

May 5, 1970

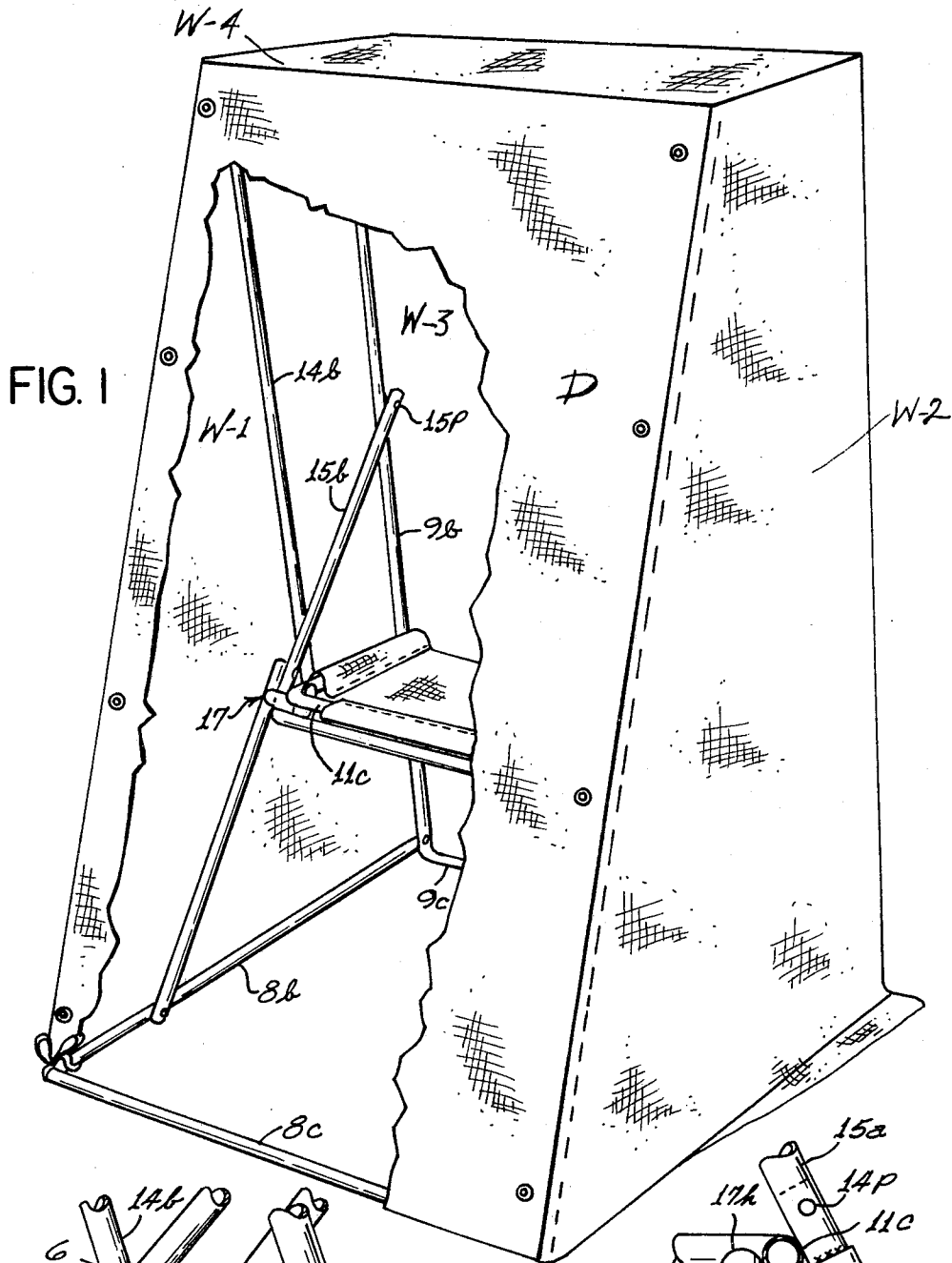
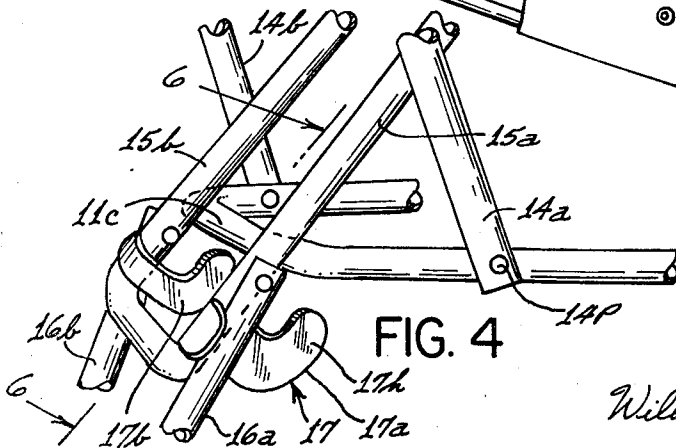
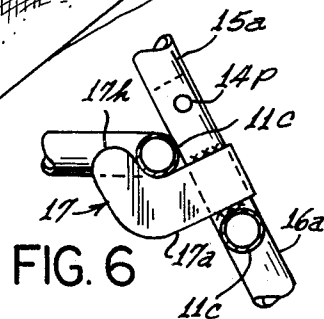
E. L. DE BOLT

3,509,891

COLLAPSIBLE SHELTER FOR ICE FISHERMEN, GAME HUNTERS AND THE LIKE

Filed Dec. 18, 1968

3 Sheets-Sheet 1



INVENTOR.
ERWIN L. DE BOLT

BY

Williamson, Palmeter & Baine
ATTORNEYS

May 5, 1970

E. L. DE BOLT

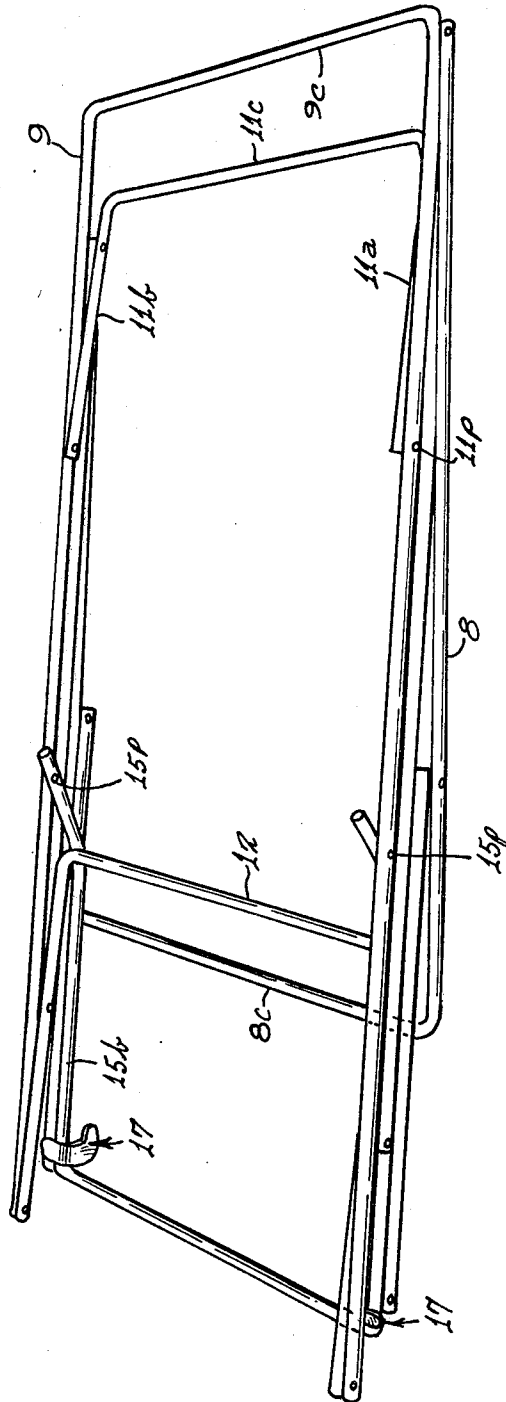
3,509,891

COLLAPSIBLE SHELTER FOR ICE FISHERMEN, GAME HUNTERS AND THE LIKE

Filed Dec. 18, 1968

3 Sheets-Sheet 2

FIG. 2



INVENTOR.
ERWIN L. DEBOLT

BY

Williamson Palmer & Bains
ATTORNEYS

May 5, 1970

E. L. DE BOLT

3,509,891

COLLAPSIBLE SHELTER FOR ICE FISHERMEN, GAME HUNTERS AND THE LIKE

Filed Dec. 18, 1968

3 Sheets-Sheet 3

FIG. 3

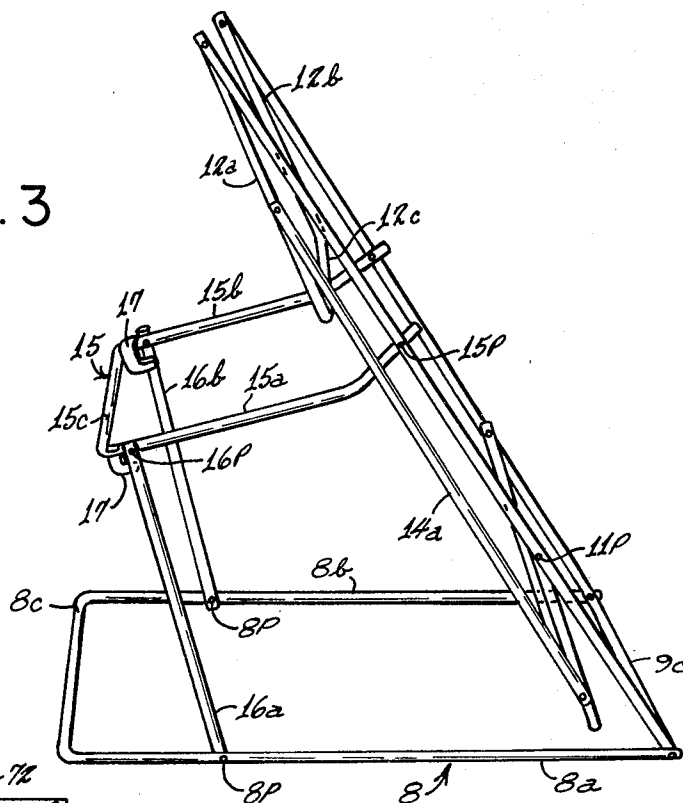
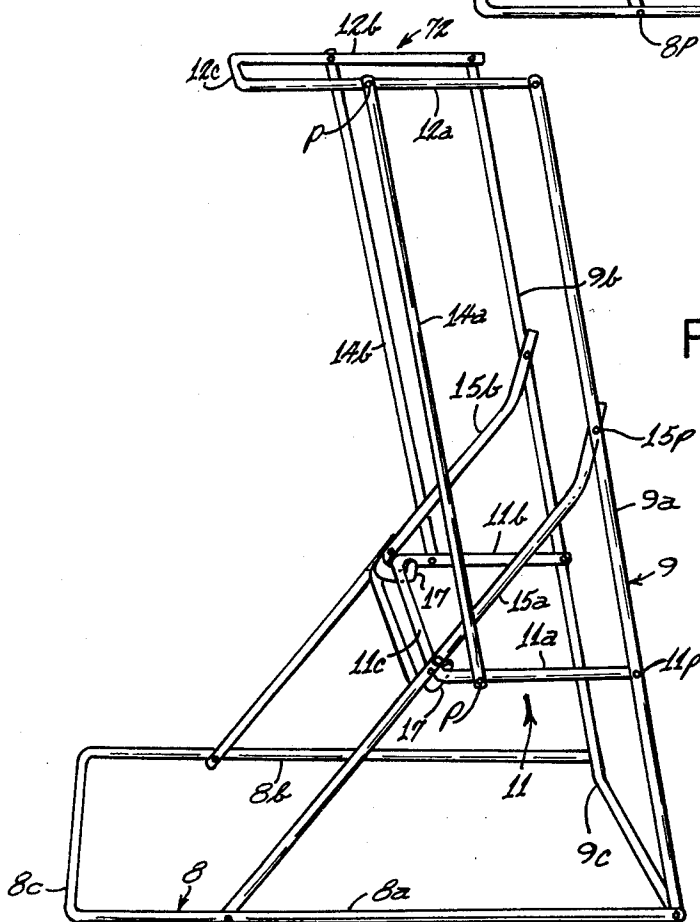


FIG. 5



INVENTOR.
ERWIN L. DEBOLT
BY
Williamson, Palmatrix & Cairns
ATTORNEYS

1

3,509,891

COLLAPSIBLE SHELTER FOR ICE FISHERMEN, GAME HUNTERS AND THE LIKE

Erwin L. De Bolt, 3426 Bryant Ave. N.,

Minneapolis, Minn. 55408

Filed Dec. 18, 1968, Ser. No. 784,641

Int. Cl. A45f 1/16

U.S. Cl. 135—4

6 Claims

ABSTRACT OF THE DISCLOSURE

A collapsible shelter for ice fishermen, game hunters and the like, consisting in a number of interfolding frame sections adapted to be readily outswung from a very compact collapsible position to an erect position and including brace sections which may be manually and quickly interlocked with wall sections and a seat section to rigidly retain the entire structure in fully erected, operative position. The said multi-section frame is combined with a highly flexible covering to constitute a full enclosure when erected and the covering is folded with the interhinged frame sections to form a profile-like, very light portable collapsed structure. No coupling or uncoupling parts are required in the erection of the shelter.

This invention relates to collapsible, portable shelters for ice fishermen, hunters and the like, which may be very quickly erected and operatively positioned without the use of any tools, and which may be collapsed into a very compact profile shape of very light, portable construction.

Public interest in outdoor cold weather sports and recreation such as ice fishing and spearing, game hunting and exploration and travel as by snowmobile, has progressively increased throughout the past twenty years. At the present time there is great demand on the part of ice fisherman alone for temporary shelters and fish houses which may be readily removed from point to point, and which will protect the sportsman from cold and wind. By far the most of the fish houses and shelters used in the outdoors in winter weather require towing or transportation by truck, or sliding on the ice from place to place.

It is an important object of my present invention to provide a quickly collapsible shelter comprising essentially a framework made up of a number of closely cooperating pivoted sections with a flexible covering medium to provide walls, roof and front flap, all of which may be quickly erected in operative position without the use of any tools, and which for portability, may be compacted into a profile shape of small dimensions and of a weight not exceeding that of the average packed suitcase.

A further object is the provision of a collapsible shelter of the class described wherein the supporting and cover-distending frame is made up of a plurality of hinged or pivoted sections, closely cooperating when properly swung apart and distended without interconnection of parts or application of tools, to provide side and back walls and roof for a sizable enclosed shelter which may be entered from a flap front flexible panel or the like, and preferably including a comfortable seat for one or more sportsmen.

A more specific object of my improved and novel structure is the provision of a plurality of cooperating hinged frame sections which may be unfolded and swung to provide rear wall, side wall and roof supports together with an interlocking, diagonal brace construction which locks all the parts together in operative position under tension.

The foregoing and other objects of the invention will be more apparent from the following description made in connection with the accompanying drawings wherein:

FIG. 1 is a front and side, perspective view of an em-

2

bodiment of my invention erected and distended for use, a portion of the front flexible flap being broken away to show interior structure.

FIG. 2 is a perspective view of the frame structure of the device with covering housing removed in compactly collapsed position for transportation, storage or shipment;

FIG. 3 is a perspective view showing an intermediate stage from the outwardly swinging of cooperating frame sections during the erection of the shelter;

FIG. 4 is a perspective view on a slightly larger scale, illustrating the interlocking of the intermediate double toggle structures with the forward portion of the seat section to positively secure the entire supporting frame structure under tension;

FIG. 5 is a side perspective view of the supporting frame structure completely erected and interlocked for use; and

FIG. 6 is a detail cross sectional view showing the mechanism for interlocking and bracing the erected frame structure.

Referring now to the embodiment of the invention illustrated, it is preferred that the several cooperating hinged sections of the frame seat and braces be constructed from appropriately shaped or bent tubular or rod materials of rigid or semi-rigid construction, to conserve on weight and bulk. It is however, to be understood that the base section, upstanding back section, seat, and top or roof-supporting sections may be constructed of suitable reinforced sheet materials, with provision for pivot pins or the equivalent at interconnected terminal or other portions. The embodiment illustrated is constructed from light, substantially rigid tubular metal such as an aluminum alloy which if properly shaped, usually in a generally rectangular manner for the respective cooperating sections of the frame.

The frame assembly as shown, comprises a base section 8 of generally rectangular configuration, having right and left side arms 8a and 8b, preferably integrally formed with a forward bar 8c. Said arms and bar lie in a common plane for contact with and support from the ground or other supporting surface.

In referring to sections or parts as "back," "front" or "side," such terms have reference to the positioning of the sections and parts when the frame structure is extended and set up for use.

An elongated, upstanding back section 9 is shaped preferably from an integral tube or rod into rectangular outline, having elongated, upstanding posts 9a and 9b and a bottom bar 9c disposed rearwardly of the base section 8 and pivotally or hingedly connected with the rear ends or portions of the side arms 8a and 8b of the base section by pivots 10.

A rectangularly shaped seat section 11, having right and left side arms 11a and 11b, and an integrally formed front bar 11c is pivoted at the rear ends of arms 11a and 11b to the posts of back section 9 by pivot pins 11p, passing through the hingedly connected members at horizontally aligned points intermediate of the height of posts 9a and 9b and at a desirable height for seating of the user.

A U-shaped top section 12 generally defining a rectangle having right and left side bars 12a and 12b, and a front bar 12c integrally formed therewith, is hinged by pivot pins 12p to the top portions of back posts 9a and 9b respectively.

A pair of upstanding front posts constituting parallelogram links 14a and 14b are pivotally connected at their upper terminal portions by pivots p with intermediate portions of the side arms 12a and 12b of the top section, and at their lower ends are hingedly connected by pivots p' with intermediate portions of the side arms 11a and 11b of seat section 11. Front posts 14a and 14b it will be noted, are related in length with the pivotal attachment

of top section 12 with the back posts 9a and 9b to the end that a parallelogram relationship is always present in the swinging and hinging of the structure from a collapsed position to the fully erected and braced, locked position, as will appear in detail later in this specification.

In this connection the distances between the upper pivots *p* of the front posts to the pivot connections at the rear of the top section 12 are precisely equal to the distances between the lower pivots *p'* connected with the forward portion of seat section 11, and the pivot pins 11*p* which connect the rear ends of the seat section with the rear posts.

Closely cooperating with the hinged section structure previously described, is a double sided toggle brace mechanism which with simple related elements, serves to brace and lock together the entire frame structure in its fully erected, operative position. This double sided toggle brace structure in the form shown, comprises a U-shaped upper toggle section 15 having rearwardly extending right and left toggle arms 15a and 15b respectively, preferably interconnected integrally by a front bar 15c. The rear portions of the toggle arms 15a and 15b are hingedly connected by identical pivot pin elements 15*p*, with intermediate portions of the rear posts 14a and 14b, and at aligned horizontal points a substantial distance above the pivotal connections 11b of the rear of the seat section with upstanding posts 9a and 9b.

Completing the double sided toggle brace structure are a pair of toggle arms 16a and 16b which at their upper ends are pivoted to forward portions respectively of toggle arms 15a and 15b, at points 16*p* disposed short distances from the forward bar 15c of the toggle section 15. Toggle links 16a and 16b at their lower ends, are pivoted by pivot elements 8*p* to intermediate but forward portions of the side arms 8a and 8b respectively of the base section.

At the forward side corners of the upper toggle section 15, dual function interlocking members designated as entirities by the numerals 17 are affixed, as shown in detail in FIGS. 4 and 6. These interlocking members 17 have flat intermediate attachment portions 17a which are adapted to be brazed, riveted or otherwise rigidly secured to the interior side surfaces of the toggle side arms 15a and 15b, just inwardly of the forward bar 15c and at points disposed outwardly somewhat of the common toggle pivots 16*p*. Each interlocking member 17 has a rigid, outturned and overhanging abutment arm 17b which is adapted to engage the portion of the related lower toggle link or arm (16a or 16b) adjacent but below the corresponding common pivot 16*p* when the cooperating pair of toggle arms are fully swung apart to at least dead center position.

To positively interlock the several hinged sections of my frame in fully erected position and under tension, each of the interlocking members 17 are provided with rigid, inwardly and upwardly extending hook members 17h, which when the seat section 11 is swung upwardly and forwardly with tension placed upon the rear posts 9a and 9b and upon the forward posts 14a and 14b, engage under and secure the forward bar 11c of the seat section. FIGURE 4 shows the positioning of the related interlocking parts just prior to full securing of front bar 11 of the seat section with the hook elements 17h.

To complete my shelter and exclude rain and wind as shown in FIG. 1, a multi-wall covering identified as an entirety by the letter C is provided, having as shown a trapezoidal right side portion W-1, a left side wall portion W-2, a rear wall portion W-3, and a rectangular top wall portion W-4. The wall portions W-1, W-2 and W-3 may be integrally formed from a continuous flexible sheet such as canvas, preferably treated for moisture repellants, or certain plastics which remain quite flexible in cold atmospheres, or the wall sections may be separately made and seamed ruggedly together along the lines of the rear posts 9a and 9b, top section sides 12a and 12b. The lower edges of the wall sections are suitably secured

at spaced points or by hemming to the side arms 8a and 8b of the bottom section and to the bottom bar 9c of the upstanding back section. The forward edges of the top wall section W-4 are suitably secured to the forward bar 12c of the top frame section.

A rectangular front panel or door section D is provided for connection with the forward cross bar 12c of the top section and is preferably provided with a plurality of spaced fastener elements for full connection with the forward longitudinal edges of the wall sections W-1 and W-2. In this connection it is desirable to disconnect the upper portion (top and sides) of the door flap D, particularly when the shelter is used for hunting big game, so that the person or persons seated on seat section 11 may have clear view ahead and at the sides while the lowermost portion of the door flap is connected and preferably sealed.

The hinged seat section 11 includes a web of sturdy, preferably non-stretchable material, tensioned across and interconnecting the side arms 11a and 11b for support of the person seated.

The dimensions of the cover C and its side walls and top wall are such that the flexible material will be quite fully distended when the multi-sectional frame structure is fully erected, distended and locked in operative, upstanding position.

A fully collapsed and compacted position of the frame structure is clearly illustrated in FIG. 2, wherein the upstanding back section 9 and the front posts 14a and 14b are swung forwardly on their lower pivots, and substantially against the side arms 8a and 8b of the base section. The lower toggle arms or links 16a and 16b are likewise swung forwardly into collapsed relation against the arms 8a and 8b of the base and extend forwardly and outwardly beyond the forward bar 8c of the base. In collapsed position, the U-shaped top section 12 is swung downwardly and due to the parallelogram relationship of the back upstanding posts 9a and 9b, with the forward links or posts 14a and 14b, the seat section 11 is simultaneously swung rearwardly into final flush relationship between the two back posts. The bracing and locking toggle mechanism comprising the U-shaped upper toggle section 15 and the lower toggle arms or links 16a and 16b, collapses in a forward and downward direction, as clearly shown in FIG. 2.

In the said collapsing of the frame the flexible wall sections W-3 (rear) and W-4 (top) remain relatively positioned with respect to the rear upstanding back section 9 and the top section 12. The side wall sections W-1 and W-2 naturally drape as the backing section swings forwardly towards the base section and the draped portions thereof (wall sections W-1 and W-2), are folded inwardly across one another and the draped ends, then somewhat triangular in shape, may have means for attachment together to form the enclosure and covering for the entire frame structure when the device is collapsed.

While in FIG. 1 the front flap or wall D is shown closed it will be understood that the upper end thereof may be disengaged and folded downwardly when the shelter is used for hunting or observation purposes.

From the foregoing description it will be seen that I have provided a multi-use, economical and highly efficient collapsible shelter which in its inherent folding construction provides a comfortable seat for the occupant, elements of said seat support constituting important bracing and locking mechanism for the erection and tensioning of the frame and flexible covering.

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

What is claimed is:

1. In a compact, light portable shelter of the class described, a collapsible supporting frame having in combination,

5

a base section of generally rectangular shape having rear end portions,

an upstanding back section pivoted at its lower ends to the rear end portions of said base section and adapted at its upper end to at least assist in the support of a roof,

a seat section generally rectangularly shaped having a rear portion pivoted to intermediate sides of said back section,

a pair of similar, diagonally-bracing toggles, each disposed at one side of the overall structure and each comprising a pair of pivotally interconnected arms swingable on a common axis from a collapsed side-by-side position to an outwardly swung, diagonal and approximately dead center position, one of said arms of each toggle being pivotally connected at its outer end to an intermediate side portion of said base section and the other of said toggle arms being connected pivotally at its outer end with an intermediate point of one of the sides of said upstanding back section and at a level above the pivotal connection of said seat section with said back section, and mechanism for locking and interconnecting the forward end portion of said seat section with said toggles adjacent their common pivot axis when the arms of said toggles are swung out to substantially dead center relation, whereby the entire frame structure is interlocked in operative position.

2. The structure set forth in claim 1 wherein, said mechanism comprising for each toggle a hook element affixed to a toggle arm and extending inwardly of said toggle arms and adjacent said common axis thereof when said arms are swung to substantially dead center relation.

3. The structure set forth in claim 1 further characterized by, means for rigidly and transversely interconnecting two corresponding arms of said toggles, said seat section having a front bar extending transversely of the sides thereof, and said locking and interconnecting mechanism constituting hook means

6

engageable with the front bar of said seat when said toggle sections are swung outwardly to substantially dead center relation and when said seat section is swung upwardly to substantially extreme, outwardly projecting position from said upstanding back section to which said seat section is pivoted.

4. The structure set forth in claim 2 and abutment means for limiting the outward swinging of said toggle arms to positions wherein said arms are substantially aligned.

5. The structure set forth in claim 1 and a shelter covering for said frame comprising, top, rear and side walls and a front door section, said side walls being constructed of very flexible sheet material supported from the top of said frame structure and distended by said frame when the same is fully erected, and being intermediately foldable with the collapsing of said frame.

6. The structure set forth in claim 5 further characterized by a rectangularly shaped top section hinged to the upper portions of said back section, means for retaining said top section in outwardly disposed, overhanging position when said frame is erected, said covering including portions for overlying said top section and said rear section, and highly flexible side wall portions supported from said top section and connected with the sides of said base section.

References Cited

UNITED STATES PATENTS

2,268,281	12/1941	Detosto	135—4
2,546,730	3/1951	Dickerson	135—4
2,811,977	11/1957	McClish	135—5
3,027,189	3/1962	Scott	297—184
3,242,935	3/1966	Williams	135—4 X

J. KARL BELL, Primary Examiner

U.S. Cl. X.R.

297—184