

June 17, 1969

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3,450,274

PILE DRIVING CRANE

Filed May 1, 1967

Sheet 1 of 2

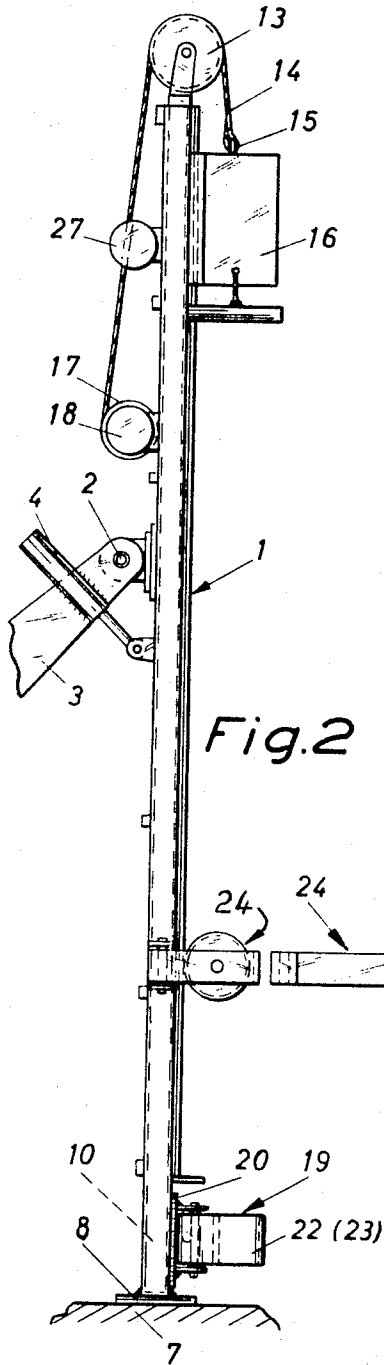


Fig. 2

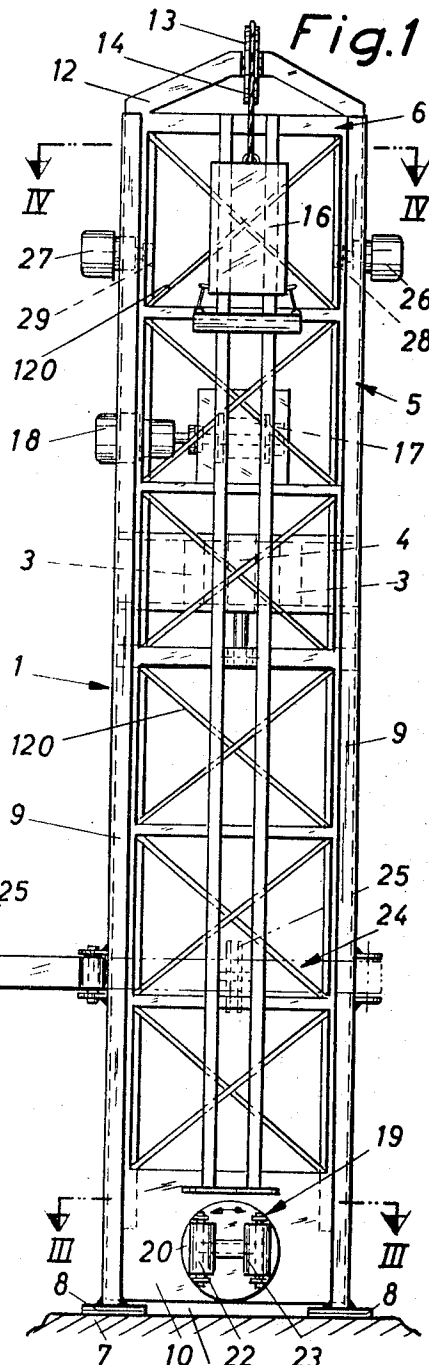


Fig. 1

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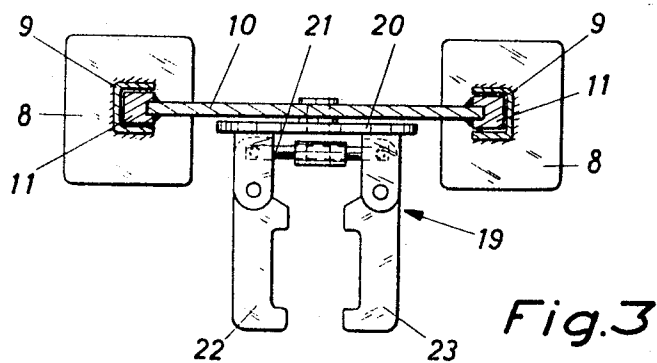
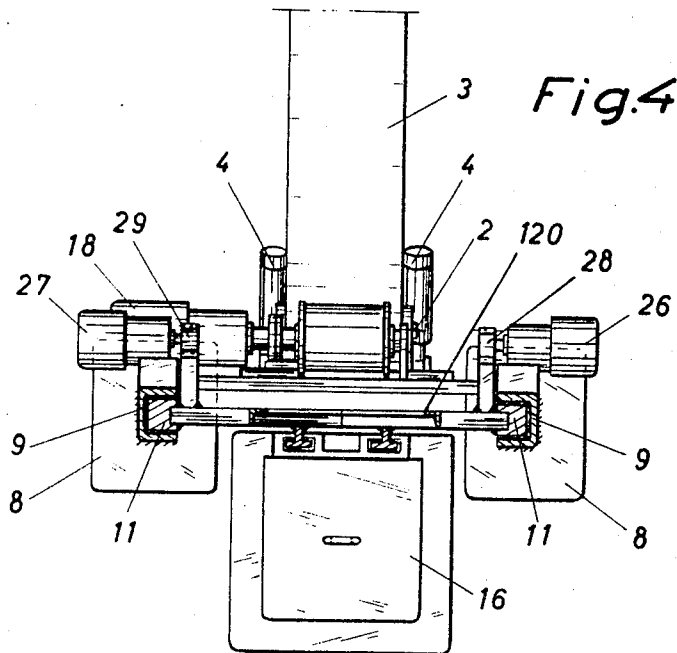
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Sheet 2 of 2



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1

2

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PILE DRIVING CRANE

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U.S. Cl. 214—3 3 Claims

ABSTRACT OF THE DISCLOSURE

This invention has reference to a pile driving crane of the kind having boom, displaceable by means of a tractor or similar vehicle and comprising telescopic sections and a pile catching device for raising and keeping the pile such that the handling of the piles is considerably facilitated.

This invention has reference to a pile driving crane of the kind provided with a stand from the upper portion of which a rammer or a similar beater is allowed to drop down against a vertically arranged pile so as to drive the same down into the ground. Preferably, the stand is adapted to be moved by means of a tractor or a similar vehicle from place to place where it can be raised to operation position, said stand comprising sections which are telescopically displaceable one in the other.

One object of the present invention is to render such a pile driving aggregate easier to move from place to place, easier to erect to operation position and to give better and safer devices for raising the pile to vertical position.

For obtaining this purpose, the means for holding the pile comprises a rotatable plate or disk provided with two catching arms displaceable to and from each other, said plate being displaceable along the stand.

In the following the invention will be explained more in detail with reference to the accompanying drawings. In the drawings:

FIG. 1 shows the device according to the invention in a front view,

FIG. 2 is a corresponding side elevation,

FIG. 3 shows on an enlarged scale a section on the line III—III in FIG. 1, and

FIG. 4 shows a section on the line IV—IV in FIG. 1.

The device according to the invention comprises a stand 1 which by means of a pivot 2 is journaled on an arm 3 from a vehicle (not shown) such as a tractor. The stand 1 can be swung about the pivot 2 by means of a hydraulic piston-cylinder unit 4. The stand 1 comprises sections, in the shown embodiment two sections 5 and 6 which are telescopically displaceable one in the other. The lower section 5 rests on the ground 7 by means of feet 8 and comprises two profiled irons 9 of channel section. The irons 9 are interconnected by means of cross stays 90, e.g. in the vicinity of the feet 8. The irons or beams 9 are of course interconnected at several places for obtaining the necessary stability. However, this is a measure of dimensioning which is to be calculated for the actual case. The internal stand 6 comprises two lateral beams 11 which are arranged to slide in the channel irons 9 and interconnected by means of several cross stays 120. These cross stays 10 and 120 may take many a shape.

The inner section 6 is at its top, on a cross beam 12, provided with a pulley 13 over which runs a cable 14, one end 15 of which being attached to a rammer 16 or a similar beater. The cable 14 is at the other end wound on a drum 17 which in a way known per se is operated by means of a motor 18.

The stand 1 is in the vicinity of its lower end provided

with a pile catcher 19 which comprises a rotatable disk or plate 20 on which there are attached two catching arms 22, 23 which by means of a piston and cylinder unit 21 are movable to and from each other for catching and releasing a pile. The stand 1 is just above the pile catcher 19 provided with a device 24 for hauling a pile in the direction towards the stand and this device 24 may comprise a wire (not shown) running over a wheel and having its free end attached to the actual pile.

In the vicinity of its upper end the outer and stationary stand section 5 is provided with a device for displacing the inner section 6. According to the shown embodiment this displacing device comprises two motors 26 and 27 arranged on either side of the stand 1, these motors 26 and 27 driving sprockets 28 and 29 which mesh with the teeth on or the tooth gaps in the beams 10 of the inner stand section 6.

At operation with the pile driving aggregate according to the invention one proceeds in the following manner.

The stand 1 is by means of a vehicle (not shown) advanced to the operation place where the stand, the rammer being in its lower position, with its feet is placed steadily on the ground 7. By means of the motors 26 and 27, the sections 5 and 6 are drawn apart in a way that the stand 1 be given the desired length or height with regard to the length of the piles to be driven down into the ground. Devices are arranged for locking the sections 5 and 6 in the desired position in relation to each other. The pile is then by means of the device 24 drawn to the pile catcher 19 and the plate or disk 20 is swung in such a way that the pile can be caught by means of the catching arms 22 and 23 when these arms 22 and 23 are moved towards each other by means of the device 21, the pile thereby being caught with safety preferably at a place between the center of gravity of the pile and its upper end when in driving down position. By displacement in upward direction of the stand section 6, the pile is raised and the rammer is lifted to a position for beating thereby that the wire which runs from the wire drum 17 over the pulley 23 shall have the same or unchanged length at the displacement of the section 6. When the pile is in vertical position, the pile driving operation is carried out by means of the rammer 16 in a way known per se and familiar to anyone skilled in the art.

A preferable embodiment of the pile driving aggregate is obtained when the pile catcher 19 is fixedly connected to the lower end of the stand section 6 such that when the stand is drawn apart to be adjusted to the length of the pile, the pile is raised simultaneously, the pile being then kept by the catcher 19 near its upper end in such a way that in raised position there is obtained a suitable ramming distance for the rammer 16.

The invention has been described in the foregoing for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims. Thus, many modifications could be carried out without departure from the inventive idea. As already mentioned, the pile catcher 19 may either be displaceable separately or in conjunction with the hoistable stand section.

Further, the stand may comprise more than two sections such that it is either rendered possible to obtain a more considerable stand height while having the same transportation length of the stand or at the same maximal stand height provided a stand which in the transportation position has a considerably reduced height. Also the power devices for driving the rammer 16, for lifting and lowering the stand, for the displacement of the catching arms 22 and 23 as well as for the device 24 for hauling the pile may be modified in many ways. The sections of the beams 9 and 11 could take many a shape. It is of course also possible to drive the pile down to a certain extent by means

3

of the motors 26 and 27. The lifting of the section 6 could be carried out by means of hydraulic pistons.

What I claim is:

1. An improved pile driving crane mounted upon a tractor or similar vehicle comprising a stand, means for raising said stand, means on said stand for raising and keeping a pile in vertical position, said stand comprising sections displaceable telescopically in one another, said means for raising and keeping said pile in vertical position comprising a rotatable plate, two catching arms on said plate movable to and from each other and said plate and arms being displaceable with one of said sections along the other one of said sections.

2. An improved pile driving crane as claimed in claim 1 wherein said catching arms are operated hydraulically.

4

3. An improved pile driving crane as claimed in claim 1, wherein said movable section of said stand is operated by cog-wheels driven by means of motors.

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173—86; 308—3.9