C. W. MILLER.

PILE DRIVER.

APPLICATION FILED JUNE 30, 1920.

1,380,072.

Patented May 31, 1921.

2 SHEETS—SHEET 1.

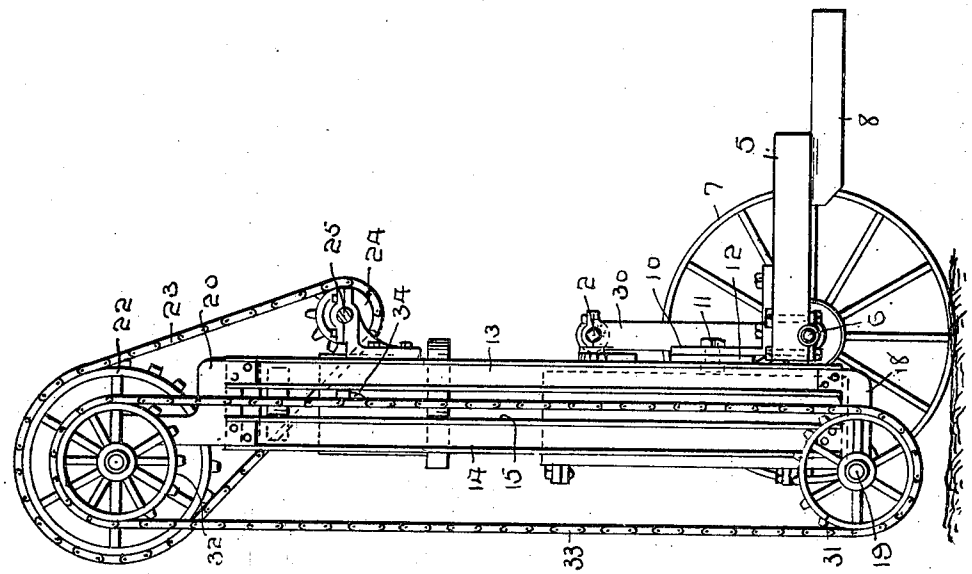


Fig. 2.

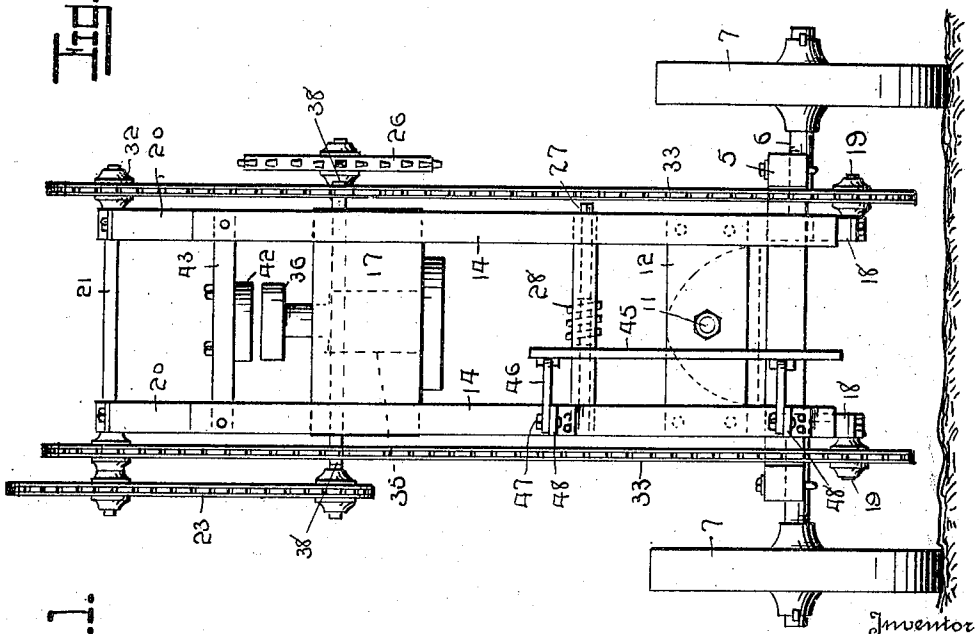


Fig. 1.

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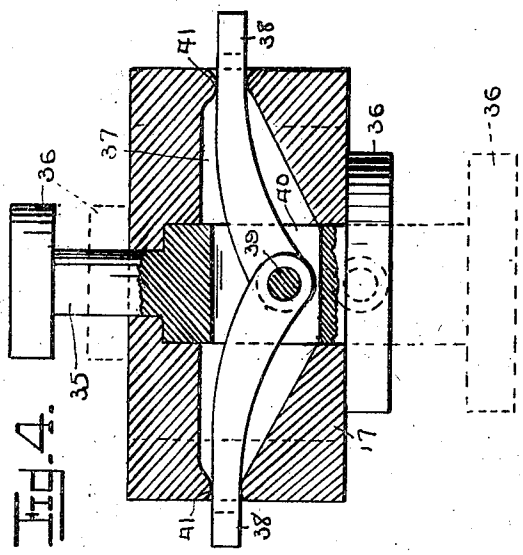



Fig. 4.

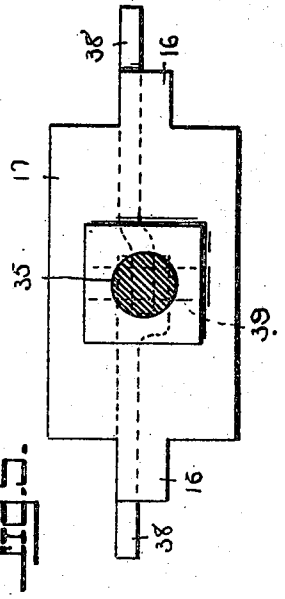



Fig. 5.

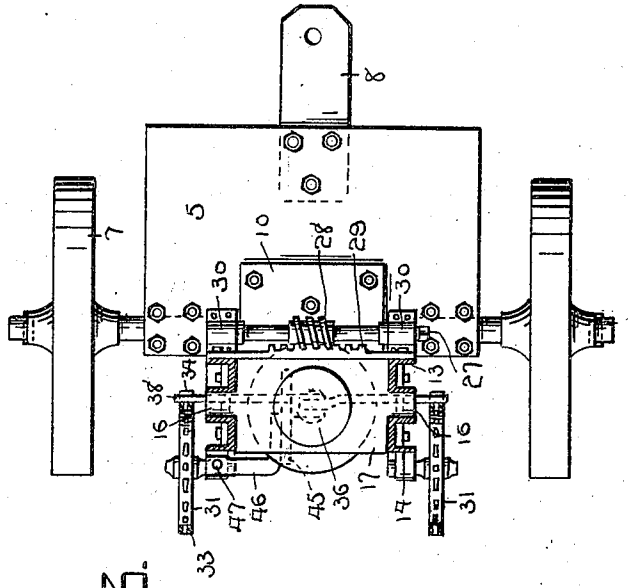



Fig. 3.

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# UNITED STATES PATENT OFFICE.

CLARK W. MILLER, OF JANESVILLE, WISCONSIN.

## PILE-DRIVER.

1,380,072. Specification of Letters Patent. Patented May 31, 1921.

Application filed June 30, 1920. Serial No. 393,172.

*To all whom it may concern:*

Be it known that I, CLARK W. MILLER, a citizen of the United States, residing at Janesville, in the county of Rock and State of Wisconsin, have invented certain, new and useful Improvements in Pile-Drivers, of which the following is a specification.

This invention has for its object to provide an improved drop hammer which, owing to its convenience of transportation and capability of wide range of adjustment is particularly adapted to driving fence posts and braces therefor.

A further object is the provision of a novel pivotal mounting and manually operable adjusting means for the hammer guides whereby the latter may be readily tilted for convenience and efficiency in driving inclined posts or braces.

A still further object resides in the provision of an improved elevating and tripping mechanism for the hammer whereby the latter may be operated at maximum speed.

With these and other objects in view, the invention consists in certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims, and in the drawings illustrative of the preferred embodiment of the invention.

Figure 1 represents a front elevation of the improved pile driver.

Fig. 2 represents a side elevation thereof.

Fig. 3 represents a horizontal sectional view through the hammer guides, looking downwardly.

Fig. 4 represents an enlarged sectional view through the hammer removed from the guides, and,

Fig. 5 represents a horizontal sectional view through the hammer.

Referring to the drawing in detail, wherein similar reference numerals designate corresponding parts throughout the several views, the numeral 5 indicates the supporting platform of the pile driver which is equipped with an axle 6 carrying wheels 7 upon which the platform is supported in an elevated position convenient for transportation. The rear portion of the platform is provided with a coupling 8 designed for attachment to a tractor or other conveying means and also designed for connection with a suitable stationary object to maintain the stability of the machine when in operation.

An angular supporting plate 10 is rigidly attached to the rear central portion of the platform 5 and the upstanding vertical portion thereof receives a horizontally disposed pivot pin 11 which also extends through a horizontal connecting plate 12 between the rear pair of vertical guides 13 whereby the latter are mounted for tilting movement. A second pair of guides 14 is arranged forwardly of the guides 13 and in spaced relation thereto to provide a guideway 15 through which the lateral extensions 16 of the hammer 17 are vertically movable.

The guides 13 and 14 are preferably formed of channel iron and the lower ends of the guides at each side of the hammer 17 are connected by a bearing member 18 which constitutes a spacing element for the guides and also a support for the lower chain supporting shafts 19.

The upper terminals of the guides 13 and 14 at each side of the hammer are connected by upstanding bearing members 20 receiving a horizontally disposed shaft 21 carrying a relatively large sprocket wheel 22 at one terminal engaging a chain 23 which is also extended to a smaller sprocket wheel 24 mounted upon a drive shaft 25 which is supported by L-shaped brackets 25ª attached to the guides 13, the shaft 25 being provided at its opposite end with a relatively large sprocket wheel 26 for receiving a driving chain or equivalent power transmitting device whereby power is transmitted to the pile driver.

The guide frame for the hammer 17 consisting of the several guides 13 and 14 is tiltable upon the pivot pin 11, adjustment thereof being readily accomplished by manual rotation of the shaft 27 carrying a worm 28 which meshes with a toothed bar 29 connecting the rear guides 13. The shaft 27 is supported in uprights 30 mounted upon the front portion of the platform 5 and is preferably provided with a squared terminal for coaction with the jaws of a wrench or with a handle crank for convenience in adjustment thereof.

Sprocket wheels 31 and 32 are arranged upon the lower and upper shafts 19 and 21, respectively, and coact with a pair of chains 33 arranged outwardly of the guides 13 and 14 and carrying hooks 34 for engaging portions of the hammer 17 and elevating the latter.

The hammer 17 consisting in a relatively heavy body receiving a vertically movable

plunger 35 having headed upper and lower extremities 36. The body 17 of the hammer is formed with a medially enlarged longitudinal passage 37 which intersects the bore receiving the plunger 35 and receives a pair of oppositely arranged slidable elevating arms 38. The inner extremities of the arms are pivotally connected at 39 in the slotted portion 40 of the plunger 35 and the restricted outer portions of the opening 35 are rounded as at 41 to permit the necessary tilting movement of the arms 38 when the pivotal axis 39 thereof is lowered due to depression of the plunger 35 with relation to the hammer body 17. The arrangement of the plunger is such that when moved upwardly within the hammer body 17 to the position illustrated in full lines in Fig. 4, the elevation of the pivot pin 39 effects outward projection of the terminals of the arms 38 beyond the ribs or flanges 16 of the body 17 and in such position the terminals of the arms are disposed in a position to be engaged by the hooks 34 of the traveling chains 33. As the hammer approaches the limit of its upward movement the upper headed extremity 36 of the plunger is engaged by the abutment 42 suspended beneath a connecting rod 43 between the upper portions of the guides 13 and 14 and during continued upward movement of the hammer body the plunger 35 is displaced downwardly effecting the automatic retraction of the terminals of the arms 38 thereby disengaging the latter from the hooks 34 and permitting the hammer to fall by gravity downwardly between the guides 13 and 14. Incident to the impact of the hammer with the post or other object being driven, the plunger 35 is projected upwardly through the body 17 resulting in the projection of the arms 38 which are again engaged by the hooks 34 of the chains and elevated thereby, whereupon the hammer is again elevated.

A post or pile guide or supporting plate 45 is provided with laterally projecting arms 46 which are pivotally secured at 47 to angular brackets 48 attached to the front guides 14. The plate 45 is designed to initially support the post in a desired position prior to the driving thereof, but after the post has been partially driven, the supporting plate 48 may be swung outwardly to inoperative position and the driving operation continued until the post is driven to the desired depth. In driving inclined posts or in operating the driving machine upon sloping ground, the desired angularity of the guides with relation to the axle 6 may be readily obtained by proper adjustment of the worm 28.

The preferred embodiment of the invention is disclosed in the drawings and set forth in the specification, but it will be understood that any modifications within the scope of the claims may be made in the construction without departing from the principle of the invention or sacrificing any of its advantages.

What is claimed is:

1. In combination, a pair of guides, chains arranged adjacent said guides, hooks carried by said chains, a hammer reciprocably mounted in said guides, hook engaging arms pivoted transversely and movably mounted in said hammer, a connecting rod between said guides, an abutment carried thereby, and means for withdrawing said arms to permit the hammer to drop, when engaged by said abutment.

2. In combination, a pair of guides, a hammer mounted for reciprocation in said guides, elevating chains having the upwardly moving portions thereof disposed adjacent the guides and hammer, arms carried by the hammer engageable with the chains for elevating the hammer, actuating means for said arms to retract the latter from chain engaging position, and an abutment adapted to be engaged by the actuating means whereby the arms are withdrawn as the hammer approaches the limit of its upward movement.

3. In combination, a pair of guides, a hammer mounted for reciprocation therein, endless elevating chains having the upwardly moving portions thereof disposed adjacent the hammer, chain engaging arms carried by the hammer and movable inwardly thereof to disengage the chains, a plunger slidably mounted in the hammer connected with the arms for withdrawing the latter, said plunger being arranged to project the arms upon impact of the hammer with a post, and an abutment adapted to be engaged by the plunger to effect retraction of the arms and disengagement of the latter from the chains.

4. In combination, a freely movable wheeled frame, a pair of guides, bearing and spacing members connecting the upper and lower extremities of said guides, sprockets carried by said spacing members, a vertically reciprocable hammer operable within said guides, elevating chains having hooks, driven by said sprockets, horizontally pivoted arms within the hammer and engageable by the said hooks, a transverse rod and abutment carried thereby between the guides, and adapted to disengage the said arms and permit the hammer to fall from its elevated position.

5. In combination, a freely movable wheeled frame, a pair of guides, bearing and spacing members connecting the upper and lower extremities of said guides, sprockets carried by said spacing members, a vertically reciprocable hammer operable within said guides, manually operable means

including a horizontal rack and worm gear for angling the guides, and a post supporting plate pivotally mounted to one of said guides.

6. In combination, a freely movable support, a pair of pivotally supported guides, bearing and spacing members connecting the upper and lower extremities of said guides, a horizontal rack, between said guides, a supporting plate and a worm gear meshing with said rack, a manually operable means for said rack and gear to angle the guides, a post supporting plate vertically secured to one of said guides, and a vertically reciprocable hammer intermittently operable in said guides.

In testimony whereof, I affix my signature hereto.

CLARK W. MILLER.