

Oct. 27, 1931.

C. WEBER

1,829,463

CONCRETE RETAINING WALL

Filed Aug. 9, 1930

2 Sheets-Sheet 1

Fig. 1.

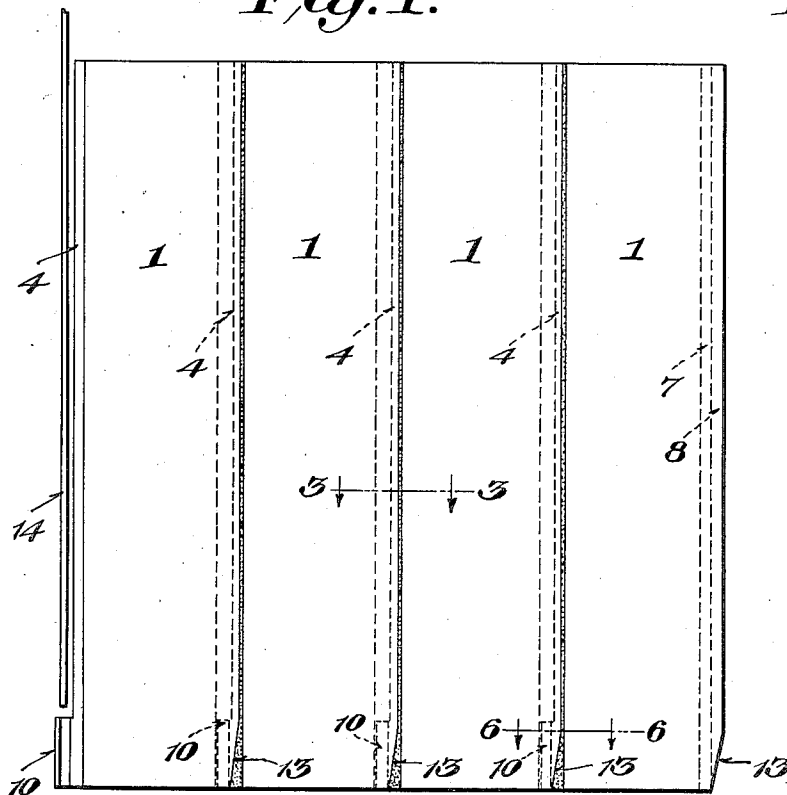


Fig. 2.

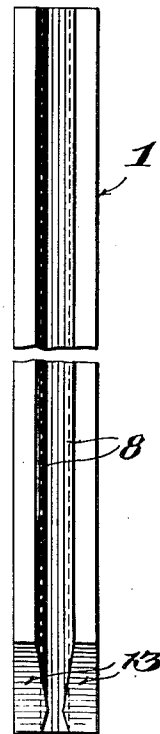
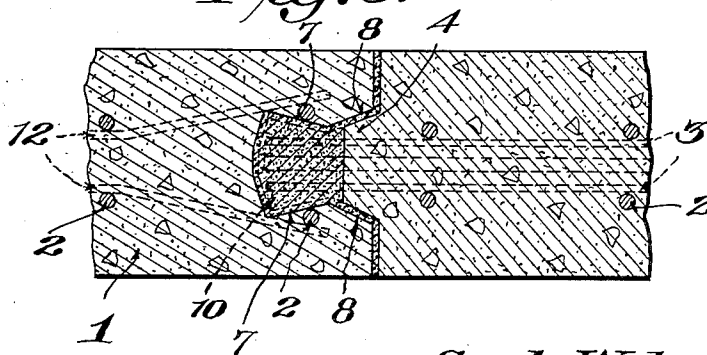


Fig. 3.



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Fig. 5.

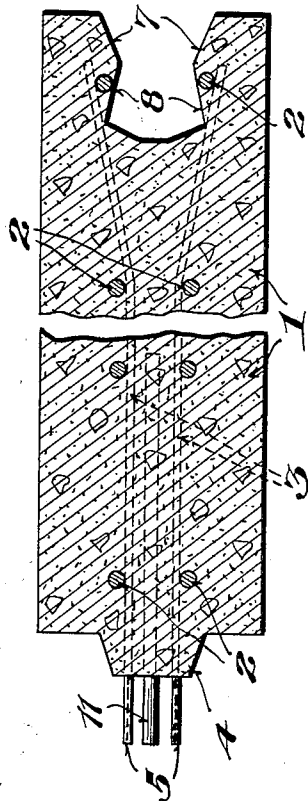


Fig. 6.

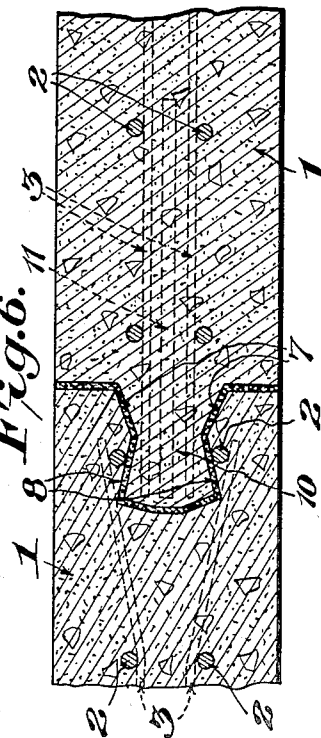
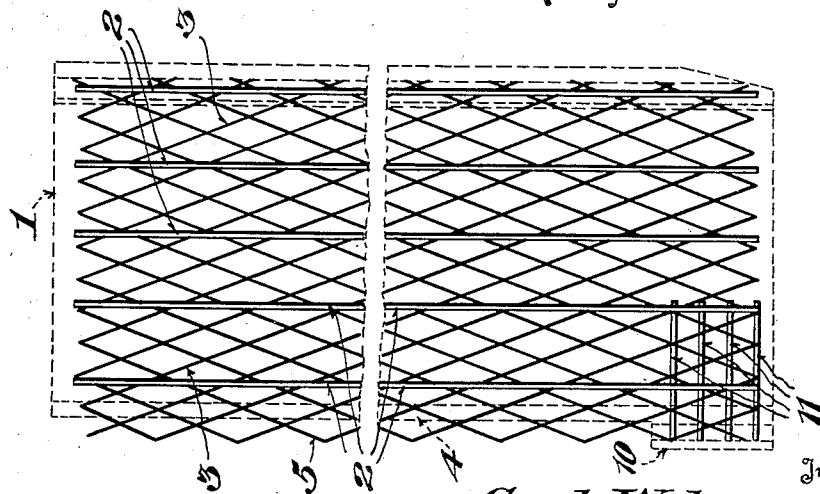


Fig. 4.



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UNITED STATES PATENT OFFICE

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CONCRETE RETAINING WALL

Application filed August 9, 1930. Serial No. 474,242.

The present invention relates to retaining walls of reinforced concrete, such as are used for the retention of earth fills, for shore-line protection, for the core-walls of levees, dams, and for similar purposes.

The object of the invention is to provide improved means for the construction of such walls, and an improved method of assembling said means, whereby the completed wall is an impervious, practically integral structure, which is also capable of resisting considerable longitudinal tensile stresses, and which can be built without great labor or expense.

I attain this result by the use of reinforced concrete slab piles of special construction, as will now be described with reference to the accompanying drawings, in which,

Fig. 1 is an elevation of the wall of my invention.

Fig. 2 is an end view of the same.

Fig. 3 is a cross section on line 3—3 of Fig. 1.

Fig. 4 is an elevation of the reinforcement in one of the slabs.

Fig. 5 is a cross section of a slab, and

Fig. 6 is a cross section on line 6—6 of Fig. 1.

In these views, the slabs of which the wall is composed are shown at 1; they are of reinforced concrete, containing vertical rods 2 and sheets of expanded metal 3, constituting the horizontal reinforcement. Each slab has a truncated tongue 4 on one vertical edge and a double dovetail groove 7, 8, in the other vertical edge. The outer portion of the groove has inwardly converging sides 7 to fit the tongue the sides of which are of less length than the sides 7, while the inner portion of the groove has inwardly diverging walls 8, thus giving it the double dovetail shape in cross section. As shown in Figs. 3 and 6, the ends of the expanded metal sheets 3 are spread apart towards the grooved edge of the slab. At its lower end, the tongue 4 has a lateral extension 10, shaped to fit the inner portion of the groove, and additional reinforcing bars 11 are placed in said extension to resist shearing stresses. The lower end of the slab on the grooved edge is beveled off, as shown at 13, to assist in the driving of

the slab, as will be further explained. 14 represents a small water pipe used to wash out the free space in the grooves before it is grouted or filled with mortar, cement or the like. The expanded metal reinforcement is extended through the face of the tongue so that it will project into the inner portion of the groove of the adjacent slab. The operation of building the wall is as follows:

The first slab or pile is set up and secured in correct position by means of pile-driving templets, guides and wales, in the usual way, and is then driven to the required depth. Then the next pile is elevated so that its extension 10 can enter the top of the groove in the already driven pile. The second pile is then driven down to place. Its extension 10 cleans out the groove of the driven pile from sand, etc., so that the projecting edge of the expanded metal reinforcement extends into the inner portion of the groove. The proper vertical alinement of each pile, after the first one, is assured by the tongues 4 following down in the outer portion of the groove of the preceding pile. After a number of piles have thus been set, the sealing of the joints so as to form an interlocking key is accomplished by filling the free space in the inner portions of the grooves with rich mortar or cement. If desired, before this filling is started, the grooves may be washed out with water under pressure, introduced near the bottom of the free groove spaces through the small pipe 14. The cement seal is then poured in. For very long piles, pressure grouting may be used. After the wall is completed in this way, attachments, such as anchors, copings, steps, railings, etc., may be applied.

Among the special advantages of the construction described are:

1. The normal tongue and groove structure is maintained for properly guiding the piles without the use of special guides or templets.
2. The perfect sealing and locking of the piles is obtained without extra cost by the projection of the reinforcement of one pile into the groove of the next, whereby the piles form an inseparable unit whole.
3. The self-cleaning feature of the groove

by the tongue so that soil filling the groove of the driven pile is removed by the operation of driving the adjoining pile, so that the groove is freed from any obstruction which might affect the projecting reinforcement and is ready for the introduction of the sealing mortar or cement.

It is common practice to build walls of this kind with tongued and grooved sheet piles, but in such cases the tongues and grooves are merely for the purpose of providing guides to aline the piles during the driving operation. Attempts have also been made to grout the grooves in such walls to seal the joints, but this did not form an interlock. In many cases the guide tongues have been omitted in order to provide a grouted joint of sufficient size, with the result that temporary pile-driven guides must be used, thereby greatly increasing the expense. Walls built in this way often develop longitudinal stresses caused by the settling of the backfill, soft ground, loss of foreshore, or even by normal backfill and surcharge pressures, temperature changes and the like. To avoid these defects, combination concrete and metal piles have been used, the metal parts forming the joints or interlocks, but such piles are too costly. The common form of such interlocking joints is one between sheet steel piles or rolled structural shapes, embedded in the concrete to prevent rusting.

By beveling off the grooved edges at their lower ends, as shown at 13, the pile being driven is crowded over towards the pile already driven, so as to keep the tongue and groove in engagement.

Having thus described my invention, what I claim is:

1. A retaining wall composed of a plurality of reinforced concrete slab piles, each having a double dovetail groove in one vertical edge and a relatively short truncated tongue on the other, and an extension on the lower end of said tongue of the same shape as the groove the free spaces of the grooves above said extensions being filled with a cement key.

2. A retaining wall composed of a plurality of reinforced concrete slab piles, tongued and grooved on their vertical edges to engage each other, the grooves being of double dovetail section and deeper than the tongues so as to leave a free space and the reinforcement extending through the tongues into said spaces, each tongue having an extension on its lower end of a size to substantially fill said grooves, and a filling of cement in said free spaces embedding the projecting reinforcement.

3. A retaining wall composed of reinforced concrete slabs, each slab having a groove, of hour-glass shape in cross section, in one edge and a tongue, of the shape of the outer part of said groove, on the other edge with the reinforcement projecting through its face, the

lower part of the tongues being extended laterally to the full size of the grooves, and a filling of cement in the grooves above the said extending parts and surrounding said projecting reinforcement.

Signed at Jacksonville, in the county of Duval and State of Florida, this 28th day of July, A. D. 1930.

CARL WEBER.