

Oct. 26, 1943.

E. W. RIEGER ET AL

2,332,812

PILING BAR

Filed July 5, 1940

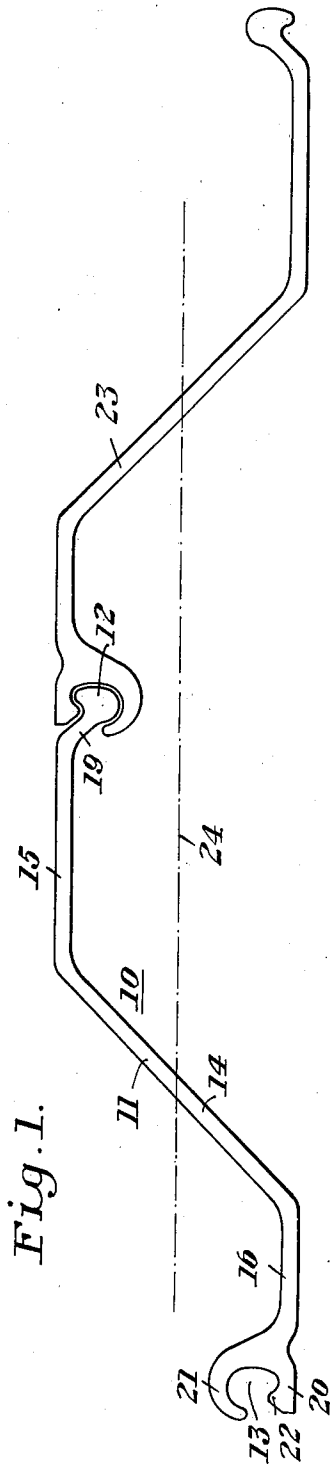
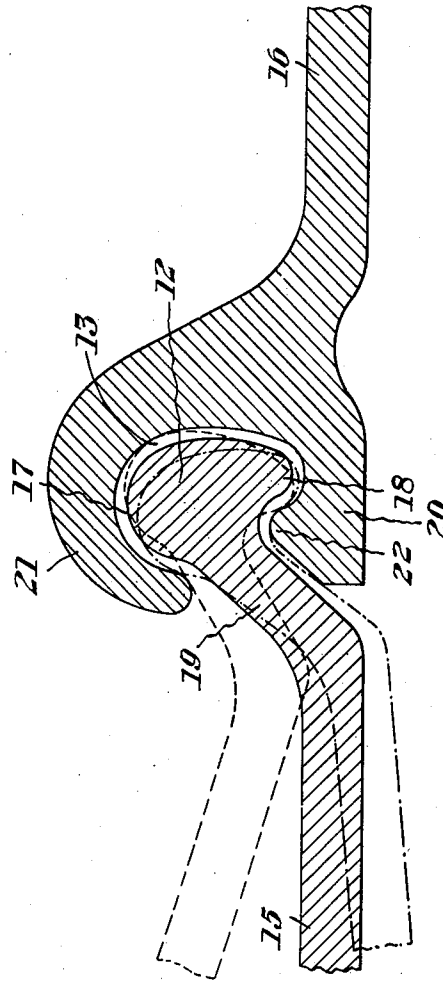


Fig. 2.



INVENTORS

Ernest W. Rieger,
Clarence J. Klein
and Peter R. Church

by their attorneys
Stebbins and Blenko

UNITED STATES PATENT OFFICE

2,332,812

PILING BAR

Ernest W. Rieger, Clarence J. Klein, and Peter
R. Church, Weirton, W. Va.

Application July 5, 1940, Serial No. 343,944

4 Claims. (Cl. 61—62)

This invention relates to a rolled structural shape and, in particular, to a member known as a piling bar used in the construction of bulkheads, coffer dams or other structures which may be made of sheet piling.

Numerous forms of piling bars have been proposed heretofore and it is the general object of our invention to improve upon previous forms of such members, particularly in respect to the interlocking portions thereof whereby adjacent bars are secured together in edge-to-edge abutment to form a continuous wall. In the preferred embodiment of the invention, our piling bar comprises a web having an enlargement or bulb along one edge and a groove along the other. A transverse section through the bulb is ovate in shape and the shape of the groove conforms generally to that of the bulb. The bar of our invention will be described in greater detail below with reference to the accompanying drawing illustrating the preferred embodiment. In the drawing,

Fig. 1 is an end view of two piling bars embodying our invention assembled together by their interlocking portions; and

Fig. 2 is a transverse sectional view taken through the abutting edges of a pair of adjacent bars.

Referring now in detail to the drawing, our piling bar, indicated generally at 10, comprises a web 11 having an enlargement or bulb 12 along one edge and a groove 13 along the other. The web 11 is of modified Z-shape including a central web portion 14 and auxiliary web portions 15 and 16 extending at an oblique angle to the central web portion and parallel to each other.

As clearly shown in Fig. 2, the bulb or enlargement 12 is substantially ovate or pear shaped in section having a greater radius of curvature at one end 17 than at the other 18 and a maximum radius at the exposed side. The bulb section is defined throughout by a smooth curve of gradually varying radius. The ends of the bulb section are directed laterally of the piling bar as a whole. The enlargement is joined to the auxiliary web 15 by a narrow connecting web 19 extending from one side of the enlargement intermediate the ends thereof. Grooves having sections defined by circular arcs are formed between the bulb and the connecting web.

The groove 13 is defined by a flange 20 extending generally parallel to the auxiliary webs 15 and 16, and a cooperating wall 21 extending

laterally from the flange, the flange and wall being disposed in such manner as to suggest the shape defined by the thumb and fore-finger in grasping relation. The flange 20 has a bead or shoulder 22 therealong adapted to extend into the curve joining the end 18 of the enlargement 12 and the connecting web 19.

The wall 21 includes a base portion adjacent the auxiliary web 16, an extreme edge portion, and a curved portion intermediate therebetween.

The groove 13 is similar in shape to the enlargement 12 but is somewhat larger, thus providing an easy sliding fit therebetween and permitting considerable angularity between adjacent bars, as indicated by the extreme positions shown in dotted lines in Fig. 2.

It will be observed that the ends of the ovate sections through the bulb and groove having the smaller radius of curvature extend in opposite directions. It is necessary, therefore, to turn alternate bars end for end in order that the enlargement fit properly in the groove. This provides a wall 23 which may be conceived of as composed of a plurality of trough-shaped sections arranged side by side, as indicated in Fig. 1, with the auxiliary webs 15 and 16 parallel to the neutral axis of the wall-section indicated at 24.

It is thus impossible to drive the bars with the line connecting the centers of the bulb and groove lying in the plane of the neutral axis 24. The major axes of the sections through the enlargement 12 and groove 13 extend generally transversely of the wall 23 thereby providing an especially strong interlock.

It will be apparent from the foregoing description that the piling bar of our invention is characterized by numerous advantages over the shapes of the bars used heretofore for similar applications. The modified Z-shape of the section provides a high resistance to buckling either under the longitudinal force applied in driving or the lateral thrust of the pressure of the material retained by the wall. In other words, the shape has a high section modulus. The bar also has a high ratio of width to sectional area so that a relatively small number of bars provides a wall of substantial width. Stated in another way, the bar of our invention has a relatively low weight per foot of length and per square foot of wall area.

The "bulb-and-claw" joint composed of the bulb or enlargement 12 and the groove 13 has a high strength in resistance to pulling apart and

is also characterized by ample clearance. The groove is also adapted to receive packing if it is desired to make the joints water-tight. The permissive angularity between adjacent bars is sufficient to conform to the curvatures of ordinary structures composed of sheet piling.

A further advantage of our piling bar is that it may be rolled without difficulty.

In a specific embodiment of our bar having a web thickness of $\frac{3}{8}$ " and a width between centers of the groove and bulb (measured parallel to the auxiliary webs) of about 16", the weight of the bar is about 29 pounds per linear foot and about 22 pounds per square foot of wall and the section modulus is about 15 in.³.

Although we have illustrated but a preferred embodiment of the invention, it will be understood that changes may be made in the details thereof as to shape, arrangement, or the like, without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A joint for sheet piling bars comprising a bulb extending along one side of a piling bar, and a groove mating with said bulb, extending along the adjacent side of a neighboring bar, said bulb having an ovate shape in section, the ends of the section being directed laterally of the bar, one side of the section being exposed and the other side merging with the remainder of the bar, said section being defined throughout by a smooth curve of a gradually varying radius of curvature, said radius being greater at one end of said section than at the other, and a maximum at said exposed side, said groove conforming closely in sectional shape to said bulb but having free clearance therefrom at all points.

2. A joint as specified in claim 1 characterized by concave cylindrical surfaces the sections of which are defined by circular arcs, between said bulb and the remainder of the bar.

3. A joint for sheet piling bars comprising a

bulb extending along one side of a piling bar, and a groove mating with said bulb, extending along the adjacent side of a neighboring bar, said bulb being pear-shape in section, the ends of the section being directed laterally of the bar, one side of the section being exposed and the other side merging with the remainder of the bar, said section being defined throughout by a smooth curve of a gradually varying radius of curvature, said radius being greater at one end of said section than at the other, and a maximum at said exposed side, said groove conforming closely in sectional shape to said bulb but having free clearance therefrom at all points and being defined by a flange having a raised bead therealong and a laterally extending wall, said wall tapering toward its free edge and being so curved that said edge is opposite said bead.

4. A joint for sheet piling bars comprising a bulb extending along one side of a piling bar, and a groove mating with said bulb, extending along the adjacent side of a neighboring bar, said bulb being pear-shaped in section, the ends of the section being directed laterally of the bar, one side of the section being exposed and the other side merging with the remainder of the bar, said section being defined throughout by a smooth curve of a gradually varying radius of curvature, said radius being greater at one end of said section than at the other, and a maximum at said exposed side, said groove conforming closely in sectional shape to said bulb but having free clearance therefrom at all points and being defined by a flange lying generally in the plane of the adjacent portion of said neighboring bar and having a raised bead therealong, and a laterally extending wall, said wall tapering toward its free edge and being curved so that said edge is opposite said bead.

ERNEST W. RIEGER.
CLARENCE J. KLEIN.
PETER R. CHURCH.