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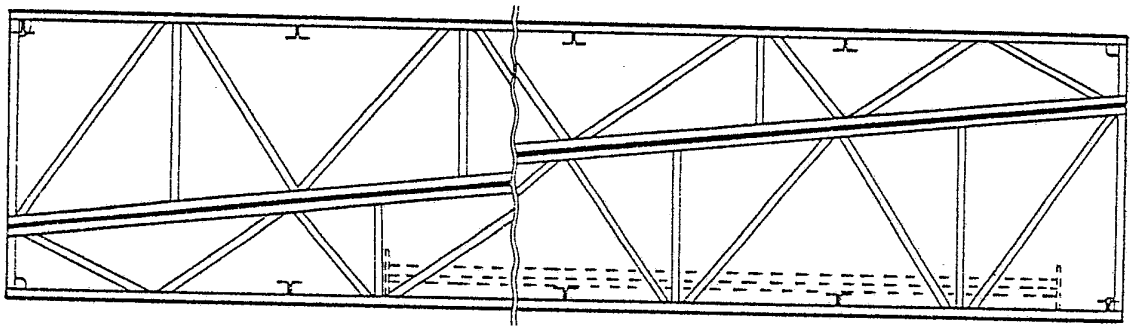
(54) Title: A CONTAINER FOR AN INDUSTRY HALL



(57) Abstract

A container for an industry hall which can be assembled to an industry hall or similar and alternatively to a container, which fulfils the international regulations concerning dimensions and strength. The composite roof beam of the industry hall consists of two interconnected roof beams (4). Each roof beam has an upper (5) and a lower (6) longitudinal girder. Two roof beams (4) are interconnected having respective upper longitudinal girder (5) abutting each other, thereby forming a rectangular composite frame (8). This rectangular composite frame forms side surfaces and the outer boundary of the container. Two such rectangular composite frames are placed alongside and spaced from each other and are interconnected by means of mounting beams (7). The remaining parts of the industry hall are placed in a suitable way inside the frame of the container formed in this way.

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# A CONTAINER FOR AN INDUSTRY HALL

The present invention relates to the building of an industry hall, a storehouse, a sport hall, an aeroplane hangar, a service hall and similar buildings, which are to be erected at a great distance from the manufacturing factory. The expression industry hall as used in the specification below comprises the above-mentioned different types of buildings as well as other similar buildings.

In order to make a simple transport of the integral parts of the industry hall possible, the parts are according to the present invention packed together into a container, which fulfils the international container regulations as faras dimension and strength are concerned. All parts for the industry hall can be contained within the boundary of the container, which can be transported in a conventional way.

According to the present invention the container is built by the roof beams of the industry hall, which may form the outer shell or frame of the container.

In view of the international regulations a container should have a length of about 12 m(or 9 m). A suitable width of span for a roof beam in the industry hall is 24 m. By the expression roof beam is meant a support composite frame, which spans between two in line mounted main uprights. The roof beam consists of two in line with each other placed roof beams, which are mounted together at the ridge of the roof. The length of the industry hall determines the numbers of roof beams required for the building.

According to the present invention two roof beams, which in the industry hall form a roof beam, are mounted together next to each other in order to form a rectangular composite frame having half the length of the roof beam, i.e. 12 m. Two such mounted composite frames form two side surfaces of the container. The distance between these rectangular composite frames is maintained by means of the mounting members, which are used in

the industry hall in order to connect together the roof beams at the ridge of the roof.

Thus, according to the present invention, parts are provided, which on one hand can be assembled to an industry hall and on the other hand can be assembled to a container, which fulfils the international regulations as far as dimensions and strength are concerned. The shell for the container is formed by roof beams mounted together, and the space inside the container is used for the remaining parts of the industry hall, which may change in dependence of the intended application. Each container has room for parts for a certain maximum size of the industry hall. If a larger industry hall is required, this may be provided with a plurality of containers. Thus, a very flexible industry hall/container is produced, which heavily reduces the transport costs over long distances, since no unnecessary material is transported and the transport package simply may be transported with the normal transport systems adapted for containers.

The problem of producing a transportable unity for the details needed for an industry hall or a house has previously been observed and solved, confer especially Norwegian patent specification No. 92215 and Swedish patent specification No. 7705402-1. The drawback by these previously known systems is that they lack flexibility, as one is bound to exactly that size of house which is projected. The advantage of the present invention is that the container is built by the roof beams which are always required in an industry hall while the remaining parts are optional. Thereby a great flexibility is achieved.

According to the present invention an industry hall container consisting of roof beams and remaining parts for an industry hall or similar, is produced. The parts are mounted together into a container which fulfills the international regulations as to size and weight. The container is transported to the building place and taken apart whereupon it is mounted together to an industry hall. According to the invention two roof beams are mounted together in line with each other in the industry hall in order to form a composite roof beam. The same two roof beams are mounted together parallel with each other in order to form a rectangular composite frame, which constitutes a side surface of the container. At least two such composite frames are arranged alongside and at a distance from each other and are connected together in order to form the said box or container, while the remaining parts of the industry hall are placed inside the frame of the container thus formed. The industry hall comprises at least four roof beams,

four gable beams and wight mounting members. By the expression gable beam is meant half the roof beam at the gable side. In the container the roof beams are connected with each other in pairs and form at least two rectangular composite frames. At the upper and lower long side of each rectangular composite frame a gable beam is connected. Each gable beam comprises several mounting ears with mounting holes. Furthermore, there are mounting members in the form of girders having mounting holes. The mounting members are connected with the said mounting ears in the gable beams and are directed sidewardly and perpendicularly against the respective rectangular composite frame. The mounting members of two alongside and at a distance from each other placed rectangular composite frames, are directed against each other and overlap each other and are connected to each other in order to mount the composite frames spaced from each other. In this way the side surfaces of the container are formed. The parts of the container are dismountable for the subsequent mounting to an industry hall.

For the purpose of examplification a preferred embodiment of the invention is described below with reference to the accompanying drawing. Fig. 1 shows schematically a gable side of an industry hall according to the invention. Fig. 2 is a cross-section through the industry hall. Fig. 3 shows two roof beams mounted together to a rectangular composite frame. Fig. 4 shows a section of a container mounted together according to the invention. Fig. 5 is an elevation of the container according to Fig. 4. Fig. 6 is plane view of the container according to Fig. 4. Fig. 7 is a detail enlargement according to the line VII of Fig. 1. Fig. 8 is a cross-section taken along the line VIII-VIII of Fig. 7. Fig. 9 shows a mounting member according to the invention.

Figs. 1 and 2 schematically show an industry hall according to the present invention. Fig. 1 shows a gable side, which comprises wall uprights 1 of different length, and two gable beams 2 for the roof. Fig. 2 shows a cross-section through the industry hall with main uprights 3 and roof beams 4. Fig. 2 shows two roof beams 4 mounted together at the centre and resting on two main uprights 3. Each roof beam 4 consists of an upper 5 and a lower 6 longitudinal girder and intermediate vertical and diagonal girders. The lower longitudinal girder 6 is essentially horizontal and the upper longitudinal girder 5 forms an angle with the longitudinal girder 6 in order to give the roof a suitable drainage inclincation. The two roof beams 4 are mounted together at the centre by means of mounting members 7, which are shown in detail in Fig. 9. The main uprights 3

are in any suitable way connected with cement blocks, anchored in the ground.

When transporting the industry hall from the manufacturing factory to the building ground, all parts for the building of the industry hall are contained within the boundary of a container, which fulfils the international regulations for containers in respect of dimensions and strength. Thus a container should have a width of 2435 mm +3, -2 mm, a height of 2410 mm ±10 mm and a length of 12187 mm ±5 mm. There is also a container size with e.g. the length of 9 m.

According to the present invention the roof beam 4 is dimensioned to form a long side at such a container. Thereby the roof beam is divided at the connection area adjacent the ridge of the roof and two roof beams 4 are mounted together as shown in Fig. 3 having respectively upper longitudinal girder 5 placed adjacent each other and connected to each other by bolts. Each roof beam 4 is manufactured with a length of 12187 mm. Two roof beams of this kind mounted together form a rectangular composite frame 8 and are arranged beside each other at a distance from each other corresponding to the width of the container and are connected with each other by means of the above-mentioned mounting members 7, as closer appears in Fig. 4. A greater number of rectangular composite frames 8 may form each side of the container, which is also shown in Fig. 4.

Each industry hall comprises four gable beams 2, which are mounted inside respectively rectangular composite frame 8 as closer appears in Fig. 4. Each gable beam comprises L-shaped mounting ears 9 as closer appears in Figs. 7 and 8.

In the embodiment shown the gable beam 2 consists of a U-profile as is shown in Fig. 8. On the U-profile, L-shaped mounting ears 9 are equidistantly welded as is shown in Figs. 1 and 7. The mounting ears 9 comprise four elongated holes 10 for connection of the roof material.

The mounting member 7 consists of a L-shaped beam with a number of mounting holes 11, as is shown in Fig. 9. The mounting member 7 has a length which more than enough corresponds to half the distance between two gable means of the container. The mounting members are connected by screws in the L-shaped mounting ears 9 of the gable beams, cf. Fig. 4. Thereupon, the two mounting members facing and overlapping each other are screwed together. The outer holes 12 of the mounting member 7 are positioned closer to the adjacent holes 11 than the distance between the remaining holes 11 of the mounting member 7, whereby it is possible to adjust the total length of the two mounting members 7 mounted together so that the width of the

container will be that intended. The modular distance between the holes 11 is suitably 100 mm, while the distance between the hole 12 and the hole 11 is 90 mm.

In order to brace the container shell formed in this way, a number of diagonal braces or crosses 13 are arranged between the mounting ears 9 at both the upper and lower surface of the container, cf. Fig. 6. These diagonal braces are used to support the wall uprights in the industry hall, cf. Fig. 1. Figs. 5 and 6 show the container mounted together according to the invention in a side view and a plane view. The inner space of the container is now used to contain wall uprights 1, main uprights 2, roof planes, windows, doors, fasade plate etc. In Fig. 5 wall uprights placed on top of the mounting members 7 are indicated by dashed lines. The wall uprights are screwed together to a package and the package is wedged by wood wedges or in another way secured in the container. The rest of the material is packaged and packed together in a suitable way and secured in the container.

The roof beams 4 comprise corner mountings 14 at the corners positioned on the outside of the rectangular composite frame, cf. Fig. 6. This corner mounting forms engagement members for the lifting cranes etc, which handle the container during the transport. In the industry hall the corner mounting 14 does not disturb the normal construction.

An preferred embodiment has been described above for the sake of examplification but a person skilled in the art realizes that this embodiment can be modified in many different ways within the scope of the invention. E.g. the roof beams can be made in many different ways with composite frames or merely supporting beams and the exact form is of no importance as soon as the roof beams can be assembled to a rectangular frame which can form the side surface of the container.

CLAIMS

1. A container for an industry hall comprising roof beams and remaining parts for a industry hall or similar, which are possible to assemble to a container for the transport, and to an industry hall, c h a r a c t e r i z e d in that the two roof beams (4) can be mounted together in line with each other in order to form a composite roof beam in the industry hall, and can be mounted together parallel with each other in order to form a rectangular composite frame (8); that at least two rectangular composite frames are arranged alongside and spaced from each other and are connected with each other in order to form a box or container; and that remaining parts of the industry hall are placed inside the frame of the container thus formed.

2. A container for an industry hall according to claim 1, c h a r a c t e r i z e d in that the industry hall comprises at least four roof beams (4), four gable beams (2) and eight mounting members (7); that the roof beams are interconnected in pairs and in parallel in order to form at least two rectangular composite frames (8); that at the upper and lower long side of each rectangular composite frame a gable beam (2) is connected; that each gable beam comprises a number of mounting ears (9) with mounting holes (10); that the mounting members (7) consist of beams with mounting holes (11); that the mounting members (7) are connected with the mounting ears (9) of the gable beams (2) and are directed transversally and perpendicular to respectively rectangular composite frame (8); that the mounting members of two alongside and spaced rectangular composite frames face and overlapp each other and are interconnected in such a way that the two rectangular composite frames are positioned at a predetermined distance from each other, thereby forming the side surfaces of a rectangular box or container; that the dimensions of the container correspond to the dimensions according to the international regulations for a transport container; and that the said parts are possible to disassemble for the following mounting to an industry hall.

3. A container for an industry hall according to claim 1 or 2, c h a r a c t e r i z e d in that the mounting member (7) is a L-beam and that the mounting holes (11) are arranged essentially equidistantly spaced, whereby at least one hole (12) deviates from this spacing.

4. A container for an industry hall according to claim 2, c h a r a c t e r i z e d in that the gable beam (2) is mounted beside and inside the respectively rectangular composite frame (8).

5. A container for an industry hall according to any of the previous claims, c h a r a c t e r i z e d in that the roof beams (4) at the outer corners of the rectangular composite frame comprise corner mountings (14) corresponding to international container standard.

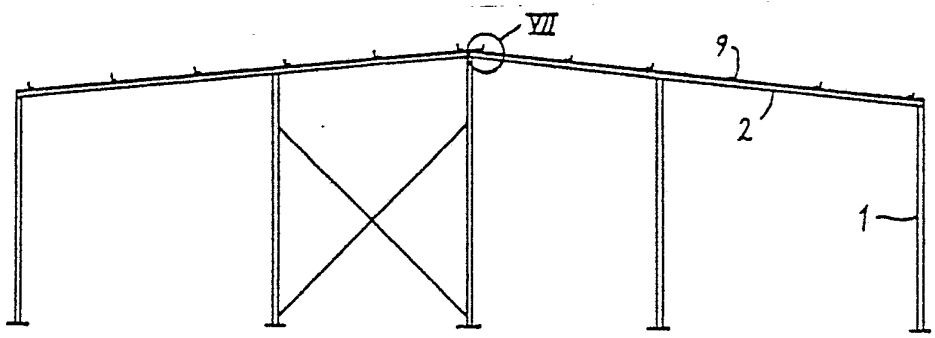


Fig 1

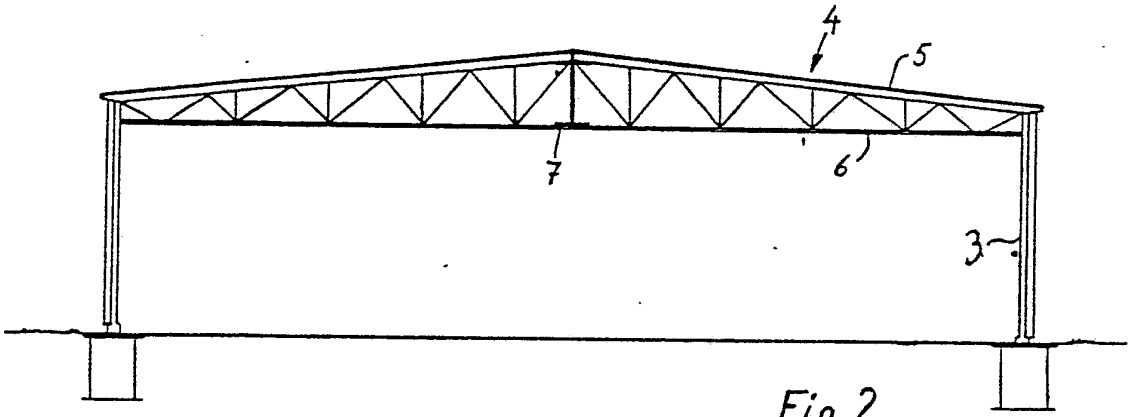


Fig 2

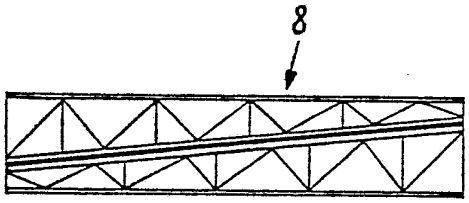


Fig 3

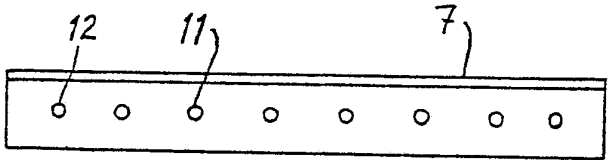


Fig 9

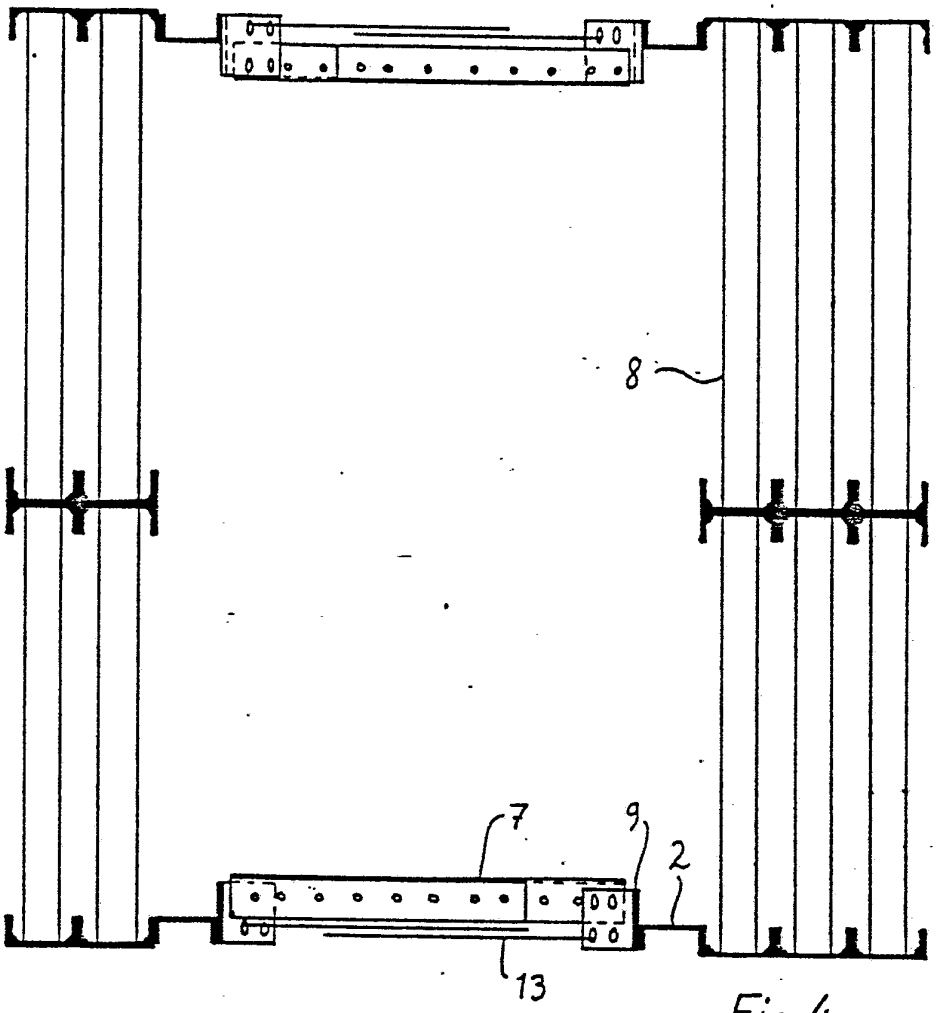


Fig 4

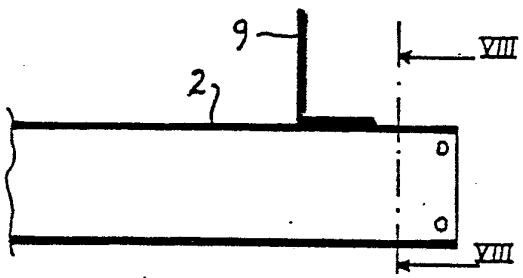


Fig 7

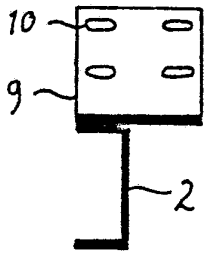


Fig 8

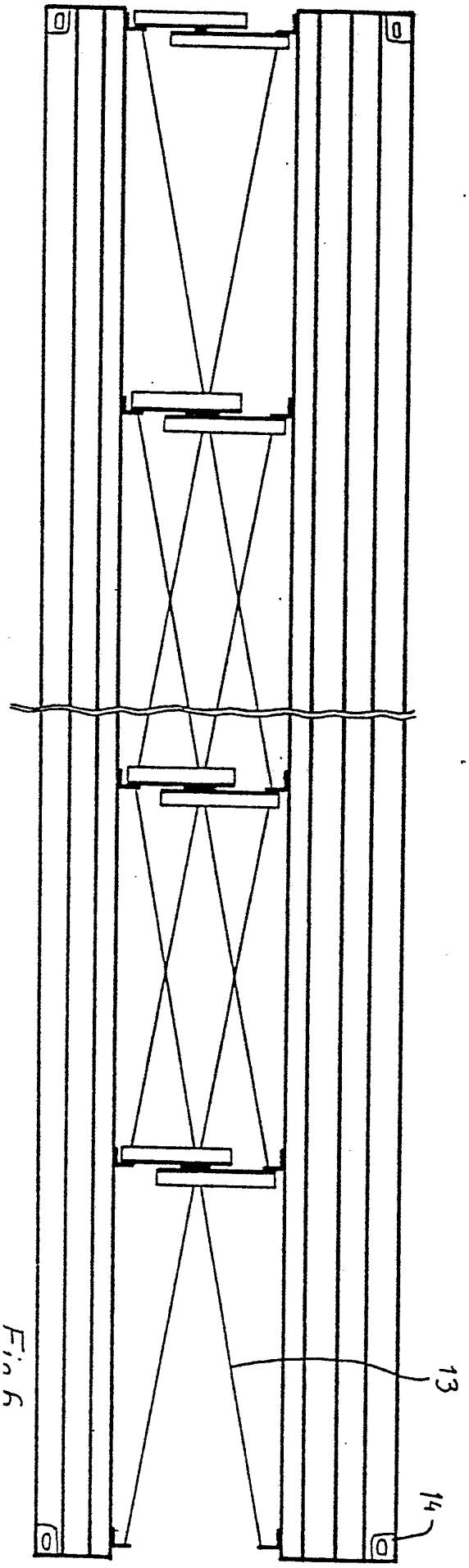


Fig 6

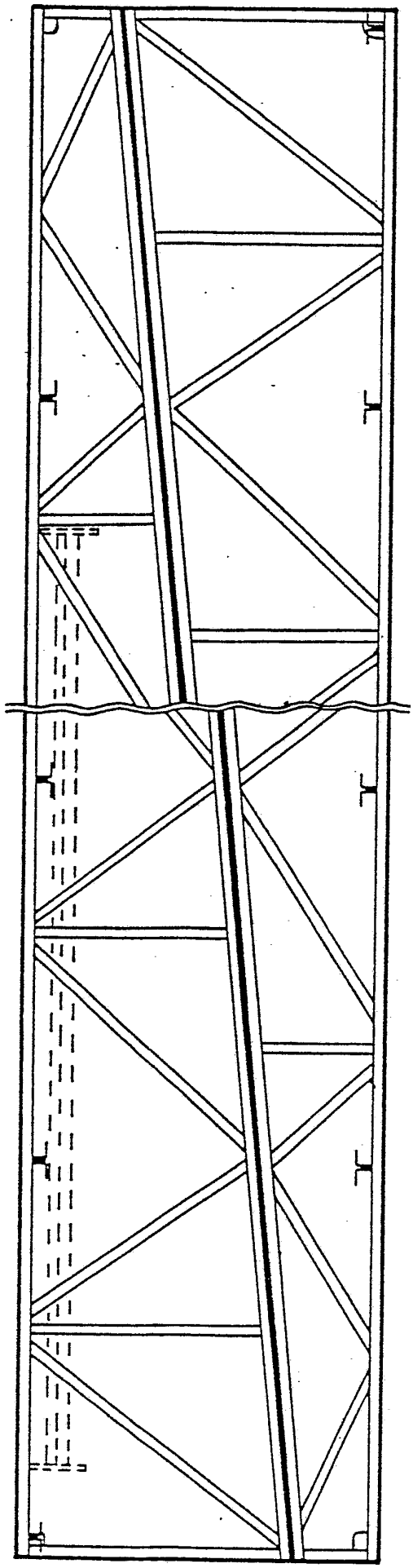

Fig 5

# INTERNATIONAL SEARCH REPORT

International Application No PCT/EP 81/00017

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 3

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl.$^3$: E 04 B 1/343; E 04 H 5/02

## II. FIELDS SEARCHED

Minimum Documentation Searched 4

| Classification System 4 | Classification Symbols |
|---|---|
| Int.Cl.$^3$ | E 04 B; E 04 H |

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched 5

## III. DOCUMENTS CONSIDERED TO SE RELEVANT 14

| Category * | Citation of Document, 16 with indication, where appropriate, of the relevant passages 17 | Relevant to Claim No. 13 |
|---|---|---|
| | GB, A, 1114091, published May 15, 1968, see page 2, lines 3-130, page 3, lines 1-65, figures 1,2,3,4, Terrapin | 1 |
| | GB, A, 1152062, published May 14, 1969, see page 2, lines 27-85, figures 1,2, 3,4, Tottle | 1 |
| | GB, A, 1506153, published April 5, 1978, see page 2, lines 68-80, figures 1,2, Milne | 1,3 |
| A | FR, A, 2065624, published July 30, 1971, see page 2, lines 36-40, page 3, lines 1-40, page 4, lines 1-10, figures 1,2, 3, Bigelow | 1 |
| A | FR, A, 2317447, published February 4, 1977, see page 2, lines 5-36, page 3, lines 1-21, figures 1,2,3, Bigelow | 1 |
| A | NO, A, 92215, published June 7, 1938, see page 1, column 1, lines 30-40, column 2, lines 1-40, figures 1,2,3,4, | 1 |

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"T" later document published on or 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

"X" document of particular relevance

## IV. CERTIFICATION

| Date of the Actual Completion of the International Search 3 | Date of Mailing of this International Search Report 3 |
|---|---|
| June 3, 1981 | June 12, 1981 |

| International Searching Authority 1 | Signature of Authorized Officer 20 |
|---|---|
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Form PCT/ISA/210 (second sheet) (October 1977)

International Application No. PCT/EP 81/00017

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

Elsrud
cited in the application

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [10]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers ....., because they relate to subject matter [12] not required to be searched by this Authority, namely:

2. ☐ Claim numbers ....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out [13], specifically:

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [11]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.