Apr. 17, 1923.

1,451,922

J. PERNA

DUPLEX SHEET PILE DRIVER

Filed March 2, 1922

3 Sheets-Sheet 1

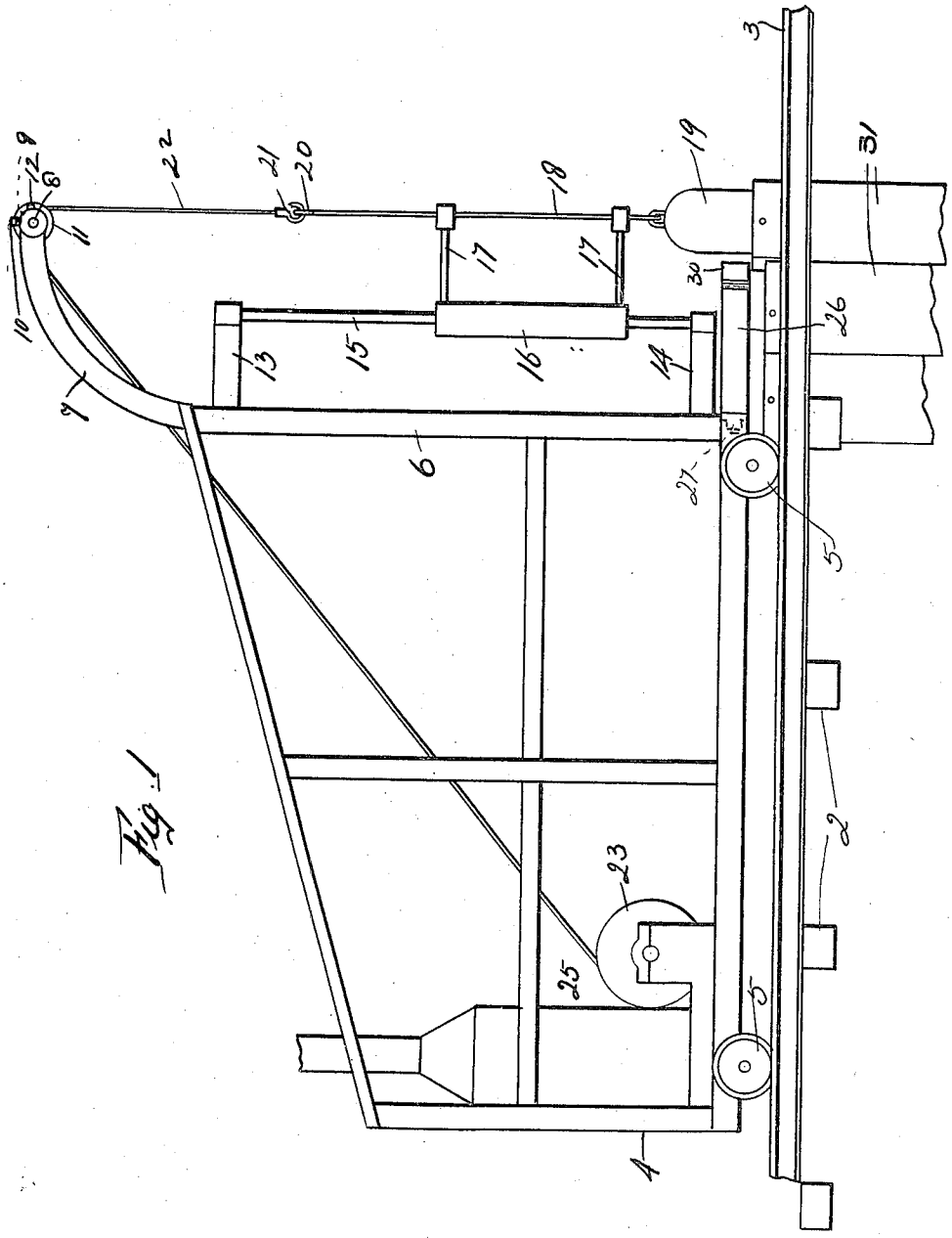


Fig. 1

INVENTOR

Joseph Perna

By W. W. Williamson Atty.

Apr. 17, 1923.

1,451,922

J. PERNA

DUPLEX SHEET PILE DRIVER

Filed March 2, 1922

3 Sheets-Sheet 2

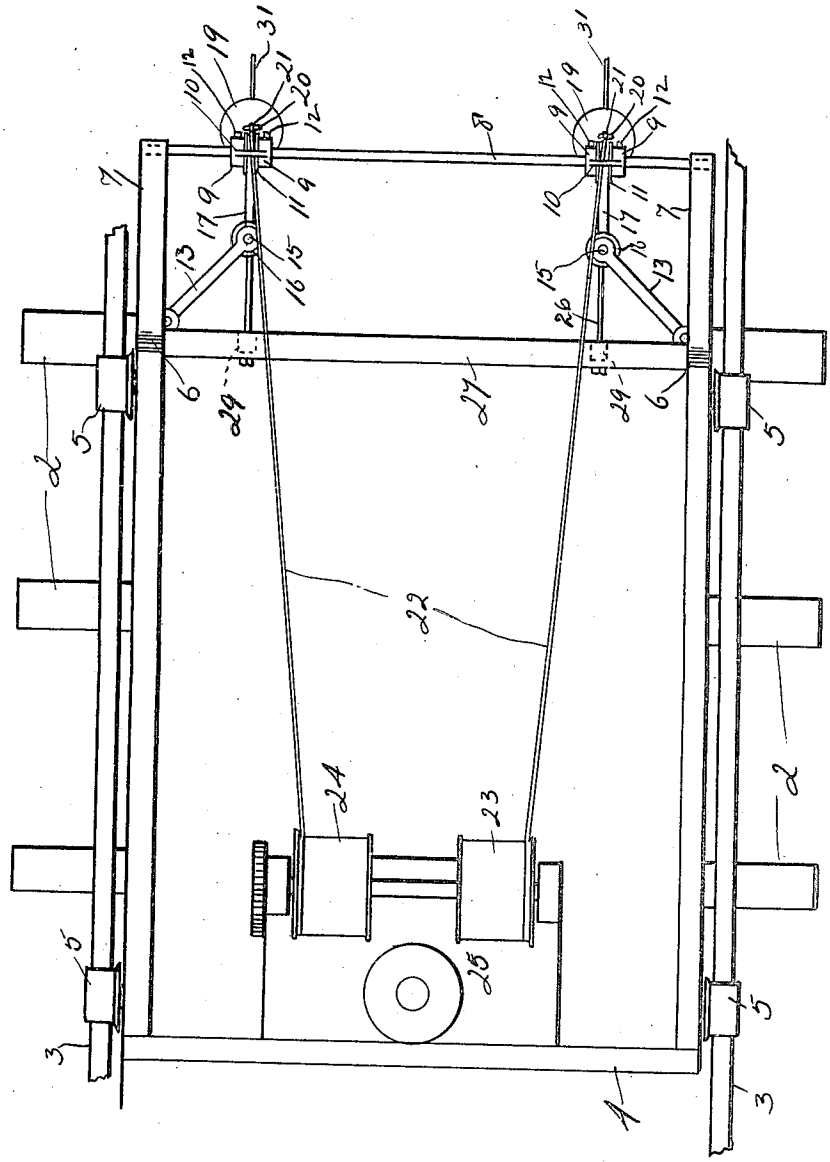


Fig. 2

INVENTOR
Joseph Perna
By W. W. Williamson Atty

Apr. 17, 1923. 1,451,922

J. PERNA

DUPLEX SHEET PILE DRIVER

Filed March 2, 1922 3 Sheets-Sheet 3

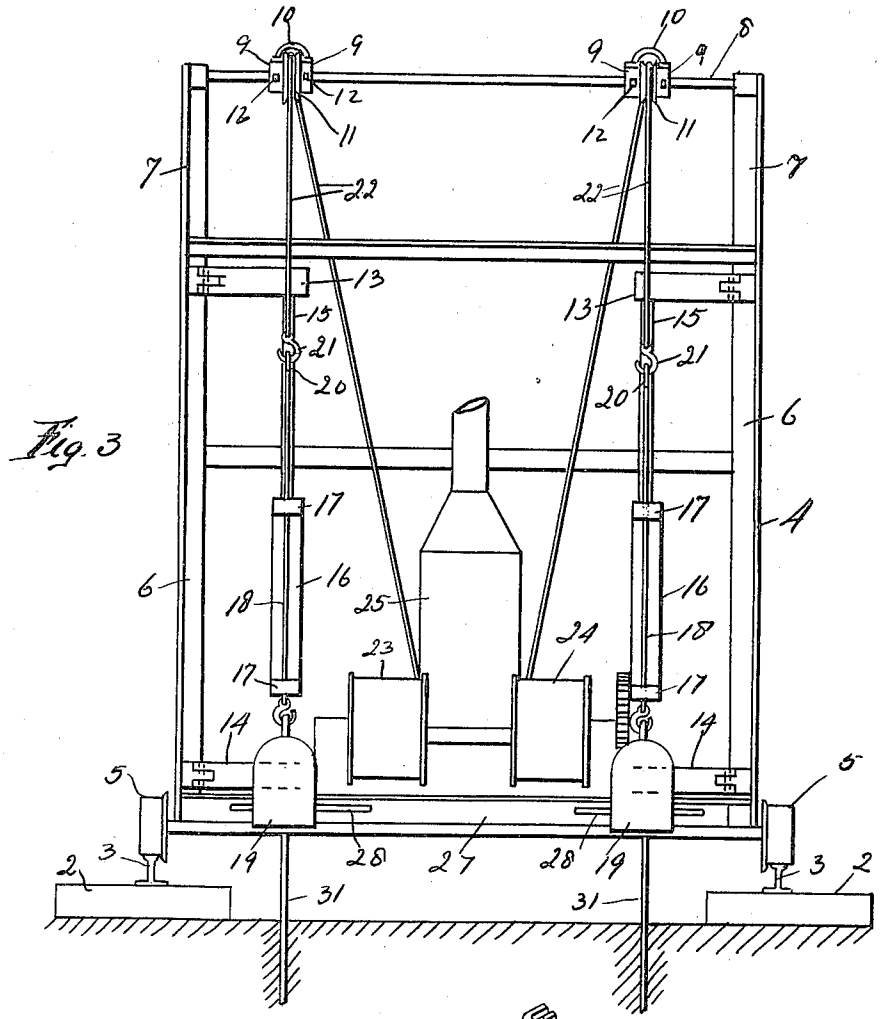


Fig. 3.

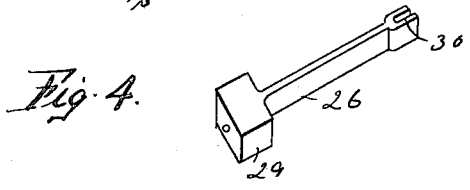


Fig. 4.

INVENTOR
Joseph Perna
By W. W. Williamson Atty

Patented Apr. 17, 1923. 1,451,922

UNITED STATES PATENT OFFICE.

JOSEPH PERNA, OF PHILADELPHIA, PENNSYLVANIA.

DUPLEX SHEET-PILE DRIVER.

Application filed March 2, 1922. Serial No. 540,420.

To all whom it may concern:

Be it known that I, JOSEPH PERNA, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in a Duplex Sheet-Pile Driver, of which the following is a specification.

My invention relates to new and useful improvements in a duplex sheet-pile driver, and has for its object to provide a portable device of this character which is movable along a track so that successive sheets of metal pile may be driven into the ground prior to excavation.

Another object of the invention is to provide an excavator frame carrying two hammers which may be used separately for driving one line of piles or used together to drive two parallel lines of piles, the said hammers being actuated by suitable hoisting mechanism receiving their power from one source, such as an engine.

A further object of the invention is to so construct the pile driver that the hammers may be adjusted transversely for driving the lines of piles different distances apart in order to outline trenches of different width.

With these ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains, may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:—

Fig. 1, is a side elevation of a duplex sheet pile driver embodying my improvements and illustrating a number of sheet piles in different positions.

Fig. 2, is a plan view thereof.

Fig. 3, is a front elevation thereof.

Fig. 4, is an enlarged perspective view of a holding or guiding arm for holding a pile upright during the driving operation.

In carrying out my invention as here embodied, 2 represents the ties or sleepers which are placed along the course of a trench to be excavated and on which are mounted the rails 3 of the track on which the pile driver runs. The pile driver consists of a suitable frame 4 mounted upon the wheels 5 for supporting the frame and permitting the same to be advanced along the track.

The frame includes two forward uprights 6 the upper ends of which are curved outwardly as at 7 so that their extreme ends project some distance forward of the main portion of the frame and in its upper outer ends is mounted a stationary transverse axle 8. On the axle are adjustably mounted the collars 9 arranged in pairs with a cable shield 10 joined to each pair so as to project across the grooved pulley or shive 11 revolubly and slidably mounted upon the axle 8 so that the pulleys may be set in different positions upon the axle when the collars are shifted, the said collars being held in their adjusted positions by set screws 12 or their equivalent.

To the uprights 6 are hinged in any suitable and well known manner the adjustable brackets 13 and 14, the brackets on each upright coacting to hold a guide rod 15 which is fixed in the outer ends of said brackets and on which slides the barrel 16 carrying the horizontal parallel arms 17 through which passes the hammer rod 18 having a hammer 19 secured to its lower end and provided at its upper end with an eye 20 for the reception of a hook 21 attached to the cable 22. Each cable runs over one of the grooved pulleys 11 and is then wound upon one of the drums 23, 24 which may be actuated separately or in unison by means of any suitable means such as steam, electricity or compressed air being herein conventionally represented as a steam engine 25.

In order to hold the piling in an upright position during the driving operations I provide suitable interchangeable guide arms 26 one form of which is shown in Fig. 4, and these may be adjustably mounted upon the forward cross beam 27 of the pile driver frame. As here shown the cross beam has longitudinal slots 28 formed therein through which pass suitable fastening devices, such as screws or their equivalent which have threaded connection with the head 29 which is of sufficient size to snugly fit within the recess of a channel iron or I-beam if such a metal section

is used as the cross beam. The outer end of the guide arms is notched or recessed as at 30 into which fits edgewise a sheet piling represented by the numeral 31 and this sheet piling is tongued and grooved so as to interlock with each other.

The pile driver herein described is particularly adapted for setting and driving sheet metal piling in relatively soft ground and preferably prior to excavating the trench and in operation both the hammers 19 are swung within the frame by rotating the barrel and swinging the brackets 13 and 14 inward at which time said hammers may be allowed to rest upon the flooring of the frame and the cables 22 disconnected therefrom or if found desirable said hammers may be allowed to rest upon the ground and the cables disconnected. After the cables are disconnected from the hammers they may be used for dragging the sheet metal piling from an adjacent locality and hoisted to an upright position and moved into registration with the slots in the guide arms and then permitted to drop which will cause the ends of the piling to enter the ground a short distance and with the assistance of the guide arms said piling will be held upright. The hammers are then again attached to the cables and raised the desired height and allowed to fall onto the upper end of the piling which will gradually drive the same into the ground as will be obvious.

Because of the barrels 16 and the arms 17 formed therewith the hammers will be constantly guided during their operations with the guiding means always close to the hammers under ordinary conditions or unless the piling being driven reaches a point considerably below the framework in which case the barrels 16 would come to a full stop when reaching the lower brackets, while the hammers could continue to fall within the limits of the rods 18 for striking their blows.

Prior to carrying on the operations above set forth the grooved pulleys or shives 11 are adjusted upon the axle 8 so that the distance between their centers is approximately equal to the distance desired between the two lines of piling.

Of course I do not wish to be limited to the exact details of construction as herein shown as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is:—

1. A pile driver consisting of a frame, an axle fixed in said frame, two pulleys adjustably journalled on said axle, means to hold said pulleys in their adjusted positions, cables running over said pulleys, means for operating the cables, a hammer connected to an end of each cable, two pairs of brackets hinged to the frame, a vertical rod between each pair of brackets and fixed thereto, a barrel slidably mounted upon each of said rods, and arms carried by each barrel through which passes a component part of each hammer.

2. A duplex pile driver consisting of a frame including a pair of forward uprights having their upper ends curved outwardly, an axle mounted in the ends of said outwardly projecting portions, pulleys adjustably mounted on said axles, a pair of brackets hinged to each of said uprights, a rod carried by each pair of brackets, a barrel slidably mounted on each rod, a pair of horizontal arms carried by each barrel, a hammer rod passing through the arms of each barrel and slidable vertically therein, a hammer carried by the lower end of each hammer rod, and a cable detachably connected to the upper end of each hammer rod and passing over the pulleys and a mechanism common to both cables for operating said cables.

3. A duplex pile driver consisting of a frame including a pair of forward uprights having their upper ends curved outwardly, an axle mounted in the ends of said outwardly projecting portions, pulleys adjustably mounted on said axles, a pair of brackets hinged to each of said uprights, a rod carried by each pair of brackets, a barrel slidably mounted on each rod, a pair of horizontal arms carried by each barrel, a hammer rod passing through the arms of each barrel and slidable vertically therein, a hammer carried by the lower end of each hammer rod, a cable detachably connected to the upper end of each hammer rod and passing over the pulleys, a mechanism common to both cables for operating them, and interchangeable guide arms adjustably mounted upon the lower part of the frame for guiding sheet piling to be driven by the hammer.

In testimony whereof, I have hereunto affixed my signature.

JOSEPH PERNA.