Jan. 2, 1940. A. E. WATERMAN ET AL 2,185,532

FARM BUILDING

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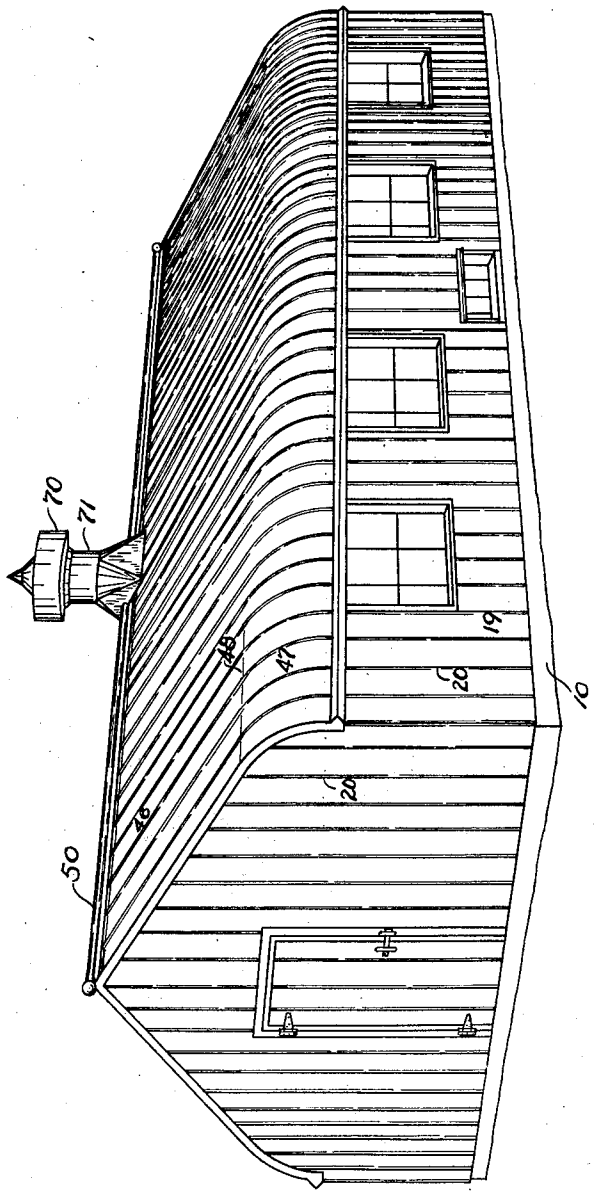


Fig. 1

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FARM BUILDING

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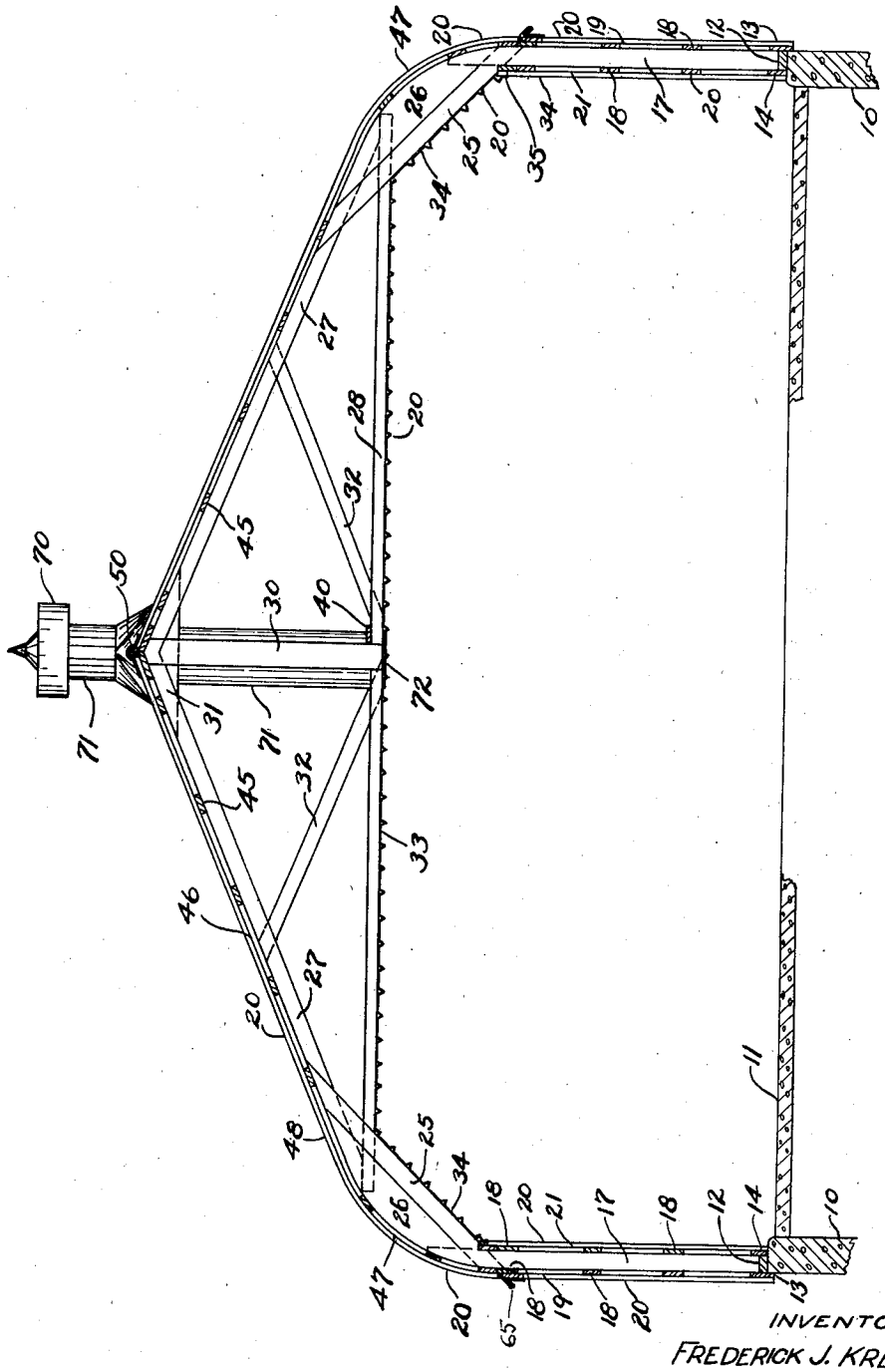


Fig. 2

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FARM BUILDING

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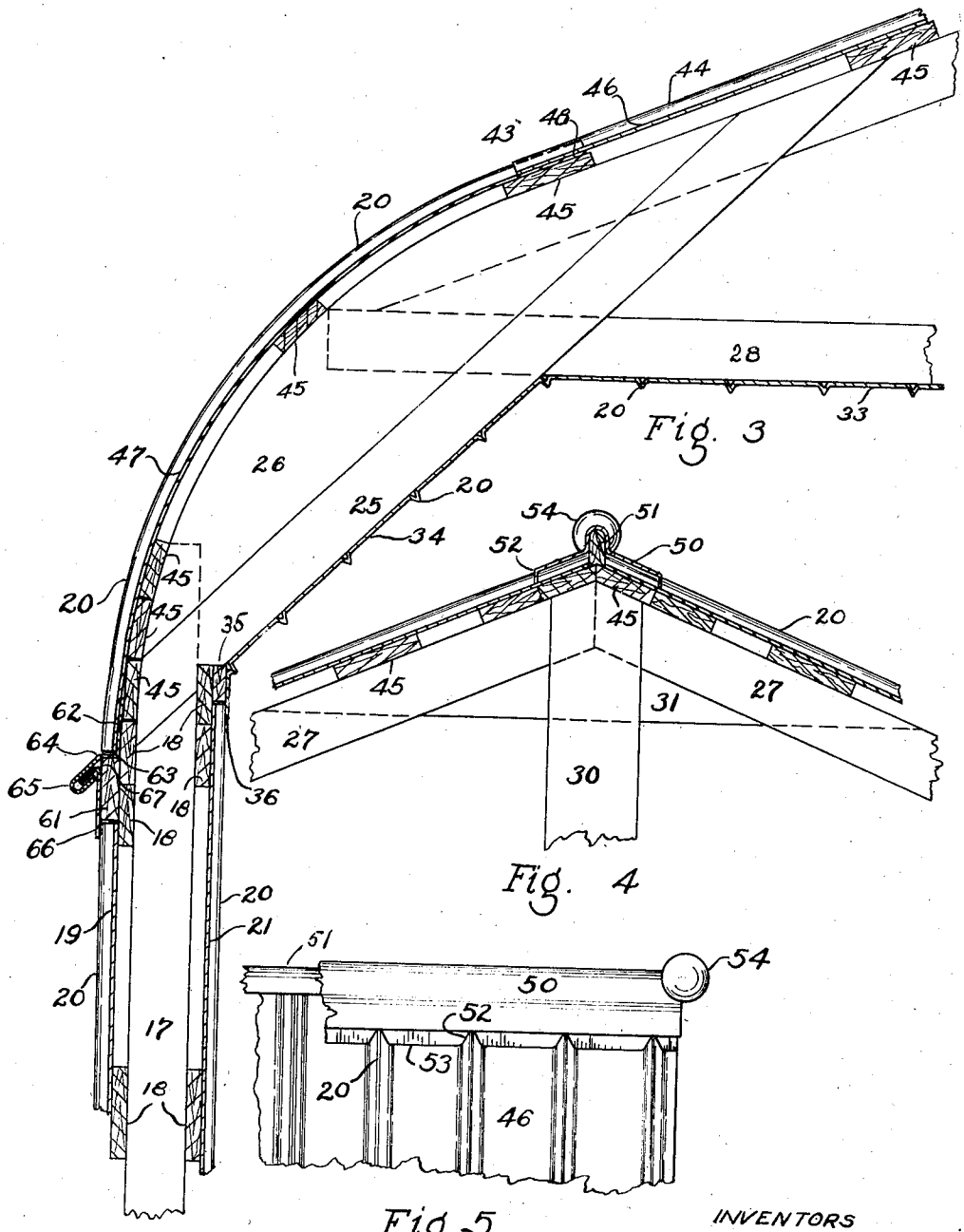


Fig. 3

Fig. 4

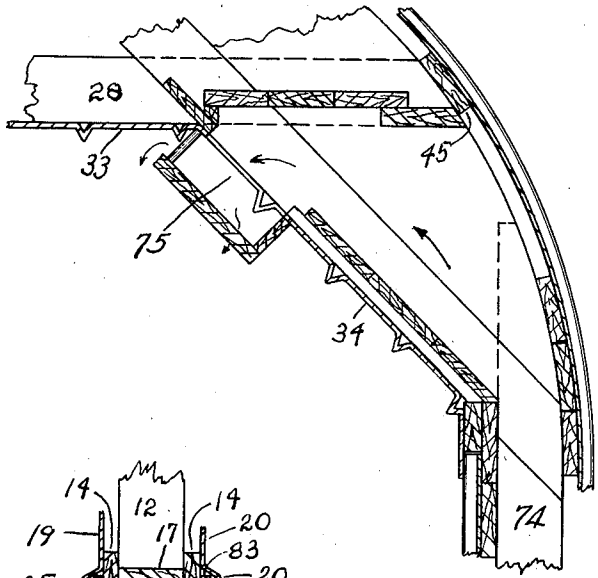
Fig. 5

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FARM BUILDING

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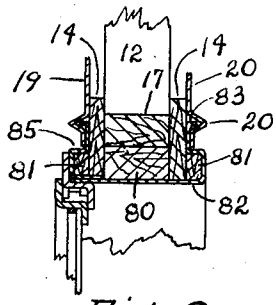


Fig. 9

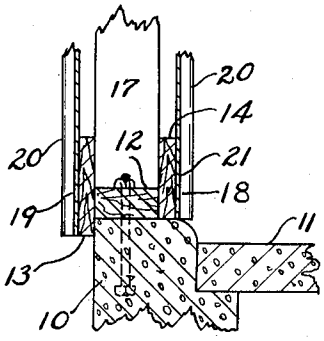


Fig. 7

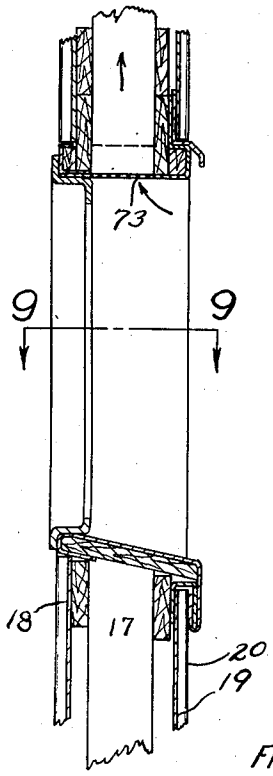


Fig. 8

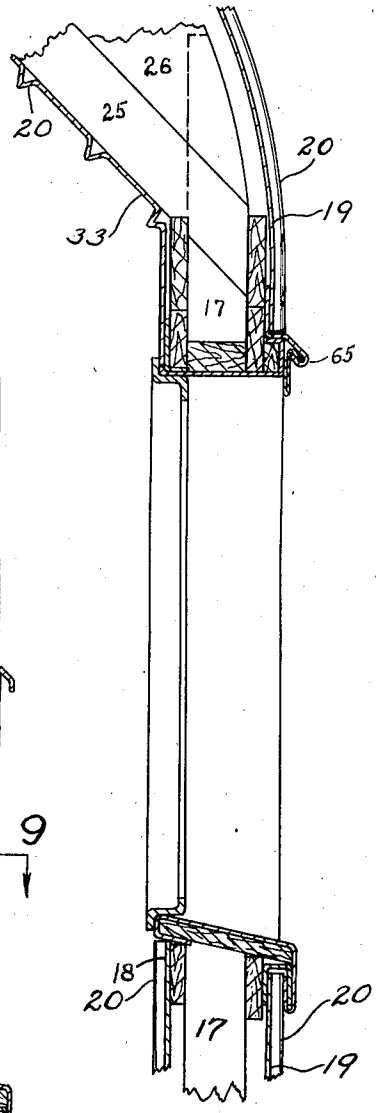


Fig. 6

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Patented Jan. 2, 1940 2,185,532

UNITED STATES PATENT OFFICE

2,185,532

FARM BUILDING

Arthur E. Waterman and Frederick J. Kreutzer, Fort Atkinson, Wis., assignors to James Manufacturing Company, Fort Atkinson, Wis., a company of Wisconsin

Application September 2, 1937, Serial No. 162,152

5 Claims. (Cl. 20—1)

Our invention relates to farm buildings and the like and has for its object, generally stated, to provide at low cost, a better, safer and stronger building, to reduce up-keep cost, and to provide better housing conditions.

An object of our invention is to provide a streamline structure, having a neat and pleasing appearance, one that will blend with the general surroundings of a well kept farm and landscape.

Further objects of our invention are to provide a building which readily lends itself to natural or forced ventilation and wherein the frame structure of the building may be either wood or steel and may be metal clad, inside as well as outside, the outside sheet plates being lapped to thereby form an electrical connection from the roof and ventilator caps to the foundation, thus to provide a fire proof structure and one that may be grounded at the base to thereby avoid damage or fire by lightning.

Another object of the present invention is to provide minimum outside and inside wall area and a dead air space therebetween including part of the roof structure, that may, when desired, be filled with insulating material, thus to preserve animal heat and reduce feed consumption during cold weather and to eliminate condensation.

Another object of the present invention is to eliminate the conventional overhanging roof and to streamline the building by means of a curved roof portion which blends into the sides of the building but having a drip strip on the roof line to thereby deflect the roof drainage and provide a line of demarcation between the walls and roof which, while not prominent, will add to the artistic appearance of the building.

Another object of the present invention is to provide a design whereby there are few specially shaped parts and when a wood frame is used, the few special shapes will be short and easily supplied from the factory or a templet furnished, thus to make it possible for the buildings to be constructed and erected by inexperienced help, and wherein the entire frame structure may be made of commercially available wood. Thus the wood frame will have an important advantage over steel in that it will cost considerably less to construct.

A further object of the present invention is to provide maximum interior space and head room by positioning the main ceiling considerably above the roof line and by means of gusset plates or braces which act as angular ceiling supports, thus to reduce the exterior surface to a minimum and provide a shape which will be proof against injury from wind storms.

To these and other useful ends our invention consists of parts and combinations thereof or their equivalents as described and claimed and shown in the accompanying drawings in which:

Fig. 1 is a perspective view of the preferred form of our improved building.

Fig. 2 is a transverse sectional view of the building as shown in Figure 1 taken in front of one of the frame members near the front end of the building.

Fig. 3 is an enlarged fractional transverse section taken on a line similar to Figure 2.

Fig. 4 is an enlarged fractional transverse view taken on a line similar to Figure 2, illustrating in detail the peak structure of the roof.

Fig. 5 is an enlarged fractional side elevation of one end of the roof.

Fig. 6 is an enlarged fractional transverse section taken through one of the windows.

Fig. 7 is an enlarged fractional transverse section of the side wall of the building illustrating its position on the foundation.

Fig. 8 is an enlarged fractional transverse view taken through the small window illustrated in Figure 1.

Fig. 9 is an enlarged section taken on line 9—9 of Figure 8.

As thus illustrated, our improved building may be mounted on any suitable foundation. In Figures 1 and 2, we illustrate a concrete foundation wall 10—10 and a concrete floor 11. We provide sill plates 12—12 which rest on members 10 as illustrated and having secured thereto an outer strip 13 which extends below member 12 so as to contact the foundation walls and form a water shed and anchor for the building. On the inner side of member 12 we provide a strip 14, thus forming a suitable support and anchorage for the vertical studs 17—17. On opposite sides of members 17, we preferably secure horizontal spaced strips 18—18 to which the inside and outside sheathings 19 and 21 are secured. Members 19 and 21 are made preferably of galvanized sheets having spaced vertically positioned corrugations 20. Thus we provide substantial side walls for the building having a suitable space for the reception of insulating material when desired. The end walls of our improved building are preferably similar to the side walls.

The roof and ceiling frame structure is preferably as follows: We provide strips 25 and 26 which are preferably secured to opposite sides of studs 17. We provide roof rafters 27, the inner

ends forming a peak for a gable roof support, the outer ends being spaced a short distance inwardly and above the top ends of studs 17. We provide ceiling joists 28 which are positioned as clearly illustrated in Figure 2. Members 25 and 26 are preferably positioned on opposite sides of the stud, rafter and joist ends, thus studs, rafters and joists are securely bound together and firmly braced.

To further strengthen the frame structure we provide a vertical strip 30 which is secured to rafters 27 and joists 28 as illustrated. We provide a strip 31 which forms a gusset plate for the inner ends of members 27. We also provide brace members 32—32 thus to securely anchor the roof rafters to the ceiling joists as illustrated.

It will be noted that the inner edges of plates 25 extend inwardly and upwardly at an angle of about 45° thus to form an angular ceiling support. The lower outside edges of members 25 and 26 are formed in single curves the straight outside edges of members 17 and 27 being tangent thereto. Thus members 25 and 26 may be considered corner gusset plates which may be made from one piece of material or separate pieces as illustrated, and forming a support for the lower portions of the roof.

It will be noted that the outer edges of members 17 and 27 are a short distance apart and slightly curved to correspond with the curved portion of members 25 and 26. It will be understood, however, that members 17 and 27 may be positioned and the curved portion of members 25 and 26 changed so the outer edge of the ends of members 17 and 27 may be left straight. This may easily be accomplished by providing a curve having a shorter radius.

We provide a main ceiling 33 and corner ceilings 34—34 each being made preferably of a material similar to members 19 and 21. We provide strips 35—35 (see Figure 3) which cooperate with the upper strips 18 to form a support for the down turned edges 36 of member 34, members 36 extending a distance below the top edge of member 21.

A notch is cut into the bottom of member 25 which rests on members 18 and 35 thus to assist in forming a slip proof joint between the stud and gusset plates. This is necessary because it will be noted that the gussets act as a full support for the roof structure. These gussets are prevented from moving outwardly at their bottom ends because of their long contact with members 27 and 28. These members are preferably secured together at their ends and cooperate with the gussets to form a very rigid structure whereby the weight of the roof structure is directly downward on members 18 and 35 and the studs.

We provide an anchor strip 40 (see Figure 2) which acts to hold members 28 in spaced relation at their centers while erecting the frame structure. We provide roofing strips 45 to which the roofing sheets 46 are secured as illustrated in the various figures, these sheets being also similar to members 19 and 21. Curved sheets 47 extend a distance under members 46 as at 48; thus members 47 may be furnished in separate sheets which are rolled to shape at the factory and stacked together in easily handled bundles.

If it is desired to fill the wall space with insulating material, this may be done before ceiling member 33 is placed into position, then all of the space may be conveniently filled to the ceiling joists 28. Thus it will be seen that all of the building below ceiling 33 may be conveniently insulated at low cost.

We provide a roof cap member 50 which is supported at its center by means of a filler strip 51, (see Figure 4) the outer edges of the cap being cut away as at 52. Thus the remaining portions may be bent downward so as to contact roofing sheets 46 as at 53. We provide a decorative member 54 having a formed portion which fits over the ends of member 51 and under cap 50.

Wood strips 61—61 are secured to the two closely spaced top members 18 as clearly illustrated, in Figure 3, forming a filler between the top of members 19 and the bottom edge of roofing members 47. We provide a drip plate, the upper edge 62 of which extends a short distance under members 47 and being bent outwardly as at 63 and downwardly and outwardly as at 64 and is then folded back as at 65. A plate 66 is secured to member 61, the lower end extending a distance over the top of member 19. This plate is bent outwardly as at 67 so its upper edge is embraced by the folded part of the drip strip as clearly illustrated in Figure 3.

Thus it will be seen that curved member 47 registers vertically with the upper edge of member 19 and that the drip strip and its supplementary member 66 form a complete seal between members 47 and 19 and also provide a line of demarcation between the roof and side walls of the building. Clearly the frame members and drip plates may be changed in detail in many ways, or made from steel or a combination of steel and wood.

By referring to Figures 2 and 3 it will be seen that the ceiling 33 is considerably higher than the side walls and that the top sill of the full sized windows may be in rear of the drip plate as clearly illustrated in Figures 1 and 6. Thus the building is made pleasing in appearance, the outside surface is streamlined and the general utility of the building increased while the cost is reduced.

In Figures 1 and 2 we illustrate a roof ventilator 70 having a duct 71 extending to an opening 72, which is positioned in ceiling 33. Ventilators of this class are usually provided with a damper (not shown) which may be adapted to be either adjusted manually or operated by a thermally controlled device.

In Figure 8 we illustrate a window similar to that illustrated in Figure 6 except it is shorter and the grille 73 is supplied with a duct 74 which leads to a ceiling outlet 75 having a damper (not shown) which may be manually adjusted or operated by a thermally controlled device. Clearly outlet 75 may, if desired, be positioned in ceiling members 33. Other well known means may be supplied for ventilating our building, the designs shown are, however, the preferred form.

In Figure 9 we illustrate in detail our improved window and door frame structure wherein 80 designates a filler stud and 81—81 designates trim strips. The outside window jamb 82 is folded over member 81 as illustrated and having a strip with an outturned flange 83, this flange fitting loosely into corrugation 20, thus to form a seal. Member 82 is nailed or otherwise secured to members 80, and 81 and 14. The inner part of the window jamb is designated by numeral 85 and is shaped similar to member 82 except in the width of the part which extends over 82. Thus it will be seen that we have provided a strong sealed, low priced metal sheathed window frame.

Having thus shown and described our invention, we claim:

1. A roof supporting structure of the class described, comprising a vertically positioned stud, a

roof rafter, the outer end of which is positioned a distance inwardly and above the upper end of said stud, said spaced ends being secured together by means of a plate, the outer portion of said plate which is positioned between said ends being formed in a single curve and the ends of the plate being at a tangent to said curved portion and registering with the outer surface of said studs and rafters, a ceiling joist secured to said plate a distance above said stud end and contacting said rafter end, the inner edge of said plate being extended a distance inwardly and upwardly above said joist to thereby form a uniform gusset plate between said joist and the stud and rafter ends, a transverse member secured to the inner side of said stud and being adapted to engage a notch in said gusset plate and act as a supplemental support therefor.

2. A frame for a building of the class described, comprising spaced vertically positioned end studs, rafters positioned to thereby form a peaked roof support, the lower ends of said rafters being spaced a distance inwardly and above the upper ends of said studs, said studs and rafters being secured together by means of plates, the outer edge of a portion of said plates being formed in a single curve which terminates on the same plane as the outer edges of said studs and rafters, a ceiling joist secured to said plates and the ends contacting the ends of said rafters, said plates on their inner edges extending inwardly and upwardly a distance above said joist to thereby form uniform gusset plates between the joist and the studs and rafters and thereby provide an angled sub-ceiling supporting means between the studs and joist.

3. A building of the class described, having spaced supporting frames, said frames comprising vertically positioned studs, rafters positioned to thereby form a peaked roof support, the lower ends of said rafters being spaced a distance inwardly and above the upper ends of said studs, said spaced ends being secured together by means of plates, an outer edge portion of said plates being formed in a single curve terminating on the same plane as the outer surfaces of said studs and rafters, ceiling joists secured to said plates a distance from the upper end of said studs and contacting the lower ends of said rafters, said plates extending inwardly and upwardly at a distance above said joists to thereby form a uniform gusset plate between the joists and the studs and rafters, and provide an angled sub-ceiling supporting means between the studs and joists, spaced transverse strips secured to the outer edges of said curved portions and the studs and rafters, roof sheathing secured to said transverse strips and extending from the peak of the roof to a point near the transverse plane of the bottom of said curved portions, side wall sheathings, the top edges being spaced from the bottom edge of said roof sheathing, a drip plate, the upper edge being positioned under the lower edges of said roof sheathings the bottom edge being turned outwardly and downwardly forming drip plates, a supplemental plate contacting the angled surface of said drip plate and extending a distance over the top edge of said side sheathing.

4. A frame for a building of the class described, comprising transversely spaced vertically positioned studs, rafters positioned to thereby form a peaked roof support, the outer ends of said rafters being spaced a distance inwardly and above the upper ends of said studs and on the same vertical plane therewith, a ceiling joist extending between and contacting the outer ends of said rafters and being positioned on the same vertical plane, gusset plates secured to opposite sides of a considerable portion of the ends of said studs, rafters and joists, a portion of the outer edges of said gusset plates being formed in a single curve, the outer normal edges of the rafters being on a tangent with said curves and cooperating therewith to form a continuous supporting surface for the roof covering, the inner edges of said gusset plates extending upwardly and inwardly to thereby form gusset plates between the rafters and joist and spacing means between the joist and rafters and the studs.

5. A building of the class described, comprising transversely spaced frames, a ceiling, a roof covering and outside and inside wall coverings, said frame comprising spaced vertically positioned end studs, rafters positioned to thereby form a peaked roof support, the outer ends of said rafters being spaced a distance inwardly and above the upper ends of said studs and on the same vertical plane therewith, a ceiling joist extending between and contacting the outer ends of said rafters and being positioned on the same vertical plane, gusset plates secured to opposite sides of a considerable portion of the ends of said studs, rafters and joists, a portion of the outer edges of said gusset plates being formed in a single curve, the outer normal edges of the rafters being on a tangent with said curves and cooperating therewith to form a continuous supporting surface for the roof covering, the inner edges of said gusset plates extending upwardly and inwardly to thereby form gusset plates between the rafters and joists and spacing means between the joist and rafters and the studs, said roof covering secured to the rafters and the curved portion of said gussets, said ceiling covering being secured to the ceiling joist and to the inner edge of said gussets and extending to said studs, said outside coverings secured to said studs and terminating adjacent the lower edge of said roof covering, said roof coverings having outwardly and downwardly extending portions adapted to act as drip plates and protect the upper edges of said outside wall coverings, said inside wall covering being secured to said studs and extending from said ceiling covering downwardly.

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