Sept. 21, 1948. C. C. CARPENTER 2,449,767

STRETCHER WITH SKELETAL TRACTION FACILITIES

Filed Aug. 2, 1945 2 Sheets-Sheet 1

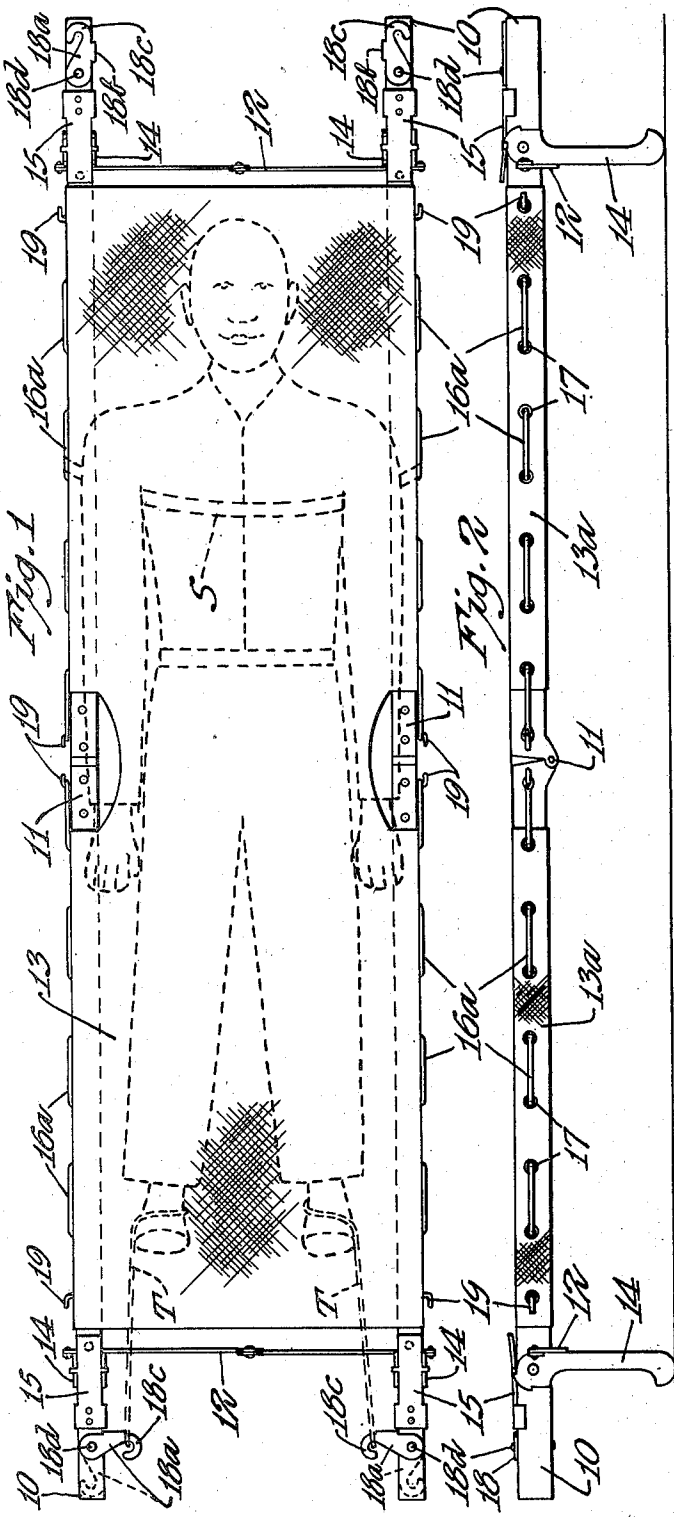


Fig. 1

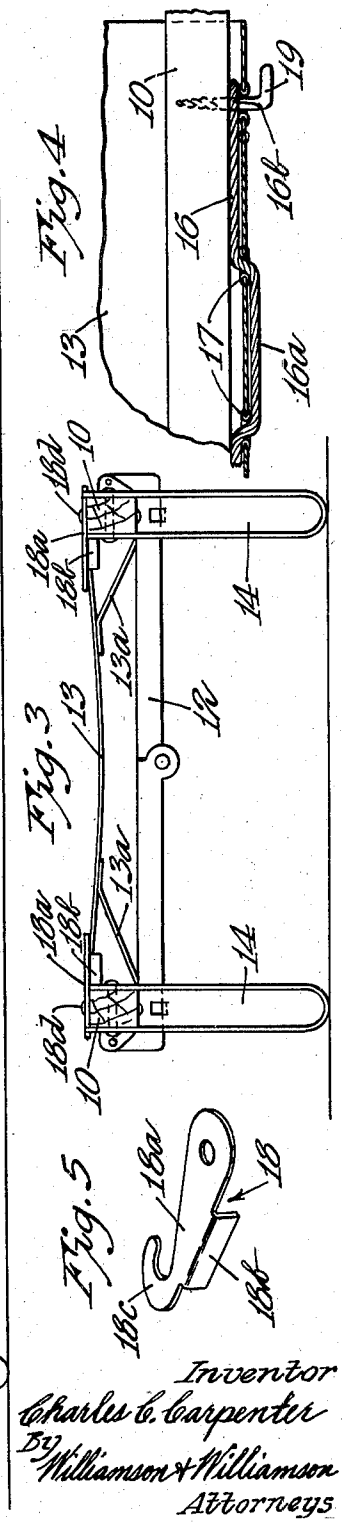


Fig. 2

Fig. 3

Fig. 4

Fig. 5

Inventor
Charles C. Carpenter
By Williamson & Williamson
Attorneys

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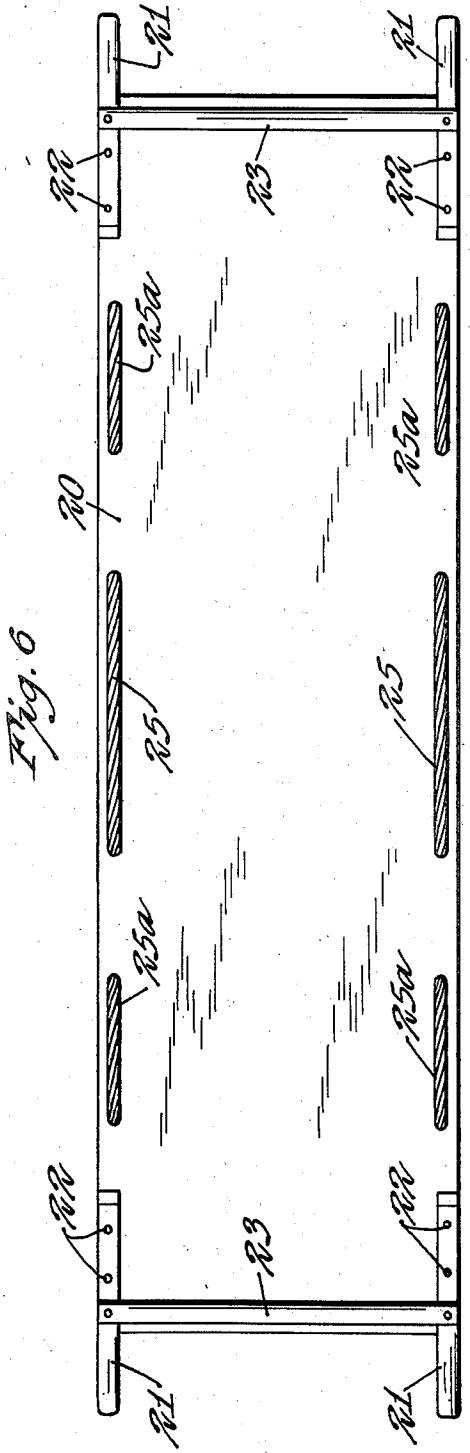


Fig. 6

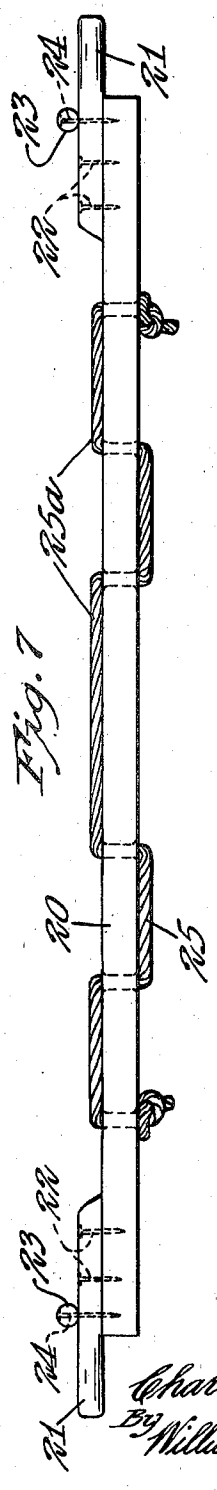


Fig. 7

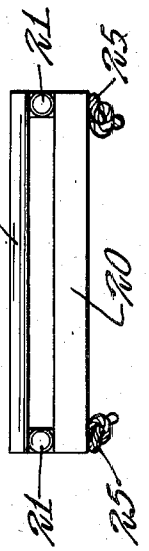


Fig. 8

Inventor
Charles C. Carpenter
By Williamson & Williamson
Attorneys

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STRETCHER WITH SKELETAL TRACTION FACILITIES

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

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7 Claims. (Cl. 128—84)

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This invention relates to stretchers and litters adapted to be employed in caring for and transporting the injured or sick.

I am the inventor and joint inventor, respectively, in U. S. Letters Patent Nos. 2,367,167 and 2,333,062 which disclose a number of valuable improvements in stretcher construction including highly practical, collapsible construction with means facilitating loading and unloading of the patient thereon as well as foldable, leg construction by which the stretcher may be quickly converted to a cot and cross brace construction for maintaining the two side rails in proper spaced relation with tension on the flexible sheet or body support.

The patents also disclose some facilities for strapping the patient to the stretcher and applying traction to parts of the body.

My present invention relates particularly to improvements in my general stretcher structure which materially increase the facility and effectiveness of applying and maintaining fixed skeletal traction for broken bones.

It is an object to provide in a stretcher of the class described, closely cooperating means whereby traction may be effectively applied to most members of the body to relieve pain and prevent further injury to fractured limbs, neck and other body portions after an accident and during transportation.

More specifically, it is an object to provide in a stretcher or litter, two series of closely cooperating, anchoring elements disposed respectively at the longitudinal sides of the stretcher and adjacent the ends thereof for anchoring traction ties and straps whereby substantially straight-line traction may be applied to the arms, legs and spine of the patient and whereby, moreover, the body may be strapped or otherwise, fixed to the stretcher in a desired, predetermined relation to permit proper traction stresses to be obtained.

A further object is the provision of a simple but highly efficient set of anchor clips for traction ties which fit very compactly into the end portions of the stretcher rails or side members without interference to other parts of the stretcher and which may be quickly extended inwardly in substantially straight line relation with the legs and arms and in combination with straight-line pull effect for the neck, and back.

Another object is the provision by simplified but highly efficient expedient of a plurality of longitudinally spaced anchoring loops at each of the longitudinal sides of the stretcher adapted for

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cooperative association with the inwardly extending, anchoring means or clips for securing traction ties.

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 the same parts throughout the several views and in which:

Fig. 1 is a top plan view of an embodiment of my improved stretcher or litter, the dotted lines indicating a human figure disposed on the stretcher with traction applied to both legs;

Fig. 2 is a side elevation of the same;

Fig. 3 is an end elevation of the same;

Fig. 4 is a detail view partly in top plan and partly in horizontal section showing the formation of anchoring loops by the application of a flexible element or cord to the marginal ends of the canvas sheet at the side of one of the rails;

Fig. 5 is a detail perspective view showing a preferred embodiment of anchor clip detached;

Fig. 6 is a top plan view of another form of stretcher with my improved cooperating anchoring elements for applying traction and strapping the patient;

Fig. 7 is a side elevation of the same; and

Fig. 8 is an end elevation of the same.

Referring now to Figs. 1 to 5 inclusive, of the drawings, the general structure of my stretcher is similar to that disclosed in my Patent No. 2,367,167 issued January 9, 1945, and comprises a pair of two-section, longitudinal side rails, the sections of which are indicated by the numeral 10, the two sections of each rail being efficiently pivoted together centrally of the stretcher by an efficient pivot construction indicated as an entirety, by the numeral 11, which as illustrated and described in my said Patent No. 2,367,167, is permissive of hinged relation to collapse the two sections of the structure; to rigidly connect the two sections in horizontal alignment and to further, fixedly connect the two sections in obtuse, angular relation with a depressed center. The two longitudinal rails are interconnected at their corresponding ends by collapsible spreader toggles 12 as disclosed in my said patent, the outer ends of said toggles being secured to the side rails and provision being made for holding said toggles in out-stretched, horizontal position, as indicated in Fig. 1. The flexible, rectangular body-supporting sheet 13 of my improved construction, is substantially identical with the flexible sheet illustrated in my said pat-

ent and may be conveniently constructed of canvas, of a length to preferably extend at its transverse edges, a short distance inwardly of spreader toggles 12 and having its marginal portions wrapped around the side rails and the longitudinal edges laced or otherwise secured to longitudinal flaps stitched to the underside of the body portion of the sheet and thereby forming longitudinal loop portions 13a which surround the side rails. Sheet 13 is of course, tensioned by extending the spreader toggles 12 and forms a comfortable and conformable horizontal support for receiving a human body in reclining position. My improved construction also embodies pivotally collapsible, short legs 14 connected with the respective end portions of the side rails and identical in structure and function with the legs disclosed in my said patent, said legs being retained in both vertical, set-up positions, as shown in Figs. 1 to 3, or in collapsed, horizontal positions, against the ends of the side rails, by means of tooth-provided, resilient plates 15, identical with those shown in my said patent attached to the top sides of the stretcher rails at points outwardly somewhat of the pivots of legs 14. With said pivotally collapsible legs 14, the stretcher may be quickly converted to a cot by erecting the four legs 14. The two legs at one end of the stretcher only, may be erected to incline the supporting sheet longitudinally to a supporting surface for longitudinally sliding a human body, such as in the case of a person whose neck, back or leg has been broken, onto the stretcher.

My present invention, as has been previously stated, relates particularly to improvements combinatively associated with the parts of my stretcher or at least some thereof herein previously described, to efficiently strap or anchor the body in various positions to the stretcher and to apply most effectively, fixed, skeletal, traction stresses to most parts of the body, in fracture cases. To such ends, it is desirable to provide facilities for strapping or securing various portions of the body by transverse tying members spaced longitudinally throughout the greater part of the length of the supporting sheet.

I accordingly, provide for each of the two foldable sections of my stretcher and at the longitudinal edges and sides of the rails, a plurality of longitudinally spaced, short horizontal loops 16a which overlie the canvas or other sheeting material, preferably at the outer and vertical sides of the rail sections 10. This, I very simply accomplish by providing said longitudinal portions of the sheeting material 13 at each side of the stretcher, with a series of longitudinally spaced, metal eyelets 17 secured to the material and extending therethrough, through which is passed for each rail section 10, a continuous strong cord or other flexible element 16, said element being woven alternately in and out relative to the canvas and as clearly shown in the drawings, extending longitudinally and outwardly of the canvas or other sheeting, between two of the eyelets 17 and then beneath or inwardly of the sheeting, between the last of said first pair of eyelets and the next successive eyelet and this procedure being continued throughout substantially the length of the sheeting constituting the supporting medium for one section of my stretcher. The ends of the flexible element 16 are provided with loops 16b which surround the shanks of L-screws or hooks 19 which may be threaded into the side portions of the rails at the appropriate point. The eyelets 17 are preferably of such internal diameter to permit the loops 16b to be passed therethrough. The flexible element 16 may be readily removed or replaced by merely turning the L-screws 19 through 180 degrees and the connected loop ends 16b, slipped off of the hooks.

With a multiplicity of anchoring loops 16a provided at the two longitudinal sides of the stretcher, straps S or fabric-securing members may be variously positioned relative to the stretcher and the body thereon, directly transversely of the body or diagonally, as desired, to secure or fix the body in a desired position to enable traction stresses to be applied to the limbs, arms, hips, neck or back of the injured.

For applying such fixed skeletal traction or more specifically, for anchoring flexible traction elements, T, I provide a plurality of laterally and inwardly extensible anchor members, as shown in Figs. 1 to 5 inclusive, in the form of pivoted anchor clips 18 comprising a hook-shaped flat plate 18a, pivoted at one end of each of the rails, to preferably the top side thereof by pivot screw or pin 18d and adapted to be disposed longitudinally of the rail and flush thereagainst, as shown at the right hand end of the stretcher, in Fig. 1. The plates 18a are provided at their medial portions with preferably, integrally formed, down-turned abutment flanges 18b adapted to abut flatwise against the inner side of the end of the rail in retracted, collapsed position and adapted when the clips are inwardly swung, to operative position, as shown at the left end of the stretcher shown in Fig. 1, to abut by edgewise engagement the inner side of the associated rail end to limit the inward swinging of the anchor clip to positions substantially perpendicular to the rails. The anchor clips 18, it will be noted, are mounted on the outer extremities of the rails to occupy, when collapsed, a position just outwardly of the resilient retaining clips 15 and out of interfering relation with said clips and the swingably collapsible legs 4. Anchor clips 18 terminate in free hook ends 18c to which the traction-tying elements such as cords, cloth strips or the like, are adapted to be secured. The anchor clips 18 are of such length that when operatively positioned, substantially straight-line stresses may be placed upon the legs and arms of the injured person. In case of fixed skeletal traction for a broken neck or broken back, the chin and head of a person are first properly engaged with the traction-applying bandage and the ends thereof properly tied to the hook 18c of the anchor clips at the upper end of the stretcher, thereby uniformly applying traction stress in a resultant straight-line direction to the back and neck or to the entire spine. The injured person is thereafter tied in or affixed to the structure by anchoring the body with transverse straps or tying members at appropriate points such as over the arms, above the hips, above the knees or by the feet, said straps or transverse tying members being connected with the appropriate anchor loops 16a.

With my structure and the widely variable means of anchoring securing straps and elements as well as the operative positions of the four inwardly extending anchor clips, fixed skeletal traction may be very efficiently applied for broken legs, ankles, knees, hips, arms, neck and for broken backs.

From the foregoing description, it will be seen that with my improved structure, many advantages in caring for and transporting fracture cases

as well as restraining the body and mental and other cases, is provided. It has been found that with the use of my structure, substantially straight line application of traction stresses is obtained with highly beneficial effects, as contrasted with the application of traction-applying elements in lines divergent to the limbs or body members.

In Figs. 6 to 8, I disclose another form of my invention applied to a non-flexible litter, comprising a relatively rigid body sheet **20** which may be conveniently constructed from wood or suitable composition material of elongated rectangular form, sufficient to accommodate a human body and having attached to the four corners thereof and extending longitudinally thereof, rounded handle members **21**. Handle members **21** may conveniently be provided with flatted anchoring portions or bases **21***a* which may be rigidly affixed to, preferably, the upper surface of supporting body or sheet **20** by elongated screws or other fastening means **22**.

Across the medial portion of the two handle members **21** at each end of the litter, I attach, as by screws, **24**, a traction tie-anchoring bar **23** preferably secured at its ends to the upper sides of the medial portions of the opposed handle members **21**, to dispose the bar **23** in transverse, spaced relationship to the upper surface and respective end of the board or supporting sheet **20**. This bar, as in the case of the inwardly swingable, laterally disposed, anchor clips **18** of the form of my invention first described, provides a laterally extending anchoring means to which the cords, ropes or textile, traction tying elements may be tied and secured.

For the purpose of providing anchor loops to which the ends of straps or other flexible securing means may be attached, I provide at each of the longitudinal portions of the supporting sheet or board **20**, a series of anchoring loops **25***a* disposed in this form of the invention, upon the upper surface of the supporting sheet **20** and in close proximity to the longitudinal edges thereof. Loops **25***a* are formed in quite similar manner to the loops **16***a* of my form of stretcher first described, by weaving in and out, portions of an elongated cord or other flexible element **25**, through a series of longitudinally spaced apertures extending vertically through the thickness of the board, adjacent its respective longitudinal edges. The cords **25** may be conveniently secured in place by knotting the ends thereof after tensioning the same in the threaded and woven position, as clearly shown in Figs. 7 and 8.

With this last described form of my invention, fixed skeletal traction for various fractures may be applied with the body secured at appropriate portions by cross straps to the supporting sheet and with the traction ties connected with the requisite limbs or portions of the body and anchored to the anchoring cross bars **23** at appropriate points to apply straight line traction stresses.

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 is claimed is:

1. A stretcher having skeletal traction facilities comprising a body supporting member, a plurality of handle members extending longitudinally and outwardly from the ends of said body supporting member and an anchoring element to which a traction tie may be secured connected with one of said handle members and extending inwardly and laterally therefrom in spaced relation to the adjacent end of said body supporting member and having a hooked extremity, spaced inwardly some distance from said handle member whereby substantially straight line strain may be applied to a limb of the human body.

2. The structure set forth in claim 1, wherein said anchoring element comprises a member pivoted on a vertical axis to said handle member and having abutment means for limiting inward swinging movement thereof to a position substantially perpendicular to said handle member when stress is applied thereto by fastening the traction tie.

3. A stretcher having skeletal traction facilities comprising a pair of spaced side rails, a body support extending between said side rails and secured thereto and an anchoring element for traction ties extending inwardly and laterally from the end portion of one of said rails and terminating in a hook for connection with a traction tie disposed in longitudinally spaced relation to said rails for applying straight line strain upon a limb of a human body disposed upon said supporting member.

4. An anchor clip for securing a flexible, skeletal, traction tie comprising a plate adapted to be pivoted adjacent one end to a rail, handle member or the like of a stretcher or analogous device in overlying substantially horizontal relationship thereto and abutment means associated with said plate for maintaining the same in substantially perpendicular and inwardly extending relationship to the rail or member with which said plate is associated when stress is applied thereto by securing of a traction tie.

5. The structure set forth in claim 4, said abutment means comprising a perpendicular flange, rigidly connected with said plate and adapted to engage the member to which said plate is attached in longitudinal relation to position said plate inoperatively and adapted to engage said member in edge-wise engagement to limit its inwardly disposed operative position.

6. A stretcher having skeletal traction facilities comprising a pair of spaced, longitudinal rails, a flexible supporting sheet stretched under tension between said rails and secured thereto, a plurality of anchor clips pivotally mounted on the top of said rails outwardly of said supporting sheet, each comprising a flat plate adapted to be disposed substantially in longitudinal alignment overlying the rail to which it is pivoted and adapted to be swung to a right angle position extending inwardly and laterally of said rail, abutment means on said plate for limiting the inward swinging thereof to said perpendicular relation and each of said plates having a terminal hook adapted to be disposed in inwardly spaced relation to said rail for receiving and fastening a flexible traction-applying element whereby straight line traction effort substantially parallel with the longitudinal center line of a body disposed on said supporting sheet may be applied to the limbs of a human body supported on said sheet.

7. A stretcher having skeletal traction facilities, comprising a pair of spaced, longitudinal rails, spreader means connecting the corresponding ends of said rails, a flexible supporting sheet stretched between said rails and secured thereto, a series of anchoring loops for restraining members disposed in over-lying relationship to said rails and formed at each side of the stretcher by

a flexible element extending longitudinally of the associated rail and woven alternately in and out of the longitudinal marginal portion of said flexable sheet and with its ends secured to said rail and inwardly and laterally extending anchoring elements at the ends of said rails for securing traction ties to cooperate with said loops in holding a body to apply traction to parts thereof, said anchoring elements constitute for each end of said rails, a pivoted anchor clip having a plate overlying one of the horizontal surfaces of the respective rail and terminating in a hook element and carrying a rigid, rectangular abutment flange adapted to limit the inward swinging movement of said clip and adapted to also engage said rail to

position said plate in inoperative position extending longitudinally of said rail.

CHARLES C. CARPENTER.

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