

March 17, 1970

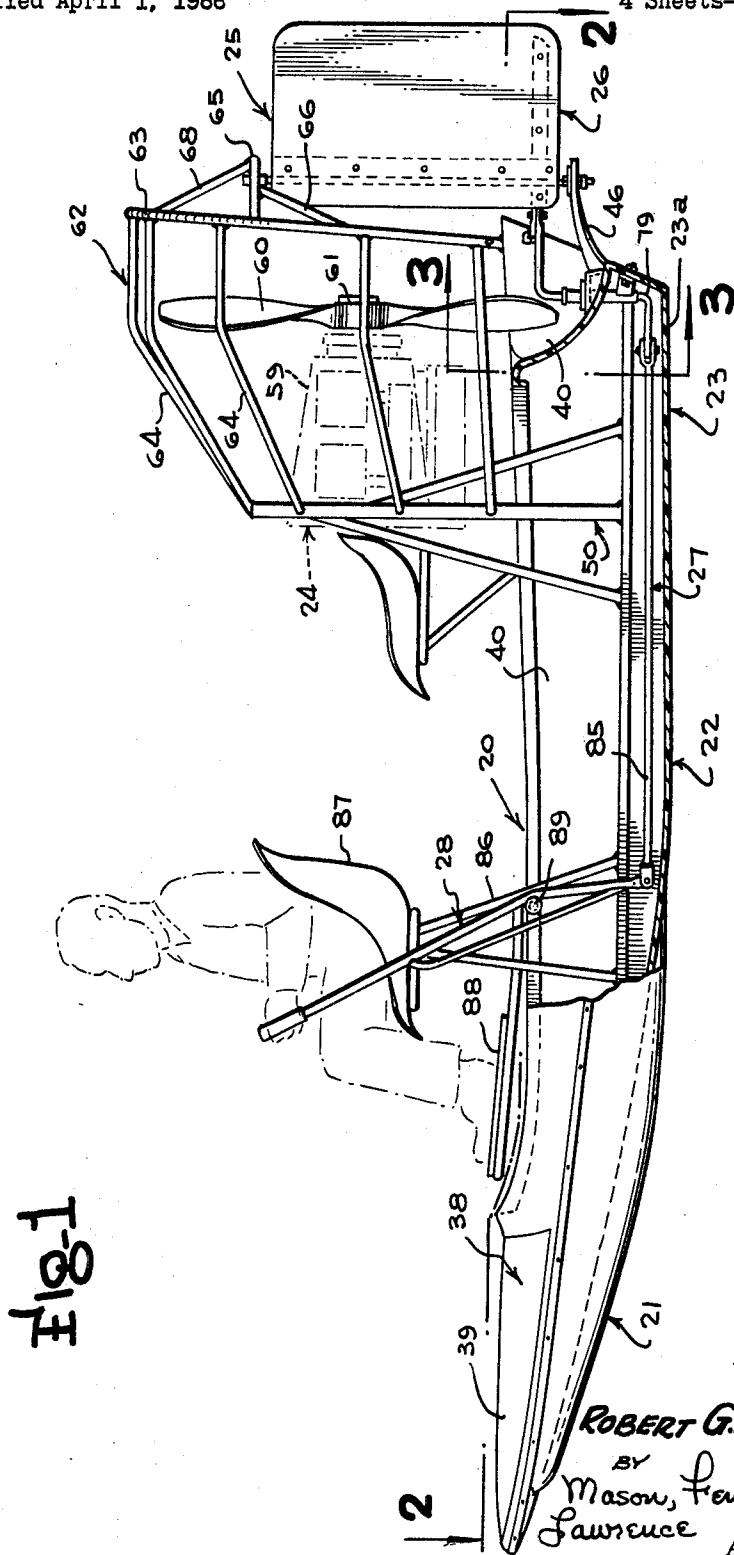
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3,500,784

SURFACE CRAFT

Original Filed April 1, 1966

4 Sheets-Sheet 1



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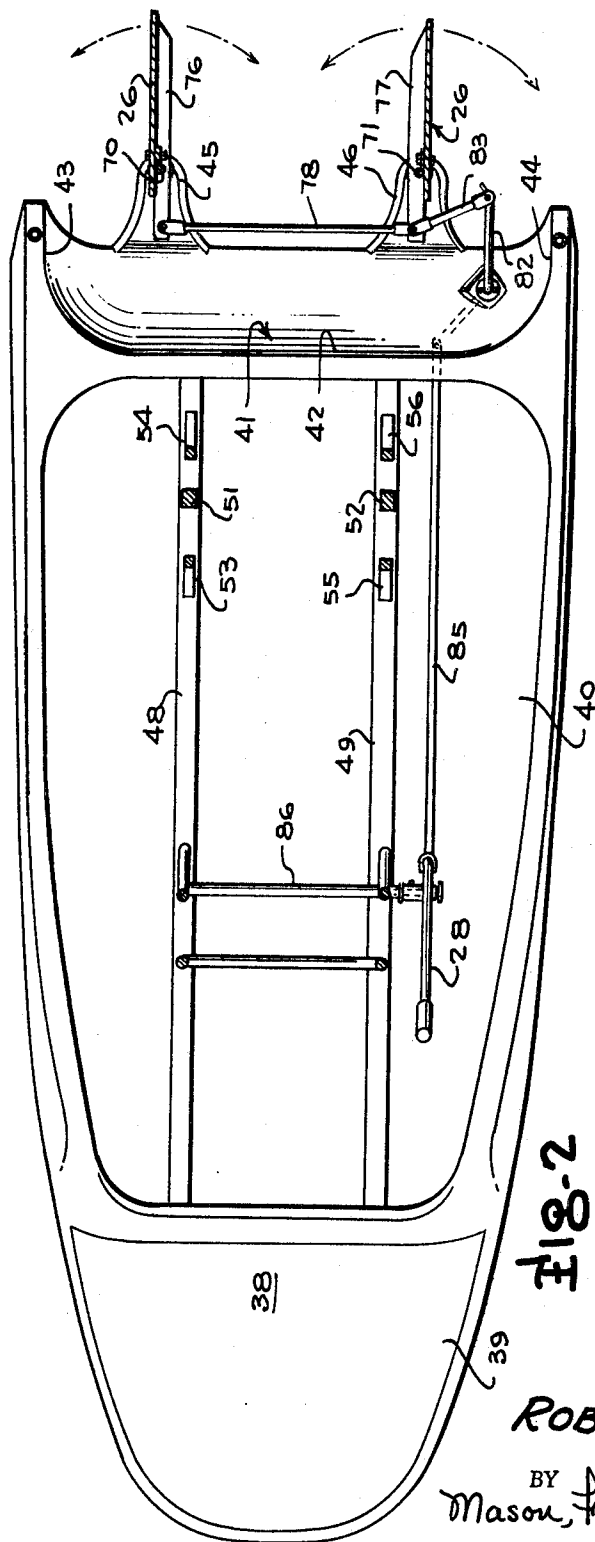
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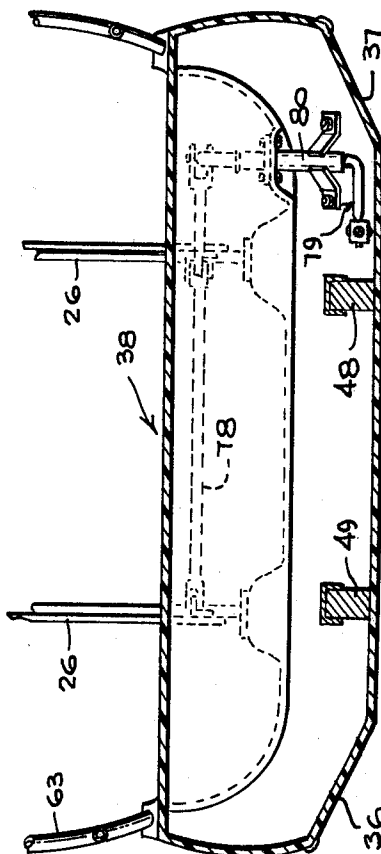


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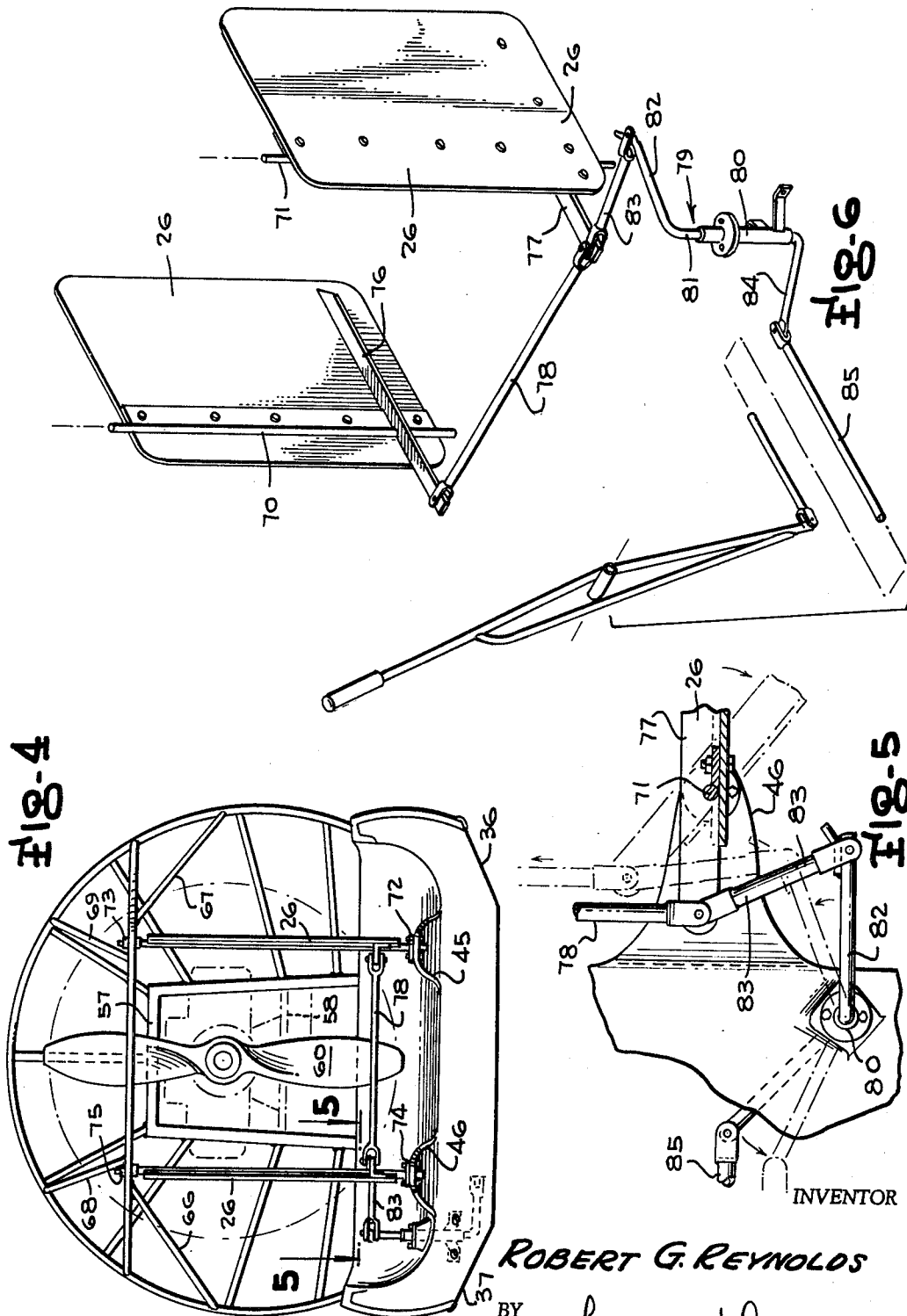
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SURFACE CRAFT

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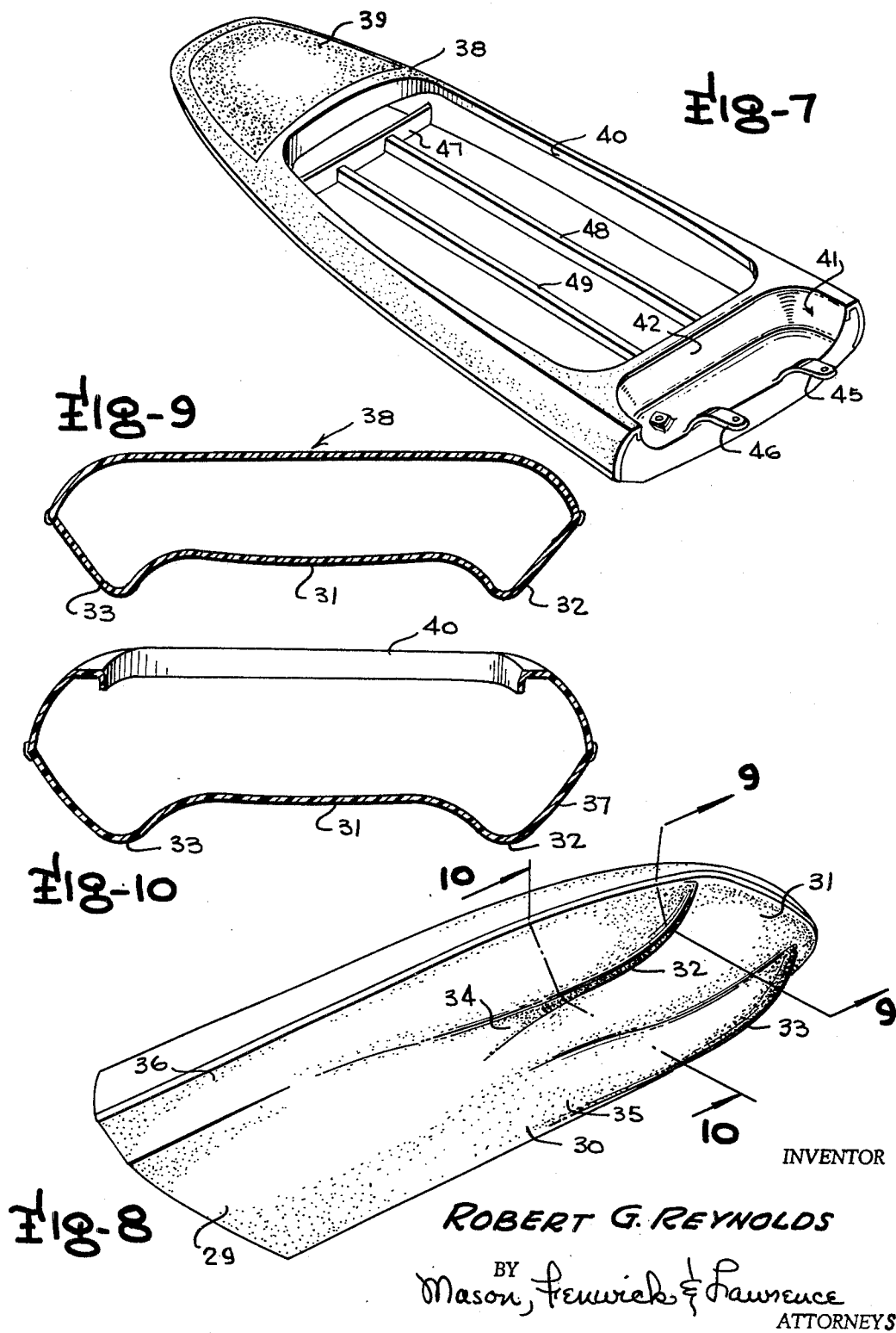
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SURFACE CRAFT

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4 Sheets-Sheet 4



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3,500,784

SURFACE CRAFT

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Continuation of abandoned application Ser. No. 539,419,
Apr. 1, 1966. This application Sept. 20, 1968, Ser.
No. 764,027

Int. Cl. B60f 3/00; B63b 1/18

U.S. Cl. 114—43

10 Claims

ABSTRACT OF THE DISCLOSURE

A surface craft generally comprising a hull including a bottom having a forward section, a mid section and an aft section, the forward section having a pair of transversely spaced, longitudinally disposed ridges, the ridges diminishing in depth from a point and aft thereof merging into the mid section, means for propelling the hull and means for steering the hull.

This application is a continuation of application No. 539,419 filed Apr. 1, 1966 and now abandoned.

This invention relates to a surface craft, and more particularly to a surface craft adapted to be propelled over land, marsh and water surfaces.

In the prior art there have been developed many types of surface craft which are adapted to be propelled by a motor driven propeller over land, marsh and water surfaces. Such craft generally include a hull structure, a motor driven propeller mounted aft on the hull structure for propelling the craft, and means for steering the craft. Most of the conventional surface craft structures, however, have been found not to be entirely satisfactory in performance. In operation, such craft have been found to be unstable when cruising in rough water, difficult to maneuver and control in turning, and inadequate in negotiating obstacles such as dikes, road grades and ditches. Furthermore, most prior art structures are not readily adapted to permit the craft to be freed quickly when the craft is run aground in shallow water, muck, mud or dry land.

Accordingly, it is the principal object of this invention to provide a novel surface craft.

Another object of this invention is to provide a novel surface craft adapted to be propelled on land, marsh and water surfaces.

A further object of this invention is to provide a novel surface craft having increased stability when cruising in rough water.

A still further object of this invention is to provide an improved novel surface craft which has greater maneuverability and control in turning, in comparison to conventional surface craft.

Another object of this invention is to provide a novel surface craft which is adapted to more easily negotiate obstacles such as dikes, road grades and ditches.

A further object of this invention is to provide a novel surface craft which is capable of being freed quickly when the craft has run aground in shallow water, muck, mud, or dry land.

A still further object of this invention is to provide a novel surface craft having an improved hull construction.

Another object of this invention is to provide an improved surface craft having a novel hull construction which imparts increased stability to the craft when cruising in rough water, and permits the craft to break waves in rough water, thus providing a smoother ride for the craft.

An additional object of the present invention is to provide an improved surface craft having a novel hull

construction, providing greater strength characteristics to the overall structure of the craft.

A further object of the invention is to provide an improved surface craft having a novel hull construction providing minimum surface contact of the craft when the craft has been run aground, to permit the craft to be rocked or spun free.

A still further object of this invention is to provide a novel surface craft which has improved speed performance.

Another object of this invention is to provide a novel surface craft having improved means for preventing water from being washed over the transom from astern, into the cockpit of the craft.

A further object of this invention is to provide a novel surface craft having a motor driven propeller which is mounted comparatively low on the craft, thereby lowering the center of gravity of the craft, and in which the slip stream of the propeller is unobstructed by any object of the craft other than the deflecting vanes or rudder utilized for steering the craft.

A still further object of this invention is to provide a novel surface craft which is comparatively simple in construction and inexpensive to manufacture.

Other objects and advantages of the present invention will become more apparent to those persons skilled in the art, from the following description when taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a side elevational view of the invention, having a portion thereof broken away;

FIGURE 2 is a cross-sectional view taken along line 2—2 in FIGURE 1;

FIGURE 3 is an enlarged cross-sectional view taken along line 3—3 in FIGURE 1;

FIGURE 4 is a rear elevational view of the embodiment;

FIGURE 5 is an enlarged cross-sectional view taken along line 5—5 in FIGURE 4;

FIGURE 6 is a perspective view of the steering system for the embodiment illustrated in FIGURES 1 through 5;

FIGURE 7 is a perspective view of the hull of the embodiment illustrated in FIGURES 1 through 5, illustrating the top thereof;

FIGURE 8 is a perspective view of the hull of the embodiment illustrated in FIGURES 1 through 5, illustrating the bottom thereof;

FIGURE 9 is an enlarged cross-sectional view taken along line 9—9 in FIGURE 8; and

FIGURE 10 is a cross-sectional view taken along line 10—10 in FIG. 8.

Briefly described, the present invention relates to a surface craft generally comprising a hull including a bottom having a forward section, a mid section and an aft section, the forward bottom section of the hull having a pair of transversely spaced, longitudinally disposed ridges diminishing in depth from a point and aft thereof and merging into the mid section, means for propelling the hull, and means for steering the hull. Preferably, the upper stern section of the hull is recessed, opening upwardly and aft. The propelling means comprises a motor driven propeller mounted on the hull, so that the lower portion of the propeller path extends within the recess, and the steering means comprises at least one deflecting vane mounted aft of the propeller in the slip stream thereof, including a control linkage operable from an operator's station, disposed forward for deflecting the vane. In addition, the mid section of the hull preferably is curved transversely and merges aft into the aft section, and the aft section is substantially flat.

Referring to the drawings, there is illustrated an embodiment of the invention. As best illustrated in FIGURE

1, the embodiment generally includes a hull structure 20, including a bow section 21, a mid section 22, and a stern section 23, a propelling means 24 mounted on the stern section of the hull structure, and a steering system 25, including a deflecting vane for rudder assembly 26, a control linkage 27 and a control stick 28.

As best illustrated in FIGURES 8, 9, and 10, the bottom of the hull structure includes a substantially flat aft section 29 which merges gradually into a mid section 30, which is rounded transversely, which in turn merges gradually into a forward section 31 which is gradually inclined upwardly and forwardly. The aft section 29 is substantially flat and broad abeam, to permit a broad planing surface when the craft is cruising. As best seen in FIGURE 1, the aft end of section 29 is slightly curved downwardly and rearwardly as at 23a, which functions to hold the bow of the hull down to enable the airboat to get up to plane faster. The mid section 30 is slightly crowned or concave in configuration, to provide a minimum amount of surface contact when the craft is run aground in shallow water, muck or dry land. The minimum surface contact of the mid section permits the operator to more easily free the craft under such conditions, by rocking the craft with intermittent blasts of the propeller and spinning the craft by deflecting the vanes or rudders.

The forward section 31 is provided with a pair of transversely spaced longitudinally disposed catamaran type ridges 32 and 33. Each of the ridges 32 and 33 have forward portions thereof curved upwardly and forwardly into the forward section 31 of the bottom hull surface. The ridges also diminish in depth from an intermediate point and aft thereof, gradually merging as at 34 and 35 into the mid section 30. The ridge members have a streamline configuration and merge with the bottom of the hull structure to provide a smooth flow of lines on the bottom surface of the hull structure. The outer sides of the ridges also merge into upwardly and outwardly inclined surfaces 36 and 37, as best seen in FIGURE 3.

It will be appreciated that the catamaran type ridges 32 and 33 serve several purposes by rendering increased strength characteristics to the hull construction, stabilizing the movement of the craft in rough water, and breaking waves in rough water, to provide a more comfortable ride. The ridge members also serve to prevent the craft from sliding in turning, and further serve as bumpers when approaching or climbing over obstacles such as roads, grades or ditches. The resistance to skidding provided by the ridge members in turning, results in improved maneuvering and turning characteristics of the craft.

The craft is broadest abeam at the aft section and gradually diminishes in width forwardly through the mid section toward a forward point and is provided with a rounded bow section. The upper portion of the hull structure is provided with a deck 38, having a nonskid surface 39 formed on the bow section, a cockpit 40 extending from the bow section through the mid section to the stern section, and a recess 41 in the stern section opening upwardly and rearwardly including a transversely disposed downwardly and rearwardly extending wall 42 defining a transom which curves rearwardly into spaced parallel side walls 43 and 44. Projecting rearwardly from the downwardly and rearwardly extending wall 42 are a pair of transversely spaced, rudder support brackets 45 and 46.

The hull structure of the craft can be formed of any suitable material in any suitable manner. It is preferred, however, that the hull be of a molded integral structure such as a molded fiberglass or similar construction. As best seen in FIGURES 2 and 7, the interior of the hull structure is provided with an integral transverse member 47 and integral longitudinal members 48 and 49 which impart additional strength to the hull and serve as support means for mounting various components of the craft.

Mounted on the aft section is a motor mount frame 50 which includes a pair of transversely spaced vertical members 51 and 52 rigidly secured by fore and aft extending brace members 53, 54, 55 and 56, an upper cross member 57 interconnecting the upper ends of the vertical members 51 and 52 and a platform member 58 which is rigidly secured to the vertical members 51 and 52 and extends aft. Mounted on the platform member 58 is a motor 59 which is adapted to drive a propeller 60 mounted on a rearwardly projecting drive shaft 61. The motor 59 is mounted in a position on the craft so that the lower traverse path of the propeller 60 extends within the recess or well 41, as best illustrated in FIGURES 1 and 4. The propeller 60 is utilized to provide the thrust in propelling the craft.

Also mounted on the frame 50 is a guard frame 62 for the motor and propeller. The guard frame consists of a circular member 63 mounted aft of the propeller, having its lower ends secured to the stern section of the craft, and a plurality of longitudinally extending members 64 which interconnect and are rigidly secured to the vertical members 51 and 52 and the cross member 57, and the circular member 63 about its periphery. It will be seen that the connecting members 64 enclose the propeller 60 and serve to prevent any objects from interfering with its operation.

Interconnecting the upper sides of the circular member 63 and curved rearwardly is a cross piece member 65, which serves as an upper rudder support bracket. The cross piece member 65 further is supported by brace members 66, 67, 68 and 69, which interconnect the cross piece member 65 and the circular member 63.

As best seen in FIGURES 1, 4 and 6, the rudders 26, 26 are mounted on vertical pivot members 70 and 71. The lower end of the pivot member 70 is seated and supported in a suitable bearing mount 72 mounted on the support bracket member 45, and the upper end thereof is pivotally mounted in a suitable bearing mount 73 mounted on the cross piece member 65. Similarly, the lower end of pivot member 71 is seated and supported in a suitable bearing mount 74 mounted on the support bracket member 46, and the upper end thereof is pivotally mounted in a suitable bearing mount 75 supported on the cross piece member 65. As best illustrated in FIGURE 4, the pivot members 70 and 71 are disposed parallel and spaced transversely within the slip stream of the propeller 60. It will be appreciated that upon deflection of the rudders 26, the craft can be turned.

The rudders 26, 26 also are provided with a pair of forwardly projecting actuating arms 76 and 77 which are interconnected by a connecting rod 78 pivotally connected at the ends thereof to the forward ends of the actuating arms. The connecting rod 78 causes the rudders to be deflected simultaneously at the same angle in parallel relation. The deflection of the rudders is effected by means of a crank member 79 pivotally mounted in a bearing sleeve 80 which is rigidly secured to the hull structure of the craft, as best illustrated in FIGURES 1 and 3. The crank member includes a vertically disposed portion 81 mounted in the sleeve member 80, a rearwardly extending upper arm portion 82, which is connected at the free end thereof to the actuating arm 77 and connecting rod 78 by means of a connecting link 83, and a lower inwardly and forwardly extending lower arm portion 84 which is pivotally secured at the free end thereof to the rearward end of a longitudinally disposed connecting rod 85.

The operator's station on the craft is located forward, as illustrated in FIGURE 1, and includes a seat frame 86 rigidly secured to the longitudinally disposed support members 48 and 49 within the cockpit on the hull structure, a seat 87 mounted on the frame 86, and a forwardly projecting foot rest 88 which also is mounted on the frame 86. Projecting laterally from the frame 86 is a pivot member 89 on which the control stick 28 is mounted for

pivotal movement in a substantially vertical fore and aft plane. The lower end of the control stick 28 is pivotally connected to the front end of the connecting rod 85. It will be appreciated that the craft may be steered merely by moving the upper end of the control stick forwardly and rearwardly. The pivotal movement of the control stick about the pivot member 89 causes the crank member 79 to pivot in the sleeve mount 80, to move the connecting rod 78, through link member 83, thereby causing the rudders 26, 26 to pivot simultaneously about the axes of pivot members 70 and 71.

It will be noted that the recess or well 41 serves several functions. When the craft is being launched or slowed down suddenly, the forwardly disposed transom on the craft prevents water from back washing over the stern into the cockpit of the craft. The forwardly disposed transom also prevents any loose items in the cockpit from being drawn or sucked up into the propeller. Furthermore, the space provided by the well for receiving the lower portion of the traverse path of the propeller, permits the motor 59 to be mounted in a lower position on the craft, thereby lowering the center of gravity of the entire craft. In addition, the slip stream of the propeller 60 is unobstructed, except for various members of the guard frame therefor and the rudders.

The lowering of the center of gravity of the craft further increases the stability of the craft and contributes in improving the speed of the craft. The unobstructed slip stream of the propeller provided by the structure of the craft as described, further results in increased thrust, which increases the speed of the craft.

From the foregoing detailed description it will be evident that there are a number of changes, adaptations and modifications of the present invention which come within the province of those skilled in the art.

I claim:

1. A surface craft comprising a hull including a bottom having a forward section, a mid section and an aft section, said forward section having a pair of transversely spaced, longitudinally disposed ridges providing a substantially longitudinally disposed recess therebetween, said ridges diminishing in depth from a point and aft thereof merging into said mid section, said recess having a planar bottom surface interconnecting said ridges and disposed along the centerline of the hull and diminishing in depth from a point in the forward section of the hull and aft thereof whereby said planar bottom surface merges into said mid section, means for propelling said hull and means for steering said hull.

2. A surface craft according to claim 1, wherein the upper stern section of said hull is recessed, opening up-

wardly and aft, said propelling means comprises a motor driven propeller mounted on said hull and said propeller path extending within said recess.

3. A surface craft according to claim 2, wherein said steering means comprises at least one deflecting vane mounted aft of said propeller in the slip stream thereof including a control linkage operable from an operator's station disposed forward, for deflecting said vane.

4. A surface craft according to claim 3, wherein said deflecting vane is mounted on a support bracket projecting aft relative to the stern of said hull.

5. A surface craft according to claim 1, wherein said mid section of said hull is curved transversely and merges aft into said aft section.

6. A surface craft according to claim 5, wherein the upper stern section of said hull is recessed, opening upwardly and aft, said propelling means comprises a motor driven propeller mounted on said hull and said propeller path extends within said recess.

7. A surface craft according to claim 6, wherein said steering means comprises at least one deflecting vane mounted aft of said propeller in the slip stream thereof including a control linkage operable from an operator's station disposed forward, for deflecting said vane.

8. A surface craft according to claim 7, wherein said deflecting vane is mounted on a support bracket projecting aft relative to the stern of said hull.

9. A surface craft according to claim 5, wherein said aft section is substantially flat.

10. A surface craft according to claim 9, wherein the upper stern section of said hull is recessed, opening upwardly and aft, said propelling means comprises a motor driven propeller mounted on said hull, the path of said propeller path extends within said recess and said steering means comprises at least one deflecting vane mounted aft of said propeller in the slip stream thereof including a control linkage operable from an operator's station disposed forward, for deflecting said vane.

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TRYGVE M. BLIX, Primary Examiner

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114—56, 66.5