Oct. 23, 1962 G. F. HERMANN, JR 3,059,436

PILING

Filed March 19, 1956

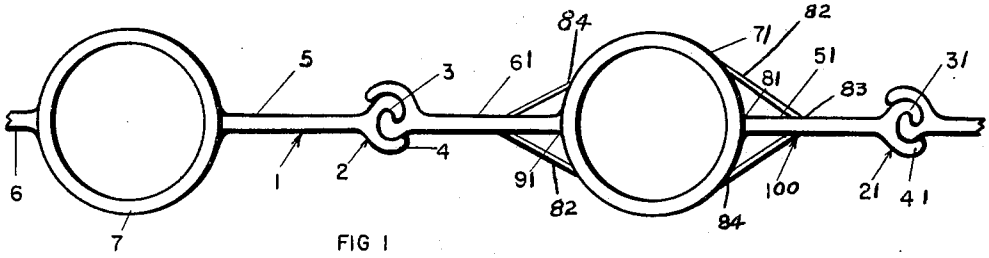

FIG 1

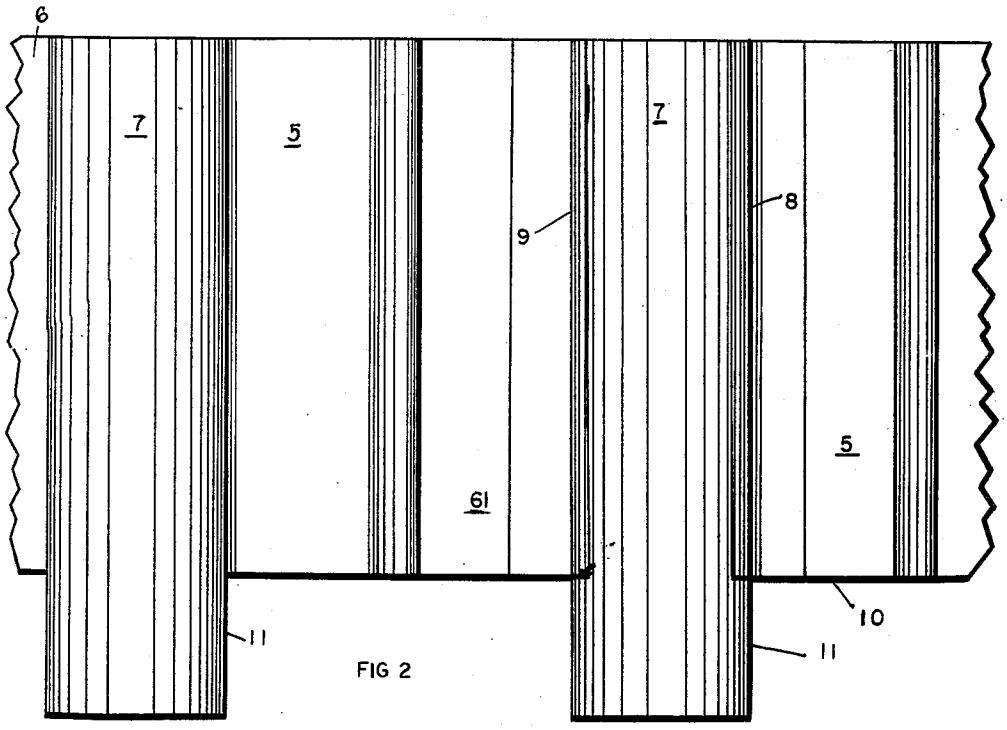

FIG 2

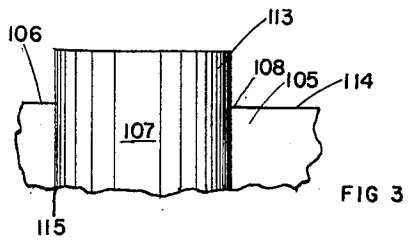

FIG 3

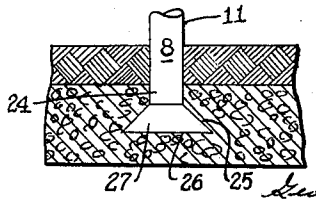

FIG. 4

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3,059,436

Patented Oct. 23, 1962

3,059,436

PILING

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Filed Mar. 19, 1956, Ser. No. 572,567
1 Claim. (Cl. 61—60)

This invention relates to piling and more particularly to the type of piling ordinarily known as sheet piling.

Pilings for reinforcing shore lines ordinarily are made of sheets of metal having interlocking joints. The sheets of metal are ordinarily driven down into the earth or sand and they penetrate progressively until they strike solid rock. Then if the driving force is continued, the bottom of the piling will ordinarily buckle, bend over, and follow along the surface of the rock and, in other manners, be distorted. Sometimes where the overburden of soil or sand is thin and the solid rock is fairly near the top of the earth or sand, the piling only penetrates the earth or sand a short distance before it engages the rock and, therefore, does not have sufficient lateral support to prevent the piling from upsetting.

It is, accordingly, an object of this invention to overcome the above and other defects in prior pilings and, more particularly, it is an object of this invention to provide a piling which is simple in construction, economical to manufacture, and simple and efficient in use.

Another object of the invention is to provide an integral reinforcing device for supporting sheet piling.

Another object of the invention is to provide a novel type of sheet piling.

A further object of the invention is to provide a novel method of driving piling.

A still further object of the invention is to provide a sheet piling having a reinforcing member at the intermediate point thereof, the reinforcing member extending down below the lower surface of the piling.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing and more particularly pointed out in the appended claim, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

FIG. 1 is a top view of piling according to the invention;

FIG. 2 is a side view of the piling;

FIG. 3 is a partial view of another embodiment of the invention; and

FIG. 4 is a cross sectional view of the bottom of the piling flared in a reamed hole in rock.

Now with more specific reference to the drawing, a sheet piling 1 is shown having interlocking joints 2. One end of each joint 2 is bent over to form a hook 3 in engagement with a similar hook of an adjacent section. The other end of each joint 2 is rounded over to form a guard 4, each side engaging around the hook on the adjacent section. The hooks 3 serve to prevent longitudinal displacement of the built up wall while the guards 4 prevent uncoupling of the section and buckling or lateral displacement of the built up wall.

The specific joints shown in this disclosure can be varied within practical limits and are not part of the invention.

Each sheet of piling 1 is divided into two parts 5 and 6 and the two parts 5 and 6 are welded on the end remote from the joints 2 to a pipe 7 at 8 and 9, respectively. The pipes or cutting members 7 are longer than the sheet piling 1 and extend below a lower edge 10 thereof at 11 so that the lower spaced ends 11 of the pipes 7 extend a substantial distance below the lower edge 10 of the sheet piling 1 and, therefore, may be driven into predrilled holes in rock, thereby preventing lateral sliding of the wall and also, due to the resistance of the pipes 7 to bending, forming a support against lateral deflection of the wall.

A piling 100 has sheets 51 and 61 having joints 21 at the outside ends thereof and pipes 71 welded between the sheets 51 and 61 at 81 and 91, respectively. Gussets 82 are welded to the sheets 51 and 61 at 83 and to the pipes 71 at 84. The sheets 51 and 61 are locked together at the joints 21 by connections 31 and 41.

FIG 3 shows another embodiment of the invention wherein sheets 105 and 106 are welded to a pipe 107 at 108 and 115 with an upper end 113 of the pipe 107 extending above top surfaces 114 of the two ends of the sheets 105 and 106. The upwardly extending end of the pipe 107 provides a surface for the pile driver to engage, thereby protecting the upper edge of the sheet piling and concentrating the force of the pile driver more directly above the pipe 107 itself.

In placing the piling in use, the operator will first drill spaced holes slightly smaller than the size of the ends 11 of the pipes in order for the pipes to form a snug fit. The holes can be reamed at the bottoms and filled with concrete in order to anchor the piling against being lifted by frost or mechanical forces. The pipe can be flared or belled at the bottom in order to expand the bottom for a secure anchor. The bottom end 11 of the piling may be inserted in a hole 24 reamed at 25 to an enlarged shape and having a bottom 26. The lower end 11 of the piling is flared out as shown at 27 and this can be done by inserting a tool such as shown in Patent No. 1,413,503 or by any other suitable flaring means. The holes can be spaced equal to the center distance spacing thereof. The operator will then set the piling in place with the pipes over the spaced holes, the holes being spaced equal to the spacing of the center distance of the pipes, and will connect the joints as shown and drive the piling down through the overburden of sand or dirt and the lower ends down into the predrilled holes in the rock, thereby providing a solid, firm, rigid wall.

The foregoing specification sets forth the invention in its preferred practical forms but the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claim.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

A method of setting piling comprising providing piling sheets and pipes, welding said pipes to the edges of said piling sheets with the ends of said pipes extending below the bottoms of said sheets, drilling holes in rock having

an overburden, said holes being slightly smaller in diameter than the size of said pipes to form a snug fit, reaming the bottom parts of said holes to oversize, connecting said sheets together, driving said sheets through the overburden into engagement with said rock and said pipes into said holes, and enlarging the bottom ends of said pipes by inserting a spreading tool through said pipes to spread the bottoms thereof into engagement with the enlarged walls of said holes.

References Cited in the file of this patent

UNITED STATES PATENTS

732,401	Dungan	June 30, 1903
905,672	Edmunds	Dec. 1, 1908
1,106,606	Wilhelmi	Aug. 11, 1914
1,296,995	Miller	Mar. 11, 1919
1,413,503	Stevens	Apr. 18, 1922
1,747,038	Weber	Feb. 11, 1930
1,761,614	Collier	June 3, 1930
1,888,282	Miller	Nov. 22, 1932
1,951,292	Cahill	Mar. 13, 1934
2,101,285	Stevens	Dec. 7, 1937
2,128,428	Murray	Aug. 30, 1938
2,287,018	Blumenthal	June 23, 1942
2,421,666	Upson	June 3, 1947
2,589,484	Ecuer	Nov. 18, 1952
2,650,476	Crockett	Sept. 1, 1953
2,667,037	Thomas	Jan. 26, 1954

FOREIGN PATENTS

1,005	Great Britain	1864
63,841	Germany	Aug. 19, 1892
915,929	Germany	Aug. 2, 1954