July 2, 1935. G. I. HOCKENSMITH 2,006,949

DEVICE FOR PULLING SHEET STEEL PILING

Filed Feb. 26, 1934

Fig. 1.

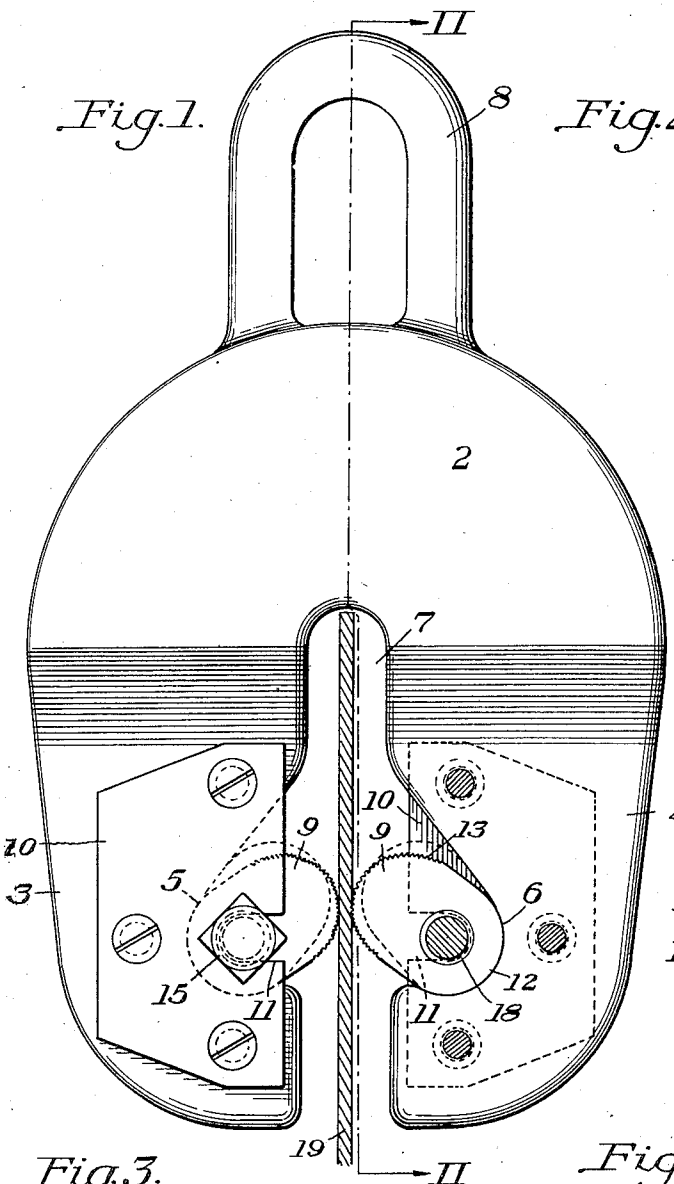


Fig. 2.

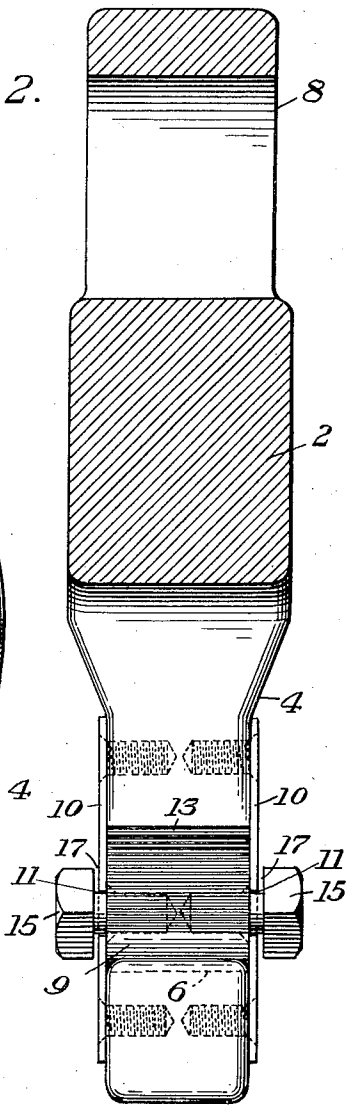


Fig. 3.

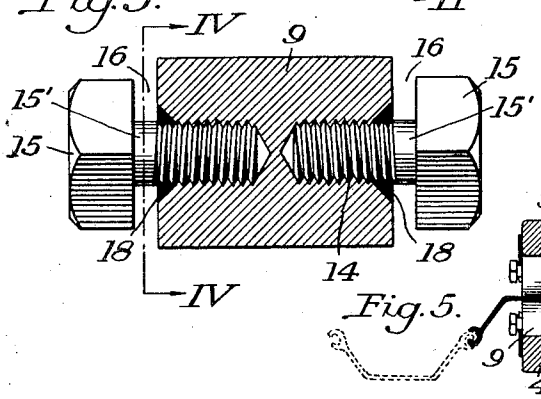


Fig. 4.

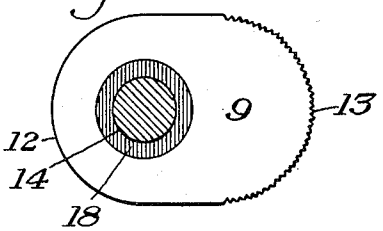


Fig. 5.

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DEVICE FOR PULLING SHEET STEEL PILING

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4 Claims. (Cl. 294—114)

This invention relates to apparatus for gripping the web portion of a sheet steel pile, and it is herein particularly described as relating to an apparatus for pulling sheet steel piling, having flanges and an intermediate web portion.

In modern construction, the use of sheet steel piling is widespread. The sheet piling is driven into the ground to a greater or less depth to form coffer dams and the like. This metal sheet piling is comparatively expensive, and, when the piling has served its purpose, it is customary to withdraw the piling from the ground and re-use it. On account of the depth to which this sheet piling is frequently driven, the problem of "pulling" the piles in such manner that the pile is not injured is a difficult one. Hitherto, it has been customary to make a hole in the web of the top of the pile and either pass a hook through the hole or pass a pin therethrough to cooperate with a U-shaped member and thus provide a connection whereby the pile may be pulled. Various types of gripping devices have been provided to perform this function. However, none of the devices proposed have been satisfactory. For instance, the common method of pulling a pile by means of a hole in the web near the top of the pile often results in the tearing out of the metal above the hole, thus mutilating the pile to such an extent that, if it is desired to use the pile again, a portion of the pile must be cut off in order to permit a new hole to be placed in the web. The other gripping devices which have been proposed have all been unsatisfactory, as they are not positive in their operation and their use constitutes a hazard to workmen engaged in pulling the piles.

According to the present invention, I provide an open yoke-like member with depending arms which form a vertically-extending open-sided recess in which gripping devices or chucks are socketed so that all the strain of pulling a pile will come directly on the extended arms of the member. The width of the depending arms is such that the device can be readily slipped over the end of the flat pile web between the flanges. My device is positive in operation, does not mutilate the pile in any way, and is readily attached to or detached from the pile when desired. It is not necessary that a hole be made in the web of the pile to cooperate with my device, as the use of my apparatus enables the pulling force to be directly exerted on the web of the pile and in such a manner that no injury can result thereto.

In the accompanying drawing, illustrating a preferred embodiment of the invention,

Figure 1 is a side elevation of my device, showing one of the plates removed;

Figure 2 is a cross-sectional view along the plane II—II of Figure 1;

Figure 3 is a cross-section of one of the gripping members;

Figure 4 is a detailed view showing in elevation one of the gripping members, the view representing a section along the line IV—IV of Figure 3; and

Figure 5 is a diagrammatic section showing the device in position on the web of the pile.

The device or tool comprises a yoke-like or U-shaped member 2 having depending spaced apart arms 3 and 4. Suitable cavities or sockets 5 and 6 are provided in arms 3 and 4, and are disposed opposite one another and faced toward the vertically-extending open-sided recess 7 between the arms. The inner portion of each socket is preferably curved and is smooth to provide a bearing surface. The upper portion of the yoke-like or bifurcated member 2 has an elongated eye portion or clevis 8 to which may be fastened a chain or cable for lifting purposes. Mounted in the sockets 5 and 6 are gripping members or chucks 9 disposed toward one another and retained in position by removable cover plates 10, mounted on each side of the extending arms or members 3 and 4. For the purpose of illustration, I have shown in Figure 1 one of my lifting tools with one of the cover plates 10 removed. Each of these cover plates is fastened to the arms by screws or other appropriate means and each of them has a cut-out portion 11 which receives the shank of the bolts 15.

The movable gripping members or chucks 9, see particularly Figures 3 and 4 are made of a suitable metal, for example, cast steel. One end 12 thereof is curved to bear in the curved seat of the cavity in the yoke-like member 2 in which it is received, whereby it may have a limited arcuate movement. The other end 13 is serrated so as to form a positive gripping surface. Threaded holes 14 are provided in the sides of the chucks, the center of these holds corresponding to the center of curvature of the end portion 12. Closely fitted in each of the holes 14 is a bolt 15 having a suitable head thereon and the bolt is preferably welded in position in the chuck as to form an operating extension or trunnion, the weld being indicated at 18. The hole 14 and the bolt 15 are so proportioned that when

the bolt is secured in place there is a space 16 between the side of the chuck and the head of the bolt. This space is somewhat greater than the thickness of the cover plate 11, so that when the chucks are in position in the lifting tool or gripping device 2 there is a space 17 between the outer side of the plate and the inner side of the bolt head (Figure 2). The portion 15' of the bolt 15 between its head and the side of the chuck 9 is received in the cut-out portion 11 of plates 10. By applying a wrench to the heads of the bolts 15, the chucks may be positively rotated. This is sometimes desirable in backing-off the chucks after they have been forced or wedged into tight engagement with the pile that has been pulled or lifted.

When it is desired to pull the pile, the web of which is represented by 19 (Figure 1), the member 2 is placed in a position straddling the web of the pile (Figure 2), the web extending into the space 7 between the arms 3 and 4 (Figure 1). When an upward pull is exerted on the tool 2, the serrated edges of the eccentric chucks 9 and 10 firmly grip the web of the piles and thus enable the pile to be lifted without injury thereto.

One of the advantages of the present invention resides in the formation of the bifurcated body or member 2, the arms of which are of reduced cross section and are entirely free of each other at their outer ends. By reason of these facts, the tool may be applied to a sheet pile having a web which has a comparatively narrow flat surface, as shown in Figure 5. The arrangement and shape of the arms is advantageous when used for pulling sheet piling of irregular section. Another advantage of the invention resides in having the ends of the movable eccentric chuck members bear directly against the curved seats forming the bottoms of the cavities 5 and 6, whereby any strain on these members is transmitted directly to the solid arms of the member 2. None of the strain falls on the trunnions themselves. The tool is of simple design and may be inexpensively constructed and may be made in various sizes depending upon the range and character of work for which it is to be used. The chucks can be easily and readily replaced when necessary by removal of the side plates 11, permitting endwise or sidewise removal and insertion of the chucks.

While I have illustrated and described the present preferred form of my invention, it will be understood that it is not limited thereto but may be otherwise embodied within the scope of the following claims.

I claim:

1. A device for pulling sheet piling having flanges and an intermediate web, comprising a body having a vertically-extending open-sided recess therein, the body being adapted to embrace the web of a pile and lie between its flanges, gripping means within the recess adapted to engage at least one side face of the web to grip the same, means on said gripping means whereby the gripping means may be positively rotated, and means comprising plates removably secured to the side face of said body and extending part way across the recess to restrain the gripping means against sidewise movement.

2. A device for pulling sheet piling having flanges and an intermediate web, comprising a body having a vertically-extending open-sided recess therein, the body being adapted to embrace the web of a pile and lie between its flanges, a socket in one face of the recess, an eccentrically movable gripping member rotatably seated within the socket and the other face of the recess being provided with gripping means for cooperation with the eccentrically movable member, and means comprising plates removably secured to the side faces of said body and extending across the socket to restrain the gripping members against sidewise movement.

3. A device for pulling sheet piling having flanges and an intermediate web, comprising a body having a vertically-extending open-sided recess therein, the body being adapted to embrace the web of a pile and lie between its flanges, each side of the recess having a socket therein, and a pair of oppositely facing gripping members seated in said sockets whereby the strain may be directly transmitted to the bearing portion of the sockets, and means comprising plates removably secured to the side faces of said body and extending across the ends of the sockets to restrain the gripping members against sidewise movement.

4. A device for pulling sheet piling having flanges and an intermediate web, comprising a body having a vertically-extending open-sided recess therein, the body being adapted to embrace the web of a pile and lie between its flanges, each side of the recess having a socket therein, a pair of oppositely facing gripping members seated in said pockets, trunnions on said gripping members, and means on said body to receive said trunnions and to restrain the gripping members against sidewise movement, said means comprising plates removably secured to the side faces of said body and extending across the ends of the sockets.

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