Jan. 7, 1936. W. PRIELIPP 2,027,288

SHEET PILING

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Fig.1.

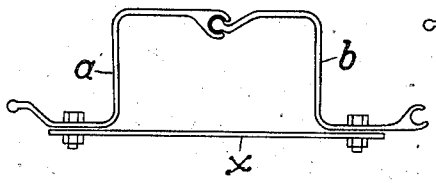


Fig.3.

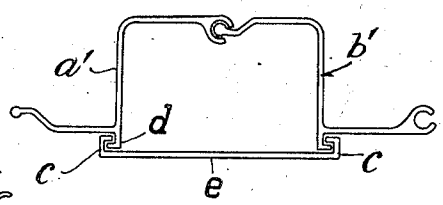


Fig.4.

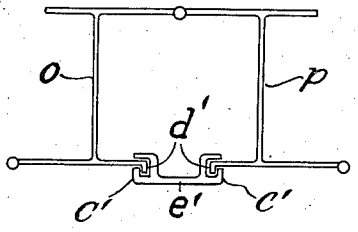


Fig.2

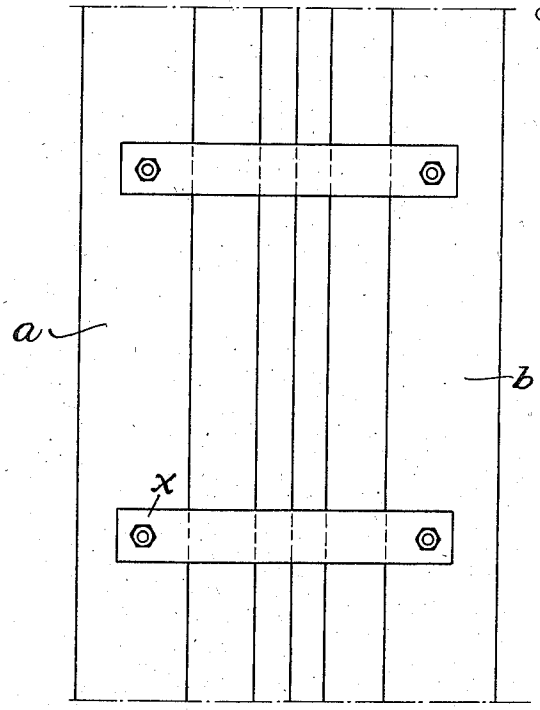


Fig.5.

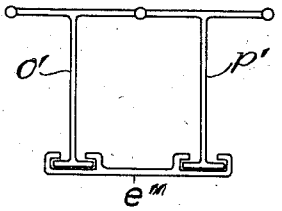
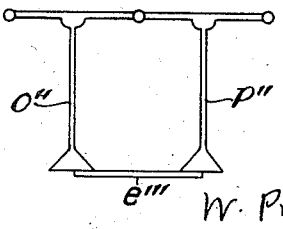


Fig.6



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SHEET PILING

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Fig. 7.

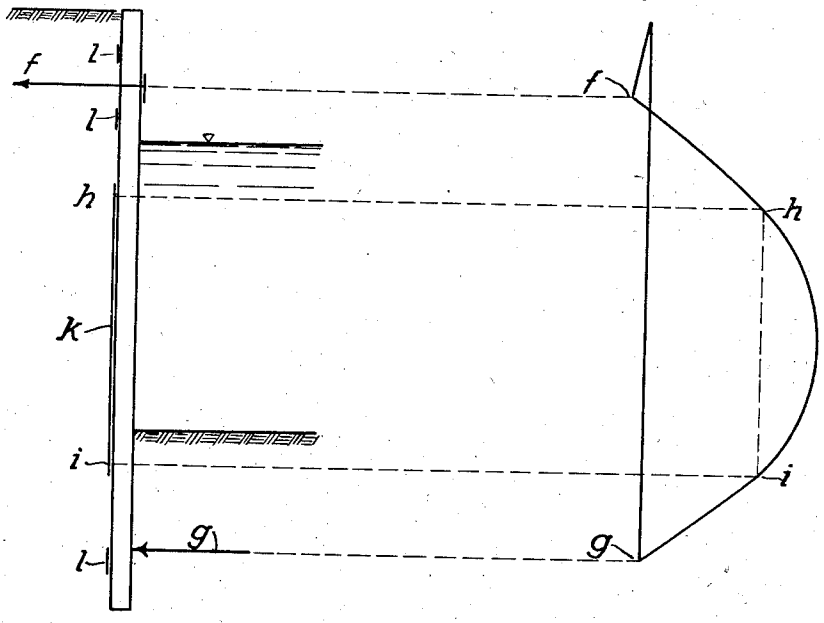


Fig. 9

Fig. 10.

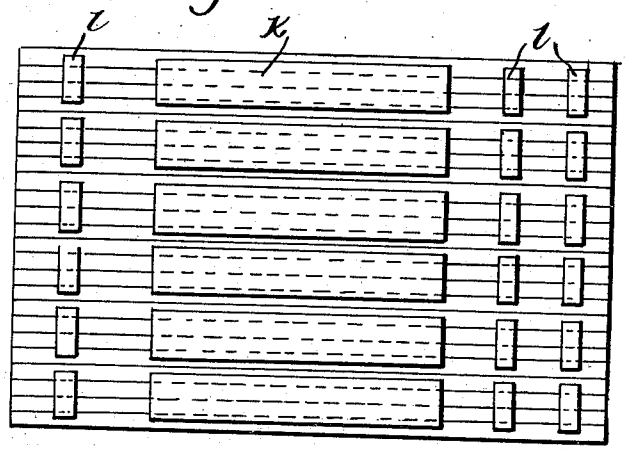
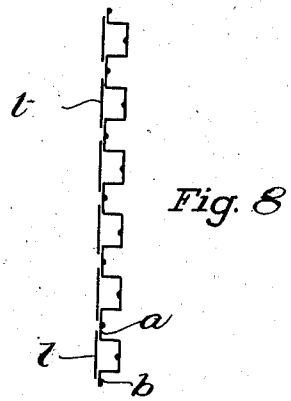


Fig. 8



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UNITED STATES PATENT OFFICE

2,027,288

SHEET PILING

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Application March 30, 1933, Serial No. 663,616
In Germany August 13, 1931

1 Claim. (Cl. 61—60)

This invention relates to a method of avoiding a lessening of the moment of resistance in sheet pilings whose connections are positioned in the outer zone of the piling.

It is known that double-walled and Z-shaped steel pilings are deformed during the driving operation and usually have their backs buckled inwardly, though, in rare instances, outward buckling takes place also. This is probably chiefly due to the fact that the ground displaced during driving is compressed by the inner part of the trough-shaped space and therefore tends to press the plank webs outwardly, which in turn causes the backs or connecting points of the planks to move inwardly.

The inclination thus imparted to the individual planks lessens, however, the moment of resistance, as the masses of the section are approaching the neutral axis.

For example, it has been found that in a sheet piling made of Z-shaped irons the resistance of the piling was reduced about 25%, which indicates that the lessening of the moment of resistance constitutes a serious drawback of Z-shaped sheet pilings.

Sheet pilings whose connecting members are positioned in the outer zones thereof are open to the same objection.

According to the invention, the drawback of lessened resistance is overcome in a surprisingly simple manned by uniting two Z-irons combined at the connection into a double plank by being drawn together and distributed over the entire length of the planks prior to driving operations on the side opposite the connection by means of bar-like members. This union is produced according to the invention by shifting bar-like members which are provided with a suitable profile over the ends of the two irons forming the double plank so as to close the space remaining between them at the side opposite to that closed by the lock. Said bar-like members are arranged with certain distances between them and in such a manner that the irons are safely secured thereby against tension and pressure. In the finished wall the bars are all disposed on one side of the wall and in such a manner as to cover the trough-like cavity. Preferably the distances between the several bar-like connecting elements are chosen in such a manner that said elements extend without interruption over that part of the wall which has to resist against the highest bending moment, whereas they are arranged with suitable distances between them over the remaining part.

By way of example, several embodiments of the invention are illustrated in the accompanying drawings, in which;

Figure 1 is a cross section of a pair of double planks consisting of Z-shaped iron pilings *a* and *b* which are interconnected by a bar *c* and by bolting;

Figure 2 is a side view of Figure 1 showing the bars distributed over the length of the planks;

Figure 3 is a cross section of a pair of double planks composed of Z-shaped sheet irons with rolled-on ribs *d* over which correspondingly shaped bars *e* are pushed;

Figure 4 is a cross section of a pair of double planks of I-shaped sheet irons with rolled-on ribs *d'* over which correspondingly shaped bars *e'* are pushed;

Figure 5 is a cross section of a pair of double planks in which the bar *e''* is pushed over flanges having no connection or connecting grooves;

Figure 6 is a cross section of a pair of double planks in which the bar *e'''* consists of a plain flat iron welded onto the flanges;

Figure 7 shows the cross section of a river side wall composed of Z-shaped pilings provided with bar-like connecting elements *l* and *k* according to the invention;

Figure 8 is a plan view of the wall according to Figure 7;

Figure 9 shows the distribution of the bending moment over the cross section of the wall according to the Figure 7; and

Figure 10 is an elevational view of section of wall according to the Figure 7.

According to Figures 1 and 2 the double plank is composed of two Z-shaped irons *a* and *b* which are joined together by means of a lock at the one side, whereas at the opposite side a bar-like connecting element *x* is bolted thereto.

According to Figure 3 the construction is similar except that a bar-like element *e* is shifted over the ends of the irons *a'* and *b'*. For this purpose the ends are provided with rolled-on ribs *d*, whereas the ends of the bar-like connecting element *e* show a corresponding profile *c*.

According to Figure 4 the plank is composed of two I-shaped irons *o* and *p* which are joined together at the one side by a lock. At the opposite side the two flanges of the I-irons lying in one line opposite to the said lock are provided with rolled-on ribs *d'* which are embraced by the enlargements *c'* of the bar-like connecting element *e'*.

According to Figure 5 the plank is also composed of I-shaped irons *o'* and *p'*, but in this case the flanges are not provided with special ribs but the

ribs for engagement with the enlargements of the connecting bar *e''* are formed by the flanges of the I-irons themselves.

In both of the constructions just described the connecting elements are shifted over the ends or flanges of the irons in such manner as to somewhat rigidly secure them against tension or pressure.

According to Figures 7 to 9 the sheet piling acts better between *f* and *g* as a beam upon two supports. In order to decrease the tension resulting from the bending moment the lathe *k* is utilized to increase the section modulus and it is carried through up to the height between *f* and *g*. The further short bars *l* are arranged with certain distances between them. In the form of the invention shown in Figure 6 the bar *e'''* is welded onto the flanges of irons *o''* and *p''*.

I claim:—

A sheet piling wall consisting of pairs of planks composed of sheet iron elements having web and flange portions, the flange portions being directly connected with each other at the one side and connecting elements arranged at the opposite side, said connecting elements being secured against tension and rigidly securing the elements forming the pairs of planks and extending without interruption over that part of the wall, which has to resist against the highest bending moment, whereas they are arranged with distances between them over the remaining part.

WALTER PRIELIPP.