United States Patent [19]

Appleton

[11] **3,903,702**

[45] **Sept. 9, 1975**

[54] **REVETMENT STRUCTURE**

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[22] Filed: **May 8, 1973**

[21] Appl. No.: **358,310**

[30] **Foreign Application Priority Data**

May 9, 1972 United Kingdom..... 21600/72

[52] **U.S. Cl.** **61/37**; 52/608; 404/41

[51] **Int. Cl.**..... **E02b 3/12**

[58] **Field of Search** 61/37, 38, 35; 404/34, 404/41, 39, 37, 29; 52/608, 609, 590

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[57] **ABSTRACT**

The invention provides a system of interfitting concrete units for surfacing revetments or other ground liable to erosion. Each unit is provided with cavities to retain earth on the finished surface and has a special outline shape such that opposite longitudinal sides are reflections of each other. This is claimed to avoid any tendency for the units to rotate when subjected to stresses in the finished structure. The units may optionally be provided with sockets into which dowels may be fitted to further prevent dislodgement of any one unit.

3 Claims, 6 Drawing Figures

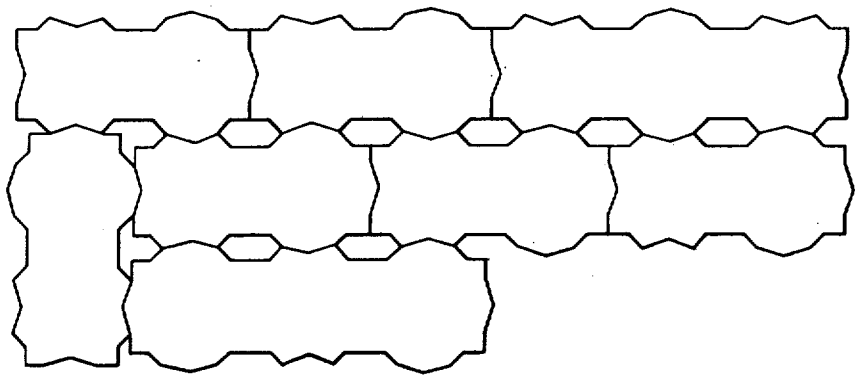


FIG. 1.

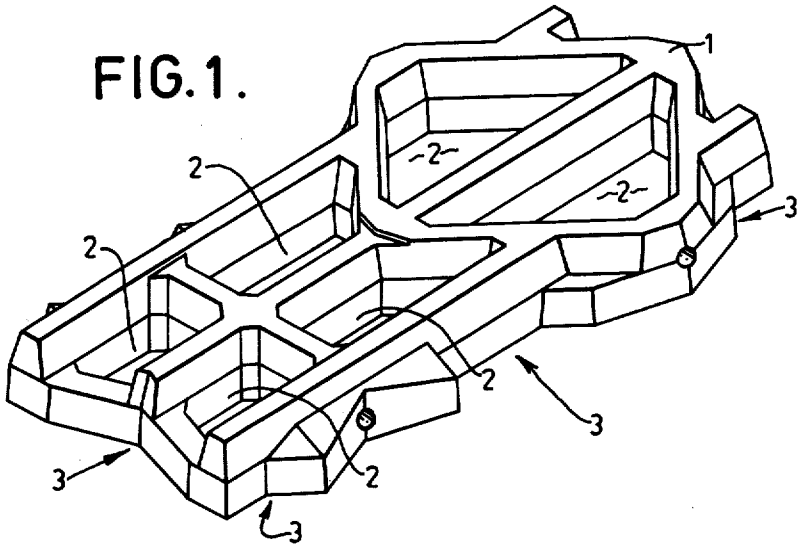


FIG. 2.

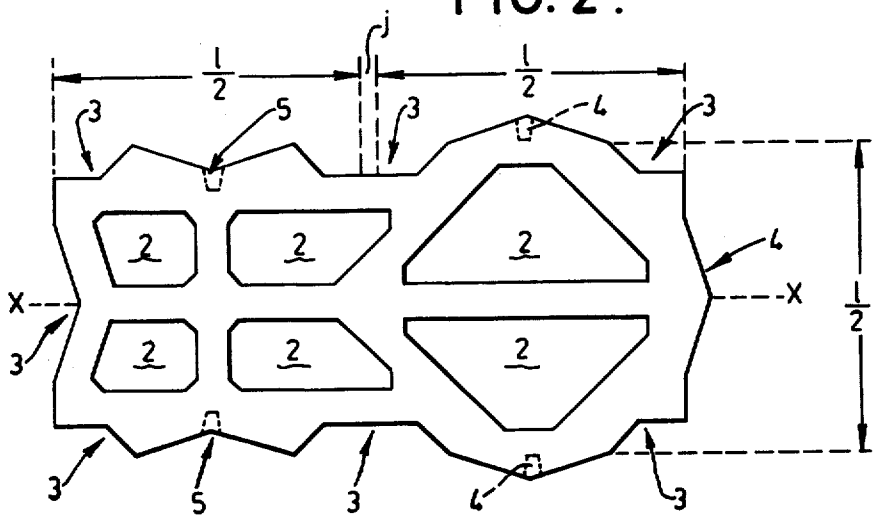
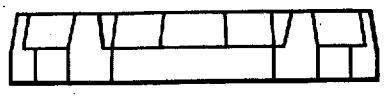


FIG. 3.



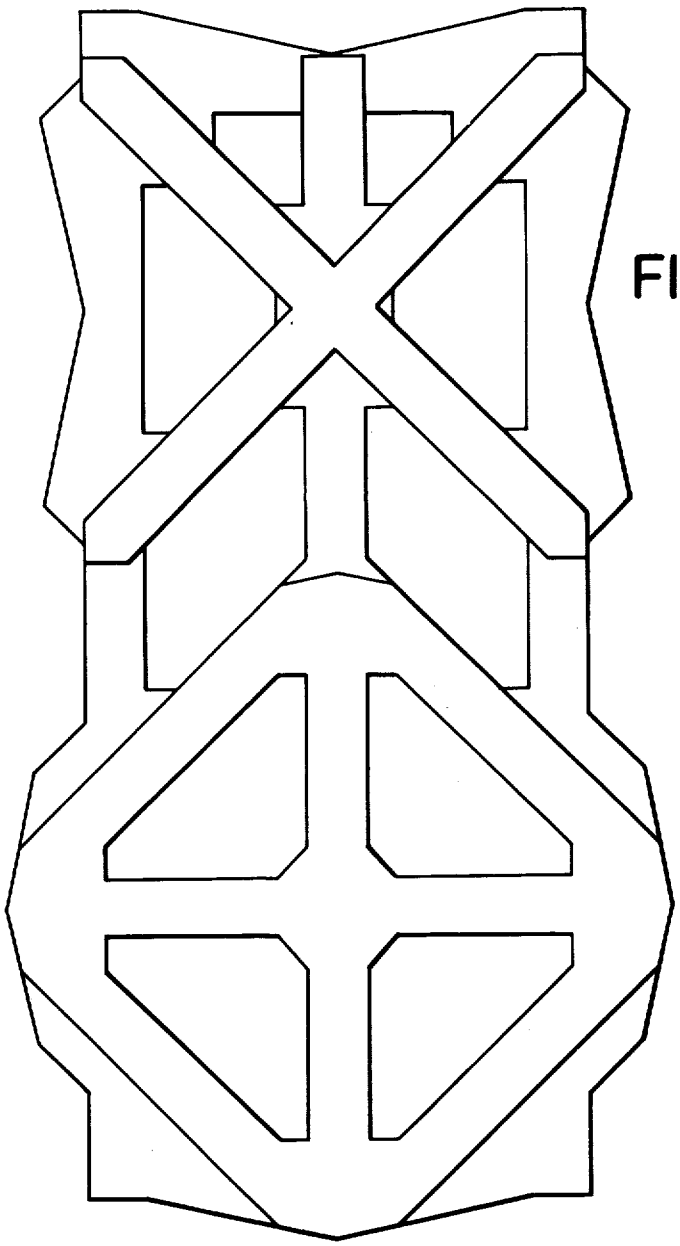


FIG. 4.

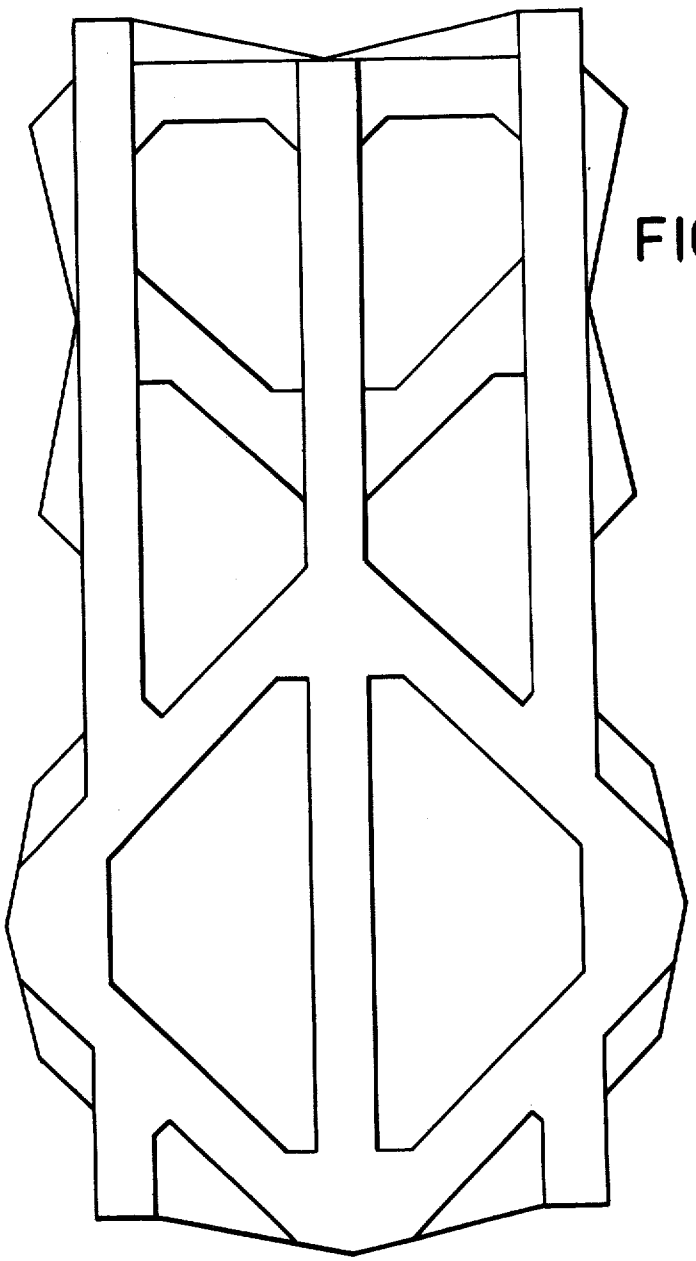


FIG.5.

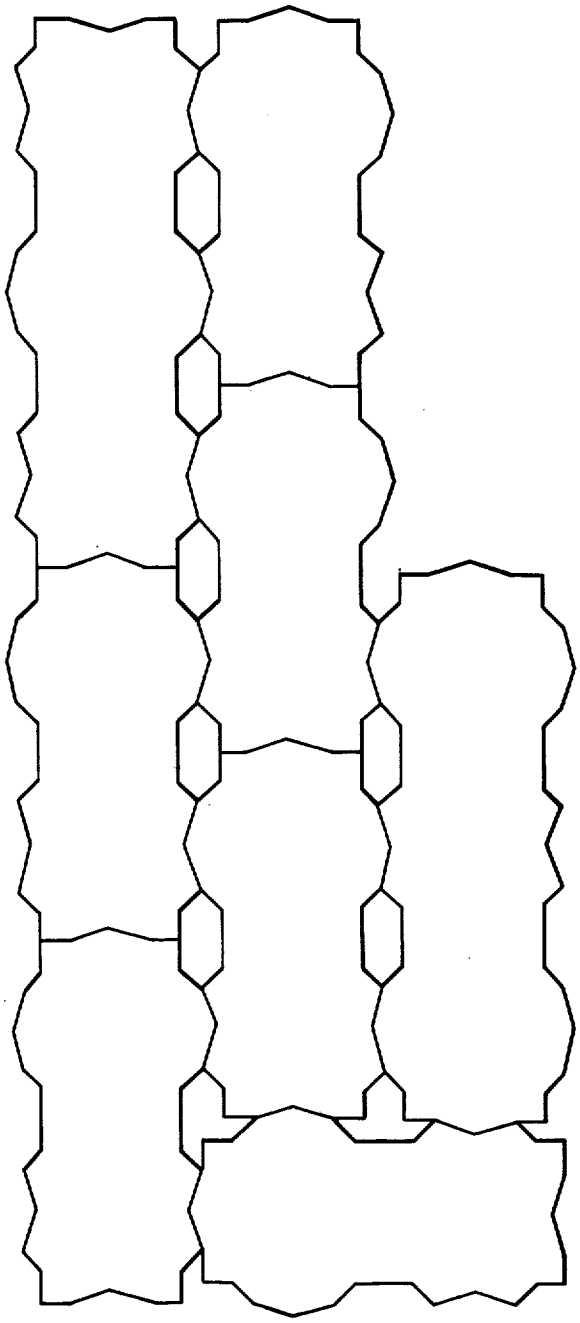


FIG. 6.

REVETMENT STRUCTURE

This invention relates to building materials suitable for the construction of revetments for the protection of slopes from erosion and for the formation of hardstandings and other earth surfacings, e.g. for vehicles.

It has previously been proposed to face ground surfaces with a matrix of interfitting masonry units provided with cavities which retain earth to give a natural appearance. Known interfitting units intended for this purpose have however, not found widespread demand and this is believed to be due to (a) high cost of manufacture (b) necessity for the costly process of grouting or otherwise fixing the blocks together to prevent dislodgement and (c) tendency for the blocks or joints between the blocks to dislodge or fracture during assembly or when the finished structure is subjected to shear forces in and perpendicular to the plane of the structure.

It is an aim of this invention to provide a novel combination of features which reduce the severity of the aforementioned problems and enable stable surfacings to be assembled quickly and inexpensively.

According to the invention, there is provided a masonry unit whose edges have laterally projecting and depressed recess portions arranged to interfit with corresponding portions on identical units to form an interfitting structure and which are formed with cavities to retain earth on the finished structure, one lingitudinal edge of the unit being a reflection of the other longitudinal edge about a longitudinal axis of the unit.

By providing opposite longitudinal edges as reflections of each other any tendancy for the block to rotate and become dislodged when subjected to shear forces is reduced.

The raised and depressed portions are preferably simple 'V' or 'U' shapes and are optionally provided with sockets adapted to receive linking members for transmitting forces between the units in a direction perpendicular to the plane of the finished structure thereby reducing the possibility of dislodgement. The Linking members may take the form of short dowels each tapered from a central position towards its ends and they fit into correspondingly tapered sockets in the masonry units.

A preferred construction is a concrete moulding formed by interconnected ribs defining cavities between them. By providing the ribs with a taper towards the upper or front faces of the units the area of concrete exposed on the finished surface after the cavities have been filled with earth is minimized. The tapered shape of the ribs also facilitates striking the units out of their moulds during manufacture.

Each longitudinal edge has a laterally projecting portion centrally located on one half thereof and a laterally recessed portion centrally located on the other half. This particular outline shape, the exact nature of which will become more apparent from the following description has been found to be particularly satisfactory with regard to forming a stable and flexible "mattress" on the ground surface.

By constructing the unit so that the shorter sides are approximately equal in length (after allowing for a joint thickness) to the said sections it is possible to assemble a revetment having some of the blocks at right angles to the others. This can be an advantage when finishing the edges of the revetment.

In order that the units may engage in a proper manner all the raised and depressed portions are of a similar shape which can advantageously be a shallow 'V' or 'U'. If a 'V' shape is used it preferably defines an angle within the range of about **140°** to **90°** for maximum strength combined with effectiveness in the transmission of shear forces.

The invention will now be particularly described by way of example with reference to the accompanying drawings in which:

FIG. **1** is a perspective view from above of an exemplary embodiment of the invention.

FIG. **2** is a view from underneath of the embodiment shown in FIG. **1**;

FIG. **3** is an elevation of the far end of the embodiment as shown in FIG. **1**;

FIG. **4** and **5** are plan views of alternative embodiments; and

FIG. **6** shows an assembly of blocks all constructed in accordance with the invention.

Referring to FIGS. **1, 2** and **3** there is shown a generally rectangular precast concrete unit whose top face **1** is defined by a latticework of interconnected slightly tapered ribs which serve to retain soil on the finished revetment. The exact formation of the ribs is not a critical feature and possible alternative designs are shown in FIGS. **4** and **5.**

Cavities **2** are provided between the ribs with further spaces **3** on the longer edges and corners of the unit. These spaces **2** and **3** all extend through the entire thickness of the unit.

Lateral projections **4** and depressions **5,** all have a similar 'V' shape are spaced around the unit as shown and it is notable that the basic outline is symmetrical about the longitudinal axis X — X (see FIG. **2**). In particular the longitudinal edges of the unit are reflections one of the other about the X — X axis. This symmetry enables identical units to be assembled in staggered relationship and also reduces tendency for the unit to turn when subjected to stresses in the finished structure.

Each of the two longer sides can be divided into two sections of length ½ plus a joint thickness *j* between the two sections as shown on FIG. **2** and this dimension (½) is equal to the length of each of the shorter sides. The advantage of this will be apparent from FIG. **6** which shows how one of the units can be fitted at right angles to the others. It should be noted that FIG. **6** is intended only to show the laying pattern of the blocks and does not show the internal cavities.

It is not essential for the spaces or cavities between the ribs to penetrate completely through the units and in one possible construction the spaces extend only through one quarter of the thickness of the unit.

As will be seen from FIGS. **1** and **2,** each laterally projecting and laterally recessed portion **4** and **5** is provided with a socket in the form of a small tapered hole. To give improved stability in the finished structure small dowels (not shown) of nylon or other similar synthetic material are inserted into these sockets during assembly. The dowels are tapered to co-act with the taper of the sockets and may be constructed so as to separate each block slightly from the next to give added flexibility.

What we claim is:

1. A revetment or earth facing structure laid directly on the earth comprising a plurality of interfitting units

to form a flexible mattress and including means defining cavities therethrough which are filled with said earth to stabilize and retain said revetment on said earth, said units being similar to one another, said units interlocking after assembly to substantially minimize rotative shifting of units adjacent any units subjected to a rotative, shifting force caused by earth movement, each of said units being of generally rectangular configuration and being formed by a series of interconnected ribs which taper towards the upper face of said unit, said unit having two parallel longitudinal edges and a central longitudinal axis, each of said edges having a projection centrally located on one half thereof, a recess, similarly dimensioned, centrally located on the other half thereof and a space provided between each projection and recess to form cavities between said units assembled into a revetment said unit having a total length of twice its breadth plus a relatively small allowance for joint thickness, each projection having sides which slope to a point of the projection farthest from the axis, each recess having sides which slope to a point of the recess nearest the axis, the projections and recesses interfitting with recesses and prpjections respectively of identical units to form said revetment, the projections and recesses on one said edge being reflections in the axis of the projections and recesses respectively of the other edge, the projections and recesses of said each of said units being provided with sockets receiving linking members for transmitting forces between adjacent units in a direction perpendicular to the plane of said revetment, whereby any heaving or shifting in the earth with resultant movement of units adjacent any one unit will cause substantially only non-rotative shifting of such one unit thereby substantially negating breaking up of the interfitting structure of the identical units forming said revetment.

2. A Revetment Structure according to claim 1 in which the projections and recesses are 'V' shaped.

3. A Revetment Structure according to claim 1 in which the projections and recesses are 'U' shaped.

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