

Dec. 22, 1925.

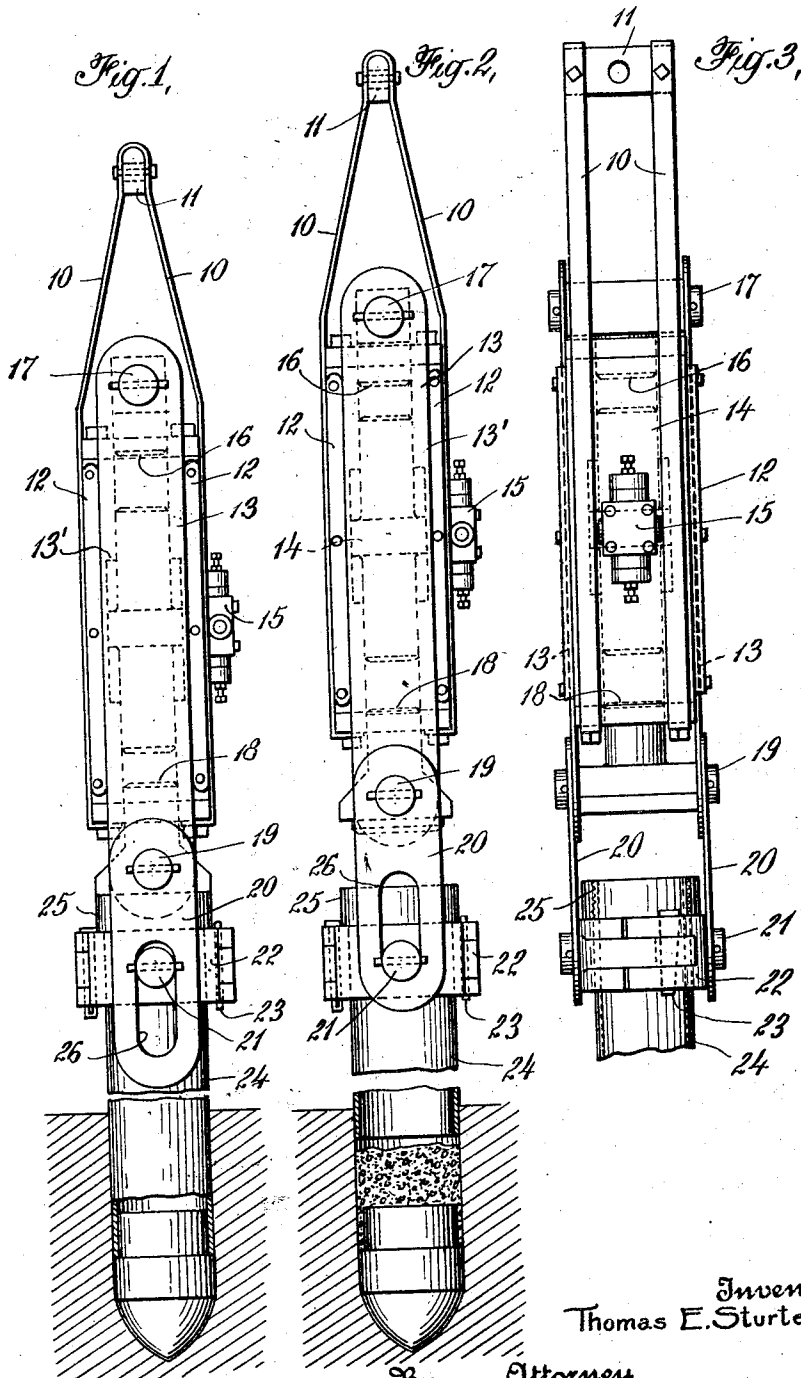
1,566,631

T. E. STURTEVANT

PILE DRIVING AND PULLING MECHANISM

Filed March 27, 1922

2 Sheets-Sheet 1



Inventor
Thomas E. Sturtevant.

By

Attorney

E. W. Marshall

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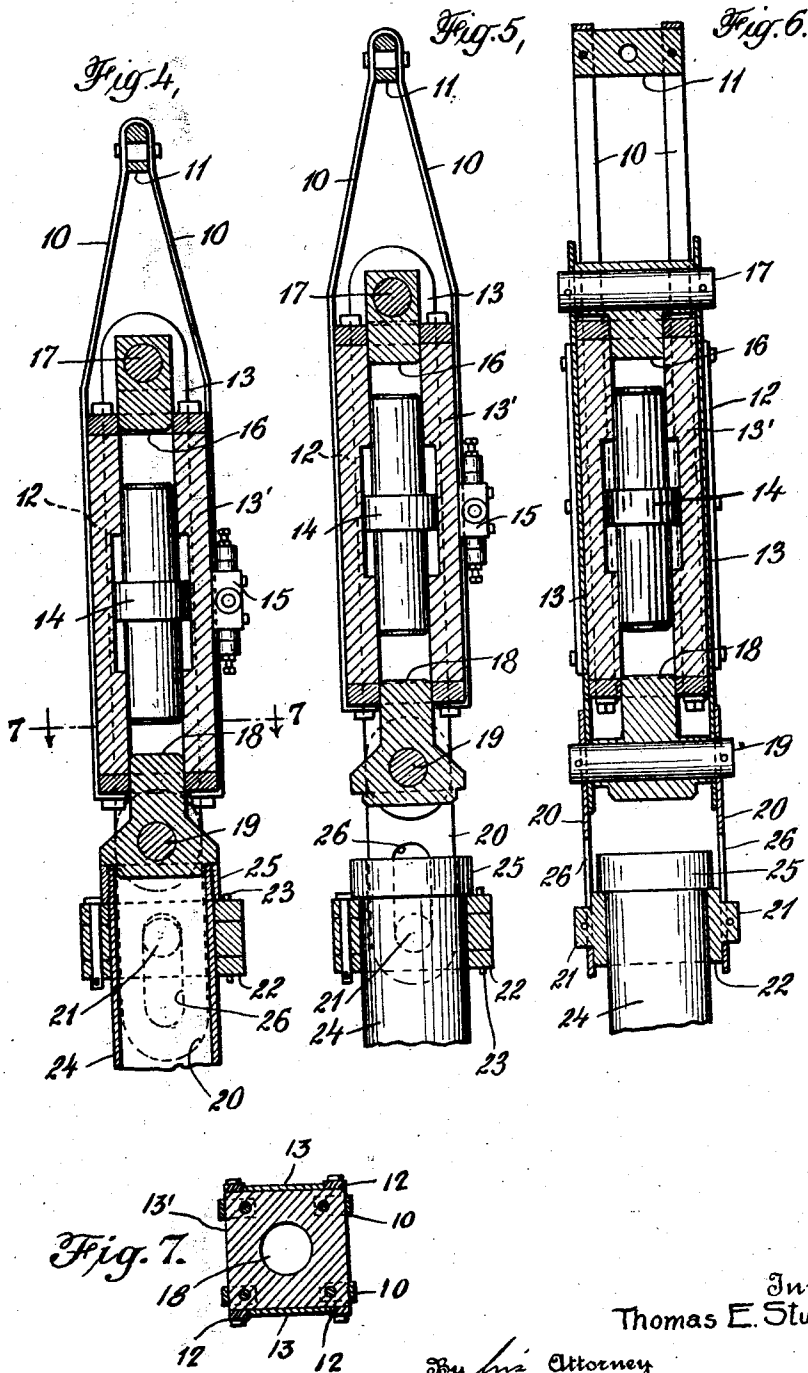
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PILE DRIVING AND PULLING MECHANISM

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2 Sheets-Sheet 2



Inventor
Thomas E. Sturtevant

By his Attorney

E. M. Marshall

Patented Dec. 22, 1925.

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UNITED STATES PATENT OFFICE.

THOMAS E. STURTEVANT, OF DOVER, NEW JERSEY, ASSIGNOR TO McKIERNAN-TERRY
DRILL COMPANY, OF DOVER, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PILE DRIVING AND PULLING MECHANISM.

Application filed March 27, 1922. Serial No. 547,168.

To all whom it may concern:

Be it known that I, THOMAS E. STURTEVANT, a citizen of the United States, and a resident of Dover, county of Morris, and State of New Jersey, have invented certain new and useful Improvements in Pile Driving and Pulling Mechanism, of which the following is a specification.

This invention relates to pile driving and pulling mechanism.

The invention more particularly relates to concrete pile construction. In such constructions a pipe having a plug closing its lower end is driven by a pile driver and is then withdrawn leaving the plug and concrete is poured into the hole.

This invention has for its object to provide apparatus by means of which concrete can be poured during the withdrawal of the pipe.

Another object of the invention is to provide a pile driving and pulling mechanism so constructed and arranged that the change from driving to pulling and vice versa can be made without disconnecting or reversing any of the parts and without change in the valve mechanism.

Another object of the invention is to provide a device of the character described that can easily and quickly be changed from a driving to a pulling rig.

Further objects of the invention will appear from the following description taken in connection with the drawings which form a part of this application and in which—

Fig. 1 is an elevation of a driving and pulling rig constructed in accordance with my invention and showing the parts in driving position.

Fig. 2 is an elevation of the construction shown in Fig. 1 but showing the parts in position for pulling or withdrawing a pile.

Fig. 3 is an elevational view taken at right angles to Fig. 2.

Fig. 4 is a longitudinal sectional elevation of the construction shown in Fig. 1.

Fig. 5 is a longitudinal sectional elevation of the construction shown in Fig. 2, and

Fig. 6 is a longitudinal view of the structure shown in Fig. 3.

Fig. 7 is a transverse sectional elevation taken upon line 7—7 of Fig. 4.

The invention may be briefly described as comprising a vibratory hammer, means for suspending the hammer and a pair of anvils supported at the opposite ends of the

hammer and means connecting the anvils to a pile. The parts are so constructed and arranged that the hammer and anvils are relatively movable in such a way that the hammer may coact with either of the anvils so that a driving or pulling action may be obtained.

Referring to the drawings I have shown a pair of suspension straps 10 adapted to be connected through a cross pin 11 to a cable in the usual manner. Each strap 10 is secured to a cylinder block 13'. Guide bars 12 are also secured to block 13' and links 13 are slidably supported between the bars 12.

The pile driving and pulling mechanism comprises the cylinder block 13' mounted on the straps 10 and formed by the blocks 12 and enclosing a piston or hammer 14. 15 is valve mechanism for controlling the admission and exhaust of the motive fluid.

An anvil 16 is mounted on trunnions 17 at the upper ends of the slidable links 13 and opposite one end of the piston 14 and an anvil 18 is mounted on trunnions 19 at the other end of the piston and in the opposite ends of the links 13. The anvils 16 and 18 are slidably mounted between the upper and lower ends respectively of the blocks 12.

The lower ends of the links 13 are connected by a pair of links 20 to trunnions 21 formed on a clamping collar 22 which is secured by wedge 23 to the pile or pipe 24. The upper ends of the links 20 are pivoted on the trunnions 19 of the anvil 18.

A collar 25 is secured to the upper end of the pipe 24 in any suitable manner as by threading the collar thereon.

As shown in Figs. 1 and 2, the links 20 are provided with longitudinal slots 26 which receive the trunnions 21 and the function of these slots will be clear from the description of the operation of the device.

In Fig. 1 the rig is shown with the parts in driving position and from this showing it will be seen that the vibration of the hammer or piston 14 will cause it to engage the anvil 18 which is positioned on top of the collar 25 carried by the upper end of the pipe and extends into the cylinder 13' a sufficient distance to be engaged by the piston or hammer 14. The pipe will therefore be driven as the hammer vibrates.

When the device is to be used as a lifting rig the straps or suspension means 10 are drawn upwardly to the position shown in

Figs. 2 and 3 in which position the hammer or piston 14 will engage the upper anvil 16 and because of its movement relative to the lower anvil the hammer will not engage the lower anvil. It will also be noted that in this position of the parts the trunnions 21 are disposed at the lower ends of the slots 26 whereas in Fig. 1 with the anvil 18 lowered to engage the top of the pipe or collar 25 the trunnions are disposed adjacent the upper ends of the slots, a slight clearance being provided in the slots beyond the trunnions.

In order to more clearly indicate the limits of movement of the piston the upper and lower limits of its movements have been indicated by dot and dash lines in Figs. 1 and 2.

It should be noted that in changing from pulling to driving the lowering of the suspension means will first effect a relative movement of the cylinder and piston in the links 13 and subsequently causes a movement of the links thereby positioning the lower anvil 18 on the upper end of the pipe collar 25.

From the foregoing description it will be seen that by simple, longitudinal movement of the straps or suspension means 10 the rig may be changed from a driving to a lifting device or vice versa and that it is not necessary to disconnect, invert or otherwise rearrange the elements.

Although one specific embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention as expressed in the following claims.

What I claim is:—

1. In a device for driving and pulling piles, a reciprocatory pile hammer, a pair of anvil blocks disposed at the opposite ends of the hammer and means for relatively slidably adjusting the blocks and hammer to bring either block into the range of the hammer.

2. In a device for driving or pulling piles, a pair of relatively slidable sections, one section carrying a vibratory hammer and the other section carrying a pair of anvils selectively engageable by said hammer and means for connecting the anvil carrying section to a pile.

3. In a device for driving or pulling piles, a pair of relatively slidable sections, one section carrying a vibratory hammer and the other section carrying a pair of anvils disposed at the opposite ends of and selectively engageable by said hammer and means for connecting the anvil carrying section to a pile.

4. In a device for driving or pulling piles, suspension means, a vibratory hammer carried thereby, a pair of anvils disposed at opposite ends of the hammer, and means for connecting the anvils to a pile, said hammer being slidable with reference to the anvils whereby either anvil may be engaged thereby.

5. In a device for driving or pulling piles, suspension means, a vibratory hammer carried thereby, a pair of anvils disposed at opposite ends of the hammer, and straps for connecting the anvils to a pile, said hammer being slidable with reference to the anvils whereby either anvil may be engaged thereby.

6. In a device for driving or pulling piles, suspension means, a vibratory hammer carried thereby, a pair of anvils disposed at opposite ends of the hammer, and straps slidably mounted in said suspension means for connecting the anvils to a pile, said hammer being slidable with reference to the anvils whereby either anvil may be engaged thereby.

7. In a device for driving and pulling piles, a cylinder, a piston therein, an anvil at each end of the piston, means for connecting said anvils to a pile, said connecting means being slidable relative to the cylinder and piston to bring either anvil into the cylinder and in a position to be engaged by the piston.

8. In a device for driving and pulling piles, suspension means, a vibratory hammer carried thereby, links slidable with respect to said suspension means, a pair of anvils carried by said links and disposed respectively at the opposite ends of said hammer, said parts being so constructed and arranged that initial downward movement of the suspension means will bring the lower anvil within range of the hammer and further downward movement will bring the lower anvil in contact with the pile.

In witness whereof, I have hereunto set my hand this 24 day of March, 1922.

THOMAS E. STURTEVANT.