T. L. MacBEAN.

REINFORCED CONCRETE SHEET PILING OR SHEATHING.

APPLICATION FILED MAR. 7, 1914.

1,249,442.

Patented Dec. 11, 1917.

2 SHEETS—SHEET 1.

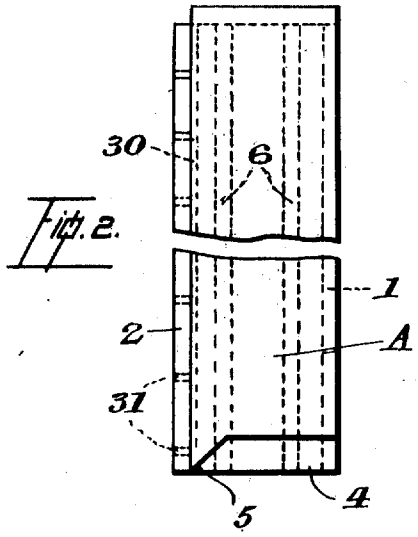


Fig. 2.

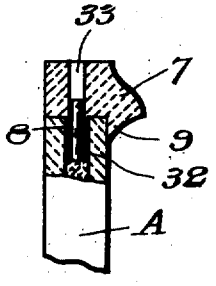


Fig. 4.

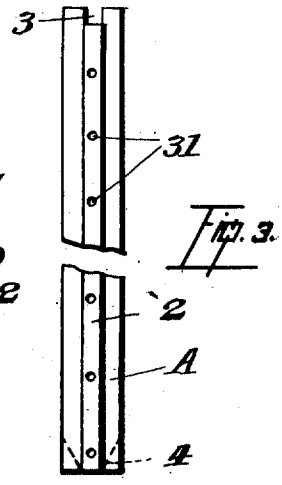


Fig. 3.

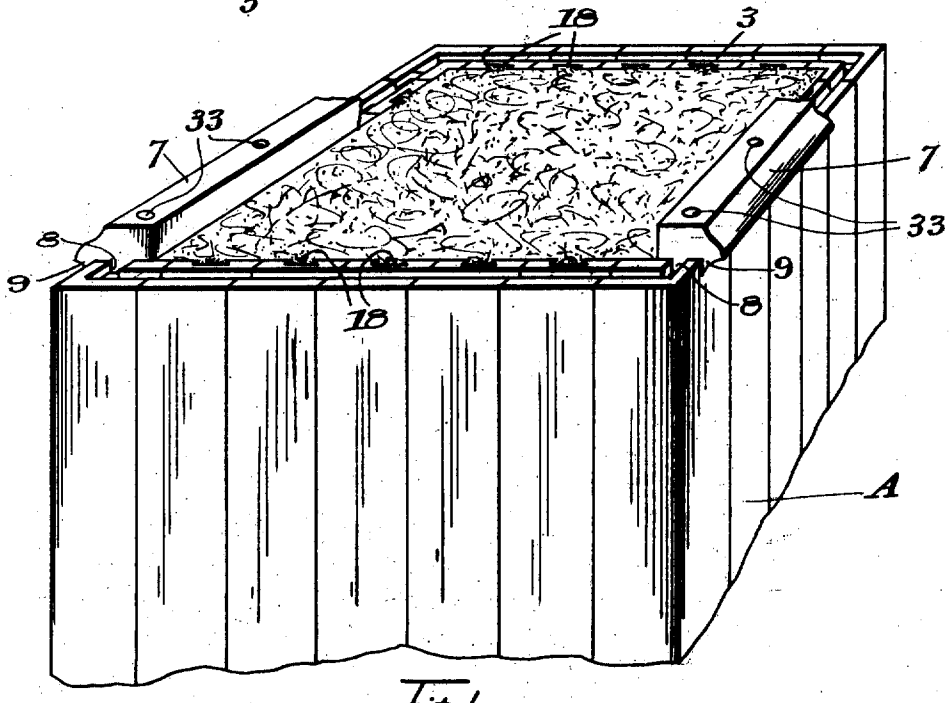


Fig. 1.

WITNESSES

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2 SHEETS—SHEET 2.

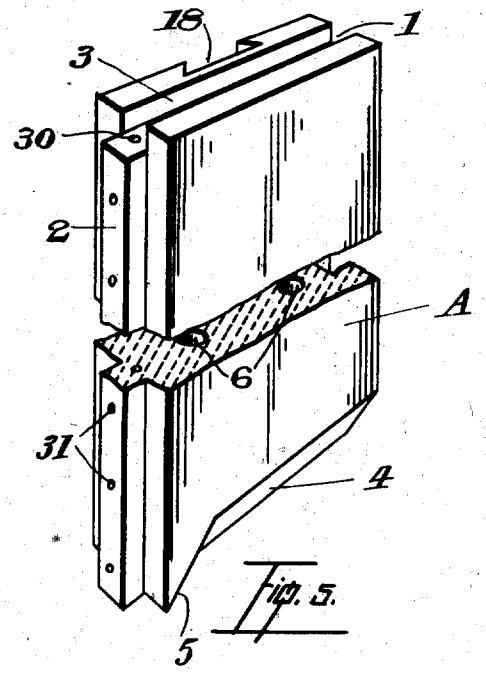


Fig. 5.

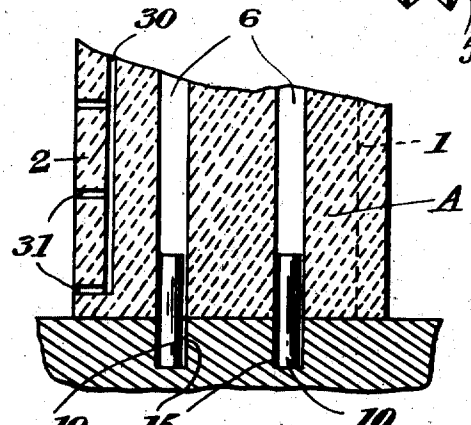


Fig. 6.

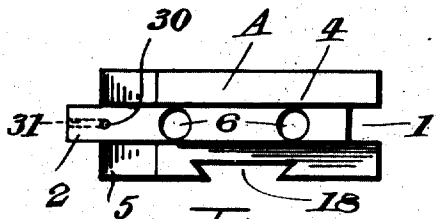


Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS LEONARD MacBEAN, OF OTTAWA, ONTARIO, CANADA.

REINFORCED-CONCRETE SHEET PILING OR SHEATHING.

1,249,442. Specification of Letters Patent. Patented Dec. 11, 1917.

Application filed March 7, 1914. Serial No. 823,153.

To all whom it may concern:

Be it known that I, THOMAS LEONARD MacBEAN, a subject of the King of Great Britain, and resident of the city of Ottawa, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Reinforced-Concrete Sheet Piling or Sheathing, of which the following is the specification.

This invention relates to reinforced concrete sheet piling and particularly refers to a type intended to take the place of or be substituted for temporary piling and sheathing commonly utilized in the construction of dock walls, wharves, piers, lock walls and the like and can also be adapted to the lining of mine shafts and underpinning or any other place where it is desired to confine the subsoil or to insert a water tight lining in passing through wet strata, and the objects of the invention are to provide permanent sheet piling which will enable a good foundation being obtained under any and all conditions where sheet piling is utilized in docks and the like, to simplify the construction thereof, to render such a wall water tight and prevent water percolating therethrough and other objects which will be shown hereafter, and it consists essentially of the improved reinforced concrete sheet piling, which will be hereinafter called sheathing, particularly described and set forth in the following specification and accompanying drawings.

In the drawings,

Figure 1 is a perspective view of a pier constructed with the improved sheathing showing how coping may be attached to the upper end thereof.

Fig. 2 is a front elevation of the improved sheathing.

Fig. 3 is a side elevation of the same.

Fig. 4 is a side view partly sectional showing how the cope stone may be fixed in position on the sheathing.

Fig. 5 is a perspective view (broken in the center) of the improved sheathing.

Fig. 6 is a sectional side elevation of the foot of the sheathing and shows the means of securing it to the rock head.

Fig. 7 is a plan view of the improved sheathing.

Like characters of reference refer to like parts in the several drawings.

Referring to the drawings, A represents the improved reinforced concrete sheathing which is provided with a groove 1 in and extending along one of the vertical sides thereof, the other vertical side being provided with a tongue 2 extending therefrom and formed integral therewith and adapted to engage with the groove 1 located in an adjacent sheathing.

3 represents a groove in the top side of the sheathing A, such groove extending between the vertical sides of the sheathing, the bottom side of the said sheathing being suitably tapered off to form a cutting edge or face 4.

As it is most desirable to extend the cutting edge along the whole length of the bottom face, an auxiliary cutting edge 5 is provided at the bottom of the side face carrying the tongue 2, such cutting edge being formed at substantially right angles to the first said cutting edge 4.

The adjacent tapered sides forming the cutting edges 4 and 5 converge toward and into each other, the tapered side of the cutting edge 5 being adapted when engaging with the ground, to draw adjacent pieces of sheathing tightly together along the bearing and interlocking faces and while obtaining a continuous cutting edge in this way it will be understood that the faces forming the joint between adjacent sheathing is not in any way reduced.

6 represents orifices or conduits located in the groove 3 and extending vertically downward through the center to the bottom of the sheathing, the object of such orifices or conduits will be made clear hereafter.

7 represents a cope stone or other super masonry placed on the top of the said sheathing so as to provide a proper bond by means of the tongue 8 projecting from and formed integral with the bottom face thereof and designed to engage with the groove 3 in the top side of the sheathing A, such cope stone being further provided with a downwardly extending projection 9, the inner face of which is substantially parallel with the side faces of the tongue 8, the said projection 9 being designed to engage on its inner face with the outer face of the sheathing, and having its outer face formed in a suitable concave curve thereby lessening the scouring action of the water thereon.

30 represents an orifice or conduit located at the base of the tongue 2 and extending donwwardly to near the bottom of the sheathing.

31 represents horizontally disposed conduits extending from the outer face of the tongue 2 and communicating at their inner ends with the conduit 31 thereby enabling grouting being run between the tongue 2 and the groove 1 of the adjacent sheathing so forming a practically perfect joint.

This sheathing A is designed to be utilized as a facing for dock walls and to be used in the construction of coffer dams, piers and the like and in cases when a hard top stratum is encountered through which the lower end of the sheathing must pass to engage with the rock head, percussive means of driving can be advantageously employed until the rock head is reached. A drill can then be inserted through the conduits 6 and a hole 15 drilled in the rock head to any suitable depth, in which the lower half of the pin 10 is designed to be located, the upper part of the said pin being located in the conduit 6.

Grouting is then filled into the conduit thereby securely attaching the sheathing A to the rock head.

To insure the pin 10 being firmly embedded in the grouting, the outer periphery of the pin is ragged or roughened in any suitable manner thereby giving a better gripping surface.

18 represents a dovetailed recess or groove extending down the center of the back vertical face, such groove being designed to anchor the sheathing securely to the filling masonry of the dock, pier or other structure and may be constructed so as to permit of the use of anchor bolts or rods to secure a stronger bond.

When the dock wall is constructed with the desired quantity of such sheathing, the groove 1 of one sheathing engages with the corresponding tongue 2 of the adjacent sheathing, buttress walls of sheathing or other design can be placed at right angles to the inner face of the sheathing A utilizing the groove 18 to anchor the buttress to the face thereof and filling of any desired kind packed behind the so constructed dock wall, the wall being finally finished by securing the cope stone or super masonry in position.

The cope stone 7 is secured to the sheathing A by means of the pin 32 which is placed in the conduit 6 and rests on the top of the grouting filled therein, the cope stone is then placed in position with the conduit 33 encircling the top of the pin 32 whereupon grouting is filled into the conduit 33 and securely binds the cope stone in position.

When the upper stratum above the rock head is of sand, then the sheathing A is allowed to sink therethrough by gravity and is finally secured to the rock head as already stated, but should the sheathing fail to reach the desired depth in this manner, a high pressure water pipe is connected to the conduit 6 forming a jet whereby the sand is washed out below the cutting edges of the sheathing thereby allowing the block to come to the desired position.

Grouting is then forced through the conduits 6 and commingling with the sand in proximity to the cutting edges 4 and 5 gives a solid foundation to the sheathing.

The manner of securing the tongues by grouting has already been described but it will be understood that all the joints between adjacent sheathing and between the top of the sheathing and super masonry are amply taken care of by the use of cement, grout, mortar and the like.

The sheathing is constructed by a process of molding thereby allowing of any shape and size of sheathing being constructed adapted to conform with the contour or shape of any dock wall, while any necessary or desired reinforcing can be utilized in conjunction with the concrete.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention, constructed within the scope of the claim, without departing from the spirit or scope thereof, it is intended that all matter contained in the accompanying specification and drawings shall be interpreted as illustrative and not in a limiting sense.

What I claim as my invention is:

A reinforced concrete piling of the class described, comprising a plurality of sections adapted to make edge to edge tongued and grooved engagement and having grooves in the top thereof with orifices extending from the said top grooves to the bottom of each section, an overhanging cope stone having a tongue on the bottom face adapted to engage with the grooves in the top of the piling and provided with a downwardly extending projection engaging with the outer face of the piling, the said cope stone having orifices therethrough designed to register with the said orifices, and pin means located in the orifices adapted to secure the cope stone and piling in assembled position.

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

THOMAS LEONARD MacBEAN.

Witnesses:
RUSSEL B. SMART,
JAMES MITCHELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."