provided at their outer ends with upwardly extending tongues or lugs 23c each having in the upper portion thereof, a bearing aperture 23d for accommodation of a rivet or pivot pin 25 which pivotally connects the outer end of each toggle arm with the associated lug 16f of the appropriate leg. The entire toggle brace therefor swings with the swinging of the connected, transversely opposed legs

as they are moved from collapsed to erect, supporting position.

Immediately adjacent the pivotal connection of the outer end of each toggle arm with the lug **16***f* of the leg, the toggle arm is provided with a rectangular recess or enlarged square notch **23***e*, as shown, defined at one side by the inner edge of the tongue portion **23***c* and of configuration and dimensions to snugly embrace the lower portion of the associated, longitudinal rail **12**, reinforced by the attached saddle clip **18**. Thus, it will be seen by reference to Fig. 9 that when the legs are swung to the erect, rail-supporting position, the toggle brace T connecting two transversely opposing legs swings therewith, bringing the recessed portions **23***e* adjacent the outer ends of the arms into gripping relation with the reinforcing saddle clips surrounding the lower portion of the rails to which the legs are pivoted. An abutment lug **16***h* is struck up or otherwise formed on the rear web **16***b* of each leg, adapted to engage and underlie the lower edge of the pivoted end of the associated toggle arm when the toggle is extended or spread and the legs are disposed in erect position. It will also be noted that the vertical lifting pin **22** for releasing the resilient locking plate **19** (see Fig. 10) is positioned just inwardly of the adjacent end of the associated toggle arm **23** to restrict inward flexing or distortion of the said toggle arm and to assist in rigidifying and tensioning the entire bracing structure. It will further be noted that the toggle brace must be spread before the legs may be swung from their folded position to supporting position, to rigidly lock the side rails together with the legs and to apply tension to the bracing structure and to the body-supporting sheet, which of course, is also a factor in the bracing and tensioning of the entire structure.

With my improved structure, collapsing is effected by swinging the two pairs of transversely opposed, interconnected legs upwardly against the handle members, to the dotted line position shown in Fig. 3 whereafter the toggle braces or spreaders may be collapsed or angled, then lying flatwise, in close relation below the rails of the stretcher, the flexible sheet folding, to enable the rails and collapsed toggle braces and folded legs to all be associated in a very compact collapsed bundle. In said collapsed position, the teeth **19***a* of the spring locking plates are engaged forwardly of the single-angle notches or detents *o* formed in the semi-circular, pivoted edges of the legs, retaining the legs in folded position.

In use as a stretch or litter, the toggle braces or spreaders T are extended to substantially align the two arms of each toggle brace and a human body may then be successfully carried, supported comfortably upon the flexible sheet without changing the positions of the folded legs. It will be noted that the flexible sheet **13** as well as the cords **14** forming attachment loops are connected and held at the end portions of the sheet by the hooks **15** which are fashioned in the inner ends of the saddle clips **18**.

To convert the stretcher into a cot, the two pairs of transversely opposed legs are quickly swung downwardly from their folded positions and in so doing, swing the toggle braces into the inter-locking, rail-engaging positions previously described, thereby tensioning the entire brace structure and quite rigidly locking the two longitudinal rails together and with the supporting legs. The abutment of the struck-out lugs **16***h* of the legs against the lower edges of the outer

portions of toggle arms **23** is a further factor in tensioning the entire brace structure.

In swinging the legs to the erect supporting position, the locking teeth **19***a* of the spring locking plates ride over the circular marginal edges of the spaced attachment portion **16***d* of each leg, causing an automatic locking engagement of the teeth **19***a* with two spaced, single-angle notches *n* for each leg. A very positive and rigid connection is thus made, with the detents *n* locking the legs against forward swinging movement and the abutment of the inter-locking recessed portions **23***e* of the toggle arms locking the legs against inward swinging movement beyond the vertical position.

It will of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention.

What I claim is:

1. In stretcher construction, a pair of spaced longitudinal rails, a collapsible rectangular, body-supporting member having its longitudinal marginal portions connected with said rails, two pairs of transversely opposed, supporting legs pivotally mounted upon said rails for positioning in folded relation against said rails and for positioning substantially perpendicular to said rails to support the same, a pair of spreader toggles, each interconnecting a pair of said transversely opposed legs and pivotally connected therewith and disposed below said body-supporting member, the arms of said toggles adjacent their outer ends having portions recessed in the shape of and to accommodate and embrace the cross sectional shape of said rails when said pairs of legs are swung to perpendicular supporting position with said toggles outspread, the recesses clearing the rails when the supporting legs are positioned in folded relation to permit the folding of the toggles parallel to the rails.

2. In stretcher construction, a pair of spaced longitudinal rails of substantially rectangular, cross sectional shape, a foldable, rectangular body-supporting member having its longitudinal marginal portions connected with said rails, two pairs of transversely opposed supporting legs pivotally mounted upon said rails for disposal in folded position and also for disposal in erect position to support said rails, means for locking said legs in perpendicular, supporting position, a pair of spreader toggles, each interconnecting a pair of said transversely opposed legs below said rails and being pivotally connected to said legs, the arms of said toggles adjacent their outer ends having substantially square notched recesses for snugly embracing the cross sectional shape of said rails when said toggles are outspread and said pairs of legs are swung to supporting position, whereby said rails, legs and spreader toggles are locked together, substantially rigidly.

3. In a combination stretcher and cot, a frame structure including a pair of spaced, longitudinal rails, supporting legs pivoted to said rails and foldable thereagainst, each of said legs including a pair of rigidly connected spaced vertical webs straddling the sides of a rail, at least one of said webs at its interconnected end having a semi circular edge disposed concentrically of the leg pivot and extending tangentially above the top of the associated rail, a spring locking plate attached to the top of said rail and having a laterally extending locking tooth adapted to ride said semi circular edge, said edge having a lock-

ing recess for receiving said tooth and releasing means for said plate comprising a slide pin disposed perpendicularly to the top of said rail and extending therethrough and having a depending end disposed for finger manipulation below the bottom of said rail, the head of said pin underlying the free portion of said spring plate.

4. The structure set forth in claim 3 and a spreader toggle for each end of said frame, the arms of each spreader toggle being pivotally connected to the rear faces of a pair of transversely opposed legs for positioning flush against said rear faces when said legs are disposed perpendicularly to said rails with said toggle spread, said plate releasing slide pins being disposed substantially flush against the arms of said toggles when the said toggles are outspread and said legs are erected.

5. In stretcher construction, a pair of spaced, longitudinal rails of substantially rectangular, cross sectional shape, a flexible body supporting sheet having its longitudinal marginal portions connected with said rails, two pairs of transversely opposed supporting legs pivotally mounted upon said rails for folding against said rails and also for disposal in erect rail-supporting position, means for locking said legs in supporting position, a pair of spreader bars, the ends of which are pivotally connected to the outer sides of the legs, each spreader bar comprising a pair of arms pivoted together and each of said arms having a recess in one edge thereof adjacent the connected leg, said recess being of the shape of the lower cross section of one of the rails and being adapted to snugly embrace the adjacent rail and be interlocked therewith when the legs are moved to supporting position with the spreader bars outspread.

6. In a stretcher construction, the combination including a pair of spaced longitudinal rails, a collapsible rectangular body-supporting member having its longitudinal marginal portion connected with said rails, two pairs of transversely opposed supporting legs pivotally mounted upon said rails for positioning in folded relation against said rails and for positioning substantially perpendicular to said rails to support the same, a pair of spreader toggles provided with arms pivotally connected to said legs adjacent the connection of said legs with said rails, said legs being provided with an abutment element for underlying the lower edges of said arms adjacent the leg connected positions, the arms of said toggles adjacent their outer ends having portions recessed in the shape of the cross sectional shape of said rails, said recesses snugly embracing the cross sectional shape of said rails when said pair of legs are swung to perpendicular supporting position with said toggles outspread.

7. In a stretcher construction having a pair of spaced longitudinal rails of substantially rectangular cross sectional shape, the combination including a pair of spreader toggles having arms adjacent their outer ends provided with substantially square notched recesses for snugly embracing the cross sectional shape of said rails when said toggles are outstretched to prevent rotation of said rails seated in the recesses.

8. In a stretcher construction having a pair of spaced longitudinal rails provided with parallel sides, said rails being supported upon pivotally mounted legs, the combination including a pair of spreader toggles having arms adjacent their outer ends provided with recesses having substantially parallel sides for snugly embracing the cross sectional shape of said rails when said toggles are outstretched, and means for pivotally attaching said spreader toggles to the legs, said means suspending the toggles under the rails and permitting rotation of the toggles through an angle of 90° causing the recesses to clear the rails, thereby allowing the toggles to be folded parallel to the rails.

9. In a stretcher construction having a pair of spaced longitudinal rails provided with parallel sides, the combination including two pairs of transversely opposed supporting legs pivotally mounted upon said rails for positioning in folded relation against said rails and for positioning substantially perpendicular to said rails to support the same, a pair of spreader toggles having arms adjacent their outer ends provided with recesses having substantially parallel sides for snugly embracing the cross sectional shape of said rails when said toggles are outstretched, said spreader toggles having their arms pivotally attached to the legs so that as the legs are positioned in folded relation against said rails said toggles are rotated through an angle of 90° causing the recesses to clear the rails to permit the toggles to be folded parallel to the rails.

CHARLES C. CARPENTER.

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