

[54] PILE CUTTING DEVICE

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[22] Filed: Jan. 26, 1970
[21] Appl. No.: 5,511

[52] U.S. Cl.143/34, 144/2 N, 144/34 E
[51] Int. Cl.B27b 23/00
[58] Field of Search143/34; 144/2.11, 3.4, 4, 34,
144/34 E, 34 F

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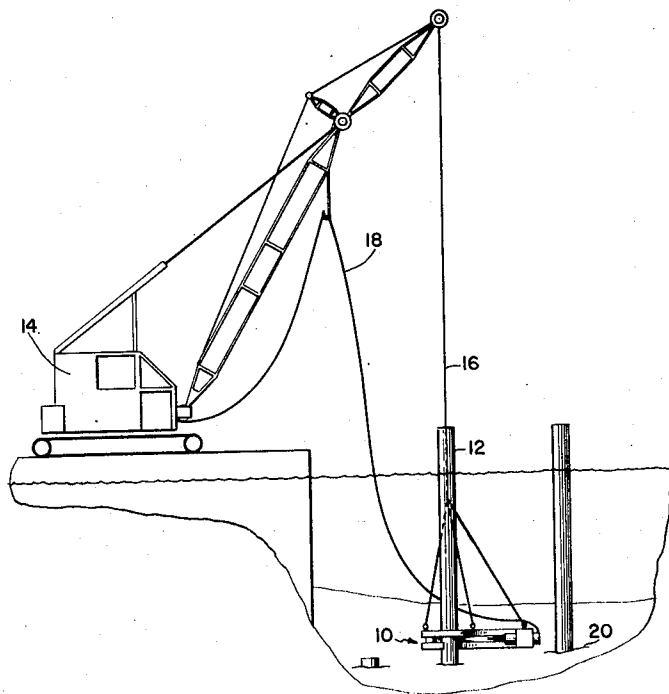
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[57] ABSTRACT

A pile cutting device comprising a base having a guide adapted for reception of a pile, the base being adapted for reciprocal movement with respect to the pile, connectors affixed to the base for suspending the base in a substantially horizontal plane, a blade having a pair of opposite extremities, one of the extremities being pivotably mounted to the base, an actuator having a fixed member and a movable member, the fixed member being pivoted to the base and the movable member being pivotably mounted to the other extremity of the blade, the blade being swept across the guide when the actuator is engaged and being retracted away from the guide when the actuator is disengaged. When the pile cutter is lowered to the base of a pile, the guide being positioned about the pile for restricting the lateral movement of the base with respect to the pile, the actuator is engaged causing the blade to shear the pile at its base.

1 Claims, 3 Drawing Figures



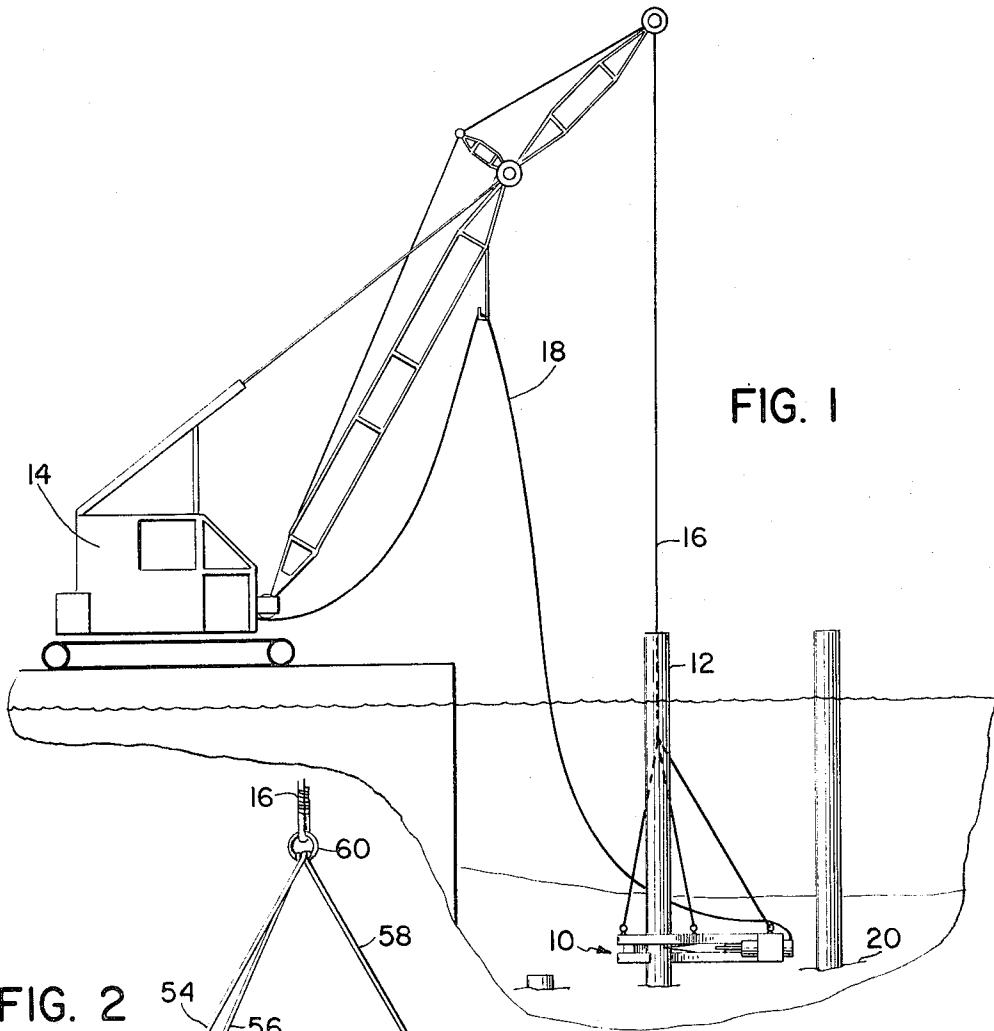


FIG. 1

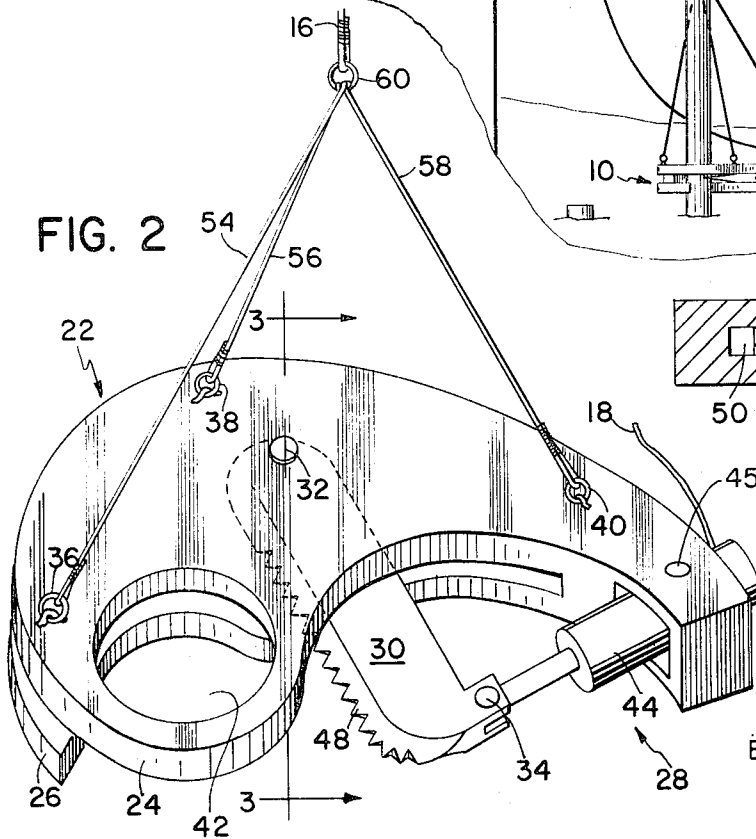


FIG. 2

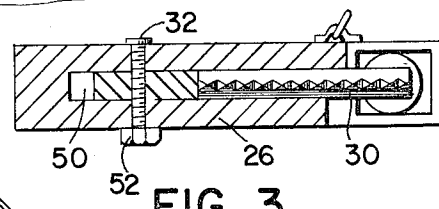


FIG. 3

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PILE CUTTING DEVICE

BACKGROUND AND SUMMARY OF THE INVENTION

The present invention relates to pile cutting devices and, more particularly, to pile cutting devices adaptable for use in locations remote from the operator. Presently, the cutting of submerged piles is a time consuming and difficult task. Generally, two divers equipped with an air operated saw descend to the base of the pile and proceed with the cutting operation. Extreme safety precautions must be employed to insure that the cut pile does not strike the divers. Furthermore, since the divers cannot remain under water for an extended period of time, only a limited number of piles can be cut.

Accordingly, it is an object of the present invention to provide a pile cutting device actuated from a remote location so that the services of divers are not necessary. The pile cutting device is characterized by a base having a guide adapted for reception of a pile, the base being adapted for reciprocal movement with respect to the pile, suspending means affixed to the base, the base being in a substantially horizontal plane when suspended, shearing means having a pair of opposite extremities, one of the extremities being pivotably mounted to the base, actuating means having a fixed member and a movable member, the fixed member being pivoted to the base and the movable member being pivotably mounted to the other extremity of the shearing means, the shearing means being swept across the guide when the actuating means is engaged and being retracted away from the guide when the actuating means is disengaged. The combination of base, suspending means, actuating means and shearing means is such as to provide a remotely actuated pile cutting device which is highly efficient.

The invention accordingly comprises the device possessing the construction, combination of elements, and arrangement of parts that are exemplified in the following detailed disclosure, the scope of which will be indicated in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the present invention, reference should be had to the following detailed description, taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective of a system embodying the present invention;

FIG. 2 is a perspective of the pile cutting device of FIG. 1; and

FIG. 3 is a sectional taken along 3—3 of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The pile cutting system of FIG. 1 is shown as comprising a pile cutter 10 which is located at the base of a pile 12. Pile cutter 10 is suspended from a lowering device, for example a crane 14, via a cable 16 and is lowered to a desired depth, for example to ocean floor 20.

As illustrated in FIG. 2, pile cutter 10 comprises a base 22 having an upper member 24 and a lower member 26, an actuator 28 affixed to the base 22, a shearing mechanism 30 pivotably mounted to base 22 via a pin 32 and pivotably mounted to actuator 28 at a pin 34, and suspending devices, for example eye-bolts 36, 38, and 40 affixed to base 22. Member 24 is formed with a generally circular opening 42 defining a guide which is adapted for reception of pile 12. In the preferred embodiment of the present invention, actuator 28 is a hydraulic device comprising a cylinder 44 pivoted to base 22 via a pin 45 and a shaft 46 having a piston (not shown) affixed to one end thereof, the other end of shaft 46 being pivotably mounted to shearing mechanism 30 at pin 34. A hydraulic line 18 is operatively connected at a rearward portion of cylinder 44. Shearing mechanism 30, for example a blade, is shown as having a toothed leading edge 48. It will be

readily appreciated that, in alternative embodiments of the present invention, the leading edge of blade 30 is other than a tooth edge, for example a sharp cutting edge and actuator 28 is other than a hydraulic device, for example an electrical device. The mounting of blade 30 to base 22 is illustrated in FIG. 3.

As illustrated in FIG. 3, members 24 and 26 are affixed to each other in such a manner that a guideway 50 is formed therebetween. Blade 30 is pivotably mounted within guideway 50 via pin 32 which is secured via a locking device 52, for example a nut.

In operation, one end of each cable 54, 56, and 58 is affixed to eye-bolts 36, 38, and 40, respectively. The other end of cables 54, 56, and 58, and the free-end of cable 16 are connected to a joining device 60 in such a way that pile cutter 10 is suspended in a substantially horizontal plane. Crane 14 is maneuvered so that guide 42 of pile cutter 10 is positioned directly above pile 12 and pile cutter 10 is lowered to the desired depth. Guide 42 restricts the lateral movement of pile cutter 10 with respect to pile 12. Thereafter, actuator 28 is engaged and shaft 46 is caused to move outward from the forward portion of cylinder 44, in consequence blade 30 sweeps across guide 42 and severs pile 12. Actuator 28 is then disengaged and blade 30 is retracted away from guide 42.

The present invention thus provides a highly efficient remotely actuated pile cutting device. Since certain changes may be made in the foregoing disclosure without departing from the scope of the present invention, it is intended that all matter contained in the foregoing description and shown in the accompanying drawings be interpreted in an illustrative and not in a limiting sense.

I claim:

1. A device for cutting a pile comprising:

- a. an arcuate frame formed with an eccentric cut out portion defining a lobe at one end of said frame and a neck at an opposite end of said frame, said lobe having a substantially larger profile than said neck, said frame having upper and lower portions, said upper and lower portions having substantially similar profiles, said upper and lower portions mounted in registration and parallel spaced relationship to one another, a first guideway being defined between a lower face of said upper portion and an upper face of said lower portion, said first guideway extending between said lobe and said neck, said upper portion formed with a generally circular opening at said lobe end of said frame, said lower portion being cutaway at said lobe end of said frame, said opening and cutaway being in registration, said opening and cutaway defining a second guideway adapted for slidable reception of a pile;
- b. hydraulic means having actuated and deactuated states, said hydraulic means including a cylinder having a reciprocating piston mounted thereto, said piston extending from one end of said cylinder when said hydraulic means is in said actuated state, said piston retracted into said cylinder when said hydraulic means is in said deactuated state, the other end of said cylinder pivotally mounted to said frame at said neck;
- c. shearing means having first and second ends and leading and trailing edges, a free end of said extending piston being pivotally mounted to said first end of said shearing means, said second end of said shearing means pivotally mounted to said frame within said first guideway, said second end of said shearing means being disposed between said lobe and neck and displaced from said opening, said shearing means slidably received within said first guideway, said leading edge of said shearing means formed with a toothed edge;
- d. said shearing means responsive to said hydraulic means, said toothed edge of said shearing means operating to engage and disengage a pile received within said second guideway when said hydraulic means is in said actuated and deactuated states, respectively, said second end of said shearing means remaining substantially fixed, said

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first end of said shearing means describing an arc when
said hydraulic means changes from said deactuated state
to said actuated state, a first portion of said shearing
means adjacent said second end thereof slidably receive
within said first guideway at said neck and a second por- 5
tion of said shearing means adjacent said first end thereof
projecting out of said first guideway at said neck when
said hydraulic means is in said deactuated state, said
shearing means being disposed out of said second
guideway when hydraulic means is in said deactuated 10
state and said piston is retracted into said cylinder, said
leading toothed edge of said shearing means swept across
said second guideway when said hydraulic means changes

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from said deactuated state to said actuated state, said first
and second portions of said shearing means at said lead-
ing toothed edge thereof slidably received within said first
guideway at said lobe when said hydraulic means is in said
actuated state and said piston is fully extended from said
cylinder; and
e. suspending means affixed to said frame, said suspending
means projecting from an upper face of said upper por-
tion of said frame, said suspending means adapted for en-
gagement with a cable, said device being in a substantially
horizontal plane when suspended free via said suspending
means.

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