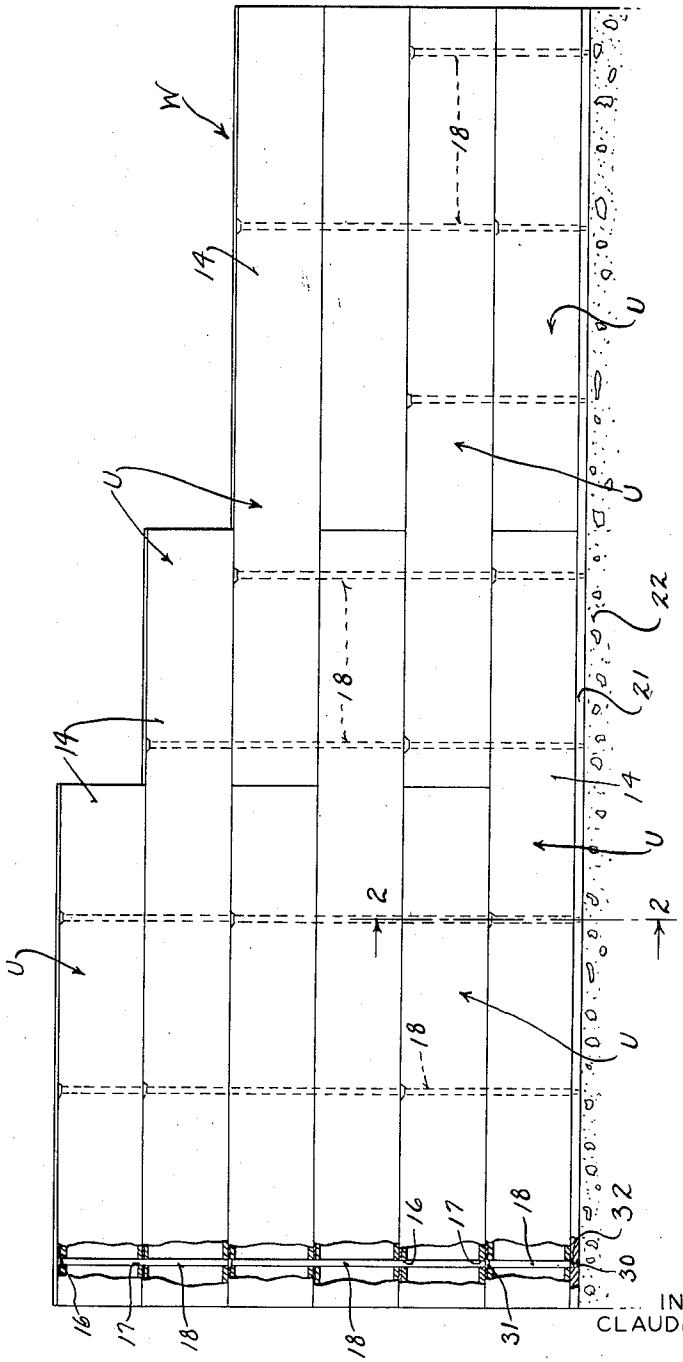
Jan. 15, 1957 C. J. DEBBINK 2,777,172

PREFABRICATED BUILDING CONSTRUCTION

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Fig. 1.



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Fig. 2.

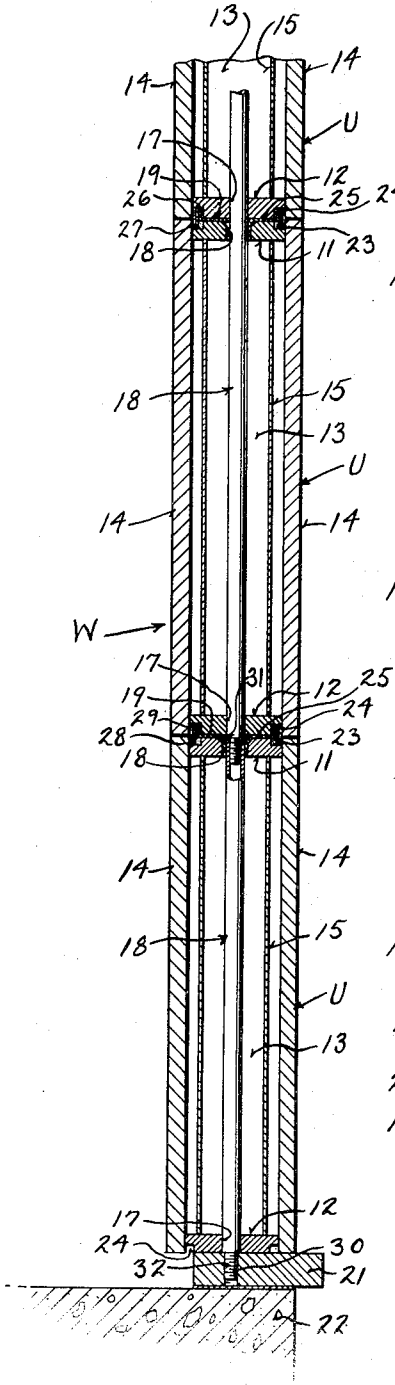


Fig. 3.

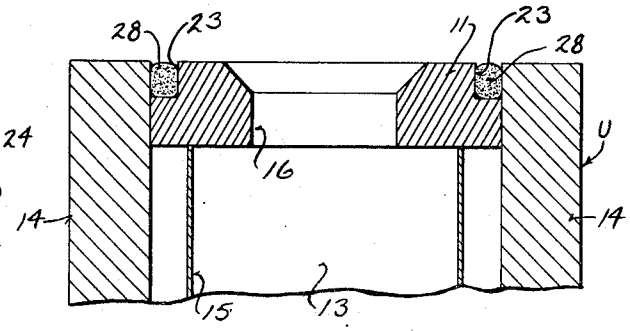


Fig. 4.

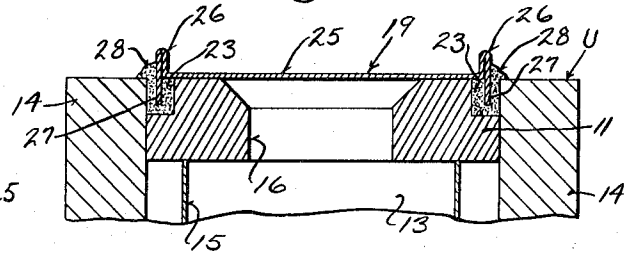
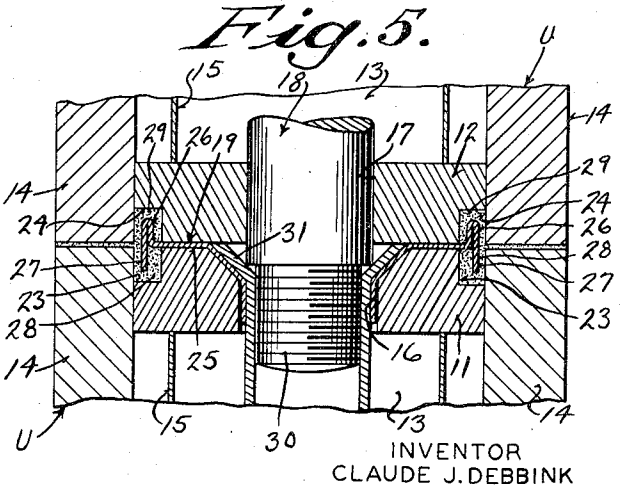


Fig. 5.



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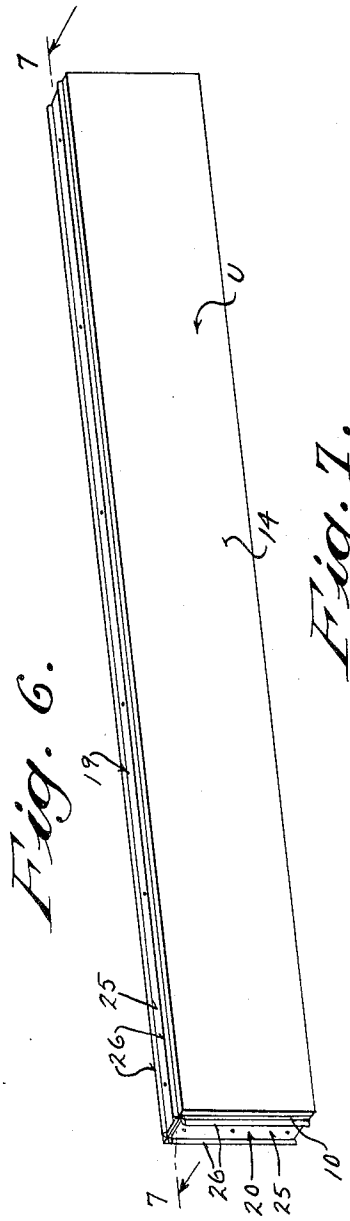


Fig. 6.

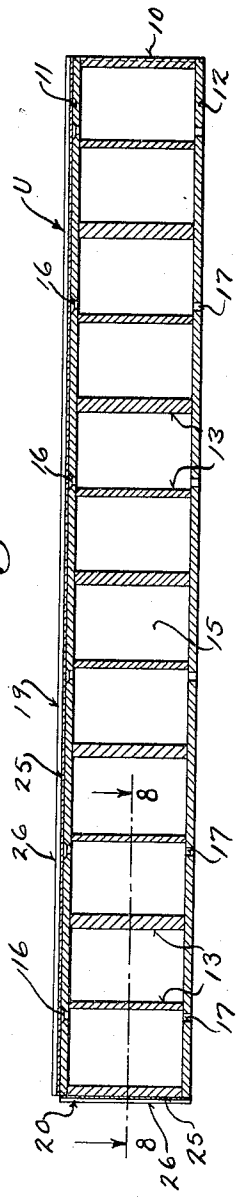


Fig. 7.

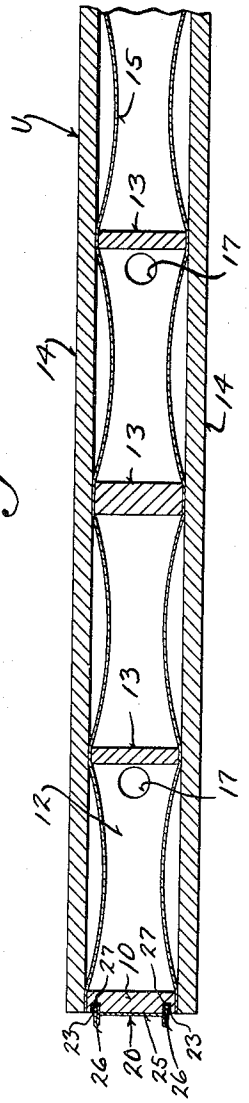


Fig. 8.

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PREFABRICATED BUILDING CONSTRUCTION

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Application March 7, 1955, Serial No. 492,605

2 Claims. (Cl. 20—4)

This invention appertains to buildings of the so-called prefabricated type, and more particularly to a novel construction and arrangement of prefabricated structural units for the formation of walls, partitions, floors, roofs etc. to replace the usual framing structure and wall, roof etc. finishing material.

One of the primary objects of my invention is to provide structural units of predetermined size, which can be quickly and rigidly connected and joined to form the desired walls, floors, etc. by unskilled labor (or do it yourself) at a comparatively low cost to form a well insulated and durable building.

Another salient object of my invention is to provide structural units or panels of certain dimensions formed of a hollow box like insulated consrtuction with the opposite exposed faces of the units formed from a finishing material, whereby upon the proper assembly of the units, the external and internal faces of the building will need no further treatment.

A further important object of my invention is the provision of novel non-exposed metal joint strips for interlocking the sides and ends of the units together during the assembly of the units to form the desired strong, weatherproof construction.

A still further important object of my invention is the provision of structural wall units and the like of predetermined dimensions to form staggered joints upon the assembly of the units with a novel arrangement of strengthening rods extending transversely through the units to effectively tie the units together to form the structurally strong wall, floor, roof etc.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described and claimed and illustrated in the accompanying drawings, in which drawings,

Figure 1 is a front elevational view of a partly constructed wall, showing the use of the prefabricated structural units or panels, parts of the figure being shown broken away and in section;

Figure 2 is an enlarged fragmentary vertical sectional view through the wall taken on the line 2—2 of Figure 1, looking in the direction of the arrows, illustrating the means of joining abutting edges of the units together and the strengthening rods for tieing the units together;

Figure 3 is an enlarged detail fragmentary vertical sectional view through the upper portion of one of the panels or units showing the same ready to receive the metal joining strip, the view being taken on a greater scale than Figure 2;

Figure 4 is a view similar to Figure 3 but showing a metal joining strip in place;

Figure 5 is a view similar to Figure 4, but showing a pair of the units joined together and united by tie rods;

Figure 6 is a detail perspective view of one of the building units;

Figure 7 is a longitudinal vertical sectional view taken through the unit on the line 7—7 of Figure 6, looking in the direction of the arrows, and

Figure 8 is an enlarged horizontal sectional view taken through one of the units on the line 8—8 of Figure 7, looking in the direction of the arrows.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter U generally indicates my structural units or panels for forming an exterior wall W as shown in Figure 1, or partitions, floors, roofs, etc.

The units U are of predetermined dimensions and of a certain selected height, width and length, and in Figure 1, I have shown the use of two different lengths of units, say 12 and 8 feet long, so that upon the proper assembly of the units, vertical joints will be in staggered relation. It is to be understood that the units can be made in any desired lengths, say from 16" up to 12' and the units themselves are so constructed that the same can be sawed at proper points to give desired short lengths of units.

Each unit U consists of an interior gridwork preferably formed from low grade or cost lumber and each unit is of a hollow box like construction. As illustrated, each unit U includes end uprights or pieces 10 joined at their opposite edges by longitudinally extending strips or side pieces 11 and 12, also preferably formed from low grade, soft lumber, rot-proofed. Between the end pieces 10 are parallel spacers 13 to form the interior gridwork. These spacers are equidistantly spaced say 8" and every other one of these spacers is a certain thickness and a greater thickness than the remaining spacers, whereby a unit can be cu tto sections of say 16", with the ends thereof finished or closed. Finishing panels 14 are provided for the opposite faces of the units and these finishing panels can be formed from any desired material, such as pressboard or the like, and hence the opposite faces of the panels form a finishing exterior or interior when the units are assembled. The various parts of the units can be secured together in any desired way either by fastening elements or a suitable type of adhesive. By providing the gridwork I form individual cells between the spacers and these cells can be insulated. I preferably use aluminum foil 15 for this purpose and the foil is held in place between the outer skins or faces 14 and the end pieces 10 and the spacers 13. The foil is pressed in or pancaked away from the inner surfaces of the outer skins or finished faces 14 so that both sides of aluminum foil 15 will act as reflecting surfaces. The longitudinal strips 11 and 12 are bored with vertically aligned openings 16 and 17 for receiving tie rods 18, which will be later described.

It is to be noted that the openings 16 in the longitudinal strip 11 flare upwardly and outwardly for a purpose, which will also be set forth. The units are also treated to receive longitudinally extending metal joining strips 19 at their longitudinal edges and metal joining strips 20 at their end edges during the formation of a wall or the like and this also will be described in detail.

Now referring to Figure 1 and considering that an outside wall W is being constructed, then a bottom plate 21 is laid upon a foundation 22 and a long unit U is placed on the plate, after which a shorter unit U is laid upon the plate in longitudinal alignment with the long unit. This constitutes the first course and in making the second course, a relatively short unit U is selected and laid on the top edge of the first long unit U after which a relatively long unit U is selected and laid upon the two bottom units and this is repeated until the wall is completed. By this arrangement, the vertical joints are staggered and are out of direct alignment. Obviously, around windows and doors, the units are cut to fit.

To effectively unite the longitudinal edges of the units U together in the different courses, I employ the uniting strip 19 and the longitudinal edges of the units are pro-

vided with spaced parallel longitudinally extending grooves 23 and 24 into which the strips 19 are fitted.

The strips 19 are, as previously stated, formed from light gauge metal and they can be either extruded or bent into form on a rolling machine. Each strip includes a longitudinally extending flat body portion 25 having upturned flanges 26. These flanges are in turn bent downwardly upon themselves to provide depending extension flanges 27. In effect, the connecting strips 19 are of an I-shape in cross-section with flanges 26 and 27 extending from the opposite sides of the flat body portion 25.

In practice, the grooves 23 are filled with a mastic 28 having desired adhesive qualities and a strip 19 is placed upon the longitudinal edge of a unit with the flanges 27 inserted in the grooves 23 and into the mastic. When a unit is placed upon the top of an adjacent unit the lower edge of this unit is also filled with a mastic so as to overflow the grooves 24 and the upper unit U is placed firmly down on the lower unit U so that the flanges 26 will extend into the mastic and into the grooves 24. The pressing of the units together will cause the mastic to flow between the units to unite the same. The ends of the units are grooved to receive the uniting strips 20 which are identically the same shape and construction as the uniting strips 19. The end uniting strips 20 are secured in place by the mastic and the mastic in turn helps to rigidly connect the units together.

As the units are assembled in their correct courses the same are firmly tied together by the rods 18 and the rods are also made in varying lengths to facilitate handling and the making of walls of different heights. If the units U are 16" wide or high, as the case may be, then the tie rods can be in lengths starting with 16". Other lengths of tie rods can be 32" and 48". By having the tie rods in different lengths, the connecting joints of the tie rods will be out of alignment with one another at different points throughout the length of a wall.

The openings 16 and 17 for the tie rods 18 are at certain definite points and when the longitudinal joining strips 19 are placed in position on a unit these metal joining strips are marked to indicate the location of the holes 16 and 17. The rods themselves can be formed from any desired material and can be of a hollow construction. However, the lower ends thereof are reduced in diameter and externally threaded as indicated by the reference character 30. The upper ends of the rods are flared outwardly, as at 31, and the inner surface of the rods inwardly of the flared portion 31 are internally threaded to receive adjacent lower threaded terminals 30. The plate 21 is also provided at exact spaced points with openings 32 for vertical alignment with openings 16 and 17 and if preferred metal sockets (not shown) can be placed and anchored in the openings 32. However, the threaded terminals of rods 18 can be threaded directly into the plate 21, as will now be set forth.

Considering that the first course of a wall has been laid then shorter lengths of rods 18 are selected and are driven through the light metal strips 19 at the indicating points and through the openings 16 and 17 until the flared upper ends thereof set into the flared portions of the openings 16. At this time, the rods are being turned so that the lower ends thereof will be threaded into the openings 32 into the plate 21. As best shown in Figure 1, short rod sections 18 are placed in every other set of openings 16 and 17 and when the second course of the units is laid the 32" rod sections are driven through the light metal uniting plates 19 of the two courses of the units between the short sections of the rods and the lower terminals of these 32" sections are threaded into the plate 21. Upon the laying of the third and fourth courses of the building, the long rod sections, namely 48", can be placed through the units and threaded into the short rod sections which were initially placed in position. This pattern of uniting rod sections of different lengths is followed until the wall is completed.

While throughout the description, I have referred more particularly to walls, it is again to be understood that the units are to be used for partitions, floors, roofs, etc.

Great stress is laid on the uniting strips 19 and 20 formed from light sheet metal and the manner in which they are used for uniting abutting edges of the units together to form a rugged wall. This in combination with the tie rods 18 forms an exceptionally strong and weatherproof building.

Various changes in details may be made without departing from the spirit or the scope of this invention, but what I claim as new is:

1. In a building construction, a wall or the like including a plurality of longitudinally extending units of predetermined dimensions, said units being adapted to be laid in courses and each course including at least a long unit and a shorter unit, with the joints of adjacent units in one course being out of alignment with adjacent joints of units in the next course, each of said units including spaced exterior finishing panels, and interior gridwork uniting said panels including equidistantly spaced partition strips, top, bottom and end closing strips for the panels united to the interior faces of said panels, said gridwork in conjunction with the panels and the top, bottom and end closing strips defining individual cells, means for uniting the units of one course with the units of another course including light metal joining strips having oppositely directed flanges, the adjacent edges of the units of the courses having grooves filled with a mastic and receiving said flanges, said joining strips for the ends of adjacent units having oppositely directed flanges and said ends of adjacent units being grooved to receive said flanges and sealing mastic, and tie rods extending transversely through the units and the courses of the units for tieing said courses together.

2. In a building construction, a wall or the like including a plurality of longitudinally extending units of predetermined dimensions, said units being adapted to be laid in courses and each course including at least a long unit and a shorter unit, with the joints of adjacent units in one course being out of alignment with adjacent joints of units in the next course, each of said units including spaced exterior finishing panels, and interior gridwork uniting said panels including equidistantly spaced partition strips, top, bottom and end closing strips for the panels united to the interior faces of said panels, said gridwork in conjunction with the panels and the top, bottom and end closing strips defining individual cells, means for uniting the units of one course with the units of another course including light metal joining strips having oppositely directed flanges, the adjacent edges of the units of the courses having grooves filled with a mastic and receiving said flanges, joining strips for the ends of adjacent units having oppositely directed flanges and said ends of adjacent units being grooved to receive said flanges and a sealing mastic, and tie rods extending transversely through the units and the courses of the units for tieing said courses together, said tie rods including sections of different lengths, and the opposite ends of said lengths being reduced and externally threaded and flared and internally threaded respectively.

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