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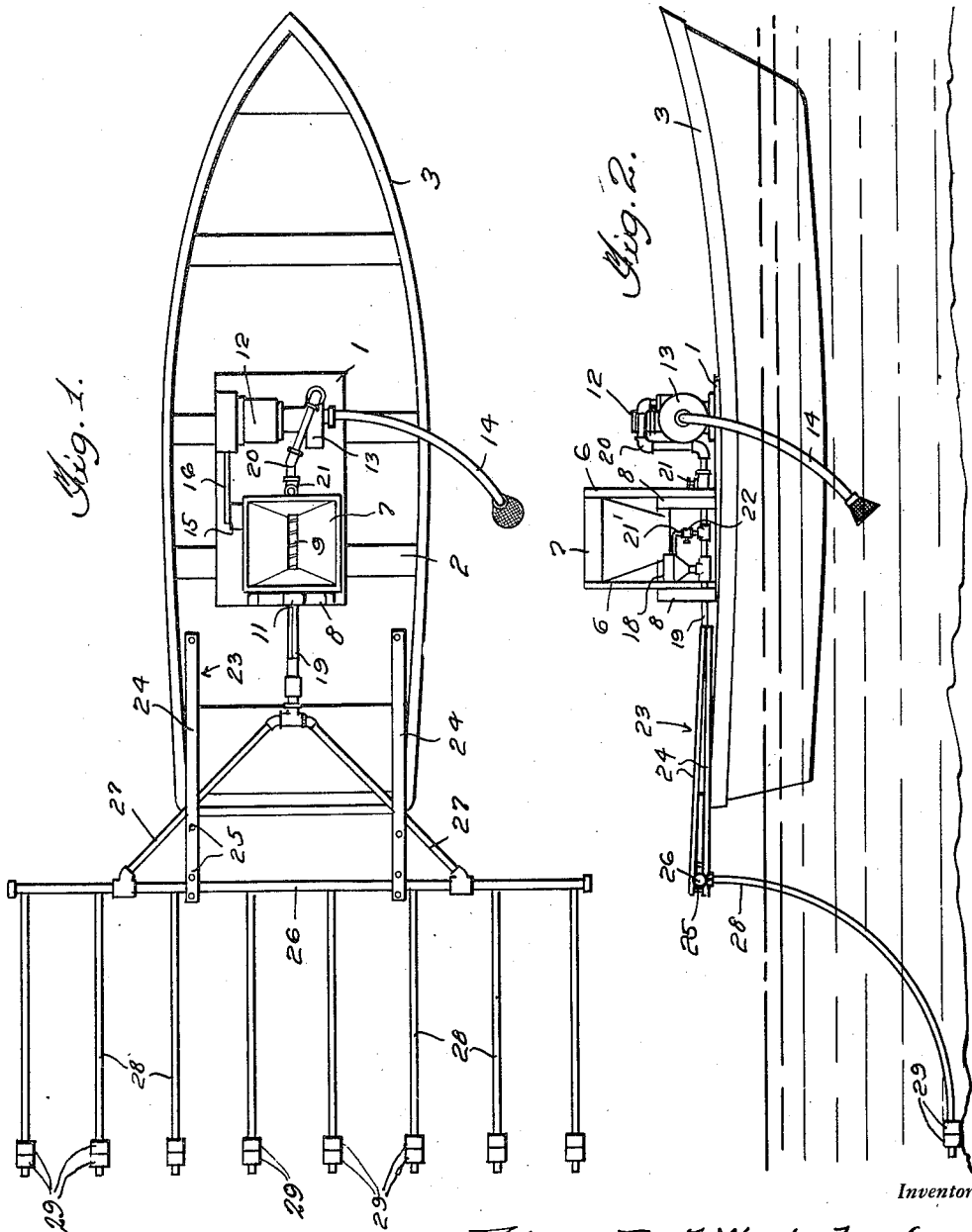
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2,330,164

SUB-AQUEOUS CHEMICAL APPARATUS

Filed March 24, 1943

4 Sheets-Sheet 1



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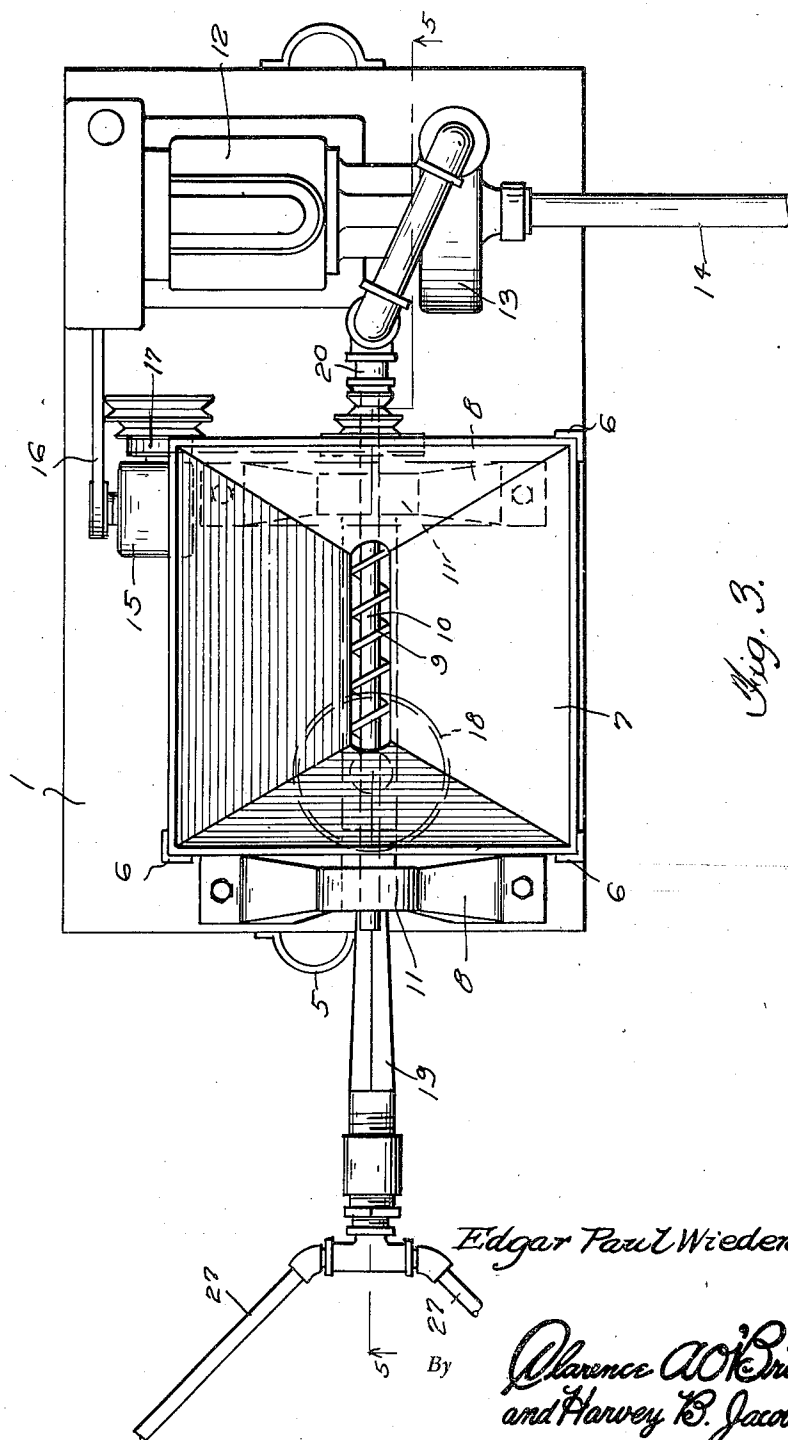
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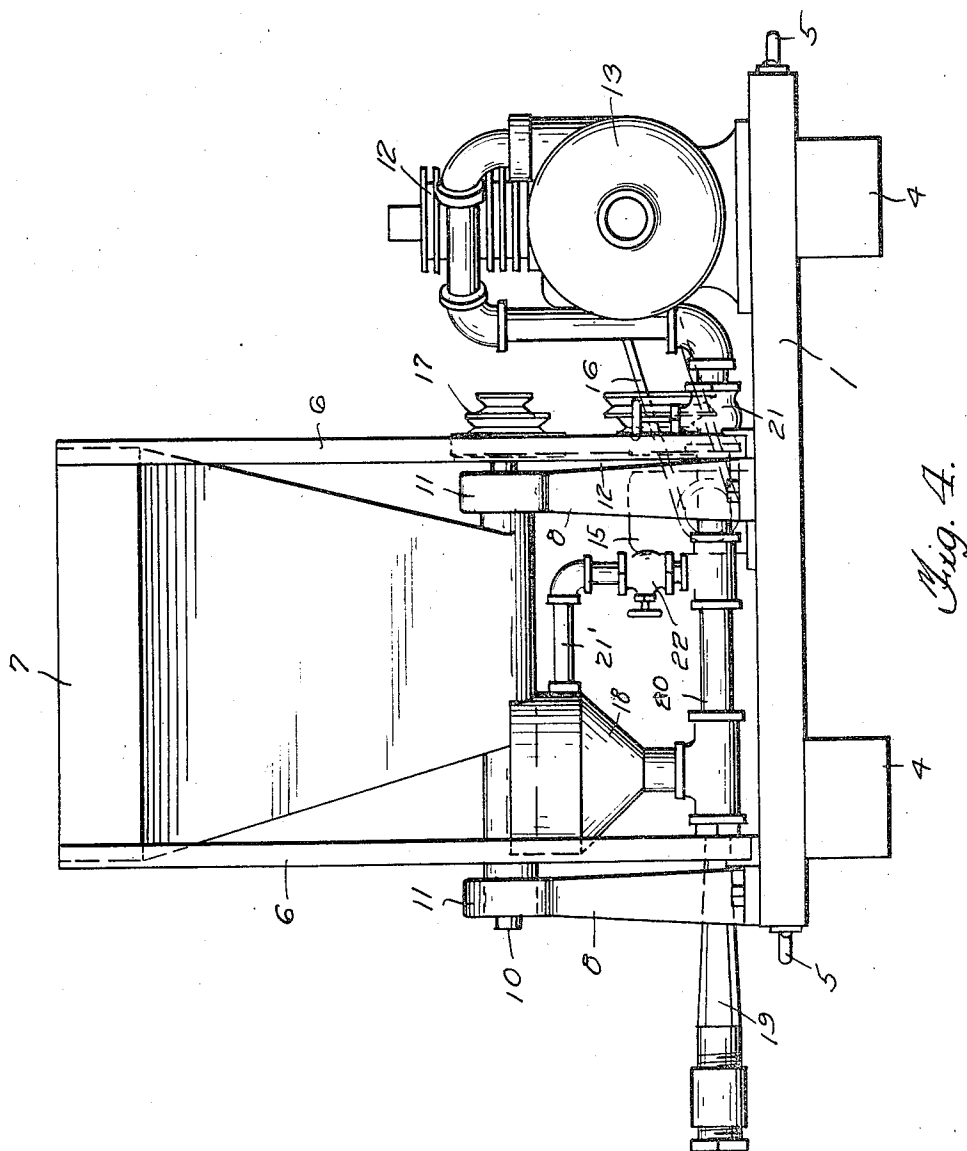
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4 Sheets-Sheet 3



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4 Sheets-Sheet 4

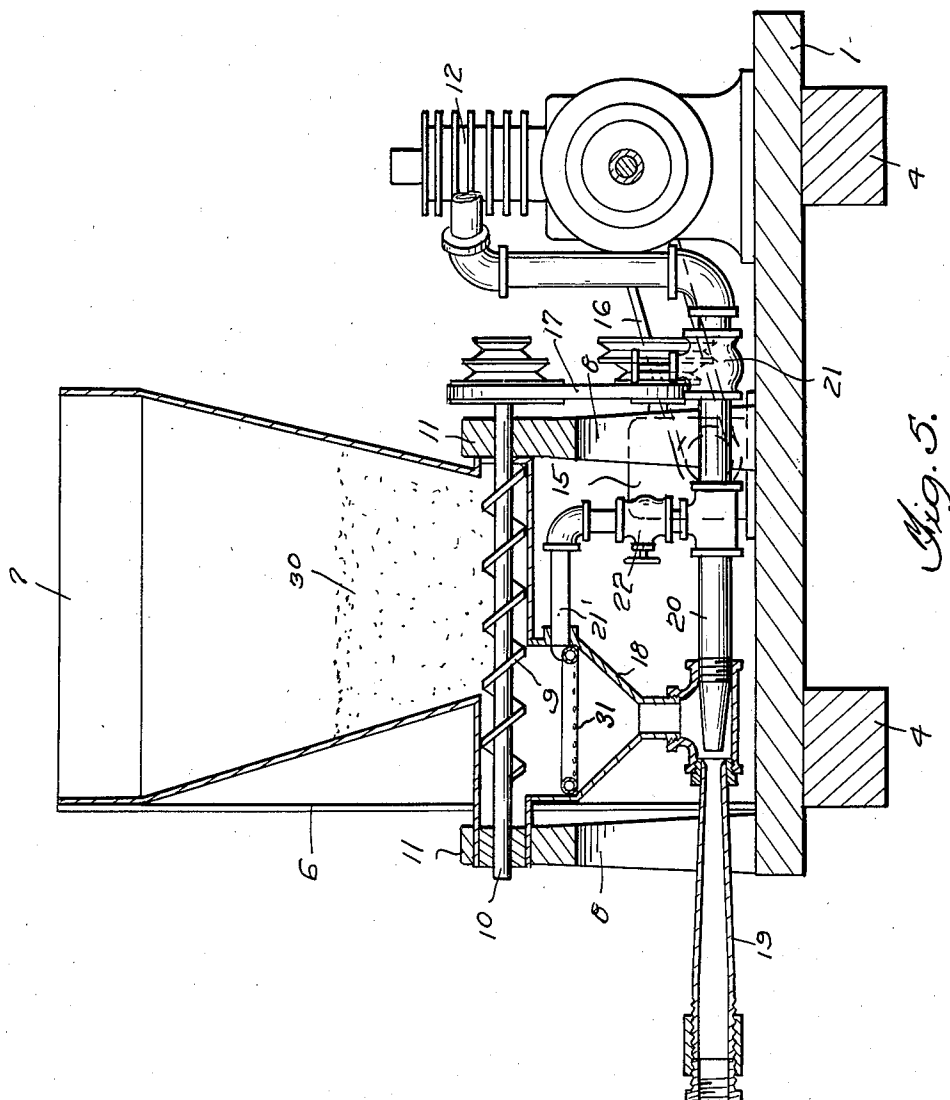


Fig. 5.

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UNITED STATES PATENT OFFICE

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SUBAQUEOUS CHEMICAL APPARATUS

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Application March 24, 1943, Serial No. 480,405

4 Claims. (Cl. 43-124)

The present invention relates to a sub-aqueous chemical apparatus for use particularly in fresh water lakes, and has for its primary object to provide novel means for chemically treating the bottom of the lake in a manner to exterminate leeches, snails, et cetera, which are responsible for the dissemination of "water itch" (*Schistosoma dermatitis*), a temporary skin infection which develops on the exposed portions of the body of a wader or bather in natural waters so affected.

Another very important object of the invention is to provide an apparatus of the aforementioned character which is adapted to be expeditiously mounted for operation in a conventional row boat or other suitable craft and removed therefrom.

Other objects of the invention are to provide a subaqueous chemical apparatus of the character described which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact, and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a top plan view, showing an apparatus constructed in accordance with the present invention mounted on a row boat.

Figure 2 is a view in side elevation thereof.

Figure 3 is a top plan view of the solution mixing unit.

Figure 4 is a view in side elevation of the solution mixing unit.

Figure 5 is a view in vertical longitudinal section, taken substantially on the line 5-5 of Figure 3.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a substantially rectangular base 1 of suitable dimensions and material, which base is adapted to be conveniently mounted on the intermediate seats 2 of a conventional row boat 3 of the flat bottom type. Transverse cleats 4 beneath the end portions of the base 1 secure said base against longitudinal movement in the boat 3 and prevent said base from warping. Handles 5 are provided on the ends of the base 1.

Legs 6 support a hopper 7 in elevated position on the base 1. Standards 8 rise from the base 1

adjacent the legs 6. A worm conveyor 9 is operable longitudinally in the lower portion of the hopper 7, the shaft 10 of said conveyor being journaled in bearings 11 which are provided therefor on the standards 8. It may be well to here state that the hopper 7, which is manually filled, is for the reception of the chemical, such as copper sulphate, in powder form.

Also mounted on the base 1 is a suitable power plant 12 which, in the embodiment shown, is in the form of a single-cylinder, air-cooled, internal combustion engine of appropriate horsepower. The engine 12 is connected directly to a centrifugal pump 13 which is mounted adjacent said engine on the base 1. A suction hose 14 has one end connected to the intake of the centrifugal pump 13. The intake hose 14 is adapted to be hung over the gunwale of the row boat 3 with its free or other end submerged in the water.

A gear reduction unit 15 on the base 1 is driven from the engine 12 through a belt and pulley connection 16. Then, the worm conveyor 9 in the hopper 7 is driven from the unit 15 through a belt and pulley connection 17.

The conveyor 9 delivers the chemical in the hopper 7 to a funnel 18. A Venturi throat 19 receives the chemical from the funnel 18. A water line 20 from the outlet of the centrifugal pump 13 is connected to the venturi 19 beneath the funnel 18. A valve 21 controls the water line 20. A bleeder 21' connects the water line 20 to the funnel 18 for flushing the latter, said bleeder being provided with a control valve 22. The bleeder 21' is connected to a perforated spray ring 31 in the funnel 18 for washing the chemical down the walls of said funnel.

Arms 23 are mounted longitudinally on the stern of the boat 3 and project rearwardly therefrom over the water. The arms 23 comprise pairs of bars 24 which are clamped together by bolts 25. Any suitable means may be provided for securing the arms 23 in position on the boat. Also, the base 1 may be clamped in position in any suitable manner.

Firmly clamped between the rear end portions of the arms 24 is a transverse manifold 26. Branches 27 connect the venturi 19 to the manifold 26. Flexible discharge conduits 28 have one end connected to the manifold 26 at spaced points. The trailing ends of the flexible conduits 28 are separately weighted with sheets of lead wrapped firmly around said conduits.

It is thought that the operation of the invention will be readily apparent from a consideration of the foregoing. Briefly, the apparatus is

mounted on the row boat 3 substantially in the manner shown to advantage in Figures 1 and 2 of the drawings. The boat 3 may be propelled in any desired manner. As the boat 3 moves forwardly, the flexible conduits 23 trail therebehind and drag on the bottom. With the engine 12 in operation, water from the lake or other body is drawn into the centrifugal pump 13 through the intake conduit 14 and expelled under pressure through the pipe 20 into the venturi 19. The worm conveyor 9 feeds the chemical, as at 30, from the hopper 7 into the funnel 18. Here it is mixed with water from the bleeder 21' and the resulting mixture is drawn by suction into the venturi 19. From the venturi 19 the solution thus formed flows to the manifold 26 through the branches 27 and is discharged by the flexible conduits 28 on the bottom of the lake for exterminating any leeches or snails that may be present.

It is believed that the many advantages of an apparatus constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of said apparatus is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. An apparatus for chemically treating the bottom beneath a body of water comprising, means for drawing water from the body, means for mixing a chemical with the water thus drawn from the body, and means connected to the second-named means for discharging the chemical and water solution on the bottom, the last-named means including a manifold connected to the second-named means, and a plurality of flexible conduits having one end connected to said manifold for receiving the solution therefrom.

2. An apparatus for chemically treating the bottom beneath a body of water, comprising a

supporting structure, a pump mounted on said supporting structure, an intake conduit connected to the pump for elevating water from the body of water, a discharge pipe connected to the outlet side of the pump, means for mixing a chemical with the water in the discharge pipe, and flexible conduits connected to the discharge pipe for applying the chemical and water solution to the bottom.

3. An apparatus for chemically treating the bottom beneath a body of water, comprising a base for mounting on a boat, a pump mounted on the base and including an intake for elevating water from the body of water, a hopper, for the reception of a chemical, mounted on the base, a discharge pipe connected to the outlet side of the pump, means for conveying the chemical from the hopper into the discharge pipe, and a plurality of flexible conduits connected to the discharge pipe and adapted to trail the boat on the bottom for applying the chemical and water solution thereto.

4. An apparatus for chemically treating the bottom beneath a body of water comprising, a base for mounting on a boat, a pump mounted on said base, said pump including a flexible intake conduit for elevating water from the body of water, a discharge pipe connected to the outlet side of the pump, a hopper, for the reception of a chemical, mounted on the base, a funnel communicating with the discharge pipe, a worm conveyor beneath the hopper for moving the chemical from said hopper into the funnel, a power plant on the base operatively connected to the pump and to the conveyor, a manifold, means for supporting the manifold transversely on the boat, branches connecting the manifold to the discharge pipe for receiving the chemical and water solution therefrom, and a plurality of flexible conduits suspended from the manifold and adapted to drag the bottom behind the boat for applying the solution to said bottom.

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