United States Patent

[11] 3,548,770

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[21] Appl. No. **816,559**
[22] Filed **Apr. 16, 1969**
[45] Patented **Dec. 22, 1970**

[54] **ADJUSTABLE PONTOONS FOR AERATOR PLATFORM**
6 Claims, 5 Drawing Figs.

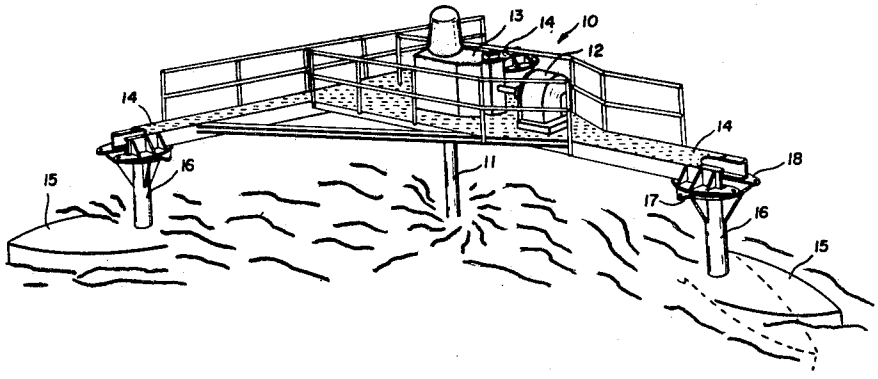
[52] **U.S. Cl.** **114/0.5,** 261/91, 261/120
[51] **Int. Cl.** **C02c 1/10,** B01d 47/16; B63b 35/00
[50] **Field of Search** 210/242; 261/91, 120; 114/0.5, 123

[56] **References Cited**
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Attorney—Cumpston, Shaw & Stephens

ABSTRACT: An aerator platform has boat shaped pontoons that are angularly adjustable through a multiple pin and slot coupling between a support plate on a shaft extending vertically from the pontoon and a bearing plate on the platform. Such an arrangement allows the liquid flow outward from the aerator impeller to be directed as desired by adjusting the orientation of the pontoons.



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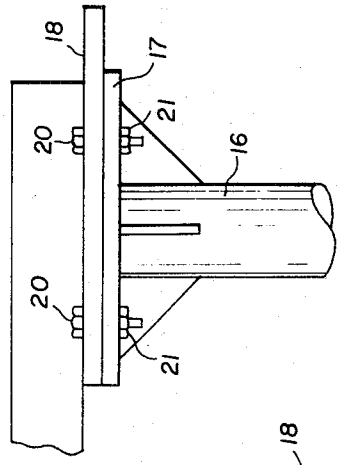


FIG. 5

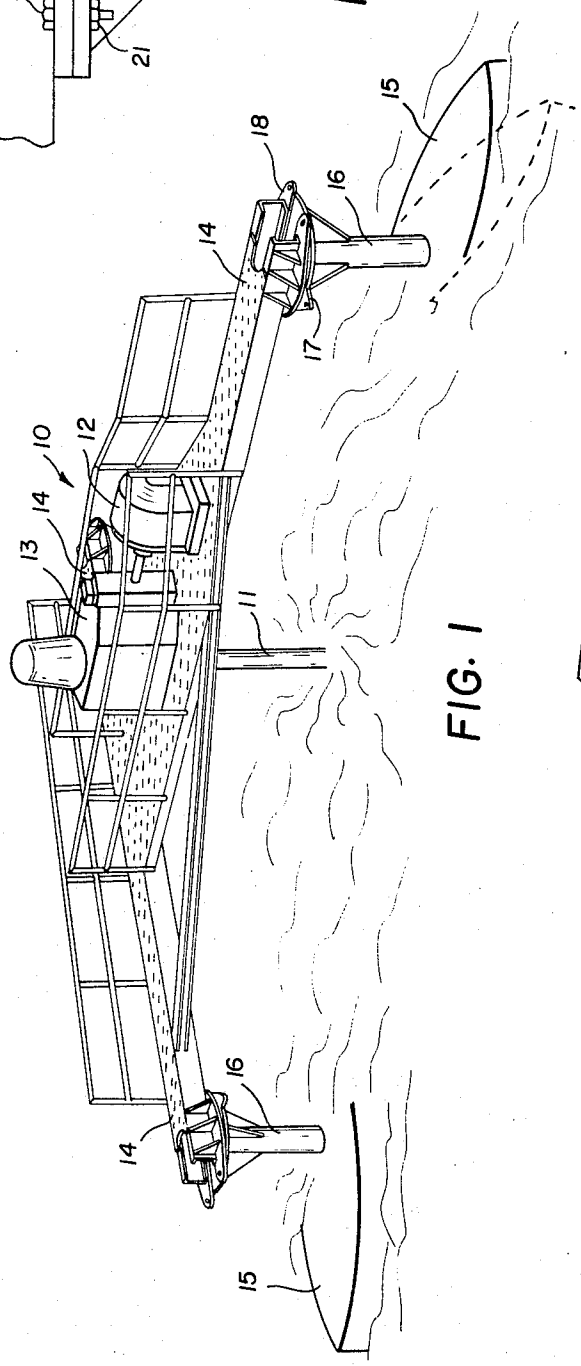


FIG. 1

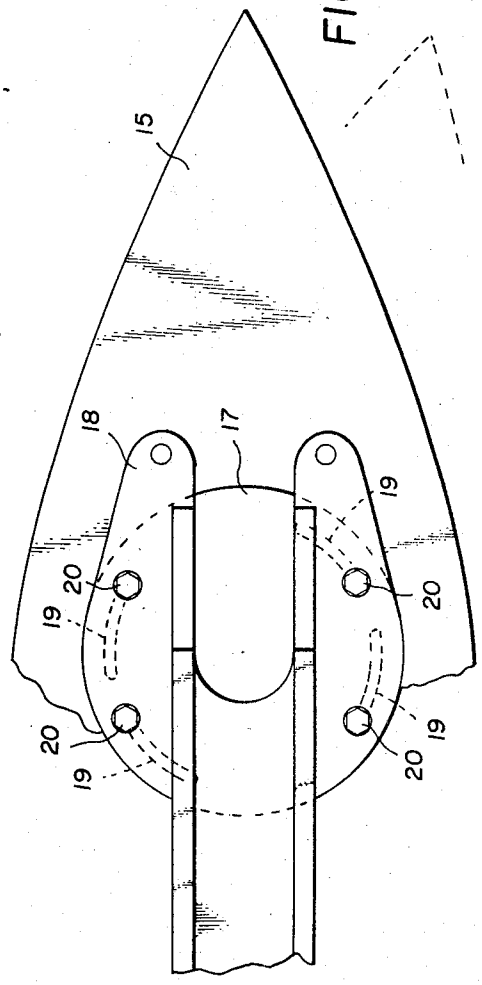


FIG. 2

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FIG. 3

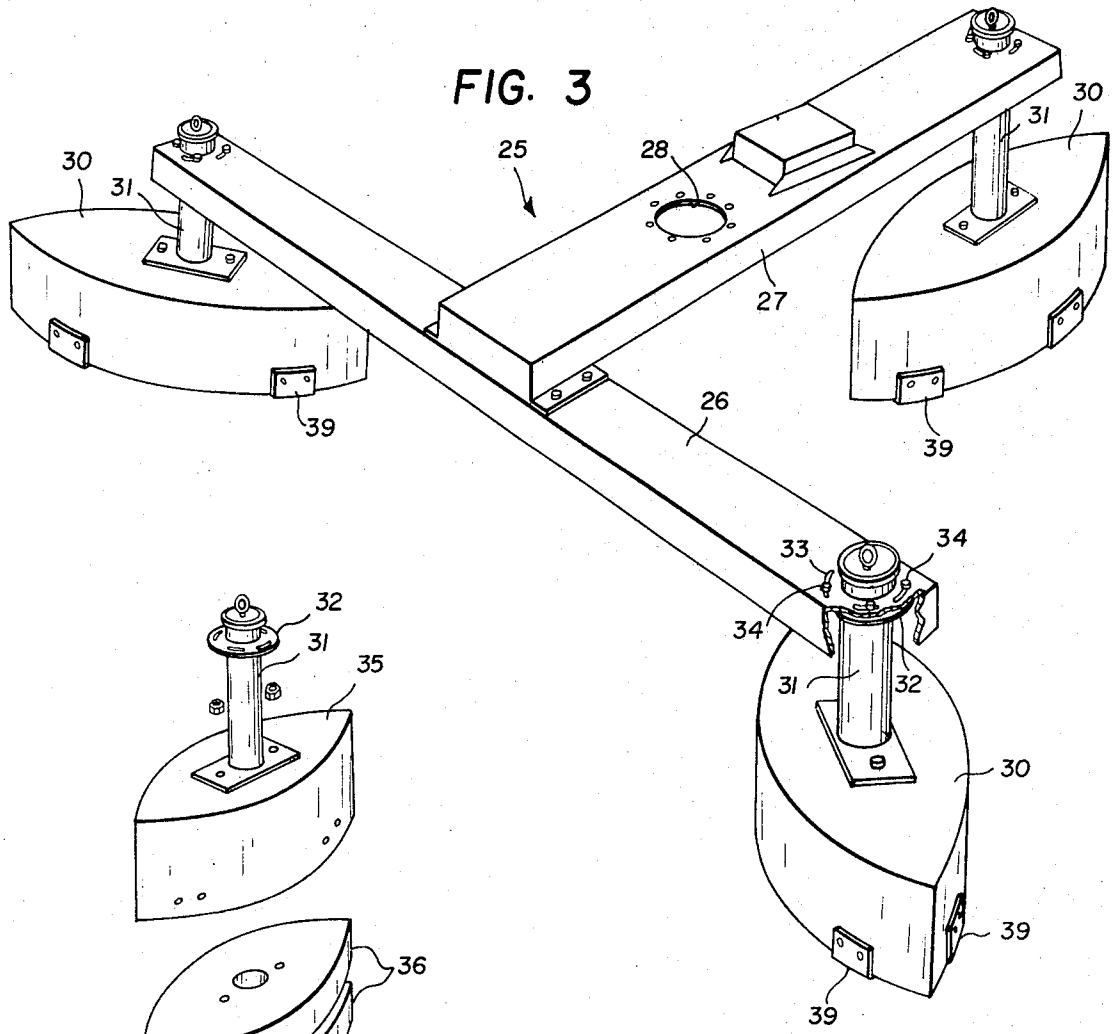


FIG. 4

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ADJUSTABLE PONTOONS FOR AERATOR PLATFORM

THE IMPROVEMENT EFFECTED

Pontoon supported aerator platforms are generally known, and such platforms have had pontoons fixed in place and oriented radially relative to the impeller. For most aerator applications, such an arrangement is quite satisfactory, However, in particular lagoons in which aerators are moored, dead spots may occur in which there is little liquid motion. This is undesirable since the aeration process is most effective if the entire lagoon is uniformly aerated.

According to the invention the pontoons of an aerator platform are made angularly adjustable to direct the outward flow of liquid from the aerator impeller so as to set liquid in motion in any lagoon areas that might otherwise be still. Hitherto, pontoons have been used only for flotation support and have been designed for minimum interference with liquid flow, and the invention involves the discovery that aerator pontoons can also serve the function of directing liquid flow in the lagoon.

The invention also includes a simple and effective arrangement for angularly adjusting pontoons by means of a vertical shaft fixed to the pontoons and carrying a support plate on which a platform bearing plate rests. A multiple pin and slot connection between the two plates allows simple and easy adjustment of any pontoon.

SUMMARY OF THE INVENTION

The inventive adjustable pontoon for an aerator platform includes a hollow, oblong flotation shell filled with foamed resin material and carrying a shaft fixed to the shell and extending vertically upward, a horizontal support plate carried by the shaft, a bearing plate arranged on the platform to rest on the support plate, slots in one of the plates following a circle concentric with the shaft, pins on the other plate extending through the slots to permit turning between the two plates concentric with the shaft, and threads and nuts on the ends of the pins for fastening the plates together in a desired angular orientation for the pontoon. DRAWINGS

FIG. 1 is a perspective view of a preferred embodiment of the inventive aerator pontoons in operation;

FIG. 2 is a fragment of a plan view of an adjustable pontoon according to the invention;

FIG. 3 is a partially cutaway perspective view of an alternative pontoon arrangement according to the invention;

FIG. 4 is an exploded view of a preferred pontoon assembly according to the invention; and

FIG. 5 is a fragment of a side elevation of the pontoon adjustment arrangement of FIG. 2. DETAILED DESCRIPTION

Aerator platform 10 includes an aerator impeller (not shown) on shaft 11 turned by motor 12 through drive gearing 13. Platform 10 has three booms 14 each of which rests on a pontoon 15 equilaterally arranged around shaft 11. Pontoons 15 are generally oriented radially relative to the impeller on shaft 11 to direct liquid flow from the impeller outward away from platform 10. Preferably each of the pontoons 15 is angularly adjustable in such generally radial orientation for directing the liquid flow outward from platform 10 to specific areas of the lagoon on which platform 10 floats. Such angular adjustment is described below.

A shaft 16 is fixed to each pontoon 15 and extends vertically upward. A support plate 17 is arranged horizontally on top of each shaft 16, and a bearing plate 18 on each boom 14 rests on top of each support plate 17. Four arcuate slots 19 are formed in each support plate 17 on a circle concentric with shaft 16. Four pins 20 extend downward from each bearing plate 18 through slots 19. The ends of pins 20 are threaded and carry nuts 21 for bolting plates 17 and 18 together in any desired angular orientation permitted within the arcuate range of slots 19.

The partially illustrated aerator platform 25 shown in FIG. 3 includes two booms 26 and 27 secured together at right angles to rest on pontoons 30 arranged at each end of boom 26 and at the end of boom 27. An aperture 28 in boom 27 receives an aerator impeller shaft (not shown).

Each pontoon 30 carries a fixed vertical shaft 31 having a support plate 32 arranged as an angular collar fixed around shaft 31. The bearing plates on platform 25 that rest on support plates 32 are simply the under surfaces of booms 26 and 27 surrounded the apertures through which shafts 31 extend. Arcuate slots 33 are formed in such bearing plates and pins 34 extend up from support plates 32 through slots 33 to permit angular adjustment of pontoons 30 relative to platform 25. Nuts tightened down on pins 34 fix such angular adjustment in place.

To adjust the pontoons of platforms 10 and 25, it is merely necessary to loosen the nuts holding the pin and slot connections between support plates 17 or 32 and the bearing plates that rest on them, turn the pontoons to the desired orientation and retighten the nuts. Such angular adjustment is preferably made on the site at the lagoon where liquid flows from the aerator platform and its effect on outer lagoon regions can be observed.

Pontoons 15 are closed metal bodies, preferably of stainless steel and are filled with a foamed resin material such as foamed polystyrene. Such foam is preferably formed in place within pontoons 15.

Pontoons 30 represent a different pontoon construction including an open bottomed metal shell 35 fixed to shaft 31 and having foam blocks 36 cut to fit up under shell 35. Bolts 37 extend from plates 38 up to the top of shells 35 to hold foam blocks 36 in place. With such an arrangement, metallic shells 35 protect the relatively easily damaged foam blocks 36 and yet the open bottom of the shells allows easy replacement of foam blocks occasionally. Retaining clips 39 are preferably fastened around he bottoms of metal shells 35 to extend inward to support the perimeter of the lowermost foam block 36.

Persons wishing to practice the invention should remember that other embodiments and variations can be adapted to particular circumstances. Even though one point of view is necessarily chosen in describing and claiming the invention, this should not inhibit broader or related applications within the spirit of the invention. For example, many pontoon shapes and structures can be used within the spirit of the invention and support and bearing plates for angular adjustment of each pontoon can be arranged in a variety of ways.

I claim: 1. An adjustable pontoon for an aerator platform including an aerator impeller and means for driving said impeller, said pontoon comprising:

a. a hollow, oblong, flotation shell generally oriented radially relative to said impeller;
b. a foamed resin material filling said shell;
c. a shaft fixed to said shell and extending vertically upward from said shell;
d. a horizontal support plate arranged on said shaft;
e. a bearing plate arranged on said platform to rest on top of said support plate;
f. one of said plates having a plurality of slots arranged to follow a circle concentric with said shaft;
g. the other of said plates having a corresponding plurality of pins extending through said slots to permit relative turning between said plates concentric with said shaft;
h. said pins having threaded ends; and
i. nuts on said threads for fastening said plates together in a desired angular relationship fixing the orientation of said pontoons.

2. Three of the adjustable pontoons of claim 1 arranged equilaterally around said impeller.

3. The adjustable pontoons of claim 1 arranged wherein said shell is a closed metallic body.

4. The adjustable pontoon of claim 1 wherein said shell is open bottomed and includes means for retaining said foam under said shell.

5. The adjustable pontoon of claim 1 wherein said support plate is arranged on top of said shaft.

6. The adjustable pontoon of claim 1 wherein said support plate is formed as an annular collar surrounding said shaft.