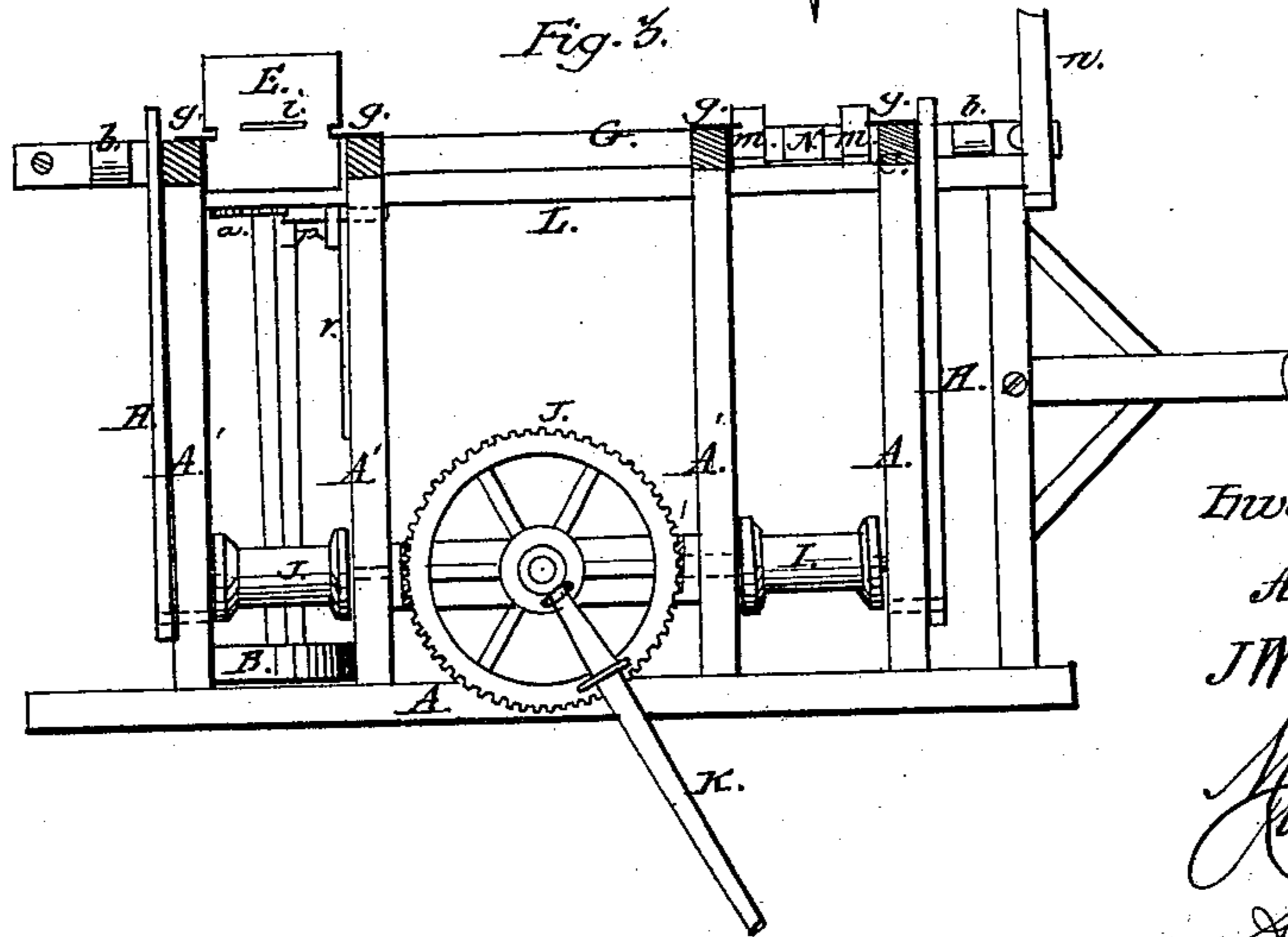
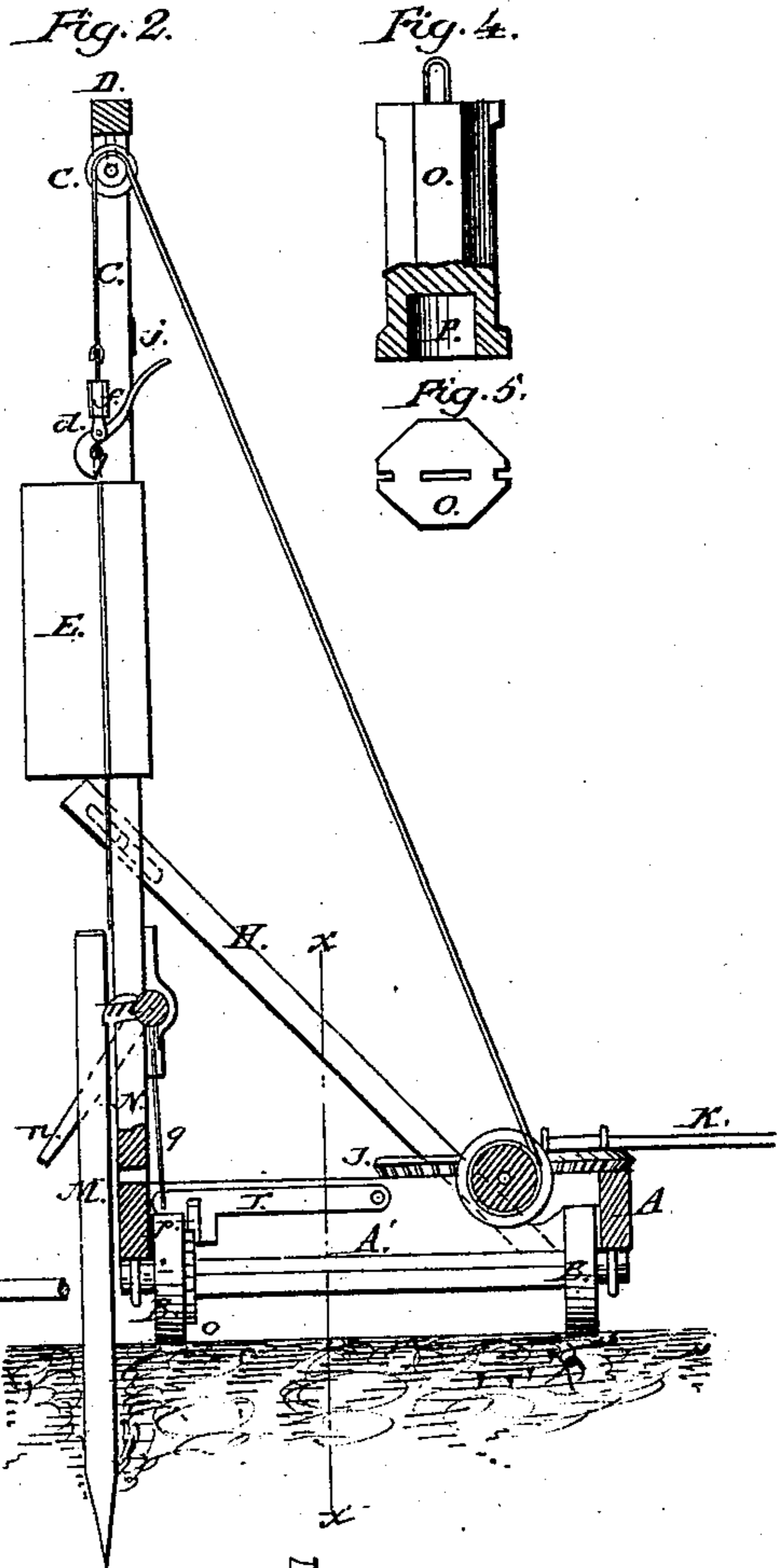
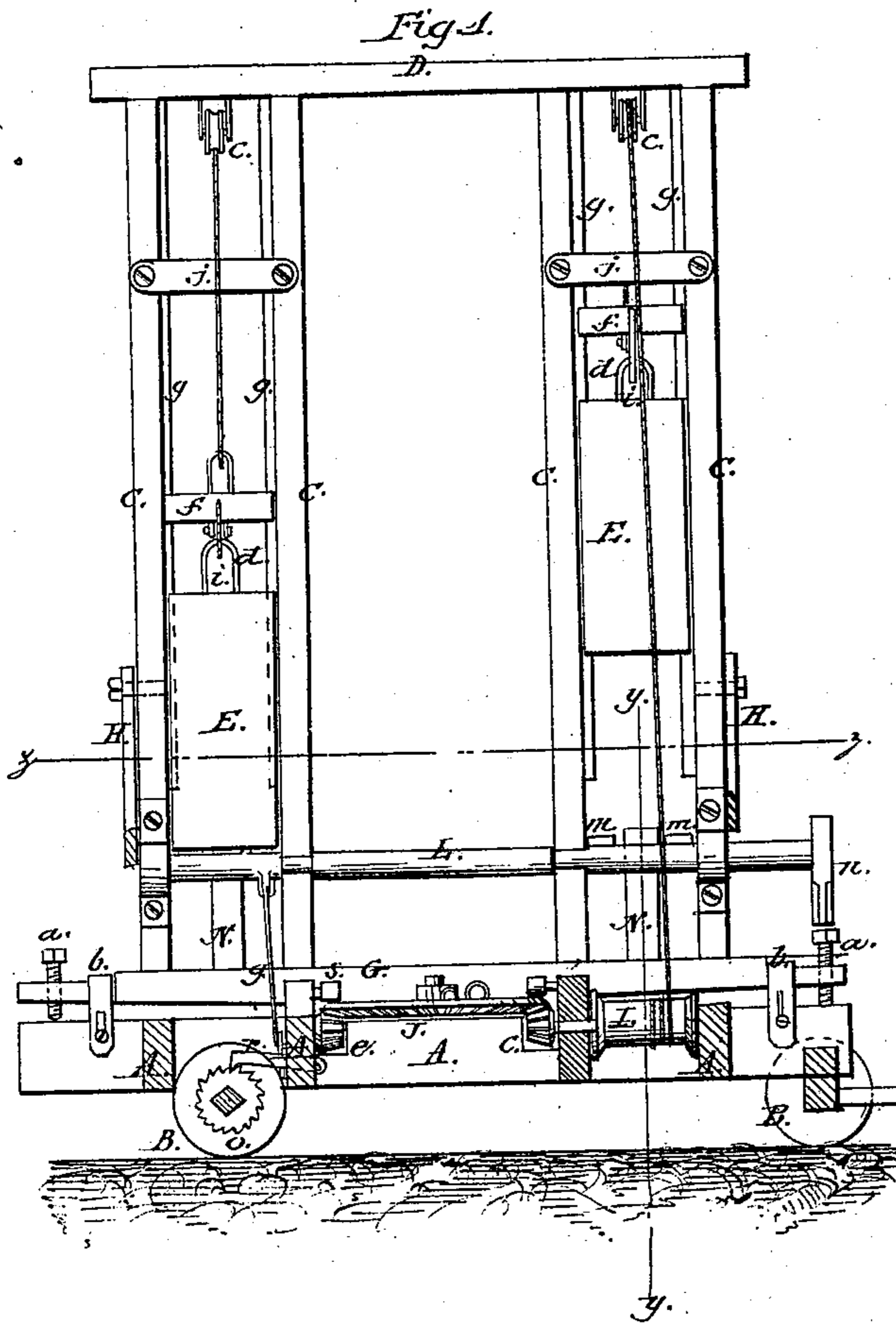


Smith & Galbraith

Pile Driver

N^o 87,010.

Patented Feb. 16, 1869.



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United States Patent Office.

ALFRED SMITH AND J. W. GALBRAITH, OF SEDALIA, MISSOURI.

Letters Patent No. 87,010, dated February 16, 1869.

IMPROVED PILE-DRIVER.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, ALFRED SMITH and J. W. GALBRAITH, of Sedalia, in the county of Pettis, and State of Missouri, have invented a new and improved Pile-Driver; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front sectional elevation of our improved pile-driver, through the line *x x*, fig. 2.

Figure 2 is a side sectional elevation of the same, through the line *y y*, fig. 1.

Figure 3 is a horizontal section of the same, through the line *z z*, fig. 1.

Figures 4 and 5 are corresponding detail views of the hollow driver.

Similar letters of reference indicate like parts.

The object of this invention is to provide a pile-driving machine which is simple and effective, and by means of which piles can be driven in a rapid and expeditious manner, also evenly, and at any reasonable angle of inclination with the ground.

It combines a number of advantageous features, which, together with devices perfecting the whole, will be hereinafter more fully set forth.

In the drawings—

A A' is the bed-frame, mounted on trucks B, the axle of the front trucks being pivoted on the king-bolt, and provided with a tongue in any suitable manner, as that shown.

C C C C are the derricks, or guide-posts, for the drivers E, and are surmounted by a single cross-beam, D.

These derricks are not affixed rigidly to the bed-frame, but arise from a rocking bolster, G, the lower face of which is convex, the middle point of the convex face resting on one of the side timbers, A, of the bed-frame, or upon a saddle-plate affixed to the middle point of the said frame.

The object of this rocking bolster is to give the required lateral incline to the derricks, and it is provided with set-screws, *a a*, at each end, which would, in practice, fit in hollow threaded plates let into the bolster, and their points would bear against plates on the side timber A.

The requisite front or rear inclination of the derricks is permitted by clevises *b b*, fitting over the rounded ends of the bolster, and affixed to the side timber A, by means of screws passing through slots in the clevises and into the said side timber, as shown.

These slots and screws enable the clevises to be adjusted to suit the lateral inclination of the derricks, while the said clevises permit the front or rear inclination of the derricks, as before stated.

The derricks are steadied by braces H, slotted at their upper ends, and clamped to the derricks by screws

through the slots, while their lower ends are pivoted to the opposite of the bed-frame, as shown, by stout pivot-bolts.

By these devices any reasonable incline can be given to the derricks, when the nature of the work requires such inclination, as in driving piles, as is frequently the case.

The drivers E are alternately raised and dropped by ropes or chains, running over pulleys *c c*, and by self-acting clutches *d*.

The ropes lead down to drums I, to which they are attached.

These drums have bearings in the cross-timbers A', and their shafts are provided with short bevel-pinions, *e*, which engage with a horizontal bevel-gear wheel, J, arranged between the drums, as shown.

This gear-wheel is oscillated by a lever, K, affixed thereto in any suitable manner, as shown.

The self-acting clutches *d* are connected with cross-heads *f*, which work on the same guide-plates, *g*, as the drivers, and serve to keep the clutches in line with the rings, or loops *i*, of the drivers.

The clutches are levers having heavy hook-ends, which catch on the said loops *i*, and are disengaged therefrom by their arms *l* encountering the cross-bars *j* as the drivers arrive at the upper part of the derricks.

L is a shaft, arranged across the lower parts of the derricks, and having bearings thereon.

It is provided with cam-arms, *m*, and a lever-arm, *n*, for actuating it.

The arms *m* serve a twofold purpose: first, they serve to guide or steady the piles M, and second, to lift the drivers therefrom when the machine is to be moved forward to the next pile.

The axle of the rear trucks bears a ratchet-wheel, *o*, and a pawl, *p*, pivoted in the adjacent cross-timbers, engages with it.

This pawl is connected with a lever, *r*, also pivoted to the cross-timber, and its opposite end is connected, by a rod, *q*, with short arm on the shaft L, as shown.

These parts are so arranged, with reference to the arms *m*, that when the latter are raised vertically, for moving the machine to another position, the ratchet-pawl *p* will be lifted from the ratchet-wheel, and the rear trucks left free to move, but when the said arms *m* are horizontal, and acting as guides, the ratchet-pawl is in engagement with ratchet-wheel, thus holding the machine steady.

S S are rollers, arranged in the bed-frame, in contact with the upper side of the rim of the gear-wheel J, to keep it engaged with the pinions.

Thus, by simply turning the shaft L, one or both drivers are lifted from the pile or piles by the arms *m*, which are thus raised clear of the piles, while the ratchet is freed from the pawl, and the whole machine left free to

move forward, and after the machine has arrived at the next piles to be driven, the shaft L, turned backward, causes the rear trucks B to be locked by the pawl and ratchet, while the arms are lowered to steady the piles, and be out of the way of the drivers.

N are buffers, of any tough, yielding substance, to limit the descent of the piles, so that the tops of the driven piles may be all even with each other. They may consist of any suitable material which will receive the impact of the drivers without undue or injurious concussion, as wood surmounted with rubber; or a densely-pressed cushion of any fibrous material, or certain kinds of tough, elastic-wood, may be employed.

These buffers rest on the bolster between the guides of the derricks, and their height is arranged in the proportion to the height of the derricks.

O, fig. 4, is a driver, of metal or stone, having a cavity, P, in the base, for the reception of a short plug, of hard, tough wood, as elm, which sustains the impact force of the driver, and imparts it to the pile, thus preventing the reaction of the impact force on the driver, and obtaining what is known as the "dead-stroke" blow, which is most effective in utilizing all the impact of the driver.

The lever K is designed to be operated by hand.

Having thus described our invention,

We claim as new, and desire to secure by Letters Patent—

1. The arrangement of the oscillating gear-wheel J, the pinions e, drums I, the two pile-driver derricks O, and the accessory bed-frame A A', as herein described, for the purpose specified.

2. The combination of the rocking bolster G, supporting one or more derricks O, with the straps b, set-screws a, and supports H, substantially as described, for the purpose specified.

3. The shaft L, having cam-arms m and lever-handle n, substantially as described, in combination with a single or double pile-driver, all as set forth.

4. The driver O, having a cavity, P, for the reception of a wooden impact-plug, in combination with a single or double pile-driving machine, substantially as set forth.

5. The ratchet-wheel o and pawl p, arranged to operate substantially as described, in combination with the shaft L, and of a pile-driving machine, all as set forth.

6. The buffer N, of any elastic wood or rubber, and wood or other equivalent material, in combination, substantially as described, employed to receive the impact of the driver E, for the purpose set forth.

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