This invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates generally to metallic sheet piling as employed in the construction of retaining and foundation walls, caissons and similar structures, but more particularly it relates to the means of interlocking the various sections of the piling.

The principal object of the present invention is to provide an improved form and arrangement of interlocking flanges whereby the strength of the interlock formed is materially increased and the pull on the piling elements, tending to separate the interlocks, is resisted by flanges which are under shearing stress and not exposed to forces tending to bend the flanges out of interlocking position.

Another object of the invention is to provide interlocking piling wherein the weight of the interlocking members may be materially reduced without sacrificing strength, and thus permit of the construction of units having thicker walls without increase of weight.

Still another object is to provide piling sections in which the number of rolls is materially reduced with consequent reduction in cost of rolling.

Further objects of the invention are that the improved design is most suitably adapted to the construction of each section wherein the approximate combined section modulus is developed and may be fully developed by riveting, bolting, or welding. The interlock is also particularly adapted to permanent construction.

The precise nature of my invention will be best understood by reference to the accompanying drawing in which like reference characters designate corresponding parts throughout the several views, and in which-

Fig. 1 shows a plan view of the piling interlock:

Fig. 2 is a plan view illustrating two interlocking straight sections.

Fig. 3 is a plan view illustrating two interlocking angular sections.

Fig. 4 is a sectional view of interlocking sections further united by either rivet or bolt and welding;

Fig. 5 is a sectional view of interlocking sections further united by a bolt; and

Fig. 6 is a plan view of interlocking sections of a web (1), on each of the interlocking edges of which is formed an engaging member, consisting of an inner or hook flange (2). At a sufficient distance from this hook flange (2) to permit engagement of a complementary flange (2') of the adjacent piling, is formed an outer or guard flange (3) which functions to retain the hook flanges (2') in locked engagement, as shown to greatest advantage in Fig. 1. It will be noted that the complementary flanges of the interlocking piling units are identical in contour.

In the art, the inner or hook flange (2) is sometimes referred to as the thumb, the outer or guard flange (3) the finger or tongue, and the space between the two flanges, which is designed for the reception of the hook flange of the adjacent piling, as the pocket. In the illustrations this groove or pocket between the flanges is designated by the numeral (4).

In the illustrations, particularly in Fig. 1, in which the interlocking members are shown in greatest detail, it will be noted that the flange (2) is a double headed member, the outer head (6) of which is engaged by the guard flange (3) of the adjacent piling and its inner head (6) engaged by the corresponding inner head (6) of the adjacent hook flange, whereas the outer head (5) is engaged by the guard flange (3) of the upper piling as illustrated in Figure 1. From this construction it will be noted any pull on the web members (1) and (1') would tend to shear the double headed hook flanges (2) and (2') along a plane illustrated by the dotted lines A—A and A'—A' at the base of the hook flanges.

It will be noted in Fig. 1 that the space (1) between the heads (5) and (6) of the hook flange, is concave. This concave area (7) is provided to lessen friction between the inner flange and the floor of the pocket (4) in which it slides. In assembling the piling, the inner flanges are fitted within the pockets and one piling thus slides into another, so it can be readily seen that reduction of the contact surfaces will greatly reduce friction between the sliding members and facilitate building up the piling members. The concave contour of the hook flange as described above not only reduces friction in driving but also reduces weight without impairing other factors of the lock.

The curve (11) formed between the head (6) and the floor (12) of the pocket (4) is designed to throw the point of the lock as close to the plane (50) of the web as possible. The guard flange (3) is designed to prevent unrolling or disengaging of the lock. The thickness of the hook flanges at the section indicated by the lines A—A and A'—A' is commensurate with the thickness of the web.
web (1), the same being that thickness required to develop the strength in shear equal to the tensile strength of the web.

In the illustrations two forms of piling are shown, that is, the piling having straight sections as shown in Fig. 2 and that made up of angular sections as shown in Fig. 3. In either of these types of piling, it will be noted that the uniting flanges and locking members retain the same construction as shown in Fig. 3. Various other types of piling may be desired embracing interlocking structure described above and therefore the applicant does not wish to be limited to the particular types of piling members shown in the illustrations. In Fig. 4 the interlocking members are further united by a rivet and also welding. This type of union may be resorted to which insures further security. It will be noted in this illustration that holes are drilled through the adjoining interlocking flanges (2) and (2') for the reception of rivets (8) and the guard flanges (3) and (3') are welded to the adjacent hook flanges at (8) and (8').

Another manner of further uniting the interlocking joints is by drilling the inner flanges (2) and (2') for the reception of bolts (7) as shown in Fig. 5. This is also done simply to insure a better union between the piling members. Welding may be used at individual spots along the sections or in a continuous line as shown at (10) in Fig. 6. This figure shows the guard flange of one piling member welded to the hook flange of another along a continuous line.

It will be noted from the illustrations that the interlocking members are of the simplest construction and therefore easy and economical to manufacture. They are not bulky since their strength is utilized in a most efficient manner by resisting the pull of the piling members at the base of the inner flanges where the forces are resisted by shear.

Having described my invention, what I claim as new and wish to secure by Letters Patent is:

1. Metal sheet piling composed of interlocking sections each section having interlocking members formed at the marginal edges thereof, said interlocking members comprising outer hook and inner guard flanges projecting an equal distance from one side of each section, the hook flanges having the contour of a double symmetrical wedge with their central planes perpendicular to the planes of the sections, and the guard flanges located in spaced relation to said hook flanges forming with one side of said hook flanges a groove the floor of which lies in the plane of the section, and having a similar contour as said hook flanges and of sufficient size to receive the hook flange of the complementary section to unite the complementary flanges of the adjacent piling.

2. Metal sheet piling composed of interlocking sections each section having interlocking members formed at the marginal edges thereof, said interlocking members of each section comprising hook and guard flanges projecting equal distances from one side of the sections, said hook flanges consisting of a double wedge shaped projection extending at right angles to the plane of the sections at the extremities thereof, and the guard flanges consisting of sloping projections located in spaced relation to said hook flanges, the intervening space between said flanges having the contour of a hook flange and being of sufficient size to form a locking groove for the hook flanges of the complementary sections, and the floors of said grooves being in the same plane as their respective sections.

3. Metal sheet piling composed of interlocking sections, each section having interlocking members formed at their marginal edges thereof, said interlocking members comprising outer hook and inner guard flanges; the hook flanges having the contour of a double symmetrical wedge with their central planes perpendicular to the planes of the sections, and the guard flanges located in spaced relation to said hook flanges, forming with one side of said hook flanges a groove, the floor of which lies in the plane of the section, and having a similar contour as said hook flanges and of sufficient size to receive the hook flange of the complementary section to unite the complementary flanges of the adjacent piling.

4. Metal sheet piling composed of interlocking sections, each section having interlocking members formed at the marginal edges thereof, said interlocking members of each section comprising hook and guard flanges; said hook flanges consisting of a double wedge shaped projection extending at right angles to the plane of the sections at the extremities thereof and the guard flanges consisting of sloping projections located in spaced relation to said hook flanges, the intervening space between said flanges having the contour of a hook flange and being of sufficient size to form a locking groove for the hook flanges of the complementary sections, and the floors of said grooves being in the same plane as their respective sections.

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