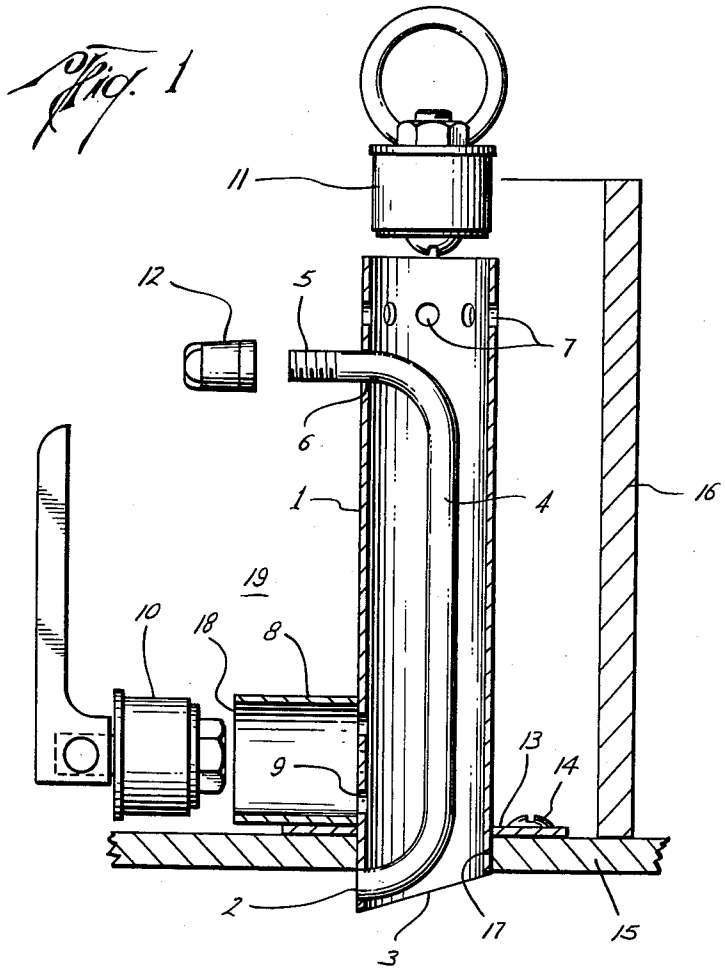
Feb. 26, 1963 G. E. WAIT 3,078,612

BAIT WELL CIRCULATOR

Filed Sept. 16, 1957 2 Sheets-Sheet 1

Fig. 1



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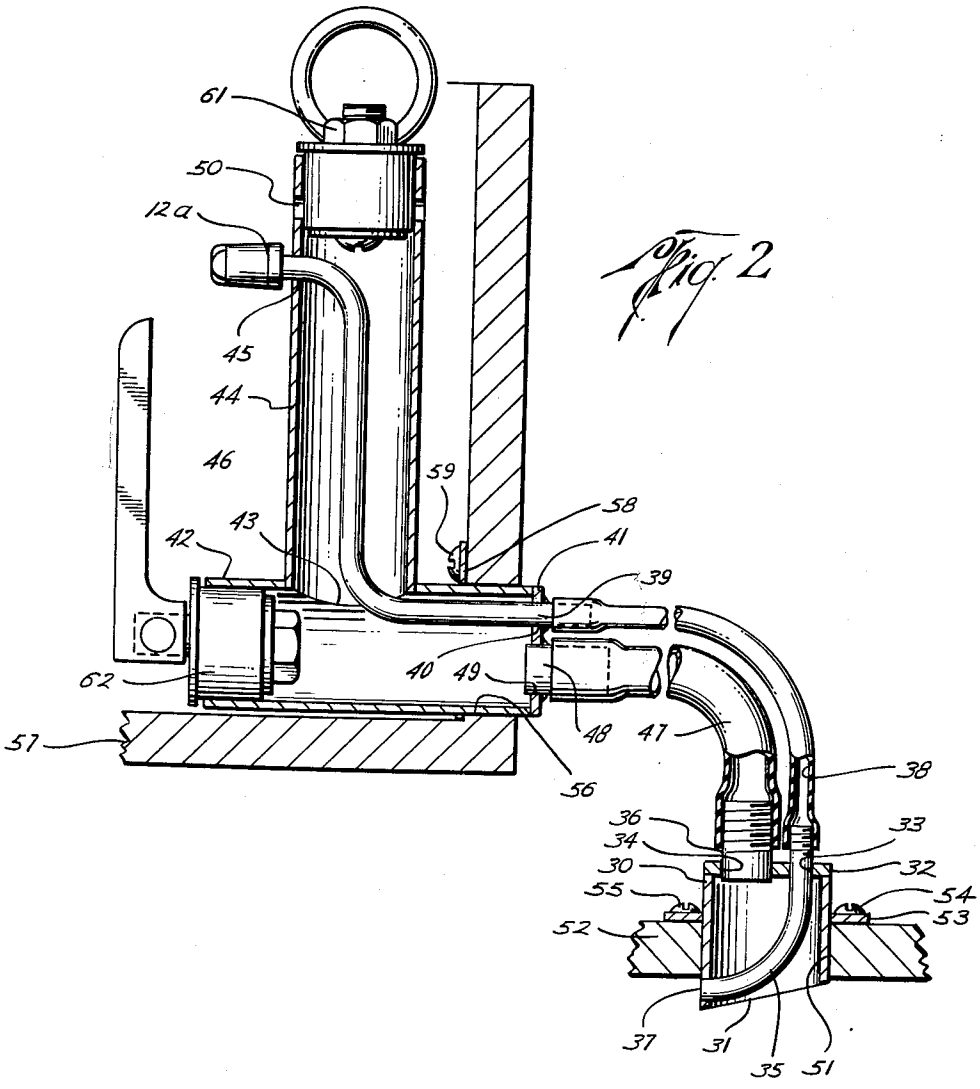


Fig. 2

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BAIT WELL CIRCULATOR

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2 Claims. (Cl. 43—55)

This invention relates to bait wells and more particularly to a device for circulating fresh water through the well while maintaining a constant level therein.

Bait wells have been extensively used by fishermen for years. In the old type of submerged or displacement hull boat, water could be supplied to a bait well by locating it at a proper level within the boat and supplying it with a simple passage to the water so that the level in the well would correspond with the level of the body of water supporting the boat. However, the modern planing hull-type boat is not adapted to such an arrangement since the bottom of the boat rides substantially on the surface of the water while the boat is in motion. It is possible to devise a scooping device to be used in connection with the boat and bait well in order to pick up fresh water while in motion, and indeed such a device with a manual flow control is known in the art and has found rather extensive use. A problem which remained unsolved in the use of all devices employed prior to my invention, including the use of the scoop-type water pick-up device, was how to maintain a constant water level within the bait well of a boat of varying speeds while continuously supplying fresh water thereto.

It is, therefore, the object of my invention to provide a bait well circulating device that will operate while the the boat is in motion to circulate a supply of fresh water through the bait well, and at all times and at all normal boat speeds, maintain a constant level of water within the bait well.

It is a further object of my invention to provide such a device that is of simple and durable construction and at the same time is economical and reliable.

It is a further object of my invention to provide such a device that is compact and that may be easily mounted in a boat.

The specific embodiment of my invention that is disclosed herein includes a cylindrical tube which serves as the outside body of the device. The lower end of the tube is cut on a taper or bevel so as to form an opening with a cross-section that presents a substantial projection on a plane parallel to the longitudinal axis of said tube.

Within the tube is located a smaller tube or conduit which has one opening through the wall of the larger tube and located thereon on the surface adjacent to the lowest point on the taper. At the upper end of the outside tube a series of perforations are located. The device, its lower portion being submerged, operates when the water is in relative motion to the boat to force water through the smaller or intake tube and at the same time to draw water from the bait well through the opening in the upper portion of the discharge tube and out through the opening in the lower end of the discharge tube. The action of the device is dependent on a relative flow of water with respect to the device rushing toward the submerged inlet opening and away from the submerged discharge opening, thereby creating a super atmospheric pressure in the former case and a depression in the latter. The overall action results in maintaining a level of water within the bait well that is substantially constant while circulating fresh water through the well. While my invention may differ in specific forms, I have shown in the accompanying drawings, typical embodiments from which the details of my invention may be understood when viewed in connection with the following description.

In the drawings, FIG. 1 is a side view of my bait well circulator, shown partially in section, as it is mounted in the bottom of a bait well. In this figure the bottom of the bait well is formed by the bottom of the boat.

FIG. 2 is a view in partial section showing a modified embodiment of my bait well circulator mounted in the bottom of the boat. In this view the bottom of the bait well is independent of the bottom of the boat.

Referring now to the drawings in detail, in FIG. 1, the numeral 1 designates a tube conduit, having in its side a small opening 2. This opening 2 is so arranged with respect to tube 1 that it faces horizontally oppositely with respect to opening 3 at the lower end of the tube 1. The opening 3 is formed by cutting tube 1 on a bevel so as to form an angle with the horizontal as shown. A relatively small tube or conduit 4 is disposed within tube 1, with the exception of a protruding portion 5 thereof which passes through the wall of tube 1 at opening 6. A series of openings 7 are located near the upper end of tube 1. A tube 8 extends from the lower part of tube 1. Openings 9 are located in the wall of tube 1 so as to connect the interior thereof with the tube 8. Stoppers 10 and 11, respectively, are provided for the open end of tube 8 and the opening at the top end of tube 1. These stoppers may be of any suitable or desired type such as the lever operated expandible plug 10 or the screw operated expandible plug 11. Cap 12 is provided for the extremity 5 of tube 4. Flange 13 is joined to tube 1 near the bottom thereof. Screws 14 are provided to mount the circulating device in the bottom of the bait well 15, which is, in the case shown in FIG. 1, formed by the bottom of the boat. One wall 16 of the bait well is shown in FIG. 1. The circulator of FIG. 1 is mounted by inserting the bottom end of tube 1 through a suitable hole 17 in the bottom of the boat, which in the case shown also serves as the bottom of the bait well. The circulator is oriented so that the cross-sectional area of the opening 2 is presented toward the direction of the motion of the boat, the opening presented at 3, in the discharge conduit 1, being oriented so as to present the horizontal projection of its cross-sectional area in the opposite or downstream direction.

In operation, the cap 12 is removed and the stopper 10 is inserted in opening 18; also, stopper 11 is preferably positioned above the small openings 7 and closes the upper opening of tube 1. The relative motion of water to the boat, while being propelled, causes water to be forced into the intake opening 2, up through tube 4 and into the bait well chamber 19. The relative motion of the water to opening 3 creates a vacuum effect in the exhaust tube 1 and accelerates the flow of water from the bait well through outlet openings 7 when the water level reaches these openings.

FIG. 2 illustrates a modified embodiment of the invention shown in FIG. 1. The embodiment of FIG. 2 is actually a two-piece version of the invention of FIG. 1. The principles of operation are exactly the same. 30 is a cylindrical tube section with bevelled opening 31 at the lower end and with a water-tight closure 32 at the top. Closure 32 is provided with suitable openings 33 and 34 for the passage of a tube 35 and a nipple 36, respectively. Tube 35 opens at 37 through the forward portion of tube 30 to communicate with the supporting body of water during operation. On its other extremity, which is open, is attached flexible conduit or tube 38. Flexible tube 38 is connected to a conduit or tube 39 which passes through an opening 40 in the end wall 41 of a larger, horizontal tube 42. The tube 39 passes inside of tube 42 and then upwardly through the opening 43 into tube 44, which is attached to tube 42, and out through opening 45 into the bait well chamber 46. The discharge end of tube 39, which is disposed to discharge into the bait well chamber, is fitted with a cap 12*a*. The lower end of nipple

36 opens into bottom tube 30, and its upper extremity is attached to and opens into flexible tube or conduit 47.

Tube 47 passes from its connection with nipple 36 and joins with a nipple 48 which in turn passes through opening 49 in end wall 40 into tube 42. Openings, such as 50, are provided in tube 44 near its upper extremity and above the opening 45.

The bottom tube 30 is mounted through opening 51 in the bottom 52 of the boat and secured thereto by any suitable means such as flange 53 which is joined to and arranged concentrically about tube 30. Small screws such as 54 and 55 secure the flange to the bottom 52 of the boat. Horizontal tube 42 is mounted by passing it through opening 56 in the wall of the bait well 57 and securing flange 58 to the inside wall of the well by means of small screws such as the screw 59. The stopper 61 is shown inserted in the upper end of tube 44 with its lower portion abreast and slightly clearing openings 50 and cap 12*a* is removed from the end of tube 39 in operation. Stopper 62 may be removed for drainage, as described hereafter and in the discussion of the embodiment shown in FIG. 1.

In operation, the device of FIG. 2 functions as follows: Inlet water passes in through opening 37 into tube 35 and upwardly through flexible tube 38 and tube 39 which discharges the water into the bait well chamber 46. When the water level in the bait well chamber 46 is substantially level with the openings 50 in tube 44, water overflows through openings 50 and downwardly through tube 44, and in sequence through the conduits or tubes 43, 47, 36 and into 30 where it discharges into the supporting body of water through opening 31. The vacuum action which maintains this withdrawal at a proper speed is provided by the relative motion of water past the bevel opening 31 in tube 30. While plug 61 closes the top of tube 44, the clearance between the plug and outlet openings 50 permits discharge of water to maintain a substantially constant level of water in the bait well or tank without loss of bait.

In the embodiment illustrated in FIG. 2, the tubes 35 and nipple 36 should be threaded and fitted with suitable caps or other closure means (not illustrated) so that, if desired, the flexible tubes 38 and 47 can be removed and the tube 35 and nipple 36 closed when the bait well 57 is not in use.

Devices constructed in accordance with my invention, though simple, operate remarkably effectively in automatically maintaining a constant level of circulating water in the bait well of the moving boat, regardless of the speed of the boat. As will be apparent from the embodiment of my invention discussed above, an increase in the speed of the boat results in increasing flow to both intake and exhaust lines of my bait well circulator devices, but no change in level, since the pressure increase in the former case is matched by a substantially proportionate vacuum increase in the latter case.

Applicant has tested several intake and discharge tube sizes with his device mounted on a 14-foot planing hull-type boat powered by a thirty horsepower outboard motor and has found that with intake to discharge tube sizes of the ratio of ¼-inch to ⅜-inch inside diameter, the device will not maintain a constant level at higher boat speeds but rather tends to overflow. Applicant found that a ¼-inch intake tube and a ½-inch discharge tube operate quite satisfactorily at all speeds of the said test boat, as of course do a ¼-inch intake tube and a one-inch discharge. The latter discharge size is very satisfactory; however, it should be noted that it is not advisable to increase the discharge tube size more than necessary to insure adequate discharge at all speeds because the problem of preventing leakage resulting from installations of tubing passing through the bottom of the boat, such as this, are increasingly troublesome with increases in the size of pipe or tubing so installed.

If desired, the bait well shown in FIG. 1 can be converted into a dry locker by screwing threaded cap 12 on the end of the outlet tube 5 and inserting a neoprene rubber plug 11 in the discharge tube so as to cover openings 7 therein. Thereafter, the plug 10 may be removed to drain the lower portion of the bait well. In operation, as a bait well, plug 10 is, of course, inserted in opening 18 of tube 8.

Applicant realizes that his device would likewise work to maintain a constant water level in a bait well or the like, in a situation where the device was fixed but the water moving, or wherever a sufficient difference of water pressure is provided at openings 2 and 3.

The foregoing disclosure in the description of the invention is illustrative and explanatory thereof and various changes in the size, shape and material, as well as in the details of the illustrated construction may be made, within the scope of the claims, without departing from the spirit of the invention.

What I claim is:

1. A device for use in circulating water through a bait well of a boat, comprising an outer tube having an opening in its upper end, an inner tube extending longitudinally within the outer tube to provide a space therebetween and having an opening in its upper end leading exteriorly of the space, means on the lower ends of said tubes providing a lateral inlet to the inner tube and an outlet from the space between the inner and outer tubes, said inlet and outlet being oppositely directed, and means for fixedly attaching said tubes to a boat hull with said tubes extending substantially upright within the bait well and said inlet facing forwardly of the boat beneath the hull.

2. In combination with a bait well in a boat, a device for use in circulating water through the well comprising a casing secured at the bottom of the well and projecting vertically thereabove, an inner tube extending longitudinally within said casing and providing a space therebetween, said tube and said casing each having an opening in its upper portion leading exteriorly into the well, and water inlet and outlet means on the lower ends of said tube and said casing and providing, respectively, forwardly and rearwardly facing inlet and outlet openings below the water level outside the boat for causing circulation of water through the well during movement of the boat.

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