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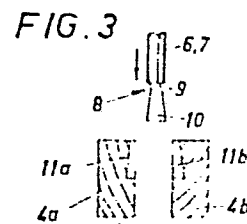
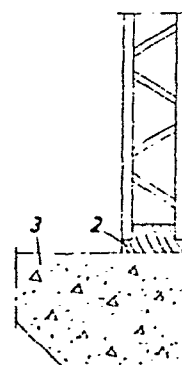
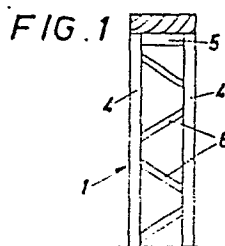
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54 A building member such as a beam, a girder or the like.

57 A building member such as a beam, a girder or the like or wooden material where the central part of the solid wood has been replaced by transverse struts (6,7) fitted in holes (11a,11b) in the two edge elements (4) of the building member, the end portions (8) of the struts being designed with varying cross-section as seen in the longitudinal direction to include a first portion (9) situated at a distance inside the end of the strut having a smaller cross-section than a second portion (10) situated outside said first portion in a direction against the end of the strut, the holes in said edge elements being formed to correspond to the end portion sections of the struts.



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A BUILDING MEMBER SUCH AS A BEAM, A GIRDER OR THE LIKEBackground of the invention

The present invention refers to a building member such as a beam, a girder or the like incorporating two mainly parallel, elongated edge elements of wood and a number of spaced apart supporting members interconnecting said edge elements.

In building activity is traditionally used a number of different wooden members of solid wood, e.g. beams, joists, girders, rafters and the like.

In later years it has however been aimed at producing building members of such low weight as possible at the same time as the wood prices have increased.

Due to this it has earlier been produced beams and girders where the central wood portion has been eliminated and replaced by interconnecting struts, which were connected to the edge elements to form a structure having a desired dimension but a considerably lower weight and requiring a reduced wood consumption.

At these older designs the frame timber or the struts have been provided with cylindrical end taps, which have been introduced into cylindrical holes in the edge element surfaces facing each other, whereupon the end taps have been glued and/or nailed to the edge element. As the struts have to be inclined against each other for allowing the structure to take up forces also in its longitudinal direction it is necessary for producing such structure elements in an automatic machine to build a very complex machine, which thereby should be very expensive. The alternative is to manufacture the element manually, which of course will make the manufacture considerably more expensive.

BAD ORIGINAL

According to another proposal it is used interspacing supporting members formed as zigzag-bent coarse steel wire, which are attached between the halves of the divided edge elements, which are thereafter joined in suitable manner. This design can presumably be manufactured in automatic machines of not too complex design but certain problems can be expected when it concerns the attachment of the wire between the edge element halves. Another drawback with this design is that steel wire of this dimension and having the properties required is comparatively expensive and it is expected that the price of the wire will nearly correspond to the price of the wood it shall substitute.

One of the advantages with these lattice formed central portions of the building members is the good possibilities of distributing insulation material e.g. by spraying into the building units, e.g. walls, floors and roofs, which are constructed with beams and girders of this type. At the design with the steel wire as a connecting member there is however the risk that this wire will act as a thermal bridge, which will reduce the insulating effect.

The purpose and most essential features of the invention

The purpose of the present invention is to provide a building member such as a beam, a girder or the like comprising two substantially parallel, elongated edge elements of wood and a plurality of spaced apart supporting members interconnecting said edge elements, which building member has the advantages of the building members referred to hereabove but which as far as possible is free from the drawbacks from which the older designs have suffered and which is easily manufactured with simple and reliable machines and the invention is characterized mainly thereby that the supporting members are wooden struts, the end portions of which are each designed with at least a first portion situated at a distance from its adjacent end and having

a smaller section than a second portion situated closer to said end, and that said end portions are fitted in holes in the edge element surfaces facing each other, said holes having a section being a complement to the end portions of said struts.

Description of the drawings

The invention will hereinafter be further described with reference to embodiments shown in the accompanying drawings.

Figure 1 shows in a cross section a wall girder built in accordance with the invention,

Figure 2 shows another embodiment of a girder according to the invention,

Figure 3 shows schematically and partially in section portions of a strut forming part of a building member according to the invention, and an edge element divided in two pieces in a position prior to the strut and the edge element have been fitted together,

Figure 4 is a view corresponding to the details according to figure 3 in a position where the components have been fitted together,

Figure 5 shows in a view corresponding to figure 3 a modified embodiment of the profiles for the strut and the attachment hole in the edge elements,

Figure 6 is a view corresponding to figure 5 of a further embodiment of the invention,

Figure 7 shows schematically and partly in section a modified embodiment of the invention with a strut and a one-piece edge element, and

Figure 8 shows the attachment of the strut according to figure 7 in its position in the edge element.

Description of the embodiments

In figure 1 is shown in a schematic cross section a wall



girder 1 according to the invention. This wall girder rests via a sill 2 on a bottom plate 3 and it comprises two elongated, mutually parallel edge elements 4, which are spaced apart by means of an intermediate piece 5 and a plurality of inclined struts 6 spaced apart in the longitudinal direction of the girder and interconnecting the two edge elements 4.

In figure 2 is shown a modified embodiment of the invention in which the girder incorporates two edge elements 4, which are spaced apart by an intermediate piece 5 and a number of struts 7 arranged mainly perpendicularly to the longitudinal direction of the edge elements. The girder shown in figure 2 has a very low ability of taking up loads in directions perpendicular to the extension of the struts but in cases where no such loads are expected this type of girder is a suitable design as it is more simple to manufacture than the design according to figure 1.

Figure 3 shows schematically a part of a strut 6, 7 having an end portion 8, which is formed tapering with a first portion 9 situated at a distance from the end of the strut, which first portion has a smaller cross section than a second portion 10 situated closer to the end of the strut. The edge element is in this case divided in two halves 4a, 4b, which in the surfaces of division are provided with recesses or turned cavities 11a, 11b, which together form a hole 11, which essentially corresponds to the section of the end portion 8 of the strut 6, 7. The end portion 8 of the strut is fitted in the direction shown with the arrow in figure 3 between the halves 4a and 4b, which are thereupon moved against each other as shown with the arrows until the edge element halves will abut each other, whereupon the halves are connected in any suitable manner, e.g. by glueing or by nail joints 12 to the shape shown in figure 4. As can be seen from this figure the strut 6, 7 is well



locked in the hole 11 in the edge element 4 as the outlet side of the hole is smaller than the largest dimension of the end portion of the strut, i.e. at the second portion 10.

Figures 5 and 6 show in views corresponding to figure 3 modified embodiments of end portions 8 of struts and of hole in the divided edge element respectively. Whereas the end portion 8 in the embodiment according to figure 3 was tapering the embodiment according to figure 5 is instead equipped with an annular groove 9b with straight walls, which groove has been recessed in the end portion of the strut and which at the end side of the shut leaves a second portion 10b having a larger section than the recessed portion. The halves 13a and 13b of the hole form in the corresponding way as in figure 3 a hole, which has a section corresponding to the end portion 8 of the strut.

In figure 6 is shown how the end portion 8 of the strut has an annular ridge-formed portion 9c at a distance from its end and between this annular portion 9c and the end a portion 10c of less diameter whereas the strut inside the ridge-formed portion has a portion smaller than the annular ridge-portion 9c. In this case is the annular ridge-formed portion 9c to be considered as the second portion whereas the portion of the shut situated inside the second portion is considered as the first portion of the shut end. The end profile of the shut thus comprising a first portion, a second portion 9c of larger diameter and an outer portion 10c of the same diameter as said first portion corresponds to a hole in the edge element, which hole is formed by hole parts 14a, 14b. In both cases the end portions of the struts are connected to the holes in the same manner as shown in figure 4.

In figure 7 is shown a modified embodiment where an edge element made in one piece is provided with a hole 15, which

has a uniform section mainly corresponding to the section of the strut 6, 7. The end portion 8 of the strut is here provided with a first portion 16, which is recessed or turned down and a second portion 17 situated between said first portion and the end of the strut, which second portion 17 has the same dimension as the hole 15 and preferably also as the remainder of the strut 6, 7. In figure 8 is shown how the strut end portion 8 has been entered into the hole 15 in the edge element 4. When this has been done - whereby the second portion 17 of the strut almost entirely fills the inner part of the hole 15 - a mouldable and cureable compound is applied or injected respectively through a bore in the wall of the edge element, which compound 18 will fill the space between the wall of the hole and the first portion 16 of the end portion of the strut. By treating the end portion of the strut in such a manner that it will have such a low ability of adherence against the cureable compound as possible and instead taking steps for increasing the adherence of the compound against the hole it is possible, when the compound cures to obtain an annulus integral with the hole wall at the outer end thereof, which in a simple and efficient manner will lock the second portion 17 of the strut in its position in the hole. The compound can be a plastic compound of any suitable type.

The invention is not limited to the embodiments shown and described hereabove but modifications are possible within the scope of the appended claims.

C L A I M S

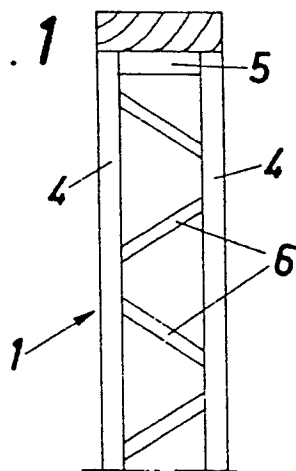
1. A building member such as a beam, a girder or the like comprising two mainly parallel, elongated edge elements of wood and a number of spaced apart supporting members interconnecting said edge elements, c h a r a c t e r i - z e d t h e r e b y, that the supporting members are wooden struts (6, 7) the end portions (8) of which are each designed with at least a first portion (9, 9b, 10c, 16) situated at a distance from its adjacent end and having a smaller section than a second portion (10, 10b, 9c, 17) situated closer to said end, and that said end portions are fitted in holes (11, 13, 14, 15) in the edge element surfaces facing each other, said holes having a section being a complement to the end portions of said struts.

2. A building member according to claim 1, c h a r a c - t e r i z e d t h e r e b y, that each one of the elongated edge elements (4) is divided in a plane substantially parallel to and extending through the centre of said hole (11), the portions (4a, 4b) of the edge elements after introduction of the struts being interconnected by means of suitable connecting means (12).

3. A building member according to claim 1, c h a r a c - t e r i z e d t h e r e b y, that the holes (15) in the edge elements have a cross section corresponding to the biggest cross section of the struts (6, 7) and that a mouldable, curable compound (18) has been applied to the wall of the hole, e.g. by injection in the area of said first portion (16) of the strut after the end portion (8) thereof has been introduced into the hole (15).

4. A building member according to claim 3, c h a r a c - t e r i z e d t h e r e b y, that the hole surface (15) is treated to give a good adherence to the mouldable, curable compound (18) and/or that the end portion (8) of the strut is treated to give a bad adherence to said compound (18).

FIG. 1



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FIG. 2

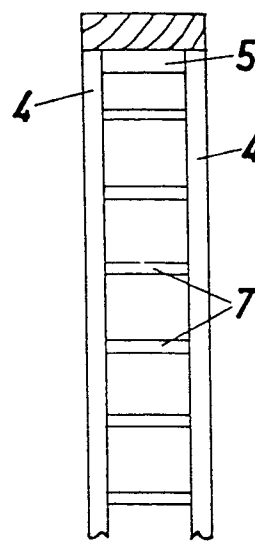


FIG. 3

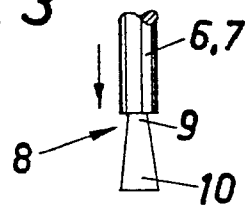


FIG. 4

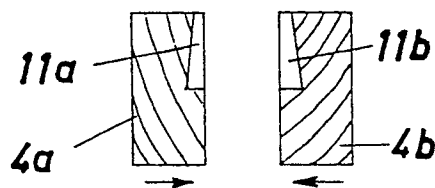
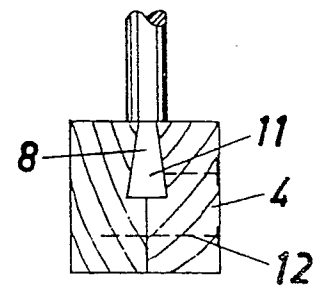


FIG. 5

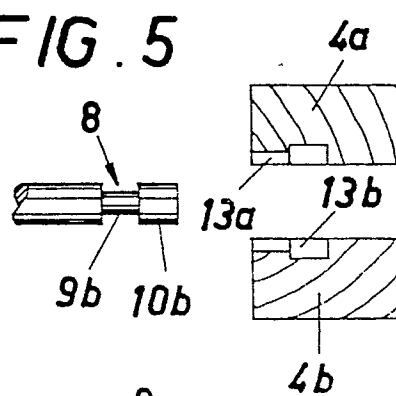


FIG. 6

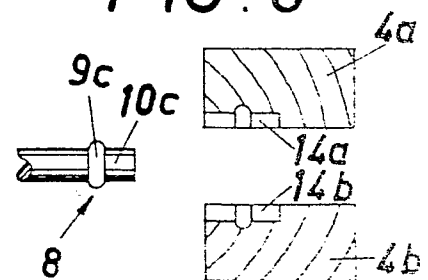


FIG. 7

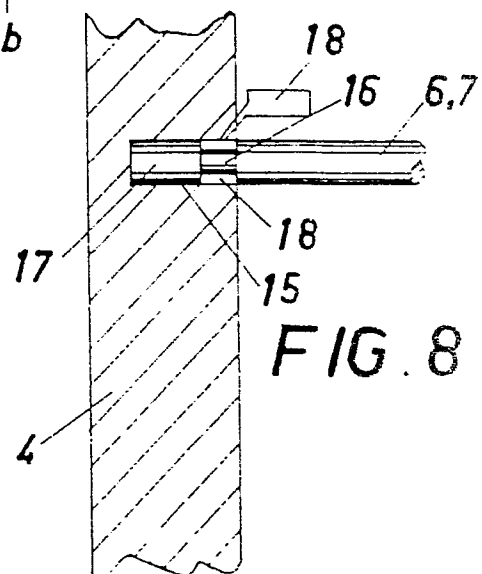
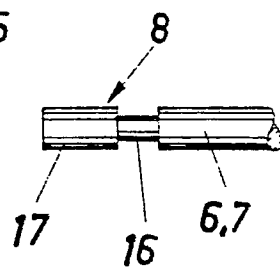
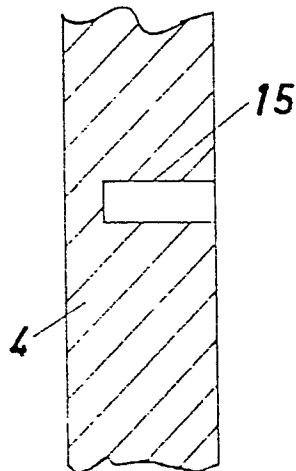


FIG. 8



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EUROPEAN SEARCH REPORT

0013563

Application number

EP 80 10 0063

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	FR - A - 506 322 (TARRANT) * fig. 3 and 4 * -----		E 04 C 3/16 E 04 B 1/26 E 04 B 1/58
			TECHNICAL FIELDS SEARCHED (Int. Cl.)
			E 04 B 1/00 E 04 C 3/00
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
☒ The present search report has been drawn up for all claims			&: member of the same patent family, corresponding document
Place of search		Date of completion of the search	Examiner
Berlin		24-03-1980	v. WITTKEN