Sept. 17, 1929. R. W. CRIST 1,728,665

PILE DRIVER

Filed May 28, 1925 2 Sheets-Sheet 1

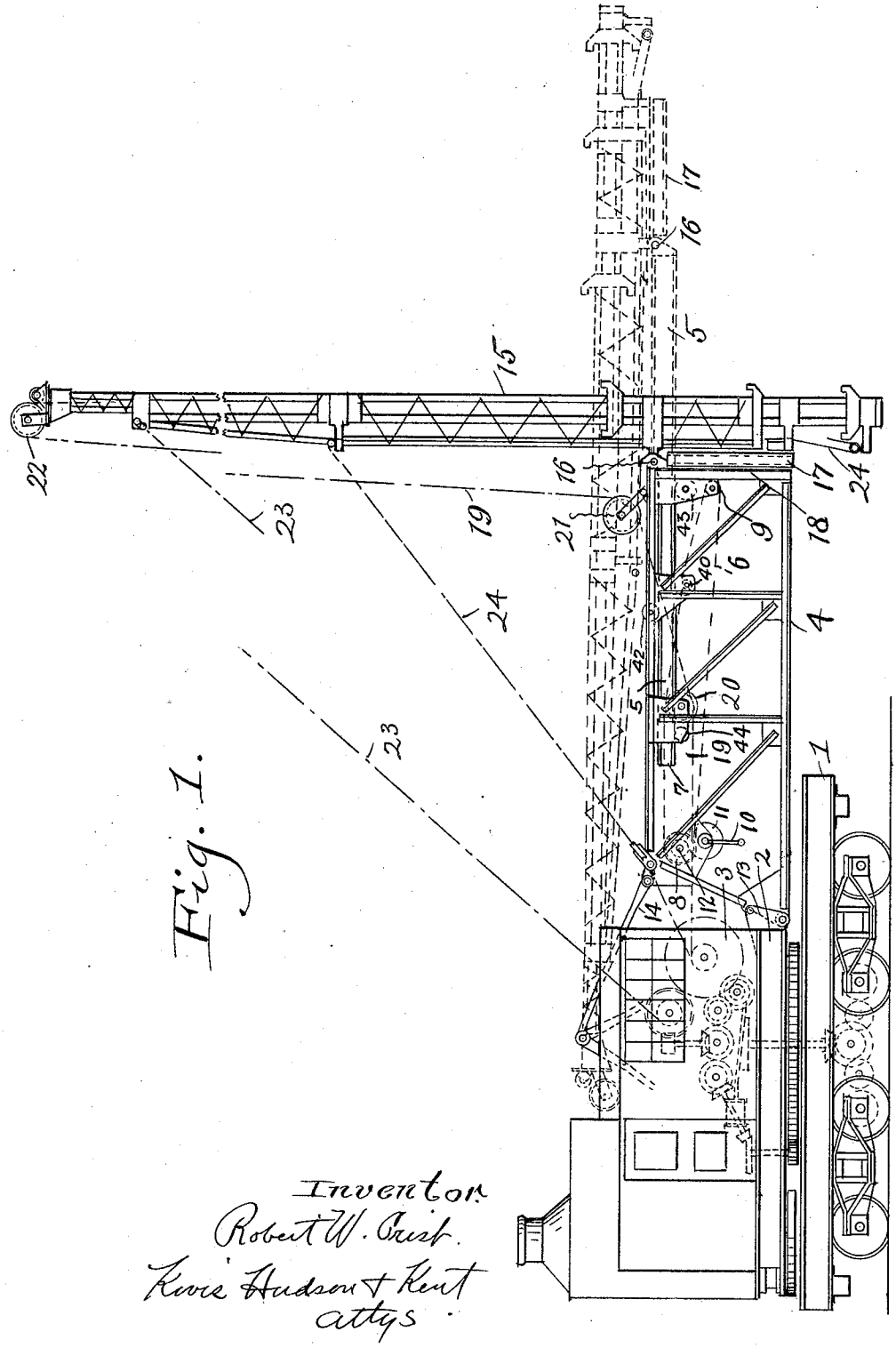


Fig. 1.

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Filed May 28, 1925 2 Sheets-Sheet 2

Fig. 2.

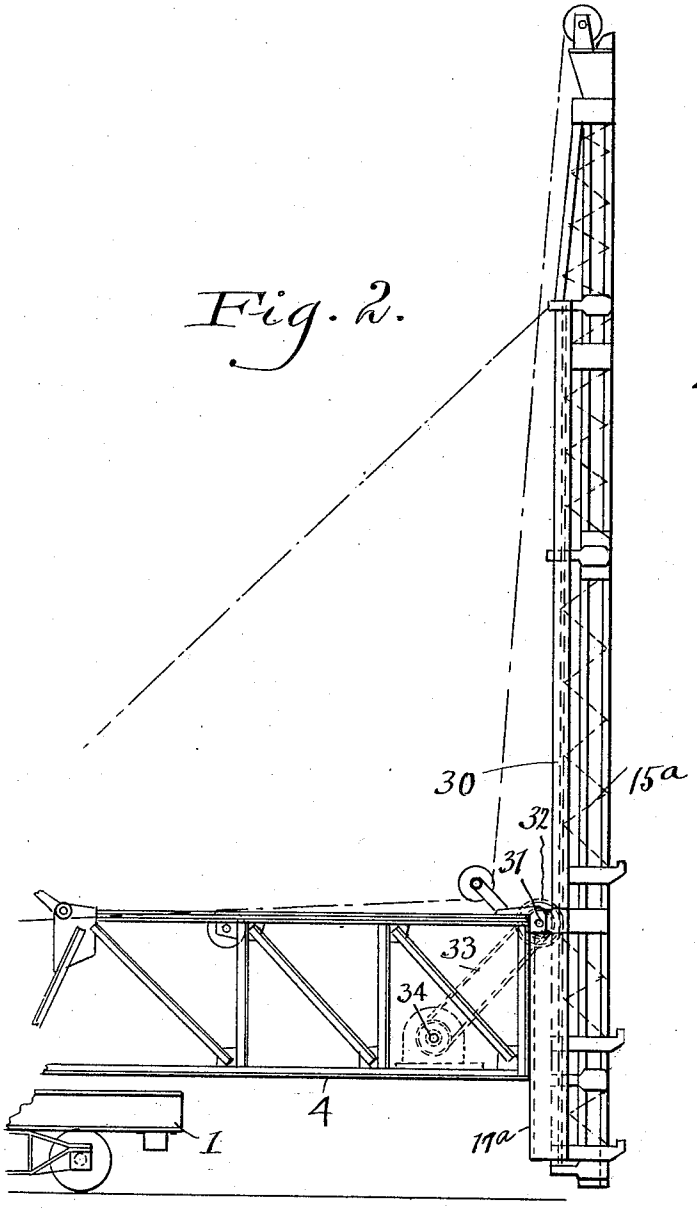


Fig. 4.

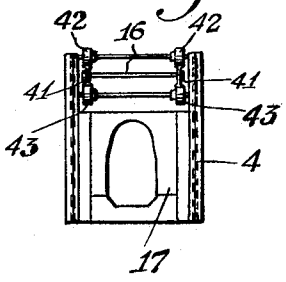
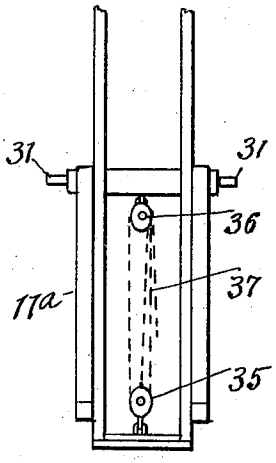


Fig 3.



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UNITED STATES PATENT OFFICE

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PILE DRIVER

Application filed May 28, 1925. Serial No. 33,374.

This invention relates to pile drivers and has for its object to provide improved supporting means for the leader which will permit long leaders to be readily collapsed from upright operative position onto the supporting boom for transportation.

Referring to the accompanying drawings and the following description, the invention may be said to comprise the device herein shown and described, together with such variations and modifications as will be apparent to those skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings in which Fig. 1 shows the pile driver in side elevation, the leader being shown in full lines in upright operative position and in dotted lines collapsed upon the boom for transportation; Fig. 2 is a side elevation showing a modified form of support for the leader; Fig. 3 is a detail view showing a modified form of leader adjusting device; and Fig. 4 is an end elevational view taken from the right of Fig. 1, with the leader removed.

Referring to the accompanying drawings, the pile driver is shown supported upon a suitable carrier or vehicle such as the railway car 1 upon which is mounted a turntable 2 of the locomotive crane type. Mounted upon the turntable 2 there is a suitable operator's cab and machinery housing 3. Supported upon the turntable and projecting outwardly therefrom there is a leader supporting boom formed of telescopic sections, the inner section 4 being in the form of a truss and the outer section 5 being in the form of a beam slidably mounted in the top portion of the truss 4. The beam 5 may be adjusted outwardly from a position in which its outer end is adjacent the outer end of the truss 4 to lengthen the boom for a purpose which will be hereinafter described. The slidable beam 5 is adjusted inwardly and outwardly by means of a chain or rope 6 which is attached to the beam 5 at the point 7 and runs over sprockets 8 and 9 adjacent the inner and outer ends of the truss 4, as well as over an intermediate sheave 40. A hand crank 10 is provided for rotating the inner sprocket 8 to shift the beam 5, the shaft of the crank 10 being connected to the shaft of the sprocket 8 through intermeshing gears 11 and 12. The truss 4 is supported in substantially horizontal position from the turntable 2, the bottom of the truss being connected to a bracket 13 secured to the turntable and the top of the truss being connected by a tension rod 14 extending therefrom to a fixed support adjacent the top of the cab 3.

A leader 15 is pivoted near its lower end to the outer end of the beam 5, being supported upon a horizontal pivot pin 16. Beneath the pivot, the leader 15 has attached to the inner side thereof channel abutment bars 17 which, when the leader is in upright position abut against the vertical forward end 18 of the truss which serves as an abutment to limit the movement of the leader about its pivot, the channel abutment bars 17 being adapted to receive suitable retention devices carried by the forward end of the truss 4 to lock the leader in upright position. A hoist rope 19 extends from a suitable drum within the housing 3 beneath guide sheaves 20 and 21 carried by the truss 4 and upwardly over a guide sheave 22 at the top of the leader, the hoist rope serving to elevate the weight within the leader. A cable 23 extends from a suitable drum within the cab 3 and is attached to the leader 15 adjacent the upper end thereof, the cable 23 serving to pull the leader inwardly about its pivot 16 when the weight is at the lower end thereof, the leader being collapsible to a position along the top of the boom and substantially parallel therewith. Before the leader is collapsed upon the boom or while the leader is being collapsed upon the boom, the beam 5 will be adjusted outwardly to lengthen the boom and to shift the pivot 16 of the leader outwardly from the vehicle frame. By extending the boom the leader may be supported in horizontal position with substantially the entire length of the leader resting upon the boom, the adjustment of the beam 5 being made sufficient to accommodate the particular leader employed. The beam 5 consists preferably of two side bars 41, which may be of I-beam section, and suitable cross braces including the pivot pin 16 above men-

tioned. This beam is slidably arranged between a pair of rollers 42 supported in the upper rails of the truss 4 and two pairs of rollers 42 and 44 mounted in gusset plates on the truss. In returning the leader to upright position, the pile driver weight may be pulled by means of a cable 24 extending from a drum within the cab 3 and over guide sheaves on the leader to the outer end of the leader so that the weight thereof will counterbalance the portion of the leader upon the inner side of the pivot 16. When so counterbalanced the leader may be brought to upright position by paying out the cable 23. Whenever desirable on account of the excessive length of the leader, an idler car may be employed to support the projecting end of the leader and boom.

Fig. 2 of the drawing shows a modified construction in which the leader 15^a is slidably mounted on an elongated guide member 30 attached to the leader 15^a which slides in a pivoted guide 17^a supported on a horizontal shaft 31 at the outer end of the boom 4. The guide member 17^a and the leader 15^a and 30 carried thereby are movable from an upright position in which the guide member 17^a abuts against the forward end of the boom 4, to a collapsible position in which the guide member and leader lie along the top of the boom 4. Suitable means is provided for adjusting the leader 15^a longitudinally of the guide member 17^a. As shown herein, a pinion 32 is mounted on the shaft 31 and meshes with a rack extending along the inner side of the guide member 30.

The pinion 32 may be driven by any suitable means and as shown herein, is driven by means of a sprocket chain 33 extending from a suitable driven sprocket 34, mounted on the boom 4 to a sprocket on the shaft 31. By means of the rack and pinion the leader 15^a may be adjusted at different heights with respect to the car 1. With the adjustable leader 15^a it is unnecessary to provide the extensible boom 4 for operating the leader in collapsible position since the leader 15^a can be adjusted in the guide 17^a to extend as much of the leader as desired beyond the end of the boom.

In place of the rack and driving pinion for adjusting the position of the leader 15^a in the guide members 17^a, there may be substituted a block and tackle arrangement as indicated at Fig. 3 in which the sheave blocks 35 and 36 are attached to the leader 15^a and guide member 17^a, a cable 37 being reeved through the blocks by means of which the leader may be raised or lowered.

Having described my invention, I claim:

1. A pile driver comprising a vehicle, an extensible boom carried by the frame of the vehicle, said boom comprising an inner truss member, and a slidable beam extending lengthwise of the truss adjacent the upper side thereof, a leader pivoted to the outer end of the beam, and means at the outer end of the truss member forming an abutment against which the leader engages when in upright position, said leader being collapsible from its upright operative position to a position parallel with and along the top of the boom and said beam being adjustable outwardly from a position in which its outer end is adjacent the outer end of the truss to provide an elongated support for the leader when the same is collapsed for transportation.

2. A pile driver comprising a vehicle, an extensible boom carried by the frame of the vehicle and extending outwardly therefrom, said boom comprising an inner truss member and a slidable beam extending longitudinally of the truss member adjacent the upper side thereof, the said truss member having an outer end portion forming an abutment below said beam, and a leader supported by a horizontal pivot upon the outer end of said beam and adapted when in upright operative position to engage with the abutment at the outer end of the truss, said leader being collapsible from its upright operative position to a position along the top of the boom, and said beam being adjustable outwardly to provide an elongated support for the leader when the same is collapsed for transportation.

3. A pile driver comprising a vehicle, a turntable on the vehicle, an outwardly extending boom carried by the turntable, a leader pivoted near its lower end to the outer end of said boom, and an abutment on the boom below the pivotal connection of the leader therewith with which the leader engages when in upright position, said leader being collapsible from its upright operative position to a position along the top of the boom, and said boom being extensible to provide an elongated support for the leader when the same is collapsed for transportation.

In testimony whereof, I hereunto affix my signature.

ROBERT W. CRIST.