J. STOCKFLETH.

SHEET PILING CONSTRUCTION.

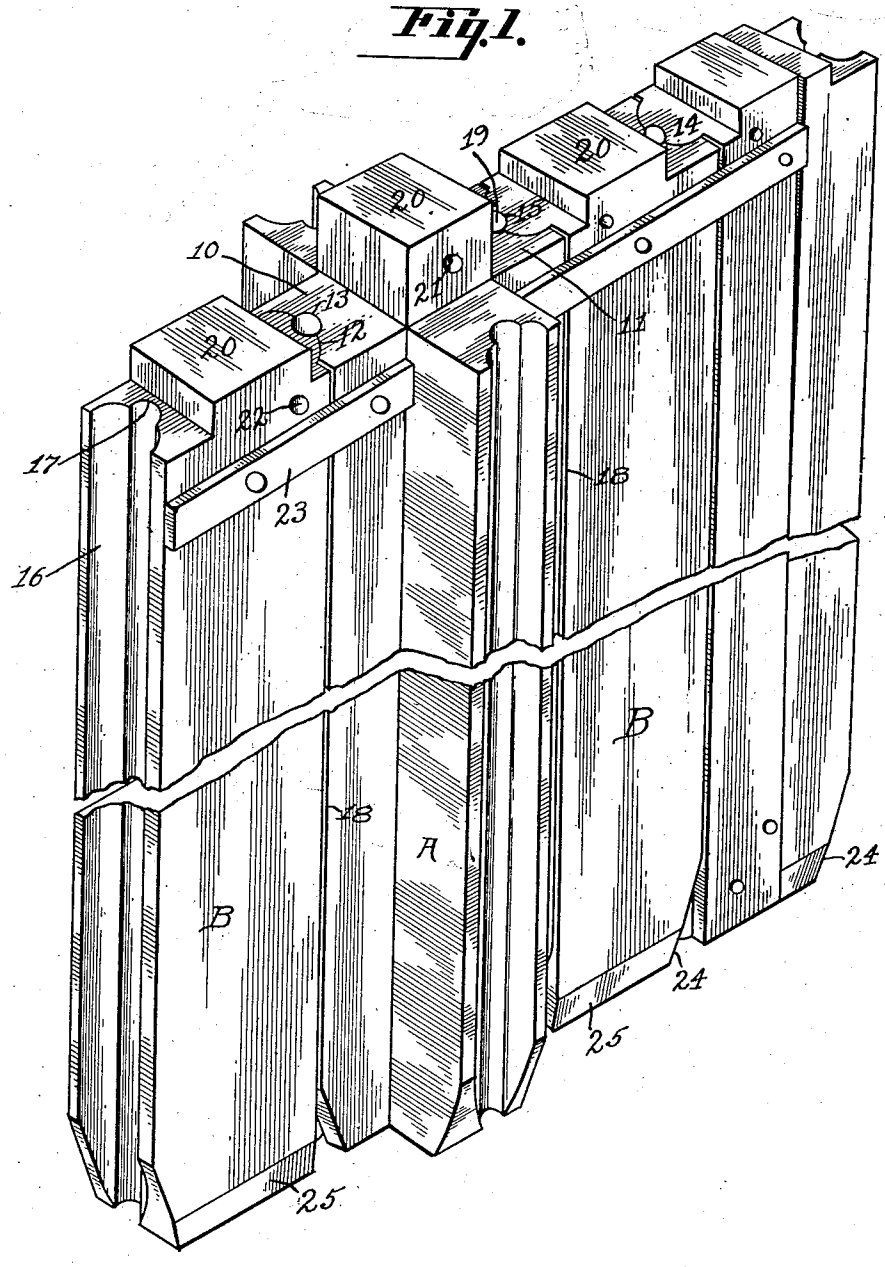
APPLICATION FILED JULY 6, 1920.

1,371,709.

Patented Mar. 15, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

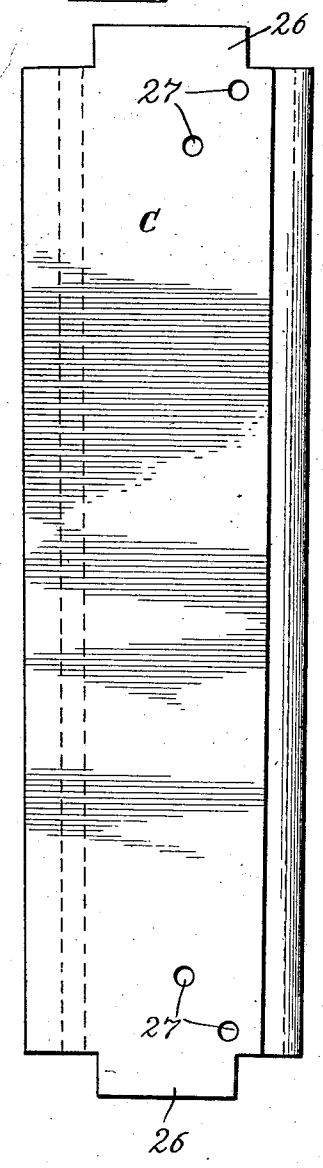


Fig. 4.

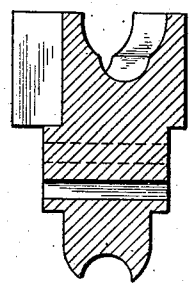


Fig. 5.

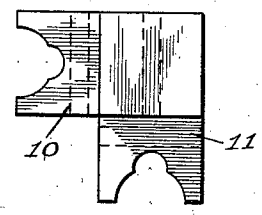
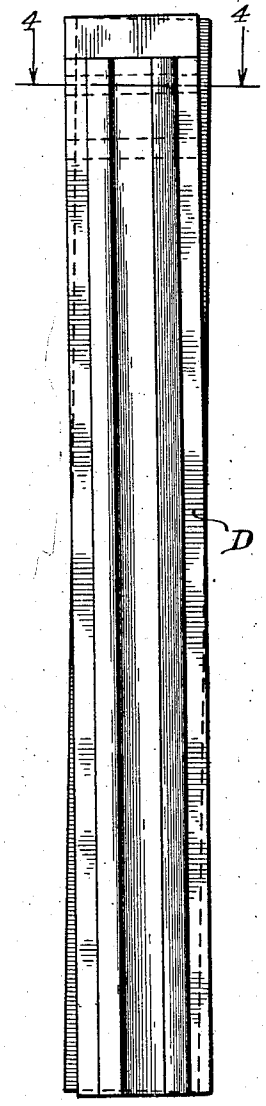


Fig. 3.



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SHEET-PILING CONSTRUCTION.

1,371,709. Specification of Letters Patent. Patented Mar. 15, 1921.

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To all whom it may concern:

Be it known that I, JOHN STOCKFLETH, a citizen of the United States, residing at Crockett, in the county of Contra Costa and State of California, have invented new and useful Improvements in Sheet-Piling Construction, of which the following is a specification.

This invention relates to sheet piling construction such as extensively used in coffer dam construction and the like.

The invention has for its object to simplify and improve sheet piling construction by the use of novel and inexpensive piles preferably of concrete construction.

The piles used are formed with tongues or grooves at their longitudinal edges which co-act in a novel way to form a water-tight joint. Different shapes of piles are provided for the purpose of restoring alinement to a dam should any of the piles be irregularly driven. Also I include a novel shape for use as a starting pile and which may include wings at right angles to each other to form a corner pile when it is desired to construct the dam in sections. There are various other features of advantage and importance in the shape and formation of the piles that will become apparent upon a further understanding of the invention.

In the accompanying drawings—

Figure 1 shows a perspective view of a section of a dam constructed of piles embodying my invention.

Fig. 2 shows a side elevation of a wedge-shaped pile used in this invention.

Fig. 3 shows an edge view of another shape of pile wherein the opposite edges are arranged at angles to each other for the purpose of restoring the alinement of the dam.

Fig. 4 shows a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 shows a sectional view of a modified form of starting pile employing two wings at right angles to each other.

The construction herein shown includes a starting pile A which may have two wings 10 and 11 in alinement, or two or more such wings at right angles to each other. Each wing is formed with a groove 12 on its longitudinal edge, preferably of semi-circular form. At the base of the groove is a second and smaller semi-circular depression 13. A series of sheet piles B are provided for cooperation with the starting pile and with each other. These sheet piles are of flat construction and have at one longitudinal edge a tongue 14 with a semicircular depression 15, and at the other longitudinal edge a groove 16, similar to the groove 12 in the starting pile. This groove 16 is also provided with a semi-circular depression 17. The tongue on one pile co-acts with a groove on the other in a way to leave spaces 18 between the edges or shoulders of adjoining piles, so that, in case a pile should veer to one side in its course when being driven, there will be no danger of chipping or cracking the thin shoulders at the sides. The two depressions, one at the base of the groove and the other at the tip of the tongue, coöperate to form a circular opening 19 into which packing material, such as oakum or concrete, is placed to form a water-tight joint.

Each pile has a central projection 20 at its top with which the driver contacts and which may also be used for lashing the tops of the piles together. In the case of the starting pile, the driving head or projection 20 is provided with an opening 21 extending transversely therethrough to receive a rod or bar with which a lifting hook or chain co-acts to raise the pile into place for driving. For similar purposes each of the sheet piles has an opening 22 arranged near its upper end and toward the edge of the pile which carries the tongue so that in lifting the pile into place for driving the tongue will be presented toward the groove in the starting pile and the lower end of the pile will swing toward the starting pile and remain in intimate contact therewith. Other transverse openings are provided in the piles to receive fastening means for a waling piece 23, or, if desired, the same openings 22 as are used for lifting the pile into place may be used for securing the waling piece in position.

The edges of the sheet piles are tapered or beveled, as shown at 24, on the edge opposite the tongue so as to cause the pile, when being driven, to be moved tightly against the pile with which it is being matched. Also these piles may be tapered on each side, as shown at 25, to facilitate driving of the same.

In addition to the shapes already described, I provide a wedge-shaped pile C and a battered pile D, shown in Figs. 2 and 3 respectively. The wedge-shaped pile is

used in connection with a pile which has gotten out of plumb in order to bring the succeeding pile back to vertical position. This pile is reversible end for end, each end being provided with a driving head 26 and openings 27 for lifting the same into place for driving and for securing a waling piece in position. The battered pile has its longitudinal edges relatively inclined so that when a pile has inclined laterally the battered member may be used to restore alinement and allow the succeeding pile to assume a vertical position. This battered pile is not reversible so that it is necessary to have two shapes, one with a forward incline at the tongue edge and the other with a rearward incline at the groove edge.

In operation, I first drive a starting pile which may have any number of wings 10 and 11 from two to four according to the way it is desired to construct the dam. These wings may be in alinement or may be at right angles to each other. A sheet pile is then swung into place with its tongue edge disposed in position within a groove on one wing of the starting pile, and, in driving the sheet pile, the taper on the lower end of the same will insure that the tongue remains in position within the groove. Should the pile swing to one side or the other, the tongue will be free to turn within the groove, and, since the shoulders do not normally contact, there will be no danger of cracking or injuring the thin edges of the pile. The manner in which the piles are lifted into place will insure that the proper edge is disposed toward the starting pile and will also insure intimate contact between the bottom portion of the sheet pile and the starting pile. Should any one pile get out of plumb, either by becoming inclined edgewise or laterally, a wedge-shaped pile, such as shown in Fig. 2, or a battered pile, as shown in Fig. 3, may be introduced to straighten the line of the dam so that the succeeding pile will assume a proper plumb position.

The piles may be made of any desired length, width and thickness, and, when constructed of concrete, should include the usual reinforcement of rods and wires. Various changes may be employed in the construction and arrangement of the several parts without departing from the spirit of my invention as disclosed in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other.

2. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, the adjacent edges of connected piles being so spaced as to permit a limited relative movement between the piles with the tongue and groove connections as an axis.

3. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, each groove having a recess at its base and each tongue having a similar recess at its tip, the two recesses coöperating to form an opening to receive calking or packing material for sealing the joint between said tongues and grooves.

4. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, each sheet pile being tapered at its lower end on the edge opposite that which carries the tongue whereby to force the tongue into intimate contact with the groove on the adjacent pile when the pile is being driven.

5. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, each sheet pile being formed with an opening near its upper end on the side adjacent the tongue by means of which the pile is lifted into place.

6. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical

longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, each pile being formed with a central projection on its upper end to form a driving head.

7. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, said piles having means for securing a waling piece in place.

8. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, certain of said sheet piles being tapered or wedge-shaped in side elevation for the purpose of restoring vertical alinement to the piles should any one be driven irregularly.

9. In a sheet piling construction, a starting pile formed of concrete having a plurality of wings, each formed at its vertical longitudinal edge with a groove, and a series of sheet piles also of concrete construction to coöperate with the starting pile and with each other, each sheet pile being formed with a tongue on one of its vertical longitudinal edges and a groove on the other, the tongue on one pile entering the groove on the other, certain of said sheet piles being formed with their opposite edges relatively inclined laterally for the purpose of restoring plumb position to the lines of the dam should any one of the piles be driven irregularly.

10. In a sheet piling construction, a starting pile formed of concrete having a central body formed with a plurality of wings longitudinally thereof said wings extending at right angles to one another and each being formed with a groove in its vertical longitudinal edge, said main body portion and wings being pointed on one end and the main body portion extending beyond the wings at its other end to form a driving head.

11. In a sheet piling construction, a starting pile formed of concrete having a central body formed with a plurality of wings longitudinally thereof, said wings extending at right angles to one another and each being formed with a groove in its vertical longitudinal edge and a second groove formed in the bottom of each first named groove, said grooves all being semi-circular in cross-section, and said main body portion and wing being pointed on one end and the main body portion extending beyond the wings at its other end to form a driving head.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN STOCKFLETH.

Witnesses:
W. W. Healey,
Mrs. John Stockfleth.