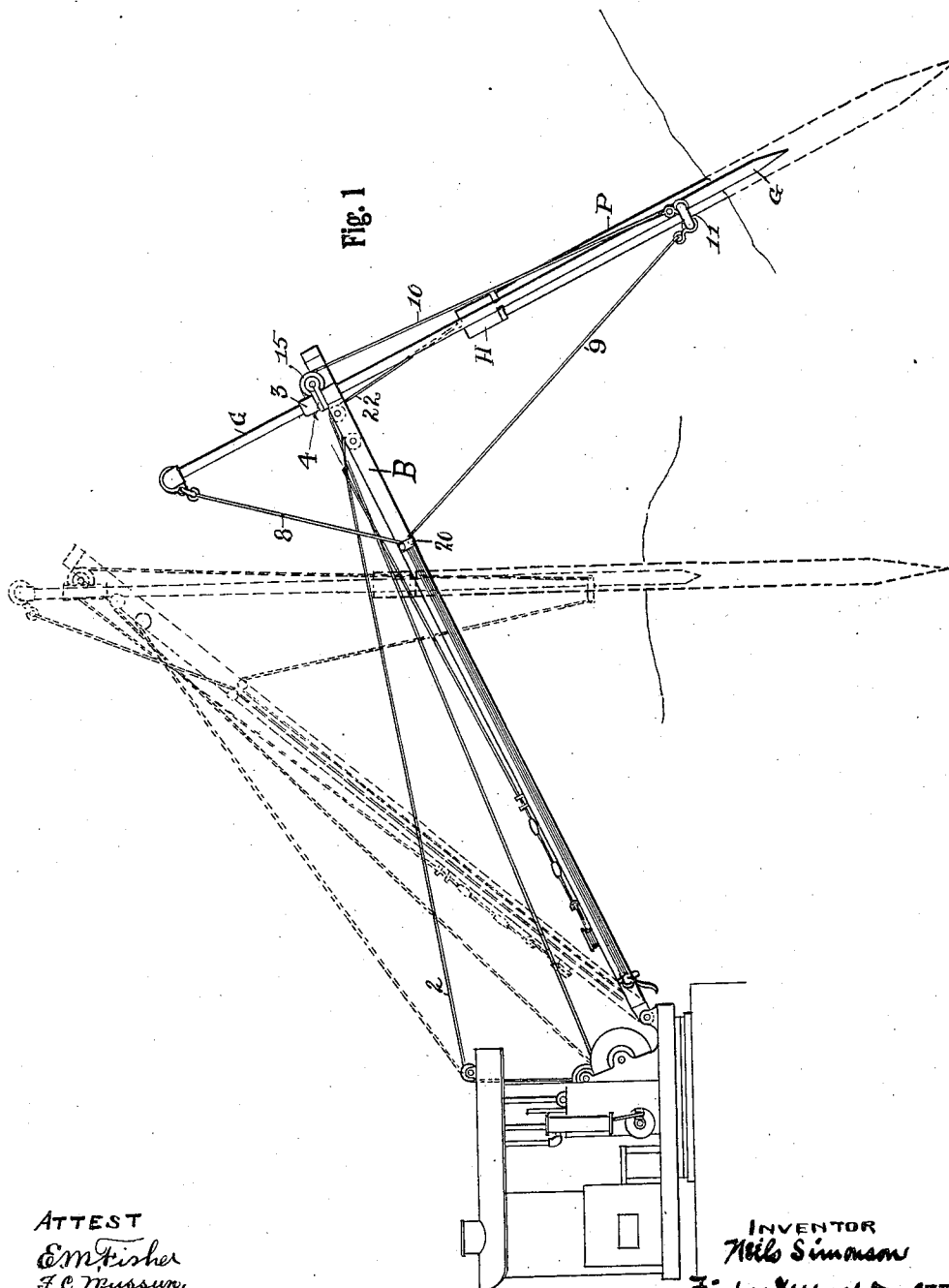


N. SIMONSON.
 PILE DRIVING APPARATUS.
 APPLICATION FILED JULY 8, 1912.

1,046,662.

Patented Dec. 10, 1912.

3 SHEETS—SHEET 1.



ATTEST
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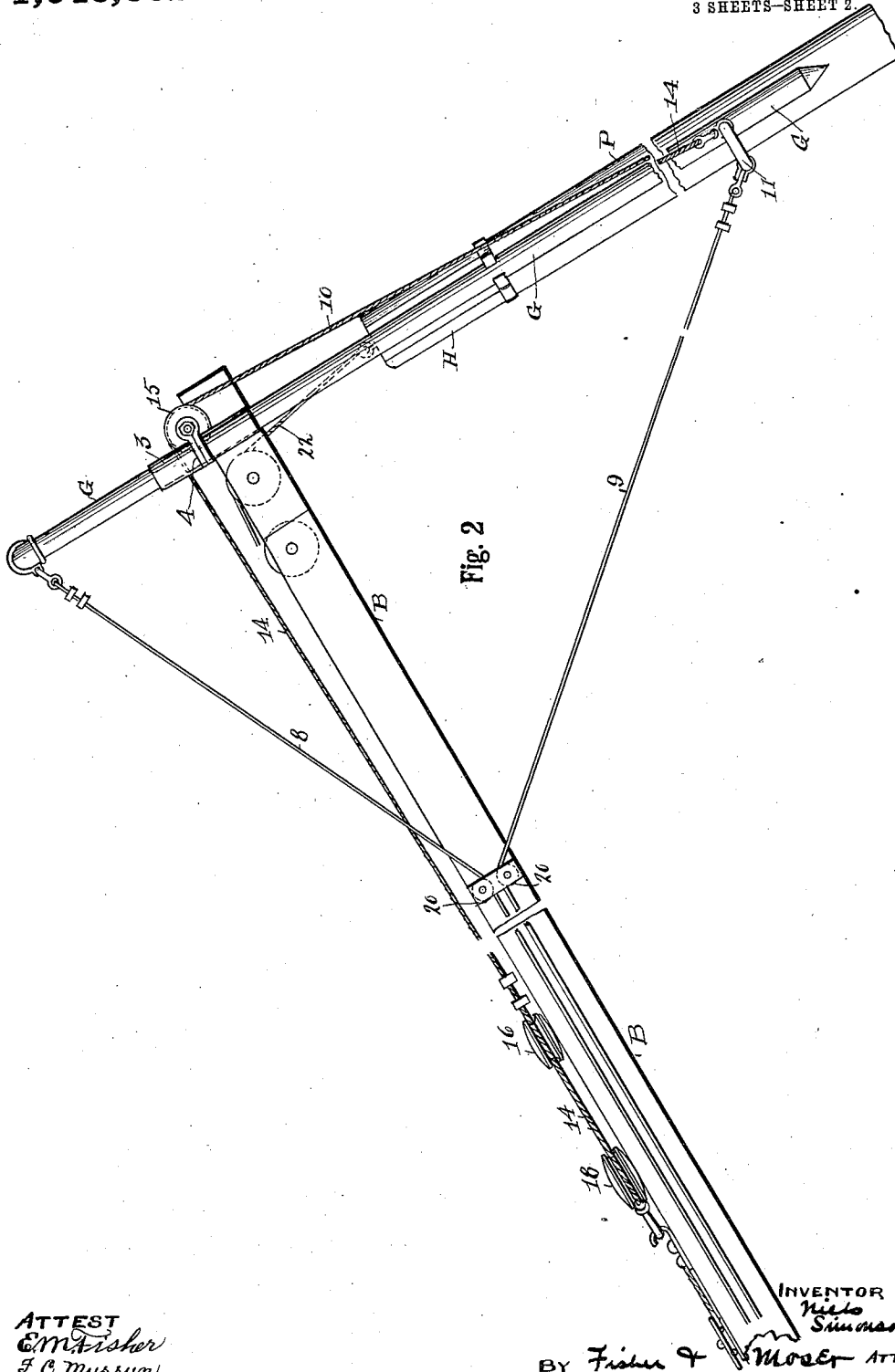


Fig. 2

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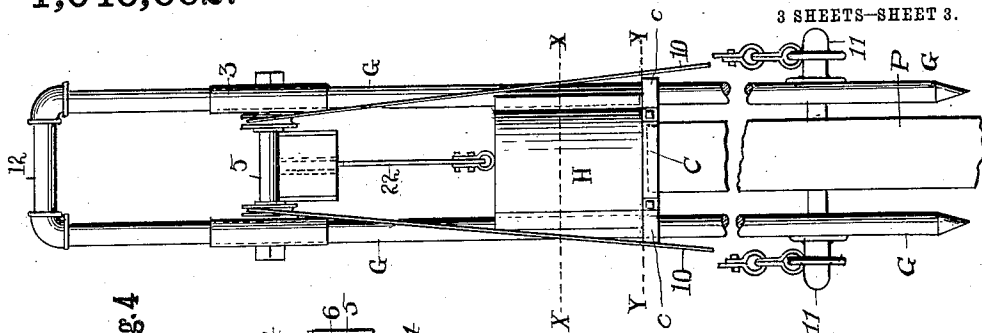


Fig. 4

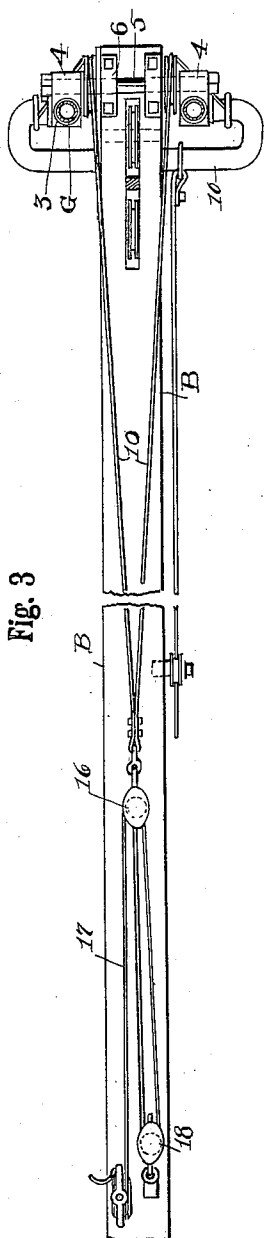


Fig. 3

Fig. 6

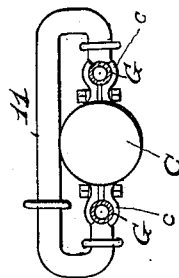
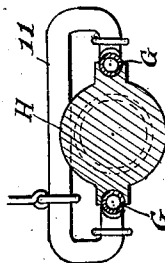


Fig. 5



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UNITED STATES PATENT OFFICE.

NIELS SIMONSON, OF CLEVELAND, OHIO.

PILE-DRIVING APPARATUS.

1,046,662.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed July 8, 1912. Serial No. 708,100.

To all whom it may concern:

Be it known that I, NIELS SIMONSON, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in a Pile-Driving Apparatus, of which the following is a specification.

This invention relates to a pile driving apparatus adapted to be positioned to work on a direct perpendicular drive or at an inclination outward or inward as may be found desirable and is an improvement on Patent No. 628,128, of 1899.

In the accompanying drawings, Figure 1 is a side elevation of the apparatus showing the immediate driving mechanism at an inclination to a perpendicular plane in full lines and in position for a direct perpendicular drive in dotted lines. Fig. 2 is a side elevation of the outer end of the boom and the parts mounted thereon enlarged as compared with Fig. 1. Fig. 3 is a plan view of Fig. 2 and Fig. 4 is a front elevation of Fig. 3. Fig. 5 is a cross section on line *x-x*, Fig. 4, and Fig. 6 is a cross section on line *y-y*, Fig. 4.

The invention as thus shown resides for the most part in the means whereby the driving mechanism is adapted to be positioned at different inclinations or angles as compared with a directly perpendicular plane, which has been the exclusive position of this class of machines heretofore so far as I know and believe, and comprises the usual boom B and two rigid guides or guide members G. These members G are in a sense unitary as shown herein, being rigidly coupled together and preferably are tubular and pointed at their lower ends in order that they may be anchored in the earth. If such anchoring be not practicable directly in the earth the lower ends of said guides may be secured in any other available way, as by cables or the like, it being understood that they are intended to serve as means for both confining and guiding the hammer H and the pile P.

The boom is an old and well known expedient in this class of machines and is adapted to be controlled as to elevation and location in the usual way, suitable cables 2 being generally employed for this purpose. The guides G are operatively mounted on or

from the extremity of the boom by means of sleeves 3 and clips 4 which are mounted on the extremities of a cross shaft 5 fixed across the top of the boom by suitable keepers 6. The said clips are free to swing on said cross shaft and to respond to any angle of inclination at which the guides are to be set for use, and the said sleeves are fixed rigidly in said clips while the guides themselves are free to slide up and down in the sleeves. The said sleeves and clips form the single practically fixed support for the guides, and otherwise the said guides are supported and controlled in working position by the two cables or leads 8 and 9 and the suspensory cable 10. The upper cable or lead 8 connects with the upper or top ends of said guides and the cable 9 with the yoke 11 toward the lower ends thereof. The said yoke 11 rigidly unites the lower portions of the guides G so that with the tubular connection 12 above the two guides or guide members G become practically a single or unitary guide frame having two parallel side guides. The said lower connection or yoke 11 is offset inward a sufficient depth to afford room for the pile P at the front and between the guides G, thus bringing the head of the pile directly in line with the hammer H which also slides between or upon the said guides or sides of the guide frame and is provided with channels or grooves in its sides for this purpose. The suspensory support of the said guides or guide frame is through the cable 10, which has two strands running over sheaves 15 on the end of the boom down to the yoke 11, while at the other end the said cable runs back over the boom to the base thereof and through suitable tackle block 16 to promote easy operation, the cord or cable 17 and block 18 serving as working extensions of this connection. Suitable sheaves 20 also are provided on the sides of the boom for the leads or cables 8 and 9.

The hammer H has a lift cable or strand as usual in my style of pile drivers.

In some of the views portions of the several cables have been omitted for clearness of illustration and as non-essential in the present presentation of the invention.

In Fig. 6 I show one of possibly several different means that may be employed for centering the pile between the guides G and

holding the same in sliding relations therewith. In some instances piles are provided with heavy iron bands about their heads which protect the head from the necessarily hard pounding it receives.

In the present construction I employ a cap C, Figs. 4 and 6, adapted to engage upon and over the head of the pile to prevent the same from splitting and provided with U-shaped projections *c* to engage the guides G.

What I claim is:

1. A pile driving apparatus comprising a boom and guides for the hammer and the pile to be driven suspended therefrom, and means to set said guides operatively at any desired inclination to a perpendicular plane.

2. A pile driving apparatus comprising a boom and rigid guides suspended therefrom, and means to fix said guides at an inclination forward or rearward from a perpendicular position consisting of flexible connections extending to both the upper and the lower portions of said guides.

3. A pile driving apparatus having a boom and a rigid guide frame slidably and pivotally mounted thereon, a suspensory cable for said frame extending over the end

of the boom and means to set the said frame in an inclined position.

4. A pile driving apparatus comprising a boom, a rigid guide frame and pivoted sleeve supports on said boom in which said frame is slidable and adapted to be fixed at different working inclinations.

5. A pile driving apparatus comprising a boom and a transverse shaft thereon, a guide frame and sleeves pivotally supported on said shaft having said guide frame slidably mounted therein and cables to hold said frame in working position.

6. A pile driver comprising a boom and a guide frame suspended therefrom having guide members at its sides and an offset yoke connecting said members near their lower end, and adjusting cables connected with the said yoke and the top of said frame respectively and adapted to change the position of the said frame to different inclinations.

In testimony whereof I affix my signature in presence of two witnesses.

NIELS SIMONSON.

Witnesses:

R. B. MOSER,
F. C. MUSSUN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."