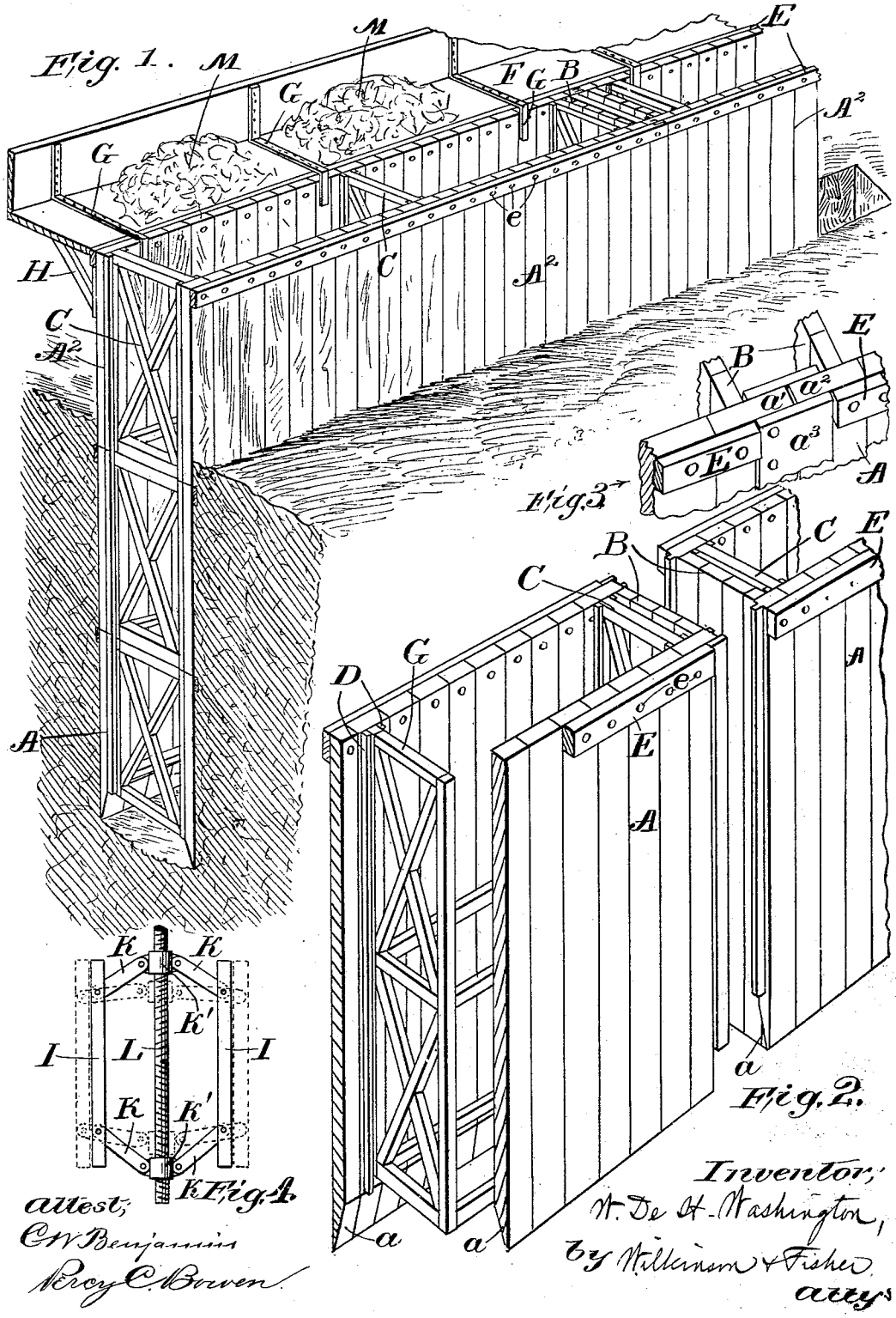
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W. DE H. WASHINGTON.

APPARATUS FOR CONSTRUCTING LINES OF EXCAVATION.

(Application filed Jan. 23, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR CONSTRUCTING LINES OF EXCAVATION.

SPECIFICATION forming part of Letters Patent No. 655,532, dated August 7, 1900.

Application filed January 23, 1900. Serial No. 2,536. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DE HERTBURNE WASHINGTON, a citizen of the United States, residing at New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Apparatus for Constructing Lines of Excavation; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for constructing lines of excavation, especially where it is proposed to build foundation-walls for buildings, side walls, subways, or shallow tunnels and where it is proposed to make the minimum excavation necessary to build the wall or place the masonry.

My apparatus consists of a plurality of lines of sheet-piling made either of wood or metal, as may be preferred, and preferably made in sections, each section being in the form of a box with the top and bottom open and the two adjoining sections being provided with tongues or other projections to engage in corresponding grooves of the adjoining section, whereby two continuous parallel lines of sheet-piling are secured. The ends of each box are preferably closed, although this is not always necessary, and the opposite sides of the box are braced by fixed or removable braces, while detachable shelves are mounted on each side of the box, on which the material dug out from the box is placed. Also artificial weights may be added, and this tends to force the box downward as the excavation is made. Where the excavation is deep, two or more tiers of sheet-piling may be placed one on top of the other; but in either case the bottom edge of the sheet-piling should be sharpened to cut into the earth.

My invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a perspective view of parts of two of the boxes forming two parallel lines of sheet-piling and shows the shelf on one side only, the opposite shelf being omitted for the sake of clearness in the drawings. In the device shown in Fig. 1 three tiers of superimposed boxes are shown. Fig. 2 represents parts of two of the lower tier of boxes shown in Fig. 1 on a larger scale and parts being broken away. Fig. 3 is an enlarged detail view showing the means for making a tight joint where the two boxes abut. Fig. 4 represents a form of spreader adapted for separating the sheet-piling so that the braces may be removed, and the boxes may be withdrawn after the excavation has been completed.

A represents one of the boxes, having the bottom of each of the piles sharpened, as at *a*, while the ends of the box are closed, as at B. The side walls of the box are braced by the sliding braces C, and the piles are held in place against upward pressure by means of the stringers E and bolts *e*. Each end of one of the boxes is provided with a tongue a^2, adapted to project into the groove between the strip a^3, fast to the tongue a' on the opposite box, as seen in Fig. 3. The shelves F, one on each side of the box, are detachably secured thereto, as by means of the brackets H and metal straps G, and on these shelves the material from the excavation is piled. As each tier of boxes is lowered the shelves are removed and a fresh tier put on and the shelves put back in place. In ordinary practice, however, only a single tier of boxes will be sufficient; but I have shown the invention as applied to a deep excavation.

As the earth is dug out from the inside of the box and piled on the shelves the sharp cutting edges of the piles will work downward, keeping always slightly in advance of the actual work of excavation until some solid obstruction is encountered. If this solid obstruction be a small rock, by drawing out a suitable number of the bolts *e* and allowing a suitable number of the piles to remain stationary while the rest of the box goes down the rock may be excavated around and removed, and these piles so released may be driven down by hand and the bolts *e* reinserted, or if a large rock be encountered these various piles may be allowed to project up-

ward, the rest of the box continuing its downward travel until the bottom of the excavation is reached. Then the masonry is filled in and connected with the wall in the preceding way, thus forming a continuous wall. Then the parts of the box projecting above the earth may be sawed off, or the entire box may be removed and used over again, and so on.

In order to remove the box or facilitate the downward travel of the box, it will ordinarily be necessary to loosen the skin friction of the adjoining earth, and this may be accomplished by means of a suitable spreader, such as shown in Fig. 4, where L represents a right-and-left screw working in the nuts K', connected to the toggles K, which carry at their ends the shoes I, the whole forming a toggle-brake, and by screwing these nuts toward each other, as indicated by the dotted lines in Fig. 4, the sides of the box may be spread out, packing the dirt tight. When so spread, the braces C, traveling between the guides D, may be withdrawn, and then when the spreader is eased up the sides of the box will spring in, skin friction will be relieved, and the box may be drawn up bodily. By driving in these boxes one after the other and lapping the ends of the same two parallel lines of sheet-piling may be simultaneously driven and the same boxes may be used over and over again, if desired.

My invention is especially applicable to sandy soils where rocks, stumps, and other obstructions do not occur; but, as hereinbefore described, it is applicable wherever the ordinary sheet-piling may be used, and it is so arranged that these obstructions will not prevent the operation of the apparatus.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus for use in excavating, a box with closed sides and ends and open top and bottom with sharpened edges at the bottom, bracing between the sides of said box, and detachable shelves mounted on the top of said box, substantially as described.

2. In an apparatus for use in excavating, a box having its sides formed of two lines of sheet-piling with stringers running along the sides thereof and bolts detachably securing said piles to said stringers, braces mounted between the sides of said box, and shelves detachably mounted on the side of said box, substantially as described.

3. An apparatus for use in excavating comprising a plurality of boxes united to each other at their ends and forming two lines of continuous piling, braces mounted between the sides of said boxes, and shelves detachably mounted on the sides of said boxes, substantially as described.

4. An apparatus for use in excavating comprising a plurality of boxes united to each other at their ends and forming two lines of continuous piling, braces removably mounted between the sides of said boxes, and shelves detachably mounted on the sides of said boxes, substantially as described.

5. An apparatus for use in excavating comprising a plurality of tiers of boxes whose sides form continuous sheet-piling with the bottom of the lower tier of boxes sharpened, braces separating the sides of said boxes, and detachable shelves mounted on the top of the upper tier of boxes, substantially as described.

6. An apparatus for use in excavating comprising a plurality of tiers of boxes whose sides form continuous sheet-piling with the bottom of the lower tier of boxes sharpened, sliding braces separating the sides of said boxes, and detachable shelves mounted on the top of the upper tier of boxes, substantially as described.

7. In an apparatus for use in excavating, a box with closed sides and ends and open top and bottom with sharpened edges at the bottom, bracing between the sides of said box, and detachable shelves mounted on the top of said box, and means for temporarily spreading the sides of said boxes from within, substantially as described.

8. In an apparatus for use in excavating, a box having its sides formed of two lines of sheet-piling with stringers running along the sides thereof and bolts detachably securing said piles to said stringers, braces mounted between the sides of said box, shelves detachably mounted on the side of said box, and means for temporarily spreading the sides of said boxes from within, substantially as described.

9. In an apparatus for use in excavating, a box having its sides adjustable vertically with respect to the box, weights supported on the sides of said box, and means for temporarily spreading the sides of said boxes from within, substantially as described.

10. An apparatus for use in excavating comprising a plurality of boxes united to each other at their ends and forming two lines of continuous piling, braces mounted between the sides of said boxes, shelves detachably mounted on the sides of said boxes, and means for temporarily spreading the sides of said boxes from within, substantially as described.

11. An apparatus for use in excavating comprising a plurality of tiers of boxes whose sides form continuous sheet-piling with the bottom of the lower tier of boxes sharpened, braces separating the sides of said boxes, detachable shelves mounted on the top of the upper tier of boxes, and means for temporarily spreading the sides of said boxes from within, substantially as described.

12. An apparatus for use in excavating comprising a plurality of tiers of boxes whose

sides form continuous sheet-piling with the bottom of the lower tier of boxes sharpened, sliding braces separating the sides of said boxes, detachable shelves mounted on the top of the upper tier of boxes, and means for temporarily spreading the sides of said boxes from within, substantially as described.

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

WILLIAM DE HERTBURNE WASHINGTON.

Witnesses:
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