Feb. 5, 1946. E. KOLLER 2,394,245

FOLDABLE STRETCHER

Filed June 17, 1942 2 Sheets-Sheet 1

Fig.1

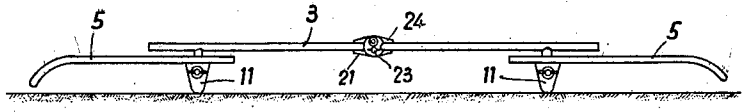


Fig.2

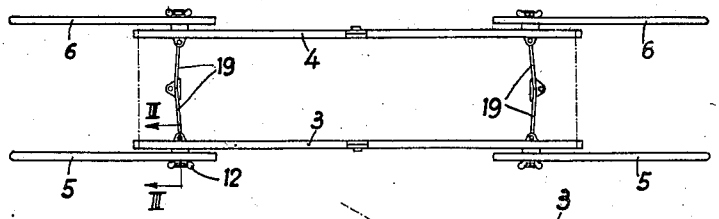


Fig.3

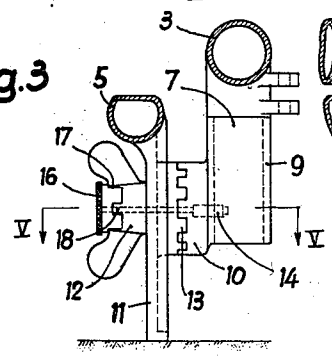


Fig.4

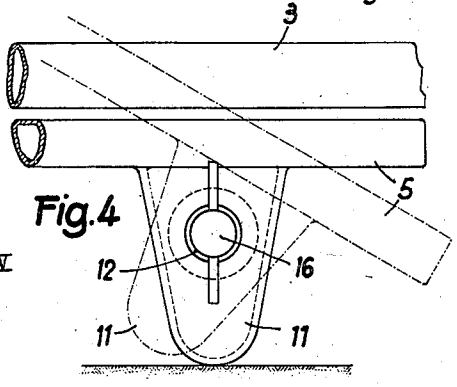


Fig.5

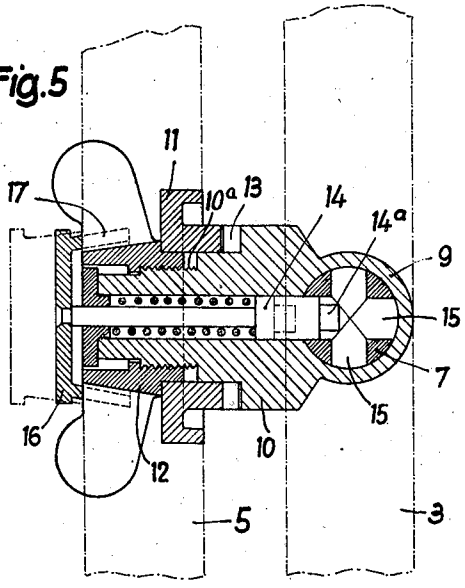
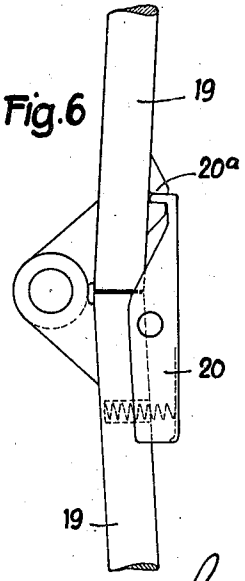


Fig.6



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FOLDABLE STRETCHER

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Fig.7

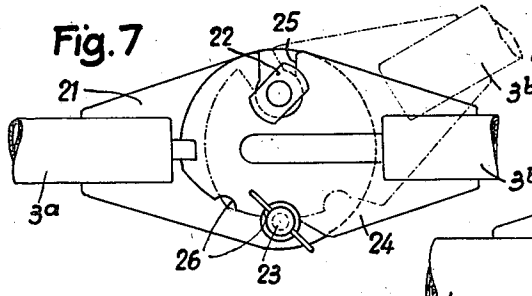


Fig.9

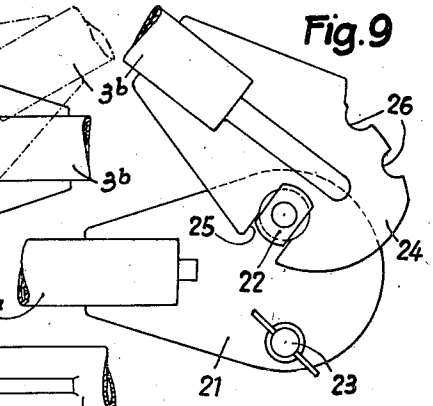


Fig.8

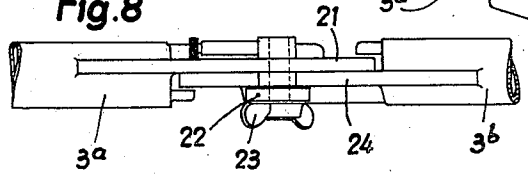


Fig.10

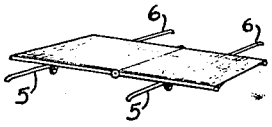


Fig.11

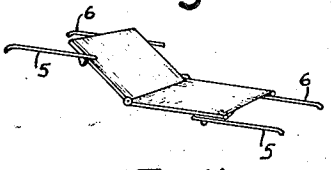


Fig.12

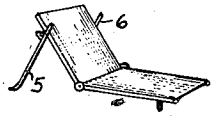


Fig.13

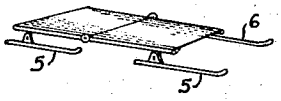


Fig.14

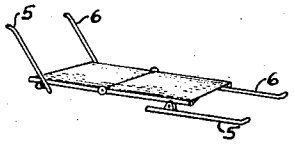


Fig.15

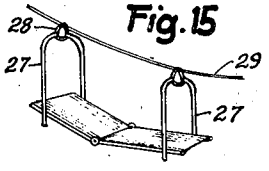


Fig.16

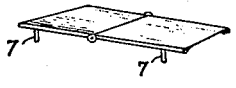


Fig.17

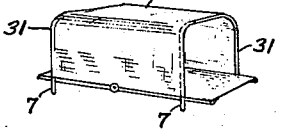


Fig.18

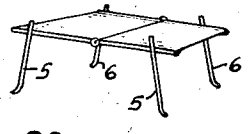


Fig.19

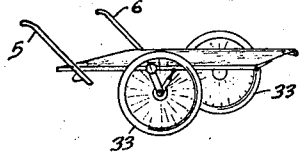
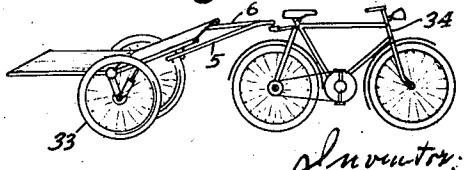


Fig.20



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UNITED STATES PATENT OFFICE

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FOLDABLE STRETCHER

Ernst Koller, Basel, Switzerland

Application June 17, 1942, Serial No. 447,416
In Switzerland July 22, 1941

6 Claims. (Cl. 5—82)

The present invention relates to foldable stretchers of the type provided at both ends with carrying handles.

An object of the invention is to provide a stretcher of the aforesaid type having such an improved structure as to enable each of its carrying handles to be independently pivoted in two directions at right angles to each other and more specifically about a vertical axis and about a horizontal axis.

Another object of the invention is to provide an improved stretcher as above stated wherein each handle can be adjusted to any suitable angular setting and readily clamped in the selected position.

A further object of the invention is to provide an improved stretcher wherein angular adjustments and clampings of each carrying handle can be easily performed by means of simple and readily accessible devices the manipulation of which can be effected even single handed.

A still further object of the invention is to provide an improved stretcher having such a convertible shape as to be utilisable for miscellaneous uses such for example as sled, barrow, bicycle trailer or the like.

With these and such other objects in view as will incidentally appear hereafter, the invention comprises the novel construction and arrangement of parts that will now be described with reference to the accompanying drawings exemplifying the same and forming a part of the present disclosure.

In the drawings:

Figures 1 and 2 show a stretcher in side and top plan views;

Figure 3 is a vertical sectional view on the line III—III of Figure 2;

Figure 4 is a side view of Fig. 3;

Figure 5 is an enlarged cross sectional view on the line V—V of Fig. 3;

Figure 6 is a top plan view showing the middle portion of two cross ties of the stretcher;

Figure 7 is a side view showing the middle portion of each of the two pairs of longitudinal girders of the stretcher;

Figure 8 is a top plan view of Fig. 7;

Figure 9 is a side view similar to Fig. 7 but assuming the parts to occupy other positions;

Fig. 10 is a perspective view of the device according to Figs. 1 and 2, but with the several handles in an alternative position;

Fig. 11 is a perspective view of the device according to Figs. 1 and 2, but with the stretcher body in an alternative position;

Fig. 12 is a perspective view of the device, used as reclining chair;

Fig. 13 is a perspective view of the device, used as a sled;

Fig. 14 is a perspective view of the device, used as a sled barrow;

Fig. 15 is a perspective view of a modified form of the device;

Fig. 16 is a perspective view of the stretcher with the handles removed, i. e. used as a field cot;

Fig. 17 is a perspective view of a modified form of field cot according to the invention;

Fig. 18 is a perspective view of a modification wherein the handles function as supporting legs;

Fig. 19 is a perspective view of a wheeled barrow embodiment according to the invention;

Fig. 20 is a perspective view of a modification constituting a bicycle trailer.

Corresponding parts bear like reference numerals throughout the several figures of drawings.

The stretcher shown in Figures 1 and 2 and made up of a pair of stretcher halves coupled together along the middle cross plane is provided with two longitudinal beams or girders 3, 4 upon the end portions of which are movably mounted carrying handles 5, 6 having downwardly bent outer ends. To that effect, the girders 3, 4 are provided at the bearing points of the handles 5, 6 with bearing pins 7 (Figure 3) extending downwardly in the vertical direction and fitted with revoluble sockets 9. Each socket 9 is provided with an outwardly projecting pivot 10 extending horizontally and having a stepped outline upon which each of the carrying handles 5, 6 is pivoted in turn through the medium of a flange plate 11 (Figure 4). These plates form supporting legs for the stretcher so that the handles can be rotated in a vertical as well as in a horizontal plane. Each flange plate 11 is held seated against the pivot 10 by means of a wing nut 12 screwed upon stepped threaded portion 10a of the pivot 10. In order to securely hold the flange plates 11 to the carrying handles 5, 6 in different pivoted positions in the vertical plane, as shown for example in Figure 4, there is provided between each pivot 10 and the corresponding flange plate 11 a safety device 13 built similarly to a claw coupling and adapted to be brought into different coupling positions after releasing the wing nut 12.

Through each pivot 10 is engaged a spring-urged securing bolt 14 provided at its inner end with a reduced portion 14a and cooperating with recesses 15 formed crosswise in the bearing pin 7. At its outer end the securing bolt 14 carries a cap 16 which, in the position shown by full lines

in Figure 5, engages by a pair of oppositely disposed slot-like grooves 17 the wings of the nut 12. In order to hold the securing bolt 14 in its off position, as shown in dot and dash lines in Figure 5, after the cap 16 is outwardly moved by sliding its grooves 17 off the wings of the nut 12 and then somewhat rotated, the said cap is abutted by its peripheral edge under the influence of the spring acting upon the bolt 14, against the wings of the nut, so that the pivot 10 can be rotated together with the parts connected thereto about the bearing pin 7. For preventing the pivot 10 from rotating outside predetermined limits, the bolt 14 can also be locked by means of the cap 16 which, besides having notches 17, may be also provided with less deep notches 18 offset relative to notches 17 (Figure 3) in an intermediate position in which only its reduced end 14a engages the desired bore in the bearing pin 7.

Accordingly, when the stretcher is used in the position of rest shown in Figures 1 and 2, a possibility is afforded to so securely clamp the carrying handles 5, 6 by means of the caps 16 as to prevent the said handles from pivoting with respect to the bearing pins 7 or alternatively as to allow them to pivot only within small limits. This last possibility is particularly valuable when the stretcher must be carried through a relatively narrow passage round a corner.

Recapitulating, the aforedescribed relationship of parts makes it possible to rotate the handles 5, 6 horizontally about vertically-disposed bearing pins, as well as in a vertical plane about journal 10, 10a which extends horizontally, i. e. perpendicularly with reference to socket 9 and pin 7.

The operation is as follows:

For horizontal adjustment, cap 16 is moved from the position indicated in full lines in Fig. 5 to the position shown by dot and dash lines, thereby moving member 14, 14a out of locking engagement with pin 7, whereupon the entire assembly of parts mounted on the latter may be rotated therearound to the desired new position. Cap 16 and member 14, 14a may then be replaced to locking position.

For adjustment in the vertical plane, the wing nut is unscrewed sufficiently to enable the dentations 13 of plate 11 to be withdrawn from the dentations 13 of member 10 whereby the plate and associated handle 5 (or 6) are released for rotary movement relative to journal 10, 10a and the wing nut. After moving the plate and handle to the desired position, dentations 13 are reengaged and the wing nut tightened, whereupon the parts are locked in place in the new position.

Between each pair of bearing pins 7 situated in the same transverse plane extends a cross tie 19 provided in its middle portion with a knuckle joint furnished with a safety device adapted to prevent the tie from unduly yielding. As is apparent from Figure 6, this safety device comprises a spring-urged locking lever 20 pivoted to one of the tie parts and cooperating with a lug 20a provided on the other part of the tie.

As above set forth, the stretcher built as shown in Figures 1 and 2 is made up of a pair of stretcher halves coupled together. To that effect, as is visible from Figures 7, 8 and 9, each of the mutually coupled girders is fitted at its oppositely disposed ends with a coupling plate.

The girder part designated by 3a in Figures 7, 8 and 9 carries a coupling plate 21 provided with a stationary obliquely positioned cam 22 and also with a set screw 23 while the other girder part designated by 3b carries a coupling plate 24 having a notch 25 to receive the subjacent cam 22 which is provided on the other plate 21 and two notches 26 for the set screw 23. De-coupling of the parts comes out with particular clearness from Fig. 9. As shown in this figure, in the illustrated position of the girder parts 3a, 3b, the cam 22 being in the notch 25, the girder part 3b is pivoted about the axis of the cam 22 engaged into the notch 25 until the desired position is imparted to the stretcher which brings the one or the other notch 26 within reach of the set screw 23, whereafter tightening of the latter permits the two coupling plates 21, 24 to be securely clamped in their reciprocal positions.

According to the embodiment shown in Fig. 10, the handles 5, 5 and 6, 6 extend laterally from each side of the stretcher instead of longitudinally from each end as in Figs. 1 and 2.

The embodiment of Fig. 11 differs from that of Figs. 1 and 2 essentially only in that one half of the stretcher is vertically inclined. The corresponding arms 5, 6 have nevertheless been adjusted to retain their parallelism with respect to the other pair of arms 5, 6.

According to Fig. 12, only one pair of handles 5, 6 are retained, and these function as supporting props for the inclined stretcher half. The resultant construction may function as a reclining seat.

In Fig. 13, the handles 5, 5 and 6, 6 are disposed relative to the stretcher so as to function as sled runners, as shown.

According to Fig. 14, the rear handles 5, 6 extend upwardly to define the arms of a sled barrow, the runners of which are constituted by the forward handles 5, 6.

According to the modification shown in Fig. 15, the arms 5, 5 and 6, 6 are replaced by suspending loops 27 provided with eyes 28 whereby the assembly may be hung from a line 29.

In Fig. 16, a field cot is provided by removing each pair of handles 5, 6. In Fig. 17, the handles are replaced by loops 31 which support a cover 32 to provide a covered cot.

In Fig. 18, the handles 5, 5 and 6, 6 are directed downwardly as shown constituting supporting props for situations where it is desired to keep the stretcher in relatively elevated position.

Fig. 19 shows the stretcher adapted to a pair of wheels 33 to provide a wheeled barrow structure. Only the rear pair of handles 5, 6 are retained.

Finally, according to Fig. 20, the wheeled stretcher of Fig. 19 is constituted a bicycle trailer, arms 5, 6 being secured to the bicycle frame 34 by any suitable and conventional connecting means.

It will be readily apparent from the different possibilities of using the device according to the invention, as shown in Figs. 10 to 20, that these depend, in large measure, upon the possibility of adjusting the handles vertically as well as horizontally.

What I claim is:

1. A foldable stretcher comprising a body including a pair of longitudinal side girders, a vertical bearing pin on each girder adjacent each end thereof, a socket revoluble on each pin, a horizontal pivot integral with the socket, a stretcher-carrying handle adjacent each end of each girder, said handle including a flange plate journaled about the pivot and having angularly adjustable coupling means, cooperating coupling means on the pivot, and a tightening member holding both coupling means interengaged.

2. A foldable stretcher comprising a body including a pair of longitudinal side girders, a vertical bearing pin on each girder adjacent each end thereof, a socket revoluble on each pin, a horizontal threaded pivot integral with the socket, a stretcher-carrying handle adjacent each end of each girder, said handle including a flange plate journaled about the pivot and having a claw coupling element, a cooperating claw coupling element on the pivot, and a nut engageable with the threaded pivot.

3. A foldable stretcher comprising a body including a pair of longitudinal side girders, a vertical recessed bearing pin on each girder adjacent each end thereof, a socket revoluble on each pin, a horizontal externally threaded hollow pivot integral with the socket, a stretcher-carrying handle adjacent each end of each girder, said handle including a downwardly extending flange plate journaled about the pivot and having a claw coupling element on the pivot, a wing nut engageable over the threaded pivot, and a spring-urged angularly adjustable member housed in the pivot and cooperating with the recesses in the pin, whereby said pivot and pin may selectively be locked together against relative movement with respect to each other and released for such relative movement.

4. A foldable stretcher comprising a body including a pair of longitudinal side girders, a vertical bearing pin on each girder adjacent each end thereof, said pins having crosswise recesses, a socket revoluble on each pin, a horizontal externally threaded bored pivot integral with the socket, a stretcher-carrying handle adjacent each end of each girder, said handle including a downwardly extending flange plate journaled about the pivot and having a claw coupling element, a cooperating claw coupling element on the pivot, a wing nut screwable upon the threaded pivot, a spring-urged bolt housed in the pivot bore and cooperating with the pin recesses, and a cap fastened to said bolt and having notches cooperating with the nut wings for angularly adjusting the handle.

5. A foldable stretcher comprising a body including parallel longitudinal side girders interconnected by ties fitted with knuckle joints, a vertical bearing pin on each girder adjacent each end thereof, a horizontal pivot rotatably girdling the adjacent pin, a stretcher-carrying handle including journal means rotatably mounted on each pivot, means for adjusting the angular position of each handle on its pivot, means for clamping the handle in the adjusted position, and means for restricting the rotary movement of said pivot about said pin.

6. A foldable stretcher comprising a body including a pair of girders, each girder including lengths of tubing adjustably coupled together end to end, the girders being interconnected by ties fitted with knuckle joints, a recessed bearing pin vertically projecting from each girder end, a horizontal pivot revolubly girdling the adjacent pin, a stretcher-carrying handle having an extension rotatably encompassing each pivot, means for adjusting the angular position of each handle about its pivot, cooperating means on the pivot and extension for angular setting of the handle in one direction, and cooperating means on the pivot and pin recesses for angular setting of the handle at right angles to said direction.

ERNST KOLLER.