ABSTRACT
An A-frame building is constructed of a floor, opposite end walls and a roof on each side which extends from the floor to the peak of the building. The steps include first, interconnecting the panels to form the floor and then erecting one end wall followed by alternately interconnecting part of oppositely disposed roof panels and then erecting the other end wall followed by assembling the remaining oppositely disposed roof panels. All joints between two or more abutting panels includes a removable rod interconnecting complementary joint half sections. Each half section is L-shaped with upstanding tongues on an inside face of one leg and the adjacent face of the other leg includes a channel. An outwardly facing edge of the other leg includes upstanding wall portions defining grooves. The half-joint sections when interconnected define a bore circular or square in cross section and the upstanding tongues are positioned in the grooves between the upstanding walls. A rod having a corresponding cross section to that of the bore is positioned in the bore to restrict movement between the joint half sections.

16 Claims, 19 Drawing Figures
BUILDING AND METHOD OF CONSTRUCTING SAME FROM INTERCONNECTED PANELS

There is a substantial demand for buildings which may be quickly assembled and knocked down if desired. These buildings may be used for vacation home purposes or as farm buildings, as an example.

The building of this invention is shown as being A-frame in shape, as an example, and includes a floor, opposite end walls and opposite roof half sections. Each of the main wall constructions is comprised of a plurality of interconnected panels. The connection between two or more panels involves a joint that is quickly closed or opened by use of an interlocking rod extending the length of the joint and having a cross section shape corresponding to a bore through the center of the joint. Each of the panels further are of a sandwich construction having sheet material with expanded foam insulation or the like therebetween. A T-shaped cover seal is positioned on opposite sides of each of the joints to prevent admittance of dirt and moisture. The A-frame building includes joints forming angles of 30°, 60°, 90° and 180°. When a wall interconnects the floor intermediate the end walls, a T-shaped joint is employed.

This invention consists in the construction, arrangements and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in the claims, and illustrated in the accompanying drawings in which:

FIG. 1 is a fragmentary perspective view of an A-frame building utilizing the panels and interconnecting joints of this invention.

FIG. 2 is a cross sectional view taken along line 1 — 1 in FIG. 1 and illustrating the joint interconnecting the floor to the lower ends of the half roof sections.

FIG. 3 is a cross sectional view taken along line 3 — 3 in FIG. 1 and illustrates the joint interconnecting abutting half roof sections along their longitudinal edges.

FIG. 4 is a fragmentary perspective view of the T-shaped sealing element provided on opposite sides of certain joints.

FIG. 5 is a cross sectional view taken along line 5 — 5 of FIG. 1 and illustrates the joint interconnecting the upper ends of half roof sections.

FIG. 6 is a cross sectional view taken along line 6 — 6 of FIG. 1 illustrating a joint interconnecting a wall to a floor.

FIG. 7 is a cross sectional view taken along line 7 — 7 in FIG. 1.

FIG. 8 is a cross sectional view of one-half of a 180° joint.

FIG. 9 is a cross sectional view of one-half of a 90° joint.

FIGS. 11 and 12 are cross sectional views of cooperating half joint sections in a 60° joint.

FIGS. 13 - 17 illustrate sequentially the method steps for assembling an A-frame building utilizing the panels and joints of this invention.

FIG. 18 is a cross sectional view of an assembled 180° joint with a cleaning element on the end of the locking rod for cleaning the interior of the bore formed by the cooperating channels in the half joint sections; and

FIG. 19 is a cross sectional view similar to FIG. 18 but showing a bore square in cross section in which a correspondingly shaped rod is received for locking the joint half sections together.

The A-frame building of this invention is referred to generally in FIG. 1 by the reference numeral 10 and includes opposite end walls 12 and 14, a floor 16 over which half-roof sections 18 extend. Floor 16 is made up of a plurality of one-piece panels 20 and the roof half sections 18 include interconnected one-piece panels 22 with the end walls 12 and 14 having a plurality of interconnected one-piece panels 24.

Each of the interconnected panel include one variation or another of the joint for interconnecting the longitudinal edges of the roof panels 22 as seen in FIGS. 3 and 8.

Each half joint 26 is L-shaped having legs 28 and 30 with adjacent inside faces. The leg 30 includes an outer edge 32. The face of the leg 28 is seen to have upstanding tongue elements 34 and 36 spaced apart from each other by a slot 38 and from the leg 30 by a slot 40. The inside face of leg 30 includes a semi-circular channel from which coplanar surfaces 44 and 46 extend. The outer edge 32 of leg 30 includes three upstanding side walls 46, 48 and 50 between which are grooves 52 and 54. A fourth wall 56 is provided parallel to the other walls 46, 48 and 50 and is interconnected to the wall 50 by a bridge 58 at the respective ends of the walls.

As seen in FIG. 3, the two half joints 26 are interconnected and the tongues 34 and 36 are positioned inside the grooves 52 and 54 of the other joint half sections while the grooves 52 and 54 of the one joint half section receive the tongues 34 and 36 of the other joint half section. The semi-circular in cross section channels 42 cooperate to form a circular bore 62 in which a cylindrical rod 64 is positioned to lock the joint half sections together. The tongue 36 is formed shorter than the depth of the groove 52 and thus forms an air pocket massageway 66 to allow for moisture, drainage or the like. The side wall 50 is shorter than the side walls 46 and 48 thus resulting in a laterally outwardly extending slot 68 in which a T-shaped sealing fastener 70 is positioned. The stem 72 of the fastener includes laterally outwardly extending gripping teeth 74 for engaging the opposite side walls of the slot 68 and the cross member 76 of the fastener seals the slot closed to the admittance of moisture and the like and further assist in rigidifying the joint.

It is further seen that rectangular in shape base portions 80 are provided on each of the half joints 26 wherein they are connected to the leg 28 having the tongues 34 and 36. The roof panels 22 having the half joints 26 along their edges also include plywood sheets 84 and 86 having expanded foam core insulation material 88 therebetween and against the base portion 80. It is seen that the length of the plywood sheets 84, 86 is staggered such that the sheet 86 extends the substantial width of the joint up to the edge of the slot 68 and the plywood sheet 84 extends to the joint and to the slot 68 on the corresponding side thereof.

In FIGS. 1 and 6, it is seen that the end walls 12 and 14 have floor panels on opposite sides thereof to provide end decks 90 and 92. The panel 14 carries a joint half section 26A interconnected by a joint half section 26B on the panel 20 of the floor 16. A joint half section 26C is also provided for connecting to a floor panel 20 forming the deck 90. The joint half section 26B is
shown by itself in FIG. 9 and a plywood sheet 26A extends the full width of the joint and is secured to a base 80A and to downwardly extending legs 100 and 102. The plywood sheet 86A also extends into engagement with the fourth wall 56A of joint half section 26C which is interconnected to joint half section 26B by the base section 80B.

The roof panels 22 are connected to the floor panels 20 by a 60 degree joint as seen in FIG. 2. The half joint 26 on the roof panel 22 is similar to that shown in FIGS. 3 and 8 but the half joint 104 on the floor panel 20 is a variation thereof. A modified base section 80C is provided on the half joint 26C. The leg 28C merges into a curved wall 106 which engages a sheet of plywood 108. The base section 80C includes a wall 110 which engages the leg 30C. The bridge element 58C merges into a base section leg 112 engaging the plywood sheet 84 along its outer face. The wall portion 112 extends up to a ledge 114 which merges with a shoulder 116 coplanar with the end of the plywood 118. Shoulder 116 provides a guideline for cutting the plywood to the right length so as not to interfere with the plywood 84 fitting in and against the base section wall 112.

The oppositely disposed roof panels 22 interconnected at their upper ends as seen in FIG. 5, utilizes a modified joint 120 having modified joint half sections 26D and 26E as seen in FIGS. 11 and 12. The half section 26D includes only the one leg 28D having the upstanding tongues 34D and 36D. The base 80D includes a wall portion 122 extending from the leg 28D at an angle thereto and merging with an angularly extending leg 124. The leg 30 is shorter and on the outer side from the leg 28D merges into base walls 124 and 126 extending at right angles to each other. The wall 124 continues and intersects a perpendicularly extending wall 128 which in turn engages a perpendicularly wall 130 parallel to a wall 132 intersecting wall 126. The joint half section 26E includes a leg 30E wherein the upstanding side wall 50E merges into a laterally outwardly extending wall portion 130 which merges into an offset base portion 132. The surface 46E adjacent the channel 42E merges into a base wall 134 which extends outwardly to engagement with a laterally extending wall portion 136 intersecting an outwardly extending wall portion 138. The half joints 26D and 26E when interconnected as seen in FIG. 5, lock the intersecting roof panels 22 together through use of the circular in cross section rod 64.

A seal cover 140 is positioned over the peak of the roof panels 22 as seen in FIG. 5 to seal the joint.

The end roof panels 22A are triangular in shape and as seen in FIG. 7 include 2X4s 140 along the outer edges between the plywood sheets 142 and 144 and against the styrofoam core 146.

The rod 64 is provided with a circular cleaning brush 150 on its end for cleaning out the bore 62 formed by the channels 42 and the rod is pushed through the length of the bore as seen in FIG. 18.

The shape of the channels 42 may be varied as desired and as seen in FIG. 19, are L-shaped to present channels 42' which when placed together provide a square bore 62' in which a square in cross section rod 64' is received.

The steps of assembling the A-frame building are set forth in FIGS. 13 - 17 and include first forming a floor 16 of interconnected panels 20 as seen in FIG. 13. Next, the end wall 12 is erected (FIG. 14) followed by some of the roof panels 22 being positioned in engagement with the floor panels 20 and the end wall 12. Then the opposite end wall 14 is erected and the remaining roof panels 22 are assembled followed lastly by the end 5 roof panels 22A being placed in position.

We claim:

1. A joint for construction members comprising, a pair of complementary construction members each being L-shaped with the legs of each member having adjacent inside faces and one of said legs having an outer edge extending perpendicular to the inside face of said one leg, a pair of upstanding tongues being provided on the inside face of said other leg, said tongues being spaced from each other and said inside face on said one leg thereby providing a pair of spaced apart slots, a trio of spaced apart upstanding walls on said outer edge of said one leg defining a pair of grooves therebetween, said inside face of said one leg having a channel formed therein with coplanar surfaces on opposite sides thereof, said members being assembled such that the pair of tongues on one member are positioned in the pair of grooves in the other member with the trio of walls on said one member being positioned on opposite sides of said pair of up tongues, and said channels cooperating to form a bore, and a detachable locking rod positioned in said bore limiting said pair of members against relative movement.

2. The structure of claim 1 wherein one of said pair of tongues is spaced from the bottom of the corresponding groove to provide a passageway.

3. The structure of claim 1 wherein said channels are semi-circular in cross section and said resulting bore is circular in cross section and said rod is circular in cross section.

4. The structure of claim 2 wherein said edge on said one leg includes a fourth upstanding wall spaced outwardly from said trio of walls and a bridge element extending between the outer ends of the fourth wall and the wall adjacent thereto of said trio of walls to form a tongue positioned outwardly and against the outermost tongue on said other leg on the other member.

5. The structure of claim 2 wherein the outermost wall of said trio of walls is further defined as being the inner wall of an upstanding tongue positioned outwardly and against the outermost tongue on said other leg on the other member.

6. The structure of claim 5 wherein said upstanding tongue terminates in spaced relationship to said inside face of said other leg thereby providing a laterally extending slot opening outwardly of said joint.

7. The structure of claim 6 wherein a removable T-shaped cover element is positioned in said laterally outwardly extending slot.

8. The structure of claim 1 wherein said bore and said rod are square in cross section.

9. The structure of claim 1 wherein said upstanding tongues are formed from solid metal material.

10. A joint for construction members comprising, a first member being L-shaped and having adjacent inside faces, one of said faces having a channel formed therein with coplanar surfaces on opposite sides thereof, and the other face having a pair of
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upstanding tongues; said tongues being spaced from each other and said one face, a second member having adjacent outwardly facing surfaces disposed at right angles to each other, one of said surfaces having a channel formed therein with coplanar surfaces on opposite sides thereof, and the other surface including a trio of spaced apart upstanding walls defining a pair of grooves therebetween,
said members being assembled such that the pair of tongues on one member are positioned in the pair of grooves in the other member with the trio of walls on said one member being positioned on opposite sides of said pair of up tongues, and said channels cooperating to form a bore, and a detachable locking rod positioned in said bore limiting said pair of members against relative movement.

11. The structure of claim 10 wherein one of said pair of tongues is spaced from the bottom of the corresponding groove to provide a passageway.

12. The structure of claim 10 wherein said joint interconnects a pair of panel members and each of said panel members includes a pair of sheets of material with a core therebetween and said sheets substantially cover said joint.

13. The structure of claim 12 wherein said sheets are staggered in length at said joint and each panel includes one sheet adjacent and parallel to said upstanding tongues which extends the length of said joint while the oppositely disposed sheet extends only to the joint and is met by the one sheet from the other panel.

14. The structure of claim 5 wherein said joint interconnects a pair of panel members and each of said panel members includes a pair of sheets of material with a core therebetween and said sheets substantially cover said joint and said sheets are staggered in length at said joint and each panel includes one sheet adjacent and parallel to said upstanding tongues which extends the full length of said joint and up to said laterally outwardly extending slot opening outwardly of said joint while the oppositely disposed sheet extends only to the joint and said laterally outwardly facing slot.

15. The structure of claim 14 wherein a removable T-shaped cover element is positioned in said laterally outwardly extending slot.

16. The method of constructing an A-frame building having elongated panels forming each of the floor, end walls, and two half roof sections, each of said panels having a half joint for connection to a half joint of an abutting panel, each joint including a first member being L-shaped and having adjacent inside faces, one of said faces having a channel formed therein with coplanar surfaces on opposite sides thereof, and the other face having a pair of upstanding tongues; said tongues being spaced from each other and said one face, a second member having adjacent outwardly facing surfaces disposed at right angles to each other, one of said surfaces having a channel formed therein with coplanar surfaces on opposite sides thereof, and the other surface including a trio of spaced apart upstanding walls defining a pair of grooves therebetween, said members being assembled such that the pair of tongues on one member are positioned in the pair of grooves in the other member with the trio of walls on said one member being positioned on opposite sides of said pair of up tongues, and said channels cooperating to form a bore, and a detachable locking pad positioned in said bore limiting said pair of members against relative movement, the steps of the method including, interconnecting the half joints of abutting panels to form the floor of the building, interconnecting the half joints of abutting panels to assemble an end wall to the floor, interconnecting the half joints of abutting panels to assemble some of the roof panels to the end wall and to the floor, interconnecting the half joints of abutting panels to assemble the other end wall to the floor, and interconnecting the half joints of the remaining abutting panels to assemble the remaining roof panels to in place roof panels and to the floor and other end panel.

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