

Oct. 26, 1937.

J. B. TEMPLETON

2,096,943

PILE DRIVING ATTACHMENT

Filed Aug. 29, 1935

3 Sheets-Sheet 1

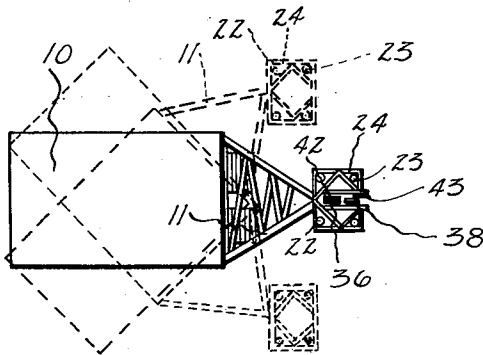


Fig. 2

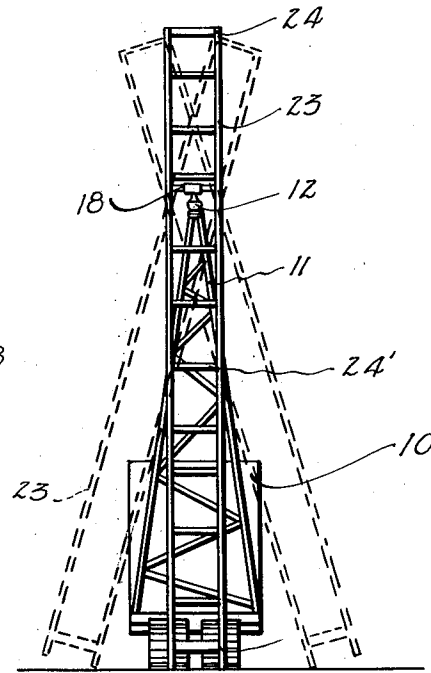


Fig. 3

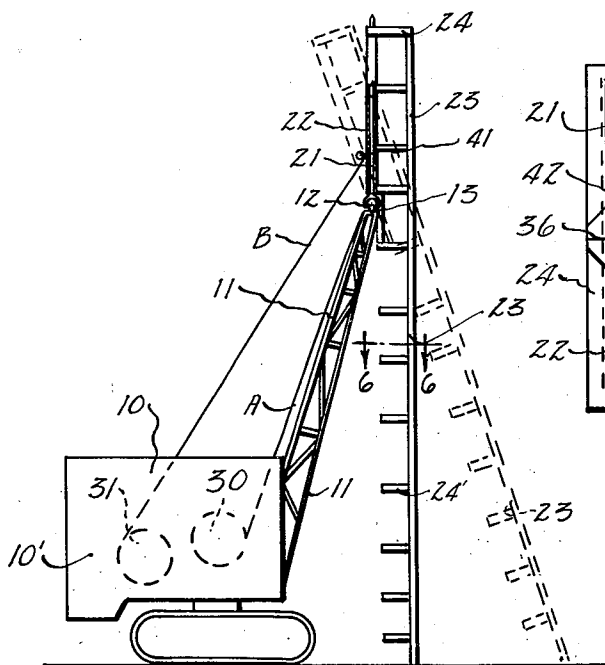


Fig. 1

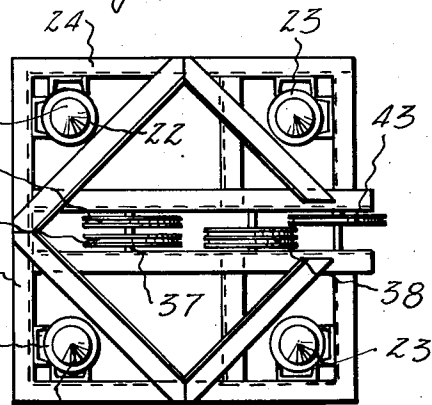


Fig. 6

Inventor
John B. Templeton

Jack Achley
Attorney

Oct. 26, 1937.

J. B. TEMPLETON

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3 Sheets-Sheet 2

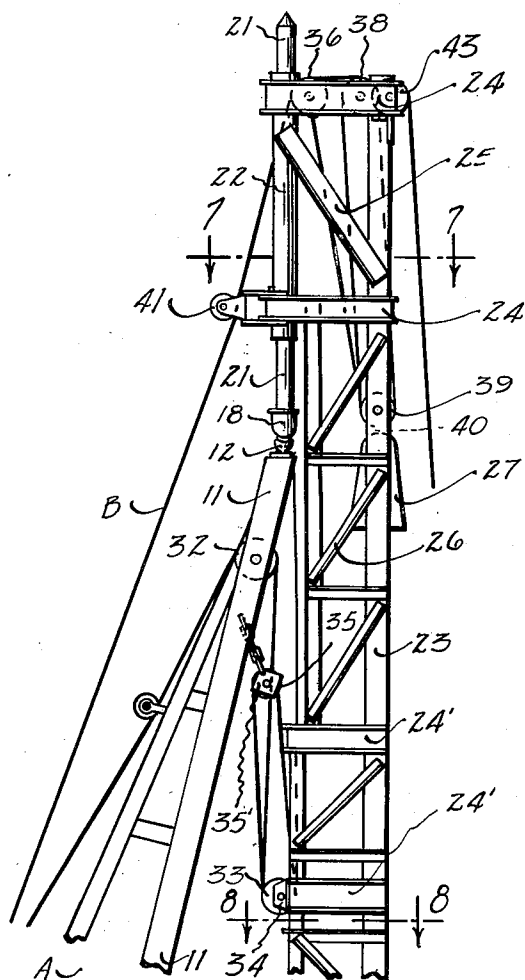


Fig. 4

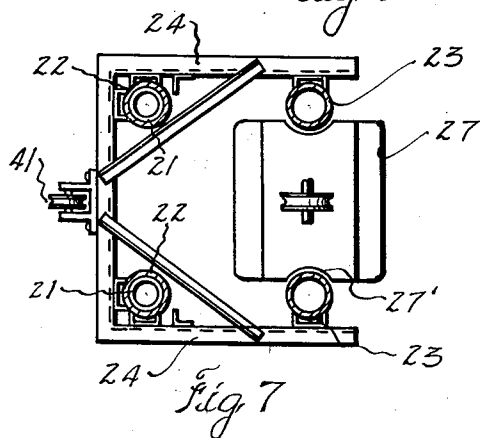


Fig. 7

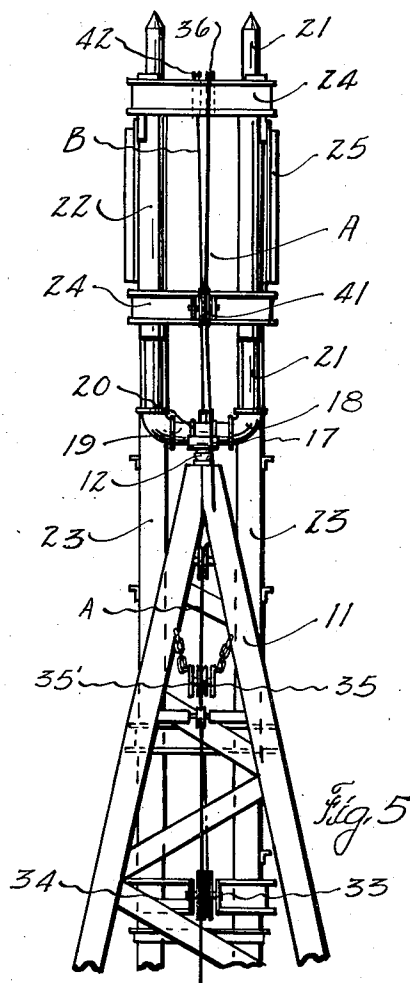


Fig. 5

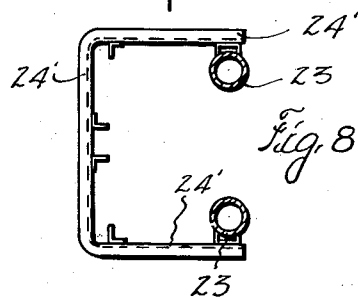


Fig. 8

Inventor
John B. Templeton

Jack Ashley
Attorney

Oct. 26, 1937.

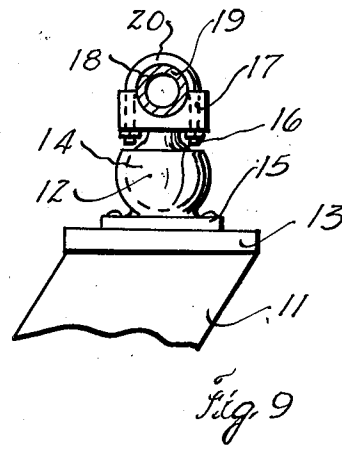
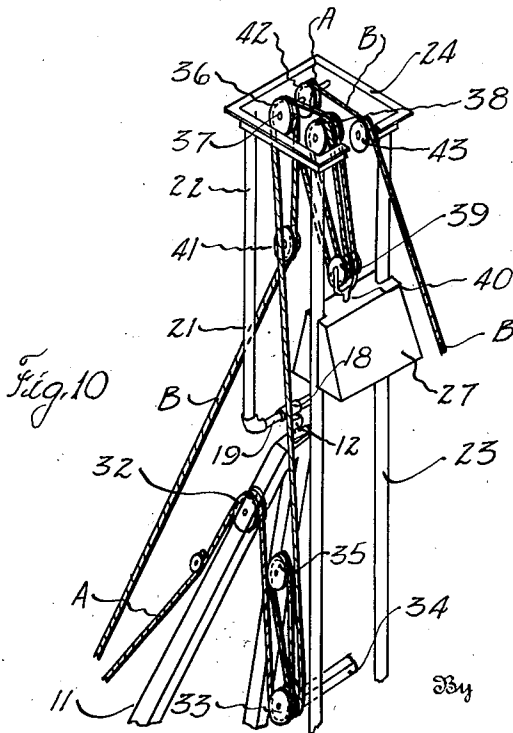
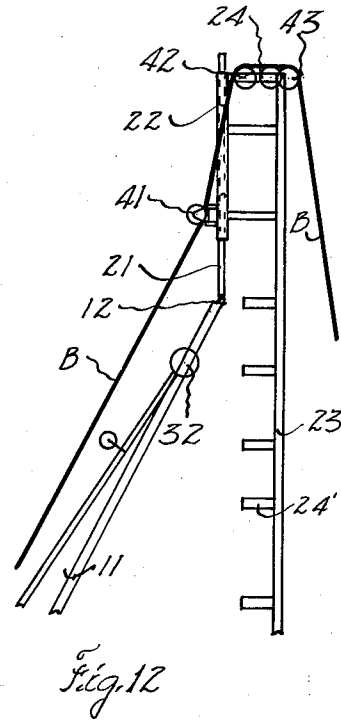
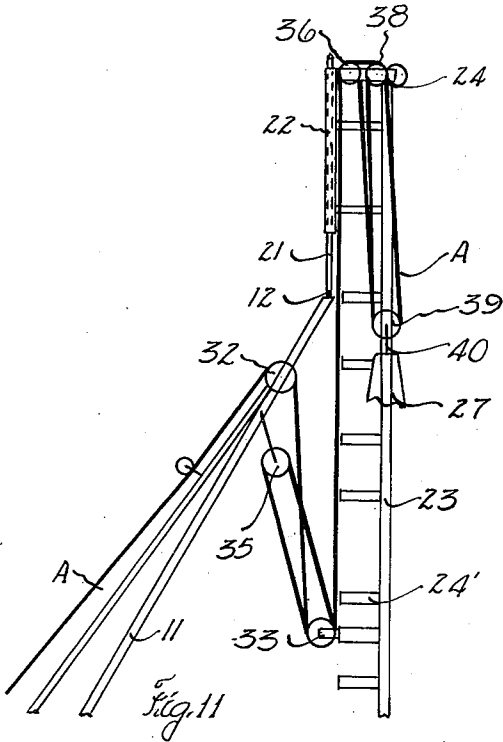
J. B. TEMPLETON

2,096,943

FILE DRIVING ATTACHMENT

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3 Sheets-Sheet 3



Inventor

John B. Templeton

John B. Templeton

Attorney

UNITED STATES PATENT OFFICE

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PILE DRIVING ATTACHMENT

John B. Templeton, Dallas, Tex.

Application August 29, 1935, Serial No. 38,357

3 Claims. (Cl. 61—74)

This invention relates to new and useful improvements in pile driving attachments.

One object of the invention is to provide an improved pile driving attachment which may be connected to the outer end of the boom and which is so mounted that the hammer leads are capable of universal adjustment, whereby an increased number of piles may be driven from a fixed position of the supporting crane or tractor, which eliminates the necessity of frequently moving the latter from place to place.

An important object of the invention is to provide an improved pile driving attachment wherein the hammer leads are supported on the end of the boom at a point below their upper ends, whereby a comparatively light capacity and short length boom may be employed for handling heavy loads to heights much higher than the boom length.

A particular object of the invention is to provide an improved pile driving attachment having its leads secured to the upper end of a boom by a universal joint, said leads being vertically adjusted, whereby said leads may be rotated on its vertical axis as well as swung in any direction and to any angle with relation to the boom.

Another object of the invention is to provide an improved pile driving attachment wherein the hammer leads are arranged to rest on the ground when said leads are in driving position, whereby the weight of said leads and hammer is taken off of the boom, together with a single cable or line which is so mounted that it not only carries the hammer but may also be utilized to raise the leads when it is desired to move the same to a new position.

A further object of the invention is to provide an improved pile driving attachment having leads which are so constructed and mounted as to be particularly adapted for use as an easily movable gin pole.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is a diagrammatical view, showing a side elevation of a pile driving attachment attached to a boom and constructed in accordance with the invention with the leads in different adjustments in dotted lines,

Figure 2 is a plan view of the same showing the

boom and leads in various adjusted positions, in dotted lines,

Figure 3 is a front elevation of the same,

Figure 4 is a side elevation of the upper end of the boom and leads,

Figure 5 is a rear elevation of the same,

Figure 6 is an enlarged plan view of the leads,

Figure 7 is a horizontal, cross-sectional view, taken on the line 7—7 of Figure 4,

Figure 8 is a horizontal, cross-sectional view, taken on the line 8—8 of Figure 4,

Figure 9 is an enlarged vertical sectional view showing the universal mounting,

Figure 10 is a perspective view, showing the cable or line sheaves or pulleys, only the outline of the boom and leads being shown,

Figure 11 is a diagrammatical view, showing the mounting of the hammer line, and

Figure 12 is a similar view, showing the mounting of the pile line.

In the drawings, the numeral 10 designates an ordinary tractor crane having the usual boom 11 secured to its forward end. The boom extends upwardly from the crane and is preferably constructed of angle bars which are suitably braced and reinforced by channel members. However, the particular structure of the boom forms no part of the invention and is, therefore, subject to variation. Further, although the invention is shown and described in connection with the tractor crane 10, it is noted that any support, such as a derrick, or other device may be employed for carrying the boom 11. So, too, the boom is usually not only swingable laterally, but is obviously capable of being raised and lowered.

In carrying out the invention, a universal connection 12 is mounted on the upper end 13 of the boom 11 (Figures 4, 5, and 9). This connection is shown as comprising a socket 14 having a base plate 15 which is welded, bolted, or otherwise fastened to the end of the boom. A ball 16 is mounted in the socket in the usual way and a saddle 17 is made integral with the upper end of the ball. It is, of course, obvious that the ball and socket permit a free universal movement of the saddle 17. It is here noted that although a ball and socket has been found satisfactory in actual practice, any suitable universal connection may be employed.

A supporting yoke, or U-shaped member 18 has its transverse section 19 disposed within the saddle and is secured thereto by U-bolts 20, although it may be welded therein. The legs 21 of the yoke extend upwardly from the end of the boom and may be of any desired length which is found

practical. The yoke is illustrated as being constructed of pipe section which are connected together by elbows, but the yoke could be made of a single piece of material bent to the proper shape.

The upwardly extending legs 21 telescope into tubular guide members, or sleeves 22, and by observing Figure 4, it will be seen that said guide members are slidable vertically above and with relation to the upper end of the boom. The vertical hammer leads 23, which are shown as tubular pipe members extend in parallel relation to the guides 22. The leads are spaced from and have their upper ends secured to the guides 22 by channel members 24. These channel members may be welded or otherwise secured to the leads and guides. Suitable angular reinforcing bars 25 serve to brace the connection between the leads and guides. The lower end of the leads are connected together by channel members 24' which are similar to the members 24. Suitable bracing 26 reinforces the lower end of the leads 23.

The leads are sufficiently spaced from the tubular members and are also spaced from each other to permit a free sliding movement of the hammer 27 vertically on the leads. The hammer is provided with vertical recesses 27' for receiving the leads. It is noted that the leads are of such length that when said leads are resting on the ground, the upper end of said leads is above the end of the boom. The point of suspension of said leads is below the upper end of said leads, which permits a shorter boom to be used in handling longer leads. Further, since the leads are resting on the ground or other support, the load is taken off the boom which permits a comparatively light boom to be employed for heavy work.

From the above, it will be seen that the leads as, being fastened to the tubular guides 22 by the transverse, channel members 24, are capable of a vertical adjustment, whereby they may be raised or lowered as desired. The guides have the legs 21 of the yoke 19 telescoping therein and since the yoke is universally adjustable, due to its being carried by the ball and socket attachment, it will be seen that the leads may be rotated on the vertical axis of said attachment and may also be swung to any desired angle universally with relation to the boom; as clearly shown by the dotted lines in Figures 1, 2, and 3. With this arrangement, it is not only possible to employ a lighter and shorter boom, with longer leads, but it is also possible to drive piling at any angle or at any point within the swinging radius of the boom.

The cab 10' of the crane has the usual cable or line drums 30 and 31 rotatably mounted therein. The drum 30 carries the hammer line A which extends upwardly therefrom and passes over a pulley or sheave 32 which is mounted on the upper end of the boom (Figure 10). After passing over this pulley, the line extends downwardly and around the under side of one of the grooves of a double sheave 33 which is journaled in a bracket 34 secured to the rear of one of the channel members 24' (Figure 4).

The line A then passes upwardly over a sheave 35 which is mounted in a clevis or other obviously suitable supporting member suspended from the upper end of the boom. From the sheave 35 the line extends downwardly around the second groove of the double sheave 33 and then upwardly over an idler pulley 36 which is journaled on a transverse pin 37 fastened in the top channel

member 24. From the idler 36, the line passes over one of the grooves of a double pulley 38 which is journaled at the forward end of said top channel member, and then downwardly around one of the grooves in another double sheave 39, which is journaled in a clevis 40 which extends upwardly from, and is secured to, the hammer 27.

From the groove of said double sheave 39, the line A passes upwardly over the second groove of the double pulley 38, and then downwardly around the second groove of the sheave 39 which is carried by the hammer. The end of the line A is then extended upwardly from this double sheave and is suitably fastened to the top frame member 24 of the leads 23.

By passing the line A over the various pulleys and sheaves, as shown, the power applied to the single line is increased to the point where it can carry a much greater load. It will be obvious that since one end of the line is made fast to the frame at the top of the leads and also since the line passes over the double sheave 39, which moves with the hammer 27, that when the drum 30 is rotated to permit slack in the line A, the weight of the hammer will immediately cause the same to fall downwardly between the leads. It will further be seen that when the drum is rotated in an opposite direction, the line A is tightened to draw the hammer upwardly.

If it is desired to raise the leads 23 from the ground, as is necessary in moving the same from one position to another, it is only necessary to lower the hammer and anchor the same to the leads in some suitable manner, not shown. Then when the line A is wound on the drum, the hammer and leads will be raised together, due to uplift applied at 35 through the proper arrangement of sheaves and lines. The boom may then be swung to properly position said leads.

For steadying the leads 23 and also for swinging the lower ends thereof to a proper position, the piling line B is provided. This line is wound around the drum 31 and is controlled thereby. The line B extends upwardly from said drum and passes behind an idler 41 which is journaled on the rear of one of the transverse channel members 24 above the pivot of the leads on boom. The line then extends upwardly and over a pair of sheaves 42 and 43 which are mounted between the upper channel member 24, and then downwardly contiguous to the leads 23. Its lower end is suitably secured to the leads and it is obvious that by winding or unwinding said line on its drum, the swinging of the lower leads 23 is controlled and the eccentric load of the hammer and leads can be offset so that the leads can be plumbed, or vertically aligned before setting on the ground. It is pointed out that by detaching the lower end of the line B from the leads, the line may be utilized for its primary purpose, which is to pick up the piling (not shown), to place said piling into position for driving.

From the above, it will be seen that the pile driver is simple in construction and adaptable to any type of work. The leads are universally adjustable which permits piling to be driven in transverse alinement. Also by disposing the leads at an angle with relation to the boom, the piling may be driven at such angle. The lower end of the leads rest upon the ground which relieves the universal connection and boom of the load, whereby a comparatively light boom may be used in heavy work.

The suspension of the leads from a point be-

low their upper ends allows a short boom to handle longer leads which results in being able to use a smaller crane thereby saving in operating expense.

5 In actual operation, when shifting the leads 23 into position, said leads are just lifted from the ground and the lower end of the leads are then manually swung into the desired position after which said leads are lowered to rest on the ground. The line B is used to offset the eccentric load and pull the bottom of the leads out to a desired location. It is noted that if desired, the structure may be utilized as a gin pole for, having a universal adjustment in all directions as well as means for vertically moving the lower end thereof, it is particularly adapted for such use. It is again noted that the single line A, due to its mounting on the various sheaves and pulleys, is capable of sustaining an increased load and thus, 20 may be utilized to lift the leads, as well as the hammer.

What I claim and desire to secure by Letters Patent, is:

1. A pile driving attachment for a boom comprising, an elongated frame including opposed longitudinal hammer leads, said frame having opposed longitudinal guide members at one side thereof, a supporting yoke including longitudinal members on which said guide members are slidably mounted, and a single universally swiveled connection between said supporting yoke and the end portion of the boom whereby the hammer lead frame is swingable in any direction relative to the boom.

35 2. A pile driving attachment for a boom comprising, a supporting yoke universally and supportingly swiveled on the end portion of the boom, said yoke having a parallel pair of longitudinal supporting members, and a hammer lead 40 frame including longitudinal tubular supporting guide members, said guide members slidably sleeved on said longitudinal supporting members of said yoke.

3. A pile driving attachment for a boom comprising a supporting yoke universally and supportingly swiveled on the end portion of the boom, said yoke having a parallel pair of longitudinal supporting members, a hammer lead 5 frame including longitudinal tubular supporting guide members, said guide members slidably sleeved on said longitudinal supporting members of said yoke, a hammer slidably supported on said hammer lead frame, a cable line idler pulley on the boom near the end thereof, a similar pulley on said hammer lead frame near the upper end thereof, a pair of cable loop pulleys one on said hammer lead frame below said yoke and the other on the boom below the idler pulley and correlated to said idler pulley on the boom, a second pair of cable loop pulleys one of which is mounted on said hammer lead frame in correlation to said idler pulley on the upper portion of said hammer lead frame and the companion pulley of second 20 said cable loop pair being attached to the hammer, and a hammer cable line leading from a power source over said idler pulley on the boom, thence multiple looped about said lower pair of cable loop pulleys one of which is on the hammer lead frame, and the other on the boom and up over the idler pulley on the upper end portion of the hammer lead frame and thence multiple looped about said upper pair of cable loop pulleys and finally secured at its upper end to the adjacent upper end portion of the hammer lead frame, said hammer cable line adapted under power at the source to lift the hammer when the latter is free to move on the hammer leads and whereby the hammer drops when the cable line 35 is released from power at the source, and whereby, also, when the hammer is locked against movement on the hammer leads said cable line lifts and lowers the hammer lead frame.

40 JOHN B. TEMPLETON.