L. B. LANGWORTHY.

CONCRETE SHEET PILING AND PROCESS OF CONSTRUCTING THE SAME.

APPLICATION FILED NOV. 21, 1912.

1,198,459. Patented Sept. 19, 1916.

Fig. 1.

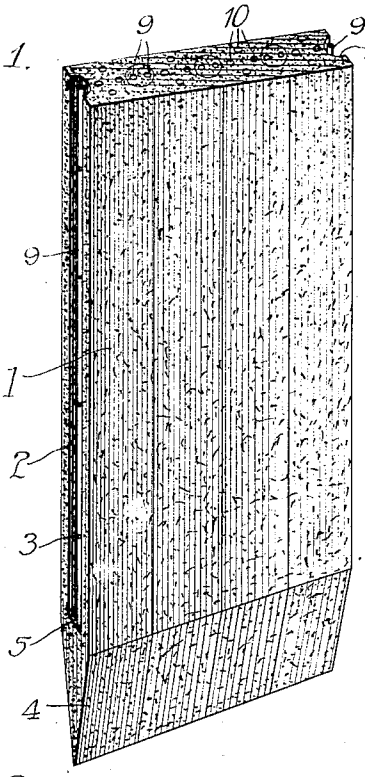


Fig. 4.

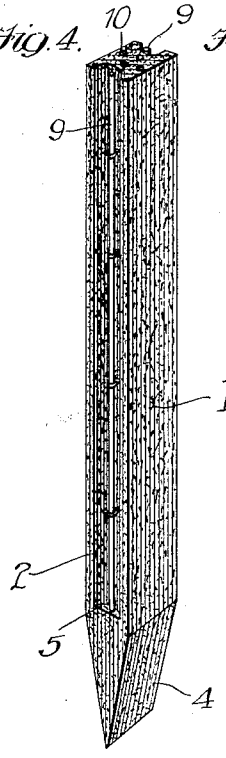


Fig. 5.

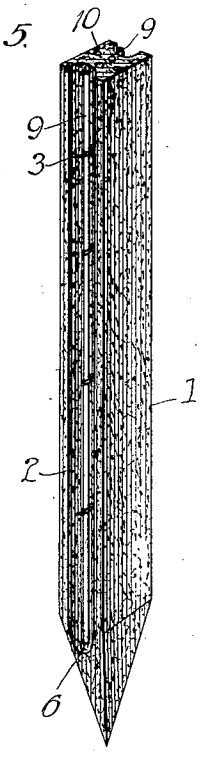


Fig. 2.

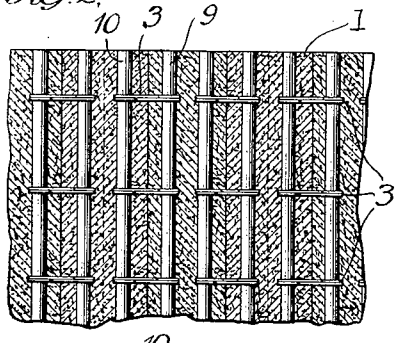


Fig. 3.

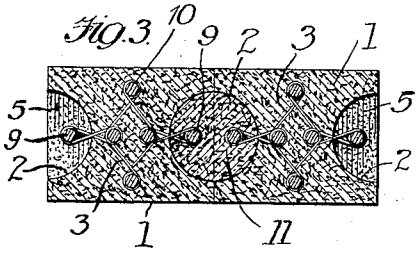
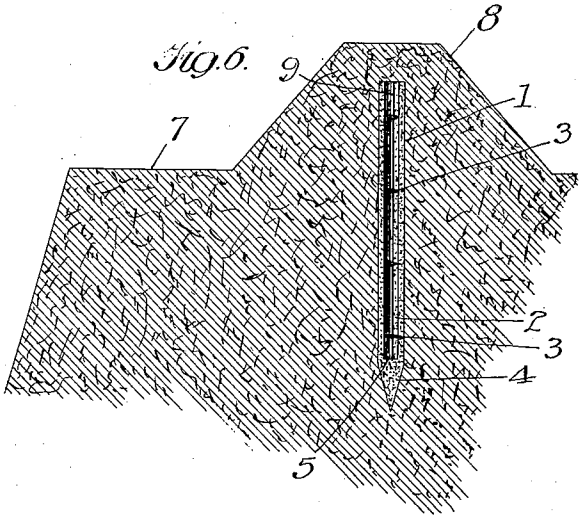


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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CONCRETE SHEET-PILING AND PROCESS OF CONSTRUCTING THE SAME.

1,198,459. Specification of Letters Patent. Patented Sept. 19, 1916.

Application filed November 21, 1912. Serial No. 732,670.

To all whom it may concern:

Be it known that I, LYMAN B. LANGWORTHY, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Concrete Sheet-Piling and Processes of Constructing the Same, of which the following is a specification.

The main objects of this invention are to provide improved means for erecting sheet piling, walls, curbings, casings, caissons, and similar structures of concrete or similar composition, without the necessity of first building a form for the structure, as is now usually done; to provide for conveniently and effectively making such structures from previously formed sections, piles or blocks, at a comparatively small cost; and to provide improved means for binding concrete piles or blocks to each other and effectively sealing the joints.

A specific embodiment of this invention is illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of a wall of sheet piling set up according to this invention and showing some of the piles bound together and sealed according to the invention. Fig. 2 is a vertical section of part of such wall showing the piles bound together and the joints sealed. Fig. 3 is a cross section of the same. Fig. 4 is a perspective view of one of the piles showing the binding grooves terminating in such manner as to form a bottom therefor. Fig. 5 is a modification of one of such piles tapered on four sides, and with the binding groove extending down into the tapered part, and therefore open at the bottom. Fig. 6 is a cross section of a levee with a core made of sheet piling constructed according to this invention.

The device shown in Fig. 1 comprises concrete blocks or piles 1 having grooves 2 in opposite faces thereof and extending longitudinally thereof. Binding members 3, which may consist of reinforcing wires, extend from the body of the block or pile into each of the grooves. These may be made to engage reinforcing rods 10 and may be extended to engage additional reinforcing rods or members 9, which are held thereby in the groove or space between the adjoining blocks or piles and which serve to reinforce the concrete fillings or binders 11, and are so spaced from the body of the block as to permit the concrete to be poured around the same and down the space between the blocks.

The piles or blocks may be tapered at the lower end, as at 4, in suitable manner to be driven or forced into the ground, but it will be seen that such taper is not necessary when they are to be used for foundations for buildings or for cellar walls, or the like, in structures in which it is not necessary to drive or force the piles.

The groove 2 may be made as shown in Fig. 4 so as to terminate at the lower end in an abrupt bottom 5, or this groove may be made to gradually decrease in depth at the lower end, as shown at 6 in Fig. 5, where the lower end of the groove extends into the tapered part of the pile.

In constructing a wall according to this invention, these piles are placed or driven into position side by side with the grooves registering as shown in Fig. 1, with the ends of the members 3 extending into the grooves. Concrete in liquid or semi-liquid form is then poured into the openings formed by the grooves. When this hardens it serves both as a binder 11 for holding the piles together, and also as a seal for the joints between the piles.

The form shown in Fig. 4 is designed to effectually prevent earth from entering the groove in driving the piling. In the form shown in Fig. 5 some earth will enter the groove at the bottom when the pile is driven, but such open form may be effectively used when a considerable part of the piling projects above the earth.

In building a wall around the side of an excavation the piles or blocks 1 will be placed side to side in similar manner as when they are driven, and the concrete will be similarly filled into the grooves.

It will be understood that it is not essential that the grooves be formed in the shape here shown, or that both sides of the blocks be grooved. The essential feature of the groove is that an opening be provided between the blocks into which opening the binding members or reinforcing members extend, and into which the liquid or semi-liquid concrete may be poured; the blocks having parts abutting against each other so as together to form walls surrounding the space into which the concrete is to be poured.

In the building of levees as shown in Fig.

6, the sheet piling is first constructed as hereinbefore described, the piles being driven partly below the surface of the ground upon which the levee is to be built, as below the ground level 7, and after the piles have been bound together and sealed as herein described, earth will be heaped over the piling, as shown at 8 in Fig. 6. This piling effectively prevents the burrowing of animals under the levee and thus prevents openings for water such as eventually undermine levees which are not constructed with an effective core.

Although but two specific embodiments of this invention have been herein shown and described, it will be understood that the construction may be considerably altered, particularly with respect to the form of the grooves, and the manner of providing the spaces to be filled with concrete, and that other details may be altered without departing from the spirit of this invention as defined by the following claims.

I claim—

1. A water-tight wall comprising a plurality of concrete sheet-piles adjoining one another, the abutting faces of said sheet-piles being formed with complementary longitudinal grooves one on each side, the adjacent grooves being arranged for mutual registry and providing tubular spaces between adjacent piles adapted to receive and hold concrete or the like, bars disposed longitudinally one within each groove, means disposed mainly within the body of each pile and projecting into said grooves, and engaging said bars for holding the same in place, and a binding filler surrounding the bars in each tubular space and positively securing the adjacent bars and piles together, said bars and their said holding means being disposed wholly within their respective grooves so that the piles are freely movable independently of one another until the binding filler is applied.

2. A water-tight wall of monolithic character, comprising a series of vertically disposed laterally abutting sheet-piles positively bonded together, said piles being longitudinally grooved respectively in registry on their abutting sides thereby providing a closed tubular space between each pair of piles, projecting anchorage means structurally independent of each other carried by said piles wholly in their complementary grooves respectively, and concrete or the like filling the space surrounding said anchorage means and bonding adjacent anchorage means together in positive interlocked relation.

Signed at Chicago this 16th day of November, 1912.

LYMAN B. LANGWORTHY.

Witnesses:

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EDWIN PHELPS.