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APPARATUS FOR COLLAPSING WATER WAVES

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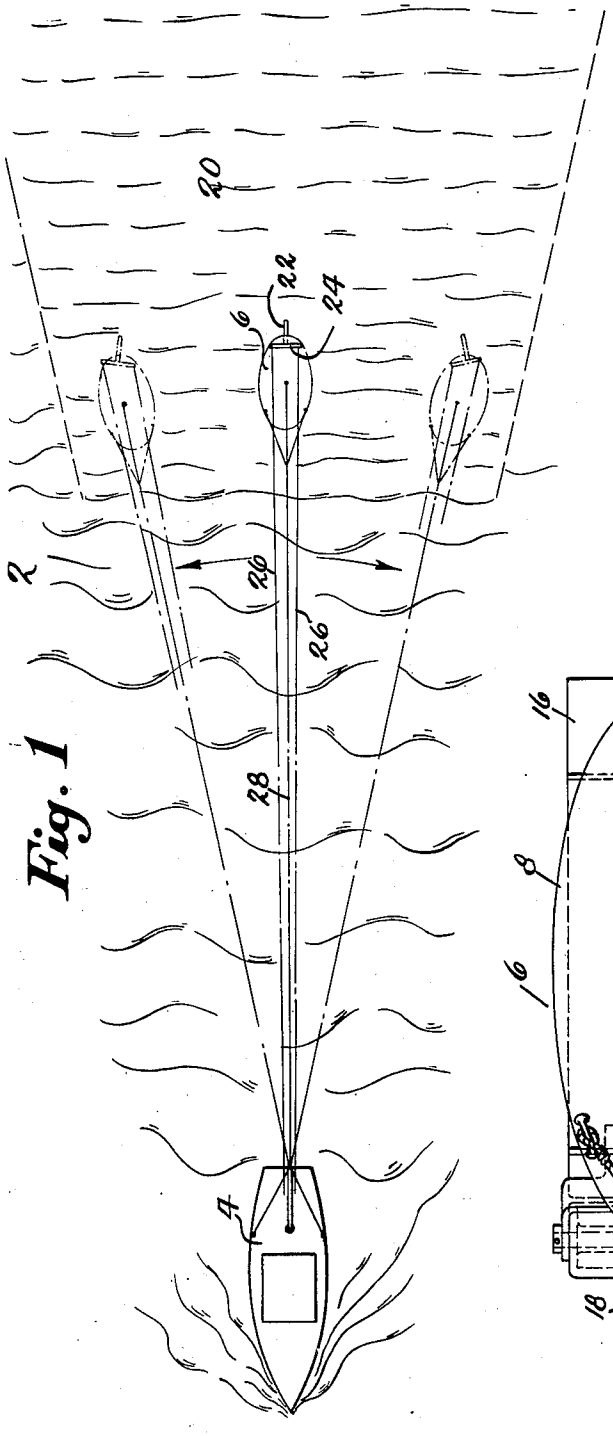


Fig. 1

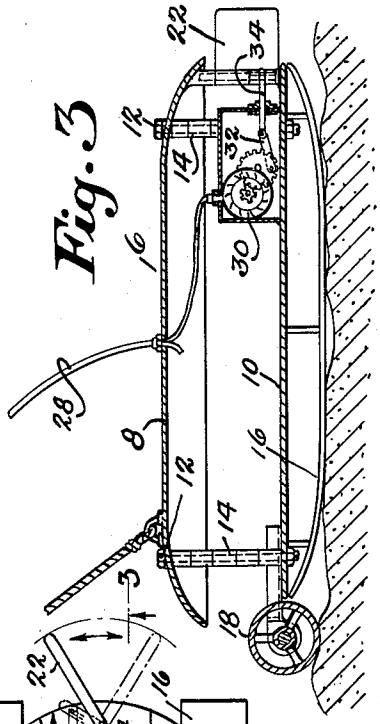


Fig. 3

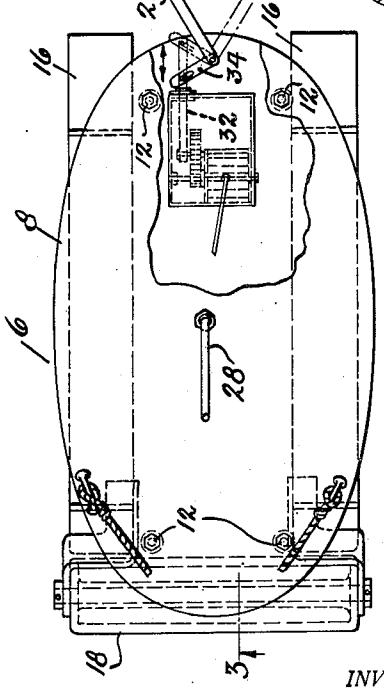


Fig. 2

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APPARATUS FOR COLLAPSING WATER WAVES

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4 Claims. (Cl. 114—0.5)

1

My invention is directed to an apparatus for collapsing water waves to create a calm or quiescent area at the surface of large bodies of water, such as the ocean for example.

While my invention may be used to create a calm or quiescent area at the surface of a body of water to protect floating objects or stationary objects, such as a bulkhead or pier against the action of water waves, I am concerned more particularly in providing a method and means for creating a calm or quiescent area which can be used as a landing strip or lane for seaplanes. For example, my invention may be used in rescue work at sea, making it possible for a plane to land in the vicinity of a stranded or a sinking ship under conditions which ordinarily would be impossible.

Projects are now in contemplation where large platforms are to be erected in the ocean long distances from shore, these platforms to be used in connection with oil well drilling operations. This constitutes another field of use for my invention, in that I can create calm or quiescent areas in the vicinity of these platforms, to provide quick lanes upon which a plane may alight or from which it can take off, thereby permitting of a shore to platform plane service which otherwise would not be feasible.

More specifically I contemplate discharging air or other elastic fluid into the water a substantial distance below the surface of the same and in substantial quantity over a constantly changing area, the air rising to the surface of the water, thereby to effect collapse of the water waves and provide a calm or quiescent area of almost any extent desired.

Still more specifically I provide for towing an object through the water at a substantial distance below the surface thereof while discharging air into the water from this object. In addition I provide for imparting pendulum like lateral movement to the object as it is being drawn through the water, the extent of this swing or lateral movement of the object being controlled so as to vary the width of the quiescent lane or strip as desired. Inasmuch as my equipment is mobile it will be appreciated of course, that the lane or strip can always be created so as to extend in the proper direction with respect to prevailing winds, it being necessary or at least very desirable for a plane to land "into the wind."

It will be appreciated from this brief outline of my invention that because of its maneuverability my equipment is useful in creating a quiescent area in a large body of water not only for the

2

purpose of landing a plane thereon, but for temporary protection of other objects against wave action.

In the accompanying drawing I have illustrated my invention somewhat schematically without any attempt to show the invention to scale.

Fig. 1 is a plan view, illustrating my invention in use;

Fig. 2 is a partial plan view of the object from which air is to be discharged into the water beneath the surface of the same; and

Fig. 3 is a section on the line 3—3 of Fig. 2.

Referring to the drawings in detail, 2 designates a body of water, such as the ocean for example, and at the surface of which it is desired to create a quiescent area or lane which may be used as a landing strip upon which a plane may alight or from which it may take off.

Numeral 4 designates a tow vessel, while 6 designates the object to be towed through the water beneath the surface of the same, and from which air or other elastic fluid, is to be discharged into the water, and allowed to rise to the surface thereof.

As will be seen from Figs. 2 and 3, the object 6 comprises two oval shaped plates 8 and 10 which are disposed in superimposed spaced relation. They are conveniently held in spaced relation by bolts 12. These bolts may be equipped with washers 14, so that the spacing of the plates 8 and 10 may be varied as desired.

It is to be noted that the plates 8 and 10 are spaced from each other completely about the periphery of the object, thereby to permit of the discharge into the water of large volumes of air. It is to be noted also that the upper plate 8 is dished slightly so that the periphery of this plate will deflect the air downwardly. This is desirable as I have found if the air is allowed to rise naturally to the surface of the water it is more effective in collapsing the water waves than when the air is discharged horizontally or vertically.

Inasmuch as the object 6 is to be drawn through the water near the bottom thereof, I prefer to equip the object with runners 16 extending lengthwise of the object, and at its leading end with a roller 18 which will facilitate dragging of the object over large stones or other obstructions which may be encountered on the ocean bed.

The runners 16 and the roller 18 function primarily when the apparatus is being started, the speed of the towing vessel 4 being sufficiently high eventually to raise the object 6 clear of the bot-

tom, so that it may be given a pendulum movement such as indicated in Fig. 1 to produce a quiescent area 20 of the desired width.

The object 6 as illustrated in Fig. 1 is equipped with rudder 22 and cross bar or tiller 24, and a line 26 is led from each end of the tiller 24 to the towing vessel, so that as the towing vessel moves forward the rudder 22 can be swung manually first in one direction and then the other as illustrated in Fig. 1 to impart pendulum movement to the object as it moves forward.

The towing vessel 4 is equipped with a suitable compressor, and the fluid line, designated 28 leads from the compressor through the upper plate 8 of the object.

The tow line may be attached in any convenient fashion to the forward end of the object 6, preferably to the upper plate 8 thereof.

In operation the object 6 is merely lowered overboard into the water in the desired location, and allowed to trail behind the tow vessel 4 at whatever distance may be found desirable and when the speed of the object 6 is sufficiently high to lift the same from the bottom, the fluid line 28 from the compressor is opened to allow air to be discharged into the object and out of the object into the water. By reason of the fact that the two plates 8 and 10 are spaced from each other throughout their entire extent, and because the upper plate 8 is dished slightly, the air or other fluid will discharge from the object all about its periphery in a downward direction. Throughout this operation the rudder 22 is manipulated so that the object 6 will swing in a horizotal plane from side to side with a pendulum movement. The extent of swing of course depends upon the manipulation of the rudder 22 and forward speed of the object so that the width of the quiescent area or lane 20 is conveniently and readily controlled.

It is understood of course that the area 20 will not remain quiescent indefinitely, but it will remain quiescent for a length of time sufficient to permit of the landing of a plane thereon with perfect safety.

From the foregoing it will be appreciated that I have provided a method of and apparatus for collapsing water waves to create a quiescent area or lane at the surface of a body of water of sufficient extent or area to provide a landing strip for a plane, the apparatus being mobile, so that the direction of the lane can be varied in conformity to the prevailing winds, and so that the lane or quiescent area can be created at any desired location.

At the outset of this description I made mention of the fact that this method and apparatus may be used to protect stationary objects such as piers and bulkheads against wave action. It now will be appreciated that in such use it is merely necessary to tow the object 6 back and forth across the front of the object to be protected.

In Figs. 2 and 3 I have shown the object 6 as equipped with automatic means for shifting the rudder 22. In this construction I provide a fluid turbine 30 which may be mounted on the lower plate 10 of the object. This turbine is properly enclosed, and the fluid for its operation is taken from the fluid line 28. The turbine is geared down to a crank arm 32 connected to arm 34 which is rigid with the rudder 22. Obviously when the apparatus is in operation the rudder will be swung automatically from side to side as

illustrated in Fig. 2 to effect the desired deflection of the object 6.

It is to be understood that changes may be made in the details of construction and arrangement of parts hereinabove described without departing from the spirit and scope of my invention.

What I claim is:

1. An apparatus for effecting collapse of water waves to produce an extended comparatively quiescent area or lane at the surface of the water, said apparatus comprising in combination an object to be towed through the water a substantial distance below the surface of the water, said object comprising two plates disposed in spaced-apart superimposed relation, one of said plates being provided with an air inlet whereby air may be supplied continuously to the object between said plates and discharge therefrom into the water all about the periphery of the object.

2. Apparatus for effecting collapse of water waves to produce an elongated comparatively quiescent area or lane at the surface of the water, said apparatus comprising an object adapted to be towed through the water a substantial distance below the surface of the same, said object comprising two plates disposed in superimposed spaced relation, the upper plate about its periphery extending downwardly toward the lower plate, and means for supplying air continuously into the space between the plates for continuous discharge therefrom into the water the air as it discharges being deflected downwardly by said extending plate periphery.

3. Apparatus for effecting collapse of water waves to produce an elongated comparatively quiescent area or lane at the surface of the water, said apparatus comprising an object adapted to be drawn through the water a substantial distance below the surface of the same, said object comprising two plates secured to each other in spaced, superimposed relation, an air inlet through one plate whereby air may be continuously charged into the space between the plates and continuouly dicharged therefrom into the surrounding water, runners on the bottom of said object, and a roller at the leading end of the object.

4. Apparatus for effecting collapse of water waves to produce an elongated comparatively quiescent area or lane at the surface of the water, said apparatus comprising two superimposed plates secured to each other in spaced relation and adapted to be advanced through the water a substantial distance below the surface of the same, an air inlet to the space between the plates whereby air may be continuously supplied thereto for discharge into the surrounding water, a rudder for said object, and a motor carried by one of said plates for deflecting said rudder alternately in opposite directions, to effect pendulum-like movement to the object as it advances through the water.

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The following references are of record in the file of this patent:

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