Nov. 4, 1958 A. C. JOSEPHS 2,858,916

METAL BUILDING CONSTRUCTION

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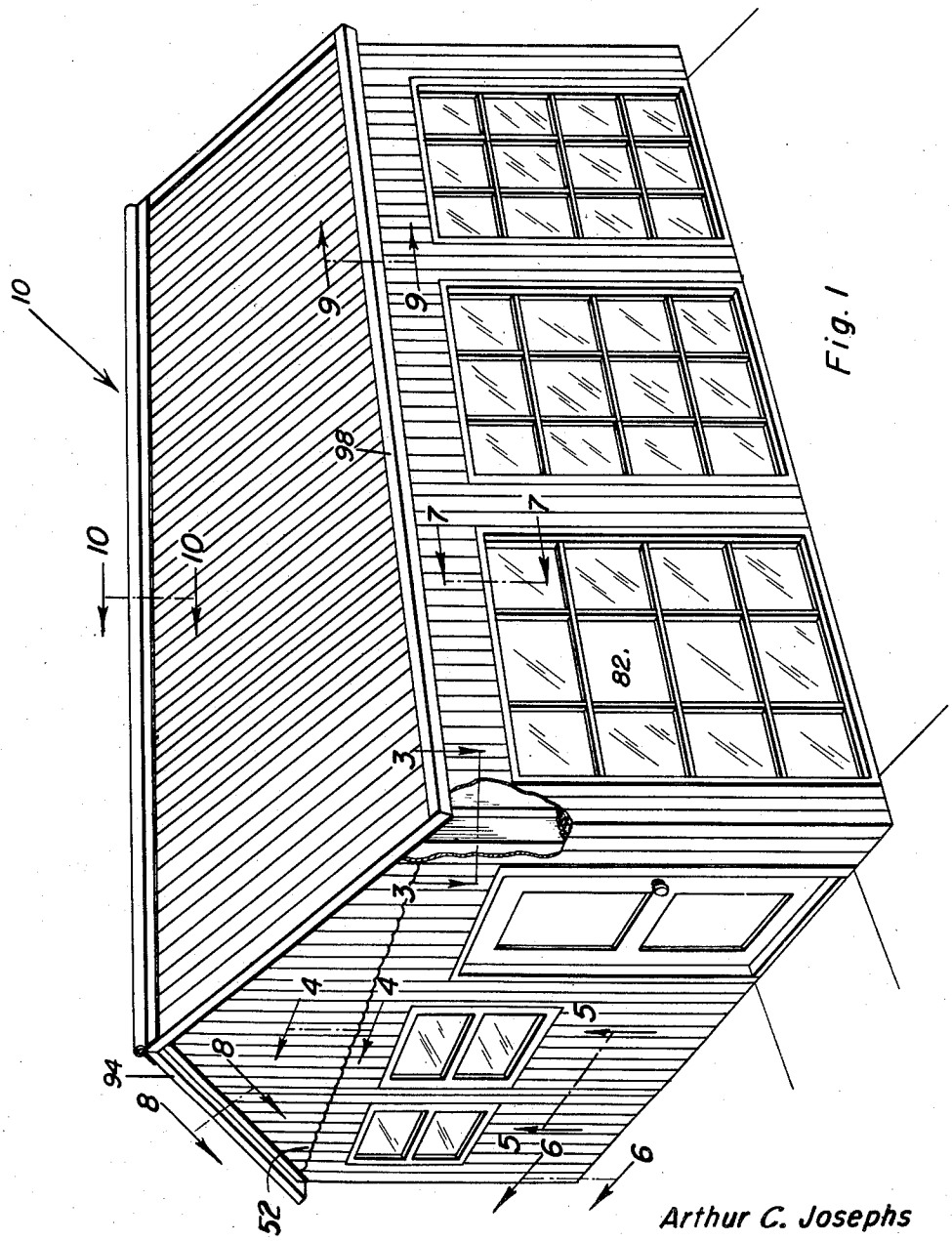


Fig. 1

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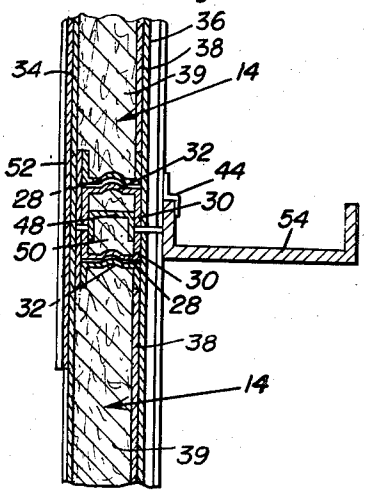
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METAL BUILDING CONSTRUCTION

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Fig. 4



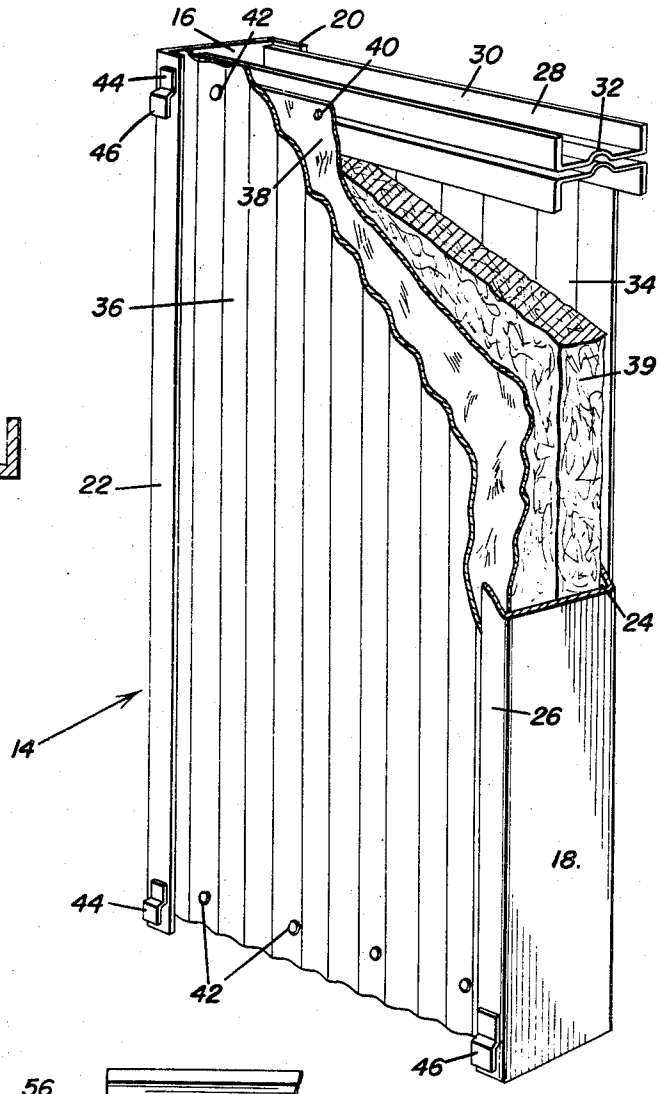
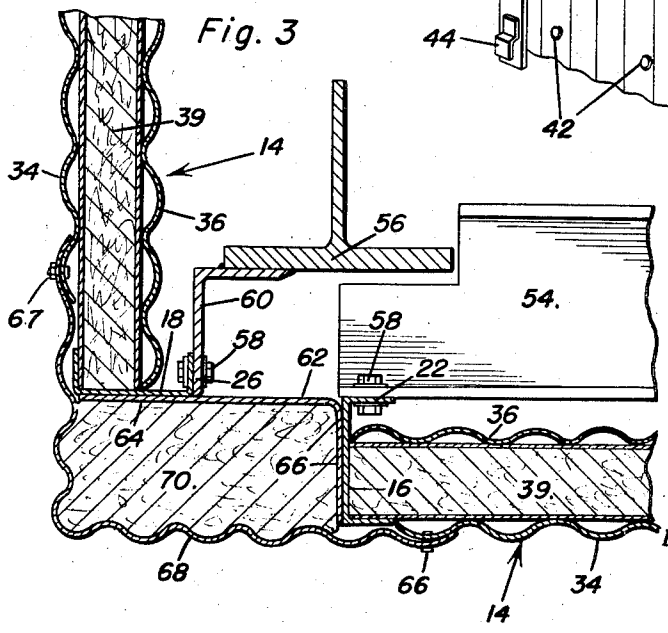


Fig. 2

Fig. 3



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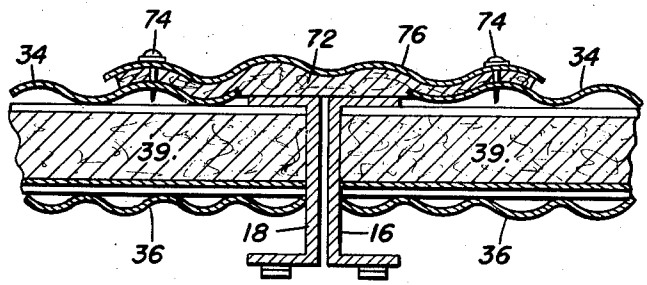


Fig. 5

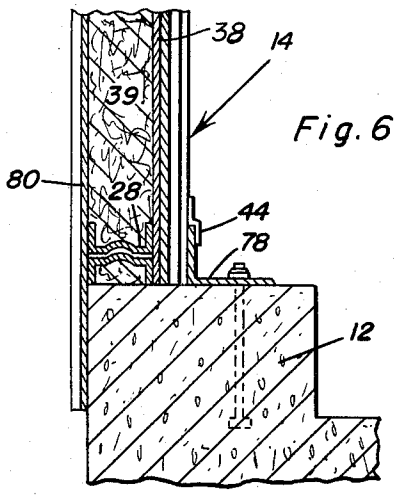
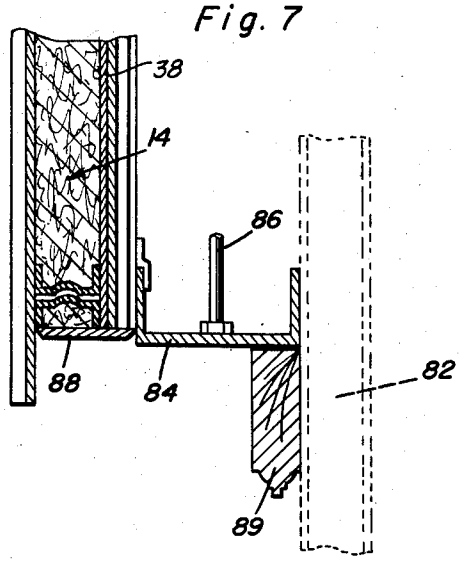


Fig. 6

Fig. 7



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METAL BUILDING CONSTRUCTION

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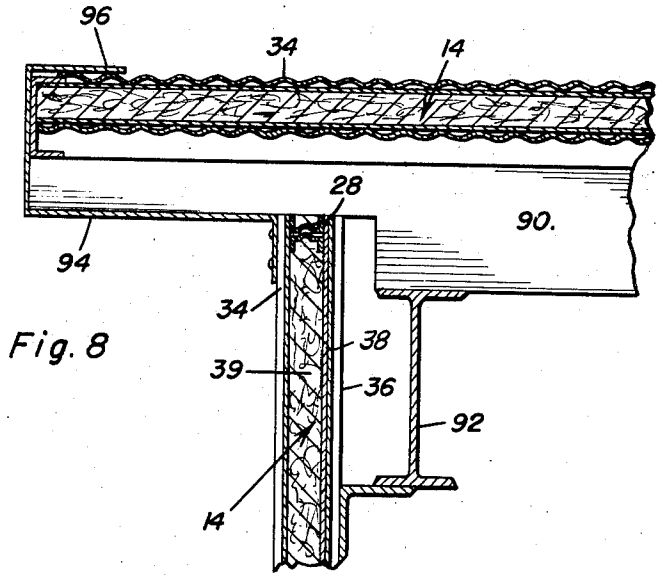


Fig. 8

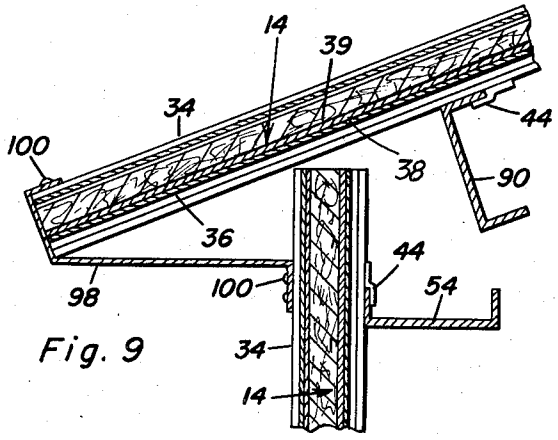
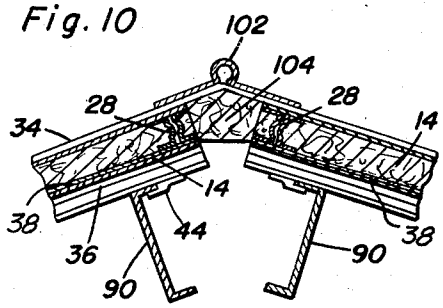


Fig. 9

Fig. 10



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METAL BUILDING CONSTRUCTION

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Application September 28, 1953, Serial No. 382,630

2 Claims. (Cl. 189—2)

This invention relates to the class of metal building construction and more particularly to a novel building formed from prefabricated panels which are easily attached to a supporting framework.

The construction of this invention features roof and wall panels which are held in place on suitable supporting members such as roof purlins and wall girts by clips secured to the frame portions of the panels. The clips resiliently engage the supporting structures and lockingly hold the panels in their proper position without requiring bolting or the like thus eliminating the use of interior scaffolding when erecting the building. In addition, the use of these clips associated with the panels and supporting structures permits the easy removal of any or all of the roof or wall panels in the event that a portion of the building's walls must be removed for removal or placing of machinery and the like or in the event that the building is to be moved from one location to another.

The panels comprising the basic elements of the invention include vertically extending channel members are spaced apart and have secured thereto suitable nailable members. One of the particular features of the invention resides in the fact that the panels utilize protruding channel sections with nailable members being of a lesser thickness than the channel members thereby permitting the inner portions of the channel members to protrude inwardly from the rest of the panel. This permits the channel members to form a vertically rigidifying structure while also preventing the panel surface from becoming a bearing surface which would otherwise cause a distortion of the plates of the panels as heretofore had occurred in other metal building constructions.

Utilized in the construction of this invention are corrugated plates which assure proper circulation of air on either side of a blanket of insulation thereby controlling condensation within the individual panels. Also incorporated in the invention is a barrier sheet of suitable foil such as aluminum foil which has thermo-insulative qualities.

Still further objects and features of this invention reside in the provision of a model building construction that is strong and durable, simple in construction and erection, capable of being substantially prefabricated at a location remote from the site of erection of the building, which can be constructed of various types and sizes of material in accordance with the requirements of the ultimate user, and which may be utilized to erect a building at a comparatively low cost.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this metal building construction, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a perspective view of a building constructed in accordance with the concepts of the present invention;

Figure 2 is a perspective view of one of the novel panels

utilized in the invention with parts thereof being broken away to show other parts in greater detail;

Figure 3 is a horizontal sectional view as taken along the plane of line 3—3 of Figure 1 and being shown on an enlarged scale for greater clarity to illustrate the corner construction utilized in this invention;

Figure 4 is a vertical sectional view as taken along the plane of line 4—4 illustrating in an enlarged scale the joints between vertically superimposed panels;

Figure 5 is a horizontal sectional view as taken along the plane of line 5—5 in Figure 1 illustrating the joint construction between adjacent panels;

Figure 6 is a vertical sectional view as taken along the plane of line 6—6 in Figure 1 illustrating the manner in which the building is anchored to a suitable foundation;

Figure 7 is an enlarged sectional detail view as taken along the plane of line 7—7 in Figure 1 and illustrating the construction of the invention at locations where an overhead door is incorporated into the building;

Figure 8 is a sectional detail view as taken along the plane of line 8—8 in Figure 1 illustrating the gable end construction;

Figure 9 is an enlarged sectional detail view as taken along the plane of line 9—9 in Figure 1 and illustrating the eave construction as incorporated in the invention; and

Figure 10 is an enlarged sectional view illustrating the ridge cap as secured to the adjacent roof panels, as taken along the plane of line 10—10 in Figure 1.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, reference numeral **10** generally designates a building constructed in accordance with the present invention. The building is constructed mainly from a suitable skeleton of supporting members usually including roof purlins and wall girts which are suitably erected from a poured concrete foundation such as is indicated by reference numeral **12** or other suitable foundation. Secured to these supporting members is a plurality of panels generally indicated by reference numeral **14**. The construction of these panels can be best seen in Figure 2.

Each of the panels **14** includes a pair of spaced channel-shaped members **16** and **18**, the channel member **16** being provided with an outer flange **20** and an inner flange **22** while the channel member **18** has an outer flange **24** and an inner flange **26**. Welded or otherwise secured to the upper and lower portions of the channel members **16** and **18** are nailable members **28** each of which comprise pairs of substantially U-shaped members **30** having a nail locking arc **32** medially located therein and having alternatively upwardly and downwardly extending flanges. Obviously, as desired other suitable nailable materials may be used in lieu of the metal members **28**. It has been found that wolmanized fir is quite suitable for use as nailing members. It is to be noted that the nailable members **28** are of less width than the width of the channel members **16** and that the nailable members **28** abut against the outer flanges **20** and **24** of the channel members **16** and **18**. An outer plate **34** is suitably nailed to the nailing strips **28** and is preferably formed from corrugated sheet metal. An inner panel **36** is nailed over a sheeting **38** of aluminum foil or like material and a blanket of insulation **39** which sheeting has previously been secured by nails **40** or other fasteners to the nailable members **28**. Suitable nails **42** are utilized to secure the inner sheeting **36** to the nailable members **28** with the inner sheeting **36** spaced from the inner flanges **22** and **26**. Welded or otherwise attached to the flanges **22** and **26** are clips **44** forming important elements of the invention. These clips **44** are substantially of a Z-shape and have downwardly and outwardly angularly extending portions

46 adapted to overlie and resiliently engage a suitable supporting member.

When the panels are arranged in vertically superimposed position it will be noted that the nailable members 28 have their U-shaped members 30 in opposed relationship with the U-shaped member of the upper panel 14 being inverted. A channel-shaped member 48 is then inserted between the U-shaped members 30 to thereby overlie the space between the adjacent vertically superimposed panels 14. A suitable filling of insulation as at 50 is positioned between the U-shaped members 30. As may be desired, an outer covering plate 52 may be nailed or otherwise secured. It is to be noted that the clip 44 of the panel 14 is secured over a wall girt 54.

In the corner construction as is best seen in Figure 3 it will be noted that the panels 14 are arranged at right angles relative to each other. The wall girts 54 together with rigid frame columns 56 form the framework for the lower portions of the building and at the corners of the building the panels 14 may be bolted to the structural support members of the skeleton. Suitable bolts as at 58 extend through the inner flanges 22 and 26 of the respective panels 14, the bolt 58 extending through the flange 26 being utilized to connect the panel 14 to an angle shaped frame member 60 secured to the column or vertical member 56. A substantially L-shaped inner member 62 is positioned within the confines of the corner construction with the legs 64 and 66 thereof abutting the channel shaped members 18 and 16 respectively. Secured by means of suitable screws or other fasteners 67 is a substantially angular shaped corrugated outer plate 68 forming the outer configuration of the corner of the building. Received between the L-shaped member 62 and the outer plate 68 is a blanket of insulation as at 70. A joint between horizontally spaced but adjacent panels is formed utilizing a layer or blanket of insulative material 72 which is positioned in overlying relationship relative to the space between the adjacent panels. It is noted that the outer panels 34 are cut away short of the channel members 16 and 18. Secured by means of self-tapping screws as at 74 or like fasteners is a covering plate 76.

In attaching the panels 14 to the foundation 12 it will be noted that a suitable angle iron 78 is utilized over which the clips 44 are resiliently emplaced. A lower covering plate 80 is utilized to cover the joint between the panel 14 and the footing or foundation 12. Incorporated in the building 10, are overhead doors 82. Hence, the supporting frame member 84 suitably is suspended by means of a vertical tie rod 86 so as to provide means for supporting the lower end of panel 14 as may be necessary. A bottom capping plate 88 is provided for the panel 14. As may be desired a molding 89 of suitable configuration can be positioned below the supporting member 84.

A detail view of the gable end construction of the invention can be readily seen in Figure 8 and herein the panels 14 are used to form both the wall and the roof. The roof purlins 90 are tied by suitable beams 92 or the like. However, utilizing the angulated plate 94 of the configuration, as can be best seen in Figure 8, the gable end of the building is closed and protected, the plate 94 extending substantially the length of the gable and, of course, being optionally formed in sections. Suitable sheet metal screws 96 or like fasteners are utilized to connect the gable plate 94 to the outer plates 34 of the panels 14. The eave construction can be best seen in Figure 9

and as can be readily observed, the panels 14 of the roof are supported on the roof purlins 90 while the panels 14 forming the wall construction are supported on the wall girts 54. To form the eave an eave plate 98 is secured by sheet metal screws 100 or other suitable fasteners to the outer plates 34 of the panels 14 used for the wall and roof construction. It is to be noted that the shape of the plates 98 can be varied depending upon the overlapping of the roof relative to the wall.

In Figure 10 it will be noted that a ridge cap 102 is suitably secured between the relatively angularly positioned panels 14 supported by the roof purlins 90. A suitable layer of insulative material 104 is positioned below the ridge cap 102 and extends between the adjacent panels 14.

Since from the foregoing the construction and advantages of this metal building construction are readily apparent, further description is believed to be unnecessary.

However, since numerous modifications will readily occur to those skilled in the art, after a consideration of the foregoing specification and accompanying drawings, it is not intended to limit the invention to the precise embodiment shown and described, but all suitable modifications and equivalents may be readily resorted to.

What is claimed as new is as follows:

1. In a metal building construction a pair of adjacent panels, each of said panels comprising a pair of spaced channel members each having the inner and outer flanges thereof extending towards the inner and outer flanges of the other of said channel members, spaced nailable members secured to said channel members and extending therebetween, said nailable members engaging against said outer flanges and being spaced from said inner flanges, an upper of said pair of panels being arranged in vertically superimposed relationship relative to the lower of said pair of panels, said lower panel having a nailable member with a portion of substantially U-shape, said upper panel having a nailable member with another portion of inverted substantially U-shape, a locking member received between said U-shaped portions.

2. In a metal building construction a pair of adjacent panels, each of said panels comprising a pair of spaced channel members each having the inner and outer flanges thereof extending towards the inner and outer flanges of the other of said channel members, spaced nailable members secured to said channel members and extending therebetween, said nailable members engaging against said outer flanges and being spaced from said inner flanges, said inner flanges of said channel members having clips secured thereto, said clips having downwardly and outwardly extending portions for resiliently engaging supporting means to hold said panels in a selected position, an upper of said pair of panels being arranged in vertically superimposed relationship relative to the lower of said pair of panels, said lower panel having a nailable member with a portion of substantially U-shape, said upper panel having a nailable member with another portion of inverted substantially U-shape, a locking member received between said U-shaped portions.

References Cited in the file of this patent

UNITED STATES PATENTS

2,073,036	Voigt	Mar. 9, 1937
2,116,020	Gauvin	May 3, 1938
2,300,743	Hauf et al.	Nov. 3, 1942
2,585,976	Teeter	Feb. 19, 1952