June 15, 1943. W. E. WILSON 2,321,567

STRUCTURAL UNIT

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Fig. 1

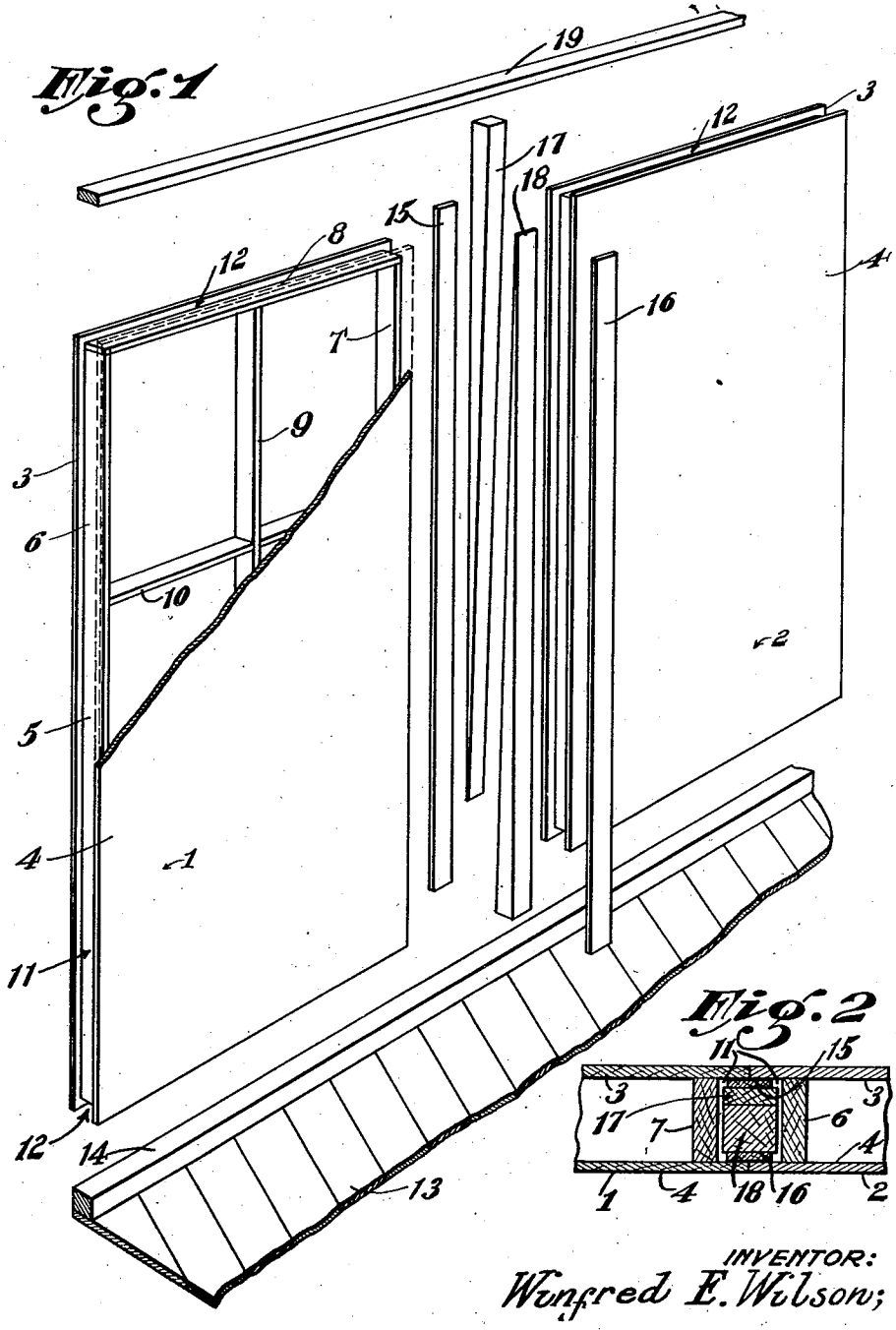

Fig. 2

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STRUCTURAL UNIT

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2 Claims. (Cl. 20—4)

This invention relates to structural units, and particularly to a system of utilizing plywood structures for the prefabrication of houses, buildings, and the like.

I have found from experiment that it is possible to prefabricate various elements that enter into the proper fabrication of a building structure. My invention is not to be confused with so-called structures wherein, for instance, timber is cut to length and lettered or numbered, but rather to that form of structure which utilizes plywood. For instance, a basic unit for wall construction may be of any size, say 4 feet by 8 feet, and constructed of plywood. This basic unit may be cellular, which is to say, has two sheathing members of plywood in substantial parallel relationship separated by framing. Nails, screws, and the like are not used, but the unit is constructed in such a manner that all its members are held in working relationship by gluing. The unit takes advantage of the stressed-skin principle. In the construction of my panel, I so arrange the sheathing with relation to the framing that the panels may be readily erected and held together in a novel manner, as hereinafter described. It is contemplated that prefabrication will be made at the factory of the window units, door units, and the basic wall units. Variation in the assemblage of these units permits flexibility in the design of the dwelling.

An object of the present invention is the provision of a prefabricated structure and system of construction and installation which results in greater strength and rigidity of structure when assembled.

Another object is the provision of an unique method of pressure gluing the field joints between panels.

Another object is the provision of prefabricated units to permit a ready erection of a dwelling within a minimum of time and without wastage.

Another object is the provision of a system of prefabricated panel construction for dwellings which is superior to conventional frame and stucco structures.

Another object is the provision of a plywood structure for use in the prefabrication of dwellings wherein plastering is entirely eliminated.

Another object is the provision of a plywood structure for the prefabrication of dwellings which is superior to ordinary building structures, in that there is an ease of installation of electrical work, the structures readily insulated, and a vapor seal readily incorporated.

Other objects include a structural system as well as a structural unit which is economical in cost of manufacture, simple of structure, and generally superior to devices now known to the inventor.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, construction, association, and relative arrangement of parts, members and features, all as shown in a certain embodiment in the accompanying drawing, described generally, and more particularly pointed out in the claims.

In the drawing:

Figure 1 is a perspective fragmentary, partly sectional, separated view of panels which may be utilized in the fabrication of a dwelling, and

Figure 2 is a fragmentary transverse sectional view of a system of pressure gluing the field joints between panels.

Referring now with particularity to the drawing, I have shown two panels 1 and 2 of identical construction. These panels, for the purpose of illustration, may be stated as being, when completed, 4 feet by 8 feet in size. Each panel includes a pair of sheathing 3 and 4, and framework 5 interposed therebetween. The framework includes a pair of separated side members 6 and 7, and end members 8. Extending between the end members 8 is a vertical member 9. Cross members 10 lie between the vertical member 9 and the side members 6 and 7. The frame is, therefore, of a skeleton type and the members of the frame are held together by means of waterproof adhesive. Both sheathings 3 and 4 are formed of plywood. By way of example, if sheathing 3 is the exterior member, I prefer to use exterior grade Douglas fir plywood of say, five plies, whereas the interior sheathing 4 consists of three ply interior Douglas fir plywood. The sheathing is secured to the framework 5 under pressure with waterproof adhesive, such as a casein glue.

The interior framework is recessed back of the sheathing edges, thus providing side and end grooves designated generally as 11 and 12, respectively.

As has been before stated, these panel units are manufactured at the factory, and such features in a panel unit as may be desired are also incorporated at the factory, having reference to windows, doors, insulation, vapor seal, electrical outlets, etc.

I assume, by way of example, that two panels of the type shown in Figure 1 are to be assembled to form a wall. The usual foundation for

the building is, of course, provided. In Figure 1, I have shown a flooring at 13 and secured to the flooring is a sill 14. This sill is adapted to be accommodated within the end groove 12 of a panel. Panels 1 and 2 are fitted over the sill 14, and the contiguous side edges thereof are brought into butt to butt engagement, as shown in Figure 2. A fish plate is then applied in overlapped relationship between the aligned sheathing of the two units. In Figure 2, two fish plates 15 and 16 are utilized, and before being placed in position on the inside surfaces of the sheathing, glue of the waterproof type is applied to each fish plate surface that is to engage the sheathing. To assure a pressure glue spline, I have provided a pair of elongated wedges 17 and 18. By pounding downwardly upon the enlarged head of wedge 17, the wedges will slide on the inclined surfaces thereof and force the fish plates into pressure engagement with the sheathing. After the fish plates have thoroughly set, the wedges may be removed or left in position as use and circumstance indicate. The resultant structure is very rigid and it is to be observed that no nail or screw holes appear in the panels at the joint.

A top plate 19 may be received within the grooves 12 of the two panels and be held in place through the medium of a waterproof adhesive. Thus, the recessing of the frame back of the sheathing edges permits of joining to the sills, plates, and adjoining units. This method of assemblage adheres in all the units, with the result that a stress resisting wall is provided which, under actual test, has been found superior to the usual nailed frame and covered building structure. I intend that all sheathing members should be given a priming coat of paint. The inside surface of the sheathing may be given a coat of elastic paint which resembles a plastered surface without, however, the hazard of cracks and spalling. The joints between panels are completely covered through the use of elastic paint. Examples of elastic paints are the well known trade porducts sold throughout the United States under the names of "Plastereez" and "Rezitex." The outside sheathing of the panel may be painted in the usual manner.

Reference to Figure 2 shows that the fish plates 15 and 16 are of a breadth sufficient to overlap the sheathing but not entirely fill the end grooves 11. When the side members are secured to the sheathing by gluing, the glue exudes at the corners and leaves a glue bead. To take and remove this bead would entail considerable labor operation. Consequently, I may preserve the glue bead, which is included between the sheathing and the frame members, together with whatever advantage the bead affords, by reducing the breadth of the fish plates. Hence, when the fish plates are glued in position, any glue which is exuded from between the fish plates and the sheathing may enter the space included along the sides of the fish plates, side members, and sheathing.

It is also evident that in certain installations I may dispense entirely with the fish plates and use the elongated wedges as the faces of the wedges will lie flat against the two butt to butt related pairs of sheathing and have a pressure engagement therewith when one of the wedges is moved relative to the other wedge. The sheathing engaging faces of the wedges may have a glue surface and therefore become secured to the sheathing after the glue has set.

It is also apparent that neither the fish plates nor the wedges need of necessity have a glue surface engaged with the sheathing but simply a pressure engagement. In certain installations, this may be preferable, particularly if a given dwelling is to be erected and dismantled rapidly. I have reference to Army cantonments where buildings must be erected quickly and perhaps as quickly dismantled for use elsewhere.

I claim:

1. In combination, a pair of structural units each comprising a spaced pair of plywood sheathing and a cellular frame therebetween, the cellular frame being recessed inwardly from the edges of the sheathing, said structural units being in butt to butt relationship, a pair of fish plates overlapping and glued to the sheathing of each unit at the recessed portions thereof, and a pair of wedges interposed between said fish plates for maintaining said fish plates in pressure engagement with the sheathing.

2. In combination, a pair of structural units, each comprising a spaced pair of sheathing and a cellular frame therebetween, the cellular frame being recessed inwardly from the edges of the sheathing, said structural units being in butt to butt relationship, and a pair of co-engaging wedges overlapping and co-extensial with the edges of the sheathing of each unit within the recessed portions thereof for maintaining said structural units in working relationship when the wedges are relatively moved longitudinally to be in pressure engagement with the inner faces of said sheathing.

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