E. LARKIN.

PILE-DRIVING MECHANISM.

No. 181,788. Patented Sept. 5, 1876.

Fig. 1.

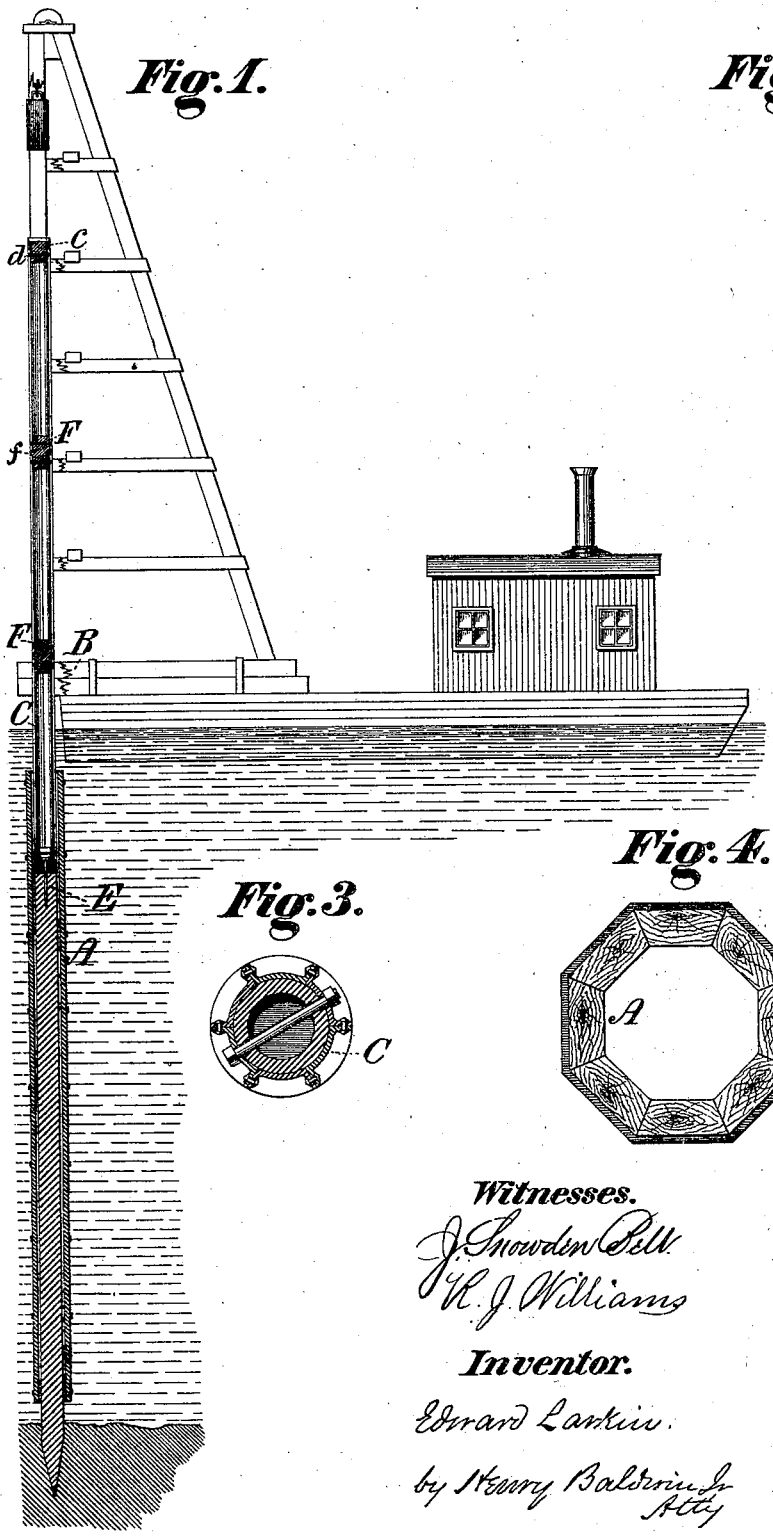


Fig. 2.

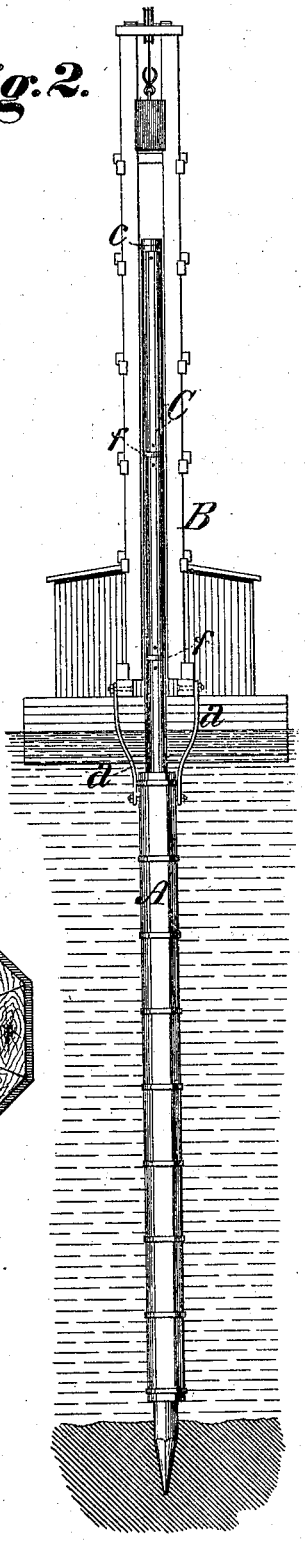
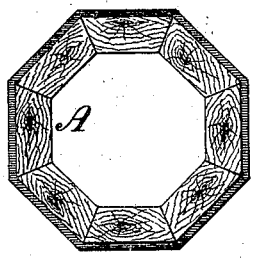


Fig. 3.

Fig. 4.



Witnesses.

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EDWARD LARKIN, OF HAVRE DE GRACE, MARYLAND.

IMPROVEMENT IN PILE-DRIVING MECHANISMS.

Specification forming part of Letters Patent No. **181,788**, dated September 5, 1876; application filed August 10, 1876.

To all whom it may concern:

Be it known that I, EDWARD LARKIN, of Havre de Grace, in the county of Harford and State of Maryland, civil engineer, have invented certain new and useful Improvements in Pile-Driving Mechanism, of which improvements the following is a specification:

It is the object of my invention to start the pile in alignment with the guides that control the course of the driving-hammer, and to maintain this alignment during the whole time the pile is being driven, to whatever depth under water it may be desired that the head of the pile shall be sunk; and, to these ends, my invention consists in combining with the pile-driver a swinging sleeve or tube, so suspended from the pile-driver frame, or from the floating scow which carries the pile-driver, that the center of this swinging sleeve or tube will be in line with the center of the hammer, and will continue in this line while the pile is being driven within the sleeve, this swinging sleeve or tube extending from about the water-level to about the point to which the head of the pile is to be sunk; and my invention further consists in combining with the pile-driver and the swinging sleeve or tube a follower, which co-operates with the sleeve in maintaining the alignment between the pile within the sleeve and the falling hammer, until the head of the pile has been driven to the desired depth under water.

The accompanying drawings, which form part of this specification, exemplify the principle and mode of operation of my invention.

Figure 1 is a side view, in elevation, of a pile-driver mounted upon a floating scow, with my swinging sleeve or tube, the follower, and the pile within the sleeve, shown in section. Fig. 2 is an end elevation of the floating scow and the pile-driver mounted thereon, with a front view of my swinging sleeve, the follower, and the lower end of the pile projecting below the sleeve. Fig. 3 is a transverse section, on an enlarged scale, of the follower, and Fig. 4 is a transverse section, on an enlarged scale, of the swinging sleeve or tube.

The sleeve A may be of any form—round, rectangular, or polygonal—and of any suitable material, its internal diameter being somewhat greater than the largest diameter of the piles to be driven.

I have used, with entire satisfaction, for driving piles of eighteen inches maximum diameter, an octagonal sleeve or tube, having an internal diameter of nineteen or twenty inches, and made of four-inch oak planks fitted together, and banded with iron, as shown in Figs. 2 and 4 of the drawings. The length of the sleeve or tube will conform to the depth of water, or the distance between the surface and the bottom of the space through which the head of the pile is to be driven. I have used a sleeve of about forty feet in length.

I suspend this sleeve or tube below the frame or support B of the pile-driver, by strong rods *a a* pivoted at their respective ends to the frame or supports of the pile-driver, or to beams projecting therefrom, or from the scow, and also pivoted to the sides of the sleeve or tube by horizontal bolts, which can readily be detached, (shown in Fig. 2,) so that in all cases the center of the sleeve or tube shall be in line with the center of the driving-hammer, the sleeve being free to swing on its bolts within certain limits. I have found, in practice, that a range of about four inches is sufficient for the swing of the sleeve or tube.

The follower C consists, preferably, of a section or sections of the well-known Reeves wrought-iron column, described in Letters Patent No. 35,582, granted to Samuel J. Reeves under date of June 17, 1862, for columns, shafts, braces, &c.

In the upper end of the follower is fitted a plug of cast-iron, *c*, with a flanged top, which covers the end of the column, and prevents it from being wedged or jammed by the hammer. This plug is secured by a pin or bolt, *d*, passing through the column and into the plug, or through both, in such case securing it by a screw and nut, as shown in Fig. 3. In the lower end of the follower is secured, in like manner, a similar plug of cast-iron, with a flanged bottom, through which projects a strong pin, E, which will be driven into the head of the pile, and thus the follower will co-operate with the sleeve in maintaining the pile in alignment with the driving-hammer.

Where it is requisite, by reason of the depth

of water, or for other reasons, to join two or more sections of the columns to obtain the desired length of the follower, the adjacent ends of the sections are fitted with a cast-iron plug, F, having a flange, *f*, around its center so that the respective ends of the sections will be covered and protected by the upper and lower surfaces of this flange, while the body of the plug strengthens the joint, as is seen in Figs. 1 and 2. These plugs are pinned or bolted in place above and below the flange, as already described, and exemplified in Fig. 3.

The maximum diameter of the follower should be substantially less than the internal diameter of the sleeve or tube, so as to allow for some range of play or motion of the sleeve, as already described.

The operation of my improved mechanism is as follows: The pile-driver being duly located in its desired position, and the sleeve or tube duly suspended therefrom, as before described, a pile is hoisted up and dropped into the sleeve, the flexible connection between the pile-driver frame and the sleeve or tube preventing any strain or torsion of either of them. If the pile is so long that it projects above the sleeve after its lower end has reached the bottom, it will be driven down in the ordinary way by the hammer falling directly upon the pile, until the head of the pile has reached the water-level, or the top of the sleeve or tube. To drive the head of the pile to any required distance within the sleeve or tube, the follower is placed upon the pile, and between it and the driving-hammer, and the blows of the hammer are transmitted through the follower to the pile. As the pile is driven and the follower gradually descends within the sleeve or tube, it will be seen that they co-operate in maintaining the alignment of the pile with the hammer until the last blow is delivered.

The follower is then removed, the sleeve is unbolted from its support, and hoisted clear of the driven pile, again hung in place, and another pile let down into it for a repetition of the driving operation, as already described.

Having thus described the objects and nature of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a pile-driver, of a swinging sleeve or tube suspended therefrom, and extending from about the surface nearly to the bottom of the water, or of the space through which the head of the pile is to be driven, substantially as and for the purposes set forth.

2. The combination of a pile-driver, a swinging sleeve or tube suspended therefrom, and extending from about the surface to the bottom of the water, and a follower extending from the head of the pile being driven into and above the swinging sleeve, and in line with the driving-hammer, substantially as and for the purposes set forth.

In testimony whereof I have hereunto affixed my signature.

EDWARD LARKIN.

In presence of—
HUGH T. HUGGINS,
WM. GREENLEAF.