

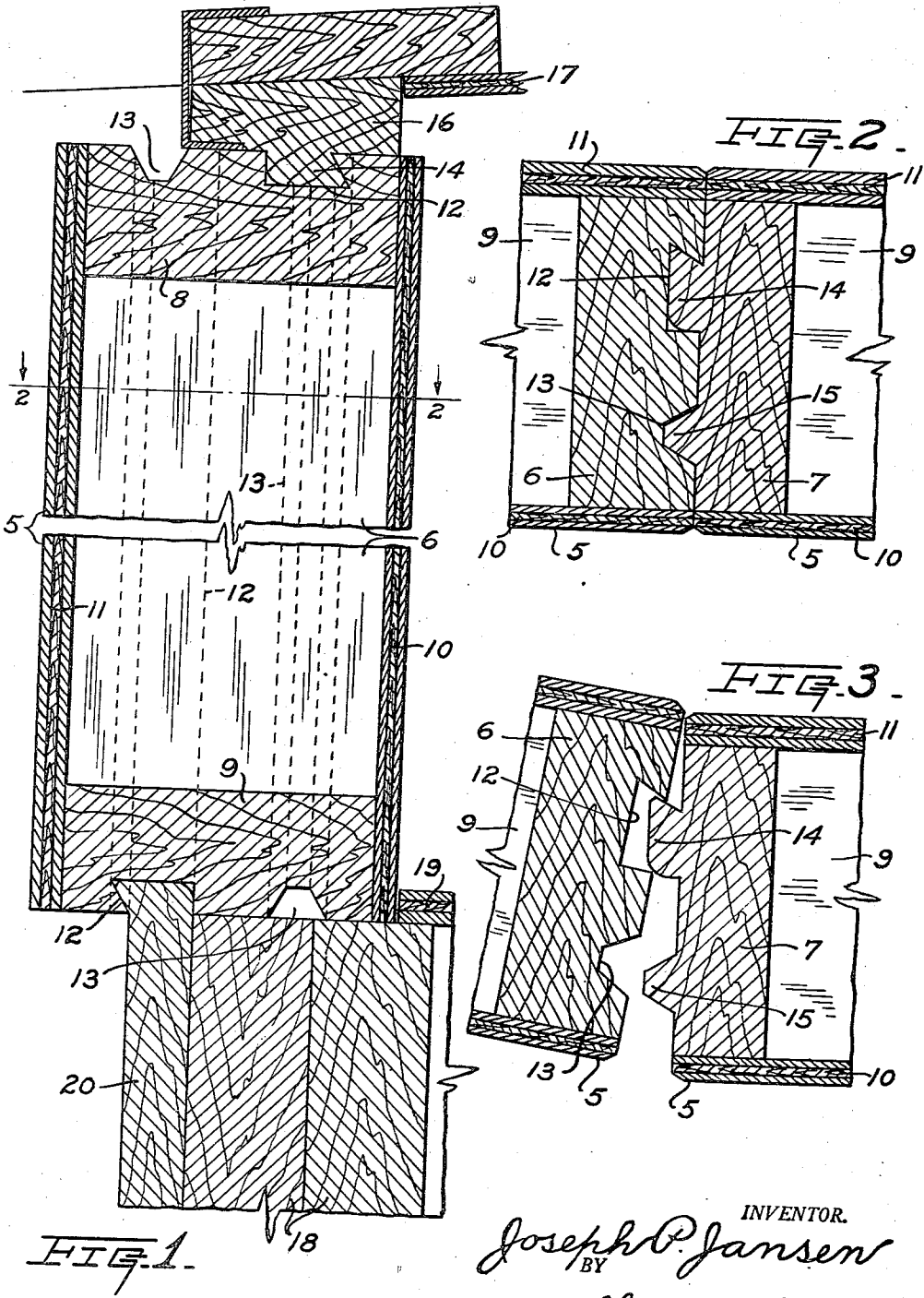
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JOINT FOR COMPOSITE STRUCTURAL ELEMENT

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JOINT FOR COMPOSITE STRUCTURAL ELEMENTS

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2 Claims. (Cl. 20-92)

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This invention relates in general to improvements in the art of building, and relates more specifically to improvements in the construction and manufacture of composite elongated structural elements such as beams, studs, joists or the like adapted for diverse building purposes.

The primary object of my present invention is to provide an improved composite elongated structural element formed of simple sections which may be readily assembled or dismantled, and which are also firmly and effectively united when assembled without necessitating the use of additional fasteners.

Many different types of so-called ready built houses and building structures, wherein the major portions are pre-fabricated at the manufacturing source and are adapted to be conveniently assembled in the field or at the place of ultimate utilization, have heretofore been proposed and used with moderate success. It is very desirable in the manufacture of such pre-fabricated structures, to provide floor, wall, and roof sections of relatively extensive areas and of standard sizes, which may be quickly and conveniently assembled and firmly united in perfect alignment without the use of nails, bolts, or other fasteners, and which may also be just as easily dismantled if so desired. It is also necessary that the pre-fabricated elements and sections be of simple, strong, and rigid formation in order to produce a sturdy and durable final structure; and it should furthermore be possible to economically manufacture the composite parts of the pre-fabricated buildings in quantity and at costs sufficiently moderate to attract the purchasing public. All of the prior pre-fabricated building structures have failed to adequately meet or incorporate one or more of these requirements and desirable features, and they have therefore failed to become very popular with the trade.

It is therefore a more specific object of the present invention to provide an improved structural element which is especially adapted for use in the manufacture of pre-fabricated building sections of diverse sizes and shapes, in order to effect rapid and firm uniting and perfect alignment of the adjacent sections.

Another specific object of the invention is to provide a new and useful sectional elongated member having interlockable parts, which may be manufactured at moderate cost with simple wood-working equipment, to produce interchangeably similar parts; and which may also be united to provide a sealed joint without the aid of battens or the like.

A further specific object of my invention is to provide an improved composite timber or the like, the cooperating sections of which are of simple and durable construction, and are adapt-

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ed to be rigidly united or assembled without the use of additional fastening elements, thus also making them readily separable.

Still another specific object of this invention is to provide an elongated stud or joist formed of interlocking sections, which may be firmly interconnected or disconnected, by merely moving the coacting sections laterally of each other and without necessitating relative longitudinal displacement thereof.

An additional specific object of my present invention is to provide a sectional beam which may be quickly and conveniently assembled or dismantled, and in which the cooperating sections are perfectly aligned and rigidly joined when the parts are assembled.

These and other specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of the features constituting my present improvement, and of the mode of constructing and of utilizing the improved structural members, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a fragmentary vertical section through the wall of a building embodying adjoining sections provided with improved composite studs and top and bottom plates made in accordance with my invention;

Fig. 2 is a transverse horizontal section through one of the interlocking composite studs of Fig. 1 in assembled condition, the section having been taken along the line 2-2, but the wall plates and stud having been swung into horizontal position; and

Fig. 3 is a view similar to that of Fig. 2, but showing the cooperating stud sections in the act of being assembled, though not fully united.

While the invention has been shown and described herein as having been specifically embodied in a wooden elongated stud especially useful for uniting adjoining sections and parts of pre-fabricated buildings, it is not my desire or intent to thereby unnecessarily restrict the scope or utility of the improvement which is obviously more generally applicable to composite elongated structural members of various dimensions, and formed of different materials.

Referring to the drawing, the pre-fabricated building shown therein comprises primarily, a series of side walls composed of adjoining rectangular sections or units 5 each consisting of an upright longitudinally recessed stud section 6 at one end and an upright complementary stud section 7 at its opposite end; parallel horizontal top and bottom plates 8, 9 respectively, spanning the space between the upper and lower extremi-

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ties of the stud sections 6, 7; and inner and outer parallel vertical wall boards or ply-wood sheets 10, 11 respectively, secured to the opposite sides of the rectangular frames formed by the stud sections 6, 7 and plates 8, 9 of each wall unit 5. The top and bottom plates 8, 9 are preferably formed of longitudinally recessed stock which is identical in cross-section with that used in the stud sections 6, and these plates 8, 9 and the closure sheets 10, 11 may be glued, nailed, or otherwise permanently united to produce rigid standard wall units 5 of any desired size or dimensions. If the wall units 5 are of considerable size, the interiors thereof may be re-enforced or braced by additional one-piece internal strengthening studs, in an obvious manner; and these internal re-enforcements may be ordinary strips of wood or the like.

As clearly illustrated in Figs. 2 and 3, the end stud section 6 of each wall unit 5, is provided with parallel recesses 12, 13 extending throughout the entire length thereof, the recess 12 having one side undercut or inclined and its opposite side disposed perpendicular to the adjacent face of the section 6, while the other recess 13 has inwardly converging opposite bounding surfaces. The opposite end stud section 7 of each wall unit 5, is provided with parallel projections 14, 15 also extending throughout the entire length thereof, the projection 14 being of approximately the same cross-sectional shape as the recess 12 except that the outer corners thereof are rounded or blunted, while the other projection 15 is tapered and of substantially the same cross-sectional shape as the recess 13. The projection 14 of each stud section 7 is adapted to snugly engage and to interlock with the recess 12 of the stud section 6 of an adjoining wall unit 5, and the wedge shaped projection 15 is adapted to simultaneously snugly engage the corresponding tapered recess 13 of the same section 6, so as to positively align the cooperating sections 6, 7 and the wall sheets 10, 11 secured thereto.

Due to the improved formation of the recesses 12, 13 and of the projections 14, 15, all of which may be readily produced with ordinary and well known wood-working machinery, the complementary sections 6, 7 of each stud may be readily joined and interlocked in the manner depicted in Fig. 3, by merely inserting the projection 14 within the interlocking recess 12 and by thereafter swinging the sections 6, 7 laterally toward each other so as to cause the other projection 15 to enter the recess 13 as in Fig. 2, whereupon the coacting sections 6, 7 will be perfectly aligned and positively locked against separation due to straight pulls exerted perpendicular to the coacting end surfaces of the stud sections. This interlocking and uniting of the sections 6, 7 is accomplished without the use of additional fasteners such as nails, bolts, or the like, and the two sections of each composite stud may be just as readily dismantled or disconnected by merely reversing the assembly operations. In cases where the wall sheets 10, 11 are formed of ply-wood or the like, the extreme outer meeting edges of these sheets may be chamfered as shown, in order to prevent marring thereof when the adjoining sections are swung apart.

As previously indicated, the top and bottom plates 8, 9 of each wall unit 5, and which are confined between the upper and lower extremities of the adjacent stud sections 6, 7 and wall sheets 10, 11, may be formed of the same standard recessed stock as that used in the construction of

the stud sections 6, in order to facilitate attachment of super-structure such as a roof, and foundation structure. As shown in Fig. 1, the top plates 8 of the units 5 may readily be utilized for firm attachment of roof stringers 16 having longitudinal tongues or interlocking projections 14 formed for locking cooperation with the undercut recess 12 thereof, and the roof deck 17 may be secured to the stringers 16 in any suitable manner. The bottom plates 9 of the units 5 may be caused to rest upon and may be firmly secured to outer floor or foundation joists 18 to which a floor 19 may also be attached, and the undercut recesses 12 of these lower plates 9 may also be utilized for the attachment of apron boards 20, as shown. These apron boards 20 may be rigidly attached to the joists 18 in any desirable manner, and this assemblage of elements obviously provides simple means for firmly holding the wall units 5 in assembled condition and for preventing inward or outward displacement thereof.

While the invention has been shown in the drawing as having been applied to the end studs of adjoining wall units 5 of a pre-fabricated building, it must be apparent that the improvement is just as readily applicable to the end joists of floor sections or units of any desired size, as well as to roof sections or units, or the like. When thus applied, the adjacent ends of the successive units will cooperate and will be connectible and disconnectible in precisely the same manner as depicted in Figs. 2 and 3 of the drawing, but in each case, the sections 6, 7 of the elongated interlocking members will be provided with longitudinal parallel recesses 12, 13 and with longitudinal parallel projections 14, 15 adapted to coact with these recesses. In every case, the recesses 12, 13 and projections 14, 15 may be readily formed with ordinary wood-working machinery such as commonly used in producing matched lumber and mill-work, so as to insure perfect fitting and alinement of the complementary sections 6, 7.

From the foregoing detailed description it will be apparent that my present invention provides an improved composite elongated structural element adapted for diverse uses, and which is formed of simple sections which may be readily assembled or dismantled. The improved sectional member is obviously adapted to firmly and effectively unite the parts associated with the sections thereof, without the use of additional fasteners, and the separable sections may be conveniently interlocked by merely moving the two sections laterally of each other. The sections of the structural element may also be readily manufactured with standard equipment and at moderate cost, and when the two sections of a member are interlocked, they not only serve to prevent separation of the sections, but also maintain the same in perfect alinement with each other. While the improved interlockable member has special utility when applied to pre-fabricated houses and buildings; it may obviously be utilized for diverse other purposes and constructed of different materials, so that the improvement in fact has considerable utility as applied to diverse structures. By utilizing the same stock in the formation of the top and bottom plates of wall units, as shown in the drawing, the associated roof and foundation may be firmly and detachably connected to the wall sections so as to maintain these in proper position at all times, and the units embodying

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the invention may obviously be manufactured in various sizes and shapes.

By forming the recess 12 under-cut and the complementary projection 14 hook-shaped, firm interlocking results; and by forming the recess 13 convergingly tapered and the projection 15 wedge-shaped, perfect alinement of the sections 6, 7 is assured. As illustrated in Fig. 2, the inclined surface of the wedge projection 15 which is farthest from the hook projection 14, cooperates with the latter and with the diverging recess 13 to force the locking projection 14 into intimate contact with the under-cut surface of the recess 12 when the sections 6, 7 have been properly assembled, thereby providing a liquid and air tight seal without the aid of battens or other external sealing strips. This is an important feature of my invention as it eliminates labor and material, and avoids unsightly external strips at the joints between the wall, floor, and ceiling units.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of use, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A joint for uniting complementary elongated sections of a structural element, said joint comprising, two parallel projections formed integral with and extending outwardly away from a plane side face of one section of said element and snugly coacting with parallel recesses extending inwardly away from an adjacent plane side face of the complementary section of the element, said coacting projections and recesses being disposed entirely within and spaced inwardly away from the longitudinal bounding edges of said side faces and one set of said coacting projections and recesses having uniform approximately half-dovetailed transverse cross-section converging away from the plane of said faces while the other set of said coacting projections and recesses has uniform wedge-shaped transverse cross-section diverging away from said plane, and said element sections being laterally unitable only by swinging the complementary side faces thereof toward each other about their longitudinal bound-

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ing edges nearest said half-dovetailed set to cause the half-dovetailed projection to swing into its receiving recess before the wedge-shaped projection is brought into engagement with its receiving recess.

2. A joint for uniting complementary elongated sections of a structural element, said joint comprising, two parallel projections formed integral with and extending outwardly away from a plane side face of one section of said element and snugly coacting with parallel recesses extending inwardly away from an adjacent plane side face of the complementary section of the element, said coacting projections and recesses being disposed entirely within and spaced inwardly away from the longitudinal bounding edges of said side faces and one set of said coacting projections and recesses having uniform approximately half-dovetailed transverse cross-section converging away from the plane of said faces while the other set of said coacting projections and recesses has uniform wedge-shaped transverse cross-section diverging away from said plane, and said element sections being laterally separable only by swinging the complementary side faces thereof away from each other about their longitudinal bounding edges nearest said half-dovetailed set to cause the wedge-shaped projection to be withdrawn from its confining recess before the half-dovetailed projection is swung out of its confining recess.

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