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(54) **Self-raising crane with structurally simplified locating means.**

(57) A self-raising crane with structurally simplified locating means, comprising a bearing construction (2) including a plurality of arms (11) coupled to a central framework (3) and ending with guide seats (12) engage-

able by upright columns (13), characterized in that said crane further comprises driving means (40) for driving said bearing structure (2), said driving means (40) being adapted to be removably coupled to and operate between said guide seats (12) and upright columns (13).

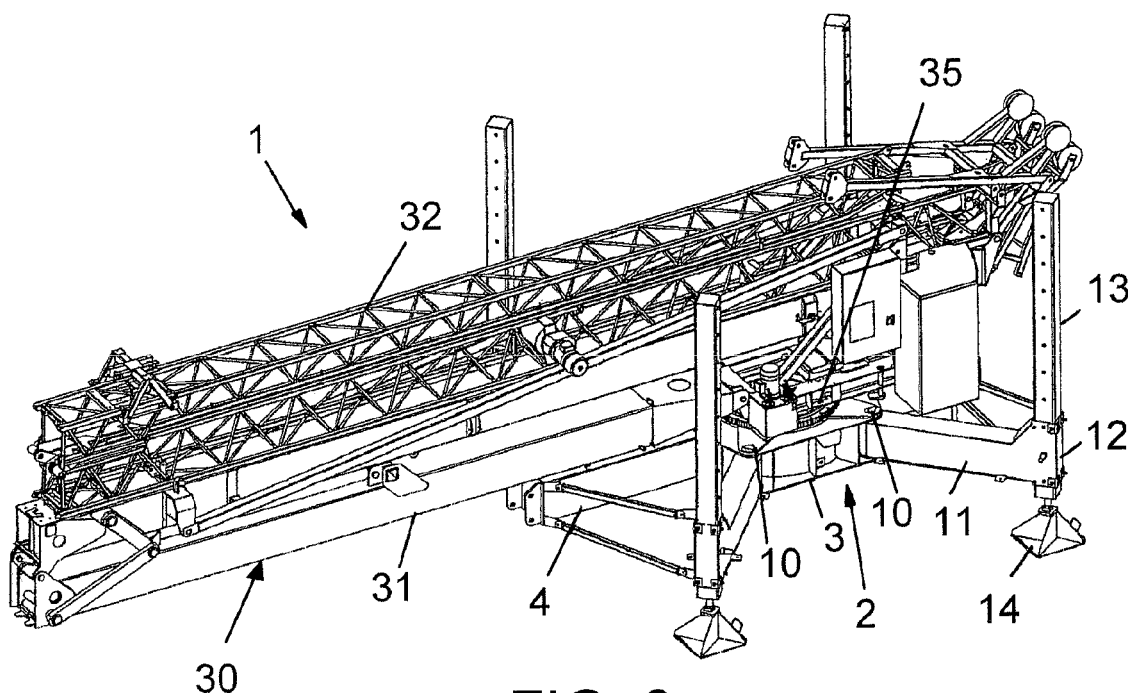


FIG. 3

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a self-raising crane with structurally simplified locating means.

[0002] As known, prior self-raising cranes conventionally comprise a crane bed to which a crane assembly including dedicated load raising and lowering means is coupled.

[0003] In many situations, crane beds leaving free a space under the bed, thereby allowing traffic or the like to pass thereunder are used.

[0004] In the above prior approaches, the crane bed driving means, for driving the bed with respect to the crane uprights, are very complex construction wise and very expensive which negatively affects the end cost of the crane.

SUMMARY OF THE INVENTION

[0005] Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a self-raising crane including structurally simplified locating means and driving and raising assemblies, so designed as to provide the crane with a very low construction cost.

[0006] Within the scope of the above mentioned aim, a main object of the invention is to provide such a self-raising crane which may be easily conveyed to a use place or yard, and which, moreover, can be quickly and easily erected.

[0007] Another object of the present invention is to provide such a self-raising crane which, owing to its specifically designed construction and features, is very reliable and safe in operation.

[0008] Yet another object of the present invention is to provide such a self-raising crane, including structurally simplified locating means, which can be easily made starting from easily available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

[0009] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a self-raising crane with structurally simplified locating means, comprising a bearing construction including a plurality of arms coupled to a central framework and ending with guide seats engageable with upright columns, characterized in that said crane further comprises driving means for driving said bearing structure, said driving means being adapted to be removably coupled to and operate between said guide seats and upright columns.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Further characteristics and advantages of the

present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention, which is illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is a schematic top plan view of the self-raising crane according to the present invention, in a transport or shipment condition thereof;

Figure 2 is a further top plan view of the inventive crane with its bearing framework at a use condition thereof;

Figure 3 is a perspective view showing the self-raising crane according to the present invention in a lowered condition thereof;

Figure 4 is a schematic view showing the self-raising crane according to the present invention with load bearing structure construction in a raised position or condition thereof;

Figure 5 is a further schematic perspective view showing the inventive crane in a raised position thereof;

Figure 6 is a side elevation view showing the inventive crane in a raised fully extended position thereof;

Figure 7 is a schematic view showing the crane driving means in a lowered position thereof; and

Figure 8 shows the crane driving means after having performed a first raising operation.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] With reference to the number references of the above mentioned figures, the self-raising crane including structurally simplified locating means, according to the invention, and which has been generally indicated by the reference number 1, comprises a bearing construction 2, including a central framework 3 which is connected to a base or bed element 4, including a plurality of rear wheels 5 and front steering wheels 6.

[0012] To said central framework or body 3 are pivoted, so as to rotate or pivot about pivot pins 10 extending substantially perpendicular to the ground, a plurality of arms 11 which, at their free end portions, comprise guide seats or recesses 12 for engaging with upright columns 13, which may comprise a bearing base 14, of a not affixed to ground type and which, optionally, may be connected to means which are directly anchored to the ground.

[0013] Under a transport or shipment condition, as shown in figure 1, said arms 11 are bent on a side of the base framework whereas, in a use condition of the crane, as shown in figure 2, strut elements 20 arranged between the arms and the base framework thereby arranging substantially at the vertex points of a square the four guide seats or recesses are herein provided.

[0014] At said central framework or body 3, a crane assembly, generally indicated by the reference number

30, which, in a per se known manner, comprises a folding crane tower 31 and a crane boom 32, which may also be bent in a transport condition and may be arranged at a use position by conventional raising means, is arranged.

[0015] On the base or bed 35 of the tower 31 counterweights 36 which are opposite to the crane boom, thereby operating as crane anti-tilting elements are moreover arranged.

[0016] A main feature of the invention is that the inventive crane further comprises driving means, generally indicated by the reference number 40, which are removably coupled to the guide recesses or seats and to the upright columns.

[0017] More specifically, at said guide seats or recesses 12 a fixed pin 41 and throughgoing holes 42 for engaging therein locking pegs 43 in turn engaged in coupling holes 44 formed on the upright columns 13 are provided.

[0018] Said coupling holes 44 are designed for engaging therein coupling pins or pegs 45 allowing to connect a driving means 40 which, at the other end portion thereof is coupled to the fixed pin 41.

[0019] To drive or displace the bearing construction with respect to the upright columns, said driving means are operated, which, in this embodiment, comprise a hydraulic cylinder but, in further embodiments, may also comprise worm screws, motor-reducer units, rack elements, rope or chain and pulley systems, to modify their length thereby allowing the crane bearing construction to be displaced with respect to the upright columns.

[0020] In operation, the crane assembly is operatively driven and, upon having achieved the desired position, the locking pin 43 is again engaged to provide a proper position of the crane bed, which positioning may be obtained step by step.

[0021] After having brought to the desired level the bearing construction, it is possible to stabilize the overall structure by stabilizing screws 50 arranged on the guide recesses or seats 12 and allowing to firmly clamp the upright columns to the related guide seats.

[0022] In this connection it should be pointed out that the raising of the crane is performed in a fully autonomous manner, that is without using outer machines.

[0023] Thus, with the disclosed arrangement, it is possible, after having properly located the bearing structure or construction with respect to the upright columns, to remove the driving means which may be used at other building yards.

[0024] From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

[0025] In particular, the fact is to be point out that the invention has provided a very simple and efficient crane construction which allows to quickly and economically locate the bearing construction.

[0026] In fact, the invention provides to use several types of raising means which after operation can be easily removed.

[0027] The invention as disclosed is susceptible to several modifications and variations, all of which will come within the scope of the inventive idea.

[0028] Moreover, all the constructional details can be replaced by other technically equivalent elements.

[0029] In practicing the invention, the used materials, provided that they are compatible to the intended use, as well as the contingent size and shapes, can be any, depending on requirements.

Claims

1. A self-raising crane with structurally simplified locating means, comprising a bearing construction including a plurality of arms coupled to a central framework and ending with guide seats engageable by upright columns, **characterized in that** said crane further comprises driving means for driving said bearing structure, said driving means being adapted to be removably coupled to and operate between said guide seats and upright columns.
2. A self-raising crane, according to the preceding claim, **characterized in that** said bearing construction comprises a bottom element including a plurality of wheels and being coupled to said central framework.
3. A self-raising crane, according to the preceding claims, **characterized in that** said bottom element comprises steering rear wheels and front wheels.
4. A self-raising crane, according to one or more of the preceding claims, **characterized in that** each said arm is coupled to said central body so as to swing about a swinging axis substantially perpendicular to a bearing plane.
5. A self-raising crane, according to one or more of the preceding claims, **characterized in that** said upright columns are coupled to supporting pyramidal elements not affixed to the ground.
6. A self-raising crane, according to one or more of the preceding claims, **characterized in that** said upright columns are coupled to ground affixed plinth elements.
7. A self-raising crane, according to one or more of the preceding claims, **characterized in that** said handling means comprise a plurality of hydraulic cylinders of a worm screw system and that said crane can be raised in an autonomous manner, without using outer raising machines.
8. A self-raising crane, according to one or more of the preceding claims, **characterized in that** said han-

dling means comprise a geared system.

9. A self-raising crane, according to one or more of the preceding claims, **characterized in that** said handling means comprise a rack system and/or a rope or chain system including sheave or gear transmission means. 5
10. A self-raising crane, according to one or more of the preceding claims, **characterized in that** said guide seats comprise thereon locking screws for stabilizing said guide seats with respect to said upright columns. 10

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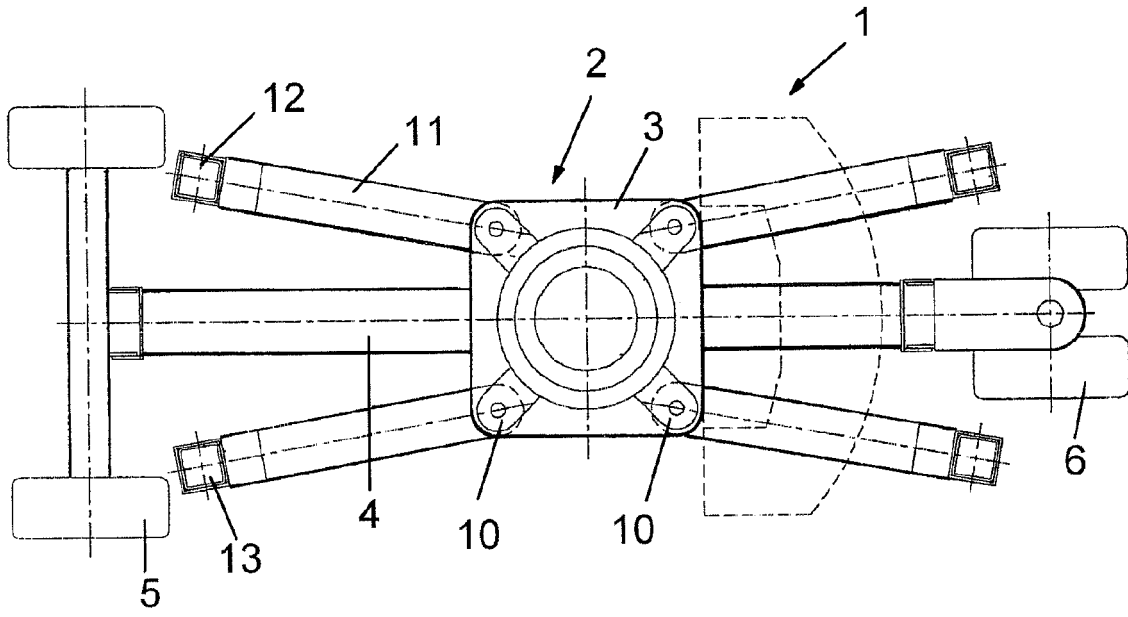


FIG. 1

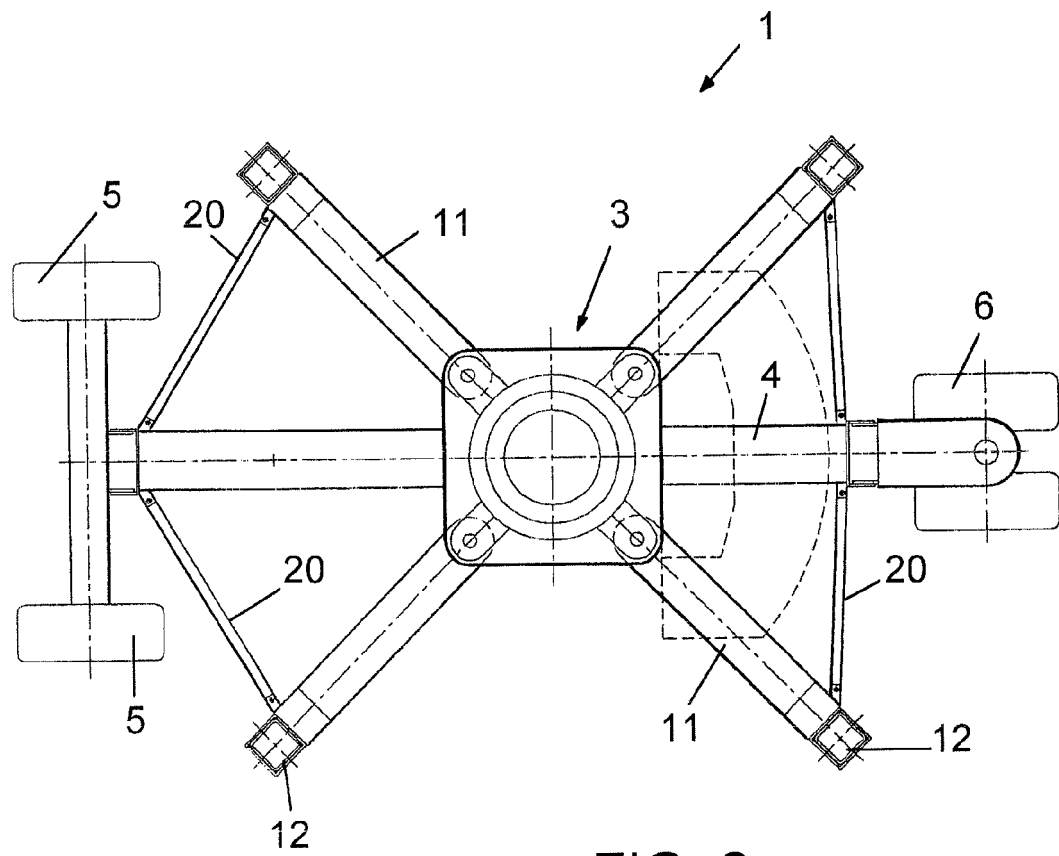
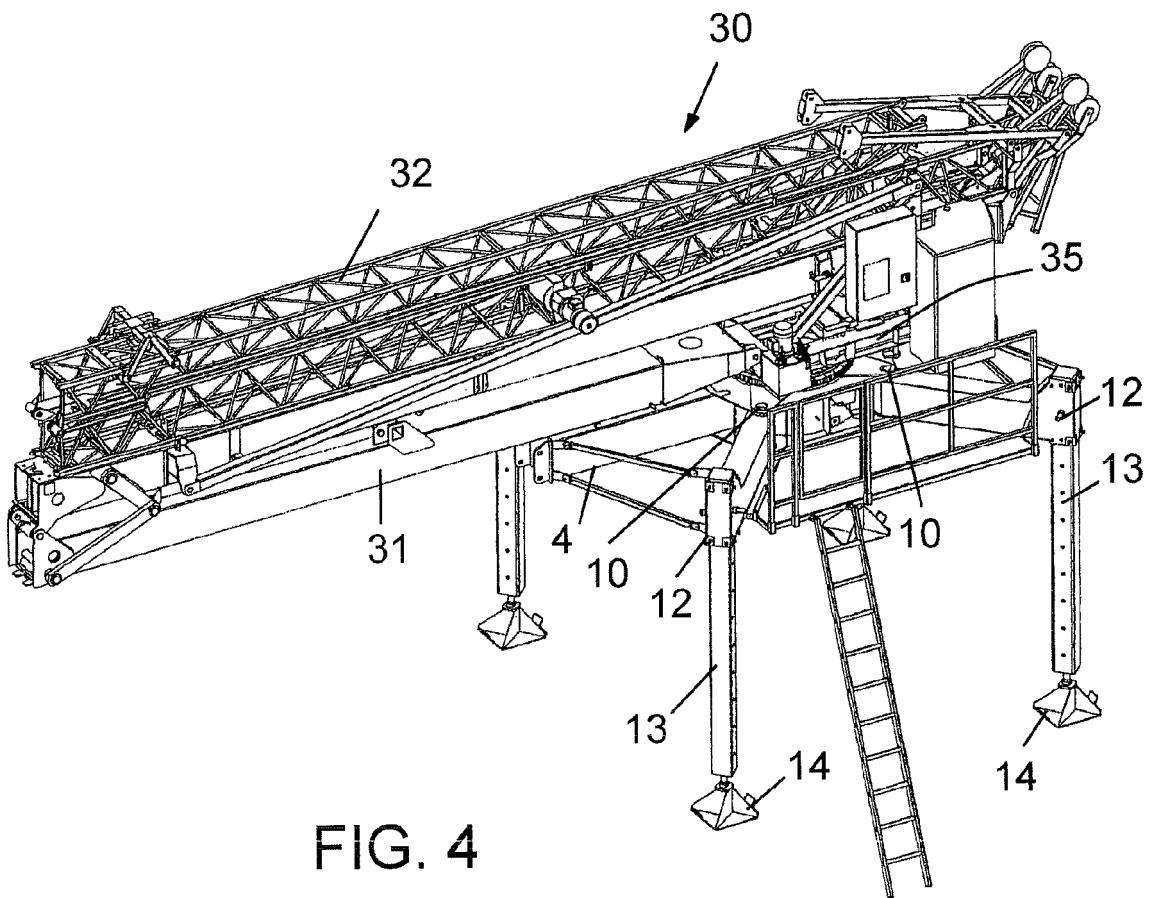
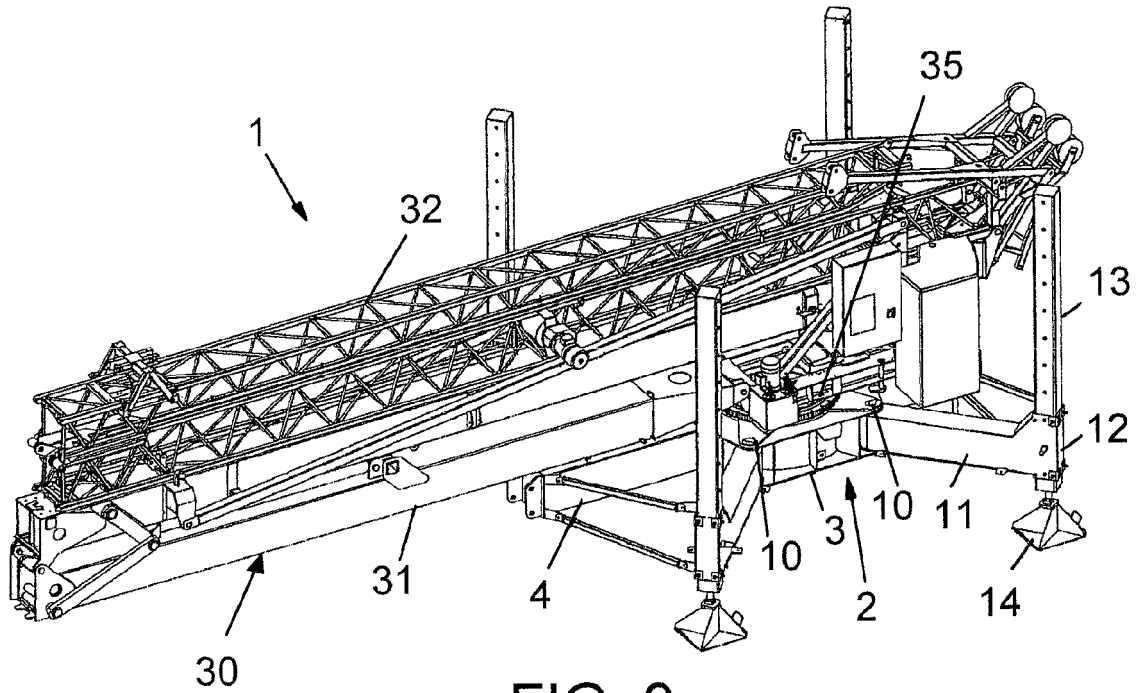


FIG. 2



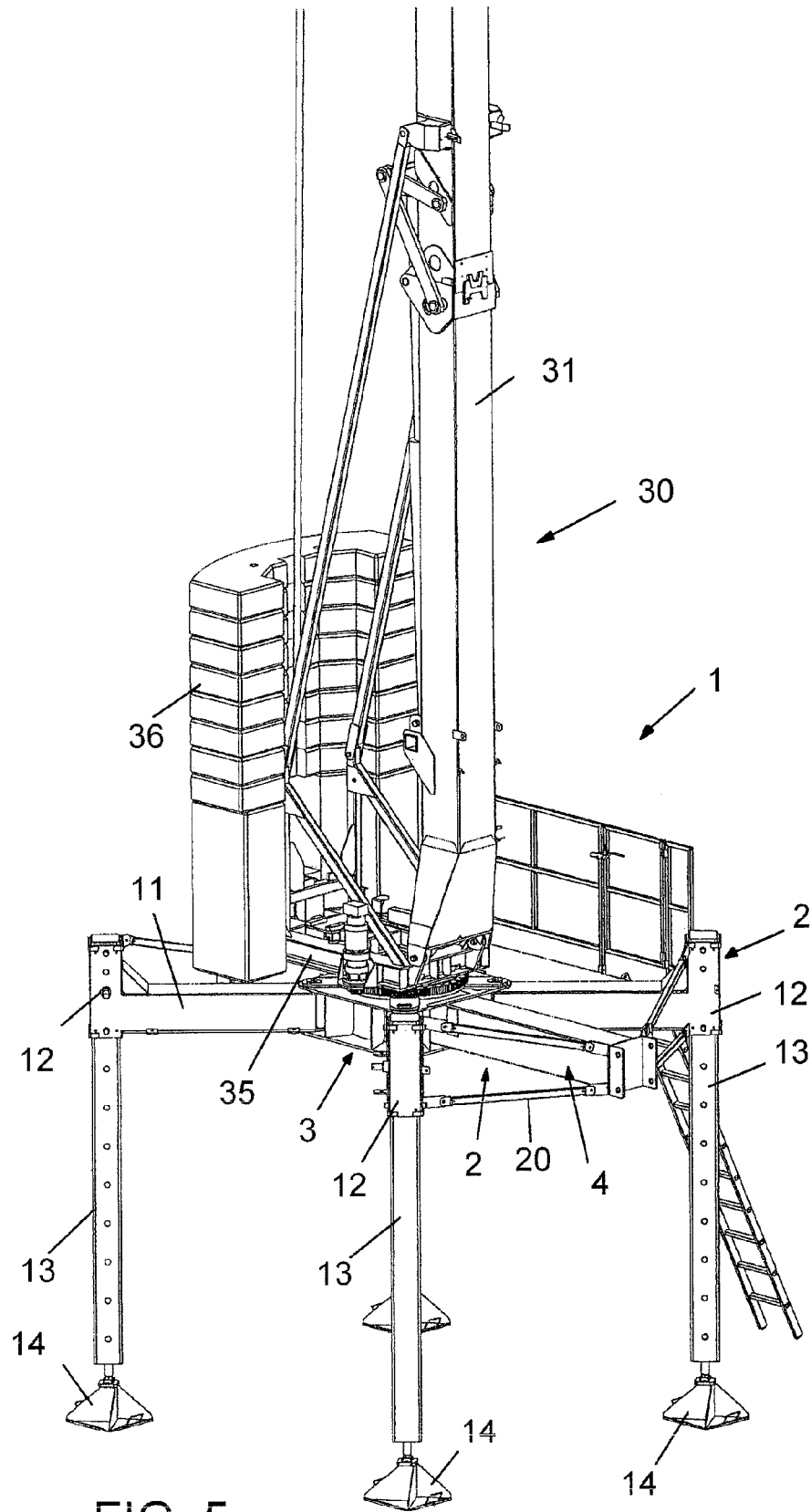
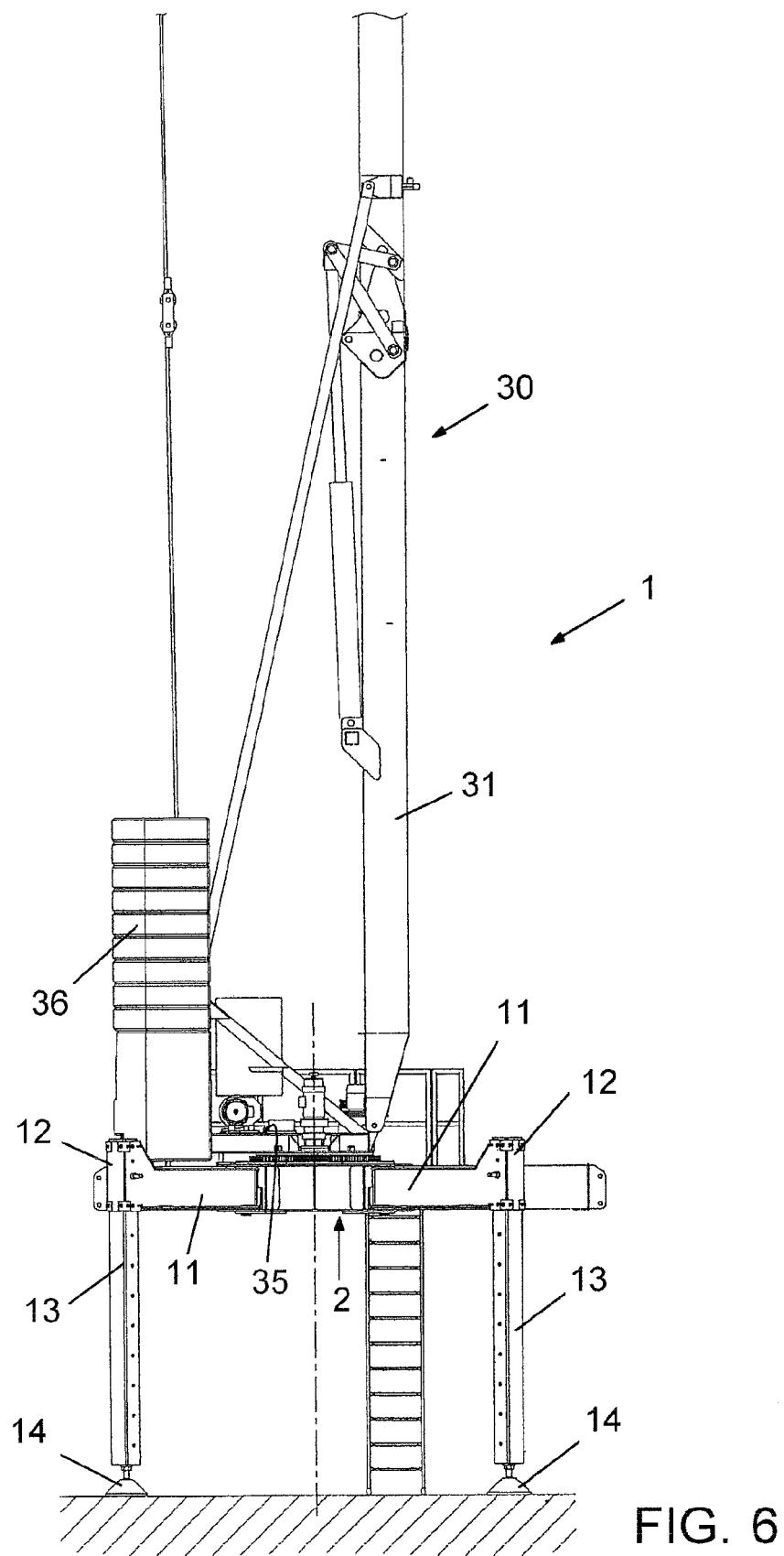
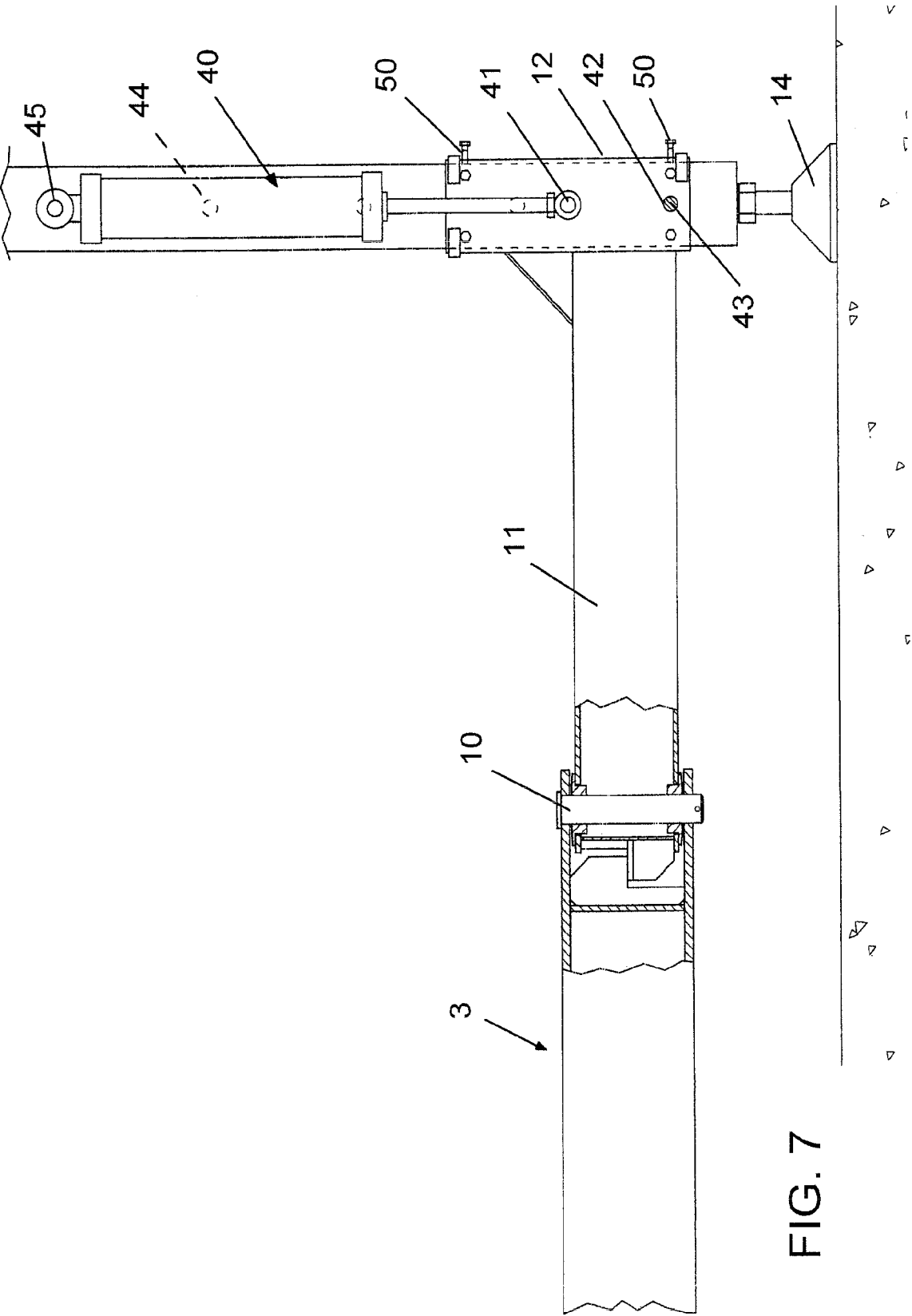


FIG. 5





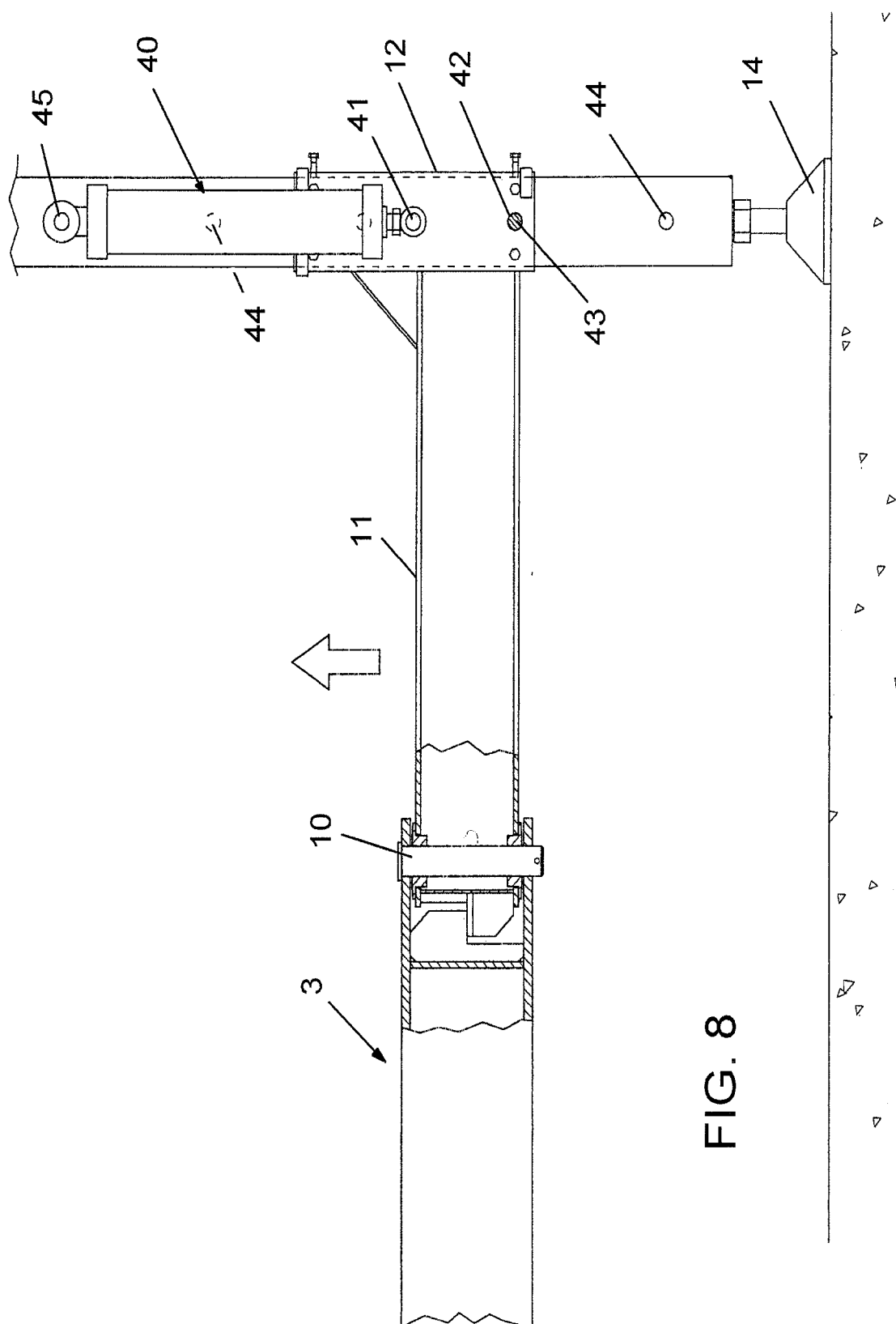


FIG. 8



EUROPEAN SEARCH REPORT

Application Number
EP 10 18 9772

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 February 2011	Examiner Rupcic, Zoran
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			

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EPO FORM 1503.03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 10 18 9772

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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