May 19, 1970 J. F. PARR 3,512,316

TAKEDOWN SHELTER

Filed Sept. 27, 1967 4 Sheets-Sheet 1

Fig. 1

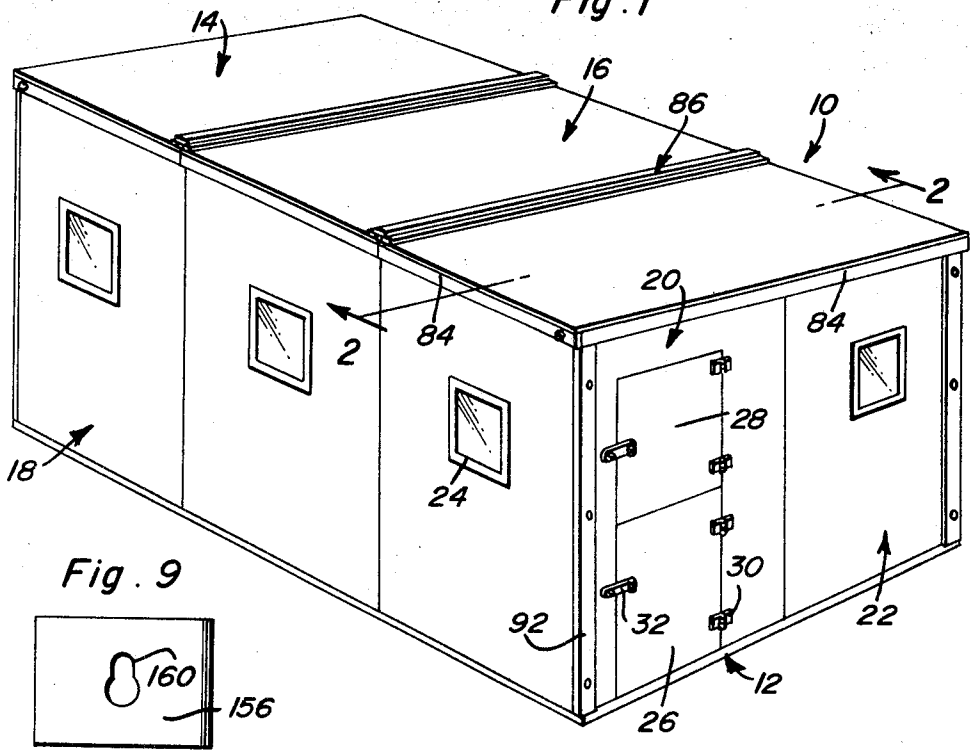


Fig. 9

Fig. 10

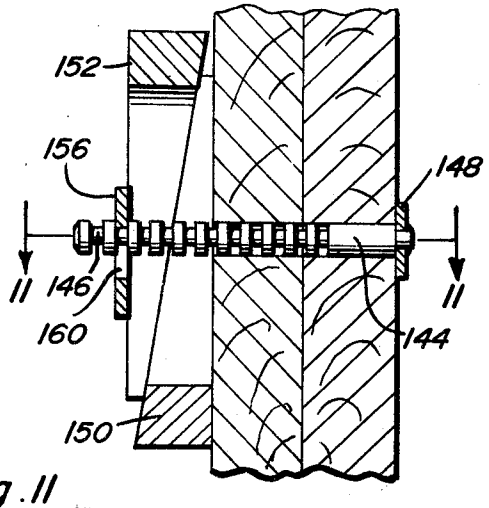


Fig. 8

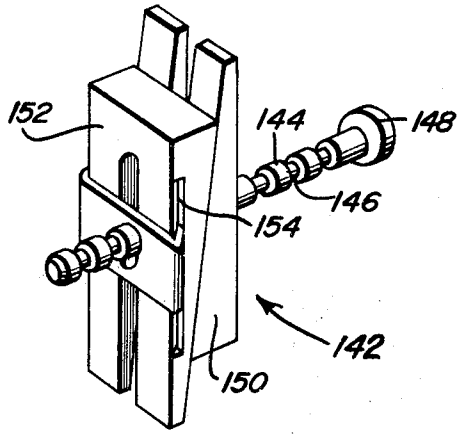
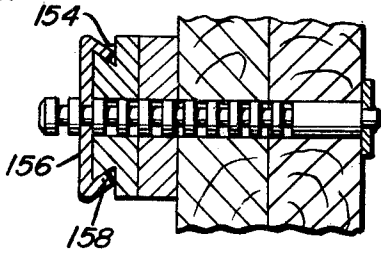


Fig. 11



James F. Parr

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

May 19, 1970 J. F. PARR 3,512,316

TAKEDOWN SHELTER

Filed Sept. 27, 1967 4 Sheets-Sheet 2

Fig. 2

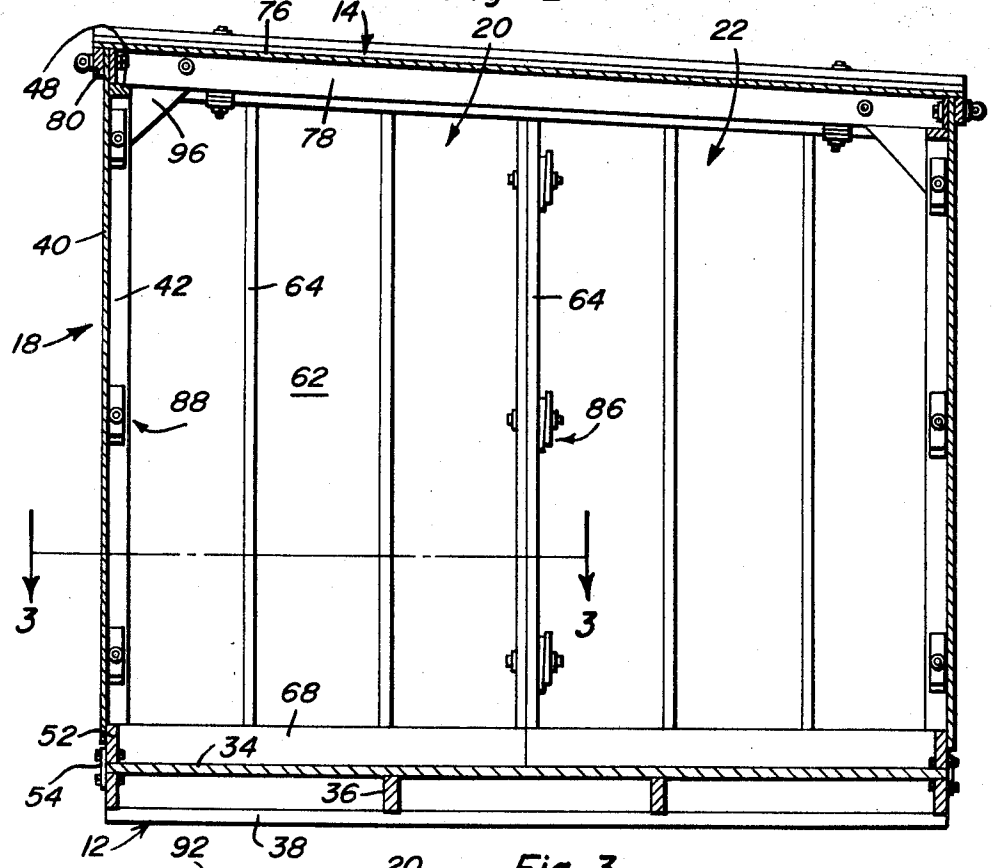


Fig. 3

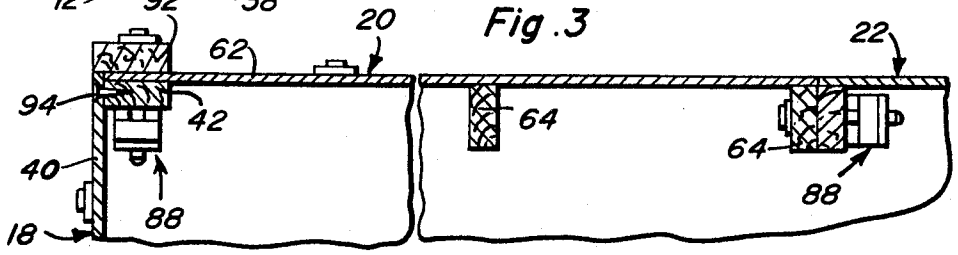
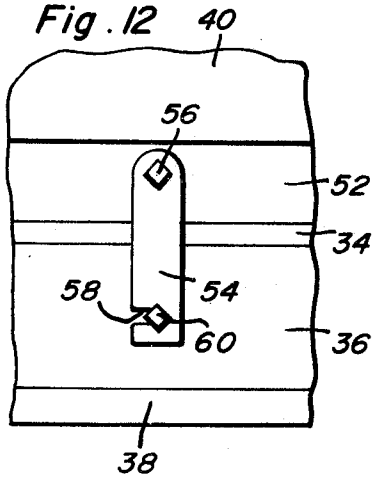


Fig. 12



James F. Parr

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

May 19, 1970 J. F. PARR 3,512,316

TAKEDOWN SHELTER

Filed Sept. 27, 1967 4 Sheets-Sheet 3

Fig. 4

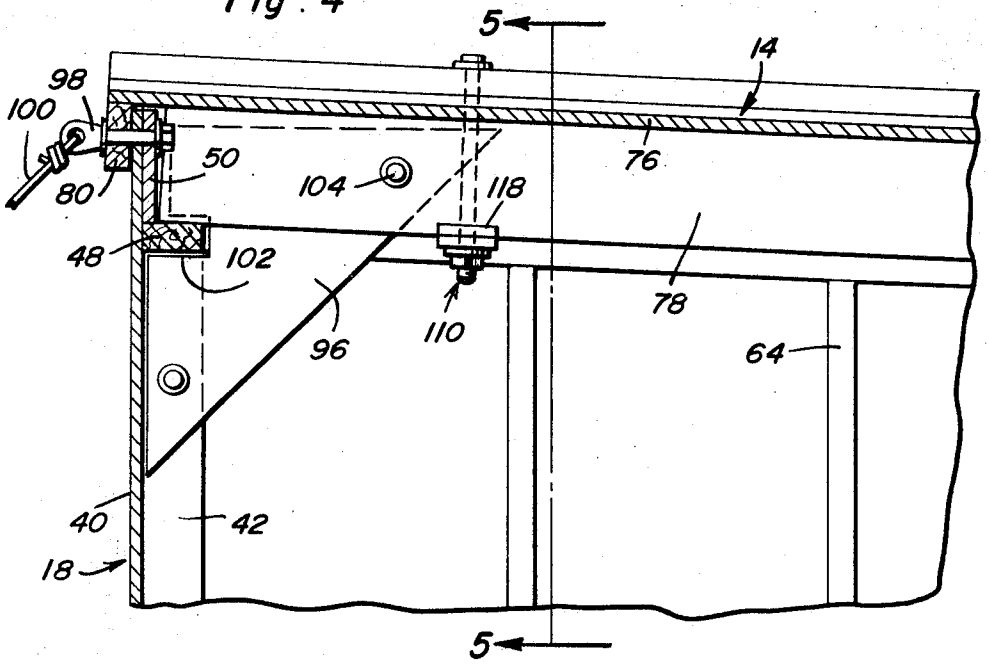


Fig. 5

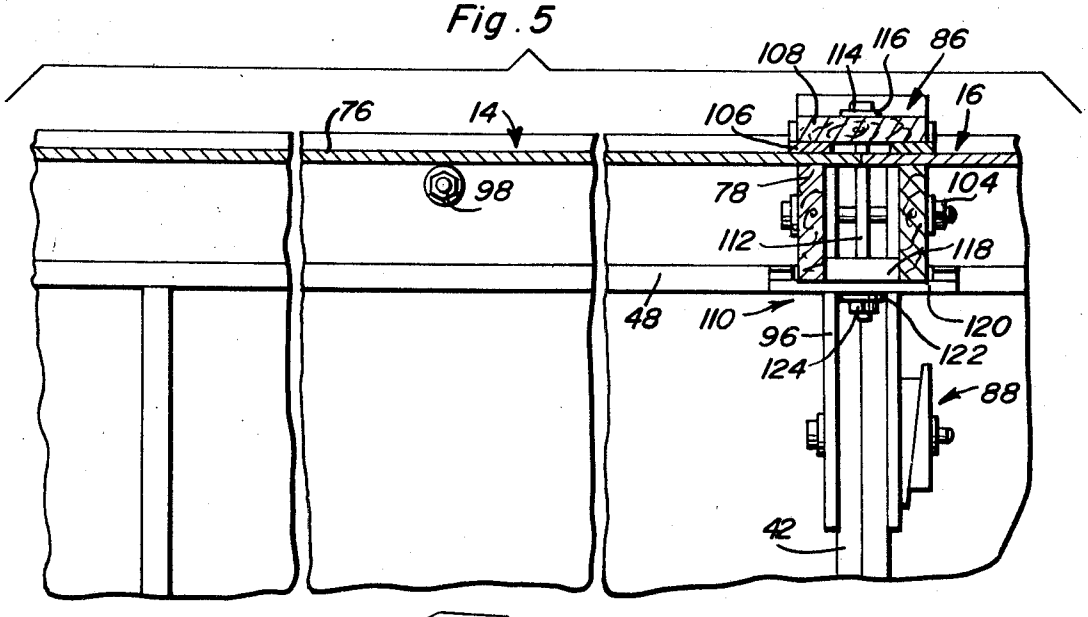
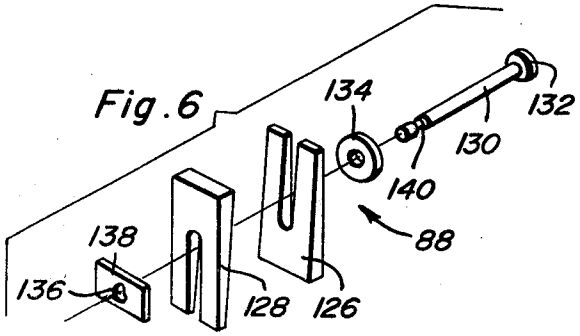


Fig. 6



James F. Parr

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

May 19, 1970 J. F. PARR 3,512,316

TAKEDOWN SHELTER

Filed Sept. 27, 1967 4 Sheets-Sheet 4

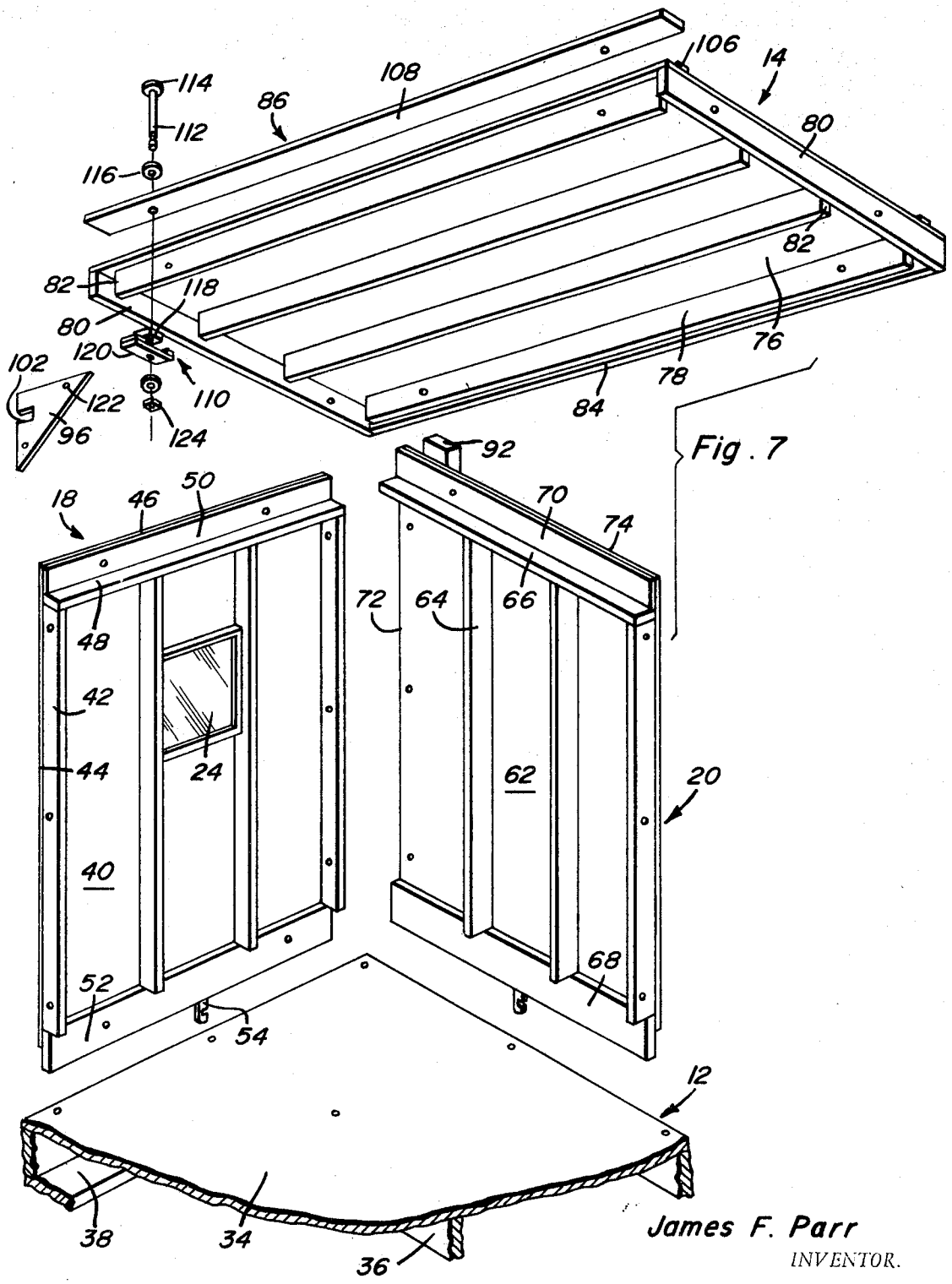


Fig. 7

James F. Parr
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office 3,512,316 Patented May 19, 1970

3,512,316

TAKEDOWN SHELTER

James F. Parr, Hamilton, Mont. (2327 E. Cameron, West Covina, Calif. 91790)

Filed Sept. 27, 1967, Ser. No. 670,995
Int. Cl. E04b 7/02, 7/06; E04d 1/36
U.S. Cl. 52—92 5 Claims

ABSTRACT OF THE DISCLOSURE

A shelter assembled from prefabricated panel sections of reduced size and weight. The shelter is held assembled by connectors securing abutting studs of the wall panel sections to each other while clamping bolt assemblies hold abutting roof panel sections clamped to sealing joints. The rafters of the roof sections are secured to the wall sections by corner braces that straddle the abutting studs.

This invention relates to prefabricated shelters and more particularly to a lightweight, modular panel type of shelter construction capable of being easily and rapidly erected and disassembled.

While many prefabricated shelter constructions have been devised, they have usually required some structural members of relatively long dimension making transport of the disassembled shelter rather difficult. Further, prior prefabricated shelter arrangements have required special fasteners and other expensive hardware in order to produce an erected shelter having the desired rigidity and ruggedness.

The shelter construction of the present invention while being rugged, leakproof and windproof, avoids the use of any structural members which dimensionally exceed in length any of the modular panel sections from which it is constructed and also utilizes relatively short connectors that do not require any special tools for installation. Thus, the modular panels from which the shelter is assembled, as well as all other parts necessary to assemble the shelter may be easily stored or transported, rapidly assembled and taken down.

In accordance with the present invention, the prefabricated shelter may be made from a plurality of vertical wall panel sections which are interconnected to form the sides of the shelter by relatively short connectors including a novel wedge-type of connector extending through abutting studs of adjacent wall sections. The wall sections are secured by pivoted latches to a floor assembly and may also be tied down by means of cables. Triangular braces which are interconnected with the abutting studs of the wall sections form a rigid connection to flat roof panel sections which are fitted over the upper edges of the wall sections. The roof panel sections are interconnected to each other by sealing joints so as to form a leakproof assembly.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a perspective view illustrating a typical shelter constructed in accordance with the present invention.

FIG. 2 is a side sectional view through the shelter taken substantially through a plane indicated by section line 2—2 in FIG. 1.

FIG. 3 is an enlarged partial sectional view taken substantially through a plane indicated by section line 3—3 in FIG. 2.

FIG. 4 is an enlarged partial sectional view corresponding to a portion of the construction illustrated in FIG. 2.

FIG. 5 is a partial sectional view taken substantially through a plane indicated by section line 5—5 in FIG. 4.

FIG. 6 is a perspective view showing the disassembled parts of one of the connectors utilized in the shelter construction illustrated in FIGS. 1–5.

FIG. 7 is a perspective view illustrating the disassembled components of a corner portion of the shelter construction as shown in FIG. 1.

FIG. 8 is a perspective view of another form of connector capable of being utilized in place of the connector illustrated in FIG. 6.

FIG. 9 is an elevational view of the clamping plate associated with the connector of FIG. 8.

FIG. 10 is a side sectional view of the connector illustrated in FIG. 8 as installed.

FIG. 11 is a sectional view taken substantially through a plane indicated by section line 11—11 in FIG. 10.

FIG. 12 is an enlarged partial elevational view illustrating the manner in which the wall sections are secured to the floor of the shelter.

Referring now to the drawings in detail, FIG. 1 illustrates a typical shelter constructed in accordance with the present invention which is generally referred to by the reference numeral **10**. The shelter is assembled from modular panel setions mounted on a floor assembly **12**. In the illustrated embodiment, the shelter is formed by four vertical sides and a flat, sloping roof. The roof is formed by three interconnected roof sections consisting of two end roof sections **14** of identical construction and an intermediate roof section **16** similar in construction and of the same size as the end roof sections **14**. The roof sections **14** and **16** constitute the largest in both dimension and weight of the prefabricated components of the shelter. The vertically larger side of the shelter is formed from three side wall panel sections **18** of identical construction. The opposite vertically lower side of the shelter is also formed of three side wall sections identical in construction to the side wall sections **18** except as to vertical height. The side walls formed by the sections **18** and the vertically lower side wall sections are interconnected by end wall panel sections **20** and **22**. As shown in FIG. 1, the wall sections may be provided with suitable windows **24** such as utilized in trailers while one of the end wall sections **20** may be provided with a Dutch door consisting of the door panel sections **26** and **28** hinged by hinges **30** to the wall section and adapted to be locked in closed positions by the latch lock hasps **32**.

Referring now to FIG. 7, it will be observed that the floor assembly which is made of suitable flooring panels **34** secured to floor joists **36** interconnected by the sills **38**, is adapted to support along the edge portions thereof, the wall panel sections **18**, **20** and **22**. Each of the side wall panel sections **18** is formed from a rectangular sheet of material such as a ¼" plywood panel **40** to which a plurality of vertical studs or posts **42** are secured along the vertical edges **44** of the panel **40** and intermediate those edges. The upper ends of the studs **42** are spaced from the upper edge **46** of the panel **40** and are tied together by a top plate or frame member **48**. Secured to the panel **40** above the top plate along the upper edge **46**, is a reinforcing strip **50**. A baseboard strip **52** is also secured to the panel **40** abutting the lower ends of the studs **42** and projecting below the lower edge of the panel **40**. The studs **42**, reinforcing strip **50** and baseboard **52** may be nailed and glued to the panel **40** in order to form a rigid wall panel section. The wall panel section when properly positioned and mounted along an edge portion of the floor assembly **12**, is secured to the floor assembly by means of a pivoted strap iron latch element **54**. As more clearly seen in FIG. 12, the latch element **54** is pivotally mounted on the baseboard **52** by a lag screw **56** and is provided with a slot **58** adapted to

receive the lag screw **60** secured to one of the edge joists **36** associated with the floor assembly.

The end wall sections such as the wall section **20** shown in FIG. 7, is similar in construction to the side wall sections **18**. Accordingly, the wall section **20** includes a plywood panel **62** to which a plurality of studs **64** are secured interconnected at the upper ends by a top plate **66** and abutting at the lower ends, a baseboard **68**. Also, a reinforcing strip **70** is secured to the panel **62** above the top plate **66**. However, no stud is secured to the panel **62** along the vertical corner edge **72** of the end panel section so that the panel **62** may be bolted or otherwise fastened to the stud **42** associated with the panel section **18**. It will also be appreciated, that the upper edge **74** of the panel section **20** slopes downwardly from the vertical corner edge **72** in view of the downward slope of the roof from the vertically higher side wall of the shelter formed by the panel sections **18** to the vertically lower side wall.

The roof sections such as illustrated in FIG. 7, include a flat roof panel **76** to which a plurality of parallel spaced rafters **78** are secured. Also secured to at least two edges of each of the roof panels **76**, are end strips **80** which are spaced from the ends **82** of the rafters so as to provide a space within the roof section for receiving the upper portion of the wall section above the top plates. The end roof sections **14** are also provided with edge strips **84** along the longitudinal edge of the roof panels **76** spaced from the adjacent rafters **78** so as to form spaces receiving the upper portions of the end wall sections **20** and **22** above the top plate **66** for example as shown in FIG. 7. When the roof sections are assembled on the wall sections, they are joined by sealing joints **86** as will be hereafter explained in detail. It will however be now apparent that each of the roof sections forms a rigid assembly when the rafters **78** and edge strips **80** and **84** are nailed and glued to the roof panel **76**.

Referring now to FIGS. 2 and 3, it will be observed that the vertical studs of adjacent wall sections that form the sides of the shelter, such as the wall sections **20** and **22**, abut each other and are tied together by a plurality of connectors **88**. The same type of connector **88** may be utilized to secure the wall sections at the corners as for example between the stud **42** of the wall section **18** and the panel **62** of the wall section **20** as shown in FIGS. 2 and 3. Further, the corners of the shelter may be reinforced by corner strips **92** secured to the outside of the panels **62** associated with the wall sections **20** and **22** by the connectors **88** extending through the studs **42** to which panels **40** are nailed by nails **94**. The roof sections on the other hand are secured to the wall sections along the edge strips. Further, the roof sections are secured to the side wall sections by coupling assemblies including pairs of triangular braces **96** where adjacent wall sections and roof sections meet and fasteners **104** and **105** respectively securing the braces to the rafters **78** and the posts **42** aligned therewith.

Referring now to FIGS. 4 and 5, it will be observed that the edge strips **80** of the roof sections are secured to the wall sections by eyebolts **98** that extend from the edge strips through the wall panels **40** and reinforcing strips **50** for example. Thus, the eyebolts **98** not only tie the roof sections to the wall sections but also form a connection to an anchoring cable **100** that may be used to tie the shelter down to the ground. The eyebolts **98** may interconnect the wall and roof sections adjacent the corners of the shelter horizontally spaced from the triangular braces **96** which straddle the abutting studs **42** for example of the wall sections as shown in FIGS. 4 and 5 to which the braces are connected by means of a connector **88** for example. The vertical legs of the braces **96** are provided with notches **102** receiving the top plates **48** of the wall sections while the upper horizontal legs of the braces are received between the rafters **78** of the adjacent roof sections **14** and **16**. The fastener bolt assembly **104** interconnects each pair of braces **96** with the

adjacent rafters. Thus, a rigid assembly of the wall and roof sections is provided.

The area between the roof sections is sealed by means of the sealing joints **86** aforementioned. Each sealing joint includes a pair of spaced sealing strips **106** secured to the adjacent roof sections as more clearly seen in FIG. 5. Bridging the sealing strips is a batten strip **108** which extends the length of the roof section. A clamping assembly **110** secures the sealing joint adjacent opposite ends thereof to the roof section. Each clamping assembly includes a bolt shank **112** having a head **114** and washer **116** engaging the top of the batten strip **108**, the bolt shank **112** extending downwardly between the rafters of the adjacent roof sections and the braces **96** through a spacer block **118** and a clamp plate **120**. The spacer block is disposed between the rafters while the clamp plate **120** bridges the rafters and engages the bottom edges thereof. The clamping assembly is completed by a washer **122** and clamping nut **124** which abut the clamping plate **120**.

As more clearly seen in FIG. 6, each of the connectors **88** aforementioned includes a pair of cooperating wedge elements **126** and **128** having oppositely directed slots through which a connector rod **130** extends, the rod having a head **132** and a washer **134** abutting one of the studs in spaced relation to the wedging element **126** through which the studs are clamped to each other. The rod **130** in order to limit axial movement of the wedge ment **128** and extends through a key slot **136** formed in a clamping plate **138**. The key slot **136** is adapted to axially lock the clamping plate to the groove **140** in the rod **130** in order to limit axial movement of the wedge elements relative to the members being clamped. The wedge elements which may be made of wood may, after being assembled on the rod **130** between the clamping plate **138** and the members to be clamped against the washer **134**, then be transversely displaced relative to each other and the rod **130** in order to tighten the connector.

Another form of connector is shown in FIGS. 8 through 11 which is similar in use to the connectors **88** previously described. The connector **142** as illustrated in FIGS. 8 through 11, includes a connector rod **144** provided with a plurality of axially spaced grooves **146** in order to accommodate the clamping of structural members of different widths. The structural members abut the head **148** welded to one end of the rod and engage one of the wedge elements **150** made of metal which is slotted to open in a direction opposite to the slot associated with the other coacting wedge element **152** from which the rod **144** projects. The wedge element **152** is also provided on the sides thereof with a dovetail recess **154** to slidably mount a clamping plate **156** having inturned sides **158**. A key slot **160** is formed in the clamping plate to engage one of the grooves **146** of the rod. Thus, the connector **142** may be utilized to secure abutting members to each other in the same manner as hereinbefore described in connection with the connectors **88**.

From the foregoing description, the construction of the modular panel sections that form the shelter as well as its assembly and disassembly will be apparent. It will be appreciated, that the panel sections may be constructed without reliance upon any costly or unusual manufacturing methods and will be lightweight and limited in size to facilitate storage and transport. Further, the panel sections may be assembled and interconnected without any long and extensive fasteners to form a rigid, leakproof shelter. The shelter may also be readily disassembled for erection at any other desired location.

What is claimed as new is as follows:

1. In a shelter construction having a plurality of vertical sides supporting at least two roof sections and each vertical side being made of at least two wall sections, each of said roof sections including a roof panel and a plurality of rafters secured to the roof panel in spaced

relation to each other having ends beyond which the roof panel extends, said wall sections supporting the roof panel at said ends of the rafters, a pair of corner braces connected to adjacent wall sections between rafters of adjacent roof sections, means securing the braces to said rafters of the adjacent roof sections, a sealing joint overlapping the roof panels of said adjacent roof sections and clamping means extending from the sealing joint between said rafters of the adjacent roof sections for holding the sealing joint clamped to the rafters and the roof panels of the adjacent roof sections, each of said wall sections including a wall panel, a plurality of vertical studs secured to the wall panel, a top plate interconnecting the studs in spaced relation to an upper edge of the wall panel, said wall panel adjacent the upper edge being secured to the edge strips of the roof section in which the wall section is received, the corner braces being provided with notches receiving the top plates and being secured to abutting studs of adjacent wall sections, and a plurality of connectors securing the abutting studs to each other.

2. The combination of claim **1** wherein each of said connectors includes a pair of contacting wedge elements, a connecting shank extending through said abutting studs and the wedge elements having a head portion engaging one of the wedge elements and a groove portion projecting from the other of the wedge elements, and a clamping plate having a key slot through which the groove portion extends.

3. The combination of claim **2** wherein said sealing joint includes a pair of spaced sealing strips secured to the roof panels of the adjacent roof sections, and a batten strip bridging the sealing strips, said clamp means extending from the batten strip between the sealing strips.

4. The combination of claim **3** wherein said clamping means includes a fastener bolt having a head engaging the batten strip, a spacer block disposed between the rafters of the adjacent roof sections through which the fastener bolt extends, and a clamp plate bridging the rafters below the spacer block through which the fastener bolt extends.

5. In a shelter construction having a plurality of vertical sides supporting at least two roof sections and each vertical side being made of at least two wall sections, each of said roof sections including a roof panel and a plurality of rafters secured to the roof panel in spaced relation to each other having ends beyond which the roof panel extends, said wall sections supporting the roof panel at said ends of the rafters, a pair of corner braces connected to adjacent wall sections between rafters of adjacent roof sections, means securing the braces to said rafters of the adjacent roof sections, a sealing joint overlapping the roof panels of said adjacent roof sections and clamping means extending from the sealing joint between said rafters of the adjacent roof sections for holding the sealing joint clamped to the rafters and the roof panels of the adjacent roof sections, said clamping means including a fastener bolt having a head engaging the sealing joint, a spacer block disposed between the rafters of the adjacent roof sections through which the fastener bolt extends, and a clamp plate bridging the rafters below the spacer block through which the fastener bolt extends.

References Cited

UNITED STATES PATENTS

1,931,750	10/1933	Blaske	52—90 X
2,706,538	4/1955	Schumann	52—90 X
3,013,642	12/1961	Hammitt et al.	52—572 X
3,418,772	12/1968	Helgesen	52—463 X
1,387,226	8/1921	Aird et al.	85—8.6
1,552,200	9/1925	Benish	85—8.6
2,653,356	9/1953	Brannon	52—262 X
2,793,401	5/1957	Paschke	52—285 X
2,927,665	3/1960	Hauf	52—262
3,376,676	4/1968	Tatevossian	52—463
1,372,206	3/1921	Stadelman	52—92

HENRY C. SUTHERLAND, Primary Examiner

S. D. BURKE III, Assistant Examiner

U.S. Cl. X.R.

52—262, 270, 285, 463, 467