Oct. 9, 1956 K. W. COUSE 2,765,499

COLLAPSIBLE HUT

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Fig. 1

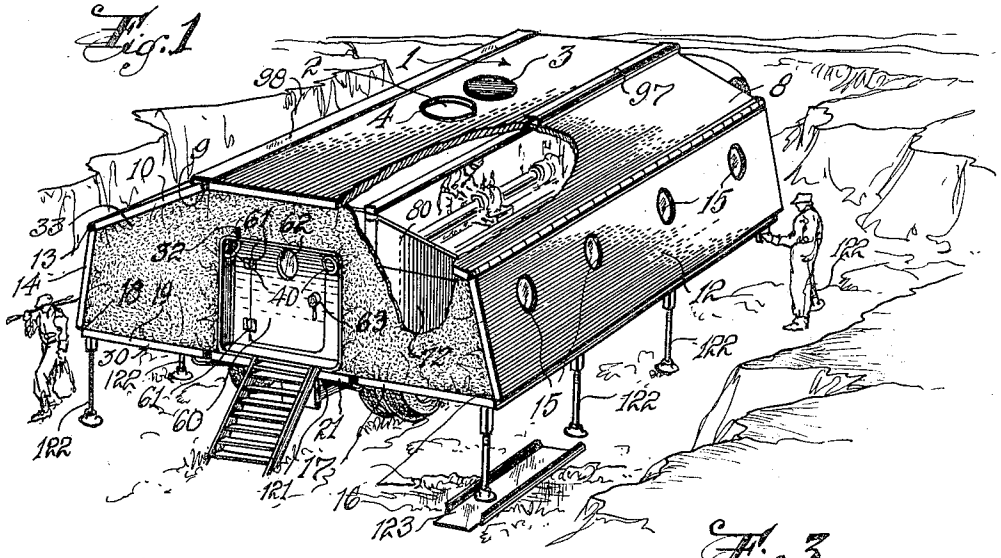


Fig. 2

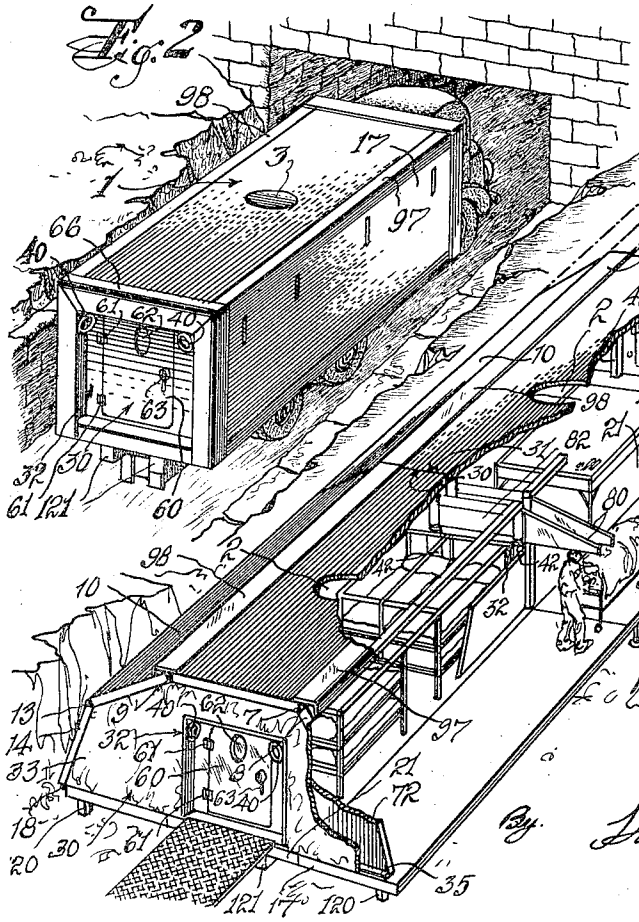


Fig. 3

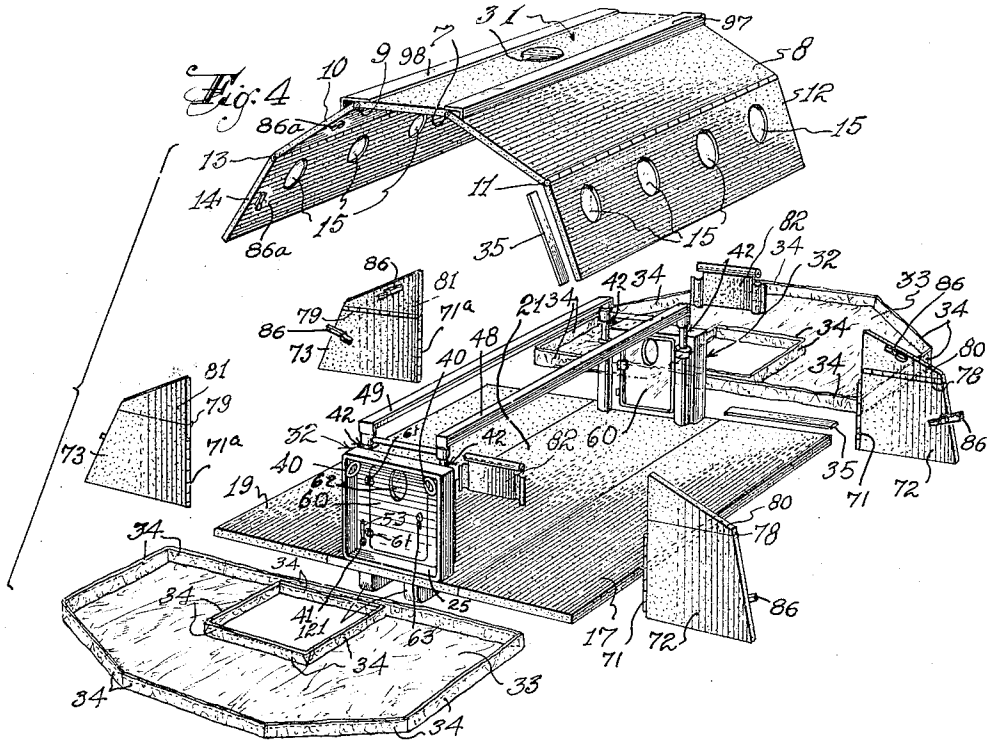
Inventor:
Kibbey W. Couse.
By Harry A. Cook
Attorney

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Fig. 4



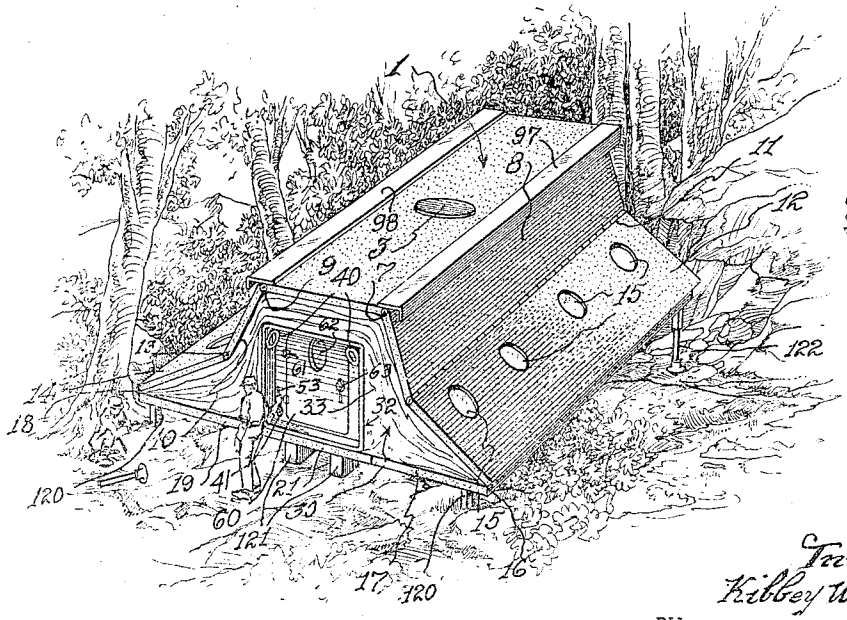


Fig. 5

Inventor:
Kibbey W. Couse
BY
Harry A. Cook,
Attorney.

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Fig. 6

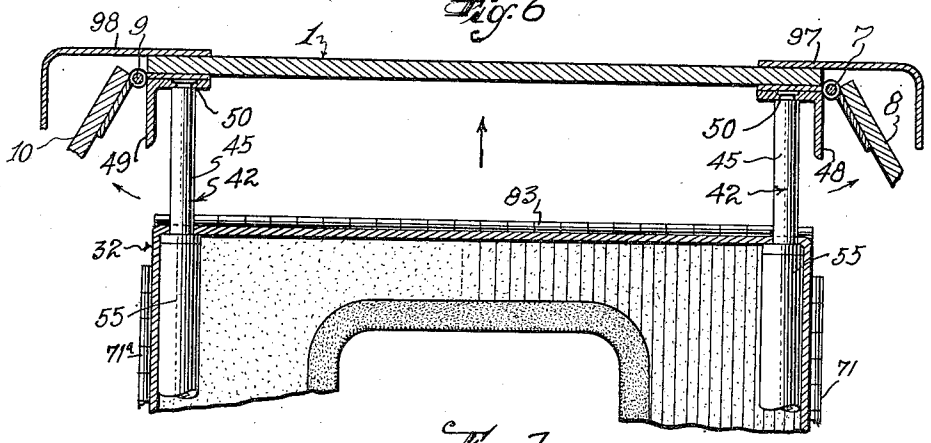


Fig. 7

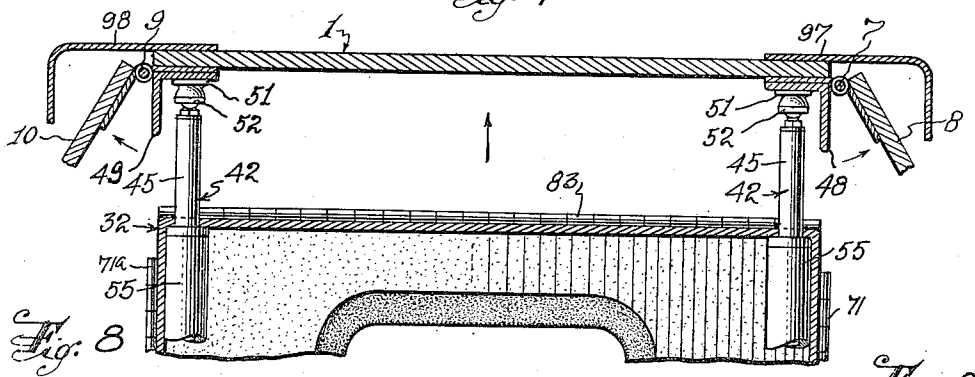


Fig. 8

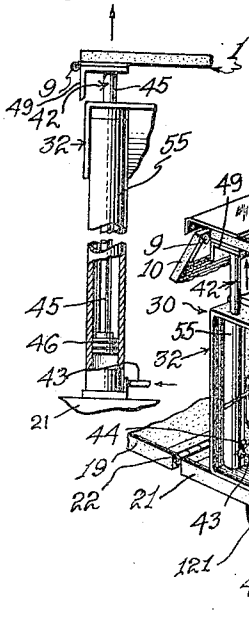
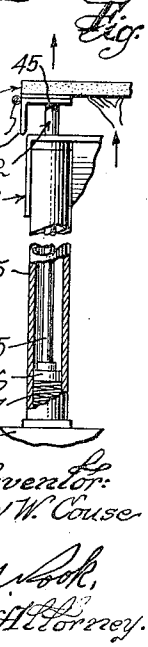


Fig. 10

Fig. 9



Inventor:
Kibbey W. Couse

BY

Lacy A. Cook,
Attorney.

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COLLAPSIBLE HUT

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Fig. 11

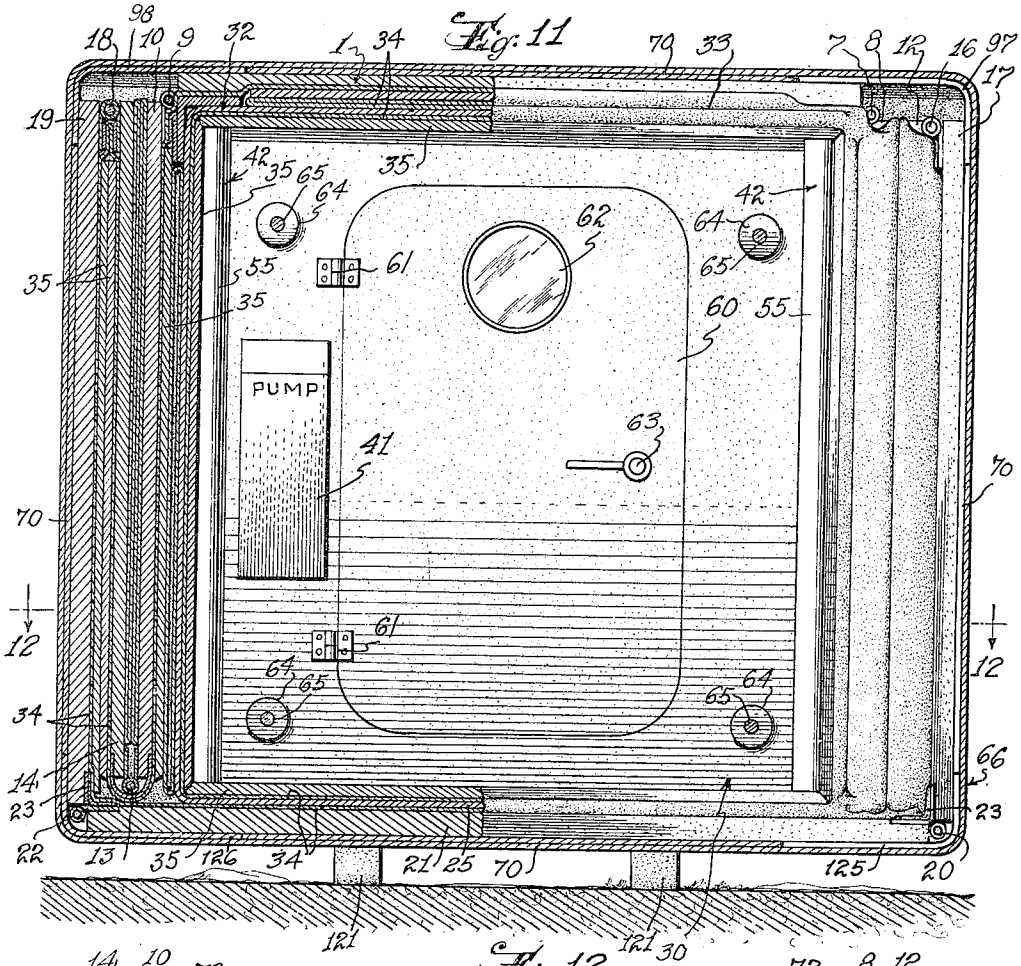


Fig. 12

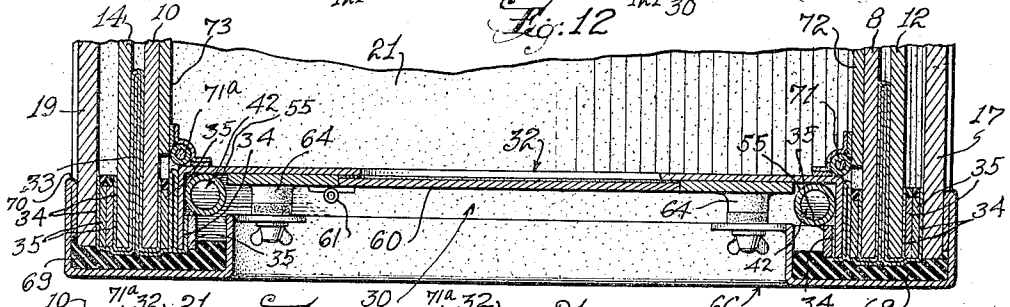
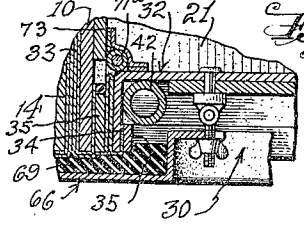


Fig. 14



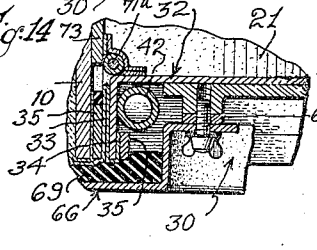


Fig. 13

Inventor:
Kibbey W. Couse
BY Harry B. Cook,
Attorney.

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Fig: 15

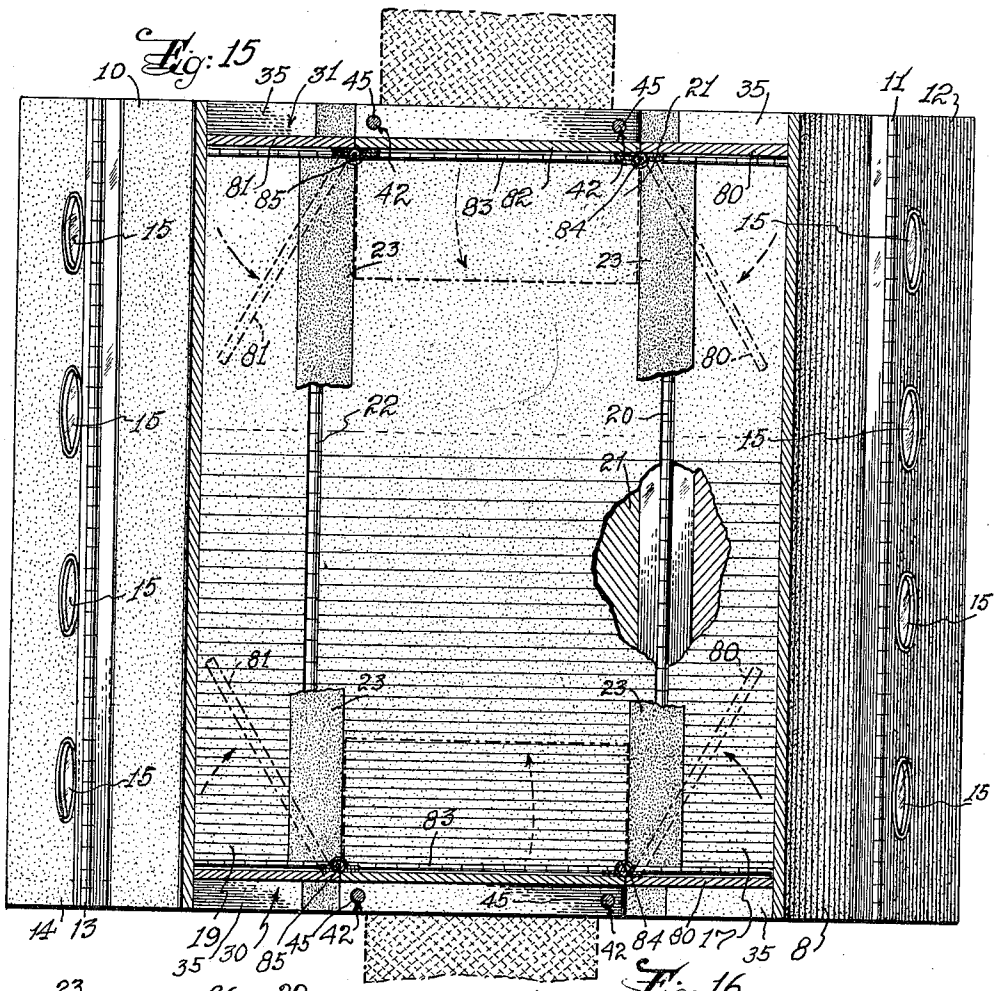
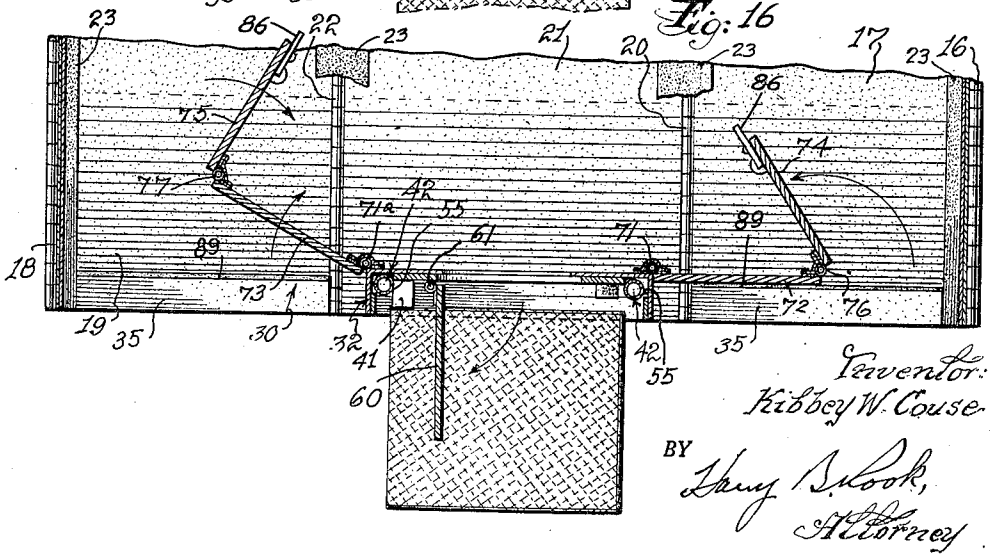


Fig: 16



Inventor:
Kibbey W. Couse

BY Harry B. Cook,
Attorney

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COLLAPSIBLE HUT

Kibbey W. Couse, Newark, N. J.

Application April 30, 1952, Serial No. 285,263

8 Claims. (Cl. 20—2)

My invention relates to a collapsible hut and has as its prime object the provision of a collapsible hut which can be folded for transportation into a shipping container about a rigid rectangular frame incorporated therein.

It is another object of my invention to provide a collapsible hut of the described type which incorporates suitable means for raising the roof from its collapsed to its erected position.

It is still another object of my invention to provide a collapsible hut of the described type which is self contained in all its essential components.

It is a further object of my invention to provide a collapsible hut of the described type which incorporates suitable means for rendering the collapsed and expanded hut substantially air-tight and moisture proof, and for also rendering the hut water-tight so that it may be floated and transported by water when collapsed.

Other objects and advantages of my invention will appear as the course of the specification progresses.

To attain the objects and advantages of my invention I provide a hut having foldable side and floor panels. These panels can be folded with the end sections of the hut which are of a flexible material about a rigid rectangular frame positioned in each end section, to collapse the hut into a shipping container. Suitable jacking means secured to the floor of the hut are provided for raising the roof of the hut when the hut is to be erected from its collapsed condition. The hut is preferably provided with sealed joints to render both the collapsed and expanded hut air-tight and moisture proof, and to also render the hut water-tight so that it can be floated and transported if necessary when collapsed.

In the accompanying drawings:

Figure 1 is a perspective view of the expanded hut shown mounted on a trailer chassis and in use as a machine shop;

Figure 2 is a perspective view of the collapsed hut transformed into a shipping container and mounted for transportation on a trailer chassis;

Figure 3 is a perspective view showing two expanded huts joined end to end for use as a field hospital, portions of the huts being broken away to show the interior thereof;

Figure 4 is an exploded view of the hut structure;

Figure 5 is a perspective view of the hut with the primary seals attached shown in the process of erection;

Figure 6 is a fragmentary vertical cross-sectional view showing the relationship between the roof and the lifting jacks according to one mode of construction;

Figure 7 is a vertical fragmentary cross sectional view showing the relationship between the roof and the lifting jacks according to another mode of construction;

Figure 8 is a fragmentary elevational view partially in section of one form of hydraulic roof lifting jack;

Figure 9 is a view similar to Figure 8 showing a modified form of roof lifting jack;

Figure 10 is a semi-diagramatic perspective view showing the hydraulic system for the hydraulic roof lifting jacks;

Figure 11 is an end view partially in section of the hut collapsed and transformed into a shipping container, with the end cap removed;

Figure 12 is a fragmentary sectional view taken on the line 12—12 of Figure 11, with the end cap in position;

Figure 13 is a detail sectional view showing the manner of securing the end caps to the door frames;

Figure 14 is a detail sectional view showing alternative means for securing the end caps to the door frames;

Figure 15 is a horizontal sectional view taken through the roof of the hut as assembled in Fig. 1 but with the primary flexible seal of the end section omitted illustrating the manner of folding the transverse partitions;

Figure 16 is a fragmentary horizontal sectional view taken through one end portion of the hut and the corresponding end frame, and illustrating the end partitions partly unfolded.

Similar reference characters refer to similar parts in each of the several views.

Referring to the drawings, reference character 1 designates the roof section of my collapsible hut which roof section has an opening 2 therein to permit a man to enter or leave the hut when all other openings are closed as by snow. Opening 2 is provided with an air-tight and water-tight cover 3 which may be merely fitted into opening 2 to be held there by any suitable means.

Roof section 1 is hinged along one longitudinal edge by hinge members 7 to side panel 8 and along its other longitudinal edge by hinge members 9 to another side panel 10. Side panel 8 is hinged along its free longitudinal edge by hinge members 11 to still another side panel 12 and side panel 10 is hinged along its free longitudinal edge by hinge members 13 to yet another side panel 14, side panels 12 and 14 being each provided with a plurality of sealed port-like windows 15 for the purpose of admitting light to the interior of the hut. Side panel 12 is hinged along its free longitudinal edge by hinge members 16 to outwardly extending floor panel 17 and side panel 14 is hinged along its free longitudinal edge by hinge members 18 to outwardly extending floor panel 19. Outwardly extending floor panel 17 is hinged along its free longitudinal edge by hinge members 20 to one longitudinal edge of central floor panel 21 while floor panel 19 is hinged along its free longitudinal edge by hinge members 22 to the other longitudinal edge of floor panel 21. The aforesaid hinge connections are preferably each provided with a flexible sealing strip 23 suitably secured to adjacent sections and extending the length of the connection to render each such connection air-tight and water-tight.

Roof section 1 and the aforesaid side and floor panels connect with front and rear end section 30 and 31 respectively each of which comprises a rectangular frame 32 surrounded by an area of flexible material 33, sometimes referred to hereinafter as a primary seal. Each rectangular frame 32 is secured to central floor panel 21 along the inside edge of its base plate 25. The flexible material or primary seal 33 of each end section is secured along folded edges 34 to top section 1, side panels 8, 10, 12 and 14, floor panels 17, 19 and 21, and around frames 32 by cleats 35 fastened in position by screw studs 36. It is to be noted that the primary seal is wrapped about the outer edge of base plate 25 being secured in the usual manner to the upper side of the base plate by cleat 35 and being held tightly against central floor panel 21 by the lower side of the outer edge of the base plate.

Side panels 8, 10, 12 and 14 which are preferably all of equal size are foldable inwardly, and outwardly extending floor panels 17 and 19 which are preferably equal in size to the aforesaid side panels are foldable upwardly

to collapse such side and floor panels and top section 1 around rectangular frames 32 into a shipping container or packing case which may be mounted for transportation on a truck trailer as shown in Fig. 2 and which container in the preferable form of construction is air-tight and moisture-proof to prevent damage to any machinery transported therein and also is water-tight to render its transportation by water feasible. The folded panels are forced under spring plates 97 and 98 secured to the roof 1 which spring plates hold these panels in their collapsed positions until the hut is again expanded. The flexible portions or primary seals 33 of end sections 30 and 31 of course fold together when the hut is collapsed and the excessive folded material is tucked between side panels 8 and 12 and side panels 10 and 14 (see Fig. 12). If desired, the hut may be utilized with one side collapsed and the other side expanded. This arrangement is particularly desirable where an obstruction exists on one side.

Frames 32 each have a pair of loops 40 secured thereto in opposite upper corners to which two lines may be attached when it is desired to transport the collapsed hut by water. One frame 32 also has a hydraulic pump 41 secured thereon which pump connects with a plurality of hydraulic jacks 42 preferably four in number of which two are secured to one of rectangular frames 32 and central floor panel 21 while the other pair of jacks are secured to the other rectangular frame and central floor panel 21. Jacks 42 may be secured to rectangular frames 32 on the inside thereof as shown in Figs. 4, and 11 or on the outside as shown in Figs. 6–12. Pump 41 connects with each of jacks 42 by an individual conduit line 43 provided with a suitable control valve 44. Each hydraulic jack 42 comprises a cylinder 55 and an actuating element 45 having a piston 46 secured thereon at one end reciprocable in its associated cylinder. Actuating elements 45 have their ends opposite from pistons 46 connected with a pair of supporting channels 48 and 49 which are secured to the underside of roof section 1 to provide for the raising of the roof when the hut is to be expanded from its collapsed condition. Actuating elements 45 may be connected with supporting channels 48 and 49 in the manner shown in Fig. 6, the channels being recessed to receive specially formed ends 50 of actuating elements 45, or the channels may as shown in Fig. 7 be provided with pads 51 which rest upon ball-like fittings 52 secured to actuating elements 45. The latter method of connecting the actuating elements and supporting channels permits the channel to automatically adjust to any unevenness in the motion of the actuating elements. To raise roof section 1, it is only necessary to operate pump 41 by reciprocating its handle 53 to provide for the transmission of hydraulic pressure through conduit lines 43 to cylinders 55 and the underside of pistons 46 whereby actuating elements 45 are moved upwardly to raise roof section 1. As an alternative to the hydraulic system described each cylinder 55 may be provided beneath piston 46 with a compression spring 47 in which sufficient energy is stored with the hut in its collapsed condition to provide for the raising of roof 1 when the hut is expanded from its collapsed state (Fig. 9). In the erecting the hut, roof section 1 is raised by jacks 42 beyond its normal position until the side panels are substantially in line whereupon the side panels are pushed outwardly and the roof lowered to the normal erected position. In collapsing the hut, the roof is again raised beyond its normal erected position until the sides thereof are in alignment whereupon the sides are pushed inwardly. The roof is then lowered and the side and outwardly extending bottom panels are folded in the manner already described to collapse the top side and foldable bottom panels about rectangular frame 32.

Preferably, each of rectangular frames 32 includes an air-tight and water-tight door 60 which is hingedly connected thereto at 61 and is provided with a sealed port-

like window 62 and suitable locking means 63. Each of rectangular frames 32 has a plurality of bosses 64 mounted thereon having threaded openings 65 which function in securing an end cap 66 to each end of the collapsed hut. Each end cap 66 has a plurality of bosses 67 formed thereon through which suitable bolts may be inserted to connect with threaded openings 65 in bosses 64 which bolts with the aid of wing nuts 68 serve to secure cap 66 in position. Each end cap 66 is adapted to receive a gasket 69 of rubber or other like material which gasket is held in place by folded edges 70 of the cap. When end caps 66 are secured in position over the ends of the collapsed hut gasket 69 contacts the edges of frame 32 and the edges of the roof, side and bottom sections of the hut forming a water-tight seal with such parts to further assure the water-tightness of the collapsed hut.

Means are provided for partitioning the hut transversely at each of frames 32. Thus each of frames 32 is hingedly connected by hinge members 71 and 71*a* to transverse partitions 72 and 73 respectively. Partitions 72 and 73 may as shown in Fig. 4 each extend to the sides of the hut when closed, the edges of partitions 72 and 73 in such case being adapted to conform to the inclination of side panels 12 and 14 respectively. Partitions 72 and 73 may however extend but part way across the hut when fully opened out as shown in Fig. 16, the panels 72 and 73 being connected to other transverse partitions 74 and 75 respectively by suitable hinge members 76 and 77 which other transverse partitions extend to the sides of the hut and are adapted to conform to the inclination of side panels 12 and 14. The aforementioned transverse partitions are hingedly connected along their top edges by suitable hinges members 78 and 79 to wedge shaped transverse partitions 80 and 81 which conform to the inclination of side panels 18 and 10 respectively. Interposed between roof section 1 and each frame 32 is a transverse rectangular partition 82 which partition is hingedly connected by hinge member 83 to the top of frame 32 and by hinge members 84 and 85 to opposite sides of wedge shaped partitions 80 and 81 respectively. Transverse partitions 72, 73, 74, 75, 80 and 81 are provided with suitable latches 86 pivotally connected thereto and insertable in grooves 86*a* in the side panels of the hut to hold such partitions in their closed positions (Figs. 4 and 16.).

When more space is required than is afforded by one hut, two or more huts may be positioned end to end, the opposing primary seals having been first removed. Two huts positioned end to end for use as a hospital are shown in Fig. 3. Suitable sealing strips preferably are secured to and overlie the abutting edges of the two huts, and similar sealing means preferably are provided between the abutting end frames of the two huts.

Other incidental features of the hut include the provision of a plurality of legs 120 normally positioned beneath outwardly extending floor panels 17 and 19 of the expanded hut, and a pair of skids 121. Normally on flat ground the weight of the hut is entirely supported by legs 120 and skids 121. When, however, the hut rests upon uneven terrain as shown in Fig. 5 or when the expanded hut is mounted on a trailer as shown in Fig. 1 additional support means such as jacks 122 must be provided. It is advantageous to position legs 120 and jacks 122 in supporting channel pieces 123 where soggy ground is encountered.

It is to be understood that various changes and modifications may be made in my collapsible hut as herein shown and described and within the scope of the appended claims without departing from the spirit and scope of my invention.

Having described my invention, what I claim is:

1. A collapsible hut comprising two rigid rectangular end frames at least one of which has a door therein, a roof portion disposed at the top sides of said end frames,

foldable side panels hingedly connected to opposite edges of said roof, a foldable floor portion including a central floor panel and two outwardly extending floor panels, said central floor panel being disposed at the bottom sides of said rigid end frames and each of said outwardly extending floor panels having one edge hingedly connected to one edge of the central floor panel and its other edge connected to the lower edge of one of said side panels, and flexible end sections connected to said end frames, said roof, said side panels and said outwardly extending floor panels, said foldable side panels and said outwardly extending floor panels being foldable against the corresponding sides of said end frames with said flexible end sections folded and tucked inwardly between said panels.

2. A collapsible hut as defined in claim 1 with the addition of a plurality of jacks interposed between said floor panel and said roof at the side of each of said rigid end frames and operable to raise the roof upwardly from said end frames, and wherein said outwardly extending floor panels and said flexible side panels are of such dimensions that the outwardly extending floor panels may be disposed horizontally when the roof is elevated from the end frames and said foldable side panels may be inclined from the roof to said outwardly extending floor panels.

3. A collapsible hut comprising two rigid rectangular end frames at least one of which has a door therein, a roof portion disposed at the top sides of said end frames, foldable side panels hingedly connected to opposite sides of said roof, a foldable floor portion including a central floor panel and two outwardly extending floor panels, said central floor panel being disposed at the bottom sides of said rigid end frames and each of said outwardly extending floor panels having one edge hingedly connected to one edge of the central floor panel and to the lower edge of one of said side panels, foldable end panels hingedly connected to the vertical sides of the rigid end frames and latch means for separably connecting the outermost of said end panels to the side panels, said foldable side panels and said outwardly extending floor panels being foldable against the corresponding sides of said end frames, said foldable end panels being foldable inwardly and inside said outwardly extending floor panels when the latter are folded upwardly.

4. A collapsible hut as defined in claim 3 with the addition of a plurality of jacks disposed between the central floor panel and the roof at the inside of each rigid end frame to raise the roof upwardly from said end frames, and wherein said outwardly extending floor panels and said flexible side panels are of such dimensions that the outwardly extending floor panels may be disposed horizontally when the roof is elevated from the end frames and said foldable side panels may be inclined from the roof to said outwardly extending floor panels, and another foldable end panel hingedly connected to the top side of each of said end frames, the first mentioned end panels being extendable from the respective end frames to the side panels and the last-mentioned end panels extending from the top sides of the corresponding end frames to said roof.

5. A collapsible hut comprising a roof, a foldable floor portion including a central floor panel and two outwardly extending floor panels, one such outwardly extending

panel being hinged to one longitudinal edge of the central floor panel and the second outwardly extending panel being hinged to the other longitudinal edge of the central floor panel, two side panels hinged together along opposing longitudinal edges, the free longitudinal edge of one of said side panels being hinged to one longitudinal edge of the roof and the free longitudinal edge of the other side panel being hinged to the free longitudinal edge of one outwardly extending floor panel, two other side panels also hinged together along opposing longitudinal edges with the free longitudinal edge of one of such other side panels being hinged to the free longitudinal edge of the roof and with the free longitudinal edge of the other panel of such other side panels being hinged to the free longitudinal edge of the other outwardly extending floor panel, front and rear end sections, each end section incorporating therein a rigid rectangular door frame having a door therein, and flexible material secured to the roof, floor portion, the corresponding door frame and the aforesaid side panels, said outwardly extending floor panels being foldable upwardly and the aforesaid side panels being foldable inwardly against the corresponding sides of said door frames with said flexible material folded and tucked between said panels, to collapse the hut into a rectangular shipping container.

6. A collapsible hut as defined in claim 5 with the addition of foldable end panels hingedly connected to the vertical sides of each of said door frames inwardly of said flexible material, and latch means for separably connecting the outer edges of said foldable end panels to the corresponding side panels when said floor panels and said side panels are unfolded or extended.

7. The collapsible hut as defined in claim 5 with the addition of a flanged cap telescopically fitted under the door frame and the ends of said panels when said panels and roof are folded against the door frame, the flange of said cap embracing the central floor panel, the roof and the folded floor panels when said panels are in collapsed or folded condition, to hold said panels in such collapsed or folded condition, and means for separably fastening said caps to the respective door frames.

8. A collapsible hut as defined in claim 5 with the addition of a plurality of jacks interposed between the roof and the central floor panel at the inside of each door frame to raise the roof from a collapsed to an expanded position, and wherein the dimensions of said outwardly extending floor panels and all of said side panels are such that the outwardly extending floor panels may be disposed horizontally and said side panels may be inclined from the roof to the outwardly extending floor panels when the roof and said floor and side panels are unfolded or extended.

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