Oct. 27, 1970 W. B. NICHOLS 3,535,834

PREFABRICATED BUILDING

Original Filed April 18, 1967 3 Sheets-Sheet 1

Fig. 1.

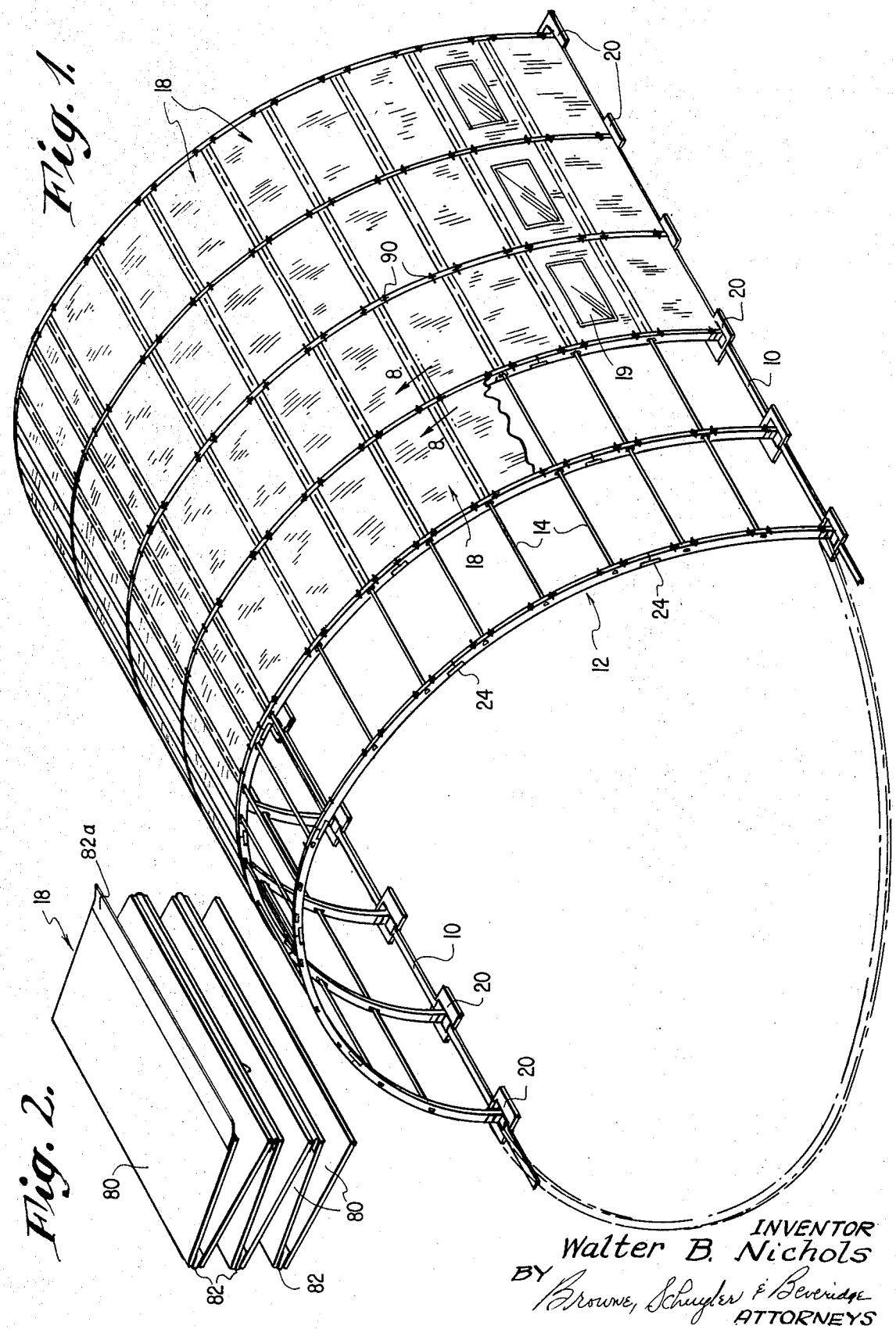


Fig. 2.

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PREFABRICATED BUILDING

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Fig. 3.

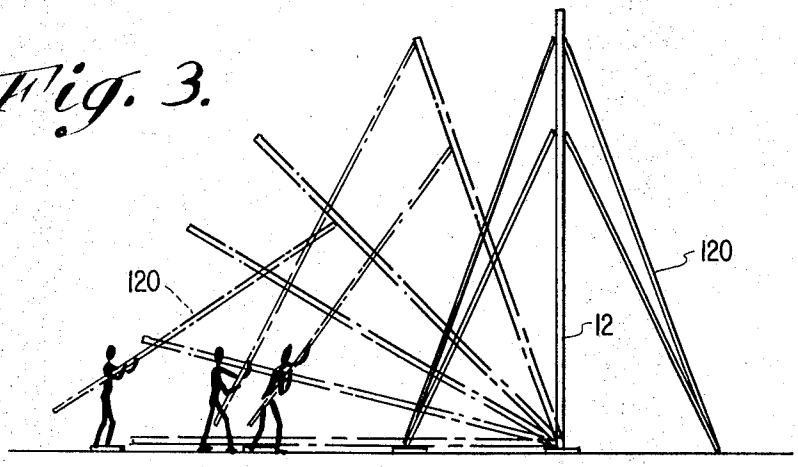


Fig. 4.

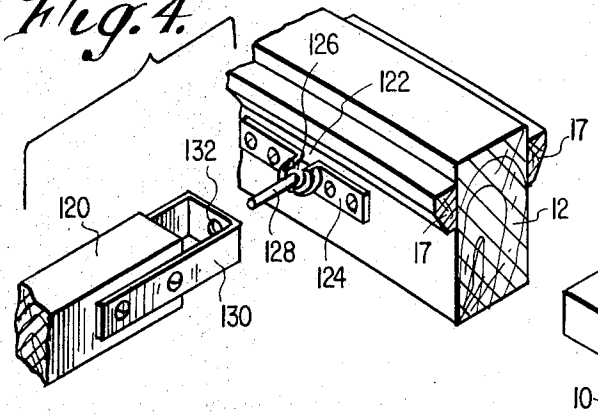


Fig. 5.

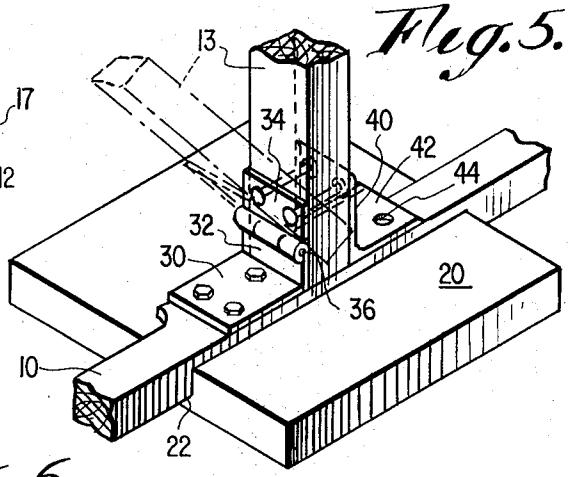
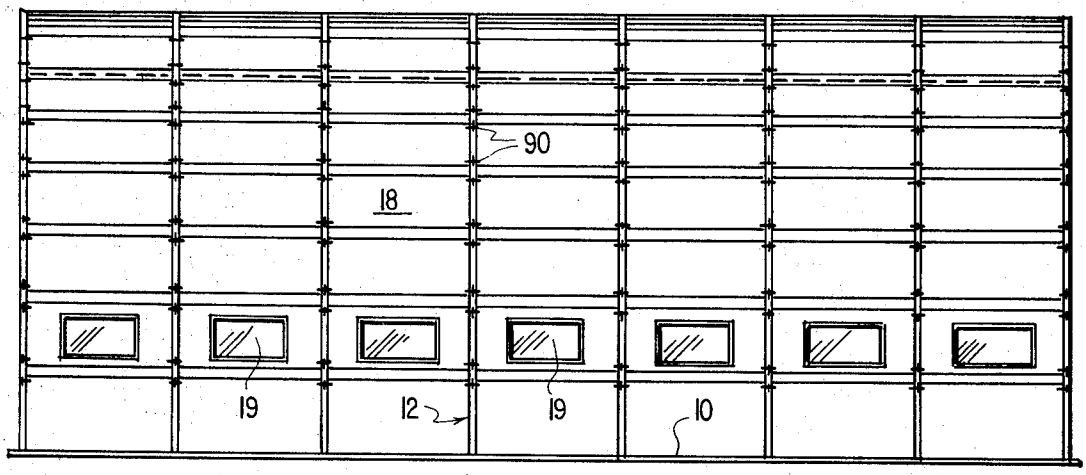


Fig. 6.



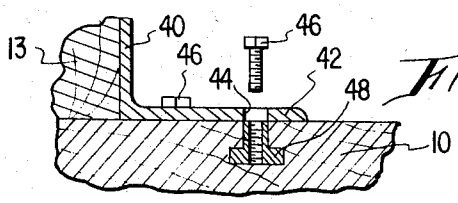


Fig. 5a.

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PREFABRICATED BUILDING

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Fig. 8.

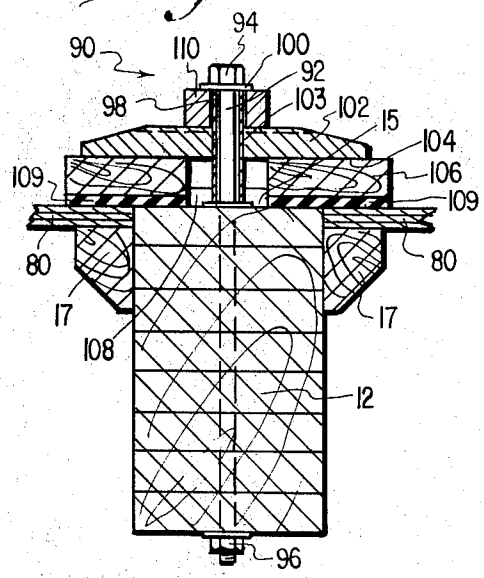


Fig. 7.

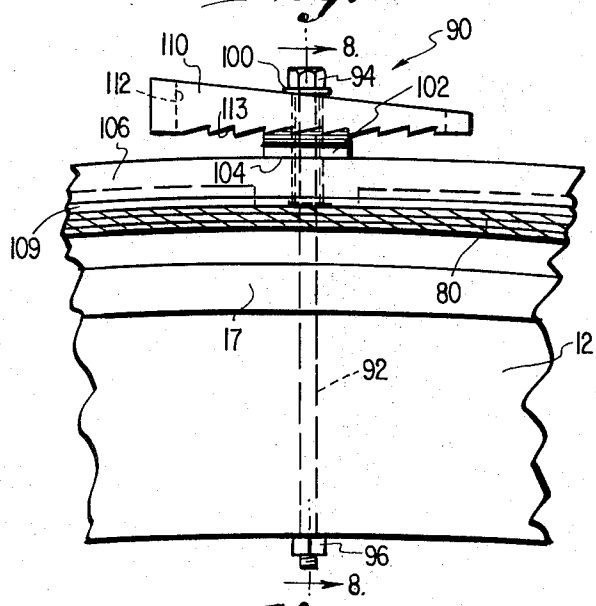


Fig. 9.

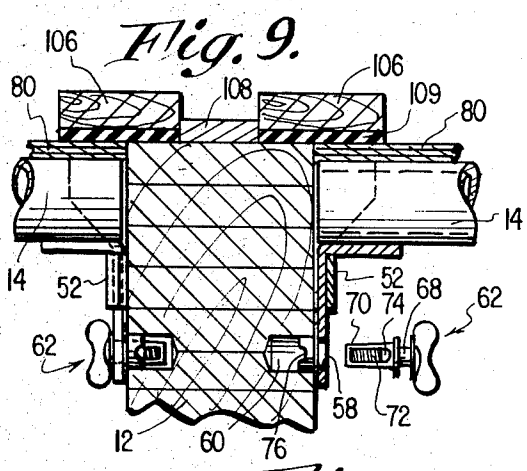


Fig. 10.

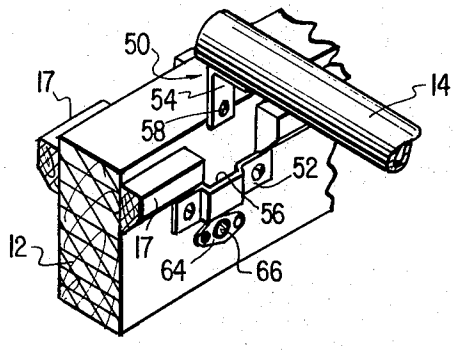


Fig. 11.

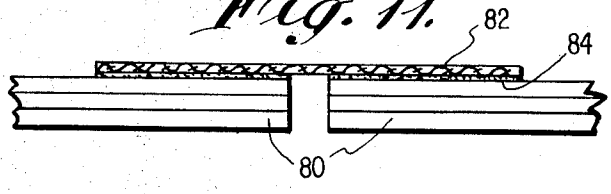


Fig. 12.

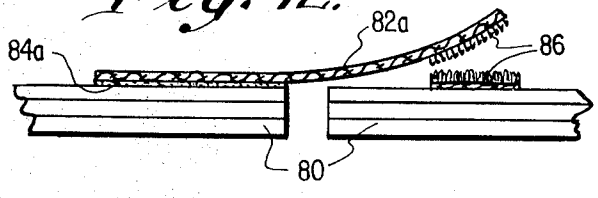
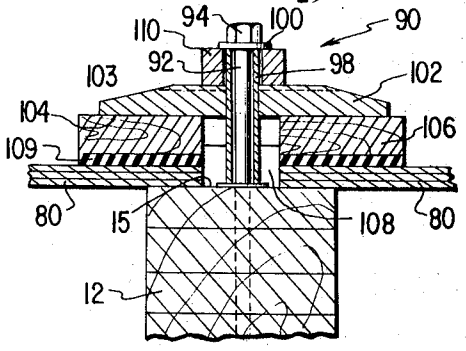


Fig. 13.



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United States Patent Office 3,535,834 Patented Oct. 27, 1970

3,535,834

PREFABRICATED BUILDING

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Continuation of application Ser. No. 631,799, Apr. 18, 1967. This application Aug. 19, 1969, Ser. No. 866,408
Int. Cl. E04b 1/32, 1/344; E04c 1/24
U.S. Cl. 52—69 12 Claims

ABSTRACT OF THE DISCLOSURE

A prefabricated building including a pair of elongated base sills extending along the opposite sides of the building with a plurality of base plates underlying the sills at spaced intervals. Superstructure ribs span the sills at the locations of the base plates and are pivotally connected to the sills for movement between a horizontal position prior to erection and a vertical position projecting upright from the sills. Upon erection, the ribs are secured at their base to the sills by releaseable fasteners. Secured between the ribs longitudinally of the building are a plurality of purlins which also form, in effect, a ladder structure facilitating assembly. The purlins are releaseably secured to the ribs by male and female brackets located respectively on the purlins and the ribs. Roofing and side facing are provided by a plurality of foldable panel units which in their unfolded coplanar positions are placed over the purlins with their opposite ends engaged on the ribs. In each panel unit, the individual panels are flexibly interconnected by continuous strips of flexible material which also form a weatherproof seal between the individual panels. Adjacent panel units are interconnected by similar strips having releaseable fasteners such as hook piles providing interlocking and sealing engagement between the adjacent panel units. To secure the panel units on the ribs and purlins, a plurality of releaseable clamping assemblies are provided on the upper rib faces at intervals throughout the ribs. The clamping assemblies include elongated pressure bars extending over the ribs into engagement with the end portions of the panels, pressure blocks extending transversely into engagement with the pressure bars, and wedges for forcing the pressure blocks against the bars to clamp the panels in position on the ribs. The pressure blocks and wedges are permanently attached to the ribs by studs projecting from the ribs and receiving the wedges and pressure blocks. The clamping assemblies also serve to form a continuous weatherproof seal between the ends of the panels and the ribs. This seal is enhanced by continuous resilient sealing strips interposed between the pressure bars and upper ends of the panels. All parts of the building may be prefabricated and the building may be entirely disassembled, removed to another site and then reassembled without requiring additional parts or replacements.

This is a continuation of application Ser. No. 631,799, filed Apr. 18, 1967, and now abandoned.

SUMMARY OF INVENTION AND OBJECTS

The present invention relates to a unique prefabricated building and method for erecting the same. Although particularly suitable in commercial construction such as hangars, warehouses, or manufacturing plants, the present invention is also applicable in other types of construction.

One of the principal objects of the present invention is to provide a new and improved prefabricated building which may be quickly and easily erected for use and subsequently disassembled for storage or transportation to another site. Included herein is such a prefabricated building which may be erected or disassembled with a minimum of workmen using standard tools and without any special skills.

A further object of the present invention is to provide a new prefabricated building having a modular construction making it highly versatile in dimension as well as design while also having the characteristics of strength and lightness.

A still further object is the provision of such a prefabricated building which requires no excavation or subsurface foundation and also does not require a level construction site.

A still further object of the present invention is to provide a prefabricated building possessing the above characteristics and yet is economical in fabrication, transportation and storage.

Other objects and advantages of the present invention will become apparent from the following more detailed description in conjunction with the attached drawings in which:

FIG. 1 is a perspective view of a building constructed in accordance with the present invention and shown with certain portions removed and others in phantom for purposes of illustration;

FIG. 2 is a perspective view of a panel unit employed in the building illustrated in FIG. 1;

FIG. 3 is a schematic view illustrating partly in phantom, sequential steps in erecting rib framework included in the building;

FIG. 4 is a fragmental perspective view of a rib included in the building and a tool which may be employed in erecting the rib;

FIG. 5 is a fragmental perspective view, with portions in phantom, illustrating attachment of a rib to a sill at the base of the building;

FIG. 5*a* is a fragmental detail view illustrating assembly of fasteners for securing a rib to a sill;

FIG. 6 is a side elevational view of the building as completed;

FIG. 7 is an enlarged, fragmental view of a rib as viewed longitudinally of the building;

FIG. 8 is a cross-sectional view taken generally along lines 8—8 of FIG. 7;

FIG. 9 is a cross-sectional view taken generally along lines 9—9 of FIG. 1;

FIG. 10 is a fragmental, perspective view illustrating assembly of a purlin to a rib as included in the building;

FIG. 11 is a fragmental, transverse, cross-sectional view of two adjacent panels included in the panel unit of FIG. 2 illustrating the connection therebetween when in unfolded coplanar position;

FIG. 12 is a view similar to FIG. 11 except it is taken with respect to adjacent end panels of two successive panel units;

FIG. 13 is a view similar to FIG. 8 but illustrating a modified and preferred rib construction.

Referring now to the drawings in detail, FIG. 1 illustrates one form of a building embodying the present invention and having a semi-cylindrical construction the major components of which include a pair of base sills **10** extending along the base on the opposite sides of the building; a plurality of arched ribs **12** spanning the sills and defining the superstructure framework; a plurality of secondary supporting members or purlins **14** extending between the ribs; and a plurality of panel units **18** attached to the ribs, to form the cover of the building.

Base sills **10** may be made from any suitable material such as wood having for example a 6" x 2½" (inches) cross-section and a length sufficient to extend between the opposite ends of the building as shown in FIG. 1. For stability and load distribution, a plurality of base plates **20** are provided below sills **10** at the rib locations. In the

shown embodiment as illustrated in FIG. 5 each base plate **20** has a U-shaped passage **22** in its upper face receiving the sills. Any suitable material such as wood dimensioned 24" x 24" x 3½" (inches) may be employed for the base plate. Although other modular dimensions may be employed, in one embodiment, the distance between ribs **12** or the centers of base plates **20**, may be for example about 8' (feet). Additionally in one standard size the sills **10** may be 64' (feet) long corresponding to the length of the building, with a lateral spacing of approximately 50' (feet) corresponding to the building width.

Ribs **12** may also be constructed from wood, for example laminated Douglas Fir (2500 p.s.i.) having a cross-section 3½" x 6" (inches). Each rib **12** may be formed of sections 12½' (feet) in length spliced together for example by the plates **24** so as to span the sills with a clear height at its crown of approximately 24' (feet).

For purposes of erection and disassembly, ribs **12** are pivotally connected to sills **10** for swinging movement between a generally horizontal position extending generally parallel to the plane of the sills such as illustrated in the lowermost position shown in FIG. 3, and a vertical erected position projecting upwardly from the sills as shown in FIG. 1. In the specific embodiment shown, this connection of the ribs to the sills is achieved by hinge anchor members each having a first leaf **30** fixed to the sill with an arm portion **32** projecting upwardly at right angles from the sill and engaged against the leg **13** of the associated rib as shown in FIG. 5.

Leaf arm **32** has formed at its upper extremity a portion of the hinge barrel which extends horizontally transversely of the sill at a point spaced above the sill as clearly shown in FIG. 5. The other leaf of the hinge designated **34** is attached to rib leg **13** and has formed therein the remaining portion of the hinge barrel. A conventional hinge pin **36** is received in the hinge barrel to complete the hinge assembly. It will thus be seen that in moving between the horizontal and vertical positions, the ribs will pivot about the hinge pins **36** which are spaced upwardly from the sills to provide sufficient room for the ribs.

After erection into the vertical position, ribs **12** are secured to sills **10** by shoes shown as right angle members each having a first arm **40** bolted to the associated rib leg **13** in a position opposite hinge portions **32**, **34** and a second arm **42** normally projecting from the rib leg, see FIG. 5. Shoe arm **42** is secured to the sill by threaded fasteners such as bolts or screws **46** inserted through apertures **44** in the shoe arm and into nuts **48** fixed in the sill. To facilitate placement and securement of fasteners **46**, nuts **48** are of the T type and embedded in the sill so that fasteners **46** may be secured in the nuts from above the shoes.

In erecting ribs **12**, the endmost rib is first erected and secured through hinges **30**, **32**, **34** and shoes **40**, **42** as described above after which the remaining ribs are erected and secured in successive order. After the first two ribs are erected, assembly of purlins **14** between the ribs may be commenced, that is, during the erection of the remaining ribs.

In the shown embodiment, purlins **14** have a tubular construction formed from any suitable material, preferably aluminum water tubes 1⅝" (inches) O.D. and approximately 8' (feet) in length. The opposite ends of purlins **14** are fixed to adjacent ribs at two foot centers along the ribs by any suitable means which preferably include right angle male brackets **50** fixed to the opposite ends of the purlins and cooperable female brackets **52** fixed to the opposite sides or the ribs at 2' (feet) centers. Brackets **50** each have depending arms **54** which are passed through the channel passage **56** in the cooperable female brackets **52** to align apertures **58** in the male brackets with passages **60** extending transversely in the side faces of the ribs.

To lock male brackets **50** in female brackets **42** conventional releasable fasteners **62** known as a "Simmons" fastener may be employed. These fasteners **62** each include an anchor plate **64** fixed to the side face of the rib and having an aperture **66** overlying passage **60** in the rib, and a male member composed of inner and outer telescoping parts **68**, **70** biased apart by a spring **72** located in the outer part **72**. Male member **68**, **70** is placed through anchor plate aperture **66** into passage **60** in the rib and the inner male part **68** is depressed against spring **72** and rotated to snap lugs **74** on the inner male part **68** in corresponding notches **76** formed in the anchor plates as shown in FIG. 9. Inasmuch as "Simmons" fasteners are of conventional construction further description in this regard is not believed to be necessary. Moreover it will be understood that other releasable fasteners may be employed instead of that shown in the drawings.

After purlins **14** are secured between ribs **12**, panel units **18** may then be assembled. In the specific embodiment illustrated and with reference to FIGS. 2, 11 and 12, each panel unit comprises six rectangular panels **80** made from any suitable material for example ⅜" (inch) plywood which has been spray-coated with an epoxy substance to make it water and weather resistant and also to increase its durability and strength. Panels **80** are flexibly interconnected along their sides by continuous elongated strips **82** of flexible material such as cross-woven nylon with a vinyl coating marketed under the trademark Herculite. Adjacent panels **80** in each unit are interspaced a predetermined distance and the flexible strip **82** extends through the length of the panels while being bonded thereto by any suitable means such as an adhesive designated **84**. Flexible strips **82** act as a hinge to permit the panels to be folded in overlying relationship as shown in FIG. 2 for purposes of storage and transportation. Additionally flexible strips **82** because of their material, also provide continuous weatherproof seals between the panels.

In order to connect adjacent panel units **18** together to maintain continuity particularly with regard to sealing, the end panels (see FIG. 12) are provided with a releaseable fastener preferably a strip **86** of hook pile fabric or other material such as marketed under the trademark Velcro. In each panel unit **18** one end panel is provided with a flexible strip **82***a* along its outer side so as to extend outwardly beyond that side for purposes of overlapping the end panel of the adjacent panel unit as shown in FIG. 12. Flexible strip **82***a* has a hook pile strip **86** attached along its underside so as to be engageable with a corresponding hook pile **86** continuously placed on the adjacent end panel. Hook pile strips **86** may be secured to the panels, by any suitable means, such as an adhesive. In engaging the hook pile strips **86**, finger pressure is merely required. Once engaged, a continuous seal will be maintained between adjacent panel units. Upon disassembly of the building, hook pile strips **86** may be separated by slight manual effort.

In the embodiment shown in FIG. 8, panels **80** are placed on molding strips **17** fixed to the opposite side faces of the ribs below the upper faces **15** of the ribs. The spacing of molding strips **17** below the rib face **15** is equal to the thickness of the panels **80** so that the top surfaces of the latter are flush or continuous with the top face **15** of the rib. Additionally the ends of panels **80** are placed in abutting engagement against the side faces of the rib to form a closed joint.

To secure and lock panel units **18** in place on the ribs and purlins, a plurality of releaseable clamping assemblies **90** are provided on the upper faces **15** of the ribs at suitable intervals as may be required throughout the ribs. In the preferred embodiment, clamping assemblies **90** are of the wedge type each including a stud provided by a threaded bolt **92** fixed in the rib and projecting perpendicularly from upper face **15** thereof a suitable distance for purposes of accommodating a wedge as will be described. The head **94** of bolt **92** forms a stop for the pressure applying elements to be described, while the

bottom end of the bolt is locked by a nut and washer assembly **96** engaged against the bottom face of the rib. A spacer tube **98** is placed about bolt **92** and extends between rib face **15** and a washer **100** abutting bolt head **94** so that a predetermined distance between bolt head **94** and rib face **15** may easily be produced during fabrication.

Slidably and rotatably received about spacer tube **98** is a pressure block **102**; the latter having a central aperture **103** through which spacer tube **98** passes. Pressure block **102** has a flat bottom face **104** adapted to transversely engage a pair of elongated, continuous pressure bars **106** which extend over the opposite sides of rib face **15** into engagement with the ends of panels **80** throughout the full length of the rib. Pressure bars **106** partially overly rib face **15**, and to insure proper positioning of pressure bars **106**, elongated spacer strips **108** are fixed along the longitudinal center line of rib face **15** to be engaged by the inner side edges of pressure bars **106** as shown in FIG. 9. Spacer strips **108** are intermittently placed along rib face **15** between bolts **92**.

For sealing purposes, a pair of elongated continuous strips **109** of neoprene or other rubber-like resilient sealing material, are interposed respectively between the bottom faces of pressure bars **106** and the ends of panels **80** with portions of the sealing strips **109** also contacting rib face **15** as shown in FIG. 8. During shop fabrication of pressure bars **106**, sealing strips **109** may be bonded thereto by a suitable adhesive. Additionally during assembly at the construction site, sealing strips **109** may, if desired, also be bonded to the upper surfaces of the ends of panels **80** and/or upper face **15** of the rib.

Completing the clamping assembly is a wedge **110** having an elongated slot **112** receiving spacer tube **98** above pressure block **102** so that the wedge is mounted for slidable and rotatable movement relative to the spacer tube as well as the pressure block. In securing panels **80**, wedge **110** is oriented transversely of the pressure block and longitudinally over the upper rib face **15** as shown in FIG. 7 and then the wedge is hammered to apply pressure on pressure block **102** which in turn forces pressure bars **106** downwardly into firm engagement against panels **80**. To releaseably retain wedge **110** in its advanced, pressure applying, position, its underside is formed with corrugations or ratchet teeth **113** which are engageable with the edges of the underlying pressure block. As shown in FIG. 7, the edges in the pressure block **102** are teeth formed in the top of the latter with a shape and dimensions complementary to teeth **113** of wedge **110**.

Preferably the wedges and pressure blocks are made from aluminum, and in one exemplary construction, pressure bars **106** may have a cross-section of 1¾" by 3½" (inches) and the locating strips, 1½" by ½" (inches). It is preferred that locating strips **108** and the clamping assemblies **90** be incorporated on the ribs during fabrication in the shop so that during assembly of the building in the field, it is only necessary to apply the pressure bars **106**, orient the wedges and pressure blocks and then merely hammer the wedges into the final locking position. No adjustment of the bolts **92** in the field is required since, spacer tubes **98** insure uniform wedging action of the wedges and consequently uniform clamping pressures applied to the panels **80**. Spacer tubes **98** moreover act as a bearing between the bolt **92** and the wedge and pressure block.

FIG. 13 illustrates a preferred modification of the rib construction shown in FIG. 8 wherein molding strips **17** are omitted and panels **80** placed directly on upper face **15** of the rib. In this modification locating strips **108** also serve to properly position panels **80** on rib face **15**. The other parts of the joint in the modification of FIG. 13 are the same as that in FIG. 8. It will be apparent that the joint shown in either FIG. 8 or FIG. 13 as employed together with flexible strips **82** between the panels, render the building entirely weatherproof.

After panel units **18** have been attached throughout the rib and purlin framework, opposite end walls (not shown) with doors or windows may be attached to the structure by any conventional method assuming that the use of the building requires such. It will also be understood that panel units **18** may have incorporated therein, windows **19** as shown in FIG. 1.

To summarize assembly of the building in accordance with the present invention, sills **10** are laid on the ground site in proper spaced relationship and with the underlying base plates **20** at the proper intervals corresponding to the spacing of ribs **12**. The end rib is then hinged to the sills by inserting the hinge pins **36** in their barrels. From the horizontal position lying on the ground surface, the end rib is then raised to the upright position by pivoting at its hinges. Fasteners **46** are then placed through rib shoes **42** and engaged in the underlying nuts **48** to secure the rib in the vertical position. Depending on the size and span of the rib, it may be desirable to provide a temporary external support for the end rib when first erected. However, when the purlins are attached, the external support will not be required in view of the support and rigidity offered by the purlins.

In raising the ribs into the erected position, elongated poles **120** may be used as illustrated in FIG. 1. Although not necessary, ribs **12** may be provided with one or more recesses **122** each formed by bracket members **124** (see FIG. 4) for receiving a ball **126** attached on the end of a pin **129**. Pole **120** may then be provided at its end with a socket illustrated as a U-shaped bracket **130**, having an aperture **132** for receiving pin **128**. In this manner, poles **120** may be releasably attached to ribs **12** for purposes of erection and thereafter easily removed. However, instead of the bracket and pin assembly shown in FIG. 4, the pole may be provided with nails or spikes (not shown) projecting from their ends which may be engaged in the ribs for purposes of erecting the ribs. Additionally any other suitable means may be employed for raising the ribs into the vertical position.

After the end rib is erected, the next adjacent rib is swung into vertical position and secured, and at this stage placement of purlins **14** between the two erected ribs may be commenced, that is, while erection of the remaining ribs continues. Assembly of the purlins is easily effected merely by insertion of their brackets **54** through female brackets **52** on the sides of the ribs. This aligns bracket apertures **58** with apertures **66** and rib passages **60** after which "Simmons" fasteners **62** are merely inserted through the latter, and rotated into locking position. In assembling purlins **14**, the lowermost purlin is first installed and then the next higher purlin and so on so that a ladder structure is formed to facilitate assembly without requiring scaffolding. It will also be recognized that the installation of the purlins provides added support to the ribs so that during construction, virtually no external support is required.

After a sufficient number of purlins have been installed, assembly of panel units **18** may be commenced. In applying the panels, they are unfolded from the storage position generally shown in FIG. 2 and then placed on the purlins with the opposite ends of the panels engaged against the rib faces **15** as in the preferred modification shown in FIG. 13. This step is facilitated by spacer strips **108** which properly locate the panels. Pressure bars **106** with their underlying seal strips **109** are then applied over the ends of the panels and then pressure blocks **102** are oriented transversely of the ribs to engage the upper surface of pressure bars **106**. Oriented transverse to pressure blocks **102** as shown in FIG. 7, wedges **110** are then hammered to downwardly wedge the pressure blocks which in turn force pressure bars **106** firmly against the panels to secure them in place. The next adjacent panel unit **18** may then be installed in the same manner, and to

connect the end panels of adjacent panel units the hook piles **86** are interengaged by finger pressure applied along strips **82***a* (see FIG. 12).

To disassemble the building for storage or transportation to another site, the above steps are essentially reversed. The disassembled parts may be stored in a highly compact manner without crating and transported by truck, train, ship or plane. The same parts may again be assembled to construct the building without requiring new parts or replacements or any procedural departure from the method of assembly described above. Not only is the building easily and rapidly constructed with minimum personnel requiring only standard tools, but also it possesses sufficient strength in combination with a relatively light weight. In one embodiment such as that described above, the building will support a 40 pound per square foot roof load and exhibit vibration-free characteristics when subjected to a 100 mile per hour wind. Additionally in this embodiment the knock down volume of the building is approximately 1043 cubic feet with a total weight of 14,000 pounds which provide a 3,000 square foot building.

Although the building shown and described herein has a semi-cylindrical configuration, it will be appreciated that the present invention may be applied to construct buildings having a rectangular frame or A-frame construction as well as others.

I claim:

1. An assembly for use in fabricating a shelter or building and the like, the assembly comprising in combination, a pair of elongated base sills extending generally in the same direction but in laterally spaced relationship, a plurality of ribs positioned transversely relative to the sills at longitudinally spaced locations along the sills, said ribs each including opposite legs and intermediate portions extending between the legs above the sills, hinge means swingably connecting the legs to the sills for moving the ribs between horizontal positions prior to erection and vertical erected positions projecting upwardly from the sills to provide a framework, said hinge means each including a leaf fixed to the sill and projecting upwardly from the sill, a second leaf fixed to a leg, and a hinge pin received in the leafs and extending transversely above the underlying sill, and means releasably securing the legs to the sills in the vertical erected positions of the legs, each of said last recited means including a shoe fixed to the leg and having a portion projecting outwardly from the leg with an aperture in said portion, a bolt extending through said aperture, and a locknut receiving said bolt, one of said nut and bolt being fixed in position relative to one of the shoe and sill such that the other of said nut and bolt is the only element movable in securing or releasing said shoe relative to the sill.

2. The assembly defined in claim **1** wherein said nut is fixed to the sill against movement and the bolt is receivable through the aperture in said shoe and then into said nut.

3. An assembly for use in fabricating a shelter or building and the like, the assembly comprising in combination; a pair of elongated base sills extending generally in the same direction but in laterally spaced relationship, a plurality of ribs positioned transversely relative to the sills at longitudinally spaced locations along the sills, said ribs each including opposite legs and intermediate portions extending between the legs above the sills, hinge means swingably connecting the legs to the sills for movement between horizontal positions prior to erection and vertical erected positions projecting upwardly from the sills to provide a framework, means releasably securing said legs to the sills in the upright positions, a plurality of preformed base plates respectively positioned at longitudinally spaced locations under the sills where the legs are hinged to the sills, said sills being supported on a ground surface free of any other underlying foundation except said base plates, and a plurality of purlins extending between and secured to said ribs to provide an open self-supporting framework.

4. A shelter which may be erected for use and subsequently collapsed for storage or transportation to another location, the shelter comprising in combination; a plurality of pairs of anchor members situated at the base of the shelter with the anchor members of each pair spaced from each other in one direction and with the pairs of anchor members being spaced from each other along a second direction which extends generally at right angles to said first direction, a plurality of ribs spanning the said pairs of anchor members respectively in said first direction, said ribs having intermediate portions located above and between the anchor members and opposite leg portions projecting upwardly from the anchor members, hinge means swingably connecting the rib legs to the anchor members for movement between an erected upright position projecting upwardly from the anchor members and a lowered collapsed position extending generally in horizontal planes, a plurality of elongated purlins extending between adjacent ribs in said second direction at spaced locations along the ribs, means releasably fastening the opposite ends of said purlins to the ribs at said longitudinally spaced rib locations, a plurality of panel units supported on said purlins with the opposite ends of each panel unit supported on the upper faces of the ribs, a plurality of releasable securing means including a plurality of wedge members permanently mounted on the upper faces of said ribs at longitudinally spaced intervals along said ribs for releasably securing said panel units at their opposite ends on said ribs, said wedge members being individually operable externally of the panels to secure or release the panels without removing the wedge members from the ribs.

5. The shelter defined in claim **4** wherein said releasable securing means each further includes a stud secured to a rib and projecting upwardly from the upper face of the ribs, a stop on said stud spaced above the rib face, a wedge member having a continuous, elongated slot being received on said stud between the rib and the stop with the stud passing through said slot such that the wedge member is rotatable about said stud as well as rectilinearly movable along the stud or at right angles to the stud.

6. The shelter defined in claim **5** further including a pair of elongated pressure bars extending over the top face of each rib into engagement with the ends of the panel units, and wherein said releasable securing means further includes a pressure block having an aperture receiving the stud below the associated wedge member, said pressure block being rotatable relative to said stud into a position extending transversely of the pressure bars and in engagement with the pressure bars with the associated wedge member extending transversely relative to and on said pressure block and wedging the pressure block into firm engagement with the pressure bars for securing the panel units on said ribs.

7. The shelter defined in claim **6** wherein said releasable securing means each further includes a tube positioned about said stud and extending between the upper face as said rib and said stop.

8. The shelter defined in claim **6** further including a pair of resilient elongated rubber-like sealing strips extending above the upper faces of each of the ribs between the ends of the panel units and the pressure bars.

9. The shelter defined in claim **6** wherein said wedge member and pressure block have mutually interengaging teeth for maintaining the wedging force applied to the panel unit by the wedge members.

10. The shelter defined in claim **4** further including a plurality of elongated spacer strips respectively fixed to the top surfaces of the ribs generally over the longitudinal center line of the ribs, the ends of said panel units being in abutting engagement with said spacer strips and

are thereby located in predetermined position on said ribs.

11. The shelter defined in claim **4** wherein said panel units each comprise a plurality of foldable panels and elongated flexible sealing and hinging strips flexibly interconnecting the adjacent sides of the panels, each panel unit having opposite end panels in the outermost position thereof, the end panels of adjacent panel units having a strip of mutually engaging block piles releasably securing and sealing the adjacent panel units together in position over the ribs.

12. The shelter defined in claim **4** further including a pair of sill members extending along opposite sides of the building in said second direction, and wherein said anchor members are hinge members secured on said sills at spaced intervals along said sills.

References Cited

UNITED STATES PATENTS

2,328,197	8/1943	Cowin	52—86
2,587,159	2/1952	Holmes	52—292 XR
3,173,224	3/1965	Aagaard	52—461 XR

FOREIGN PATENTS

471,236	1914	France.
941,466	1963	Great Britain.

PRICE C. FAW, JR., Primary Examiner

U.S. Cl. X.R.

52—86, 245, 292