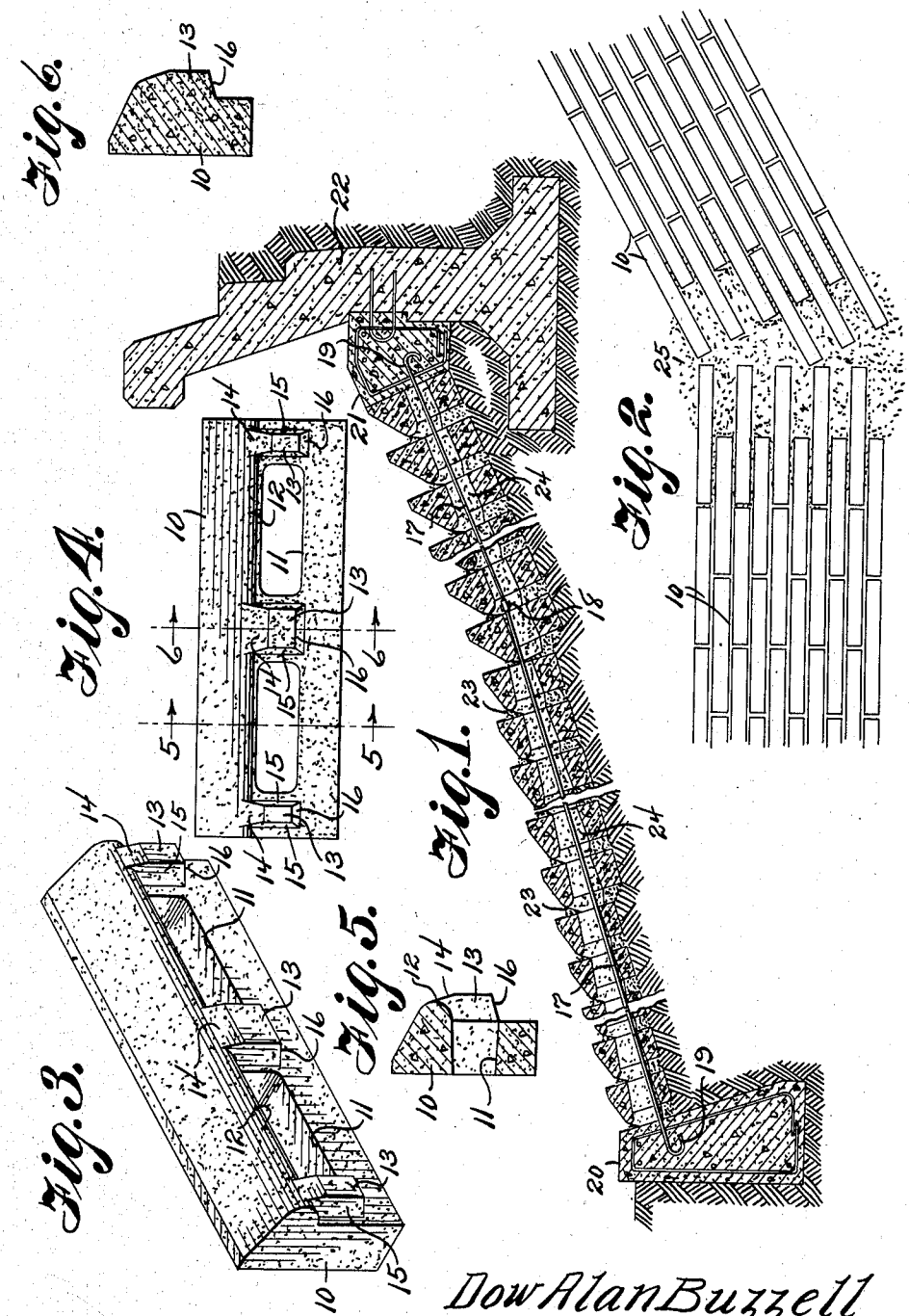
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CONCRETE RIPRAP

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CONCRETE RIPRAP

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3 Claims. (Cl. 61—37)

This invention relates to concrete ripraps and has for an object to provide precast units of such shapes and sizes that interlocking bars may be passed through orifices in the units formed to receive them.

A further object is to provide a precast unit having separators or spacers which serve to properly space the units one from another and provide drainage spaces between the units.

A further object is to provide a precast unit having an overhanging bulge or lip which promotes control of the free drainage spaces between the units.

A further object is to provide a unit of this character which may be formed in a single piece, which may be inexpensive to manufacture and assemble and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawing forming part of this specification:

Figure 1 is a longitudinal sectional view of a riprap formed of units constructed in accordance with the invention.

Figure 2 is a plan view of a riprap showing diagrammatically the joint at a corner thereof.

Figure 3 is a perspective view of one of the units showing the lip, spacers and passages therethrough.

Figure 4 is a front elevation of the unit shown in Figure 3.

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 4, through one of the openings or passages of the unit.

Figure 6 is a cross sectional view taken on the line 6—6 of Figure 4 showing one of the spacers.

Referring now to the drawing in which like characters of reference designate similar parts in the various views, each unit of the riprap is precast of concrete asphaltic or ceramic material and comprises a body 10 of substantially rectangular cross section. The body is provided with a pair of spaced substantially rectangular openings 11 extending through the front and rear faces thereof. A bulge ledge or lip 12 projects forwardly from one face of the body at the top thereof and is of rounded contour in cross section, as best shown in Figure 5. A plurality of spacers 13 are formed integral with the body below the lip, these spacers being in the form of lugs, one of which is disposed between the openings 11 and the other two of which are disposed at the ends of the openings 11, as best shown in Figure 3.

The spacers 13 project slightly beyond the lip 12 and extend downwardly to substantially the bottom walls of the openings 11, as best shown in Figure 5. The top 14 of each spacer is cut away obliquely to merge with the lip 12 and the sides and bottom of each spacer are beveled as shown respectively at 15 and 16 in Figure 4.

The riprap is formed at the desired location of the precast units by assembling the units in rows on the ground to be protected with their openings 11 in registration with each other thus providing passages from the upper end to the lower end of the riprap as best shown in Figure 1. Through these passages steel reinforcing rods 17 are engaged and the inner ends of the rods are connected by suitable couplings 18. The outer ends 19 of the rods are imbedded respectively in a conventional toe wall 20 and in the conventional stirrup 21 of a conventional wave wall 22.

Gravel is poured in the spaces between the units as shown at 23. Gravel is poured, as shown at 24, in the aligned openings 11 of the units and around the reinforcing rods 17.

The spacers 13 space the units from adjacent units a sufficient distance to provide free drainage, through the gravel, between adjacent units.

As best shown in Figure 2, when the riprap is formed of units arranged at an angular inclination to each other to follow around curves and irregularities, an anchor 25 of concrete is poured around the confronting ends of the units.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What I claim is:

1. A riprap unit comprising an elongated body of precast material having a plurality of longitudinal openings therein, an integral lip extending longitudinally of the entire length of the body and projecting forwardly from one face of the body at the top thereof and of rounded contour in cross section, and a plurality of spacers formed integral with the body below the lip and disposed to extend from the lip to the bottom walls of said openings at the ends of said openings.

2. A riprap unit formed of precast material comprising an elongated body having a row of substantially rectangular openings therethrough,

a lip extending longitudinally of the entire length of the body and projecting forwardly from one face of the body at the top thereof and of rounded contour in cross section, and a plurality of spacers formed integral with the body below the lip, said spacers extending downwardly from the lip between the ends of the openings and terminating adjacent the bottom walls of the openings, the top of each spacer being cut away obliquely to merge with the lip, the sides and bottom of each spacer being beveled.

3. A riprap comprising a plurality of units of precast material having registering longitudinal openings, lips extending longitudinally of the units and projecting forwardly from one face, spacers formed integral with each unit below the lip and disposed to extend from the lip to the bottom walls of said openings, gravel poured in the spaces between the units and in the aligned openings of the units, and longitudinally extending reinforcing tie rods extending through the aligned openings in the units.

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