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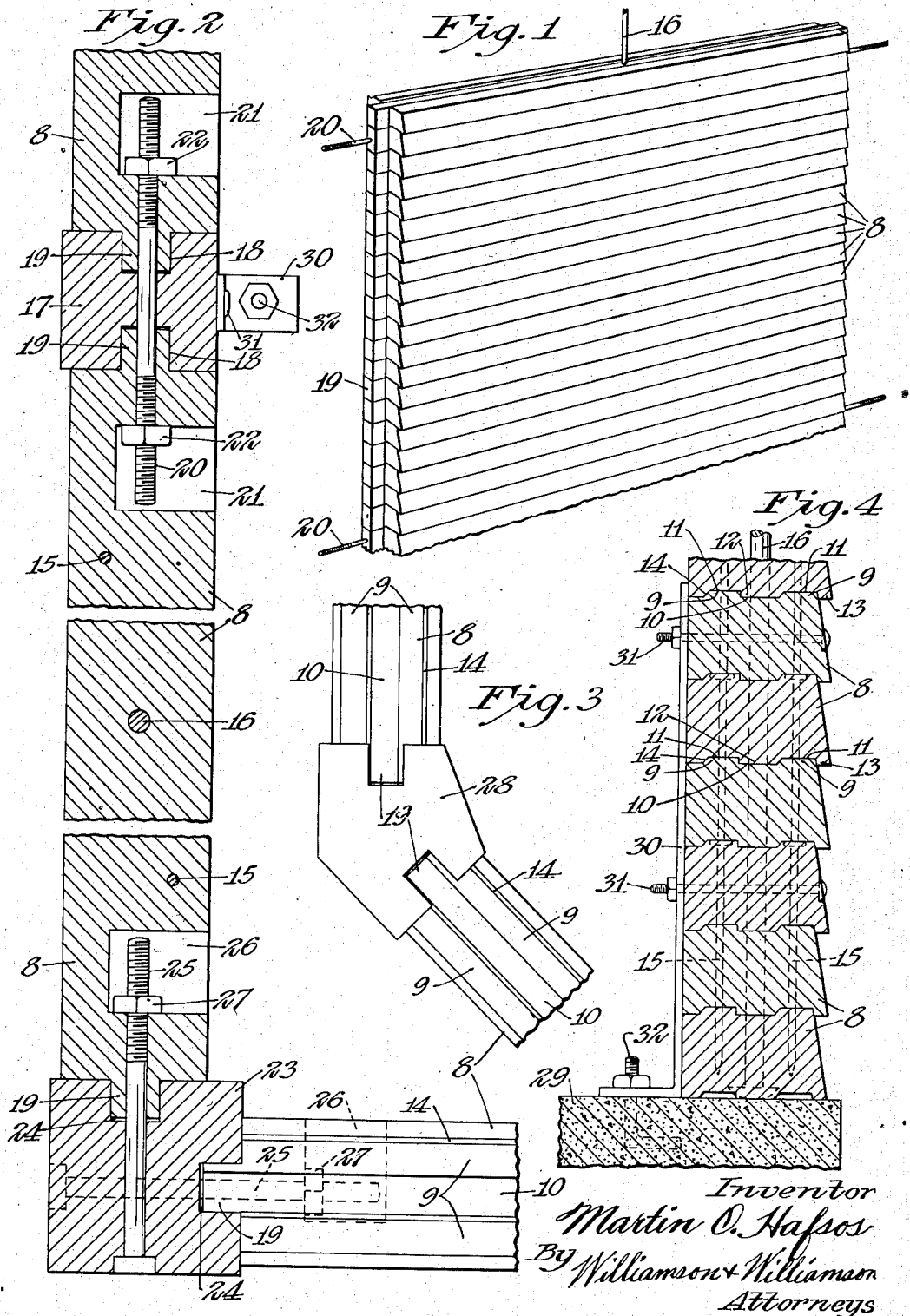
M. O. HAFSOS

2,387,659

BUILDING UNIT AND CONSTRUCTION

Filed Nov. 19, 1941

2 Sheets-Sheet 1



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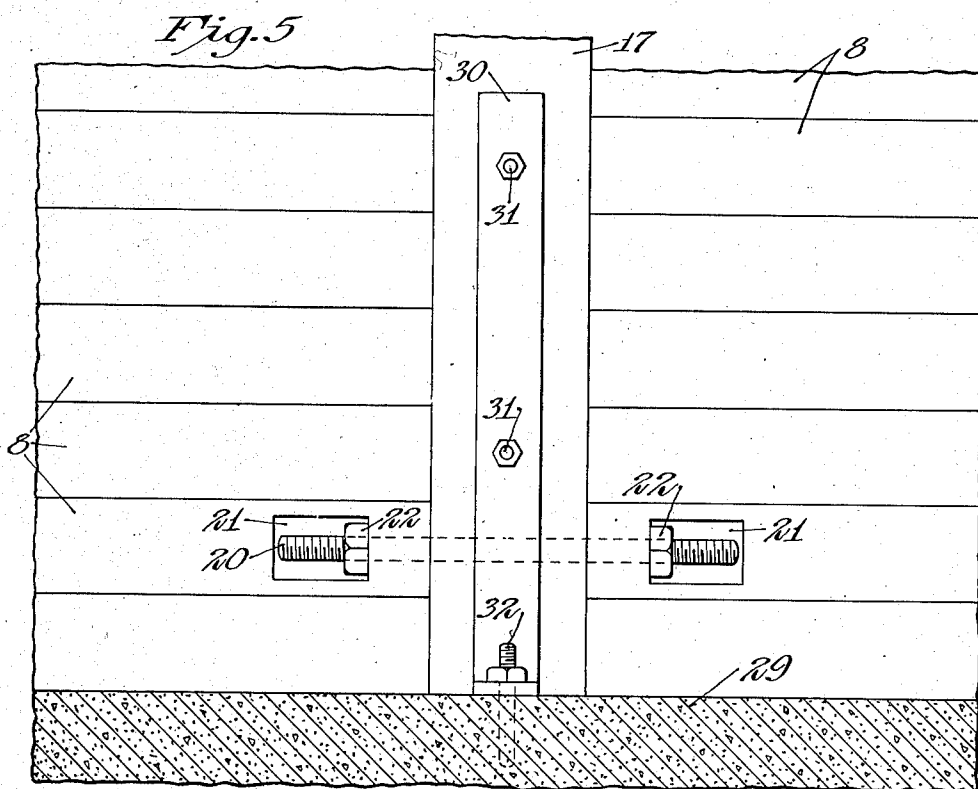
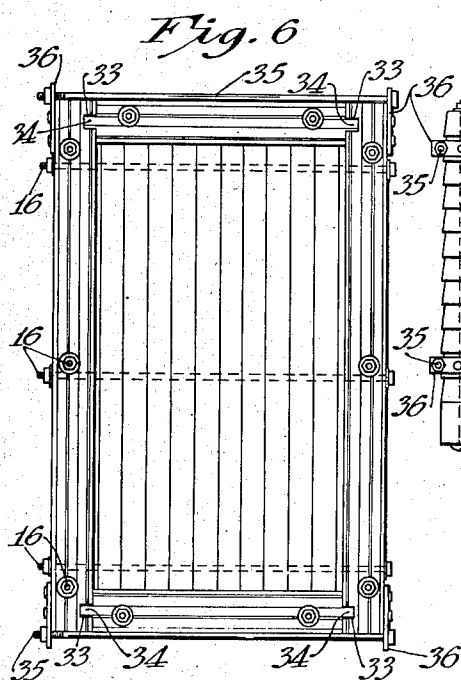
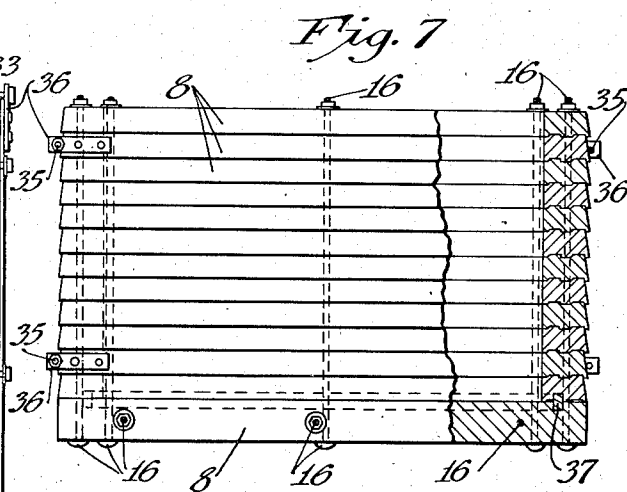
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UNITED STATES PATENT OFFICE

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BUILDING UNIT AND CONSTRUCTION

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4 Claims. (Cl. 20—4)

This invention relates to structures made up of pre-formed units.

Numerous types of pre-formed buildings and other structures have been designed heretofore with the object of reducing waste lumber and also facilitating erection, and while some of them have been practical many of them were so designed that they did not fit together tightly enough and did not have sufficient strength for ordinary usage.

It is a general object of my invention to provide structural building units which are relatively simple in design and which can be easily assembled into extremely rigid and tightly fitted structures.

A more specific object of the invention is to provide panels made up of superimposed timbers having relatively wide and shallow tongue and groove connections and overlapping portions wherein the tongue and groove connections are designed to tightly draw the overlapping portion of one timber against a portion of the next adjacent timber.

Another object of the invention is to provide panels made up of a plurality of timbers and means for securely connecting the adjacent edges of the timber panels.

A further object of the invention is to provide panel connecting means which is positioned entirely within the panels so that they do not interfere with the application of any desired finish work and which further is concealed so that it is not unsightly.

Still another object of the invention is to provide building panels which can be made into ordinary building structures or can be adapted for other uses such as stock watering tanks.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the views, and, in which:

Fig. 1 is a perspective view of a portion of one of my panels;

Fig. 2 is an enlarged fragmentary horizontal section through several interconnected panels showing a straight panel joint and a corner joint;

Fig. 3 is a fragmentary plan view of a forty-five degree joint;

Fig. 4 is a fragmentary vertical section through a panel portion;

Fig. 5 is a fragmentary elevation at a straight panel joint;

Fig. 6 is a plan view of another type of construction forming a stock watering tank and the like; and

Fig. 7 is a side elevation of the structure in Fig. 6 with portions broken away to better show the construction.

While I mention the individual units making up the panels as being timbers it should be understood that I am not limiting myself to wood construction but that term is merely used for the purpose of convenience.

In the drawings I have shown a plurality of timbers 8. These timbers are placed one upon the other and are provided with interfitting tongue and groove connections. In the form illustrated best in Fig. 4 each timber 8 has a pair of upper tongues 9 which extend longitudinally of the timbers and which define an intermediate groove 10 on the upper face of the timber. Co-operating with the tongues 9 are grooves 11 formed in the undersides of the timbers, and between the grooves 11 on the underside of each timber 8 is a tongue 12 which fits into the groove 10 on the upper face of the timber immediately therebelow.

Each of the timbers 8 is provided with an overlapping portion 13 which in combination with the right-hand or outer groove 11 on the underside of each timber, as viewed in Fig. 4, fits around the outer and upper longitudinal edge of the timber below. It should also be noted that each of the tongues 9 and grooves 11 is provided with a side wall portion 14 which slants inwardly and downwardly away from the outer surface of the wall panel and also from the overlapping portion 13 on each timber 8.

As the timbers 8 are placed on each other they are nailed together. As shown in Fig. 4 and starting from the lowermost timber 8 it will be seen that three timbers are piled vertically and the pair of long nails or spikes 15 are driven in them to secure them together. I have then shown two more timbers placed in position and another pair of nails 15 driven through the fourth and fifth timbers from the bottom and into the third timber. Of course, although I have shown that one particular arrangement of nailing it is understood that various lengths of nails can be used for more or less timbers nailed together as the panel is built up.

In order to further secure the timbers together and make a rigid panel I provide tie rods 16 which extend through the entire group of timbers comprising a panel. While only one tie rod 16 is shown in the panel in Fig. 1, of course, additional rods can be used as the type of construction demands. As one of the panels is assembled and the timbers are drawn tightly together by the nails 15 and tie rods 16 the slanting walls 14 in the tongue and groove connections tend to shift the timbers inwardly relative to each other to pull the overlapping timber portions 13 tightly against the timbers upon which they rest. This makes an extremely tight connection so that panels formed in the manner described are unusually wind and water proof making them suitable for any type of building

structure, and as indicated in Figs. 6 and 7 for use as stock watering tanks and the like.

In Fig. 2 there is shown a portion of a wall having a straight panel joint and a corner joint. The straight panel joint includes a connecting post 17 which has a pair of oppositely disposed vertical channels 18 formed therein. The channels 18 are adapted to receive tenons 19 formed on the ends of the timbers 8. Tie bolts 20 are shown in Figs. 2 and 5 to be threaded at each end and said tie bolts 20 are embedded in the panels and extend from the edge portion of one panel through its tenon 19 and through the connecting post 17 and into the adjacent edge of the next panel. The panels are provided with cut-outs 21 so that the threaded ends of the tie bolts 20 can be reached so that nuts 22 can be threaded on the bolt 20 and tightened to draw the panel edges firmly into the channels 18 and the connecting posts 17.

In the corner connections shown in the lower part of Fig. 2 there is shown a corner post 23 having a pair of vertical channels 24 disposed at right-angles to each other. The channels 24, of course, receive tenons 19 on the panels made up of the timbers 8 and tie bolts 25 extend inwardly through the corner post 23 at right-angles to each other and to the edge portions of the wall panels. As in the case of the tie bolts 20 the bolts 25 extend into recesses 26 formed in certain of the timbers 8 so that the nuts 27 can be tightened. Fig. 3 shows a connecting post 28 which is so arranged as to provide for a wall angle of approximately forty-five degrees.

In Figs. 4 and 5 there is shown a foundation 29. The wall panels made up of the timbers 8 are shown resting upon the foundation 29. Brackets 30 are shown secured to the connecting posts 17 by means of suitable bolts 31, and said brackets 30 have lower horizontally extending portions connected to anchor bolts 32, the lower ends of which are embedded in or otherwise securely fastened to the foundation 29. The brackets 30 are preferably not secured to the walls until the panels have been placed on the foundation because in some cases the panels may not rest flat upon the top of the foundation. With different types of foundation structures the brackets 30 would be placed in different positions.

In Figs. 6 and 7 I have illustrated a tank construction. The side walls and bottom are made up of timbers 8 which are built up in panels in much the same manner as those described in Figs. 1 through 5. The vertical tie rods 16 are again used. As shown in Fig. 6 the longer side walls of the tank construction are provided with cut-outs 33 to receive tenons 34 which are formed at the edges of the shorter end walls. These joints are made tight by means of horizontal tie rods 35 which extend across the end walls and are connected between end plates 36. The bottom of the tank is connected to the side walls by means of the tie rods 16, and in order to make this connection water tight I insert a strip 37 between the lowermost timber 8 in the side wall and the timbers which make up the bottom. This prevents water from seeping out between the bottom of the side wall and the tank bottom.

From the foregoing description it will be seen that I have provided a construction which is adaptable to many forms and uses and which can be pre-formed at the mill and quickly assembled on the site. Because of the slanting walls of the tongue and groove connections and

the means used for drawing them tightly together the overlapping portions of the timbers make tight connections with adjacent timbers so that a strong tight jointed panel is produced. I have provided strong and simple edge connections for the panels and have arranged the connections so that a neatly finished wall structure results.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. A building unit comprising a member having longitudinal grooves in its upper and lower surfaces, one lower longitudinal edge portion of said unit constituting an overlap flange adapted to fit closely about an upper longitudinal edge of a similarly constructed unit, the inner side walls only of said grooves being slanted downwardly and away from said overlap flange and adapted to engage with a similarly slanted portion of a complementary unit whereby the slant of said channel wall will draw said flange tightly against a complementary unit upon which it is placed, and means for drawing said timbers tightly together.
2. A panel construction comprising a plurality of timbers, certain edge portions of said timbers lying about overlapping adjacent edge portions of adjacent timbers, slanting complementary contacting portions of said timbers being slanted only away from said overlapping edge portions, and means for drawing said timbers tightly together, said contacting slanting portions of said timbers being arranged to cause said overlapping portions thereof to be drawn tightly against the adjacent portions of the timbers which they overlap.
3. A panel construction comprising, a plurality of timbers, said timbers having tongue and groove connections and being substantially identical in shape, said timbers having longitudinal edge portions overlapping the outer upper edges of adjacent timbers, certain portions of said tongue and groove connections including slanting side surfaces, all of said slanting side surfaces slanting away from said overlapping portions of said timbers, and means for tying said timbers together, said tying means exerting forces on said slanting surfaces to draw said overlapping portions of said timbers tightly against those portions of adjacent timbers which they overlap.
4. A building unit comprising, a pair of substantially horizontal superposed members, said members having adjacent surfaces with longitudinal tongues and grooves therein, said adjacent surfaces of said members being relatively closely fitting, complementary side walls of said tongues and grooves in each of said members being slanted, the opposite wall of each of said tongues and grooves being substantially vertical, the minimum transverse measurements of said tongues and grooves being at least substantially as great as their vertical measurements, and a tension device interconnecting said timbers and exerting a substantially vertical tension to draw said members tightly together whereby cooperating slanting side wall surfaces of said tongues and grooves of said members will exert a generally lateral movement to produce close contact between said adjacent substantially vertical side walls of said tongues and grooves.

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