A. A. FRIESTEDT.

SHEET PILING.

APPLICATION FILED DEC. 9, 1907.

936,529.

Patented Oct. 12, 1909.

Fig. 1.

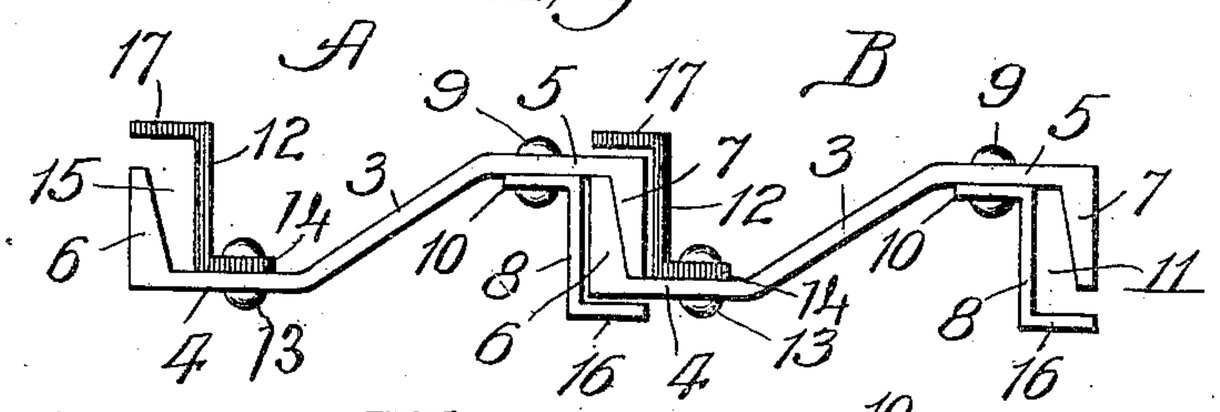
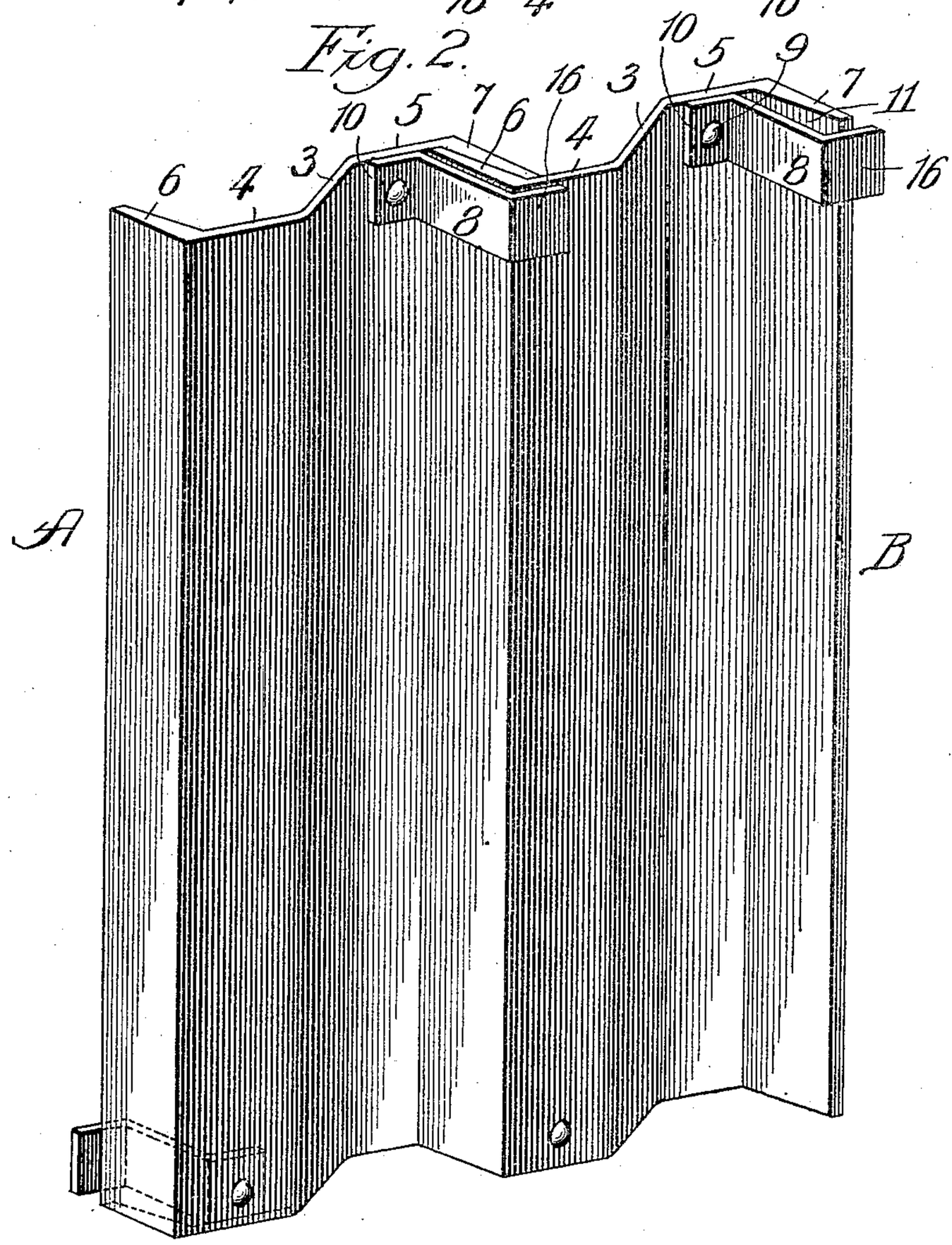


Fig. 2.



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SHEET-PILING.

936,529. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed December 9, 1907. Serial No. 405,719.

To all whom it may concern:

Be it known that I, ARTHUR A. FRIESTEDT, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sheet-Piling, of which the following is a specification.

This invention relates to improvements in the class of metal sheet-piling consisting of rolled beam sections or units capable of being loosely joined edgewise in regular order, and locked against displacement, when assembled in a continuous wall structure or inclosure.

The object of this invention is to provide a sheet-piling in which the weight is greatly reduced, the cost of production proportionately lessened, the facilities for ease of handling increased in both driving and withdrawing, by the diminution of the area of its cross-section and the locating of short clip interlocks in such positions, made possible by the beam structure itself, as to have the effect of making all sections identical and interchangeable, one with another, and further, the creation of a sheet-piling section without a continuous interlock, that readily becomes choked with earth, which tends to materially increase the resistance to the following section in driving.

The design of sheet-piling presented in this application, forms a single wall at all points, on webs, intermediate to flanges of engaging sections when assembled and is adaptable to the variety of temporary and permanent services for which a product of this character can be employed.

The present invention will make possible the application of sheet-piling in any unit length to the maximum practicable for rail or water transportation, and within the province of rolling mill and fitting-shop capacity.

This design of sheet-piling dispenses with the practice or requirement of a full length interlock, thereby reducing the weight per square foot, decreasing the time necessary for shop assemblement and lessening cost of transportation, thus a decided economy for the consumer is effected in its purchase, besides an additional advantage in the matter of cost, made possible by improvements for convenience and ease in handling and driving.

In the drawing, Figure 1 is a plan or end view of companion piling sections in their assembled relation, which embody the improved features. Fig. 2 is an elevation in perspective of the same.

Each piling unit comprises a beam-section having flanged edges and a means mounted thereon, adjacent to a portion of each flanged edge, which in combination forms an interlock for the assembling of engaging sections.

The sections or units are duplicates, but for clearness in this description, one section will be designated A and the other B. The sections are of a different shape than those ordinarily used, in not having a web that lies in one plane in its entirety. In this instance the web, while formed integral will be described as being composed of three parts. The central part 3 extends on a diagonal line, with reference to the parallel planes of web-parts 4 and 5 into which it vanishes. This diagonal feature brings the web-parts 4 and 5 into different planes, but in line with their companion parts on each section, when in assembled relation. The web-part 4 terminates in a tapering flange 6, turned at a right-angle thereto, and the web-part 5 terminates in a tapering flange 7 turned at right angles to its plane, and in an opposite direction to flange 6, thus locating the interlocking flanges 6 and 7 alternately on opposite sides when in assemblement as shown in Fig. 1. Although the interlocking flanges are located on opposite sides of their web, and are turned in opposite directions, they are in exact alinement by reason of the diagonal web feature.

The diagonal web-part being located in the center of each section and connecting with or running into the straight parallel web-parts, provides all of the advantages of a corrugated surface, imparting strength and stiffness to the sheet-piling section. The bracing effect on each section is precisely the same, thus insuring a uniform wall structure without alternating strong and weak sections, nor necessitating the use of blocking or shims to support the webs of such designs, as rest their interlocking parts against supporting wale or bracing timbers.

The uses of steel sheet-piling are so diversified, that in some of its applications, additional bracing and shoring must be resorted to, other than its inherent strength, which is particularly necessary when utilizing it for cofferdams, caissons, and similar structures that are subjected to a heavy

pressure from water or earth. Under such circumstances the pressure and support of the bracing is distributed uniformly over each section, which avoids the crippling or weakening of the interlocking edges. The construction of this sheet-piling section permits of the movement of each unsupported tapering flange and adjoining parallel web-part, when under pressure, respectively along the tapering flange and against its adjoining web-part of the section with which it is in engagement, and whose parts last referred to, are sustained by waling or bracing. This action effects water-tightness, and obviates the necessity of wood calking-strips, rope, or any other auxiliary, other than the application of saw-dust or street-sweepings, applied to the pressure side of the structure formed with the piling.

When the sections are assembled the flanges 6 and 7 relatively interlock, as best shown in Fig. 1. In this instance the means employed for loosely retaining the piling sections in their assembled relation, are short form Z-bar clips, which in reference to their position, for clearly describing their location, will be alluded to as being at the upper or lower end of sections.

The locking clips are rigidly secured to the upper ends of the sections by rivets or bolts 9, inserted through the clip-flange 10 and the straight web-part 5 of each section, though the extreme upper ends of these clips need not necessarily be flush with upper edge of piling section, preferably some distance below it. The clips 8 are set parallel with and back far enough from flanges 7 of each section to provide space 11 for the free entrance and engagement of the flanged part of the next joining section.

The locking clips 12, which are shown in dark lines in Fig. 1, are secured to the lower ends of the sections by means of rivets or bolts 13 inserted through clip-flange 14 and the straight web-part 4 of each section. The clips 12 are set parallel with and back far enough from flanges 6 of each section, to provide a space 15 for the free entrance and engagement of the flanged part of the next joining section. The lower ends of clips 12 should be flush with the respective end of each piling section in all cases. The free upper flanges 16 and 17 of the respective clips 8 and 12 are positioned so as to overlap a portion of the back of the adjoining sections, in the operation of assembling in continuous order.

It is to be noted that the locking clips mounted on the upper ends of the sections, are all located on the same side in their assembled relation, and all the companion clips on the lower ends, are on the opposite side and opposite edge. This arrangement not only locates the upper and lower locking clips of each section on opposite sides, but positions them relatively, as at the ends of a diagonal line drawn through the web-part of each section, thus making all sections interchangeable.

This form of a metal piling section having an angular web-part divided into different planes permits of its properties being increased or diminished as circumstances may require. That is, increased by lengthening and broadening the flanges and proportionately widening one or more of the web-parts without increasing the thickness thereof in obtaining greater strength; and diminishing by lessening the flanges and one or more of the web-parts.

Two locking clips are shown on each section, but it is obvious that a greater number may be used and located intermediate with reference to the end clips. Ordinarily two clips on each section will be sufficient but extra heavy work might require more.

It should be understood, that in assembling, the sections telescope endwise, but interlock edgewise, the same as though the interlocking feature extended the full length of each section.

Having thus described my invention, what I claim is—

1. A metal sheet-piling section having an interlock mounted on opposite sides and located at opposite ends thereof.

2. A metal sheet-piling section having an interlock located on opposite sides but not extending the whole length thereof.

3. A metal sheet-piling section having interlocking means mounted on opposite sides and positioned relatively, as at the end of a diagonal line.

4. A metal sheet-piling section having interlocking means comprising angle-clips mounted on opposite sides, said clips being positioned relatively, as at the ends of a line drawn diagonally through the body of said section.

5. A metal sheet-piling section, comprising a web consisting of two straight parts lying in parallel planes and connected by a diagonal part, with short form locking clips located on opposite sides and at diagonal corners.

In testimony whereof I affix my signature, in presence of two witnesses.

ARTHUR A. FRIESTEDT.

Witnesses:
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