Nov. 7, 1933. E. W. McVITTY 1,933,597

FLOATING HARBOR FOR AMPHIBIANS, FLYING BOATS, AND SEAPLANES

Original Filed May 28, 1930

Fig. 1.

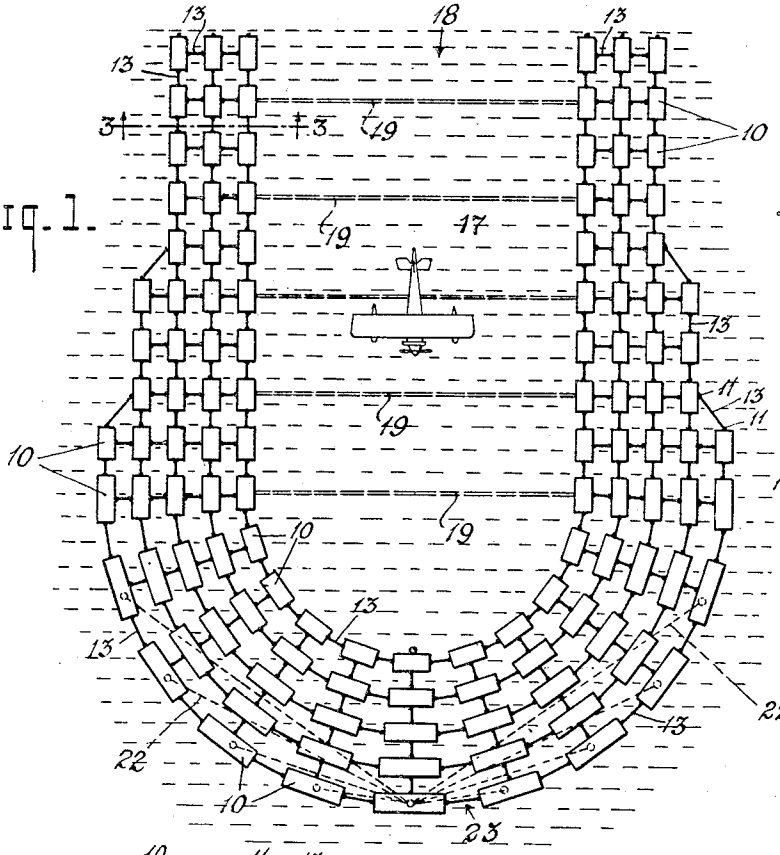


Fig. 5.

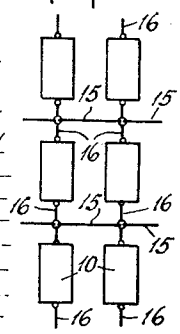


Fig. 2.

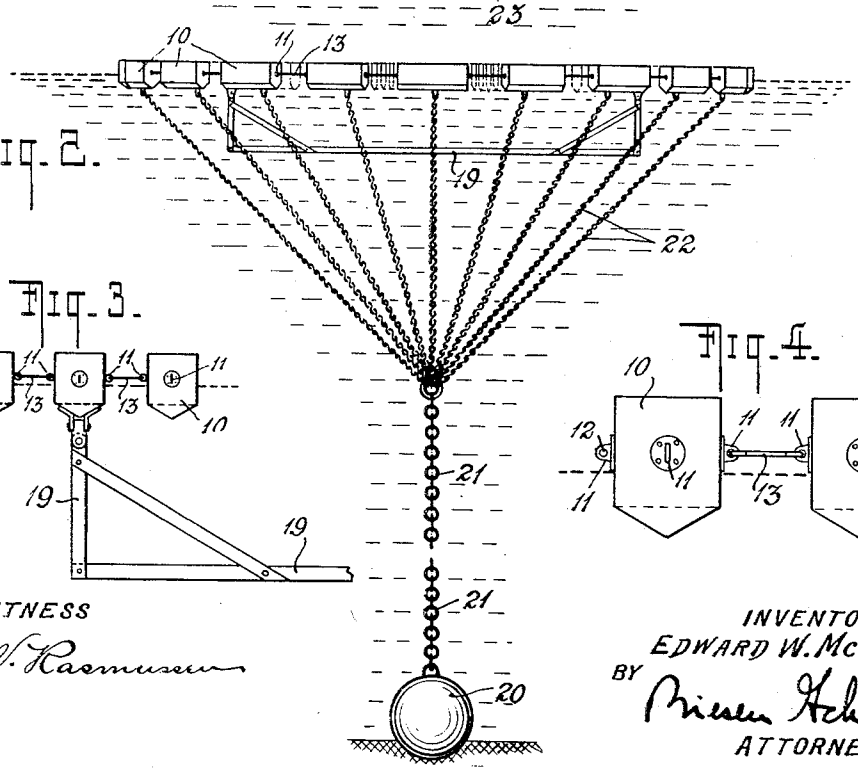


Fig. 3.

Fig. 4.

WITNESS

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Patented Nov. 7, 1933

1,933,597

UNITED STATES PATENT OFFICE

1,933,597

FLOATING HARBOR FOR AMPHIBIANS, FLYING BOATS, AND SEAPLANES

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Application May 28, 1930, Serial No. 456,339
Renewed July 20, 1932

7 Claims. (Cl. 114—0.5)

My invention relates to apparatus designed to provide a safe landing place for flying ships, such as amphibians and seaplanes, in mid-ocean, which is protected against waves and affords an area of comparative calm even during violent storms. In particular it is an object of the present invention to provide a structure of such character that it will dampen the waves within a limited area and thereby produce a safe landing and stop-over place for flying ships.

In accordance with the present invention I provide a structure, preferably of U-shape, though other shapes may be employed, which is built up of a plurality of rows of interconnected floats in the form of hollow metal or reinforced concrete tanks, wooden blocks or rafts, etc., which are connected so as partially to enclose a portion of the surface of the water of sufficient area to provide a landing and take-off place for planes and also a place for the anchoring of a repair ship, supply depot, etc.

My novel apparatus is primarily characterized by the fact that the surface of the water which is partially enclosed by such apparatus remains comparatively calm even during violent storms, so that planes may land safely upon such surface. This advantageous result is due to the fact that the waves striking the floats are progressively dampened thereby so that by the time that the wave reaches the enclosed area it has been dampened to such an extent that it presents no danger to the landing of planes within such enclosed space or to leeward thereof.

My invention also contemplates the anchoring of my improved apparatus in such a manner that it presents its wave-dampening floats to the oncoming waves so that no undampened waves can enter the partially enclosed space through the open end of the apparatus designed for the entry of the planes.

Other objects and advantages of the invention will become apparent from the following description and the features of novelty will be defined in the appended claims.

In the accompanying drawing, which illustrates diagrammatically and by way of example an embodiment of the invention, Fig. 1 is a plan view of my novel apparatus showing a plane in the act of landing within the enclosed area or harbor; Fig. 2 is an end elevation of the same; Fig. 3 is a view taken along the line 3—3 of Fig. 1 and showing the connection of one of the brace or spacer members to a float at one side of the apparatus; Fig. 4 is a detail illustrating one form of connection between adjacent floats; and Fig. 5 is a diagrammatic view illustrating a modified form of connection between the floats.

My novel apparatus is composed of a plurality of floats or floating members 10 which may be suitably weighted to maintain an upright position. These floats are connected by any suitable means, preferably in such manner that they may move relatively to each other, but are yet held apart so as to prevent their bunching together and striking each other under the action of the waves. A suitable form of connection is shown in Fig. 4 and is composed of lugs 11 attached in any suitable way to the vertical faces of the floats and provided with apertures 12 for receiving a spacing link 13. The link 13 is of such length as to permit the upward movement of one float with respect to the adjacent float and is strong enough to take compression or tension and prevent movement of the floats toward each other. Each of the floats 10 may be connected to each of the adjacent floats as shown in Fig. 1. Instead of attaching all of the links 13 to the faces of the floats, certain of the links may be connected with links which extend transversely thereto, as shown in Fig. 5, wherein the links 15, instead of connecting directly the opposite faces of adjacent floats, may be connected with the links 16 which extend in a direction transverse to the links 15.

The floats 10 may be built up of wooden blocks so as to take the form of wooden rafts, or they may be formed of air-tight metallic tanks, or reinforced concrete or they may be made in any other suitable manner or shape. The apparatus is preferably given such a form that it will practically enclose a protected area or harbor 17 and leave open only one side of such area for the entry and take-off of planes, as shown at 18. The apparatus may accordingly be given a U-shape, as shown in Fig. 1, though any other suitable form may be employed. The area of calm will extend for a considerable distance beyond the apparatus to leeward.

The two parallel portions of the apparatus (or where a V shape is employed, the two diverging portions) are held in spaced relation by means of braces 19 which are connected with the under side of one or more floats in each side of the apparatus and extend for a sufficient distance below the surface of the water to provide clearance for planes, ships, etc. The apparatus is anchored to the bottom of the ocean by means of a weight 20 with which is connected a chain or cable 21. This chain may be connected by means of a plurality of chains or cables 22 with a num-

ber of floats as shown in Figs. 1 and 2, preferably located at the closed end of the apparatus. The connection is such that the whole apparatus may swing around the weight 20 as a pivot under the force of the wind so that the closed end portion 23 is always presented to the wind while the inlet or unprotected side 18 is always to leeward.

It will be clear from the above that the floats 10 by moving upwardly for different distances may move for a more or less limited distance with respect to each other without striking each other. In view of the fact that the closed end portion 23 of the apparatus is always to windward, the waves will strike the forward floats (the lowermost floats in Fig. 1) and travel toward the protected area or harbor 17. The action of the floats upon the waves will be such that each float or row of floats parallel with the wave will exert a dampening action upon such wave, so that by the time the latter reaches the innermost row of floats it has been dampened to such an extent that it is no longer dangerous. I prefer to provide that portion of the apparatus which is between the oncoming waves and the protected area and is exposed most directly to the brunt of the waves, with a larger number of floats in the direction of travel of the waves and I accordingly increase the number of rows of floats toward the center of the apparatus. It will be apparent that the portion of the apparatus at the leeward side is not struck by the waves broadside, so that a smaller number of floats may be provided at such end.

In order to distribute the dampening effect more uniformly from row to row of floats, I may make the connecting links, and particularly the links extending in the direction of travel of the waves, of increasing length from the inner to the outer side of the apparatus, so that such links are longer where the waves are higher and decrease in length as the wave becomes progressively dampened.

In order to increase the dampening effect of this apparatus the whole or part of either or both top and bottom thereof may be covered with a flexible layer constructed of heavy canvas, hemp, metal, or other suitable material.

If desired, supply depots and repair stations in the form of floats, rafts, or ships, may be stationed within the protected harbor 17. As these structures form no part of the present invention they have not been illustrated on the drawing.

It will be understood that various modifications may be resorted to within the spirit of the invention without departing from the scope of the claims.

I claim:

1. In an apparatus of the kind described, the combination of a plurality of floats held in spaced apart relation in such manner as to form a floating structure of substantially U-shape and to present a plurality of rows thereof to an oncoming wave, whereby such wave is progressively dampened and an area of calm within and to leeward of such structure is provided.

2. An apparatus as set forth in claim 1, including braces for holding apart the two sides of the U-shaped structure.

3. An apparatus as set forth in claim 1, including an anchor connected therewith in such manner that the apparatus will be swung about by the force of the wind to present the middle portion thereof to such wind.

4. An apparatus as set forth in claim 1, including an anchor connected therewith in such manner that the apparatus will be swung about by the force of the wind to present the middle portion thereof to such wind, and wherein the middle portion of such apparatus is provided with a larger number of rows of floats to increase the dampening action of such middle portion.

5. In an apparatus of the kind described, the combination of a plurality of floats connected in spaced relation to form a floating structure and arranged to bound a protected area at least at one end and along a portion of the sides of such area, the floats at the portion of such structure presented to an oncoming wave being arranged in a plurality of rows extending transversely to the direction of said wave, whereby such wave is progressively dampened by said rows of floats and an area of calm beyond the floats is provided.

6. In an apparatus of the kind described, the combination of a plurality of floats connected in spaced relation to form a floating structure and arranged to bound a protected area at least at one end and along a portion of the sides of such area, the floats being arranged in spaced rows adapted to be presented to an oncoming wave, whereby such wave is progressively dampened and an area of calm beyond such floats is provided, there being a larger number of rows of floats at one end of such floating structure, and means whereby said structure is held in position with said end to windward.

7. Apparatus suitable for use in dampening ocean waves to provide an area of comparative calm comprising a substantially U-shaped floating structure having means comprising a plurality of connected floats at the tranverse portion thereof movable with respect to each other and adapted to dampen an oncoming wave.

EDWARD W. McVITTY.