E. DE V. TOMPKINS.

PILE DRIVING MACHINE.

APPLICATION FILED SEPT. 19, 1908.

962,080.

Patented June 21, 1910.

Fig. 1.

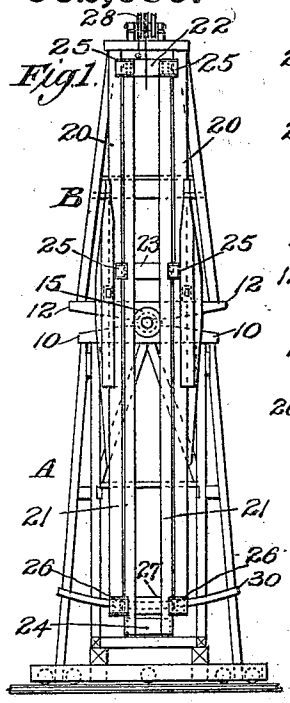


Fig. 2.

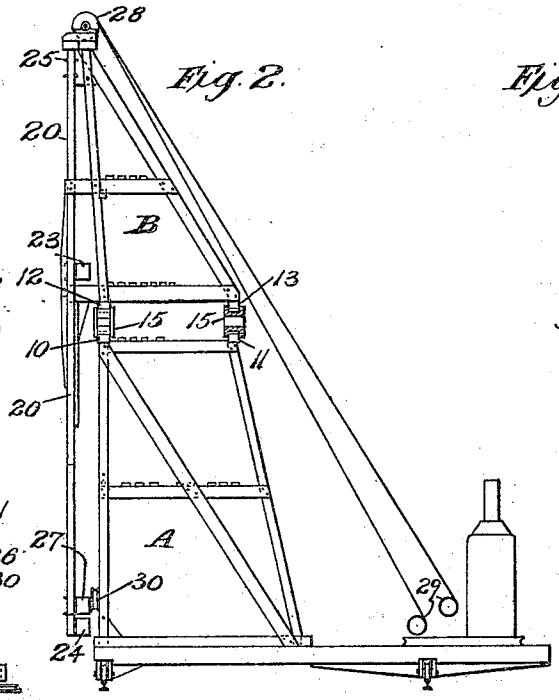


Fig. 3

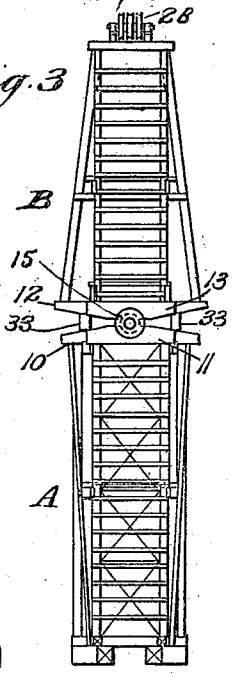


Fig. 7.

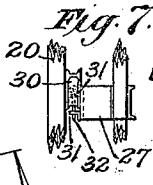


Fig. 8.

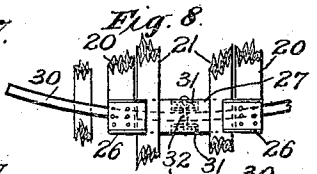


Fig. 9.

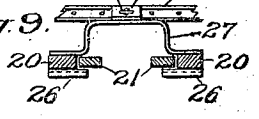


Fig. 4.

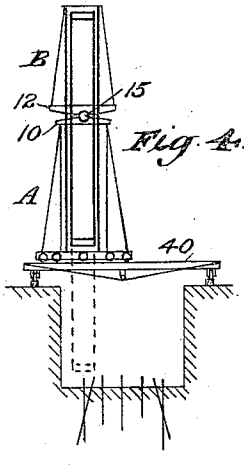


Fig. 5.

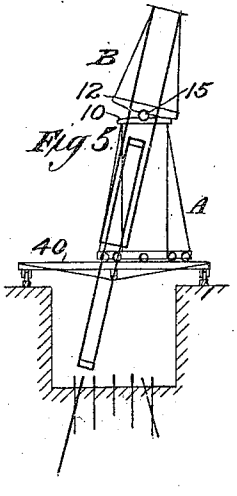
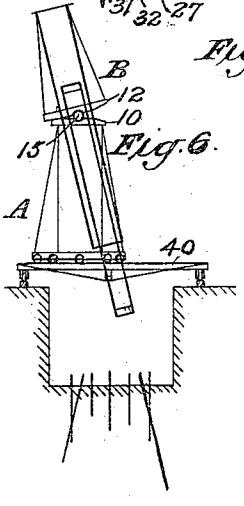


Fig. 6.



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PILE-DRIVING MACHINE.

962,080. Specification of Letters Patent. Patented June 21, 1910.

Application filed September 19, 1908. Serial No. 453,802.

To all whom it may concern:

Be it known that I, EDWARD DE VOE TOMPKINS, a citizen of the United States, residing at Pelham, county of Westchester, and State of New York, have invented certain new and useful Improvements in Pile-Driving Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to provide an improved pile driving machine, which, while being as well adapted for driving vertical piles as the ordinary pile driving machine now in use, may be readily and rapidly adjusted for driving inclined or batter piles of any given batter.

The invention may be applied to a pile driver having simple leaders or guides for the hammer or to one having extension leaders for following the piles when driving below grade, and it may be applied to a pile driver having the ordinary drop hammer, a steam hammer or other form of hammer.

Pile driving machines embodying the invention are especially adapted for use in driving piles in the bottom of trenches where batter piles as well as vertical piles are to be driven, but they may be also used on trestle work or other land work, or on a floating pile driver.

A full understanding of the invention can best be given by a detailed description of a construction embodying the features of the invention in the preferred form, and such a description will now be given in connection with the accompanying drawings, in which—

Figure 1 is a front view of a pile driving machine constructed in accordance with the invention and provided with extension leaders. Figs. 2 and 3 are side and rear views, respectively, of the machine shown in Fig. 1. Figs. 4, 5 and 6 are diagrammatic views showing the machine adjusted to different driving positions. Figs. 7, 8 and 9 are detail side, front and plan views of parts which will be hereinafter described.

Referring to the drawings, the vertical or upwardly extending supporting frame of the machine is formed in two parts, a lower part A which may be mounted in any suitable manner, and an upper part B which is mounted to rock sidewise on the upper end of the lower part A about a horizontal axis and which carries the leaders or guides for the hammer. These upper and lower parts A and B of the supporting frame may be constructed of framing substantially as shown in the drawings or in any other suitable manner, and the upper or rocking part B of the frame may be mounted in any suitable manner to permit it to rock sidewise on the stationary part of the frame A. Preferably, however, the part A carries at its upper end transverse chock pieces 10 and 11, and the rocking part B of the frame is provided on its bottom or under side with transverse chock pieces 12 and 13 spaced to come directly over the chock pieces 10 and 11. The chock pieces are recessed at their center portions to receive flanged bearing collars 15 and their opposing faces are beveled off beyond the recesses, as shown in Figs. 1 and 3. A pivot or rocking bearing will thus be formed to provide for sidewise rocking of the upper part B of the frame on a horizontal axis extending through the center of the bearing collars 15, and the flanges of the collars will prevent relative movement between the chock pieces longitudinally of the axis and hold the part B of the frame in position on the part A. The chock pieces should preferably be beveled so that the angle between the opposing faces of the chock pieces when the guides or leaders are in vertical position will be equal to the maximum angle of inclination to be given to the guides or leaders, and with the beveled pieces in planes passing through the axis on which the part B of the frame rocks. With the chock pieces so beveled, when the rocking part B of the frame is given its maximum inclination, the opposing faces of the chock pieces on the side toward which the rocking part of the frame is inclined will be in engagement with each other and form a solid support for the part B of the frame as shown in Figs. 5 and 6. Obviously only the upper or the lower set of chock pieces need be beveled, but the beveling is preferably divided between the two sets of chock pieces, as shown in the drawings.

The leaders or guides for the hammer are carried by the rocking part B of the frame and extend downward below the bottom of said part in front of the stationary part A of the frame. When extension leaders are provided, as shown in the drawings, the main leaders 20 are secured to the part B of

the frame and the extension leaders 21 are mounted to slide on the main leaders 20 in the usual manner. The main leaders will preferably extend downwardly nearly to the sills of the lower part of the frame, and the upper part B of the frame is formed to project forward beyond the lower part A so that the leaders will be carried sufficiently in front of the lower part of the frame to provide the necessary clearance for the hammer. The leaders may be constructed in the usual manner, the extension leaders being secured together and held properly in place by means of cross-plates 22, 23 and 24, the plates 23 and 24 being extended backward as shown in Fig. 2, so as to provide clearance space for the hammer. Guides 25 are provided at the plates 22 and 23 for guiding the extension leaders on the main leaders, and stationary guides 26 are provided at the bottom of the main leaders for guiding the extension leaders. A cross-plate 27 connects the lower ends of the main leaders to hold them together and properly spaced, and this plate is also extended backward, as shown in Figs. 2 and 9, to provide clearance for the hammer. It will be understood that the hammer, whether it be a steam hammer, an ordinary drop hammer or other form of hammer, will be arranged to slide in the extension guides 21 in the usual manner, a cable running from the hammer over one of the sheaves 28 mounted at the top of the part B of the frame and thence downward to one of the drums 29 of the operating engine.

To provide means for holding the lower end of the leaders rigidly in position, a curved I-beam 30, or other suitable beam or guide, is secured to the lower front part of the bottom part A of the frame curved to the arc of a circle the center of which is in the axis on which the upper part B of the frame rocks. The position of this I-beam is such that the back face of the plate 27 bears against the front flange of the I-beam, and the plate 27 is provided with backwardly extending plates or lugs 31, one above and one below the beam 30, said plates being formed as shown by the outstanding legs of angle irons secured to the plate 27. The lugs 31 are formed with holes for receiving a pin 32, and the web of the I-beam is formed with a series of holes for said pin corresponding in position to the various positions to which it may be desired to adjust the leaders. One of the holes in the I-beam 30 will be in position to receive the pin 32 when the leaders and the rocking part B of the frame are in position for driving vertical piles. The pin will serve to hold the leaders and other parts of the frame in position. For securing greater rigidity, however, when the leaders and other parts of the frame are in position for driving vertical piles, blocks 33 are preferably inserted between the forward chock pieces 10 and 12. Blocks or wedges may also be inserted for this purpose between these chock pieces when the leaders are adjusted to positions intermediate between the vertical and the positions of greatest inclination, in which latter positions the opposing faces of the chock pieces on the side toward which the head of the machine is inclined would be in contact.

For changing the position of the leaders from the vertical to an inclined position, and from an inclined position to a different position, all that is necessary to do is to remove the pin 32, and then swing the leaders to the desired position and reinsert the pin. If blocks or wedges are employed between the chock pieces, they will also have to be removed and proper blocks or wedges reinserted.

The axis on which the upper part of the machine turns is preferably located, as shown, about midway between the upper and lower ends of the main leaders, preferably a little nearer the upper than the lower end. The rocking part of the machine will thus be well balanced so that the operation of swinging the head of the machine and the leaders to any desired inclination will be comparatively easy. This operation may also be aided and made easier by raising and holding the hammer above, below, or at the level of the axis, as may be necessary to balance the rocking portion of the machine according to the direction in which it is to be rocked.

Figs. 4, 5 and 6 show the machine mounted on a traveling platform 40 and in various positions for driving vertical and batter piles in the bottom of a sewer trench.

It will be understood that the invention is not to be limited to the exact construction, arrangement and combination of parts, as shown in the drawings and to which the foregoing description has been mainly confined, but that it includes changes and modifications thereof within the claims.

What is claimed is—

1. In a pile driving machine, the combination of a supporting frame for the leaders or guides for the hammer formed of two parts, the upper part being mounted to rock on the lower part about a horizontal axis and the opposing faces of the upper and lower parts of the supporting frame being in planes extending through the axis on which the upper part rocks and at an angle equal when the leaders or guides are in vertical position to the maximum angle of inclination to be given to the leaders or guides, leaders or guides for the hammer secured to the upper part of the frame, means for securing the lower ends of the leaders or guides in the desired position, and blocks or

wedges inserted between the opposing faces of the upper and lower parts of the supporting frame for holding the upper part of the frame rigidly in position.

2. In a pile driving machine, the combination of an upwardly extending support for the leaders or guides formed of an upper and a lower part, one or more centrally recessed transverse chock pieces on the top of the lower part of the support, one or more centrally recessed transverse chock pieces on the bottom of the upper part of the support, and flanged bearing collars between the recessed parts of the chock pieces of the lower part of the support and the recessed parts of the chock pieces of the upper part of the support, said chock pieces being beveled off at each end to make the angle between the opposing faces of the chock pieces when the leaders or guides are in vertical position equal to the maximum angle of inclination to be given to the guides or leaders.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

EDWARD DE VOE TOMPKINS.

Witnesses:
E. L. BARNARD,
A. C. HEARLE.