FIG. 1

FIG. 2

FIG. 3

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Fig. 4

Fig. 5

Fig. 6

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The present invention relates to floats for mooring small craft, and more particularly to mooring float assemblies having float units cast from lightweight concrete.

In tidewaters and in lakes and rivers where the water level is subject to daily or seasonal changes it has been found more practical to moor small craft at floating moorings which will rise and fall with the changes than to moor them at piers. A variety of flotation means have been used for such moorings including logs, fiber-glass-covered plywood, boxes, blocks of styrofoam, hollow concrete pontoons, etc. Of the various materials so used it is generally conceded that concrete is the most durable since it is impervious to fungi, borers, corrosion and chemicals. Its primary liability, and namely its weight, has to considerable extent been overcome by the use of lightweight aggregates such as perlite, pumice, expanded shale and expanded clay.

I have recognized that a successful use of lightweight aggregate in floats requires a consideration of the fact that about one-half of the float body is immersed in water, and thus will remain in a moist condition, while the upper half is dried out eventually by exposure to wind and sun regardless of how much curing compound is used. While it is considered that concrete made with expanded shale aggregate up to fifteen gallons per cubic yard more water than regular hard aggregate (sand and gravel) concrete, and other lightweight aggregates require even more, it is clear that the dehydration that does not occur will not be sufficient to cause a noticeable difference in properties.

Consequently, in the past the resulting variances in shrinkage above and below the water line have caused stresses which invariably climax in cracking. This problem is even more acute when the float is a monolithic casting. Since mooring floats are subject to various stresses and strains from heating and twisting in waves and from boat impact, they must be of sturdy construction and should not be weakened by shrinkage cracks.

Accordingly, the present invention aims to provide a practical mooring float of lightweight concrete which is not susceptible to shrinkage cracking.

In the accompanying drawings:

FIG. 2 is a transverse vertical section view taken along the line 2-2 of FIG. 1.

FIG. 3 is a side elevational view of a reduced scale illustrating the juncture of two of the float units.

FIG. 4 is a fragmentary detail transverse vertical sectional view taken as indicated by the line 4—4 of FIG. 3.

FIG. 5 illustrates a modified doubler arrangement and as is taken in the same manner as FIG. 4.

FIG. 6 is a detail longitudinal sectional view of the joint between float units with the amount of flexure being exaggerated for clarity of illustration.

Referring to the drawings it is seen that the float unit of my invention is designated 10 and is a boxlike monolithic casting with open top divided by a partition 11. The entire lightweight concrete casting is reinforced by galvanized wire mesh 12 and in addition a deformed steel reinforcing bar 13 for resisting rim twist extends around the upper rim. Precast slabs 14 also reinforced by wire mesh are bedded in asphalt 15 spread on the rim of the float so that the slabs serve as a watertight cover or deck.

It should be particularly noted that the longitudinal side walls 16 and end walls 17 of the float taper gradually from a relatively thin bottom 18 to a considerably thicker vertically-faced upper rim portion 19. For ease of core withdrawal during the casting operation the taper is given to the outside walls of the float while the inside walls are vertical. The merit of the float taper is that when the out-of-water portion eventually dries out and shrinks, the stresses are better dispersed. Furthermore, the thick upper rim is desirable to withstand the impact of boats moored alongside while tapering the sides toward the bottom reduces the total weight of the float.

A pair of side stringers 20 of wood are bolted against the outer faces of the rim 19 of the float by tie rods 21 which pass laterally through the entire float. These stringers project above the float rim as great as might be and boat impact guards for the deck slabs 14, and they cantilever longitudinally of the float by end extensions. Additional precast slabs 14a are located at the stringer ends and rest by their inner ends directly on the float rim while having their outer ends seated on transverse members 22. Bolts 23 secure these members 22 onto cross braces 24 which are in turn held by bolts 25 against the underside of the stringers 20.

When several of these floats are secured together to form a continuous string of floats the stringers 20 should not bend or else the deck slabs may be loosened from the asphalt bedding and start to rock or vibrate in the corners. Accordingly, I provide a flexible joint which will take all of the bending leaving the stringer ends straight and rigid. This flexible joint comprises butt doublers 26 of bending oak or other suitable material which are secured to the stringers by bolts 27.

The cross-sectional area of the doublers 26 must be sufficiently smaller than that of the stringers 20 to insure that flexure between floats will be taken by the doublers as shown in FIG. 6 and not by the projected end extensions of the stringers. It should be recognized that the strain on the doublers 26 is not as great as might be expected. This is due to the fact that the stringer extensions act as levers to reduce the force of the floats rising or twisting with the waves. If the deck slabs are particularly large, side support for the slabs 14a can be obtained as shown in FIG. 6 from modified doublers 26a which extend up to the desired bottom level of the slabs.

The invention and the manner of its employment is believed to be clear from the foregoing detailed description of my now-preferred illustrated embodiments. Changes in the details of construction will suggest themselves and may be resorted to without departing from the spirit of the invention, wherefore it is my intention that no limitations be implied and that the hereto annexed claims be given a scope fully commensurate with the broadest interpretation to which the employed language fairly admits.

What I claim is:

1. A mooring float assembly, a lightweight concrete monolithic hollow float open at the top and having tapered side walls which widen at the top, the taper of said side walls being external of the float, a pair of wood stringers secured at opposite sides of said float, the said stringers secured at opposite sides of said float and extending up-
wardly above the top level of said float, said stringers projecting endwise beyond said float at both ends and having cross-connecting members at their free ends, end deck slabs between said stringers resting on said float and said cross-connecting members, and deck slabs between said stringers intermediate said end slabs and resting on said float to cover the open top thereof.

3. The structure of claim 2 in which the side walls of said float slope outwardly toward a thickened rim portion against which said stringers butt.

4. The structure of claim 3 in which said stringers are secured to the float by tie rods which fully traverse the float and extend through said thickened rim portion into the stringers.

5. The structure of claim 2 in which doublers are secured to said stringers below said end slabs and project endwise beyond the stringers for connection to the stringers of another such mooring float assembly, said doublers having less resistance to flexure than said stringers.

References Cited in the file of this patent

UNITED STATES PATENTS

1,457,006  Simpson  May 29, 1923
1,779,880  Holzmann  Oct. 28, 1930
2,391,059  MacFarren  Dec. 18, 1945
2,857,872  Uzab  Oct. 28, 1958

FOREIGN PATENTS

932,431  Germany  Sept. 1, 1955