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(54) **MODULAR TOWER**

(57) The present invention relates to a modular tower formed by a composition of sections (1) and sections (1.1) having different widths, which comprise a lattice formation formed by basic structures in the form of angle irons, said sections (1 and 1.1) having different widths being connected by means of transition sections (6), which in turn comprise a lattice formation formed by respective basic structures in the form of angle irons.

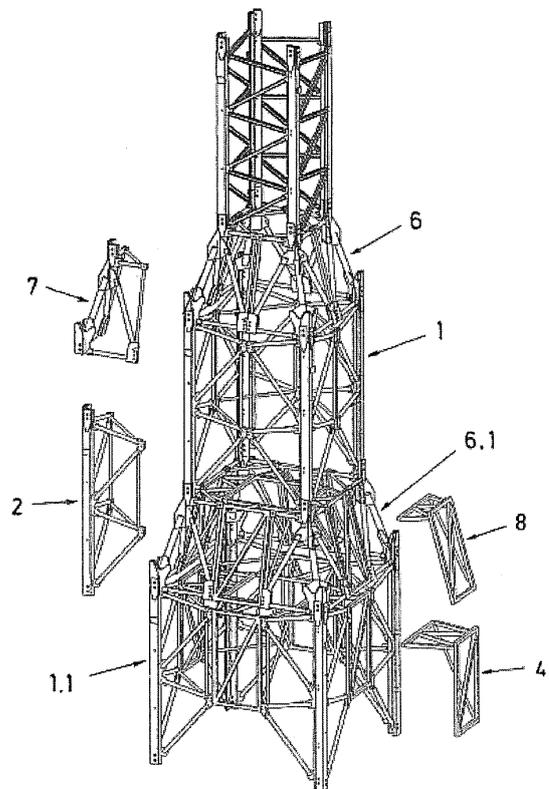


Fig.10

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Description

Field of the Art

[0001] The present invention relates to assembling lattice towers especially designed for temporary assemblies, for example for tower cranes or similar applications, proposing a modular structure formed by basic parts that allow assembling different high-rigidity and high-strength towers in a quick and easy manner with basic parts.

State of the Art

[0002] Lattice structures are load-bearing arrangements formed by bars or profiles connected to one another by means of conventional methods, with which good rigidity and strength outputs are obtained with low weight, said structures normally being used for building raised structures and towers, such as bridges, high-voltage towers, load lifting apparatus, etc.

[0003] The lattices can be formed by a single body that is assembled in its entirety at the application site, or they can be modular, being formed by partial, factory pre-assembled sub-structures which are connected to one another at the application site, which considerably simplifies, hastens and lessens costs for assembly and disassembly operations of all the structures in their usage form.

[0004] A common type of modular lattice structure is based on using sections called "monoblock" for assembling towers or similar assemblies. Such structures allow a very quick assembly, but the structural assembly of the sections that form it and the assembly operations to be performed at the application site are conditioned by the maximum dimensions of the sections allowed in transport, said sections furthermore taking up a lot of space in storage.

[0005] Another common type of modular structures uses sections called flat-pack sections, which are formed from relatively flat panels assembled to one another such that said panels can be stacked taking up very little space, which facilitates transport and storage, but the size of the panels is limited by the transport characteristics and by the increased flexibility they have as size increases.

[0006] Such structures facilitate and economize assembling towers, but, however, they are limited for application in a single design, the use thereof not being envisaged for different tower dimensions or applications and the adaptation thereof to structures having different heights with sections having variable widths being impossible.

Object of the Invention

[0007] According to the present invention, there is proposed a modular tower with which advantageous functional features are obtained because it allows tower assembly and disassembly in a quick, simple and economical manner, allowing the building of different types of

towers with good strength and load-bearing features in a quick and simple manner.

[0008] This tower object of the invention presents simple basic structures formed by bars or profiles connected to one another by means of conventional connecting methods, which are assembled for forming tower sections which, connected to one another, form the desired tower assembly.

[0009] Sections of constant cross-section, as well as transition sections for connecting sections having different cross-sections can be formed with said basic structures, different types of structures being used depending on the position and type of the sections for which they are intended. Therefore, angle irons intended for forming the corners of the section, as well as spacers which are placed between the angle irons, are used both in straight sections and in transition sections to increase the cross-section of the section.

[0010] A tower is thus obtained, the assembly of said tower being quick and simple, which allows factory pre-assembly of tower sections, facilitating the assembly of the tower assembly to be built at the application site, and furthermore with an arrangement by means of basic structures, whereby with one and the same set of basic structures different towers can be assembled depending on needs, said basic structures taking up little space for storage and transport.

[0011] Therefore, said modular tower object of the invention has certainly advantageous features, acquiring its own identity and preferred nature for the intended function of building modular towers having different configurations.

Description of the Drawings

[0012]

Figure 1 shows a perspective view of an embodiment of a section of the tower according to the invention.

Figure 2 shows a perspective view of an angle iron-type basic structure for forming the tower section of the preceding figure.

Figure 3 shows an example of packaging of angle iron-type basic structures forming a more easily transportable package than a tower section assembled from them.

Figure 4 shows a perspective view of a tower section enlarged at its cross-section.

Figure 5 shows a perspective view of a spacer-type basic structure for enlarging the section of the tower sections.

Figure 6 shows a perspective view of an assembled modular transition section formed by angle irons according to the invention.

Figure 7 shows a perspective view of a basic structure for the transition sections.

Figure 8 shows a perspective view of a transition section, enlarged at its cross-section, according to

one embodiment.

Figure 9 shows a perspective view of a basic spacing structure for enlarging the section of the transition sections.

Figure 10 shows an example of a formation of a tower, with some basic structures forming its sections seen in an exploded view.

Detailed Description of the Invention

[0013] The object of the invention relates to a lattice-type modular tower with embodying features that allow the assembly thereof from basic structures, which structures allow forming tower sections (1), a high-rigidity and high-strength assembly being obtained in a quick and simple manner.

[0014] The sections of the proposed tower consist of basic structures (2) which are assembled to one another for forming sections (1) the connection of which forms the body of the tower, the assembly being able to be performed at the application site.

[0015] The basic structures (2) are formed by bars or profiles (3) connected to one another by means of any connection method, said basic structures(2) being able to be of different types depending on the application in the structural assembly of the towers to be formed.

[0016] One type of said basic structures (2) is in the form of an angle iron, as depicted in Figure 2, with which the edges of the sections (1) of the body of the tower are formed, such that a tower section (1) is formed by means of the connection of two basic structures (2) of this type that are facing one another. This structural arrangement of the sections (1) can be disassembled and the basic structures (2) can be stacked by fitting them in with one another, as depicted in Figure 3, whereby stowing the assembly in very little space, facilitating storage and transport.

[0017] Other basic structures (4) acting as spacers can furthermore be arranged between the mentioned basic structures (2) to determine tower sections (1.1) with a larger cross-section, as seen in Figure 4.

[0018] The connections (5) of the bars or profiles (3) forming the basic structures (2 and 4) as well as the connections of said basic structures (2 and 4) to one another and the connections between tower sections (1.1) are performed by means of any conventional fixing system, such as screwed connections.

[0019] Therefore, by means of the structural arrangement of the proposed tower, tower sections (1.1.1) having different sections can be formed, being envisaged for forming the connection between sections (1) of smaller section and sections (1.1) of a larger section, transition sections (6), as depicted in Figure 6, which are formed in turn by respective angle iron-type basic structures (7), as depicted in Figure 7.

[0020] These transition sections (6) can also be widened by means of basic spacing structures (8) for forming transition sections (6.1) of larger section, as depicted in

Figure 8, depending on the sections (1 and 1.1) having different sections that have to be connected in the composition of towers with parts having different sections, such as the example depicted in Figure 10.

Claims

1. A modular tower, comprising an arrangement of sections formed by lattice structures, **characterized in that** the composition of the body of the tower comprises first sections (1) and second sections (1.1) of greater width, said first sections (1) being connected to said second sections (1.1) by means of first transition sections (6), both of said first and second sections (1 and 1.1) comprising basic structures(2) in the form of angle irons which are connected to one another in opposing positions, whereas the first transition sections (6) are in turn formed by respective basic structures (7) in the form of angle irons, which are likewise connected to one another in opposing positions.
2. The modular tower according to claim 1, **characterized in that** said second sections (1.1) of greater width further comprise, between said basic structures (2) basic spacing structures (4).
3. The modular tower according to claim 1, further comprising second transition sections (6.1) of greater width comprising basic spacing structures (8) arranged between such respective basic structures (7) in the form of angle irons.

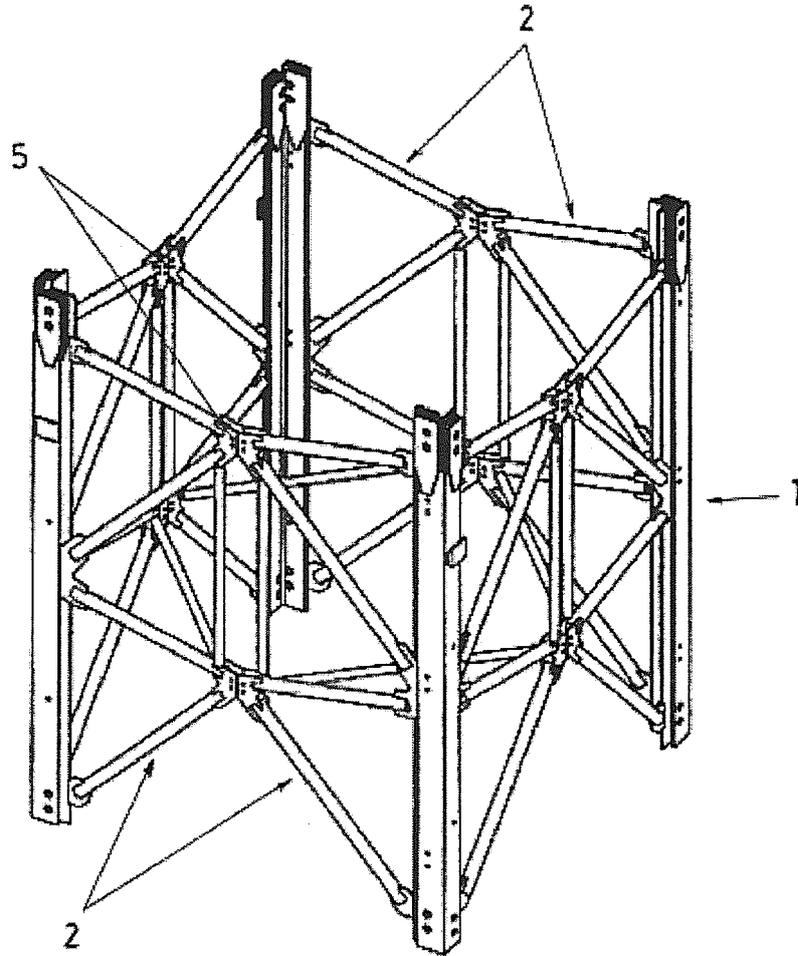


Fig.1

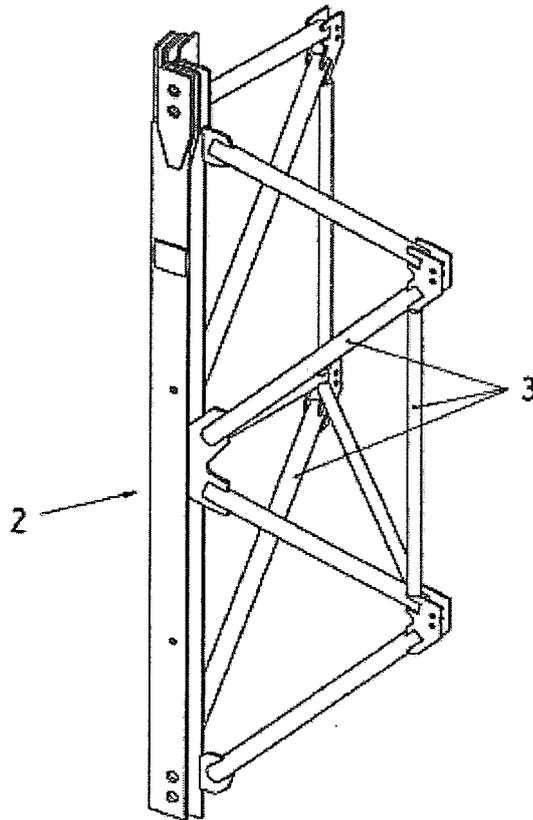


Fig.2

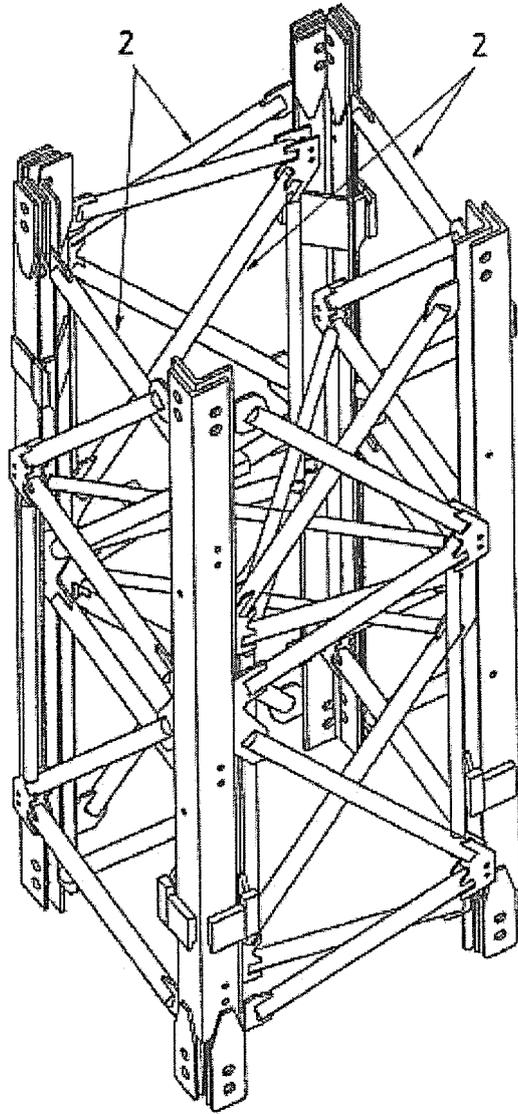


Fig.3

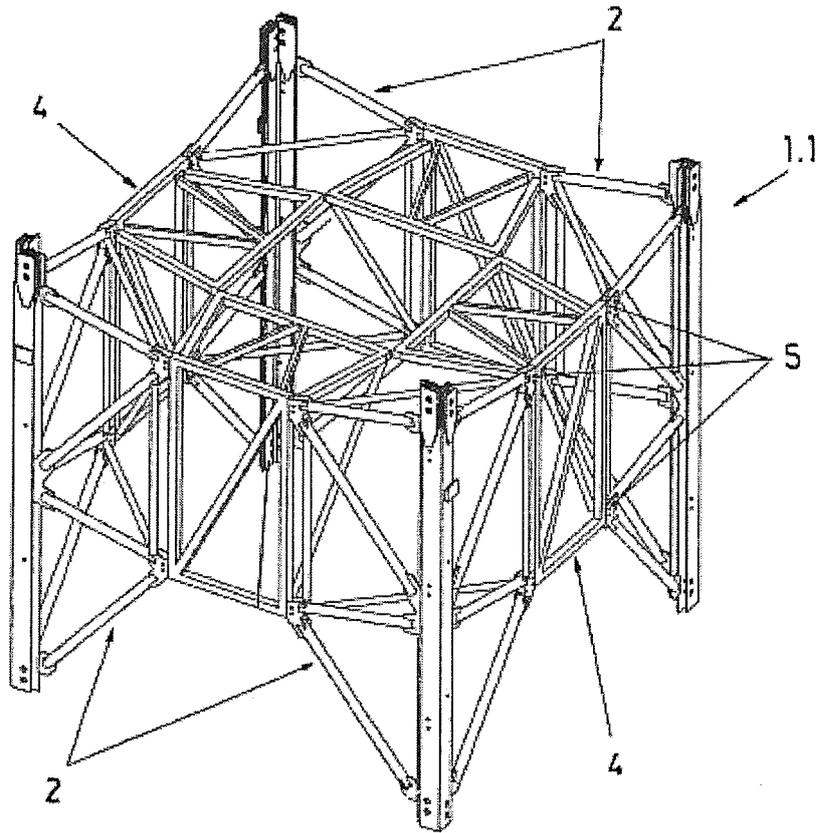


Fig.4

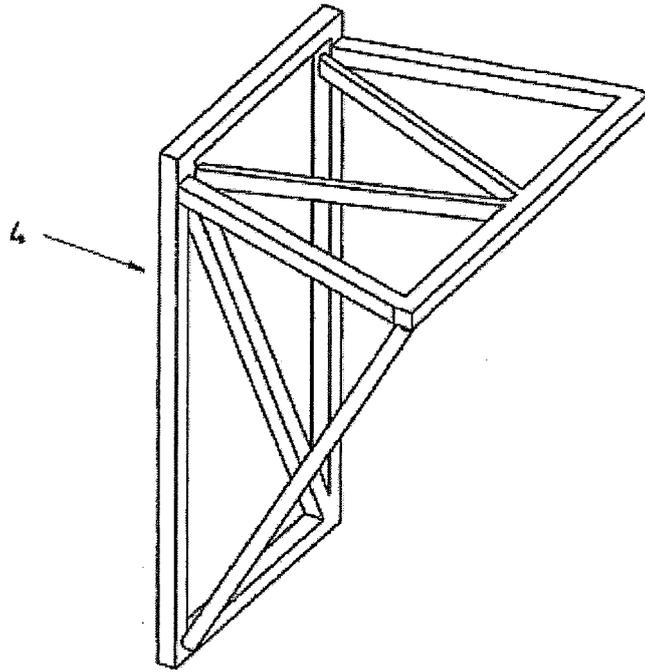


Fig.5

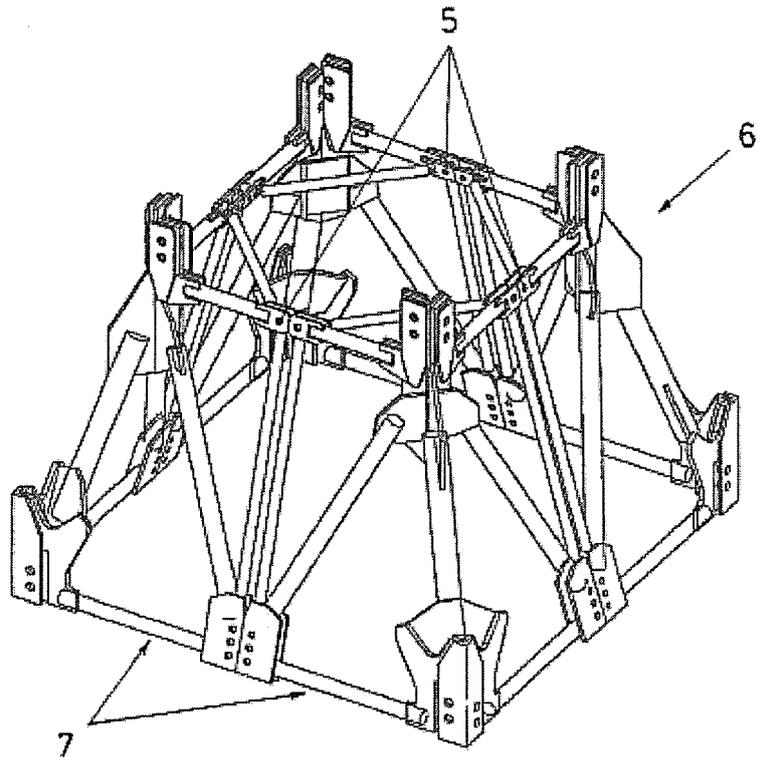


Fig.6

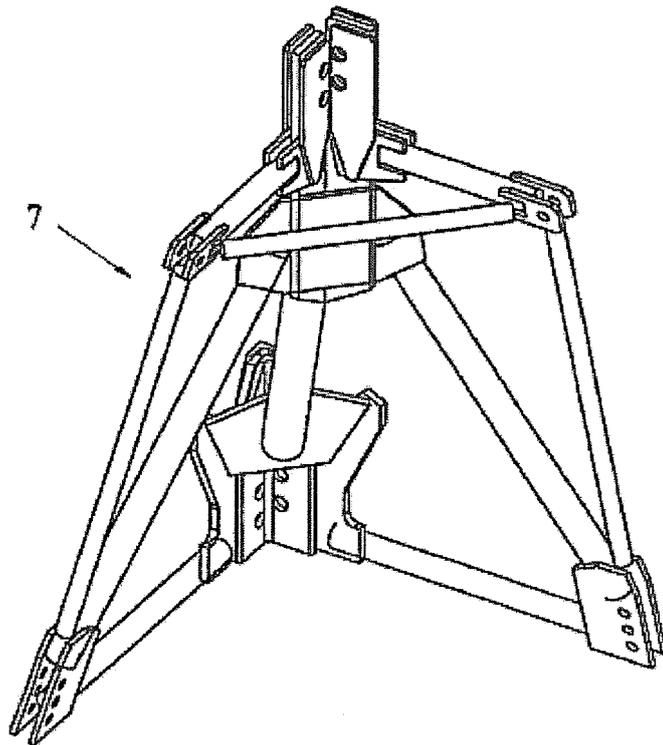


Fig.7

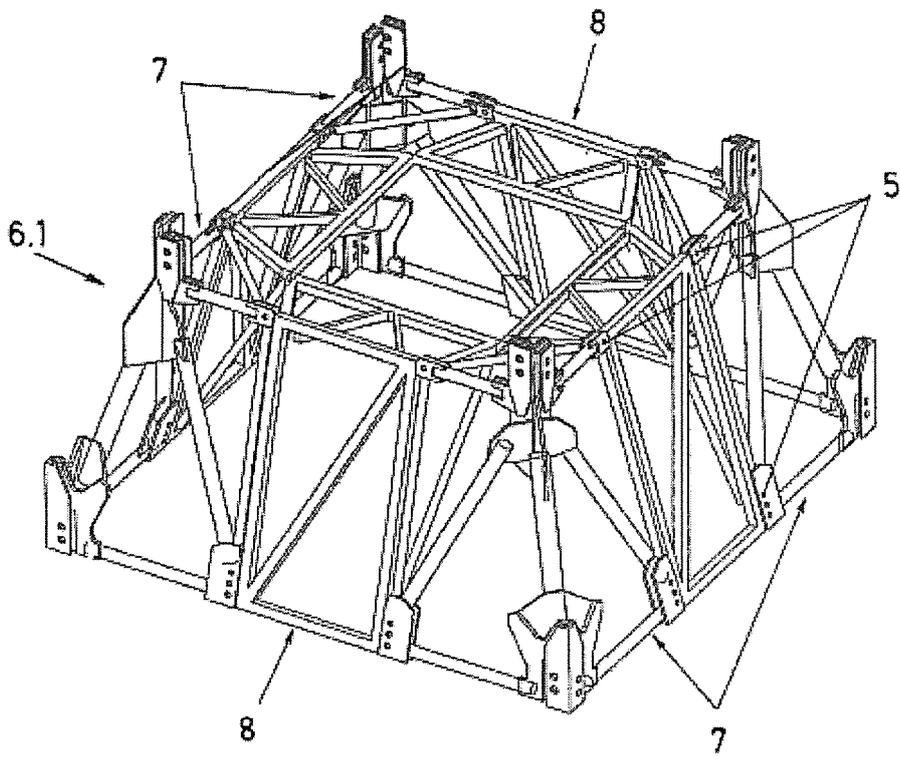


Fig.8

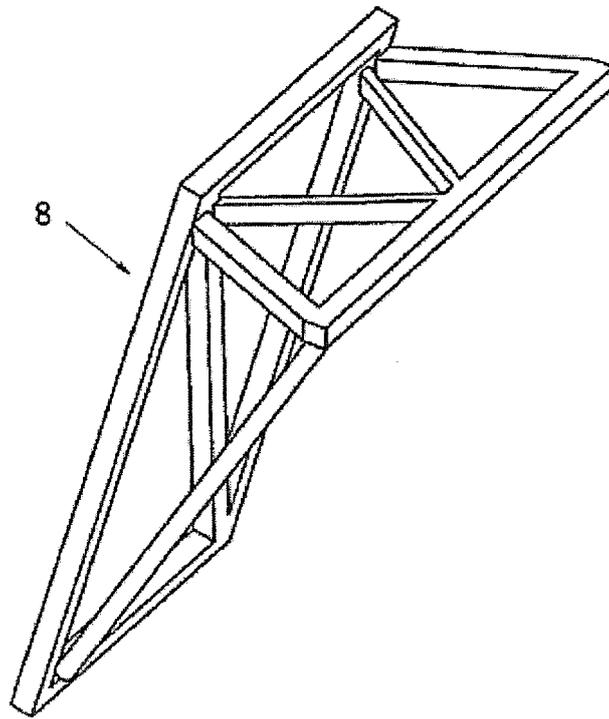


Fig.9

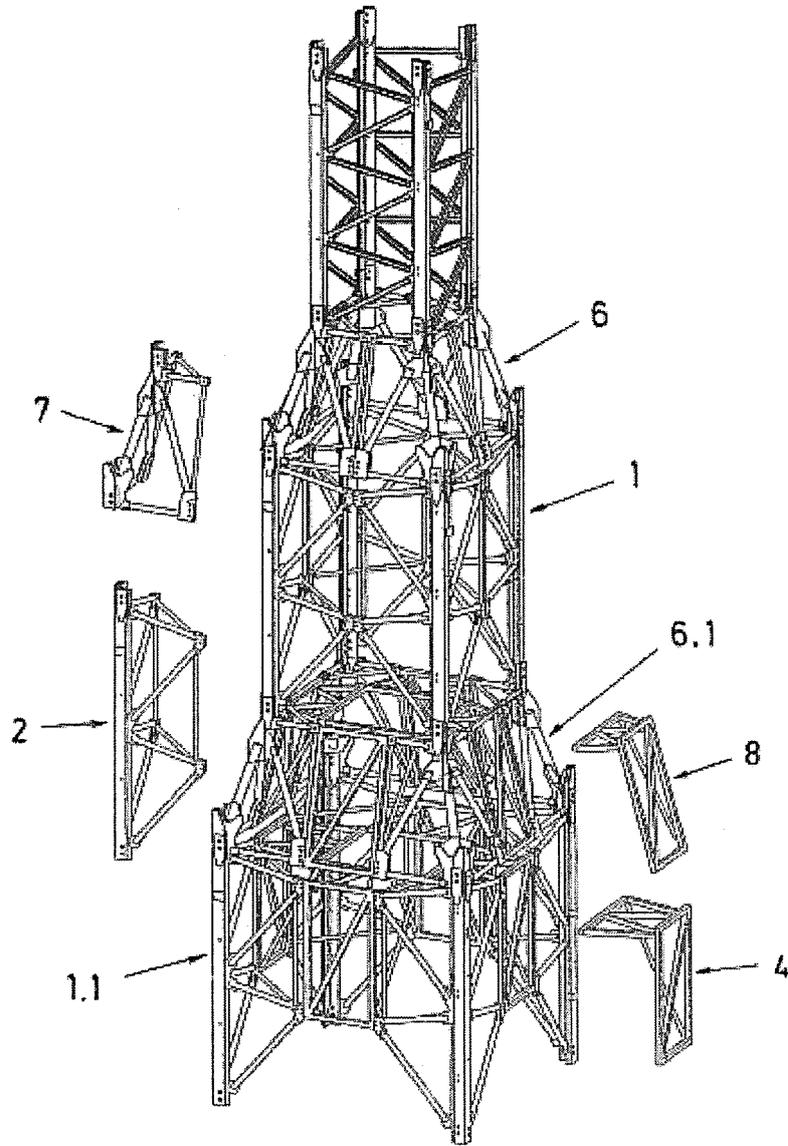


Fig.10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2012/000192

A. CLASSIFICATION OF SUBJECT MATTER

E04H12/10 (2006.01)**B66C23/28** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04H, B66C, HO1Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	ES 1037043 U (HERRAJES ELECTRICOS S A) 16/12/1997, column 1, lines 18 - 45; column 4, lines 13 - 26; figure 1.	1-3
Y	US 3407559 A (PIERRE DURAND) 29/10/1968, column 1, lines 52 - 69; column 2, lines 18 - 39; figures 1 - 3, 5, 6.	1-3
A	US 3866760 A (REICH ELMAR) 18/02/1975, column 2, lines 3 - 28; column 3, line 64 - column 4, line 18; figure 3.	1-3
A	US 2806560 A (COX EUGENE H) 17/09/1957, column 1, line 54 - column 2, line 18; figures 1, 2.	1

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"E" earlier document but published on or after the international filing date	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
26/11/2012Date of mailing of the international search report
(28/11/2012)

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No. PCT/ES2012/000192

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C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2012/000192

Information on patent family members

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