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FLOATING STATION

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Fig. 1.

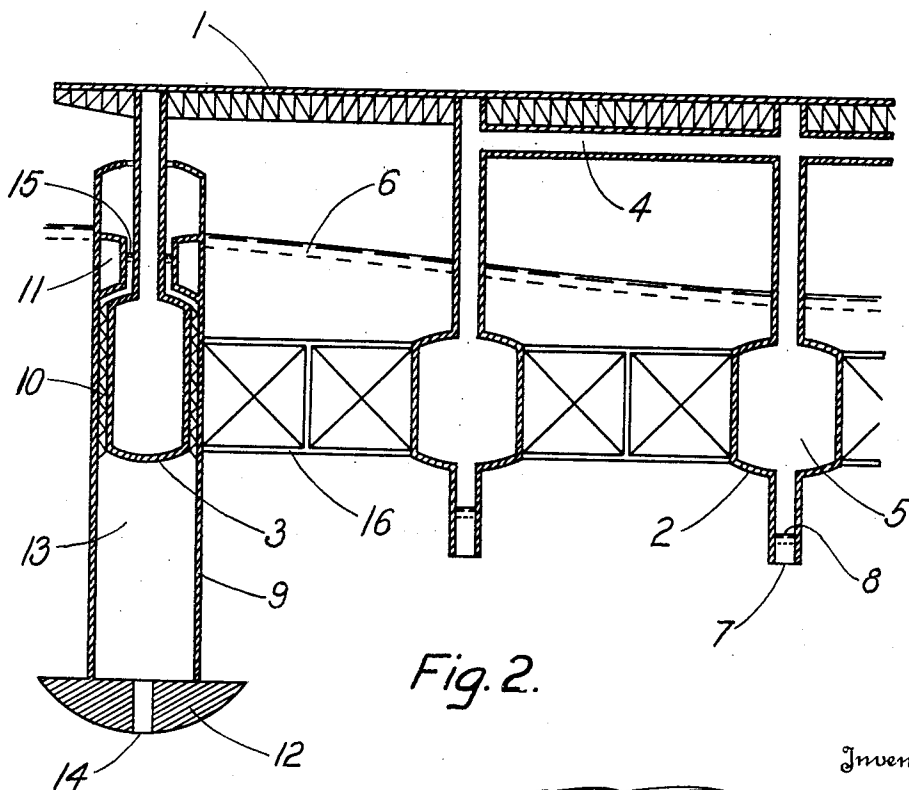
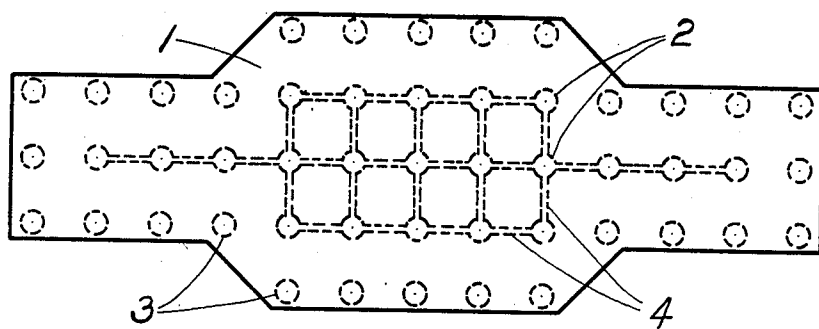


Fig. 2.

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FLOATING STATION

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My invention relates to improvements in floating stations for aircraft, watercraft, communication establishments, meteorological establishments, and other purposes. The objects of my invention are to increase the stability and decrease the cost of such stations.

I attain these objects by the methods and apparatus hereinafter described; an exemplary station embodying such apparatus and adapted to the employment of said methods being illustrated in the accompanying drawing, in which—

Figure 1 is a plan view of the station, in which the location of the supporting floats and the pressure-equalizing conduits are shown by dashed lines; and Fig. 2, a vertical section to an enlarged scale through the centers of three supporting floats two of which are connected by a pressure-equalizing conduit.

Similar numerals refer to similar parts throughout both views.

The deck 1 is supported by the equal-pressure floats 2 and the stabilizing floats 3, the former being those shown as connected by the pressure-equalizing conduits 4, and the latter those not so shown. The interior chambers 5 of the equal-pressure floats 2 are connected with the outside water 6 by the openings 7, which may be located at such depth as to reduce to any desired degree the influence thereon of waves and other surface disturbances. These chambers 5 contain compressed air, and are interconnected by the pressure-equalizing conduits 4. In case the water surface 8 in the chamber 5 of one float 2 rises above or falls below the water surface in the chamber of another, due to the influence of waves or otherwise, the said compressed air flows through the pressure-equalizing conduit 4 from the one chamber to the other, or vice versa, so as to equalize or tend to equalize the pressures in the said chambers, and hence the support afforded by the equal-pressure floats 2 to the deck 1.

If the deck 1 were supported only by floats of the type of the equal-pressure floats 2, the station would be unstable against overturning under the influence of heavy eccen-

tric deck loads, and would sink if the compressed air in the chambers 5 should accidentally escape. In order to overcome these conditions, and to add to the stability of the station, the stabilizing floats 3, which are sealed against entry of the outside water 6, are used. The shields 9 are connected to these stabilizing floats 3 by the latticing 10 or other suitable means, and are supported by such latticing and by the buoyancy of the float chambers 11 with which they are provided. These shields 9 are provided at their bottoms with the ballast weights 12, and their interior enclosures 13 communicate with the outside water 6 only through the bottom openings 14, which are at such depth as to be below the influence of waves or other surface disturbances, or at such depth that such influence is only of such magnitude as is deemed tolerable. Therefore, notwithstanding any waves or other surface disturbances, the water surface 15 within the shields 9 remains at a constant or tolerably constant elevation. Accordingly, the stabilizing floats 3, which float in the undisturbed or only moderately disturbed water within the shields 9, are uninfluenced or only tolerably influenced by any waves or other surface disturbances; and the support afforded by the stabilizing floats 3 to the deck 1 remains constant or tolerably constant.

The stability of the individual floats against overturning is provided by the following three elements: first, the bracing 16; second, the ballast weights 12; and third, the rigidity of the connections between the floats and the deck 1.

It will be understood, of course, that various changes and modifications may be made in the form, details, arrangement, and proportions of the parts of the structure described above without departing from the scope of my invention. For example, if preferred: The shape, proportions, number, spacing, arrangement, and disposition of the equal-pressure floats 2 and of the stabilizing floats 3 may differ from that shown, or either the equal-pressure floats 2 or the stabilizing floats 3 may be eliminated entirely. Features of the equal-pressure floats 2 and the

stabilizing floats 3 may be combined in single floats, as, for example, (a) by providing a single float with both a closed chamber and an open-bottomed chamber, the former being located either within or without the latter, and the latter being connected by pressure-equalizing conduit with open-bottomed chambers of other floats; or (b) by providing shields 9 for the equal-pressure floats 2 or the combination floats described under (a) above. Provision may be made for adjusting the buoyancy of the floats 2 and 3 by the addition or removal of water or other ballast to or from any appropriate part or parts thereof, either by means of compressed air working against a water surface or otherwise. Any other suitable fluid may be used in place of the air in the chambers 5. Ballast weights may be added at the bottom of the equal-pressure floats 2. Two or more floats may float within and be protected by a single shield 9. Either the latticing 10 or the float chambers 11 may be eliminated; if the latticing is thus eliminated, the shields 9 will float separately from, rather than be fixed to, the stabilizing floats 3, being free to move vertically with respect to said floats. Any one or two of the three elements which provide the individual floats with stability against overturning may be eliminated, and the remaining two or one be made to provide such stability. The pressure-equalizing conduits 4 may be located either above or under water; may convey either air, water, or any other suitable fluid; may be utilized also as parts of the bracing 16 or other bracing; may be provided with valves; may be multiple, individual ones connecting only certain ones or certain groups of the equal-pressure floats 2; and may include a manifold or manifolds connected to all, certain ones, or certain groups of the equal-pressure floats 2. The ballast weights 12 and the openings 7 and 14 may vary considerably as to number, size, shape, disposition, and location. Suitable bracing may be provided in the floats 2 and 3; the shields 9, and elsewhere as structurally desirable.

Among the advantages of my invention are the following: In view of the large number and wide variation in the locations of the equal-pressure floats 2, they will be located at any given time at varying positions with respect to wave crests and troughs. Accordingly, the pressures at the bottom openings 7 of these various floats 2 will differ widely one from another, and the average of such pressures will remain approximately constant at the value corresponding to that which would exist were the water waveless. Since the conduits 4 equalize the pressures within the various equal-pressure floats 2, the pressures within each of these floats, and hence also the buoyancy of each, will remain tolerably constant at approximately the value

which would exist were the water waveless. Similarly, as pointed out above, the shields 9 maintain the elevation of the water surface 15 in which the stabilizing floats 3 float tolerably constant at approximately the elevation at which the surface of the surrounding water would stand were it waveless. Accordingly, my invention eliminates or reduces to within tolerable limits vertical movement of the supporting floats 2 and 3, and differences between and variations in the support afforded by the floats to the deck 1. This in turn reduces or eliminates vertical movement of the deck 1, and lessens the necessary structural strength, weight, and cost of all parts of the station.

Since the shields 9 cause the elevation of the water surface 15 in which the stabilizing floats 3 float to remain tolerably constant, and the conduits 4 eliminate or tend to eliminate variations in the buoyancy of the equal-pressure floats 2 with fluctuations in the elevation of the surrounding water surface, the horizontal cross-sectional area of the floats at and in the vicinity of the water line may be made large without thereby subjecting them to intolerably large fluctuations in their buoyancy. Therefore it is not necessary to reduce such cross-sectional area in the vicinity of the water line in order to lessen the influence of waves, and accordingly the required displacement of the floats may be obtained at a relatively high elevation, thereby lessening the necessary length, size, weight, and cost of the floats.

The shields 9 do double duty in that they serve both as wave-eliminating shields to the stabilizing floats 3 and as supports for the ballast weights 12, thus economizing in material, weight, size, and cost.

All the above-noted and other savings in weight which my invention makes possible in various parts of the station also serve, of course, to correspondingly reduce the necessary buoyancy which must be provided, and hence the necessary size, weight, and cost of the supporting floats. Such savings thus work around in a circle,—each saving effected making possible others, which in turn make possible still others, etc. And all savings in weight of course make possible corresponding savings in cost.

I claim:

1. A floating station comprising a plurality of open-bottomed floats connected by pressure-equalizing conduits, a plurality of floats each provided with means to insulate it from the influence of disturbances in the surrounding water, and a deck supported by all of said floats.
2. In a floating station, the combination of a supporting float and means to insulate it from the influence of disturbances in the surrounding water.
3. In a floating station, the combination

of a supporting float, and a shield fixed thereto and adapted to insulate it from the influence of disturbances in the surrounding water.

- 5 4. In a floating station, the combination of a supporting float, and a shield floating movably with respect to the float and adapted to insulate it from the influence of disturbances in the surrounding water. 70
- 10 5. In a floating station, the combination of a supporting float and a shield surrounding it, said shield being open to the surrounding water only at depths at which the influence of surface disturbances is tolerably small. 75
- 15 6. In a floating station, the combination of a supporting float, and a shield surrounding and fixed to it; said shield being open to the surrounding water only at depths at which the influence of surface disturbances is tolerably small. 80
- 20 7. In a floating station, the combination of a supporting float and a shield surrounding it; said shield floating movably with respect to the float and being open to the surrounding water only at depths at which the influence of surface disturbances is tolerably small. 85
- 25 8. In a floating station, the combination of a supporting float, means fixed thereto adapted to insulate it from the influence of disturbances in the surrounding water, and a ballast weight attached to the lower end of said means. 90
- 30 9. In a floating station, the combination of a supporting float; a shield surrounding and fixed to the float, said shield being open to the surrounding water only at depths at which the influence of surface disturbances is tolerably small; and a ballast weight attached to the lower end of said shield. 95
- 40 10. In a floating station, the combination of a plurality of supporting floats open to the water at their bottoms, and means to equalize the pressures therein. 105
- 45 11. In a floating station, the combination of a plurality of supporting floats open to the water at their bottoms, and conduits connecting the interior chambers of said floats. 110
- 50 12. In a floating station, the combination of a plurality of supporting floats containing compressed air and open to the water at their bottoms, and means to equalize the pressures therein. 115
- 55 13. In a floating station, the combination of a plurality of supporting floats containing compressed air and open to the water at their bottoms, and conduits connecting the compressed air in the various floats. 120
- 60 14. The method of abating differences between and fluctuations in the buoyancy of the supporting open-bottomed floats of a floating station due to disturbances in the water, which consists in approximately equalizing the pressures in the various floats. 125
- 65 15. The method of abating differences between and fluctuations in the buoyancy of the supporting open-bottomed floats of a floating station due to disturbances in the water, which consists in conveying compressed air from the interior of one float to that of another. 130
16. The method of abating differences between and fluctuations in the buoyancy of the supporting open-bottomed floats of a floating station due to disturbances in the water, which consists in conveying compressed air from the interior of one float to that of another. 70
17. The method of abating differences between and fluctuations in the buoyancy of the supporting floats of a floating station due to disturbances in the water, which consists in shielding them from the influence of such disturbances. 80
18. The method of abating differences between and fluctuations in the buoyancy of the supporting floats of a floating station due to disturbances in the water, which consists in shielding the water in which they float from the influence of disturbances in the surrounding water. 85
19. The method of abating differences between and fluctuations in the buoyancy of the supporting floats of a floating station due to surface disturbances in the water, which consists in insulating the floats from the surrounding surface water. 90
20. The method of abating differences between and fluctuations in the buoyancy of the supporting floats of a floating station due to surface disturbances in the water, which consists in insulating the water in which they float from the surrounding surface water. 100

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