



No. 624,714.

Patented May 9, 1899.

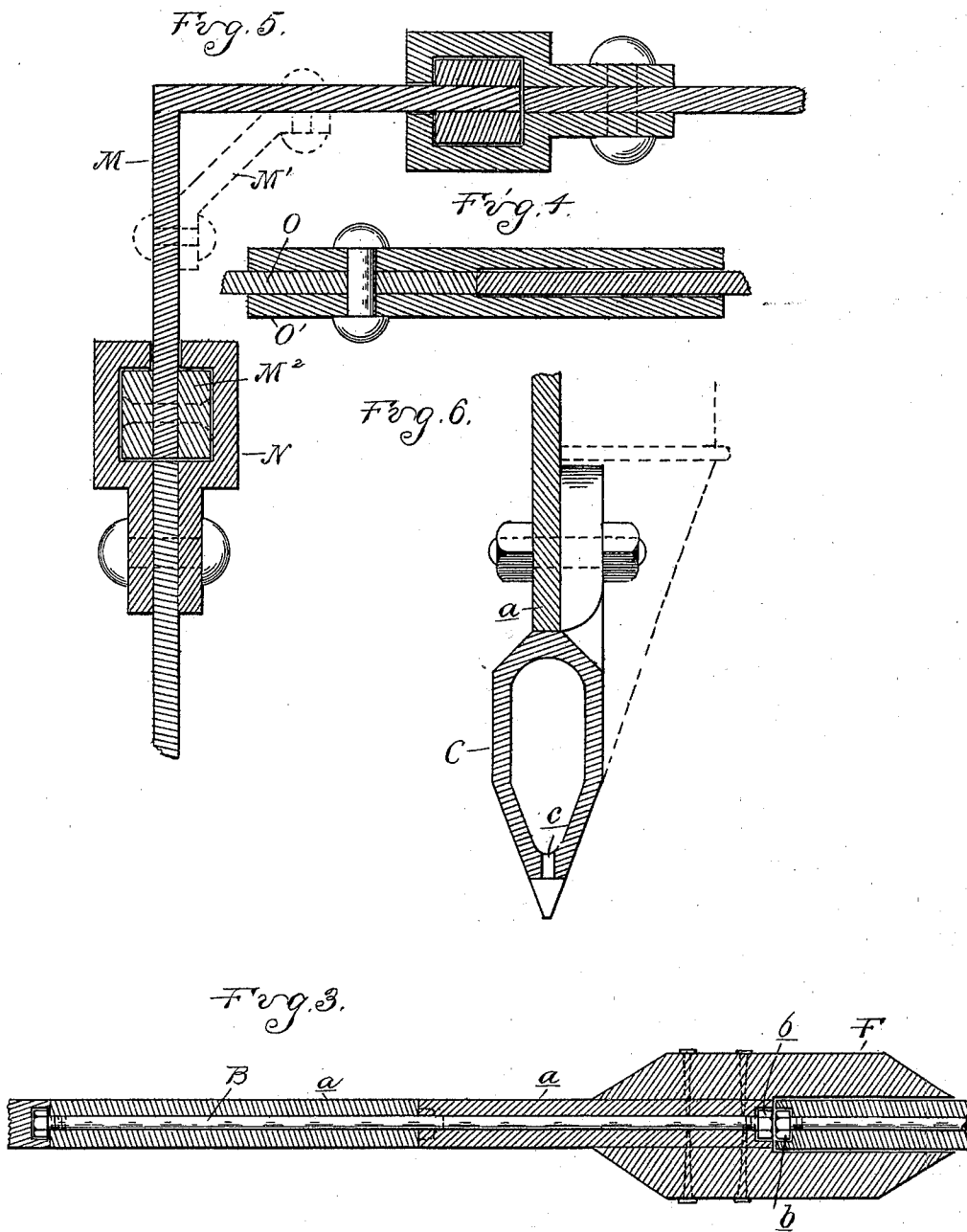
W. D'H. WASHINGTON.

SHEET PILING.

(Application filed Dec. 8, 1897.)

(No Model.)

3 Sheets—Sheet 2.



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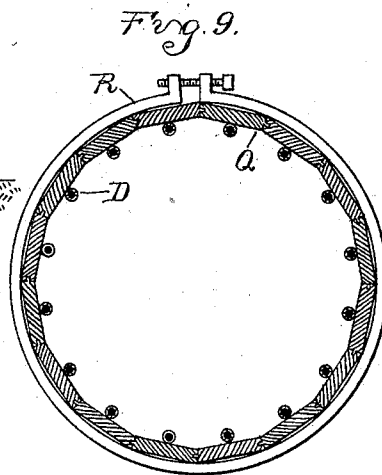
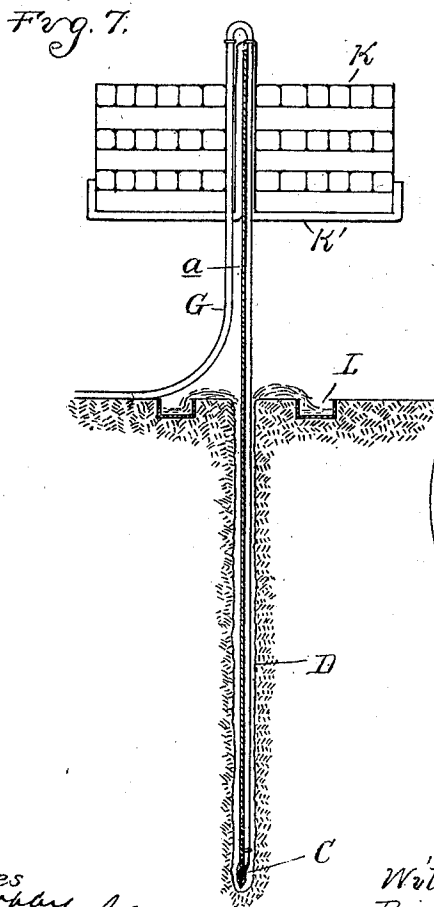
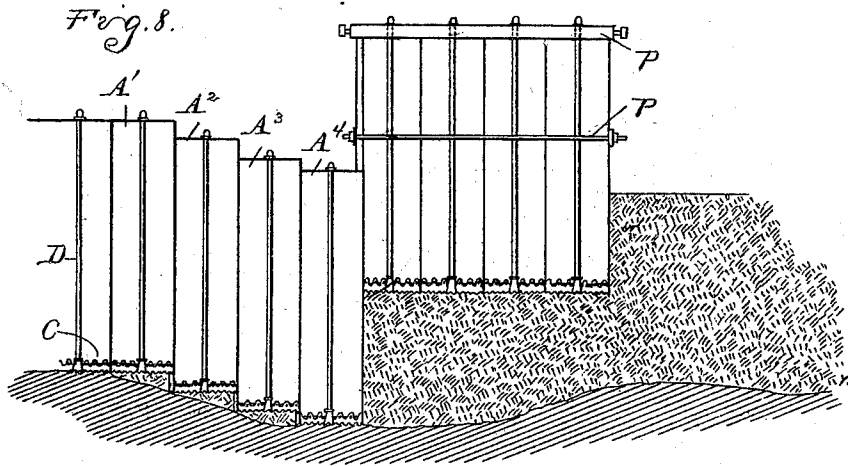
Patented May 9, 1899.

W. D'H. WASHINGTON.  
SHEET PILING.

(Application filed Dec. 6, 1897.)

(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM D'H. WASHINGTON, OF NEW YORK, N. Y.

## SHEET-PILING.

SPECIFICATION forming part of Letters Patent No. 624,714, dated May 9, 1899.

Application filed December 6, 1897. Serial No. 660,990. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM D'H. WASHINGTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sheet-Piling and Method of Making the Same, of which the following is a specification, reference being had therein to the accompanying drawings.

It is one of the objects of my invention to facilitate the placing of sheet-piling employed in the construction of coffer-dams and for other purposes by adapting it to be sunk in sections of considerable width.

The invention consists in the peculiar construction of these sections and, further, in the peculiar construction of a caisson composed of a number of sections, all as more fully hereinafter described.

In the drawings, Figure 1 is a side elevation of two adjoining sections of my sheet-piling. Fig. 2 is an elevation of the apparatus employed for sinking a section, which latter is shown in cross-section. Fig. 3 is a horizontal section through a portion of two adjoining sections. Fig. 4 is a similar view through a metallic construction. Fig. 5 is a detail of a corner for joining two sections at right angles to each other. Fig. 6 is a cross-section through the hollow shoe attached to the bottom edge of the section. Fig. 7 is a cross-section showing the manner of weighting a section to assist in sinking the same. Fig. 8 is an elevation of sections of the sheet-piling composed of a number of subsections adapted to be jointly or independently moved. Fig. 9 is a horizontal section through a caisson composed of sections of sheet-piling.

A represents a section of my sheet-piling, which in Figs. 1 and 3 of the drawings is shown as composed of a single ply of boards or planks *a*, arranged edge to edge and connected together by cross-bolts B. These bolts pass laterally through the center of the planks, each bolt preferably extending through but two of the planks and provided at each end with the clamping-nuts *b*, countersunk into the edges of the planks, the bolts connecting the adjoining pairs of planks being staggered, so as not to weaken the structure at any one point. The lower edge of the section is shod with a perforated hollow cutting-shoe C, com-

posed of a number of short sections arranged end to end and bolted or otherwise secured to the planking. The lower portion of the shoe is of a wedge-shaped cross-section, the cutting edge being notched or serrated, and in each of the notches is formed a perforation or jet-aperture *c*, communicating with the central chamber. D are water-inlet pipes connected to each section of the shoe and extending to the upper edge of the sheeting.

The upper edge of the section A is preferably provided with reinforcing-strips E, and one end is also reinforced by the strips F, secured upon opposite ends of the planking and overlapping the edge, so as to form a groove, with which the edge of the adjoining section may be engaged.

The sections being thus constructed, they may be sunk into position in the following manner: The first section is erected in the proper position with the shoe C either resting on the surface of the ground or in a shallow trench. The pipes D are then connected by flexible pipes G, controlled by the valves G', to a source of supply of water under pressure, which may be furnished by the pump H. (Shown in Fig. 2 of the drawings.) A downward pressure is exerted on the section either through the tackle I, attached to the upper end of the section and to the anchors J on opposite sides thereof, or by weights K, which may be suspended on chairs K', hung over the upper edge of the section, as shown in Fig. 7, or both devices may be employed. When the valves G' are opened, water will be admitted to the chambers in the shoes and, jetting down through the apertures *c*, will wash away the earth, digging a narrow well below the section, while the downward pressure on the latter will simultaneously sink it into the well. The escaping water will pass up on opposite sides of the section, carrying with it the loosened earth, which may be carried off in the trenches L. By adjusting the valves G' the quantity of water admitted to the different shoes may be varied according to the hardness of the soil. After the first section has been sunk some distance into the earth a second one may be started, with its edge engaged with the grooved edge of the first section, which will guide it in its downward movement. Thus the sections may be sunk

successively, the last one always being guided by the preceding one. If a turn is to be made, a corner connection—such as M, Fig. 5—may be used, provided with the braces M' and the guide-strips M<sup>2</sup> at each end, with which the box-shaped guides N on the ends of the sections may be engaged.

For a certain class of work I preferably employ a sheet-piling composed of metallic sections O, as shown in Fig. 4, provided with the overlapping reinforcing-strips O', riveted to one end of the section.

Where it is desired to sink the sheet-piling down to the bed-rock, I preferably employ the construction shown in Fig. 8 of the drawings, in which each section is composed of a number of subsections A' A<sup>2</sup>, &c., which preferably engage with each other by a tongue-and-groove joint. When the main section is to be sunk, the subsections may be secured together by clamps P or by any suitable means and the operation proceeded with as before described. After sinking the main section to a certain depth the clamps P may be removed and the subsections sunk independently. Thus if the surface of the rock is irregular or inclined the subsections may be sunk to different depths to conform to the shape of the rock.

In Fig. 9 of the drawings I show my invention as applied to the construction of a caisson, in which Q are staves or sections of sheet-piling united to form a cylindrical caisson and clamped preferably by the hands or hoops R, each section being shod with a shoe C, connected to the pipe D, leading to its upper end. The caisson thus formed may be sunk as a whole by a similar process to that already described as employed in sinking the sections of sheet-piling. When a certain depth is reached, the bands R may be loosened and the staves sunk independently to bed-rock.

What I claim as my invention is—

1. The herein-described sheet-piling comprising a plurality of main sections each composed of a plurality of subsections comprising a single ply of boards or planks arranged edge to edge and united by bolts extending lat-

erally therethrough, hollow perforated shoes secured to the lower edge of the planking, and pipes extending upward from said hollow perforated shoes.

2. A section of sheet-piling composed of a single ply of boards or planks *a*, arranged edge to edge and united by the bolts B, extending laterally therethrough, the hollow perforated shoes C, formed in sections and secured to lower edge of the planking, and the pipes D extending upward from such section of the shoe.

3. The herein-described sheet-piling composed of a plurality of main sections each comprising a plurality of subsections, means for securing the subsections together to form the main section, whereby each main section may be sunk as a whole and the subsections can be sunk independently of each other.

4. The herein-described sheet-piling comprising a plurality of main sections, each made up of a series of subsections, detachable means for securing the subsections together, and means for sinking each main section as a whole, substantially as and for the purpose described.

5. The herein-described sheet-piling comprising a plurality of main sections each made up of a series of subsections, detachable means for securing the subsections together, means for sinking each main section, and means for guiding one main section relative to the adjacent main section, substantially as and for the purpose described.

6. The combination with two sections of sheet-piling extending at an angle to each other and provided with the box-shaped guide N on their adjacent ends, and of the corner connection M provided with the guide-strips M<sup>2</sup> with which the guides N are adapted to engage.

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

WILLIAM D'H. WASHINGTON.

Witnesses:

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