Oct. 20, 1953 J. R. DALEY 2,655,790

MEANS TO DEPOSIT WATER-BORNE SAND

Filed Nov. 12, 1952

FIG-1

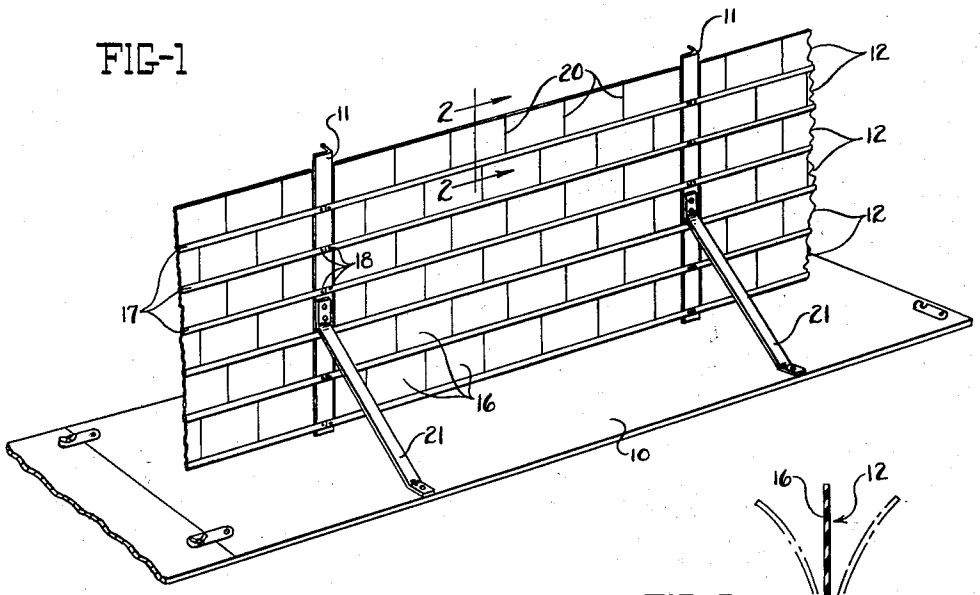


FIG-2

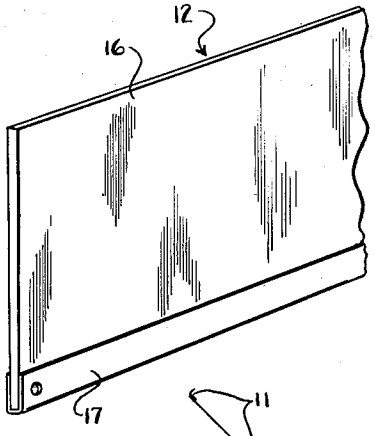
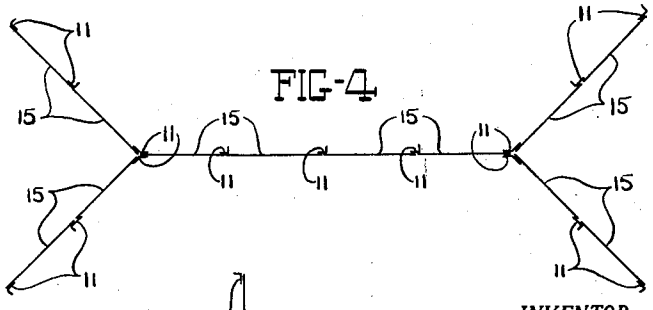


FIG-3

FIG-4



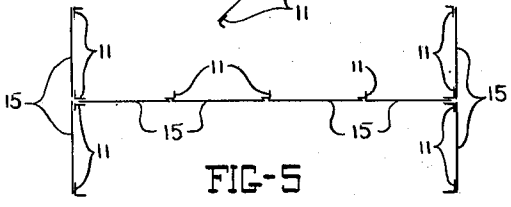


FIG-5

INVENTOR.
JAMES R. DALEY
BY Stanley McClark
ATTY.

Patented Oct. 20, 1953

2,655,790

UNITED STATES PATENT OFFICE

2,655,790

MEANS TO DEPOSIT WATER-BORNE SAND

James R. Daley, Amherst, Ohio

Application November 12, 1952, Serial No. 319,974

5 Claims. (Cl. 61—3)

1

This invention relates to means for depositing water-borne sand for the protection of beaches and banks from erosion.

The problem of protecting beaches and banks from erosion by waves and currents is one of long standing. Many attempts have been made to protect such beaches but the only complete success which has heretofore been obtained has been by the construction of heavy, massive, masonry breakwalls. In some cases attempts have been made to create protective sand bars by placing barriers in the path of the waves to slow up the water and cause the deposition of sand. These barriers have generally been unsuccessful because the water tends to scour out and undermine the foundations of the barriers, causing them to topple over and lose their effectiveness. Yet experience has shown that a natural sand bar provides the best protection against the destructive effects of the waves. For example, long stretches of the Massachusetts shore are protected by large natural sand bars standing well out from the shore which cause the waves to break and lose their force before they can drive onto the beaches and destroy them.

The object of the present invention therefore is to provide economical and effective means of producing such sand bars for the protection of beaches and the banks of streams which are subject to erosion.

Another object is to provide means for creating sand bars which takes the form of a permeable barrier permitting water to flow through it with equal ease in both directions.

Another object is to provide a barrier for creating sand bars which is economical to manufacture and which is easy to install in the desired locations, and which is readily adaptable to varying water depths and local current conditions.

Further objects and advantages will be more fully apparent from the following description of a preferred form of the invention, reference being had to the accompanying drawing in which:

Figure 1 is a perspective view of apparatus comprising a plurality of vanes embodying the present invention;

Figure 2 is a sectional view, on an enlarged scale, of one of the vanes of Figure 1, illustrating in dotted lines the manner in which the vanes are free to bend;

Figure 3 is a fragmentary view on an enlarged scale showing one of the vanes of the apparatus of Figure 1;

Figure 4 is a plan view showing diagrammatically a number of units, such as shown in Figure

2

1, arranged in a pattern effective for use; and

Figure 5 is a plan view showing diagrammatically another arrangement of a plurality of units such as shown in Figure 1.

The invention takes the form of a permeable barrier which permits the water to pass through the barrier with equal ease in both directions so that a sand bar will be built up on both sides of the barrier. The flow of the water through the barrier is directed upwardly to prevent any scouring action which usually occurs on the shore side of the prior art barriers. The upward flow of water causes it to lose velocity and to drop its suspended sand and gravel adjacent the barrier. Eventually the barrier is completely buried by the formation of the sand bar.

A preferred form of the invention comprises a base 10 having a plurality of upright supports 11 which are adapted to support a plurality of parallel vanes 12. For convenience, the portion of the apparatus, including a pair of adjacent uprights, together with the vanes extending between them, will be referred to as a unit. It is to be understood that as many units, each comprising as many vanes as are necessary, may be employed to provide the desired protection. For example, in Figure 4, four such units, each referred to as 15, are aligned to form the main protective barrier and an additional four units extend in pairs, as shown, each end of the main barrier, acting in a manner to stabilize the ends of the sand bar which is formed. Another arrangement is shown in Figure 5 but in this case only two units are shown at each end of the main portion. It will be apparent that these are only two of the possible arrangements of units embodying the invention. Both of the examples illustrated have proved successful but the final disposition of the units will in large part be dictated by the actual conditions of the water and currents which are encountered.

Each vane 12 comprises a flexible strip 16 of rubber, plastic or the like which is mounted along its lower edge in a longitudinally extending U-shaped metal clamp 17. If desired, the U-section 17 may be reinforced with an angle iron, not shown. The strip may be held within the strip 17 merely by clamping pressure alone but, if desired, rivets or other fasteners may be used. The vanes 12 are secured to the uprights 11 by bolts or rivets 18 extending through the clamping strips 17 and through the flanges of the uprights, which, in this particular example, take the form of angle irons. With this manner of mounting, the vanes are free to flex and bend

about the metal strips 17 as a hinge point. This flexing or yielding action permits water to pass readily through the barrier and at the same time impedes the water sufficiently to cause any sand which is suspended in the water to be deposited adjacent the base of the unit.

One of the features of the invention is that, by virtue of the vanes being hinged about their lower edges, the water passing through the barrier, in either direction, is directed upwardly away from the base of the apparatus. This deflection of the water upwardly prevents any scouring action which might otherwise undermine the base. Another advantage in having the vanes hinged at their lower edges is that a vane will continue to be flexible even though half buried in sand, whereas vanes hinged at their top edges become locked in place as soon as the bottom edge is buried. With the present invention each vane continues to function effectively until it is virtually completely buried.

In some cases it may be desirable to slit the flexible portions of the vanes vertically at intervals so as to give the vanes more freedom to flex and permit water to pass through. Such slits are indicated at 20 in the vanes of Figure 1.

The base 10 is shown in the present example as being of solid sheet metal. It may, however, take the form of a heavy screen or in some cases may merely comprise bars extending transversely to the uprights. The uprights, if necessary, may be braced as by the members 21, but again the manner of bracing is a matter of choice. Only six vanes are shown in the present example, but it will be apparent that the uprights may be extended and as many vanes as are necessary may be added.

Further modifications and changes will occur to those skilled in the art without departing from the spirit and scope of the present invention, the essential features of which are summarized in the appended claims.

I claim:

1. A barrier adapted to be positioned in the path of moving water to protect shores from erosion, comprising a support, a plurality of horizontal, parallel vanes of flexible material mounted on said support, said vanes having fixed bottom edges, and top edges free to move in either direction by flexing of the vanes, whereby water passing between said vanes will be directed upwardly and slowed in velocity to deposit sand adjacent the base of said vanes.

2. A barrier according to claim 1 in which said vanes comprise strips of flexible rubber-like material mounted along their bottom edges on relatively rigid metal supporting strips.

3. A barrier according to claim 2 in which said metal strips are secured to spaced upright supporting members secured to a base of substantial area.

4. A barrier according to claim 3 in which said vanes are slit vertically at intervals between said uprights from said free upper edges downwardly toward the said bottom edges.

5. A barrier according to claim 2 in which said metal strips are substantially U-shaped in section with the legs thereof clamping the faces of the strips immediately adjacent the bottom edges therebetween.

JAMES R. DALEY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
278,975	Koon	June 5, 1883
2,185,458	Giliasso	Jan. 2, 1940