

Sept. 12, 1961

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2,999,507

COLLAPSIBLE SHELTER USING BELLOWS-LIKE SECTIONS

Filed May 27, 1960

2 Sheets-Sheet 1

FIG. 1.

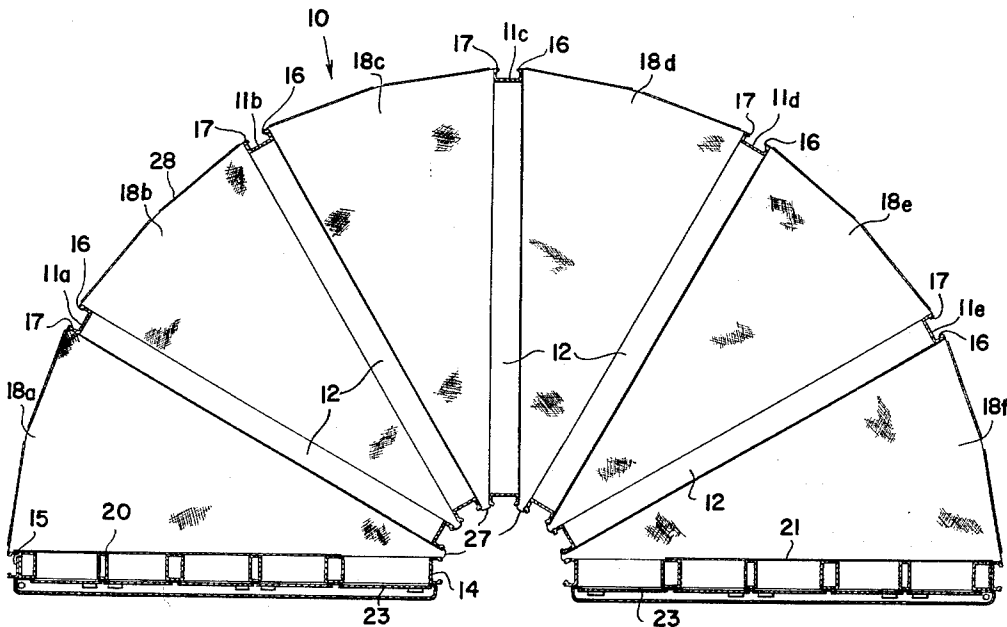


FIG. 2.

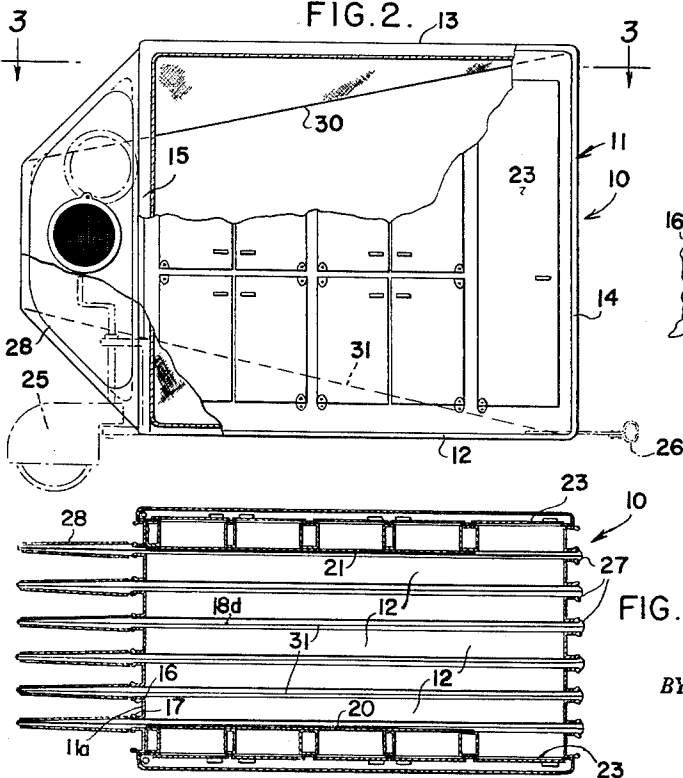


FIG. 4.

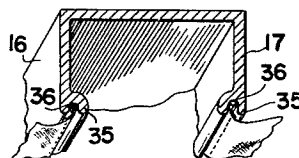


FIG. 3.

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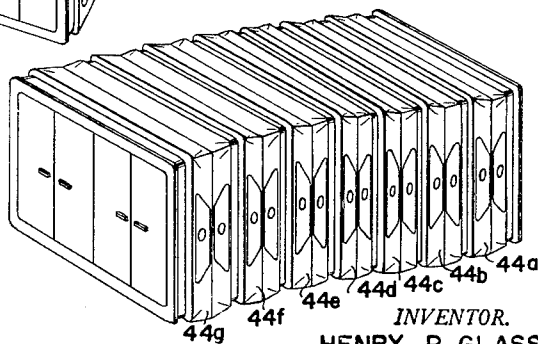
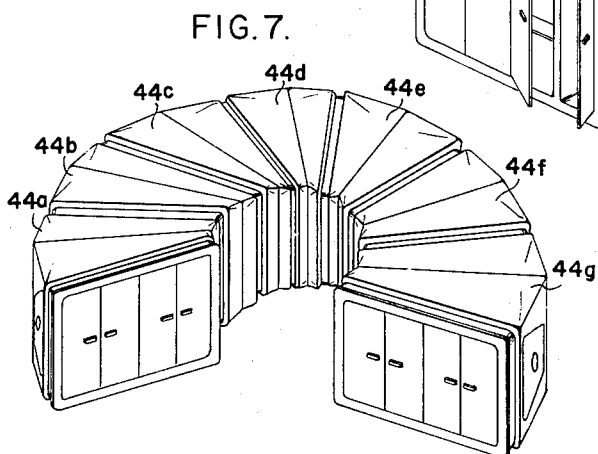
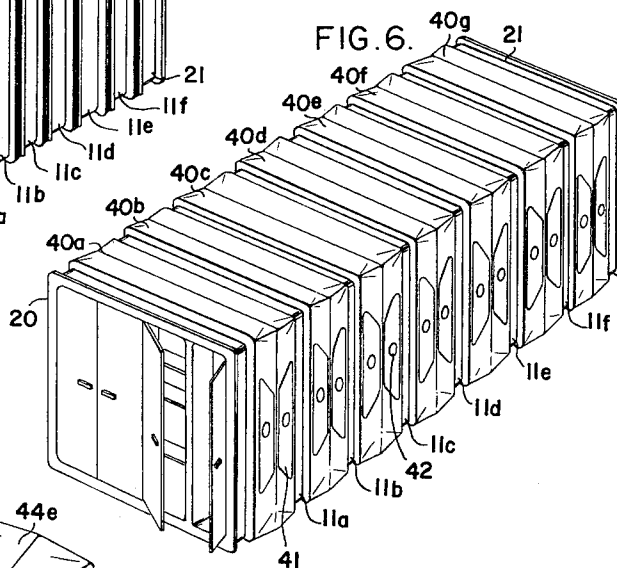
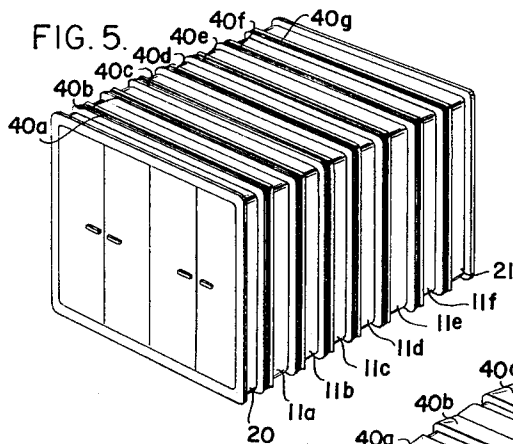
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2,999,507

COLLAPSIBLE SHELTER USING BELLOWS-LIKE SECTIONS

Filed May 27, 1960

2 Sheets-Sheet 2



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2,999,507

COLLAPSIBLE SHELTER USING BELLOWS-LIKE SECTIONS

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Filed May 27, 1960, Ser. No. 32,213
5 Claims. (Cl. 135—1)

This invention relates to collapsible and expandable shelters and more particularly to camping shelters which may be ground or trailer mounted.

Collapsible shelters, particularly camping trailers and tents, have been generally of a flimsy construction usually having canvas walls requiring extensive anchoring about their lower edges. Further, the known collapsible structures when expanded had to assume their full extended position in order to remain upright, regardless of the needs of the user or the space available to be occupied by the structure.

Therefore, in accordance with the invention claimed a new and improved collapsible shelter is provided comprising a framework structure. The framework structure may be provided with a floor section, a roof section and a pair of end sections. A folding cover similar to that of an accordion or bellows is attached to the perimetral edges of one or both sides of the framework and is extendable to expand the volume of the shelter.

It is, therefore, one object of the present invention to provide a new and improved collapsible shelter.

Another object of this invention is to provide a new and improved collapsible shelter which may be extended to a plurality of given sizes and geometrical configurations.

A further object of this invention is to provide a new and improved shelter in which a plurality of covers of accordion or bellows type are utilized to expand and collapse the structure.

A still further object of this invention is to provide a new and improved shelter which expands outwardly from opposite ends of a rectangularly shaped, vertically positioned framework.

A still further object of this invention is to provide a new and improved trailer mounted accordion type collapsible and expandable shelter.

A still further object of this invention is to provide a new and improved shelter which is expandable in an arcuate manner.

A still further object of this invention is to provide an improved shelter of relatively simple construction which is light in weight, economical to manufacture and easily collapsed and erected.

Objects and advantages other than those set forth will be apparent from the following description when read in connection with the accompanying drawing, in which:

FIG. 1 is a top cross sectional view of the trailer mounted shelter structure shown in FIG. 2 in expanded position and embodying the invention;

FIG. 2 is a side elevational view partly in section of the structure shown in FIG. 1 and in collapsed position;

FIG. 3 is a cross sectional view taken on the line 3—3 of FIG. 2 of the shelter shown;

FIG. 4 is a partial perspective view of a channel section of the framework of the shelter showing the accordion type cover connection thereto;

FIG. 5 is a perspective view of a modification of the structure shown in FIG. 1 in collapsed position;

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FIG. 6 is a perspective view of the structure shown in FIG. 5 in one expanded geometrical arrangement;

FIG. 7 is a perspective view of a structure similar to that shown in FIG. 6 in another expanded geometrical arrangement; and

FIG. 8 is a perspective view of a structure similar to that shown in FIG. 6 mounted on an uneven surface.

Referring more particularly to the drawing by characters of reference, FIGS. 1, 2 and 3 disclose a collapsible shelter 10 comprising five four-sided hollow framework structures 11a, 11b, 11c, 11d, and 11e. Each structure may be formed out of a metallic U-shaped channel member and comprises a floor section 12, a roof section 13 and a pair of side sections 14 and 15. The side sections are secured along their lower and upper edges to corresponding edge portions of the floor and roof sections, respectively, or are formed integral therewith. Each U-shaped channel member comprises a pair of leg members or edges 16 and 17. To each of the perimetral edges formed by legs 16 and 17 of each framework structure is attached one edge or end of a cover.

FIGS. 1, 2 and 3 illustrate a six cell cubicle of a multi-cell shelter wherein the five framework structures are interconnected by bellows 18b, 18c, 18d and 18e. Bellows wedge-shaped sections or covers 18a and 18f are connected to legs 17 and 16, respectively, of framework structures 11a and 11e on one end thereof and to framework structures or walls 20 and 21 on the other ends thereof.

Each wall has a given thickness which may be similar to that of the framework structures 11a through 11e and is provided with a door 23 to the shelter enclosure and a plurality of closed storage spaces 24 for cooking utensils, supplies and the like. Drawer spaces and drawers may be provided for clothing or other duffel, if so desired.

FIG. 2 illustrates in dotted lines a trailer wheel arrangement 25 which may be detachably mounted on base or floor section 12 of framework structure 11c and a trailer hitch 26. In view of the fact that the trailer wheel arrangements and hitches are well known to a man skilled in the art, this structure will not be shown or described in detail. When the shelter is in use, the wheel may be moved relative to the shelter so as to lower the shelter to the ground.

The shelter, regardless of the number of cells combined, is supported by the framework structures. Each cell or section of the shelter is formed by a pair of framework structures interconnected by a cover or bellows section. The cover of each cell is individually or simultaneously expanded or collapsed, as desired. The covers 18a through 18f, shown in FIGS. 1—3, are so formed that the shelter when expanded forms an arcuate configuration, i.e., the portions 27 of the covers or bellows interconnecting the side sections 14 of the framework structures have a very limited or relatively small amount of expansion while the portions 28 at the outer periphery of the semicircle formed by the expanded shelter, as shown in FIG. 1, have a large or relatively great amount of expansion. Each cover section or bellows shown in FIGS. 1—3 when expanded forms a wedge with its tapered end extending toward the center of the arcuate configuration formed by the shelter.

When the bellows-like sections are collapsed as shown in FIGS. 2 and 3, the flexible outer portions 28 fold

outwardly while the top and bottom portions 30 and 31 thereof fold inwardly. The very limited expansion of the inner portions 27 of the covers makes it possible for these portions to fold outwardly or inwardly as necessary without affecting to any great extent the collapsing of the multi cover shelter. As shown in FIG. 2 the outer portions 28 of the covers may be provided with one or more screened ventilator openings 33 with suitable covers or closure lids 34 therefor.

In order to firmly fasten bellows 18a-18f to the framework structures the legs 16 and 17 at their free ends are each provided with a bifurcated or U-shaped channel 35. The legs of this channel firmly grip the ends of the bellows. As shown in FIG. 4 the flexible material of the bellows may each have formed at their ends a pocket for receiving a cord 36, and this cord then is firmly grasped by the legs of the U-shaped channel 35 when it is inserted with the bellows material therebetween.

In order to expand the collapsed shelter shown in FIG. 2 after the trailer wheel has been removed or the shelter is lowered to ground level, the operator merely grasps either wall 20 or 21 and pulls it away from the remaining shelter structure in an arcuate or semi-circular manner. It is probably easier to erect the structure by pulling wall 20 through an arc of ninety degrees and then pulling wall 21 through an arc of ninety degrees. In this manner only half of the shelter structure is expanded at one time with the framework structure 11c remaining relatively stationary.

FIGS. 5 and 6 illustrate a modification of the structure shown in FIGS. 1-3 wherein the framework structures 11a through 11f and 20 and 21 are interconnected by bellows-like sections 40a through 40g in the manner shown. The sides, top and bottom portions of these bellows-like sections are all of the same length so that the shelter, when expanded, forms substantially a rectangular parallelepiped. It is recognized that the covers or bellows-like sections 40a through 40g may not all be expanded fully at any one time, but the overall shape is of a three dimensional figure having substantially a rectangular cross section.

In the structure shown in FIGS. 5 and 6 the cover sections 40a through 40g fold inwardly so that all portions thereof are covered and protected when the structure is collapsed. As shown, sections 40a through 40g may be provided with ventilator openings 42 in the inwardly foldable end plates 41. Either or both of the end walls 20 and 21 may be provided with entrance doors and closed cupboards, drawers, etc., for storage purposes.

FIG. 7 is a perspective view of a structure similar to that shown in FIG. 6 wherein the cover sections 44a through 44g are so shaped that they can assume a wedge shape causing the shelter to assume an arcuate configuration, or the shelter may be expanded into a structure of rectangular cross section. In other words, the shelter shown in FIG. 7 may be expanded in the manner shown in FIG. 6 or in a variety of arcuate forms one of which is shown in FIG. 7. As shown in FIG. 7, the outer portion of the bellows is fully expanded while the inner portion of the bellows is only partly expanded. This is an important feature of the shelter because it may be made to fit the space available or adjusted to provide the shelter space needed.

FIG. 8 is a perspective view of a structure similar to that shown in FIG. 6 wherein the structure is shown mounted on uneven ground. The new and improved structure disclosed and claimed herein when expanded follows the contour of the ground and therefore is rendered stable and usable without other supports.

As readily noted, the structures shown may be expanded and collapsed by merely pulling or pushing on the structure in the usual manner of expanding or collapsing a bellows or an accordion. Further, the new and improved structure does not require tent posts, stakes,

guide ropes, etc., thereby not only eliminating these parts but reducing the work connected with the erection and collapsing of the shelter. Even though the drawings show framework structures having four sides, it is intended to be within the scope of this disclosure to include framework structures having any number of sides, including a three sided triangle which would define a tent-like configuration having sloping roof sections with a peak at the tent top.

Although but a few embodiments of the present invention have been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A collapsible shelter comprising a plurality of four sided framework structures, each of said structures comprising a floor section, a roof section and a pair of end sections, and a plurality of wedge-shaped bellows-like sections one attached to each of the opposite perimetral edges of adjacently arranged structures to interconnect them into a unitary shelter, said wedge-shaped bellows-like sections having their narrow ends at the same side of the shelter and being extendable in an arcuate manner about a common point to expand the volume of said shelter.

2. A collapsible shelter comprising a plurality of four sided framework structures each defining vertically a rectangular frame section, each of said structures having a floor section, a roof section and a pair of end sections, one of said floor sections of one frame section being adapted to be attached to a trailer chassis, and a plurality of wedge-shaped bellows-like sections one attached to each of the juxtaposed perimetral edges of said structure to interconnect them into a unitary shelter, said bellows-like sections having their narrow ends at the same side of the shelter, each of said bellows-like sections being individually extendable to expand the volume of said shelter, said bellows-like sections and said framework structures arranged on each side of said frame section attached to said chassis being extended in an arcuate manner from said chassis mounted framework structure through approximately ninety degrees.

3. A collapsible shelter comprising a plurality of four sided framework structures each defining vertically a rectangular cross section, each of said structures comprising a U-shaped channel having leg members facing the outside of the rectangle, said leg members having bifurcated ends, each framework structure comprising a floor section, a roof section and a pair of end sections, and a plurality of bellows-like sections one attached to each of the bifurcated ends of the juxtaposed legs of said structures to interconnect them into a unitary shelter, each of said bellows-like sections being individually extendable to expand the volume of said shelter.

4. A collapsible shelter comprising a plurality of four sided framework structures each arranged vertically in spaced relationship, each of said structures defining a four sided cross sectional configuration formed from a U-shaped channel element comprising spaced leg members having bifurcated ends, said structures each comprising a floor section, a roof section and a pair of end sections, and a plurality of bellows-like sections, each of the ends of said bellows-like sections being firmly grasped between the bifurcated ends of the legs of different juxtaposed structures to interconnect said structures and said bellows into a unitary shelter, each of said bellows-like sections being individually extendable to expand the volume of said shelter.

5. A collapsible shelter comprising a plurality of four sided framework structures each arranged vertically in spaced relationship with respect to another, each of said structures defining a four sided cross sectional configuration formed from a U-shaped channel element compris-

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ing spaced leg members having bifurcated ends, said structures each comprising a floor section, a roof section and a pair of end sections, a plurality of wedge-shaped bellows-like sections, each of the ends of said bellows-like sections being firmly grasped between the bifurcated ends of the legs of different juxtaposed structures to interconnect said structures and said bellows-like sections into a unitary shelter, each of said bellows-like sections having their narrow ends at the same side of the shelter and being individually extendable to ex- 10

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pand the volume of said shelter in an arcuate manner about a common point, and a wall portion including a doorway formed in at least one of said structures forming the outer ends of said shelter.

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