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(54) **Apparatus for displacing loads using a mobile platform**

(57) An apparatus for displacing loads, such as a telescopic handler, which apparatus comprises a mobile platform (1) and a telescopic arm (4) supported by this platform (1) for an attachment which can be mounted releasably on the free end thereof, wherein the attachment is formed by an elongate straight guide (8) and a carriage (9) movable therealong for a hoisting tackle (10) for the purpose of forming a mobile building crane.

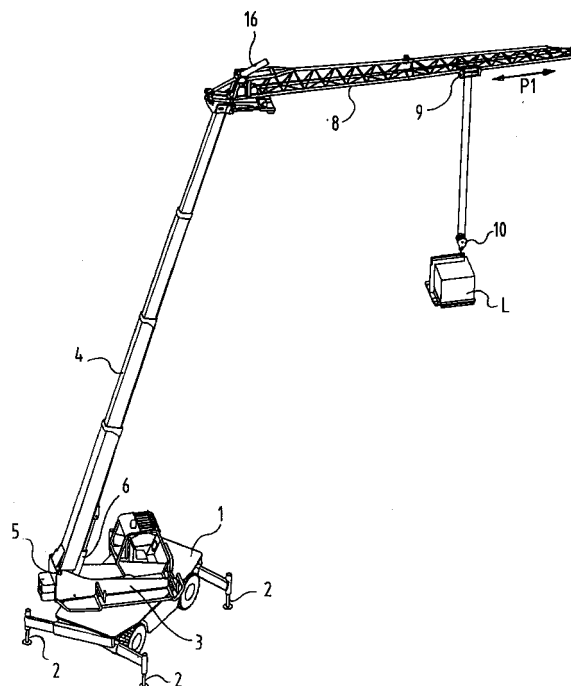


FIG. 1

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Description

[0001] The invention relates to an apparatus for displacing loads, which apparatus comprises a mobile platform and a telescopic arm supported by this platform for an attachment which can be mounted releasably on the free end thereof.

[0002] Such an apparatus is normally used for earth moving purposes or load displacement, for which purpose the telescopic arm is provided with an exchangeable attachment. Such a vehicle is also known in the field as a "telescopic handler". This machine is provided for this purpose with a number of suitable attachments, for instance an excavator or gripping device, forks for use with pallets and a tackle for hoisting purposes. A lift platform can further be arranged for lifting workers such as painters and the like.

[0003] The invention has for its object to modify the apparatus of the type stated in the preamble such that it can operate in even more universal manner as hoisting apparatus.

[0004] To this end the apparatus according to the invention is distinguished in that the attachment is formed by an elongate straight guide and a carriage movable therealong for a hoisting tackle.

[0005] Owing to the use of the straight guide and the carriage for a hoisting tackle movable therealong it is possible to use the apparatus as tower building crane.

[0006] Since the mobile platform is usually embodied as a foldable system, it is recommended according to the invention to embody the straight guide in two or more elongate parts which can be locked mutually in line. The straight guide, or jib, can thus be stowed on the same mobile platform for transport purposes.

[0007] A simple manner of disassembling the jib or straight guide is for the parts to be pivotable relative to each other.

[0008] The straight guide will preferably be mountable along a lying pivot shaft on the end of the telescopic arm, since at a random inclination of the telescopic arm the straight guide can thereby be placed horizontally in simple manner.

[0009] The jib can of course also be placed therewith in the line of the telescopic arm.

[0010] In a further embodiment the straight guide is also embodied with a standing pivot shaft, wherein the pivot shafts between the parts thereof preferably run parallel to the standing shaft.

[0011] For a simpler embodiment an active motor means such as a pneumatic, hydraulic cylinder or electric adjusting motor is arranged between the telescopic arm and the straight guide with which the jib can be placed horizontally in simple manner. By feeding this motor means with the normal power supply system of the mobile platform, for instance the hydraulic system, attachment and operation of the straight guide or jib is simplified even further.

[0012] The invention is further elucidated in the fig-

ure description hereinbelow of an embodiment. In the drawing:

figure 1 shows a perspective view of the mobile platform in the position of use,

figures 2 and 3 each show a perspective top view of the platform of figure 1 in the transporting position, in which all components are placed folded onto the mobile platform, respectively in the starting position for erecting the hoisting apparatus according to the invention,

figure 4 shows a view corresponding with figure 3 on a smaller scale with the jib or straight guide according to the invention in disassembled state,

figure 5 is a perspective view of a detail of the coupling device between the jib according to the invention and the end of the telescopic arm,

figures 6, 7, 8 show in each case a side view of the mobile crane in diverse positions, i.e. the starting position after assembly, the position of use at an intermediate height and the position of use at the final height,

figure 9 is a side view corresponding with figures 6-8 of a third position of use of the apparatus according to the invention.

[0013] Designated in figure 1 with the numeral 1 is the mobile platform, which can be manufactured in random manner. At the four corner points the mobile platform 1 is embodied with outriggers which can be retracted and extended in known manner to enable stable arrangement of the platform in the situation of use. On platform 1 is arranged a turret 3 which is embodied here with a telescopic arm in the form of four pipe sections 3 slidable into each other. In the folded state the mobile arm can be lowered horizontally onto turret 3, see figure 2, which is further elucidated hereinbelow. Starting from the folded-down position of figure 2, telescopic arm 4 can be folded in upward direction at pivot shaft 5 which extends horizontally, this being possible with random means, for instance a cylinder 6. On the free end of telescopic arm 4, i.e. the end remote from pivot shaft 5, is arranged a coupling member 7 which in the normal course of events is used for coupling of random attachments, for instance forks for pallet use, excavators for excavation purposes and other types of attachment.

[0014] Arranged according to the invention on the top end in a manner to be further elucidated below is a horizontal guide 8 in the form of a lattice jib along which a carriage 9 for a hoisting tackle 10 is movable in the direction of the arrow P1. Together with a mobile platform 1 and a telescopic arm 4 there is thus created a mobile building crane for displacing loads L suspended from tackle 10.

[0015] Figure 2 shows mobile platform 1 in the transporting position. Outriggers 2 are retracted, while telescopic arm 4 is likewise retracted and carried round

pivot shaft 5 into a lying position supported by turret 3 on platform 1. In a manner to be further elucidated hereinafter, the jib 8 is dismantled into parts adjacently of telescopic arm 4 and supported on a rack-like support 11 beside telescopic arm 4.

[0016] Figures 3 and 4 show the structure of the mobile apparatus according to the invention, the position as shown in figure 2 being used as starting point for this purpose. Mobile platform 1 is first stabilized by means of outriggers 2, whereafter the parts of jib 8 are lifted from support 11 and assembled on the ground in front of the mobile platform, i.e. at the end of telescopic arm 4 with the coupling member 7, for which purpose the parts are placed mutually in line and locked.

[0017] For attachment of jib 8 to coupling member 7 of telescopic arm 4 use is made of the known coupling pins forming pivot shafts. Thus shown on larger scale in figure 5 is that swivel pins 15 form a lying pivot shaft making it possible to hold jib 8 in horizontal position when telescopic arm 4 is raised, see also figure 1.

[0018] In order to reach this horizontal position a cylinder 16 is arranged, the cylinder rod of which is connected via a universal joint 17 to the end of telescopic arm 4. Energizing of cylinder 16, the power supply for which is taken off the normal hydraulic feed system of the mobile platform, provides an increase in distance between coupling frame 18 and the end of jib 8. It is noted that cylinder 16 is connected pivotally at 19 to the end of jib 8, whereby it acquires a freedom of movement during rotation of jib 8 relative to telescopic arm 4, see the inclining position of cylinder 16 in figure 1.

[0019] Coupling frame 18 on the free end of telescopic arm 4 is constructed in two parts, i.e. a fixed part 18' and a pivotable part 18". These are mutually coupled with pins 20, whereby a vertical pivot shaft is created. When the jib is stowed in the position of figure 2 the jib hereby does not have to be disconnected from telescopic arm 4 but can be carried to a position beside telescopic arm 4 after release of one of the pin groups 20.

[0020] In the case of a long jib 8 it is advisable to separate the jib into two or more pieces, which at hinge 21, see figures 3 and 4, can be placed mutually adjacently in the position according to figure 2 respectively 3. Jib 8 can thus readily be folded and stowed away in the transporting position of platform 1.

[0021] The jib serves as straight guide for the carriage or trolley 9 which can travel along the girders 22 of the jib by means of a cable system (not shown). The drive system by means of cables can be replaced by any other random drive system.

[0022] It is however advantageous according to the invention to accommodate the cable drum 25 for the hoisting cable respectively the transport cable in the jib 8, so that this will form a total unit and attachment is limited solely to coupling of the power supply for the diverse motors.

[0023] Although figures 4 and 5 show that jib 8 can

have its own coupling system, it is also possible to make use of the existing coupling means 7 on the telescopic arm 4 itself. The application thereof depends on the size of the jib and the required load thereof whereby application can be allowed of the known fork system on which the jib is placed.

[0024] The different positions according to figures 6, 7 and 8 can be reached through the use of the horizontal pivot shaft 15 between jib 8 and telescopic arm 4. In figure 8 the maximum tower crane height is reached at which the jib lies horizontally, while figure 9 shows an application wherein jib 8 is placed in line with telescopic arm 4 by retracting the cylinder 16. Carriage 9 is herein locked in the end of jib 8, so that an extended hoisting crane as according to figure 9 is realized.

[0025] The invention is not limited to the above described embodiment, wherein a different structure of the jib can be envisaged, i.e. also a tubular jib in optionally telescopic form along which carriage 9 is movable.

[0026] It is on the other hand also possible to embody telescopic arm 4 in other manner, for instance a lattice arm constructed in parts which can be mutually coupled with the known pin/hole connection.

Claims

1. Apparatus for displacing loads, which apparatus comprises a mobile platform and a telescopic arm supported by this platform for an attachment which can be mounted releasably on the free end thereof, **characterized in that** the attachment is formed by an elongate straight guide and a carriage movable therealong for a hoisting tackle.
2. Apparatus as claimed in claim 1, **characterized in that** the straight guide consists of two or more elongate parts which can be locked mutually in line.
3. Apparatus as claimed in claim 2, **characterized in that** the parts are pivotable relative to each other.
4. Apparatus as claimed in any of the foregoing claims, **characterized in that** the straight guide is mounted round a lying pivot shaft on the end of the telescopic arm.
5. Apparatus as claimed in any of the foregoing claims, **characterized in that** the straight guide is mounted round a standing pivot shaft on the end of the telescopic arm, wherein the pivot shafts between the parts thereof run parallel to the standing shaft.
6. Apparatus as claimed in claim 4, **characterized in that** a motor means such as a pneumatic, hydraulic cylinder or electric adjusting motor operating between telescopic arm and straight guide is arranged at a distance from the lying pivot shaft.

7. Apparatus as claimed in claim 6, **characterized in that** energizing of the motor means is provided by the power medium of the power supply system of the mobile platform.

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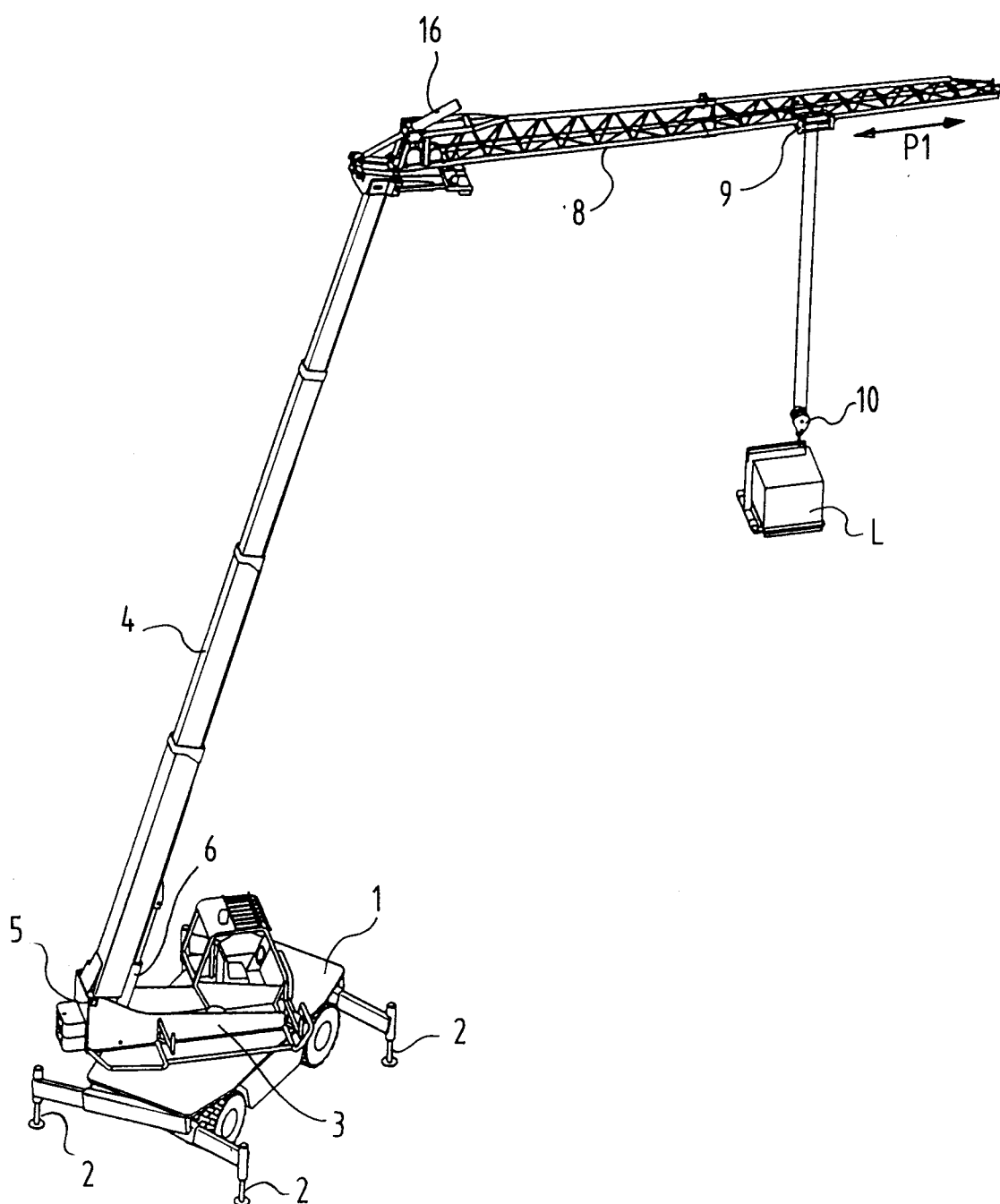
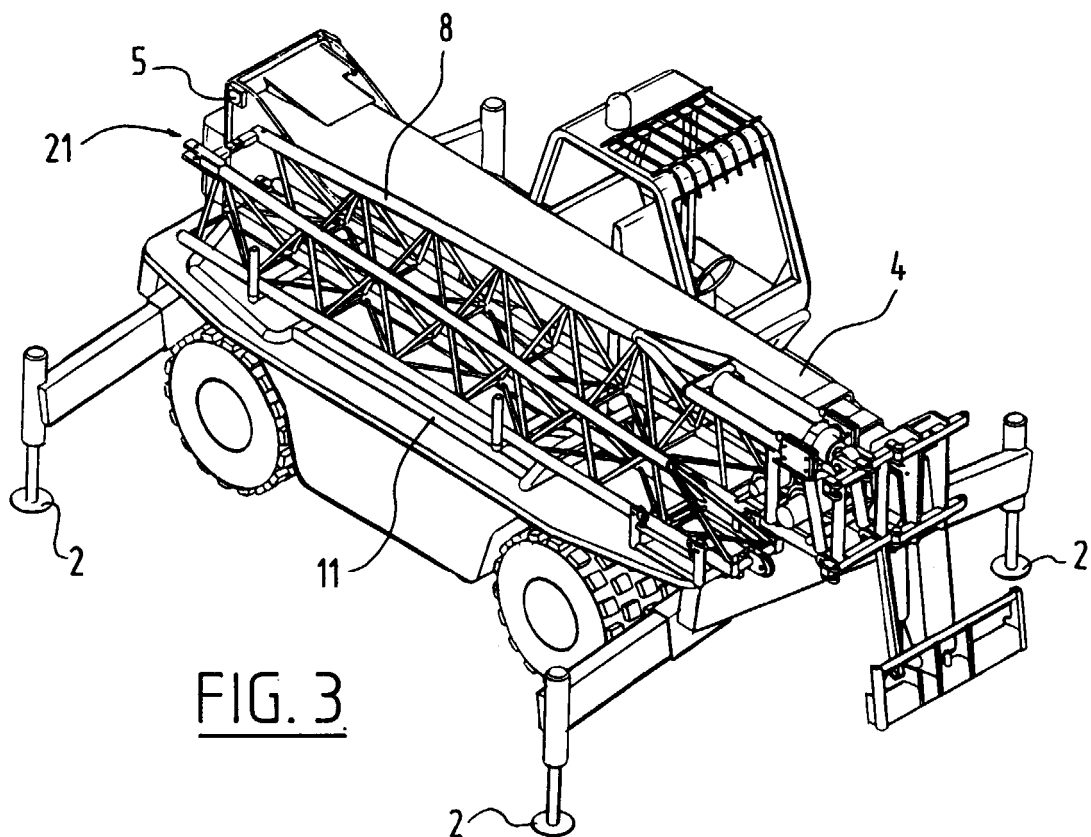
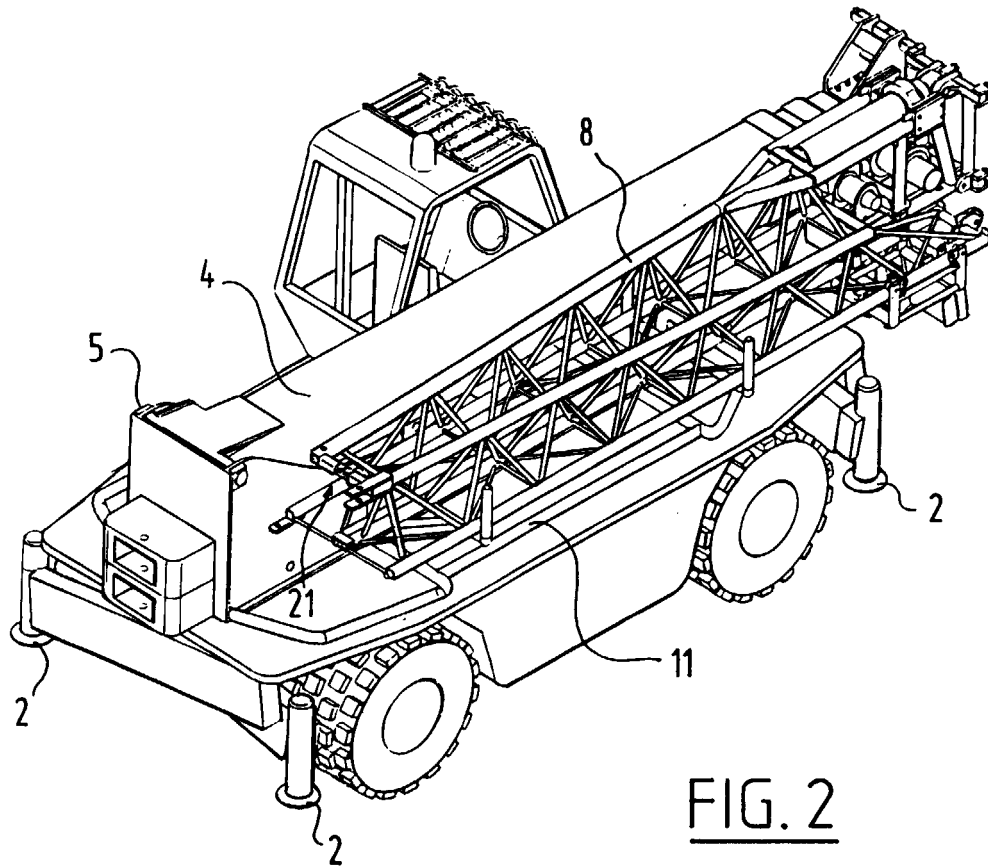
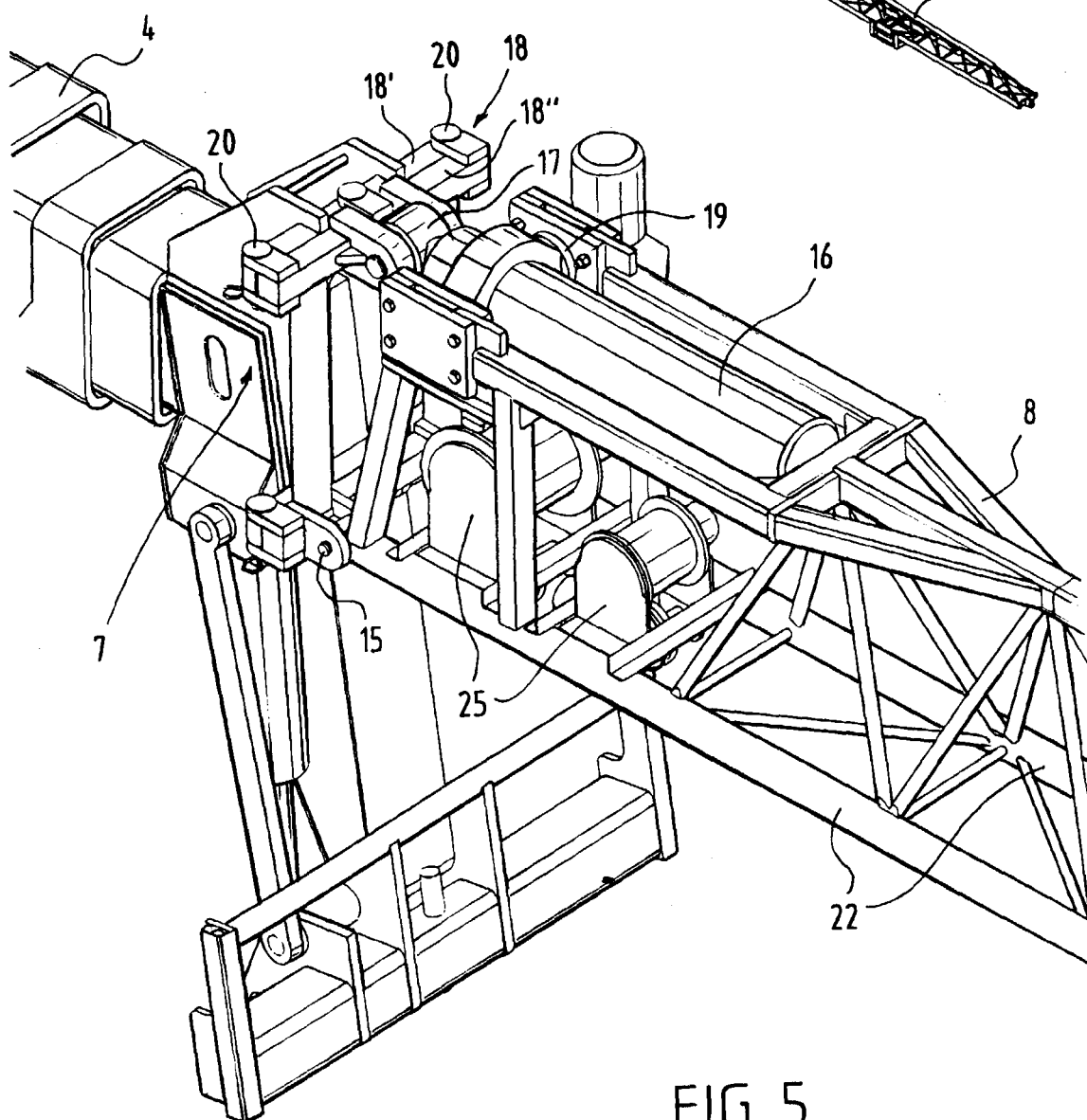
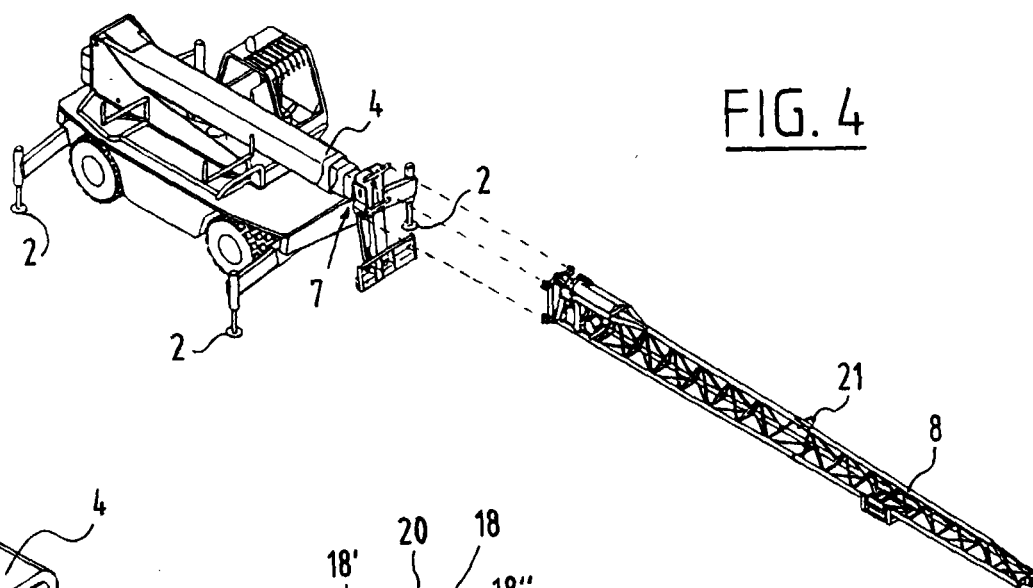


FIG. 1





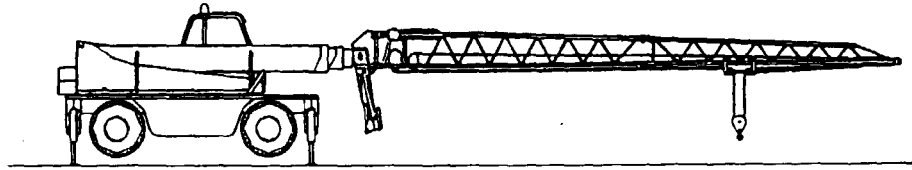


FIG. 6

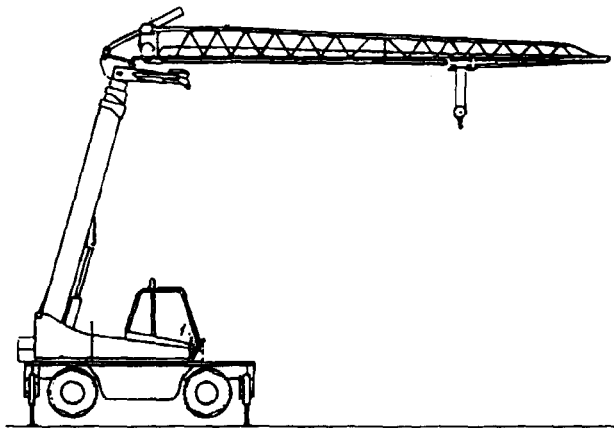


FIG. 7

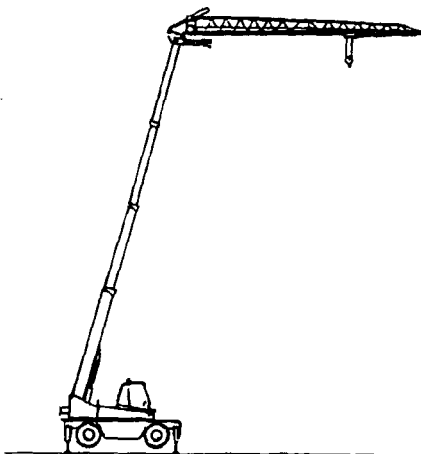


FIG. 8

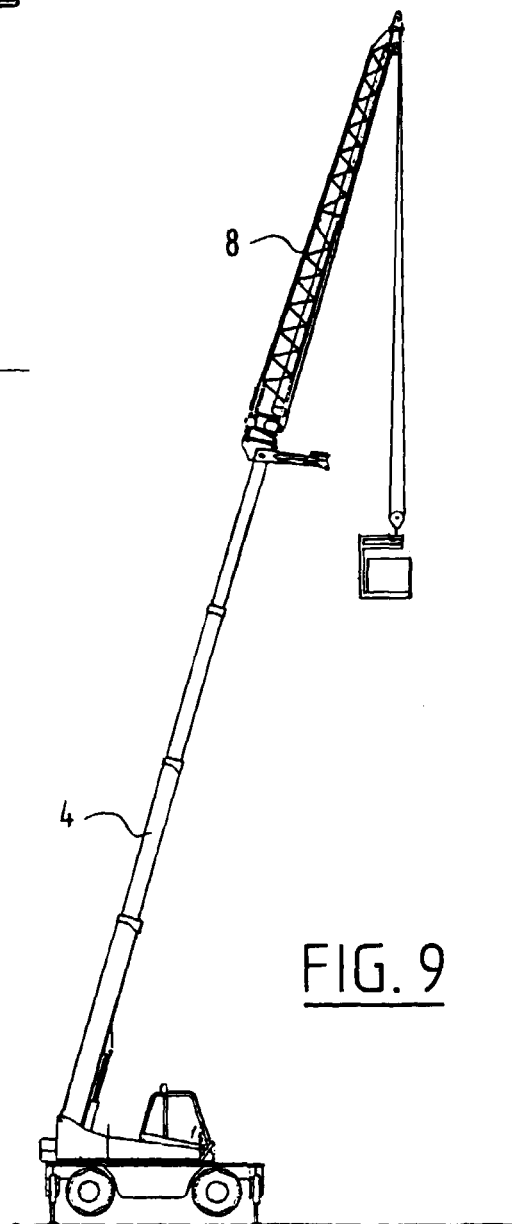


FIG. 9



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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 3016

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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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Place of search		Date of completion of the search	Examiner
THE HAGUE		9 November 2000	Van den Berghe, E
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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 00 20 3016

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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