June 6, 1939. S. G. NEFF 2,160,891

POST OR PILE PULLING DEVICE

Filed March 14, 1938

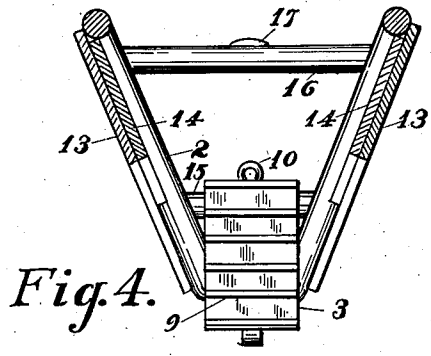


Fig. 4.

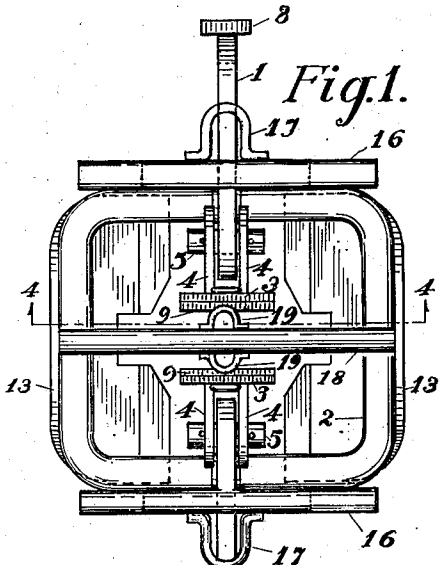


Fig. 1.

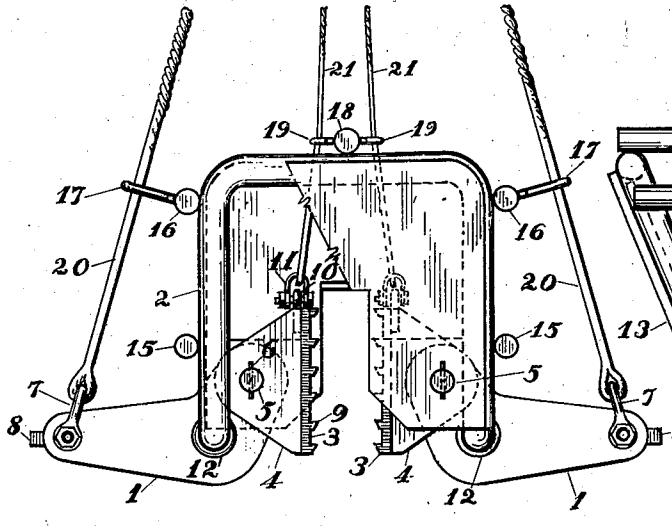


Fig. 3.

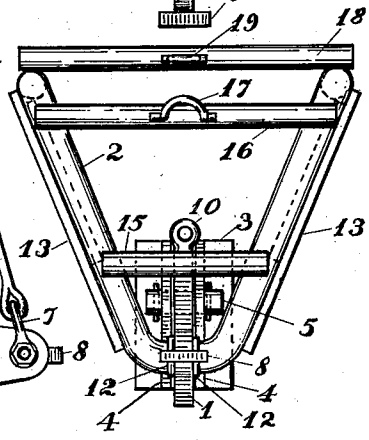


Fig. 2.

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UNITED STATES PATENT OFFICE

2,160,891

POST OR PILE PULLING DEVICE

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Application March 14, 1938, Serial No. 195,887

3 Claims. (Cl. 294—111)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

The purpose of my invention is to facilitate the pulling of wood or steel sheet piles or square posts that have been driven into the earth, by providing a mechanical device for attaching the pulling cable to the upper end of the pile or post in such manner that it cannot slip or pull loose; this device being so constructed that it can be easily and quickly attached to and detached from the pile or post.

One form of the invention is illustrated in the accompanying drawing, in which Figure 1 is a plan view, Figure 2 an end view, Figure 3 a side view, and Figure 4 a vertical section on line 4—4, Figure 1.

The device consists of two lever arms 1 mounted on a rigid frame 2, of circular section, which frame acts as axle and fulcrum for these lever arms 1; each lever arm 1 is connected to a gripping jaw 3 by means of plates 4, jaw pin 5, and cotter pins 6, and fitted at its outer or lifting end with shackle 7 and shackle stop 8.

Each gripping jaw 3 is fitted, on its inner face, with lugs 9, beveled on their lower sides to form a cutting edge; the outer face of each jaw is fitted with plates 4 welded to it and connected to arm 1 by means of jaw pin 5; the top of the jaw assembly is fitted with a loop or eye 10, rigidly attached, and to this eye 10 is attached a shackle 11.

The frame 2 serves as a fulcrum and axle for lever arms 1, the arms being held in place by shoulders 12 (welded to the frame 2); it also serves as a rigid mounting for the entire assembly. This frame 2 is reinforced by plates 13 and 14, plates 13 being welded to the outer surface of the frame and plates 14 being fitted inside the frame and welded in place. The lower part of plates 13 and 14 contain a slot of sufficient size to allow the machine to be lowered to a point where all the lugs 9 are below the top of the pile; stops 15 for the lever arms are welded to frame 2 at each end. Across each end of frame 2 is welded bar 16, fitted with loop 17, and across the top of frame 2 at the center is welded bar 18, fitted with loops 19. Slings 20 are led through loops 17, thus holding the machine in an upright position. Slings 21 are led through loops 19 in order to hold jaws 3 upright when machine is being lowered over piling or post.

It is evident that when the outer ends of lever arms 1 are rotated upward on axle 2, the jaws 3 must move downward and inward, and, conversely, when lever arms 1 rotate downward, jaws 3 must move upward and outward; it is also evident that when an upward pulling power is applied to jaws 3 through loop 10, the movement of jaws 3 will will be upward and outward.

In operation, the entire assembly is lowered over the top of the pile or post by means of wire cable slings 21, attached at their lower ends to shackles 11 and at their upper ends to the lowering line leading from the boom of the crane, the lifting or pulling line with slings 20 being slacked off slightly during this period. Thus the jaws 3 are held apart to their maximum opening by the upward pull of slings 21 and the downward movement of lever arms 1, the outer ends of which, of their own weight, tend to rotate downward, thereby drawing the jaws 3 apart. When the puller has been fitted to the pile or post, the lowering cable is slacked off, transferring the weight of the machine to the lifting cable through the two cable slings 20.

It will be seen that as the weight of the machine is transferred to the lifting cable through slings 20, the outer ends of arms 1 are pulled upward, thus forcing the jaws 3 inward to grip the pile; and, further, that as pulling or lifting power is applied, this gripping action increases and forces the lugs 9 to bite into the pile; any further power applied through the lifting cable is used in the operation of pulling the pile or post. After the pile or post has been pulled, it is released from the machine by taking up on the lowering line (through slings 21) and slacking off on the lifting line (slings 20), thus causing jaws 3 to open and release the pile.

I claim:

1. A lifting device of the class described comprising a rigid frame formed from a circular cross-sectional element defining the top and lateral edges of converging rectangular sides; bell crank levers having interiorly and exteriorly extending lever arms, fulcrumed at the intersection of the converging edges of said rectangular sides; gripping elements pivotally connected to the interiorly extending lever arms, and operating slings connected to said gripping elements and to the exteriorly extending arms of said bell crank levers.

2. A lifting device of the class described comprising a rigid frame formed from a circular cross-sectional element defining sides having rectangular and V-shaped continuous lateral edges; bell crank levers having interiorly and exteriorly extending lever arms, fulcrumed at the intersection of the converging edges of said rectangular

sides; gripping elements pivotally connected to the interiorly extending lever arms, and operating slings connected to said gripping elements and to the exteriorly extending arms of said bell crank levers.

3. A lifting device of the class described comprising a rigid frame formed from a circular cross-sectional element defining sides having rectangular and V-shaped edges, reinforcing plates connected to the rectangular edges of said frame, bell crank levers having interiorly and exteriorly extending lever arms fulcrumed at the vertices of the V-shaped edges; gripping elements comprising gripping jaws mounted on bearing plates pivotally connected to the interiorly extending lever arms and operating slings connected to the gripping elements and to the exteriorly extending arms of said bell crank levers.

SAMUEL G. NEFF.