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54 **Light duty metal structural frames.**

57 A light-duty wall frame of prefabricated galvanised steel members comprising a top plate, a bottom plate, a plurality of studs (2) each extending between said top and said bottom plate and a plurality of co-aligned noggings (10) interconnecting said studs (2) each to the next; each said stud (2) being pierced by laterally extending slots (11) at the intended positions of said noggings (10); each said nogging (10) comprises a longitudinally extending tongue (12) at one end adapted to extend neatly through any said slot (11), and affixture means (15) on each said tongue (16) and at the other end of each said nogging whereby the tongue (12) of any one nogging (10) on one side of any one stud (2) may be affixed to an adjacent nogging (10) on the other side of said any one stud (2).

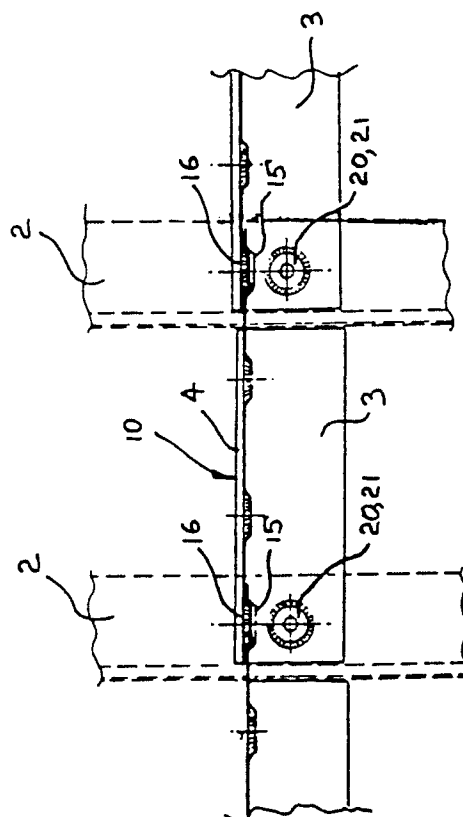


FIG 1

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This invention relates to light duty structural frames of the kind comprising a bottom plate, a top plate, a plurality of upright studs extending from plate to plate and a plurality of substantially horizontal noggings extending from stud to stud.

More particularly, the invention relates to such frames when the individual components are prefabricated from light gauge sheet metal, for example, galvanized steel. Each component may be cut from a length of rolled channel; typically, such a channel may comprise a 75mm wide web and two 32mm wide flanges rolled from 1mm-2mm thick stock.

Frames of the kind discussed above have largely supplanted timber frames (of which the components are cut and fitted on site) as wall or partition frames in dwelling, office suites and the like.

The prefabricated, and thus accurately dimensioned, components are conventionally provided with end and intermediate formations of various kinds intended to enable them to be quickly and accurately engaged or located each to each for permanent affixture by bending over lugs or the like, or, more usually and preferably, by inserting screwed fasteners, pop rivets or the like into preformed clearance holes therefor. An example of such prior known affixture techniques, being one which is well adapted for use in frames according to the present invention, is described in the complete specification of our prior Patent No. 531244.

In all prior known proposals difficulty has been found in so assembling the noggings to the studs. The difficulty arises because once the studs are assembled to the plates the overall length of the prefabricated nogging must be exactly equal to the inter-stud spacing if the insertion and affixture of a first nogging is not to cause difficulty in the affixture of a next nogging between the same pair of studs. The necessary exactitude is difficult to achieve in practice. This has lead to the usual practice of providing at one end of each nogging no more than an upwardly or downwardly projecting tongue which may be manually bent on site to bring it more or less flatly against the web of a stud for affixture thereto by a self-tapping screw or rivet.

Because the tongue may easily bend such prior known affixture between stud and nogging has lacked rigidity. Moreover, as it is usual for economy's sake to use only one fastener between stud and nogging, the nogging has been able to turn about the axis of that fastener which has proved dangerous to assemblers using prior placed lower noggings as ladder rungs when fixing higher noggings.

A similar problem arises where noggings are to be connected to a stud at the intersection of two or more frames. In such situations the problems are exacerbated since each of the studs at the inter-

section must be secured together.

An objective of the present invention is to provide an improved structural frame.

The invention achieves that object by providing a prefabricated wall frame comprising a top plate, a bottom plate, a plurality of studs each extending between said top and said bottom plate and a plurality of co-aligned noggings interconnecting said studs each to the next, each said stud being pierced by a laterally extending slot at the intended position of said noggings; each said nogging comprises a longitudinally extending tongue at one end adapted to extend neatly through any said slot, and affixture means on each said tongue and at the other end of each said nogging whereby the tongue of any one nogging on one side of any one stud may be affixed to an adjacent nogging on the other side of said any one stud.

Thus the invention enables the noggings in each horizontal run of noggings to be affixed end to end, each to each, in a manner providing an inter-stud spacing of an accuracy conforming to that of the prefabricated components. Moreover the fact that a tongue on each nogging extends through a slot in its adjacent stud effectively prevents rotation of the nogging about its longitudinal axis.

The invention is applicable to the most frequently occurring situation in which two noggings extend co-axially away from an intermediate stud in a straight run of wall. However it is also applicable to situations wherein the noggings are secured to a stud at the intersection of two or more walls.

In such situations the invention provides an essentially square connector plate with a tongue similar to that of each nogging projecting from each of its sides. By "similar" it is meant that each tongue of the plate is adapted to extend through the slots in the studs and is furnished with locating affixture means the same as those on the tongues of the noggings.

Therefore at end studs or at studs common to two or more intersecting walls a connector plate may be provided at each horizontal run of noggings with tongues projecting from the stud for affixture to the nogging or noggings adjacent to the stud. If all four tongues of the connector plate are connected to noggings (at the crossing intersection of two walls) the plate is automatically locked in position, otherwise the un-used plate tongues are bent over to fasten the plate to the stud.

Preferred embodiments of the present invention will now be described by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows two studs constituting part of the structural frame interconnected by three noggings applied to the studs in end to end relationship.

Figure 2 shows an enlarged plan view showing the central nogging of figure 1;

Figure 3 is an end elevation of one of the studs of figure 1; and

Figure 4 is a plan view of a connector for connecting the end stud of one frame to the end stud of an adjoining frame.

The structural frame of the present invention comprises a top plate, a bottom plate and a plurality of studs 2 extending between the top and the bottom plate. Each stud 2 is rolled from a one millimetre thick strip galvanised steel into structural members comprising a pair of spaced apart flanges 3 and a web 4 extending between the flanges 3 and from a corresponding edge thereof to provide a stud having a C-shaped cross section.

A plurality of noggings 10 are provided extending between each stud 2.

Each stud 2 is pierced by a laterally extending slot 11 at the intended position of nogging 10.

Each nogging 10 is formed by the same manner and in the same shape as the studs 2. The noggings further comprise a longitudinally extending tongue 12 adapted to extend neatly through any of slots 11 in the studs 2. An affixture means 15 is provided on the tongue 12 which cooperates with like affixture means 16 on the web and at the other end of the nogging 10 so that the tongue of any noggings on one side of a stud 2 may be affixed to the cooperating end of an adjacent nogging on the other side of the stud. The co-operating affixture means 15 and 16 each comprise a raised frusto-conical formation pressed into said nogging which raised formation may be nested in a like raised formation of an adjacent nogging. A central hole 17 is provided through both affixture means 15 and 16 through which a rivet or the like may pierce to hold the two affixture means 15 and 16 together. When so held the tongue 12 of one nogging is held in overlapping relationship with the web 4 at an opposite end of a like, adjacent nogging.

In order to further stabilize the frame further co-operating affixture means 20 and 21 are provided on the flanges of the studs 2 and the noggings 10 respectively where those webs overlap.

Referring now to figure 4 an essentially square connector plate 30 is shown. From each side of the square connector plate 30 a tongue 32 projects. Each tongue 32 is adapted to extend through one of the slots 11 in a stud 2 at the end of a frame. Each tongue 32 includes an affixture means 33 which is identical to affixture means 15 and 16 and is able to cooperate with either of them so that the

connector plate 30 may be connected with a nogging 10 through a stud 2 at the end of a frame.

The connector plate 30 is intended for use when connecting two or more frames intersectioning at right angles. To this end some of the tongues 32 may be recessed as indicated at 34 to enable each of the tongues 32 to project through a slot 11 in a stud 2 without those studs interfering with one another or with the connector plate.

Claims

1. A prefabricated wall frame comprising a top plate, a bottom plate, a plurality of studs each extending between said top and said bottom plate and a plurality of co-aligned noggings interconnecting said studs each to the next, each said stud being pierced by a laterally extending slot at the intended position of said noggings; each said nogging comprises a longitudinally extending tongue at one end adapted to extend neatly through any said slot, and affixture means on each said tongue and at the other end of each said nogging whereby the tongue of any one nogging on one side of any one stud may be affixed to an adjacent nogging on the other side of said any one stud.

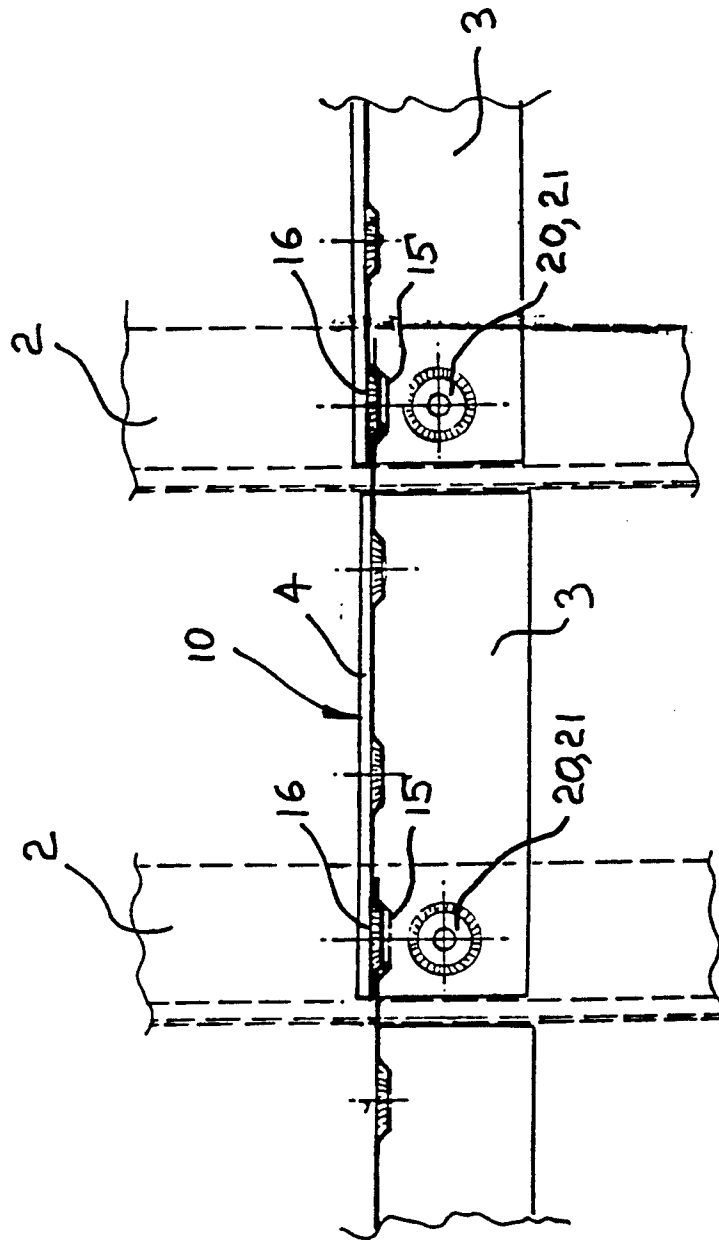
2. A prefabricated wall frame according to claim 1 wherein said studs are C-shaped in cross-section having a pair of spaced apart flanges and a web extending therebetween.

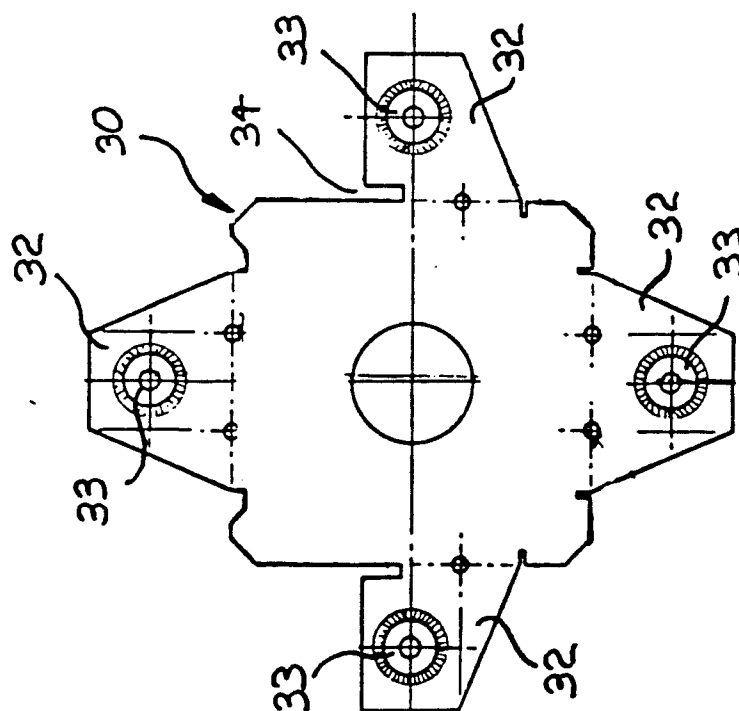
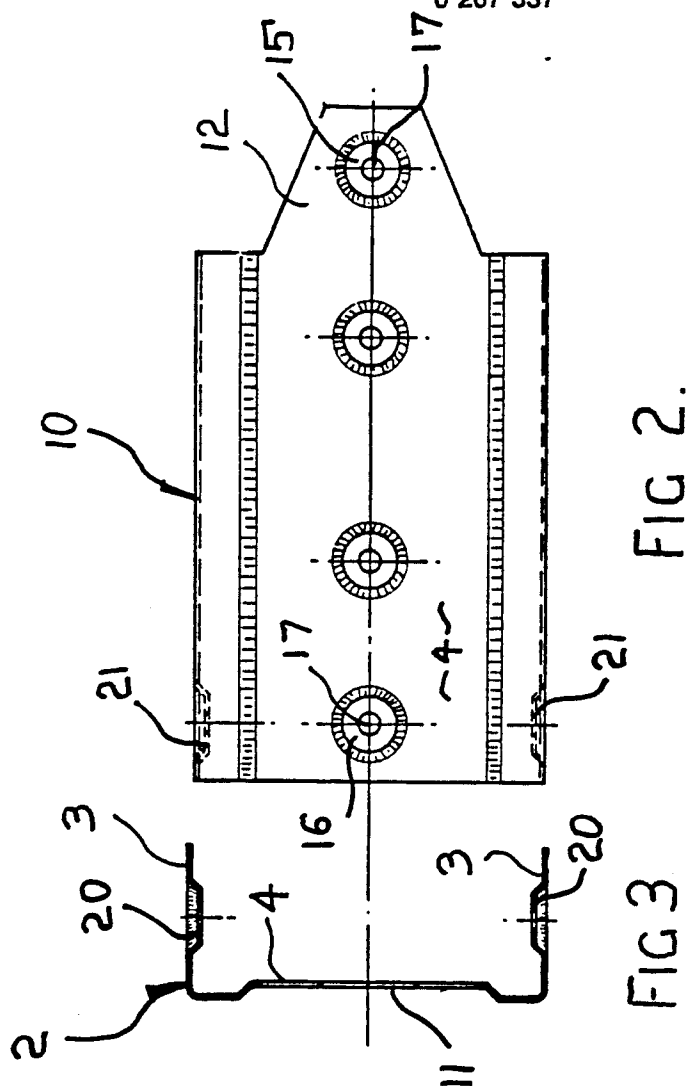
3. A prefabricated wall frame according to claim 2 wherein said nogging is C-shaped in cross-section including a pair of spaced apart flanges and a web extending therebetween.

4. A prefabricated wall frame according to claim 3 including further co-operating affixture means on the webs of said studs and of said noggings where those webs overlap.

5. A prefabricated wall frame according to any one of the preceding claims wherein said affixture means comprises a raised frusto-conical formation having a central hole adapted to accept a rivet.

6. Two, three or four prefabricated wall frames according to any one of the preceding claims held in end to end abutment by an essentially square connector plate, said connector plate having a tongue projecting from each side thereof and affixture means on said tongues, each tongue being adapted to project neatly through the slot in a respective end stud of said two three or four frames and to be affixed to adjacent corresponding nogging.







EP 86 30 8893

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
Y	GB-A-1 468 190 (EKERT) * Page 1, lines 45-57; page 2, lines 43-124; figures *	1-4	E 04 B 1/24 E 04 B 1/58
A	---	6	
Y	US-A-3 604 176 (CAMPBELL) * Column 2, lines 20-30, 37-51; column 2, line 69 - column 3, line 6; figures *	1-4	
A	---		
A	DE-A-2 202 339 (ELECTROLUX) * Page 3, lines 9-30; figure 3 *	5	
A	AU-B- 515 285 (MCDONOGH et al.) * Page 5, line 12 - page 6, line 20 *	1-3	

A	DE-C-3 442 550 (RICHTER) * Column 3, line 2 - column 4, line 34; figures *	1-3	E 04 B A 47 B

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30-06-1987	Examiner LAUE F.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			