

June 15, 1943.

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2,321,860

BUILDING CONSTRUCTION AND UNITS THEREFOR

Filed Feb. 3, 1941

2 Sheets-Sheet 1

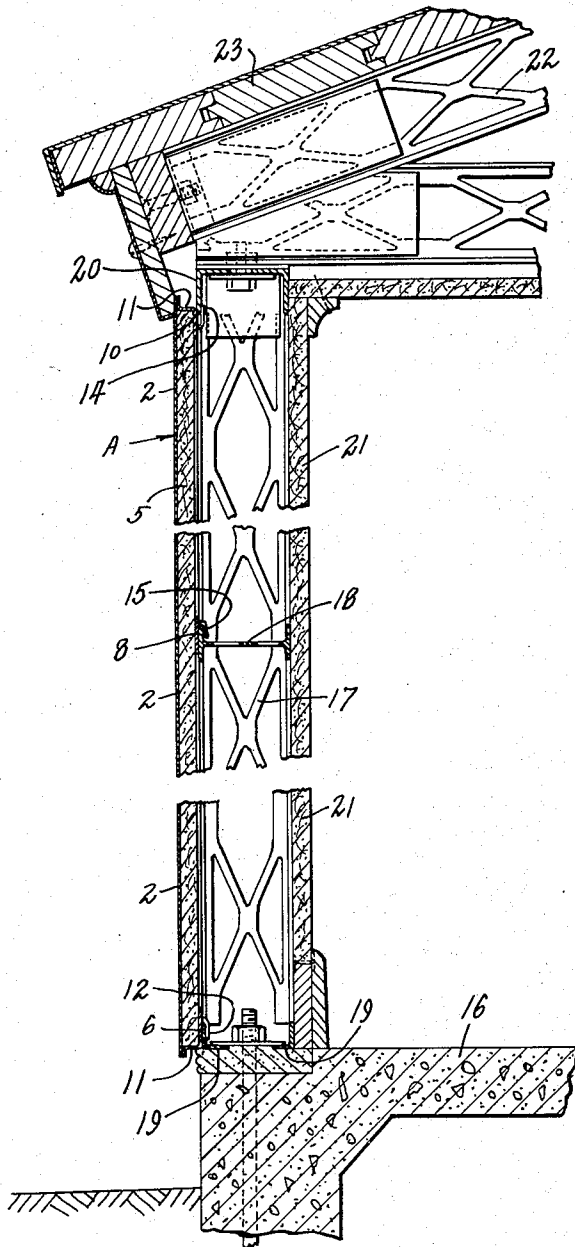


Fig. 1.

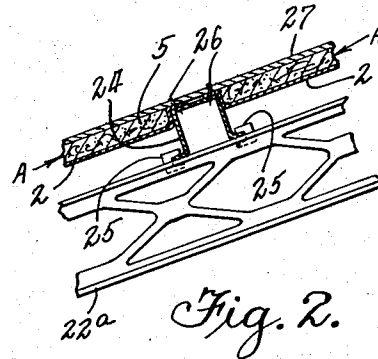


Fig. 2.

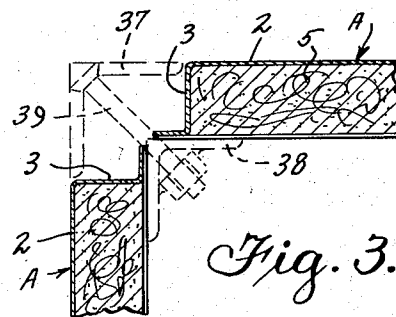


Fig. 3.

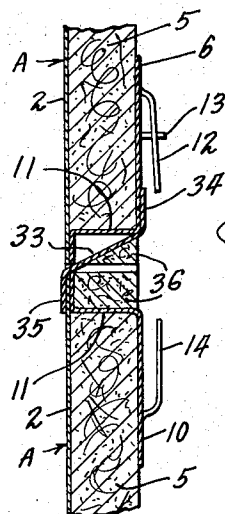


Fig. 6.

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2 Sheets-Sheet 2

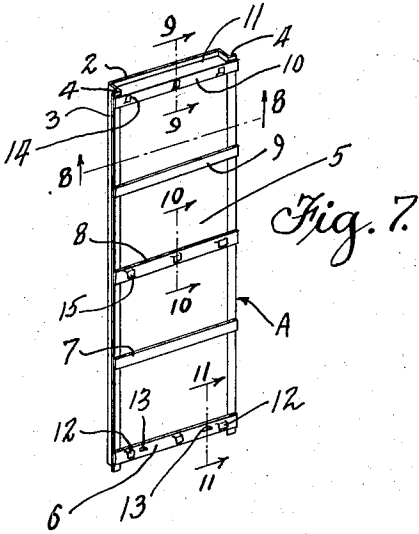


Fig. 7.

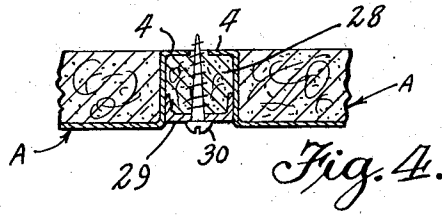


Fig. 4.

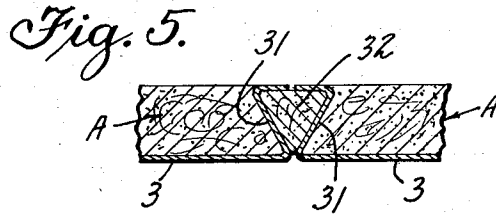


Fig. 5.

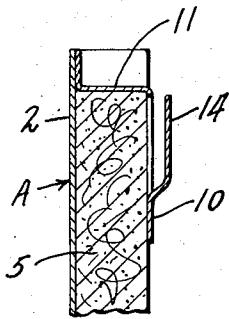


Fig. 9.

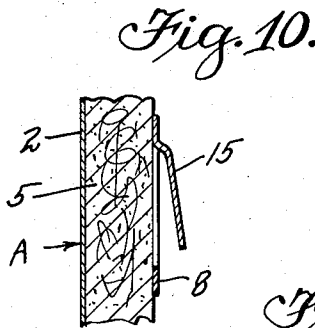


Fig. 10.

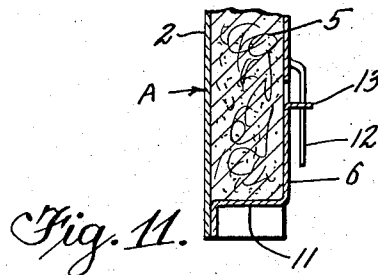


Fig. 11.

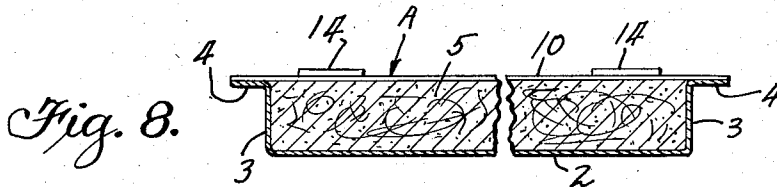


Fig. 8.

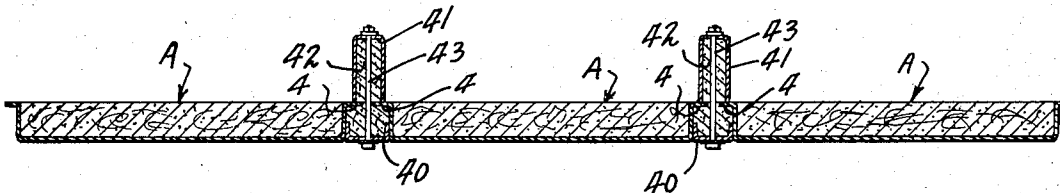


Fig. 12.

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2,321,860

BUILDING CONSTRUCTION AND UNIT THEREFOR

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Application February 3, 1941, Serial No. 377,151

5 Claims. (Cl. 189—85)

This invention relates to a building construction and to units for said building construction, and refers particularly to a building construction the units of which are adapted to be prefabricated and demountable from the building.

An object of the present invention is to provide a siding unit for a building, which siding unit is composed of a composite of metal and insulating material, and which siding unit may be prefabricated at a relatively low cost.

The siding unit of the present invention is made of sheet metal, such as galvanized iron, combined with a material to provide heat and sound insulation, such as fiberboard, in such a manner as to form a rigid siding unit possessing, because of the combined relationship of the component parts, a considerable structural strength. By the present invention there is provided siding which may be substituted for lumber, which siding is composed of materials of low cost and adapted to be readily prefabricated for use. By means of the present invention, sheet metal such as galvanized iron is made into metal lumber having a number of novel attributes and advantages. Previous attempts to employ galvanized iron, for example, for building sidings have had the disadvantage that the galvanized iron provided a noisy siding which did not retain shape and kinked readily in use. By means of the present invention sidings of galvanized iron are produced which are rigid in form and fully insulated against transfer of sound and heat. The sidings of the present invention are further so produced that they may be readily installed in a building, and in case it is desired to dismantle the building are readily demountable and movable therefrom in a form suitable for their subsequent use in the construction of other buildings.

Another object of the invention is to provide novel means for interconnecting siding members, including certain novel corner connecting units adapted to facilitate the mounting and demounting of the siding units in the operations of constructing or demounting a building using such units.

Various further objects and advantages of the invention will be apparent from a description of a preferred form or example of the invention, and for that purpose I have hereafter illustrated in connection with the accompanying drawings a preferred example of the invention, in which—

Figure 1 is an elevation in vertical section of a building wall.

Figure 2 is a fragmentary section of an alternate form of roof structure.

Figure 3 is a fragmentary horizontal section of a corner construction.

Figure 4 is a fragmentary horizontal section of a typical joint between siding units.

Figure 5 is a similar view of a modified form of joint.

Figure 6 is a fragmentary vertical section indicating the manner of vertically joining the siding units.

Figure 7 is a perspective view of one of the siding units.

Figure 8 is an enlarged fragmentary section on the line 8—8 of Figure 7.

Figure 9 is an enlarged fragmentary section on the line 9—9 of Figure 7.

Figure 10 is an enlarged fragmentary section on the line 10—10 of Figure 7.

Figure 11 is a section on the line 11—11 of Figure 7.

Figure 12 is a section of a modified form of connecting the structural units at the sides.

Referring first to Fig. 7 of the drawings, the structural units of the present invention are formed of metallic sheets 2 of any desired material, preferably galvanized iron, such, for example, as 24-gauge. I find it desirable, for example, to employ sheets of galvanized iron of a standard width in forming the units of the present invention. Thus, standard widths of galvanized iron sheets of either 12, 16, 20, 24, 28, 32 or 36 inches, etc., may be selected, of any desired length such as 8, 10 or 12 feet, etc. Such sheets 2 are bent at their edges to form sides 3 of a flat trough and a portion of the edge then bent outwardly as indicated at 4 to provide flanges. The flanges serve, as indicated hereafter, as means by which suitable strengthening straps 40 may be attached to the unit and by means of which connections may be made between adjacent units. As illustrative but not limiting the invention, the sides 3 may be conveniently three-quarters of an inch and the flanges three-eighths of an inch.

The sheet metal member 2 thus formed provides a trough or panel designed for holding suitable insulating material 5. For such insulating material I have found fiberboard satisfactory, and the resulting material 5 is cut to a suitable length to correspond to the width and height of the trough provided by the sheet metal member 2, and then inserted in said member after first properly coating the inner faces of the trough with a suitable binding material. As an example

of such a binding material I have found a high melting point asphalt or petroleum cement most satisfactory.

After the installation of the insulating material, I further strengthen the resulting unit by the addition of a plurality of reinforcing straps such as the straps 6, 7, 8, 9 and 10. Obviously any desired number of straps may be employed, and in certain cases it may be found desirable to employ some diagonal straps. Straps 6, 7, 8, 9 and 10, for example, are attached to the flanges 4 of the sheet metal member 2 in any preferred or desired manner, such for example as welding. The bottom strap 6 of the unit and the top strap 10 of the unit include portions 11 adapted to be bent inwardly to extend into the trough formed by the sheet metal member 2 and cover or enclose the ends of the fiberboard member 5. The bottom strap member 6 is further preferably provided with means by which the resulting siding unit may be mounted in position, and for this purpose the member is indicated as provided with certain clips 12 extending downwardly, which clips 12 may be conveniently formed by cutting the straps and bending the clips thus formed outwardly into the desired position as indicated. There is also preferably provided on the bottom strap 6 one or more stop clips 13 which likewise may be formed by cutting the strap 6.

The upper strap member 10 is likewise preferably provided with clips 14 preferably cut from the strap member and bent outwardly to extend upwardly as indicated.

In certain cases it may be desirable to provide clips such as 15 on certain of the other straps, such as 8 of the unit.

Now referring more particularly to Fig. 1 of the drawings, I have there indicated a typical exterior wall constructed by the prefabricated units of the present invention. While the units of the present invention may be attached to various studdings and frameworks, I have indicated a wall unit in which on the foundation 16 there are provided studs of the light weight expanded beam form 17, and which studding may include certain horizontal bridgings 18 of the expanded beam form. At the bottom of the wall, certain angle irons 19 are indicated. The units A of the present invention are mounted in place by the clips 12 being slipped over the angle irons 9 and the member lowered until the upper edge of the angle iron 19 engages the stops 13. The clips 15 similarly engage the horizontal bridging 18. At the upper end of the siding the clips 14 are engaged with top plates 20 provided at the upper end of the studding employed in the frame.

The other elements of the typical exterior wall indicated may be of any desired or conventional form. I have shown an inner facing 21 which may be formed of fiberboard, although in certain instances it may be desirable to form such inner facing from the units A of the present invention. 22 indicates a suitable roof truss structure formed of expanded I-beams in the manner described in my Patent No. 2,201,504, issued May 21, 1940. While in general it may be preferable to provide the sheathing of the roof with board 23 as indicated, in certain cases the siding units of the present invention may be employed for that purpose in the manner indicated in Fig. 2. In Fig. 2 the roof truss member 23 is indicated as provided with a purlin 24, which may be formed of sheet metal bent into an inverted U shape and held to the truss member 22^a by purlin clips 25,

The sidings A of the present invention are mounted as indicated with their flanges 4 engaging the top of the purlin 24 and may be fixed to the purlin 24 by suitable sheet metal screws indicated at 26. Any desired roofing material 27 may then be placed over the siding members, which are in this case employed as roof members.

Now referring more particularly to Fig. 4 of the drawings, a preferred means for interconnecting the siding members along vertical meeting lines is there indicated. The connection is made by inserting suitable insulating material such as fiberboard 28 in the trough-like space formed between the adjacent siding members A, which fiberboard may be cemented in place by suitable binding material, and over the surface of the fiberboard 28 is placed a channel member 29. Suitable means are provided for holding the channel member in place and for this purpose I preferably employ sheet metal screws 30 of a sufficient length to extend between the flanges 4 adjacent siding members A.

An alternate form of joint between adjacent siding members is indicated in Fig. 5, which, however, requires a slightly modified form of siding member having its side walls 31 bent inwardly so that the adjacent siding members, when pushed together, form a triangular space between the members. Such triangular space is filled with an insulating material 32 such as fiberboard, which likewise may be cemented in position by a suitable binding agent. The joint indicated in Fig. 5 of the drawings has the advantages of bringing the flat sides 3 of the sheet metal members of the sidings approximately together, but the connection so made does not leave the siding members readily demountable as in the case of the connection indicated in Fig. 4.

In Fig. 6 of the drawings I have indicated one preferred method of interconnecting the siding members vertically, when, because of the height of the wall to be constructed, it becomes desirable to stack the siding members vertically over each other. For such purpose the sheet metal connecting member 33 is indicated having a leg 34 disposed against the inner side of the upper siding member A and a leg 35 disposed against the outer side of the lower siding member. Insulating material such as fiberboard may be inserted at 36, as indicated.

Now referring more particularly to Fig. 3 of the drawings, I have indicated the manner of forming corner connections between the siding members, for which purpose I provide an outer angle iron 37 of a size to bear against the adjacent siding members and form a completion of the intended corner. A second angle iron 38 is provided on the inner side of the siding members and bolts 39 are indicated as interconnecting the two angle irons 37 and 38 for the purpose of drawing and tightening the adjacent siding members together.

Referring to Fig. 12 of the drawings, a modified method of connecting the structural units A at the sides is indicated, in which the trough provided by the flanges 4 of adjacent structural units A is preferably filled with insulating material such as fiberboard, suitably cemented in position. The channel iron 40 is placed against the top of the groove, and at the rear face of the units A I provide U-shaped members 41 which may be formed of sheet metal such as galvanized iron and which are filled and cemented with insulating material as indicated at 42. Bolts 43 are provided extending from the channel 40

through the U-shaped member 41. By the construction thus provided the U-shaped member 41 and its filling of insulating material unite structurally to form what may be considered a supporting stud for the facing units A.

While the particular form of the invention herein described is well adapted to carry out the objects of the invention, it is to be understood that various modifications may be made, and this invention is of the scope set forth in the appended claims.

I claim:

1. A composite structural siding which comprises a sheet metal member formed into a shallow trough, an unbroken board of insulating material entirely filling said trough, an asphaltic binder between said board and metal member uniting the same into a composite unit, reinforcing strips connecting opposite trough edges, and mounting clips provided by certain of said reinforcing strips.

2. A composite structural siding which comprises a sheet metal member formed into a shallow trough, an unbroken board of insulating material entirely filling said trough, an asphaltic binder between said board and metal member uniting the same into a composite unit, reinforcing strips connecting opposite edges of said trough, there being reinforcing strips at the ends of said siding, said reinforcing strips having portions bent inwardly/ to cover the ends of the insulating material, and mounting clips formed from said strips and extending outwardly.

3. A wall structure for a building comprising

a studding, a plurality of siding members supported by said studding, each siding member including a sheet metal member formed into a shallow trough, an unbroken board of insulating material entirely filling said trough, an asphaltic binder between each board and metal member uniting the same into composite units, and reinforcing strips extending across said trough, certain of said reinforcing strips providing mounting clips, said mounting clips engaging the elements of said studding for holding said siding members thereto.

4. A composite structural siding which comprises a sheet metal member bent to form a shallow trough, an unbroken board of insulated material entirely filling said trough, a binder between said board and metal member uniting the same into a composite unit, reinforcing strips connecting opposite trough edges, and mounting clips provided by certain of said reinforcing strips.

5. A wall structure for a building, comprising a studding, a plurality of siding members supported by said studding and horizontal members of a wall frame, each siding member comprising a sheet metal member formed into a shallow trough, an unbroken board of insulating material entirely filling said trough, a binder between each board and metal member uniting the same into composite units, and reinforcing strips extending across said trough; certain of said reinforcing strips providing mounting clips, said mounting clips engaging the horizontal members for holding said siding members thereto.

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