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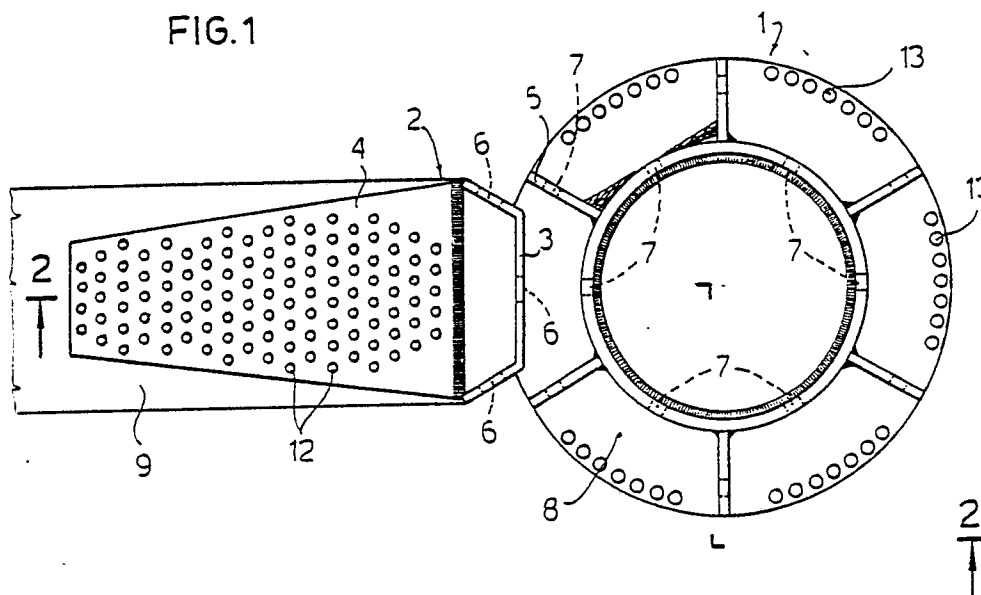
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54 Multiple joint for wooden beams making up a geodetic or spatial structure and structural assembly obtained therewith.

57 The subject of the present invention is a multiple-hinged metal joint (1) for wooden beams (9) making up a geodetic or spatial structure, consisting of a central body (10) provided with a supporting base (8) such as to form a support for the ends of laminated or solid wood beams (9) and an upper connection (6, 7) for fixing said end of each beam (9) which is shaped so that it can be fixed to said connection (6,7).

FIG.1



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MULTIPLE JOINT FOR WOODEN BEAMS MAKING UP A GEODETIC OR SPATIAL STRUCTURE AND STRUCTURAL ASSEMBLY OBTAINED THEREWITH

The present invention concerns metal joints for assembling beam elements to create geodetic or spatial structures, in particular of the type comprising laminated or solid wooden beams.

Among prefabricated building structures a very important part is played by structures consisting of rods arranged according to surface geodetics, owing to the different fields of application to which they lend themselves, such as, for instance, coverings for large structures (industrial, civil, sports installations etc.).

In large prefabricated structures, however, apart from the problems connected with overall design, there exists a series of problems of the parts, which includes organization of the joints to carry out assembly of different parts produced to form a single body.

The object of the present invention is to provide an easy, safe and simple manner of joining the single laminated or solid wood rods making up geodetic or spatial structures, by use of metal joints.

A further object is to create a joint that in no way spoils the aesthetics of the structure or causes weakening of the wooden parts due to the holes necessary for fixing bolts.

The object has been achieved by creating a multi-hinged metal joint consisting of a central body provided with a supporting base such as to create a support for the ends of the laminated or solid wood beams and an upper connection for fixing said end of each beam which is shaped so that it can be fixed to said connection.

A preferred embodiment provides for a hollow polygonal or even circular body, the inner cavity of which is stiffened with special reinforcements.

The connection may be in particular a projection for fixing the ends of the beams; if the body is hollow this projection can be simply an extension of the side wall of the polygonal or even cylindrical body.

In particular this extension may be provided with holes to allow fixing, by means of bolts, of a connecting support that is made fast to the beams by nailing. Said holes in at least one of the parts forming the connection are preferably ovalized.

A preferred embodiment also provides for radial wings, which demarcate the space reserved for each single beam, these also equipped with connections, in particular holes.

The structural assembly according to the present invention comprises the above described joints and laminated or solid wood beams, the supporting ends of which can be tapered and pro-

vided with a metal element to complete the joint. This completing element is formed by a plate and an end part equipped with connections matching those on the central body, for example holes for the clamping bolts. The wooden beams are nailed to the metal plate which thus forms an upper end connection.

The joint according to the present invention permits safe and easy joining of the various beams which, arranged along the surface geodetics, make up the covering framework.

A further aesthetic advantage lies in the fact that no bolts or fixing assemblies such as brackets are visible on the inside of the structure, the nails that make the metal element fast to the beam being situated on the extrados of the covering.

A preferred but not restrictive embodiment, relative in its size and number of assembled beams to a certain covering, of a joint according to the present invention is illustrated in the accompanying drawings in which:

fig. 1 shows an exploded top view in reduced scale of a joint with a cylindrical central body;

fig. 2 shows a side view, again in reduced scale, of the joint, partly cutaway along the line 2-2 of fig. 1, in which the wooden beam has been eliminated for greater clarity;

fig. 3 shows a cross-section similar to that in fig. 2, but in reduced scale and in use;

fig. 4 shows a bottom view on the left and a top view on the right of the joint in use.

Figures 1 and 2 show the joint 1 consisting of a hollow cylindrical body 10 equipped with reinforcements 11. An upper projection 15 is equipped with holes 7 for connection to a completing element 2 of the joint attached to the end of the laminated or solid beam 9. This beam 9 rests on the base 8 of the body 10 between the radial wings 5 provided in said body 10. In the end part 3 of completing element 2 three oval holes 6 are disposed to allow fastening by means of bolts to cylindrical central body 10. Holes 7 are also provided on the wings 5 to accomplish assembly of the beam 9. Number 4 designates the metal plate that is joined by nailing (nails 12) to the beam 9.

Figure 2 shows more clearly how the two parts making up the joint are joined together. The supporting base 8 is integral with the bottom part of the body 10 and forms a circular shelf, on which the beams 9 rest. These are fastened to the base by means of nails 13 (figure 4).

Figure 3 shows a cross-section of the joint in

use, in which the joining means between the various parts can be seen.

In the top view the plates 4 fixed by the nails 12 to the laminated wood beams 9 are visible. The fastening of the wings 5 to two adjacent end parts 3 can also be seen, as well as the fastening of the latter to the upper projection 15 of the cylindrical body 10 by means of bolts and relative washers. In the bottom view the beams 9 can be seen fastened by nailing (nails 13) to the base 8 extending from the bottom surface of cylindrical body 10.

As will be noted from the above, no bolts pass through the wood as this would weaken it.

10. A structural assembly according to the preceding claims characterized in that the parts making up the joint are connected with bolts (16) passing in holes (6, 7) disposed on the wing (5) of the central body and on the end part (3) of the completing element (2) and also holes (7) disposed on the end part and on the upper projection (15) of the central body (10).

11. A structural assembly according to the preceding claims, characterized in that all the connections are provided solely on the extrados of the geodetic structure.

Claims

1. A multiple metal joint for wooden beams making up a geodetic or spatial structure, characterized in that it consists of a central body (10) provided with a base (8) such as to create a support for the ends of the beams (9) and an upper connection (6, 7) for fixing said end of the beams (9) shaped accordingly.

2. A joint according to claim 1, characterized in that the central body (10) is provided with radial wings (5) that demarcate the space reserved for each single beam (9).

3. A joint according to claim 1 or 2, characterized in that the connection consists of a projection (15) extending upwards from the central body (10).

4. A joint according to claim 1, 2 or 3, characterized in that the central body (10) is hollow, in particular it is polygonal, even circular, in shape, and has inner reinforcements (11).

5. A joint according to claim 4, characterized in that the upper projection (15) is an extension of the hollow central body (10).

6. A joint according to any one of the preceding claims, characterized in that the connection consists of holes (7) through which bolts pass, said holes (7) being made in the projection (15).

7. A joint according to any one of the preceding claims, characterized in that the connection consists of holes (6, 7) one of which (6) is ovalized.

8. A structural assembly comprising joints according to any one of the preceding claims, characterized in that the laminated or solid wood beams (9) are provided at their supporting ends with a metal element (2) completing the joint.

9. An assembly according to claim 8 characterized in that the completing element (2) is formed by a plate (4) which is joined to the beam by means of nails (12), and an end part (3) equipped with connections (6) matching those provided on the central body (10) of the joint.

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FIG. 1

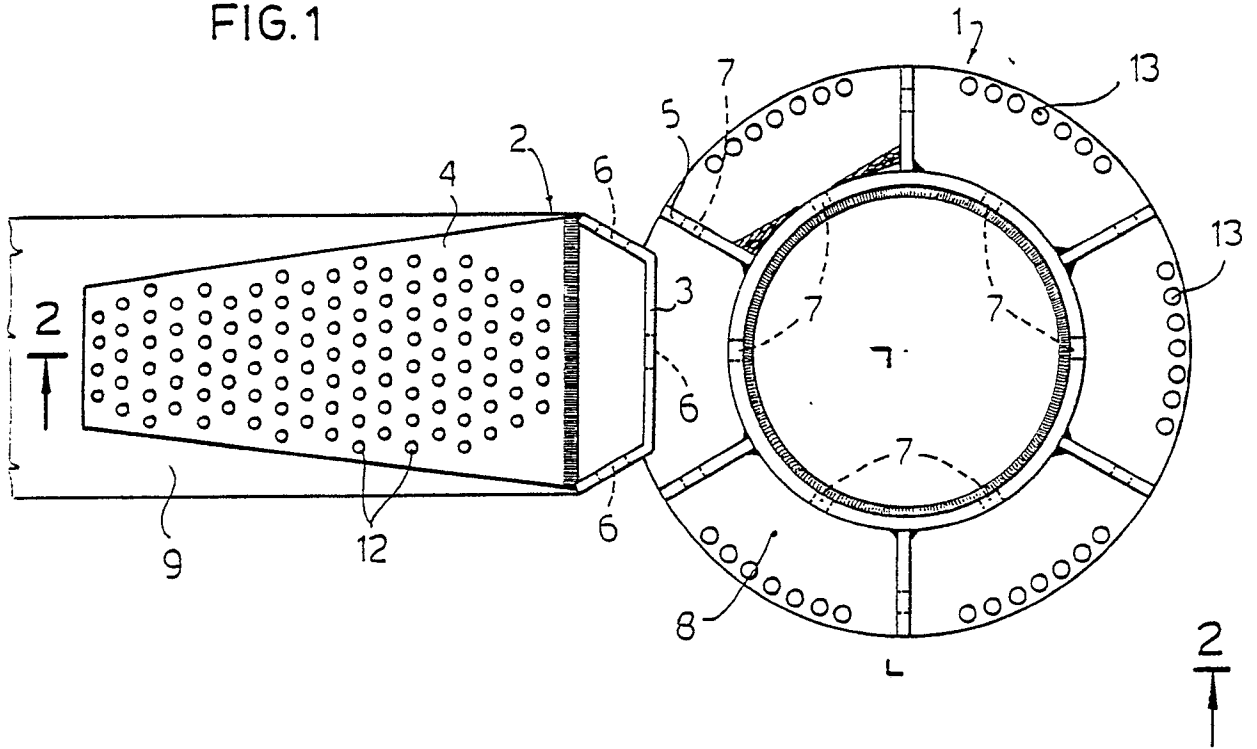
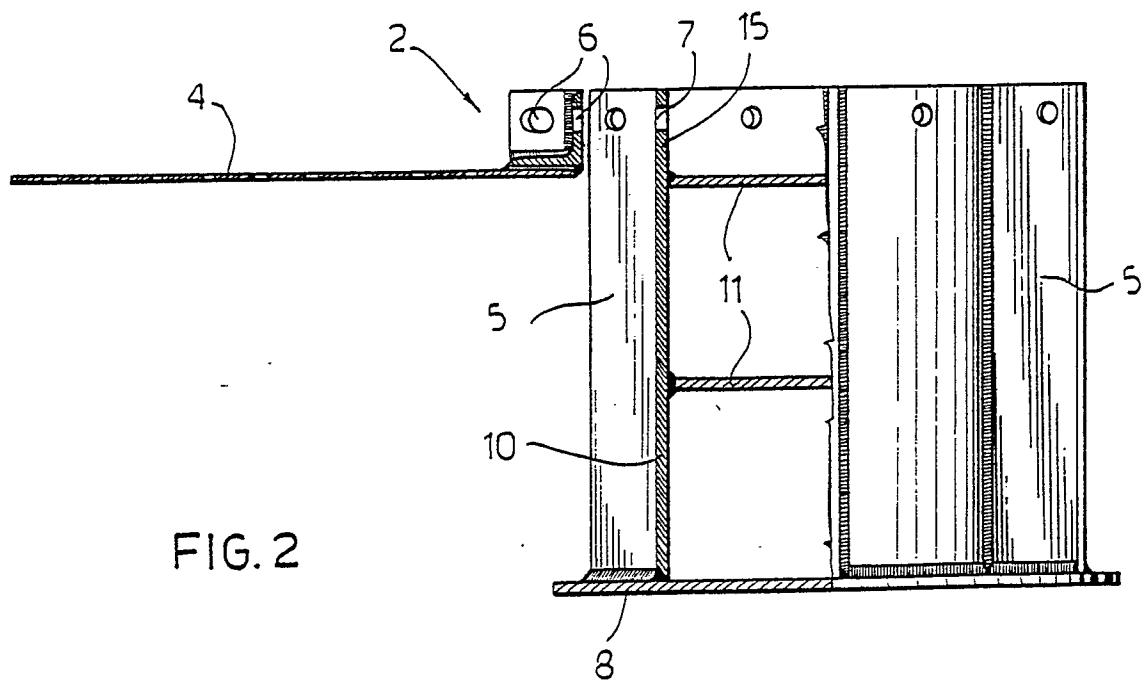
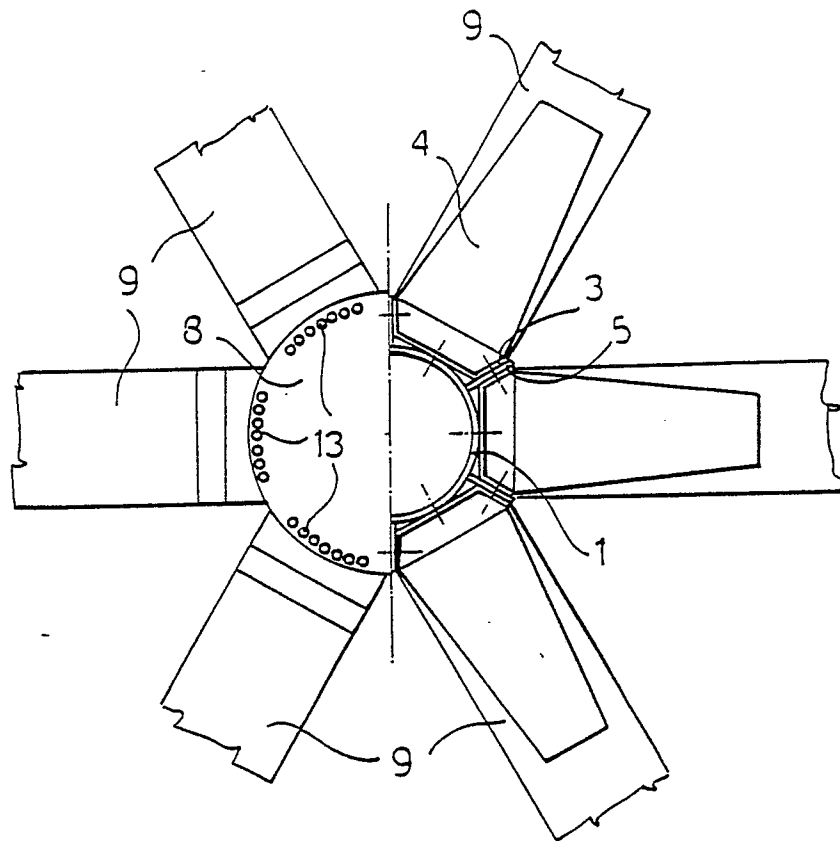
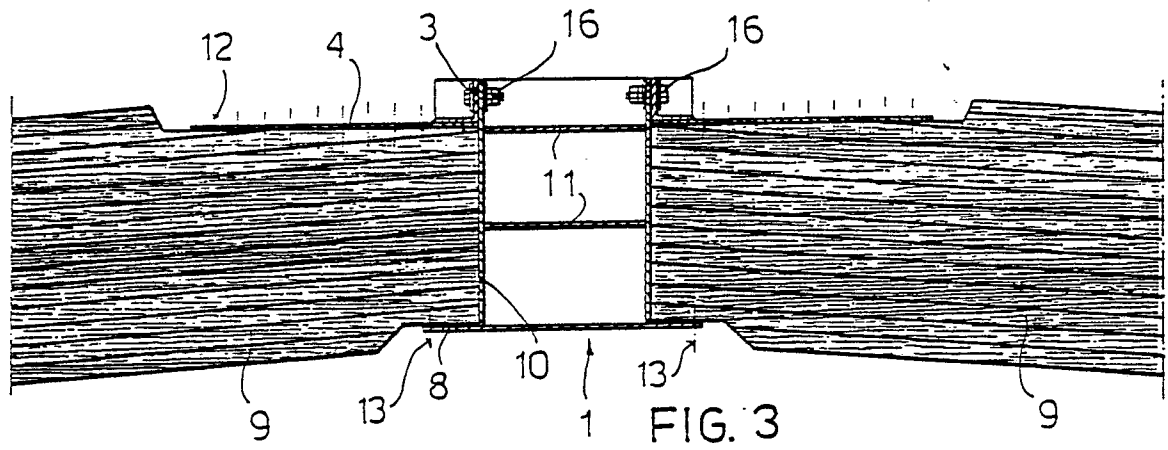


FIG. 2







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)
X	US-A-4 671 693 (ROSSMAN) * Column 2, line 45 - column 3, line 13; column 4, lines 31-38; figures 1,2,5,6 *	1,4,8	E 04 B 1/32
Y		3,5	
A		2	
Y	EP-A-0 072 139 (ROSSMAN) * Page 7, lines 11-24; page 9, lines 11-27; figures 1,3 *	3,5	
A	US-A-4 357 118 (MURRAY) * Column 2, line 11 - column 3, line 16; figures 1-4 *	2,9	
A	EP-A-0 031 804 (UTEMA-TRAVHYDRO S.A.) * Page 6, line 20 - page 7, line 18; page 9, line 14 - page 10, line 3; figures 1,2,8 *	2,10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			E 04 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20-12-1988	Examiner PORWOLL H.P.
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			