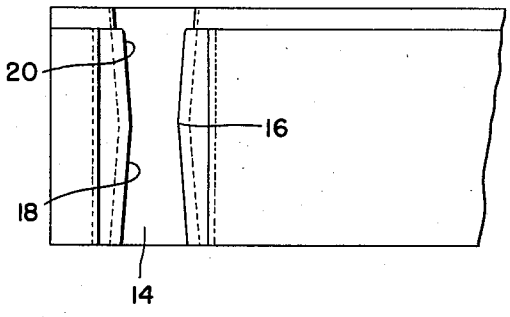
Sept. 8, 1959 G. R. JUSTUS 2,902,733

CORNER CONSTRUCTION FOR SAWED TIMBER WALLS

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FIG 2



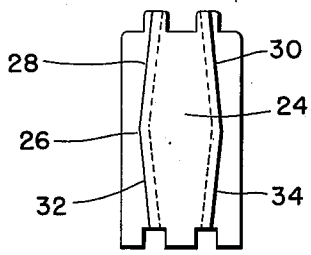


FIG 3

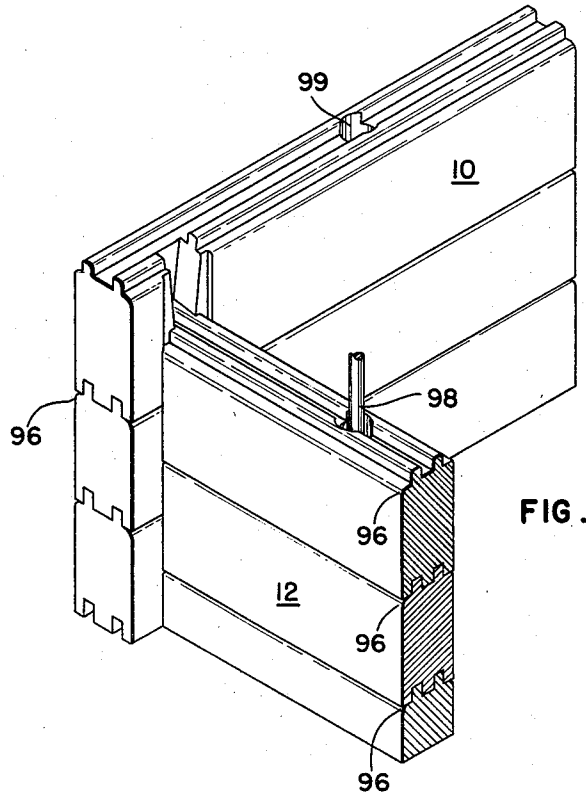


FIG 1

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FIG. 4

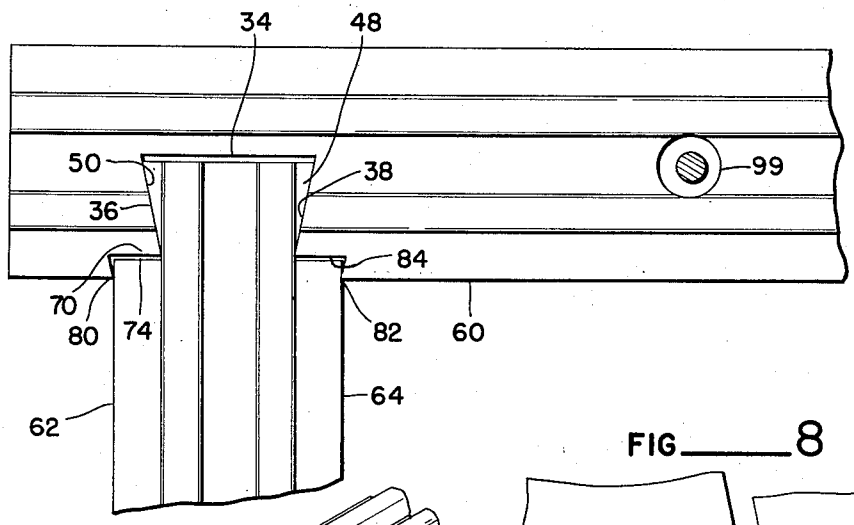


FIG. 5

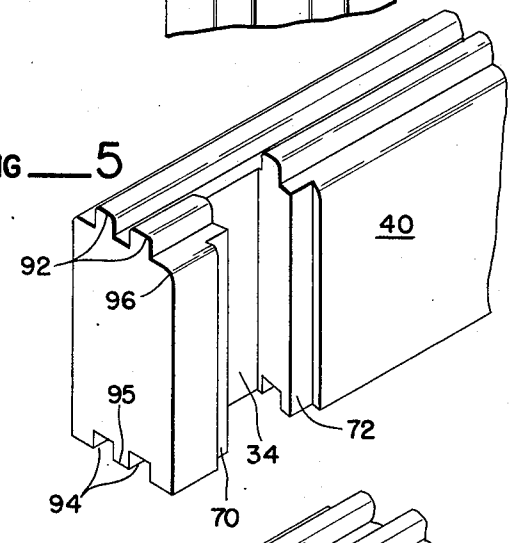


FIG. 6

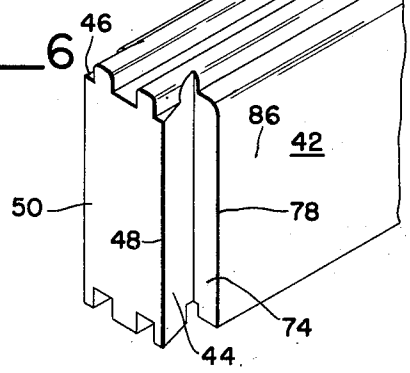
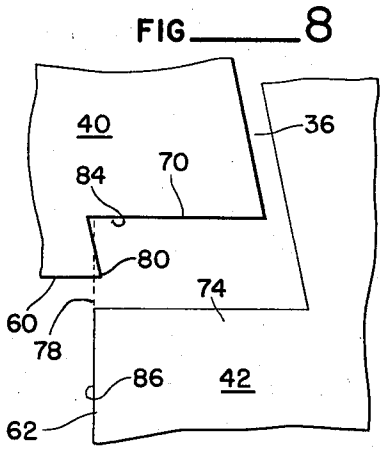


FIG. 8



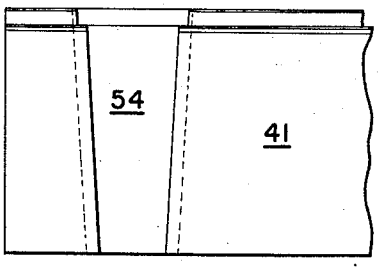


FIG. 7

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United States Patent Office 2,902,733 Patented Sept. 8, 1959

2,902,733

CORNER CONSTRUCTION FOR SAWED TIMBER WALLS

George R. Justus, Seattle, Wash.

Application October 28, 1955, Serial No. 543,385

4 Claims. (Cl. 20—92)

The present invention relates to the general art of timber house construction and more particularly to a corner construction for use in the erection of houses and the like wherein the walls are made of sawed timber of substantial thickness. This invention contemplates that corners, either interior or exterior corners, will provide for one wall to overlap the abutting wall. The overlapping wall is provided with a dove-tailed slot on one side of each of the timbers making the wall, and on the abutting wall the timbers are faced with a dove-tailed tongue to the end that the timbers are laid up with the center of one timber on the juncture between the timbers of the co-acting wall forming the corner or may be positioned on the same horizontal plane, depending on the type of groove and tongue employed.

In the past many attempts have been made to employ the desirability of heavy timber construction in the building up of walls for the smaller buildings such as are used for residences and other buildings of comparable size. Many forms of structures have been provided but those observed have been on one hand difficult to machine in the mill or plant and required considerable skill on the part of the erectors if reasonable appearance and weather tightness were to be achieved. Further, the majority of types inspected have not provided real rigidity in the erected structure. In this present structure means have been provided to insure that the joints can be formed of the abutting timbers in only one possible way and that insures uniformity of appearance, and because of the interlocking of the abutting timbers a very secure and weather tight joint can be achieved. By embodying the principles of this present joint in the construction of timber walls a very appreciable saving is made in initial cost of the materials themselves but most especially in that the bulk of the erection labor is unnecessary and the construction lends itself very well to owner erection, which is a very desirable characteristic.

The principal object of this invention is to provide a corner construction which will insure the rigidity of a walled structure in which the individual walls are made of a single thickness of sawed lumber.

A further object of this invention is to provide a unique groove and tongue arrangement so that the joints may be broken vertically between the overlapping wall and the abutting wall.

A further object of this invention is to provide a groove and tongue arrangement for joining the wall timbers at the various corners of a building wherein the tongue and its coacting groove are oppositely pitched from the center of the timbers both ways in the vertical and also provide a dove-tail arrangement when viewed in plan.

A further object of this invention is to provide a configuration to the ends of the abutting logs and to the margins of the grooves in the overlapping logs so that a neat weather tight junction is provided.

A further object of this invention is to provide a plurality of grooves and tongues on each edge of the individual timbers to the end that a finished appearing

and weather tight joint can be achieved between each of the super-imposed timbers making up the wall.

A further object of the invention is to provide vertical tie means so that the entire wall is rigidly secured to the foundation of the building.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

Figure 1 is a perspective view, partly in section, illustrating portions of the side wall construction more particularly to illustrate the coaction between the abutting timbers and the overlapping timbers;

Figure 2 is an elevation showing one end of a sawed timber for use in the construction of this invention. The groove illustrated occurs in the overlapping timbers only;

Figure 3 is an end elevation of one of the abutting timbers and illustrating the tongue arrangement adapted to coact with the groove as formed in Figure 2;

Figure 4 is a top plan view of a corner structure, illustrating the manner in which the dove-tailed groove and tongue is employed and also illustrating the manner in which the marginal junction is made between the two members;

Figure 5 is a perspective view illustrating the manner in which the groove of the overlapping timbers may be modified to admit of having the timbers join on the same level;

Figure 6 is an end view of one of the abutting timber members illustrating the modified form of tongue required for use with the groove of Figure 5;

Figure 7 is an elevation of one end of an overlapping timber illustrating a modified form of groove having a single taper;

Figure 8 is a diagrammatic view illustrating, on an enlarged scale, the cuts employed to suitably join the outer margins of the timbers forming a corner.

Referring more particularly to the disclosure in the drawings, the numeral **10** designates the overlapping timbers forming one wall and numeral **12** designates the abutting timbers forming the coacting wall to produce a corner. In its present form the overlapping logs have sawed into one face, at each of its ends, the grooves **14**. These grooves are double-pitched—by that is meant starting at the vertical center of the groove the opposite faces producing the groove are angularly disposed so that in effect they flare both ways from the central point as **16**. The lower portion as **18** sets on top of an abutting timber which is already in place and the upper portion of the groove as **20** is unfilled until the next abutting log is put in place. Viewed in plan groove **14** is a dove-tailed groove as will be probably best understood from Figure 4, which may be considered as a typical plan view for the various tongue and groove arrangements provided in this invention.

Adapted to coact with groove **14** is a double pitched tongue **24** wherein the upper half of the tongue above the central line **26** is of a form to engage the lower portion of the groove as illustrated in Figure 2. This upper portion of the tongue provides the two surfaces as **28** and **30** which are plane surfaces that are converging toward each other to form a dove-tailed tongue when viewed in any horizontal section. The lower half of tongue **24**, consisting of the plane walls **32** and **34**, form a dove-tailed tapering tongue adapted to engage the upper half of groove **14** as illustrated in Figure 2. The coaction of the overlapping timbers with their grooves and the abutting timbers with their tongues are probably best illustrated in Figure 1 in which just the corner portion of two adjoining walls are illustrated.

The form of construction shown in Figures 1, 2, and 3 provides the most secure juncture of two joining walls. However there are times when this form of structure does not provide sufficient elasticity in arrangement of the timbers, particularly in vertical relationship. Consequently a simplified form of this groove and dove-tail is illustrated in Figures 5 and 6 and also in Figure 4 which is a plan view which is in general common to the various forms when they are cut with a horizontal section. Referring to Figure 5 groove 34 is a dove-tail in that walls 36 and 38 are convergent so as to form a dove-tail groove in the overlapping timber 40. In this arrangement however, the groove is of the same width at the top and bottom of the timber without any vertical taper. A corresponding tongue is formed in the abutting timber 42 which is provided with the beveled sides as 44 and 46, but these sides while converging as they enter the timber so as to form a dove-tailed shaped tongue are parallel when viewed in elevation from the end so that the margins as 48 and 50 are parallel. This arrangement makes it possible to have the abutting logs lie wholly in a common plane with the overlapping logs. However, the joints may be broken as is common in the typical log cabin for instance and in keeping with the arrangement illustrated in Figure 1.

In order to keep this general plan as flexible in its application as possible a further modified form is illustrated in Figure 7 in which the groove as 54 in the timber 41 is dove-tailed in form after the showing of the plan view of Figure 4 and has both the groove and the mating tongue cut with co-acting tapers as viewed in elevation throughout the whole length of the groove or tongue. This arrangement does not permit the broken joint arrangement shown in Figure 1 but it does permit a very secure joint when the abutting and overlapping logs lie wholly in a common horizontal plane.

Referring to Figure 4 and the enlarged detailed Figure 8, special treatment of the timbers is made use of so as to make a weather tight, symmetrical joining between the outer surace as 60 of the overlapping logs and the outer surfaces as 62 and 64 of the abutting timber. In the overlapping timber, surfaces are provided at 70 and 72 which are parallel to the vertical longitudinal plane of timbers 10 and 40. The abutting timbers as 12 and 42 are each provided with two coacting plane surfaces as 74 and these surfaces meet after the general arrangement of Figure 4.

Figure 8 is a fragmentary diagrammatic view of the left hand portion of the joint shown in plan in Figure 4 with the members moved slightly away from each other. This view shows particularly the provision of a weather tight seal for the corners which is executed automatically upon the mortise and tongue joinder of overlapping and abutting timbers 40, 42. Surfaces 70, 72 are provided in counter-sunk secondary grooves 84 at the corners of the primary dove-tailed groove 14. The side walls of grooves 84 are outwardly flaring providing exposed, crushable corners 80, 82 which are bent and crushed by the right-angular corners 78 and sidewalls 86 of abutting timbers 42 as the joining timbers mate. The fibers exposed at the undercut corners 80, 82 are end grain and these accept a bending and crushing movement without flaking off. Thus, the sealing of the joinder is automatic and the crushing and bending function tolerates such variations in dimensions and cuts as would occur in these timbers and the cutting thereof. This form of joint provides two sealing lines and these have been found to add very materially to the weather tightness of the joinder. It must be remembered that the most vulnerable portion of this construction is at the joints where any water entering is very likely to produce dry rot at a very essential point in the timber construction. This form of sealing is applicable to and is used on the various types of dove-tailed joinders shown herein.

In order to provide a good sealing of the horizontal joints between the superimposed timbers a form of, preferably, double tongue arrangement is employed. This uses the two upper tongues, as 92, which are adapted to coact with the grooves 94 formed in the bottom of each timber. This produces a tongue as at 95 which may be seated in mastic if desired to effect an absolute tight joint with no opportunity for the mastic to escape due to the two parallel tongues 92. In order to further assist in draining the water away from the outside surface of the joints each of the timbers is provided with an exterior rounded corner at 96.

Where maximum security is desirable such as tying the roof structure down to the foundation a plurality of through tension rods as 98 may be provided which pass through mated openings 99 in all the various timbers. Various uses may be made of this. The upper ends of the rods 98 may be secured to the purloins or rafter structure and the lower portions can be imbedded as in a concrete foundation wall. This will provide a most thorough and secure tying together of all the components comprising the building. Holes 99 are enlarged over rod 98 so that a rod may easily be passed through a number of superimposed timbers. These mating holes may also be employed as passageways for utilities.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of corner construction for sawed timber walls.

Having thus disclosed the invention, I claim:

1. A corner construction for sawed timber walls, comprising: a first and second wall each formed by a series of superposed timbers and meeting at a corner with the timbers of the first wall lapping the abutting ends of the timbers of the second wall and the lapping timbers having vertical grooves accepting the ends of the timbers of the second abutting wall, the ends of said second abutting wall timbers formed as tongues adapted to coact with the vertical grooves of the first wall timbers to form joinders for the two walls the tongue and groove joinders being in dove-tailed relationship with the tongues being formed on the abutting timbers by an enlargement on each abutting timber intermediate of its end with the terminal ends of lesser width and the grooves having outwardly converging side walls mating with the tongues whereby the walls are tied together, the timbers of the first and second walls being at different levels in a half-step relationship and the groove in each lapping timber diverging vertically from a central restricted portion to wider upper and lower portions and the tongues on each abutting timber converging vertically from a central wider portion to upper and lower narrower portions, whereby the converging upper and lower portions on each abutting timber fit the lower diverging portion of a groove on a lapping timber at a half-stepped higher level and an upper diverging portion of a groove on a lapping timber at a half-stepped lower level.

2. A corner construction for sawed timber walls, comprising: a first and second wall each formed by a series of superposed timbers and meeting at a corner with the timbers of the first wall lapping the abutting ends of the timbers of the second walls and the lapping timbers having grooves accepting the dove-tailed ends of the timbers of the second abutting wall which form coacting tongue and groove joinders, said joinders being dove-tailed with the tongues being formed on the abutting timbers by an enlargement on each abutting timber intermediate of its end with the terminal upper and lower margins of lesser width and the grooves having outwardly converging side walls mating with the tongues whereby the walls are tied together, corresponding timbers of the first and second walls being at different levels and the groove in each lapping timber diverging vertically from a central restricted portion to wider upper and lower portions and the tongue on each abutting timber

converging vertically from a wider central portion to upper and lower narrower portions, whereby the converging upper and lower portions on each abutting timber fit the lower diverging portion of a groove on a lapping timber at a higher level and an upper diverging portion of a groove on a lapping timber at a lower level.

3. A corner construction for sawed timber walls, a first and a second wall meeting at a corner each formed by a series of superposed timbers, the timbers of the first wall lapping the abutting ends of the timbers of the second wall, and the timbers of the lapping wall having dove-tailed primary grooves accepting dove-tailed tongues formed on the ends of the timbers of the abutting wall, each overlapping timber having a counter-sunk secondary groove at the corners of the primary groove at the outside of the walls and each abutting timber having a portion inside of the tongue which fits into the counter sunk grooves, the side wall of the counter-sunk groove inwardly flaring forming an undercut, exposed corner and the corner and the adjoining sidewall of each abutting timber which meets the base and side wall of the counter-sunk groove being drawn by tension applied through the dove-tailed joinder into crushing relationship with said undercut, exposed corner bending and crushing the fibers thereof whereby the tenon and groove joinder is automatically sealed to the weather.

4. A corner construction for sawed timber walls, a first and a second wall meeting at a corner each formed by a series of superposed timbers, the timbers of the first wall lapping the abutting ends of the timbers of the second wall, and the timbers of the lapping wall having primary

grooves accepting tenons formed on the ends of the timbers of the abutting wall, each overlapping timber having counter-sunk secondary grooves at the corners of the primary grooves in which the side walls of the counter-sunk grooves inwardly flare providing undercut, exposed, vertically oriented corners and the corners and the adjoining side walls of the abutting timbers which meet the base and side walls of the counter-sunk grooves are pressed into crushing relationship with said undercut, exposed corners thereby effecting seals of the timber joinders.

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