

PATENT

Floating structure having high stability

DESCRIPTION

The novel floating structure is composed of a number of modular elements (Fig. 1) linked to each other. Modular composition allows one to give the structure the length required by the specific needs to be satisfied. Typical applications of the innovative floating structure are: landing stages, pedestrian or cycle paths on stretches of water, and in general works aimed at allowing movement of people, goods and/or vehicles between points of a stretch of water (a seaside or lake one) by using floating structures. Each module, 10-15 m long, is kept afloat by the Archimedes force on its submerged parts (i.e., the so-called *hulls*), that in the innovative structure is always higher than the module total weight (mass displacement). The module is restrained in the chosen location by moorings and links to the adjoining modules (Fig. 2).

The innovation introduced is that, unlike floating structures usually employed (as, for instance, that of Fig. 3), the hulls are placed at a depth of a few metres, in order to keep them always fully submerged despite free surface fluctuation due to wave motion. As a result, the Archimedes force keeps constant even in choppy sea condition, so improving structure stability. Higher structure stability was shown by tests on physical models carried out at the Laboratory of Maritime Engineering of the Department of Civil, Environmental, Aerospace and Materials Engineering (DICAM) of the University of Palermo.

ADVANTAGES

Higher stability of the floating structure, in practice, turns into noticeable mitigation of heave, pitch and roll, the typical movements of the traditional floating structures, which in the novel structure are due only to in-depth water stir (i.e., to the turbulence) but not to the free surface fluctuation.

This important characteristic, with respect to the structures commonly used, allows: 1) the innovative floating structure to be used even in less sheltered water, provided the stretch of water is not exposed to heavy sea, and (2) a longer yearly time of use.

Moreover, the possibility to construct the structure by lighter modules that can be easily disassembled (as in a few structural sketches considered by the inventors) allows easier land transport and possible warehousing of the module parts during downtime.

SUGGESTED APPLICATIONS

The main fields of employment of the innovative structure are: 1) landing stages for limited tonnage boats, typically pleasure and fishing boats; 2) gangways for crossing of stretches of water; 3) floating paths for promenade and free-time or competitive sport activities (such as running, cycling, etc.); 4) other situations where reaching of a point inside a stretch of water, on foot or by “terrestrial” vehicles, is required. The peculiar characteristics of the novel floating structure, with respect to the traditional-type structures, allow its wider employment in terms of use in less sheltered stretches of water and working season lengthening.

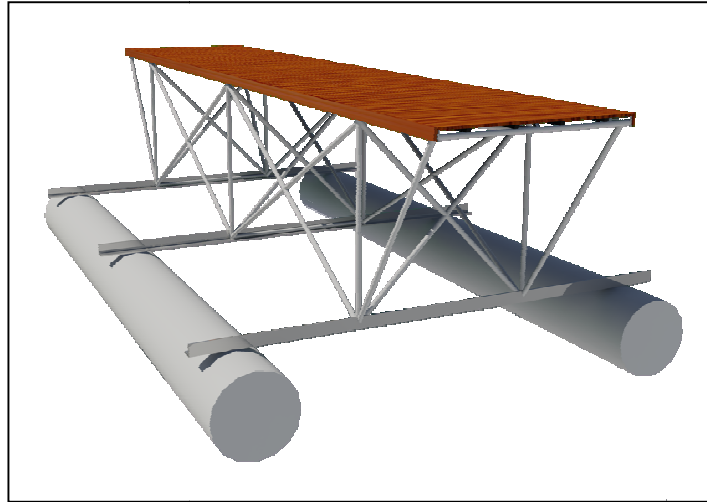


Figure 1 - Module of the innovative floating structure.

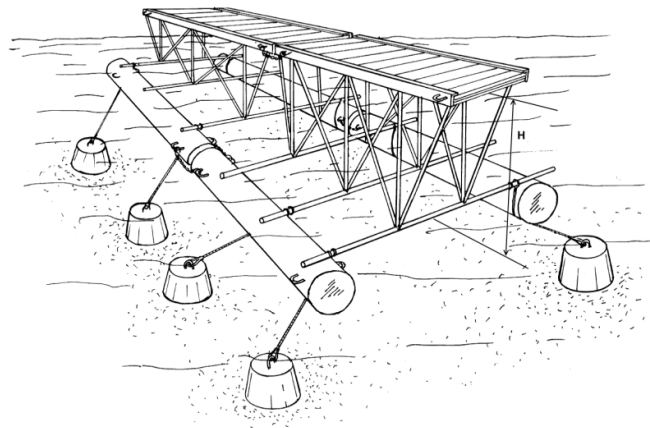


Figure 2 - Module restraining in the chosen location by moorings anchored to the bed.



Figure 3 - Example of a traditional landing stage, in this case having three transversal hulls on which the trampling floor stands.