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PROPULSION SYSTEM FOR AQUATIC VEHICLES

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2 Sheets-Sheet 1

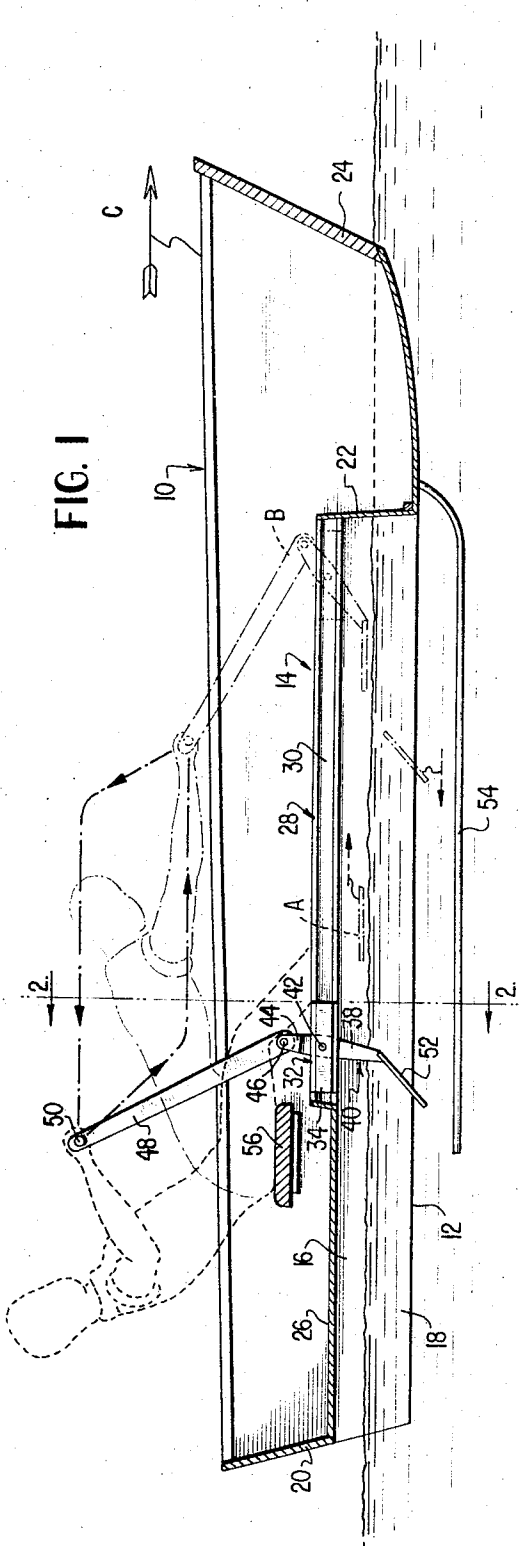


FIG. 1

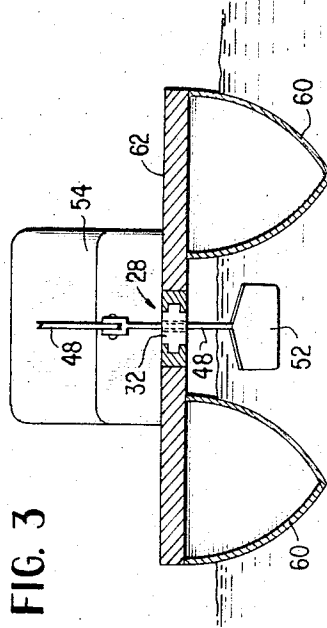


FIG. 3

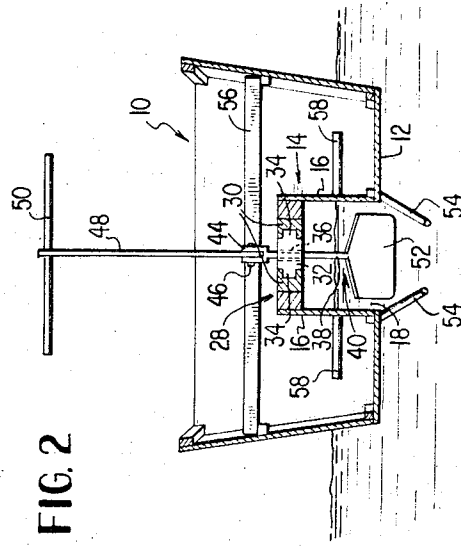


FIG. 2

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FIG. 5

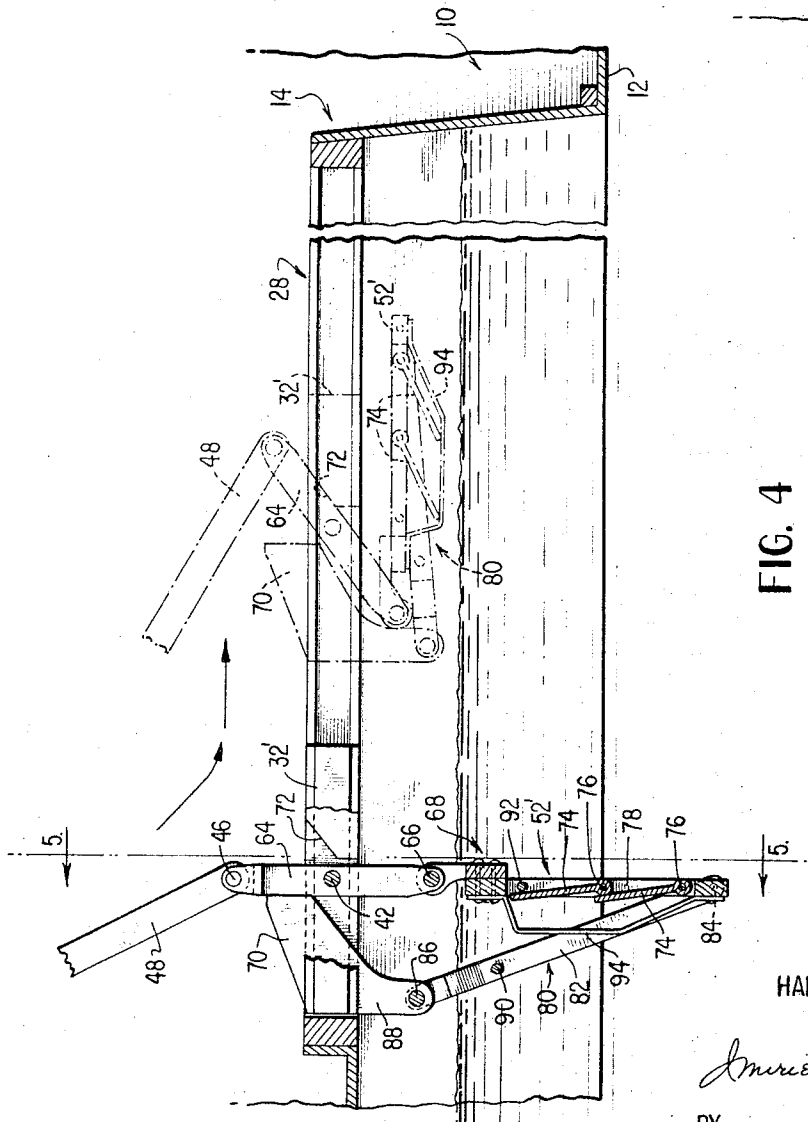
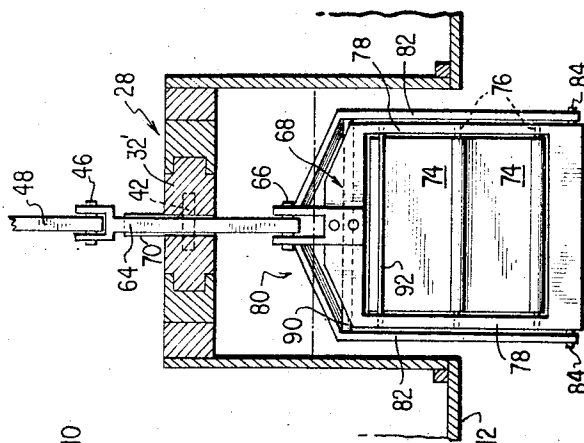


FIG. 4

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**3,369,517**  
**PROPULSION SYSTEM FOR AQUATIC VEHICLES**

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5 Claims. (Cl. 115—21)

This invention relates to improvements in aquatic vehicles and pertains, in particular, to a manually actuated rowing attachment for such vehicles.

The conventional manner of propelling a boat by oars necessitates that the oarsmen face aft and requires a relatively high degree of skill to efficiently propel the craft. Thus, not only need the oarsmen have the requisite skill to manipulate the oars to propel the craft efficiently without wasting an undue amount of energy, but also the oarsmen must be sufficiently skilled to guide the craft while facing aft thereof. Because of the difficulty experienced by the unskilled oarsmen in properly manipulating oars, it has been proposed to substitute for oars an arrangement of paddles slidably mounted on each side of a boat but these have proven inefficient and clumsy to operate.

Having in mind the defects of the prior apparatus, it is the primary object of this invention to provide an improved form of aquatic vehicle which incorporates therein a rowing or propelling attachment which allows the operator to face forward, which does not require a high degree of skill to operate and thus obviates waste motion and energy, and which is economical in construction and fabrication.

Broadly speaking, the present invention encompasses the utilization of a sliding or travelling member in association with a buoyant hull, which sliding member is disposed in elevated relationship to the water line of the hull and is movable longitudinally thereon. The slide or travelling member is disposed centrally of the hull and pivotally mounts a paddle or oar device and associated therewith is a handle for manipulation by the operator for traversing the slide or travelling member back and forth along its path of movement so that, incidental to such movement, the paddle will project below the water line of the hull in one direction of movement and will be picked up above the water line in the reverse direction of movement to thereby dip into and out of the water automatically to propel the craft in the aforesaid longitudinal direction. In one form of the invention, the paddle member comprises a normally open framework having shutter members associated therewith which automatically open and close to provide a smoother entry into and emergence from the water as the mechanism is operated.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of specific embodiments when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout the several figures and in which:

FIG. 1 is a longitudinal section taken longitudinally through an aquatic vehicle constructed in accordance with the present invention and illustrating the propulsion attachment in various positions incidental to its operation;

FIG. 2 is a transverse section taken on line 2—2 of FIG. 1;

FIG. 3 is a transverse section similar to FIG. 2 but illustrating a modified form of vehicle;

FIG. 4 is an enlarged, fragmentary longitudinal sec-

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tion showing a modified form of propulsion attachment, and

FIG. 5 is a transverse section taken on line 5—5 of FIG. 3.

With reference at this time more particularly to FIGS. 1 and 2, a boat including a buoyant hull 10 having, in the particular instance shown, a substantially flat bottom 12 provided with a longitudinally extending centrally disposed well 14. The well 14 conveniently may be formed by a pair of spaced upstanding side walls 16 bounding a longitudinally arranged slot 18 in the bottom 12 and which extends from the stern or transom 20 of the hull to a transverse front wall 22 which is adjacent but spaced slightly rearwardly of the bow 24 of the hull. Adjacent the rear of the hull, and bridging between the side walls 16 is a cover member 26 whereas forwardly of this cover member and extending to the front wall 22 is a guideway 28.

The guideway 28 includes a pair of spaced opposed grooved members 30 which slidably contain therebetween a slide or travelling member 32 in the form of a block having oppositely disposed tongues 34 engageable in the respective grooves of the members 30. The body of the slide 32 is provided with a vertical slot 36 through which the web 38 of a paddle member 40 extends and is pivotally mounted on a pin 42 establishing a horizontal transverse pivot axis between the paddle and the traveling member 32. That portion 44 of the paddle member which is disposed above the axis of the pivot 42 may be bifurcated, and is attached by a pivot 46 to a handle or actuator bar 48 having, at its upper end, a hand grip 50 to be grasped by the oarsmen or operator of the craft.

The portion of the paddle member 40 below the pivot axis 42 is of a length to extend, when in an upright position, below the water line of the hull 10 and carries a rigid paddle blade 52 which is adapted to propel the craft as the blade is moved through the water. To protect the paddle blade 52 from striking submerged objects, skid bars 54 may be provided alongside the lower slot opening 18 of the well member 14 and angling inwardly therefrom to afford maximum protection to the paddle blade 52. Just aft of the guideway 28, the craft is provided with a suitable platform or seat 56 upon which the operator may sit and forwardly of the seat, footrests 58 connected to a steering rudder (not shown) are provided.

During the operation of the device, the operator simply grasps the hand grips 50 and by alternately pushing and pulling thereon automatically causes the paddle assembly to dip into and propel the craft and then emerge from the water and return free therefrom to the initial position whereafter the cycle is repeated. In the terms of the showing in full and phantom lines in FIG. 1, the full line position therein illustrates the end of the propelling stroke whereafter the operator pushes the handle assembly 48 forwardly which action will cause the paddle assembly to pivot about the axis 42 and lift the paddle 52 free and clear above the water line as shown in phantom lines as indicated at A until the paddle assembly is carried to its forward extremity by the travelling member 32 to position B at the forward end of the guideway 28.

The operator thereafter reverses the motion and pulls upon the handle assembly 48 which will cause the paddle assembly to pivot about the axis 42 and dip the paddle blade 52 into the water and continued pulling on the handle 48 draws the paddle 50 rearwardly of the hull 10 to propel the craft forwardly in the direction of the arrow C, FIG. 1. Thus, it will be apparent that no particular skill is required to operate or manipulate the propulsion assembly, it being merely necessary for the operator to cyclically reciprocate the slide or travelling member 32 by manipulation of the handle 48 in an entirely natural and simple fashion. The steering of the craft may be

effected by any conventional fashion as by means of a foot operated tiller or the like, which forms no part of this invention.

One of the principal advantages of the present invention resides in the location of the paddle assembly centrally of the craft instead of laterally thereof. Thus, the craft can be maneuvered alongside a dock or the like without fouling the paddle assembly and the assembly is much easier to operate. Moreover, it lends itself readily for use with types of craft other than a flat bottom boat as hereinbefore described. As shown in FIG. 3, for example, it may readily be adapted to a catamaran comprising spaced twin hulls or floats 60 spanned by a deck 62 within which the guideway 28 is fitted and on which the seat 54 is mounted. Except that the well 14 and skid bars 54 are not necessary because of the twin hulls 60, the structure is identical to that previously described.

In order to provide an assembly which will cause the paddle to more smoothly enter into and emerge from the water, a modified form of the invention may be constructed in accordance with the principles illustrated in FIGS. 4 and 5. This paddle assembly includes a lever member 64 which is pivotally attached at its lower end by a pin 66 to a paddle assembly 52' including a frame 68. Otherwise, the lever portion 64 is pivotally attached to the slide or travelling member 32 by a pin 42, as previously described. The lever member 64 is oscillated between two extreme positions during manipulation of the propulsion device and is limited in such oscillation by a pair of stops 70 and 72 respectively, which are integral with or rigidly attached to the slide member 32'.

The paddle frame 68 is of open generally rectangular form and is adapted to be closed by a plurality of shutter members 74 (two being shown for purposes of illustration) respectively hinged by pins 76 between opposite side members 78 of the paddle frame 68. The paddle frame is constrained in its movement by means of a yoke shaped link 80 including arms 82 which straddle the frame 68 and are attached at the lower end by pivots 84. The other end of the link 80 is pivotally connected by a pin 86 to depending lug 88 fixed to or carried by the slide 32'. The link 80 has a cross brace 90 extending between the upper ends of the arms 82. The shutters 74, when closed, overlap one another and the frame 68 has a stop bar 92 extending between the upper ends of the side members 78 to limit the closing movement of the uppermost shutter, the lower shutters being stopped by engaging the bottoms of the immediately upper shutter, whereas a stop strap 94 limits the opening motion of the shutters 74, as shown in phantom line in FIG. 4.

In operation, as far as the rower or oarsman is concerned, the modified structure is the same as that shown in FIGS. 1 and 2, in that the operator pushes forwardly on the actuator 48 to swing the paddle frame 68 up and out of the water and move the slide 32' forwardly, and pulls rearwardly on the actuator 48 to swing the paddle frame 68 downwardly into operative position and move it rearwardly to propel the craft 10 forwardly. The operation of the paddle assembly 52' differs greatly from that of the paddle 52, however, in that at the end of its operative stroke, the paddle 52 swings upwardly and rearwardly and at the beginning of the operative stroke it swings downwardly and forwardly. The reaction of the forward movement is largely offset by the fact that the slide 32 and the paddle 52 are simultaneously starting their rearward stroke. In contrast, in the FIGS. 4 and 5 modification, the paddle frame 52' swings downwardly and rearwardly at the beginning of its operative stroke and at the end of such stroke it swings upwardly and forwardly but there is no reaction to the forward movement due to the action of the paddle shutters 74.

As the slide or travelling member 32' is reciprocated

back and forth along the guideway 28, the paddle assembly 52' will be moved between the full line position shown in FIG. 4, which represents the position of the paddle during the propulsion stroke, and the phantom line position of the paddle which represents the position of the paddle during the return stroke. During the return stroke, pushing upon the handle member 48 will cause the lever 64 to pivot about the pin 42 and the constraining link 80 will thereby lift the paddle frame 68 forwardly and the water pressure opens the shutters 74 permitting the paddle assembly 52' to emerge from the water with minimal effort. At the end of the return stroke, and upon once again pulling upon the handle 48, the paddle assembly 52' will be lowered into the water and during this action the paddle shutters 74 will be closed under the action of water pressure thereagainst so that at the opposite extremities of the stroke, upon entry into and emergence from the water, the paddle assembly is characterized by minimization of effort to effect these functions.

Although certain specific embodiments of the invention have been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

What is claimed is:

1. An aquatic vehicle comprising a buoyant hull mounting a centrally disposed longitudinally extending guideway thereon in elevated relation to the water line of the hull, a slide member freely movable along said guideway, a paddle pivotally mounted between its ends on said slide member about an axis transverse to said guideway, and a handle member pivotally attached to that portion of the paddle above said axis, that portion of the paddle below said axis being of a length to project below said water line of the hull when moved rearwardly of the hull by said handle member and to swing upwardly above said water line when moved forwardly by said handle member.

2. An aquatic vehicle as defined in claim 1 wherein said guideway is in the form of a pair of opposed members having grooves therein, said slide member being in the form of a block having a pair of tongues received in said grooves, said block having a vertical slot, and said paddle including a lever portion extending through said slot.

3. An aquatic vehicle as defined in claim 1 wherein said paddle includes a lever pivotally mounted on said slide member, an open frame pivotally attached to the lower end of said lever, a constraining link extending between and pivotally attached to said slide member and said frame, and shutter means pivotally carried by said frame and adapted to open and close with respect thereto in response to water pressure thereagainst.

4. An aquatic vehicle as defined in claim 3 wherein stop means are provided on said frame for limiting the movements of said shutter means.

5. In the aquatic vehicle as defined in claim 4 wherein said guideway is in the form of a pair of opposed members having grooves therein, said slide member being in the form of a block having a pair of tongues received in said grooves, said block having a vertical slot through which said lever extends.

#### References Cited

##### UNITED STATES PATENTS

907,303	12/1908	Wilkins	115—28
2,751,876	6/1956	Ogilvie	115—22
3,122,122	2/1964	Jenkins	115—24

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