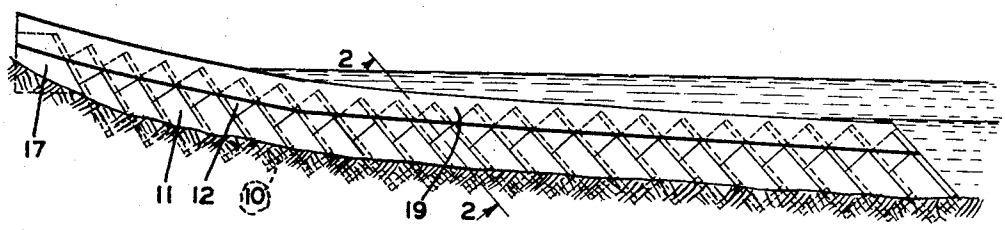
June 30, 1931. C. T. LEEDS ET AL 1,812,300

CONCRETE BLOCK GROIN OR SEA WALL

Filed June 12, 1929

FIG. 1.



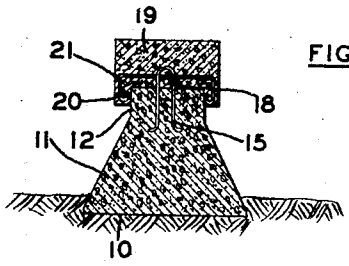


FIG. 2.

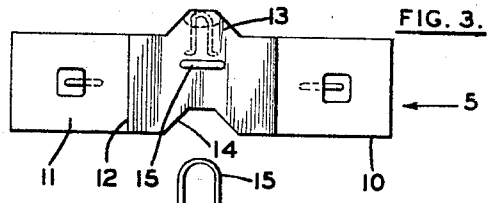


FIG. 3.

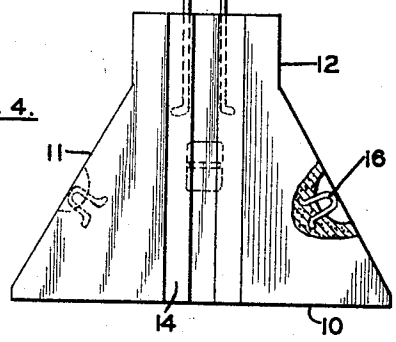


FIG. 4.

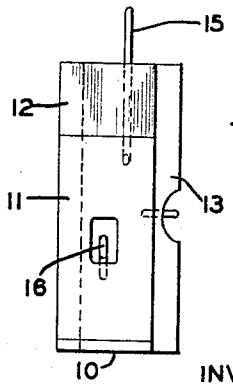


FIG. 5.

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UNITED STATES PATENT OFFICE

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CONCRETE BLOCK GROIN OR SEA WALL

Application filed June 12, 1929. Serial No. 370,271.

This invention relates to improvements in groins or sea walls.

An object of the invention is to provide an improved groin construction adapted to be erected upon sea beaches and the like to prevent or retard lateral washing or drifting of the sand and thus build up a sea beach which may be under the process of being washed away.

It is an object of this invention to provide an improved groin construction which may be easily and cheaply erected with a minimum amount of expense and labor.

Another object of the invention is to provide a groin construction composed of a series of concrete blocks laid side by side in an inclined position and which are so constructed that they will effectively be kept from overturning or displacement by wave action.

Another object of the invention is to provide a concrete block adapted to be used in constructing groins, which is of cheap, simple and durable construction, and which may be easily handled and positioned in place.

With the foregoing and other objects in view, which will be made manifest in the following detailed descriptions, and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention wherein:

Fig. 1 is a sectional view through a sea beach illustrating a groin embodying the invention after having been erected thereon.

Fig. 2 is a sectional view through the groin and may be considered as having been taken upon the line 2—2 upon Fig. 1.

Fig. 3 is a top plan view of one of the blocks employed in erecting the improved groin.

Fig. 4 is a view in elevation, parts being broken away, illustrating the rear side of the block shown in Fig. 3.

Fig. 5 is a view in side elevation taken in the direction of the arrow 5 upon Fig. 3.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the improved groin is built of a plurality of concrete blocks, these blocks being rectangular in plan, having relatively wide bases 10, and upwardly sloping and converging sides 11. At their tops the sides may be arranged vertically as indicated at 12, although this formation of the tops is immaterial. The forward or outer face of each block is provided with a projecting vertical rib 13 arranged at the center thereof, and on the rear face of each block there is formed a complementary groove 14 for the reception of the rib on an adjacent block. A suitable U-shaped steel bar 15 is imbedded in the top of a block and serves as a bail by which the block may be conveniently transported and handled. Additional bails, indicated at 16, are, or may be, imbedded in the sides of the block and in the rib 13 and have their projecting portions disposed in recesses. These bails are also employed to facilitate handling and positioning the blocks.

In erecting a groin on a sea beach a suitable initial abutment is first positioned on the beach, such abutment being illustrated as a large specially formed block of concrete, indicated at 17. The particular construction of this initial abutment or buttress is immaterial and in some instances the first block of the series of blocks forming the groin can be rested against the rock formation or high ground which may be present near the beach. Whatever structure is employed for the abutment or buttress is preferably arranged above the high water mark. The various blocks forming the body of the groin are then laid one against the other in contiguous relationship extending out into the ocean to a point preferably below the low water mark. In laying these blocks they are caused to assume the inclined positions shown in Fig. 1, and while the inclination may vary it is preferably such that the blocks may incline at an angle of between forty-five and sixty degrees to the vertical. The blocks are laid one after the other from the shore end outwardly until the groin is completed. In laying the blocks the ribs 13 are caused to enter the grooves 14 on the next forward blocks so that these ribs prevent lateral relative displacement.

After the blocks have been assembled in contiguous relationship, a bar or cable, indicated at 18, may be threaded through the bails 15, extending longitudinally of the groin. This bar or cable will form a loose tie connecting the various blocks but still enabling them to settle independently of each other.

The blocks are allowed to remain in this condition for a suitable length of time during which they will settle slightly into the sand. After the settling has been completed, a suitable concrete coping, indicated at 19, is, or may be, poured over the tops of the blocks binding them all together and causing the entire series of blocks to act as a monolithic structure. This coping may have its sides extended downwardly over the vertical portions 12 of the sides 11 and serves to cover over the projecting portions of the bails 15. Suitable reinforcing rods, indicated at 20, may be positioned in the coping 19 and caused to extend longitudinally therethrough. These reinforcing rods may be held in position and connected together by suitable ties 21, which may be passed over the cable or tie rod 18. At the same time the various recesses which are left exposed and in which the bails 16 are located may be filled with concrete so that the entire structure presents a neat and attractive appearance, and rusting of the steel is prevented.

It will be noted that the outer-most block presents an upwardly and rearwardly inclined outer surface so that waves or surf breaking on this surface will run upwardly thereon instead of pounding the blocks against each other. Whatever forces are exerted by the waves against the outer end of the groin urge the blocks against each other instead of tending to separate them. By virtue of the fact that the sides of the blocks are upwardly and inwardly inclined, waves breaking against the sides of the groin will flow upwardly on these inclined sides and the tendency to overturn the groin laterally is reduced to a minimum. This arrangement of the sides also causes the center of gravity of each block to be relatively low and thus overturning is effectively resisted.

The improved groin construction provides for flexibility in settlement by virtue of the fact that each block can settle independently of the others during the settling period. The presence of the tongues and grooves on the blocks renders the groin sand tight so that sand cannot be washed through between the blocks. During the settling period and in the event that the coping is permanently left off, it will be noted that the improved groin presents a serrated top so that the overpour of waves breaking over the groin will be effectively broken up.

By virtue of the fact that the blocks are of uniform size and shape and have upwardly converging sides and are laid in an inclined position, the improved groin presents serrated sides. This formation of the sides of the groin effectively breaks up the forces of waves running up and down the beach along side the groin, reducing any tendency to undermine it. The ability of each block to settle independently of others also assists in protecting the improved groin against being undermined.

It will be noted that the cross-sectional shape of each block corresponds to the cross-sectional shape of the finished groin so that in erecting the groin it is merely necessary to first prepare all of the blocks necessary and then lay them in position one after the other from the shore outward into the sea.

From the above described construction it will be appreciated that an improved groin construction is provided which is simple and which may be easily and quickly erected with a minimum amount of labor.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

We claim:

1. A groin or sea wall comprising a series of concrete blocks contiguously positioned, said blocks being upwardly and rearwardly inclined toward the shore, and having upwardly converging sides.

2. A groin or sea wall comprising a series of concrete blocks contiguously positioned, said blocks being upwardly and rearwardly inclined toward the shore, having rib and groove connections with each other to prevent lateral displacement, and having upwardly converging sides.

3. A groin or sea wall comprising a series of solid concrete blocks contiguously positioned, said blocks being of approximately the same shape and height and extending from substantially the top of the wall to the bottom thereof, each block presenting downwardly divergent sides and being rearwardly inclined toward the shore.

4. A groin or sea wall comprising a series of solid concrete blocks contiguously positioned, said blocks being of approximately the same shape and height and extending from substantially the top of the wall to the bottom thereof, each block presenting downwardly divergent sides and being rearwardly inclined toward the shore, there being rib and groove connections between the blocks preventing relative lateral displacement.

5. A groin or sea wall comprising a series of solid concrete blocks contiguously positioned, said blocks being of approximately the same shape and height and extending from substantially the top of the wall to the bottom thereof, each block presenting downwardly divergent sides and being rearwardly inclined toward the shore, bails embedded in

the tops of the blocks and projecting therefrom, and a coping poured over the tops of the blocks enclosing the bails and joining the blocks into a monolithic structure.

6. A groin or sea wall comprising a series of solid concrete blocks contiguously positioned, said blocks being of approximately the same shape and height and extending from substantially the top of the wall to the bottom thereof, each block presenting downwardly divergent sides and being rearwardly inclined toward the shore, bails embedded in the tops of the blocks and projecting therefrom, and a coping poured over the tops of the blocks enclosing the bails and joining the blocks into a monolithic structure, said coping having reinforcing rods extending through the bails.

In testimony whereof we have signed our names to this specification.

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WILFRED K. BARNARD.