No. 864,453. PATENTED AUG. 27, 1907.

C. D. DAY.

PILE CUTTER.

APPLICATION FILED FEB. 14, 1906.

Fig. 2.

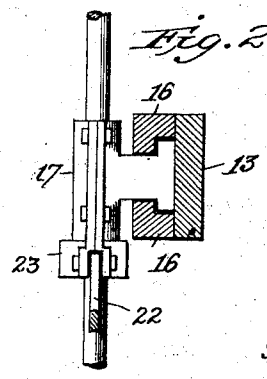


Fig. 1.

Fig. 3.

Fig. 4.

Witnesses:
Edwin L. Yewell.
F. T. Chapman.

Inventor:
Charles D. Day.
By Lyons & Bissing.
Attorneys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES D. DAY, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-FOURTH TO HOWARD TEBBS AND ONE-FOURTH TO JOHN W. SNYDER, OF BALTIMORE, MARYLAND.

PILE-CUTTER.

No. 864,453. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed February 14, 1906. Serial No. 301,073.

To all whom it may concern:

Be it known that I, CHARLES D. DAY, a citizen of the United States, and a resident of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Pile-Cutters, of which the following is a specification.

My invention has reference to improvements in pile cutting machines designed particularly to cut off the tops of piles under water at any desired depth with facility, and accurately and without danger of injuring the saw.

In the accompanying drawings, which form a part of this specification, I have illustrated my improved pile cutting apparatus in one of the forms which it may assume, without confining myself to the identical details indicated, since the same may be variably changed without departing from my invention.

In the drawings, Figure 1 is a side view of my improved pile-cutter, with parts of it in vertical section; Fig. 2 is a detail of one of the saw arbor-guides; Fig. 3, is a top view, partly in section, of one of the pile-clamps and of the means for operating the same, and Fig. 4 is a plan view of the jaws of the foot-claw employed in my pile-cutter.

Like numerals of reference indicate like parts all throughout the drawing.

In the drawing the apparatus is shown in position for operation upon a pile 1, which may be one of a series driven into the bottom of a body of water and which is to be trimmed off at a certain depth below the surface. The apparatus is mounted, as indicated, upon a scow 2, which is moored or anchored in close vicinity to the pile, or the row of piles, which are to be cut off. Upon this scow is mounted a derrick, composed essentially of an upright post 3, a boom 4, and the usual means, such as pulleys 5, 6 and rope 7, for raising and lowering the boom. In this drawing the guy-ropes for the derrick and the means for swinging the derrick on a vertical axis, as also the means for manipulating the ropes are omitted, because these parts may all be as ordinarily constructed and as well known to those skilled in the art. At some point near the foot of the derrick, and preferably on the turn-table (not shown) on which the derrick is directly mounted, is a pulley 8, and there are similar pulleys 8′ 8″, over which the rope or cable 9 is passed, and to the free end of that cable the frame-work of the cutting apparatus is secured, so that by working the cable 9 by suitable power, the cutting apparatus may be raised or lowered at will. This frame-work consists of a superstructure composed of uprights 10, 10, a horizontal beam 11, suitably braced together, and a platform 12. Underneath this platform is arranged a U-shaped frame 13, with a vertical extension 14, and this U-shaped frame is fixed with reference to the platform 12 by stays or braces 15, 15, 15, or in any other suitable manner. Each leg of the U-shaped frame 13 has mounted on it cleats 16 which form a guide for a journal-box 17, of the saw-arbor 18, on which the circular saw 19 is suitably mounted. In this manner the saw-arbor is free to be adjusted longitudinally in the guides formed by the cleats 16. This adjustment is effected by a hand lever 20, which is pivoted on the U-shaped frame at 21, and the lower end of this lever is pivoted to the links 22, the other ends of which are pivoted to the extensions 23 of the journal-boxes 17.

The saw may be driven by any suitable motor 24, which may be an electric motor, mounted on the platform 12, and geared to the saw-arbor by bevel gears 25. The two gear wheels are held in operative relation by sliding and rotating connection in the shape of an angular block 26, and the motor shaft 27 is formed with a spline, as usual, so that the bevel gear wheel mounted on that shaft may be moved along the shaft as the saw-arbor is moved in the guides on the U-shaped frame. For the purpose of permitting this movement of the saw-arbor the platform 12 is slotted at 28, and there is also a slot 29 in the platform for the projection therethrough of the hand lever 20. This lever is guided by an arc-shaped frame 30 mounted on the platform.

By means of the devices so far described the sawing apparatus can be brought up to the piles to be cut and adjusted to the proper level for the saw to cut on a predetermined line. This is done by swinging the derrick horizontally on its foundation in the scow and raising or lowering the boom, as is well understood by those skilled in the art. A counterweight 31, suspended from the rope or cable 32, which passes over a pulley 33, and is fast to the framework 11, facilitates the adjustment of the proper immersion of the saw. After this has been done the framework of the sawing apparatus is, in accordance with my invention, tightly clamped to the pile which is to be cut, in such manner that the sawing apparatus is independent of the rise and fall, or the rocking and pitching of the scow. For this purpose I use two clamps 34, 35, fastened respectively to the upper and lower leg of the U-shaped frame 13. The clamps 34 and 35 are constructed substantially alike, and the construction of clamp 35 is shown on the left hand end of Fig. 3. Clamp 35 the same as clamp

34 is composed of two jaws 35′, 35″, each pivoted to ears 35‴, so that they may be opened and closed, and this is accomplished by means of the gearing and connections indicated on the right hand side of Fig. 3. There is a hand-wheel 36 by which the shaft 37 may be operated, and this shaft, which extends down through the platform 12, has keyed to it immediately above the platform the combined segmental gear and ratchet 38; and to the lower end of this shaft is secured a short arm 39, which by a link 40 is connected with a lug on the clamp jaw 35′. Meshing with the segmental gear 38 is another segmental gear 38′, from which descends the shaft 41, to the lower end of which is also secured a short arm 39, and this latter is also connected by a link 40 with a lug on the second clamp jaw 35″. The ratchet teeth of the segmental gear 38 are engaged by a pawl 42, as shown.

It will be seen from the foregoing description that if the hand wheel 36 is turned clockwise, the pawl having been lifted to permit this movement, the two clamp jaws will be opened, so that they may receive the body of the pile between them, while, when the hand wheel is turned counter-clockwise, the two clamp jaws will close upon the body of the pile and the pawl will prevent the accidental opening of these jaws. In this manner an operator stationed on the platform 12 may clamp the sawing apparatus to a pile by the clamp 35, merely by operating the hand wheel 36. For the operation of the clamp 34 a similar hand wheel 36′ is provided, but in this case the corresponding shafts 37′ and 41′ are considerably shorter. Moreover, with this clamp the short arms 39 at the lower ends of the shafts, also the links 40, and the lugs on the clamp jaws are omitted, the clamp jaws being directly secured to the lower ends of these shafts, which are journaled in the ears 35‴, as indicated in Fig. 1.

It will now be seen that by the manipulation of the two hand wheels 36 and 36′, the whole frame upon which the cutting apparatus is supported may be clamped to a pile so tightly and securely that the saw may now be brought up to the pile by the operation of the hand lever 20, and the rope 9 may now be slackened, and in fact, should be slackened, so that the scow may have any movement without in any way or manner affecting the sawing apparatus, so that there is no danger of binding or injuring the saw or its driving mechanism.

The foot claw 43 is secured to the lower end of the vertical extension 14 of the U-shaped frame 13. It is composed of two jaws, one on each side of the vertical extension 14, and well secured to it, and the two jaws are inclined outwardly, as shown in Fig. 4, and have on their lower faces teeth 44, which are preferably inclined downwardly, as indicated in Fig. 1. The purpose of this foot-claw is twofold. In the first place, when the saw frame is brought up to the pile which is to be cut, and before the clamps 34, 35, are closed upon the pile, this foot-claw, by the biting of its teeth into the wood of the pile, steadies the apparatus and facilitates the accurate adjustment of the saw frame to the proper vertical position. The second purpose of this foot-claw is to serve as a support for the saw frame after the upper part of the pile has been cut off, so as to partly relieve the clamp 35 of strain, since the clamp 34 does not now any more help to hold the saw frame in position.

If the apparatus is to be adapted to cut at a greater depth than is convenient with the arrangement shown, the U-frame may be reversed, whereby the vertical extension 14 would extend upwardly. By this arrangement the saw would come to a greater depth below the platform 12, and the braces 15, as well as the saw-arbor 18 and the lever 20 must be suitably lengthened.

Instead of cutting the piles in a direction toward the scow, as shown, the cuts may be made in a direction away from the scow. For this purpose it is only necessary to moor or anchor the scow at a somewhat greater distance from the piles and swing the cutting apparatus around horizontally.

It will be understood that in the drawing the saw-frame and its appurtenances are shown disproportionately larger as compared with the saw and derrick, for the convenience of illustration.

Having now fully described my invention I claim and desire to secure by Letters Patent:

1. A pile cutter provided with a vertically moving platform carrying a motor, a frame secured beneath the platform carrying sliding journal boxes, a saw arbor rotating in the journal boxes, a saw mounted on the arbor between the journal boxes, a sliding and rotating connection between the motor and arbor, and a device for moving the sliding journal boxes to carry the saw into cutting proximity with the pile, substantially as described.

2. A pile cutter provided with a vertically moving platform carrying a motor, a frame secured beneath the platform carrying sliding journal boxes, a saw arbor rotating in the journal boxes, a saw mounted on the arbor between the journal boxes, a sliding and rotating connection between the motor and arbor, and a lever operated from the platform for transmitting motion to the journal boxes to carry the saw into cutting proximity with the pile, substantially as described.

3. A pile cutter provided with a vertically moving platform carrying a motor, a frame secured beneath the platform carrying sliding journal boxes, a saw arbor rotating in the journal boxes, a saw mounted on the arbor between the journal boxes, a sliding and rotating connection between the motor and arbor, and clamps on the frame respectively above and below the saw operated from the platform to secure it to the pile during the cutting operation, substantially as described.

4. A pile cutter provided with a vertically moving platform carrying a motor, a frame secured beneath the platform carrying sliding journal boxes, a saw arbor rotating in the journal boxes, a saw mounted on the arbor between the journal boxes, a sliding and rotating connection between the motor and arbor, clamping jaws for embracing the pile pivoted to the frame below the saw, links connected to the jaws, an operating shaft extending to the platform, and connecting mechanism between the shaft and links, substantially as described.

5. A pile cutter provided with a vertically moving platform carrying a motor, a frame secured beneath the platform carrying sliding journal boxes, a saw arbor rotating in the journal boxes, a saw mounted on the arbor between the journal boxes, a sliding and rotating connection between the motor and arbor, clamping jaws for embracing the pile pivoted to the frame below the saw, links connected to the jaws, an operating shaft extending to the platform, connecting mechanism between the shaft and links, clamping jaws pivoted to the frame above the saw, and an operating shaft extending to the platform for operating the upper clamping jaws, substantially as described.

6. A pile cutter provided with a vertically moving platform, a frame secured beneath the platform, a pair of clamping jaws pivoted to the frame, links secured to the jaws, gears secured to the links, and an operating shaft extending to the platform for operating the gears, substantially as described.

7. In a pile-cutter a saw-carrying frame provided with clamps for grasping the pile on each side of the saw, and an extension of the saw-carrying frame, provided with means for engaging the pile preliminary to clamping the frame thereto, substantially as described.

8. A pile cutter provided with means for clamping it to the pile in combination with a foot-claw located below the clamping means and coöperating with the latter to securely hold the pile cutter to the pile, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES D. DAY.

Witnesses:

F. T. CHAPMAN,

EDWIN S. CLARKSON.