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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **A LATTICE TRUSS.**

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Description

The invention relates to a lattice truss of the type defined in the introductory portion of the claim.

A known lattice truss of this type contains bending eccentricities which must be taken into consideration for load capacity. The same is worth for another known lattice truss (DE—A—22 39 573) whose elements are interconnected at each junction by only one bolt and nut.

The object of the invention is to provide a lattice truss of the stated type in which only normal forces occur, i.e. either tension or pressure in the lattice bars.

This object is achieved according to the invention in that the lattice truss stated in the opening paragraph is characterized by the features defined in the characterizing portion of the claim.

Thus, the centre-of-gravity lines of each individual one of the bar elements extending to a joint extend through the axis of the pivot. Owing to the symmetry about the longitudinal centre plane the truss does not contain any bending eccentricities with respect to this plane either. Thus, each of the joints will be a hinge where the calculation of the forces of load including the dead load does not have to allow for addition of moment loads. The lattice truss of the invention has the additional advantage that the lattice bars can be transported connected with the head of the rafter or the foot of the rafter in a state folded together with the member in question so that the truss can partly be pre-assembled and rapidly be erected on the building site.

The invention will be explained more fully below with reference to the drawing in which

fig. 1 shows a lattice truss of a generally known type,

figs. 2—5 show a joint connection in a lattice truss according to the invention used in all the joints in which the head or the foot of the rafter is connected with two lattice bars, where

fig. 2 shows the end of two lattice bars and a pipe section in a lattice truss according to the invention, in perspective with the members drawn apart,

fig. 3 shows the same elements as fig. 2 in perspective, but with the pipe section in position in the lattice bar called the second type lattice bar,

fig. 4 shows the same elements as fig. 3 in perspective, but with the lattice bar, called the first type, in position with respect to the second type lattice bar and the pipe section, and

fig. 5 shows the finished joint connection at the rafter head in perspective, but before the bolt shown in the drawing has been screwed in.

The general lattice truss of fig. 1, which is supported at the ends, consists of a rafter head 1 and a rafter foot 2 and lattice bars 3 interconnecting these. In all the joints in which the rafter head or the rafter foot is connected with two lattice bars, the joint is assembled as shown successively in figs. 2 to 5.

Fig. 2 shows the upper end of a first type lattice bar 10 made of a thin sheet to form a hollow profile, C-profile or U-profile. The lattice bar 10 has rectangular recesses 11, 12 in one set of opposite sides 13, 14. The recesses 11, 12 can receive and snugly surround a secnd type lattice bar 20 likewise manufactured of a thin sheet to form a hollow profile, C-profile or U-profile. In one set of opposite walls 21, 22 the lattice bar 20 has mating holes 23, 24 for a pipe section 30, which has internal threads 31, 32 at each end and the same length as the internal spacing between the second set opposite walls 15, 16 of the first type lattice bar 10; the second set opposite walls 15, 16 have mating holes 17, 18 for bolts which are shown and described in connection with fig. 5.

Fig. 3 shows how the pipe section 30 has to be disposed when positioned in the mating holes 23, 24 in the lattice bar 20, and fig. 4 shows how the first type lattice bar 10 is positioned so as to surround and support the second type lattice bar 20 in a position in which the mating holes 17, 18 are in register with the threaded holes 31, 32 in the pipe section 30.

Fig. 5 shows a rafter head 40 whose profile, which is essentially a U-profile, has been manufactured by cold deformation.

For reasons of strength the profile has additional bends along the edges so that in the embodiment shown the profile resembles that of a hat.

As shown in fig. 5, the unclamped connection of fig. 4 is introduced between the branches 41, 42 in the U-profile of the rafter head 40. These branches 41, 42 having mating holes of the same diameter as the mating holes in the lattice bar 10. The Allen screw 50 shown in fig. 5 is inserted through the mating hole 43 in the side of the rafter head 40 shown in fig. 5 and through the mating hole 18 in the lattice bar 10 and is then screwed into the threads 32; and a corresponding Allen screw 50 is inserted through the mating hole (not shown) in the opposite branch 42 of the U-profile and through the mating hole 17 in the lattice bar 10 and is then screwed into the threads 31 in the other end of the pipe section 30.

The joint connection shown in fig. 5 at the rafter head 40 is indentical with a joint connection at the rafter foot when fig. 5 is turned upside down, the same U-shaped profile being used for the rafter foot as for the rafter head.

Claim

A lattice truss in which the constituent elements, viz. rafter head, rafter foot and lattice bars interconnecting these, each consist of one and only one symmetric profile made of a thin sheet, and each having two opposite, symmetrically disposed walls, characterized in that at each point, in which the rafter head (40) or the rafter foot is connected with two lattice bars (10, 20), one lattice bar (10) is formed with a recess (11, 12) designed to receive the other lattice bar (20), and that the lattice bars (10, 20) are disposed between

the two opposite walls (41, 42) of the rafter head (40) or the rafter foot (40) and connected therewith as well as with each other by means of a trnasverse pivot (30) whose axis extends through the centres of gravity of the profile cross-sections such that both lattice bars (10, 20) are symmetrical about a longitudinal central plane for the lattice truss said plane being also a symmetrical plane for the rafter head (40) and the rafter foot.

Patentanspruch

Gitterträger, bei welchem die Bestandteile, d.h. Sparrenkopf und Sparrenfuß sowie die deiselben verbindenden Gitterstäbe jeweils aus einem und nur einem symmetrischen dünnen Blechprofil bestehen und jeweils zwei symmetrisch gegenüberliegend angeordnete Wandungen haben, dadurch gekennzeichnet, daß in jedem Punkt, in welchem der Sparrenkopf (40) oder der Sparrenfuß mit zwei Gitterstäben (10, 20) verbunden ist, ein Gitterstab (10) mit einer Ausnehmung (11, 12) zur Aufnahme des anderen Gitterstabes (20) versehen ist und daß die Gitterstäbe (10, 20) zwischen den gegenüberliegenden Wandungen (41, 42) des Sparrenkopfes (40) oder des Sparrenfußes (40) angeordnet sind und damit sowie miteinander mittels eines Querzapfens (30) verbunden sind, dessen Achse durch die Schwerpunkte der Profilquerschnitte verläuft, sodaß beide Gitterstäbe (10, 20) um eine Längsmittelebene des Gitterträgers symmetrisch sind, wobei diese Ebene auch für den Sparrenkopf (40) und den Sparrenfuß eine Symmetrieebene bildet.

Revendication

Armature en treillis, dans laquelle les constituants, c'este-à-dire les parties supérieure et inférieure de chevron et les barres du treillis qui les relient entre eux, consistent chacun en un seul et unique profilé symétrique en tôle mince et ayant chacun deux parois opposées disposées symétriquement, caractérisée en ce que, en chaque point de liaison d'une partie supérieure (40) ou inférieure de chevron avec deux barres (10, 20) du treillis, l'une (10) des barres du treillis comporte un cavité (11, 12) conformée de manière à recevoir l'autre barre (20) du treillis, et en ce que les barres (10, 20) du treillis sont disposées entre les deux parois opposées (41, 42) de la partie supérieure (40) ou inférieure (40) de chevron et reliées à celles-ci aussi bien que l'une avec l'autre au moyen d'un axe d'articulation transversal (30) dont l'axe s'étend à travers les centres de gravité des sections transversales du profilé, de telle sorte que les deux barres du treillis (10, 20) sont symétriques par rapport à un plan longitudinal central de l'armature en treillis, ledit plan étant également un plan de symétrique pour la partie supérieure (40) et inférieure de chevron.

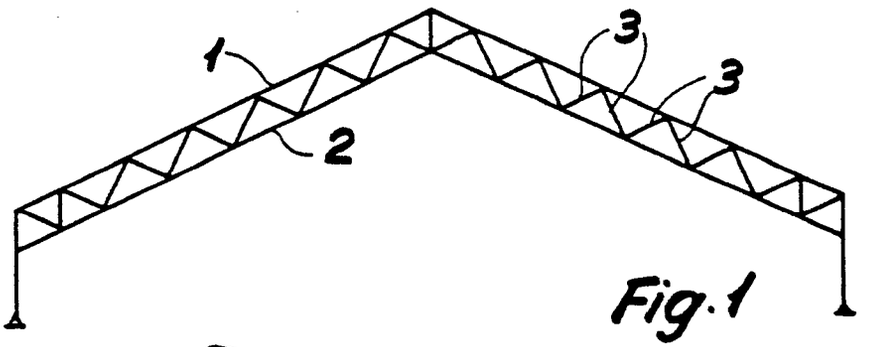

Fig. 1

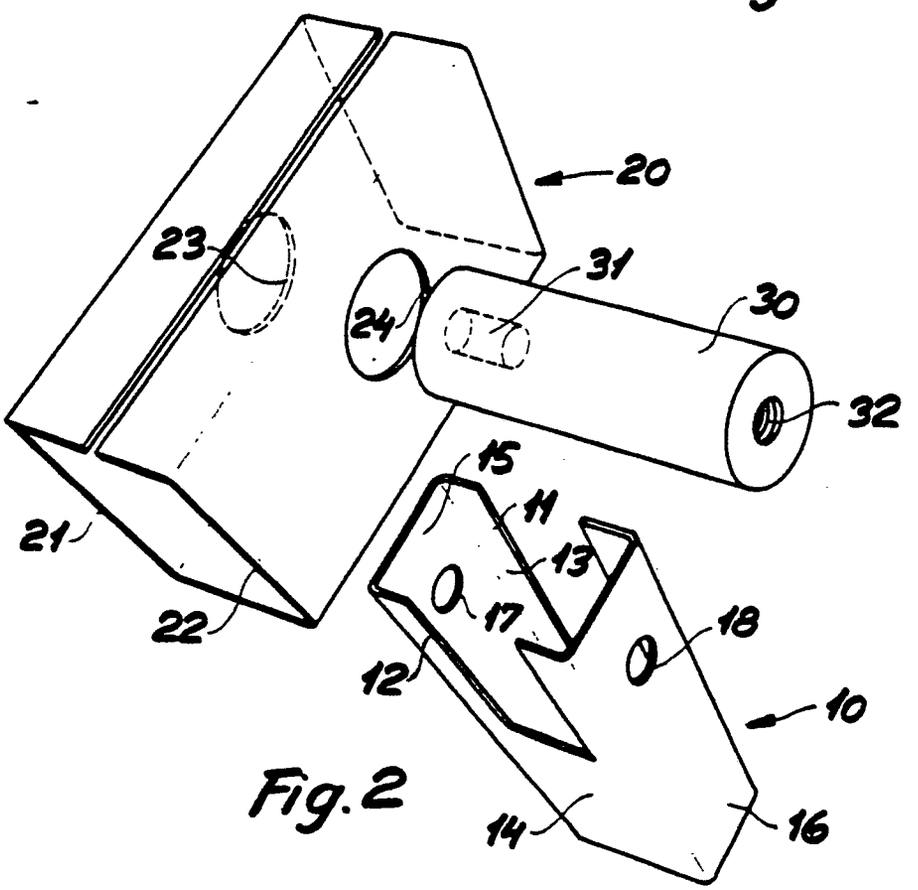

Fig. 2

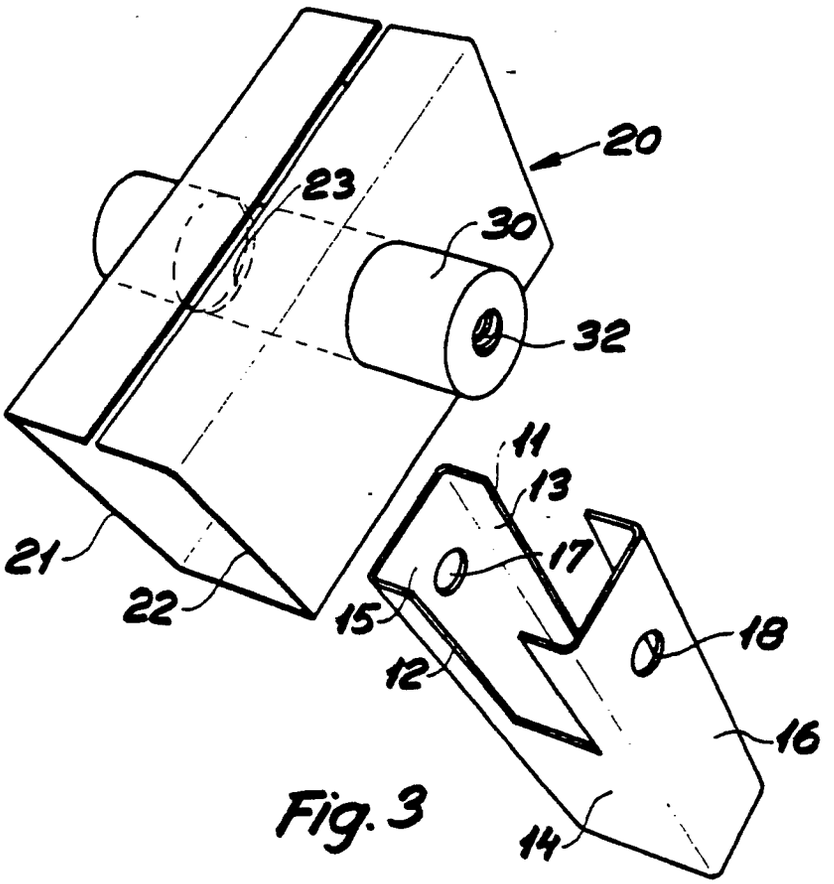

Fig. 3

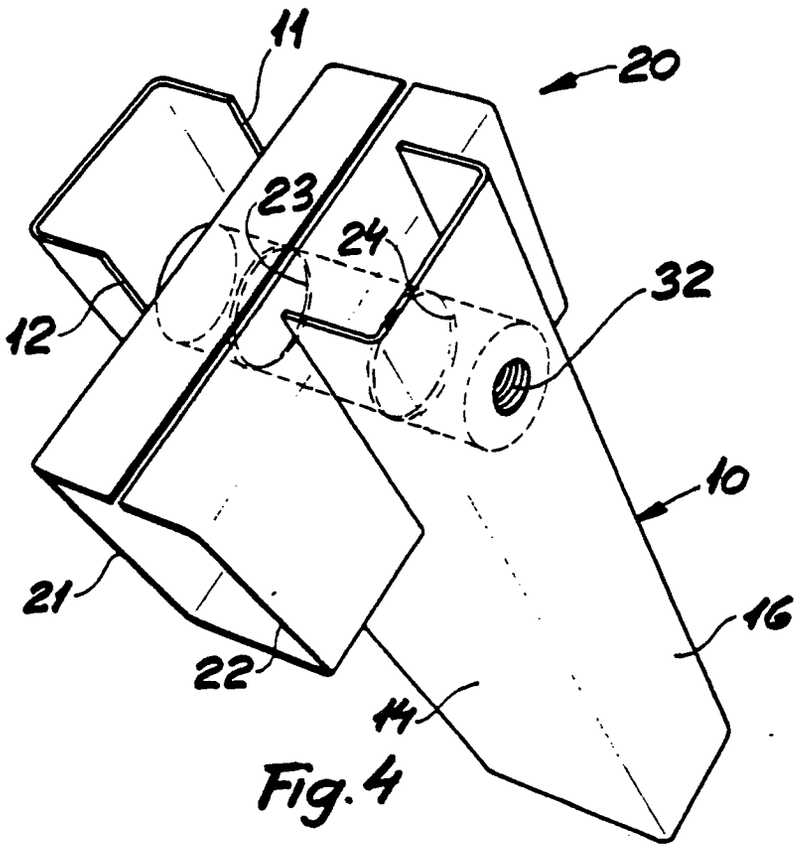

Fig. 4

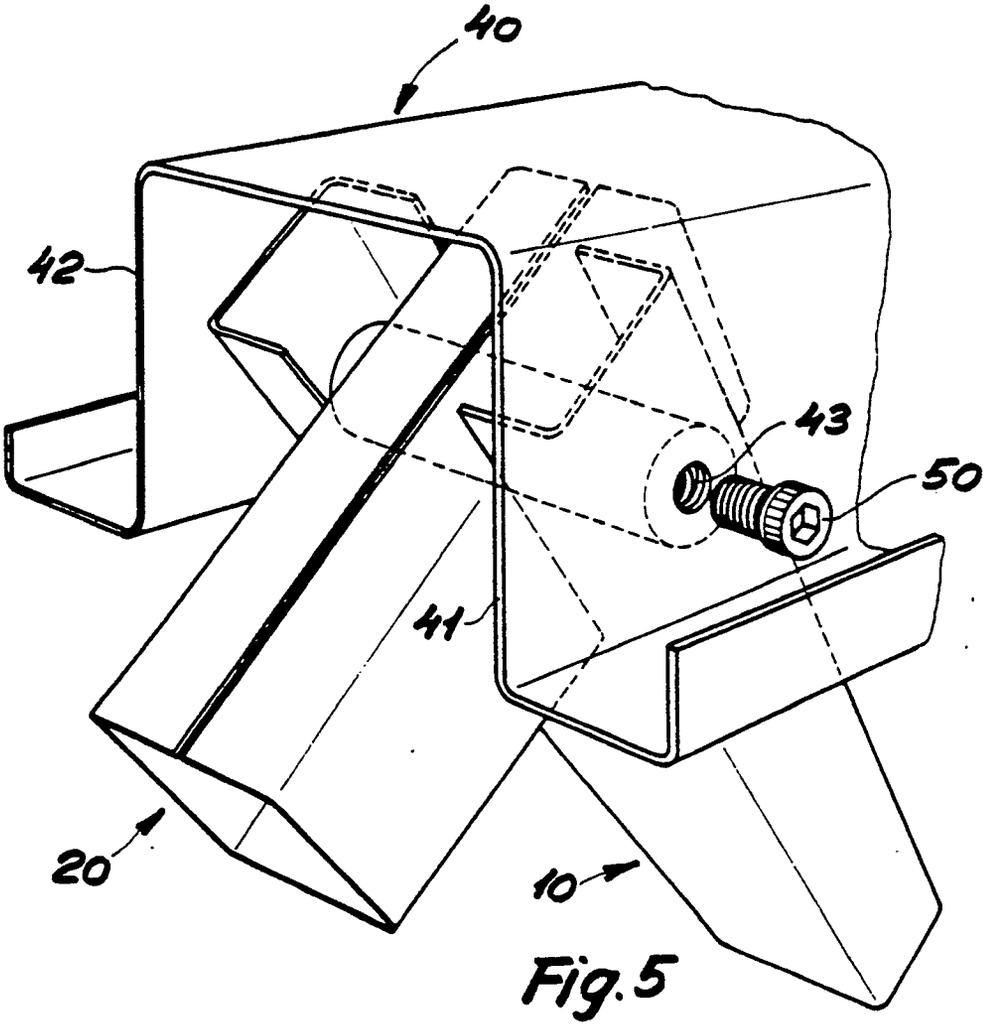

Fig. 5