J. P. SHELDON & O. F. GRAVES.

DRAWING BROKEN PILES OUT OF THE GROUND.

No. 189,962. Patented April 24, 1877.

Fig. 1

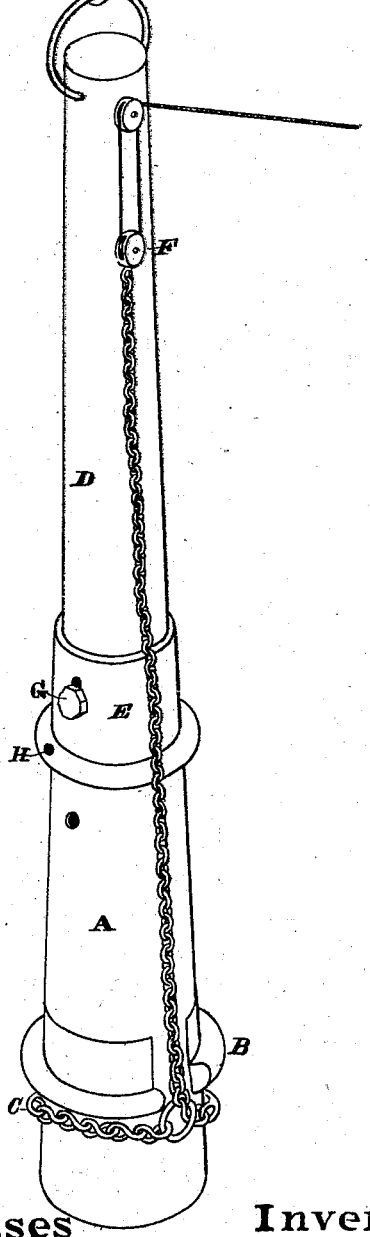
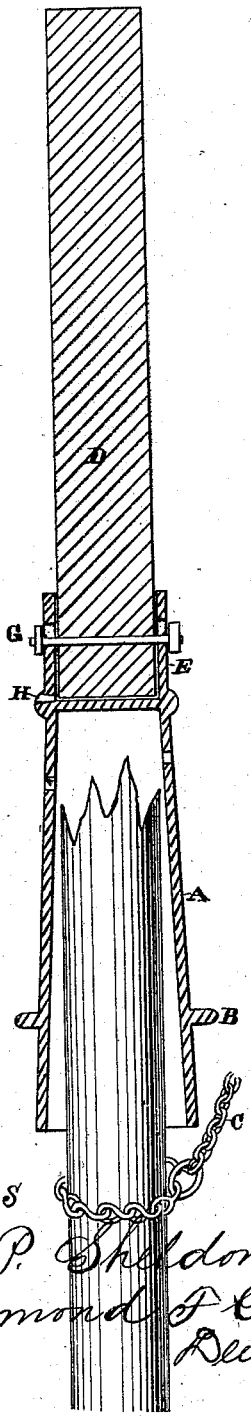


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN P. SHELDON AND ORMOND F. GRAVES, OF SAN FRANCISCO, CAL.

IMPROVEMENT IN DRAWING BROKEN PILES OUT OF THE GROUND.

Specification forming part of Letters Patent No. **189,962**, dated April 24, 1877; application filed January 27, 1877.

To all whom it may concern:

Be it known that we, JOHN P. SHELDON and ORMOND F. GRAVES, of the city and county of San Francisco and State of California, have invented a Method and a Machine for Placing Chains for Drawing Broken Piles Out of the Ground; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

The object of our invention is to facilitate the drawing out and removing of piles, and especially those that have become broken below the water-level.

It is always desirable to draw out and remove the old piles which have supported a wharf when the latter is to be removed or rebuilt, but in the course of time, by accident, decay, or the action of the teredo, or other marine insects, many piles become broken off below the level of the water, and sometimes below the surface of the mud which composes the bottom of the harbor or bay, and these broken piles become dangerous to navigation, and to vessels which may be lying at anchorage or at the wharf, and interfere with the dredging and with rebuilding or repairing the wharf.

Hitherto there has been no way of disposing of the submerged portions of the broken piles except by driving them down as far the material composing the bottom will admit, or by hammering upon their upper ends when they will drive no farther, until a portion of their upper ends are broken off.

This is very unsatisfactory and incomplete, first, because the piles are originally driven nearly to a stand-still, and an enormous power is necessary to force them any farther; and, secondly, because of the great expense of time, labor, and power required, and also because of the total loss of from twenty to sixty feet of good sound pile, which might be used again in places where the depth is not so great, as the portions of the pile below the surface of the mud nearly always remain sound.

In the drawings, Figure 1 represents the machine or device invented by us, and which we call a "catcher," and Fig. 2 represents a vertical section of the same, in connection with a broken pile about to be drawn.

D is a wooden shaft, about thirty feet long, and twelve inches in diameter. E is a metal socket, into which the lower end of the shaft enters, and G is a bolt with nuts to prevent the shaft from withdrawing from the socket. The holes in the sides of the socket through which the bolt G passes, are slots extending above and below the bolt so that if the shaft is struck by the hammer of a pile-driver, the bolt may accommodate itself to the spring or elasticity of the wood, and not be cut or broken off by the metallic sides of the socket.

As the shaft D may sometimes be broken off in the socket, and difficult to remove therefrom, a hole, H, is made through one side of the socket, and extends to a small chamber, made either in the bottom of the socket or shaft, so that when desired, the shaft may be blown from the socket with powder. A is a sleeve or tube made preferably of boiler-iron, and is made to go down over the pile intended to be drawn. A is about six feet long, and must be of sufficient diameter to receive within it any pile intended to be drawn. B is an annular projection extending around, or partly around the tube A, its object being to prevent the chain C from slipping upward around the tube. C is a heavy chain, and E is a watch-tackle for holding the chain taut to the machine, when desired.

The tube A and socket E may both be made in one piece of metal, or the socket may be of cast metal, and the tube A riveted to an annular flange left on its lower end, or the shaft may be of iron, and the entire machine made in one piece.

The following is a convenient way of operating our invention: We mount upon one end of a large scow or flat boat, an ordinary pile-driver, and also by the side thereof, a high derrick or shears, to which is hung a very powerful tackle, capable of lifting nearly one hundred tons.

A bail-handle at the upper end of the shaft D, serves as a convenient device for lifting it, and keeping it in a vertical position. The chain C is placed around the lower end of the tube A, and held there by means of the watch-tackle F and the projection B. The catcher is then vertically lifted by the rope of the pile-driver, and the scow or float is moved until

lower end of the tube is over the submerged pile intended to be drawn. The pile is conveniently found, by feeling for it with a pole. The catcher is then lowered by the engineer, and receives the upper end of the pile into the tube as it descends. As the tube descends it carries with it down and around the pile, the lower end or fake or noose of the chain C. In water or very light sediment, the weight of the catcher will furnish all the power required to force the tube down a sufficient distance around the pile. When more power is required, the catcher may be lifted a short distance, and then suddenly dropped, when its momentum will assist in forcing it down.

When the bottom is so solid that more power is required, the catcher may be driven down with the pile-driver. When the catcher has descended until the end of the pile has reached the upper end of the tube, the watch-tackle F is slackened, and the chain is thereby loosened around the tube. The upper end of the chain is then hooked to the heavy tackle attached to the derrick or shears, and the catcher is raised until the tube is withdrawn from the noose of the chain, and the chain is thus left around the pile. The chain is then drawn tight by the heavy tackle, the catcher being lowered back, so that the lower end of the tube will prevent the chain from slipping upward on the pile until it is drawn so taut around the pile that it will not slip. The catcher is then drawn up out of the way, and the pile is drawn by operating the heavy tackle.

The pile-driver and shears can be made movable, and operated upon the adjacent wharf or shore, instead of a scow or flat boat.

The dimensions named in these specifications admit of considerable variations, and a long iron rod can be used to advantage for the part of the chain that reaches from the watch-tackle down toward the lower end of the tube.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A pile-drawing machine, constructed as described, and consisting of the shaft D, socket E, and tube A, provided near its lower end with the annular projection B, in combination with the catcher C, and watch-tackle F, all constructed to operate substantially as set forth.

2. The perforation H, with its connecting-chambers, substantially as and for the purpose set forth.

3. The slotted holes through which the bolt G passes, as and for the purposes herein set forth.

4. The tube A, provided with the annular projection B near its lower end, and with the socket E at its upper end, in combination with the shaft D and bolt G, substantially as set forth.

5. The method of placing and fixing chains upon broken or submerged piles, the same consisting in guiding and forcing down the noose of the chain by means of a tube, A, and a suitable tackling device constructed to operate substantially as and for the purpose herein described.

In witness whereof we have hereunto set our hands and seals.

JOHN P. SHELDON. [L. S.]
ORMOND F. GRAVES. [L. S.]

Witnesses:
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