United States Patent

Jalowiecki et al.

[15] **3,689,950**

[45] **Sept. 12, 1972**

[54] **COMBINATION BOAT TRAILER**

[72] Inventors: **Jerzy George Jalowiecki,** 1715 De Seve St., Montreal, Quebec; **Jan Metelski,** 22, 58th Ave., Laval, Quebec, both of Canada

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[21] Appl. No.: **24,298**

[52] **U.S. Cl.** .....**9/1 T,** 114/56

[51] **Int. Cl.**.....**B63c 13/00**

[58] **Field of Search** .....9/1 R, 1 T, 6; 114/56, 61, 114/62, 65 R, 66.5 R

[56] **References Cited**

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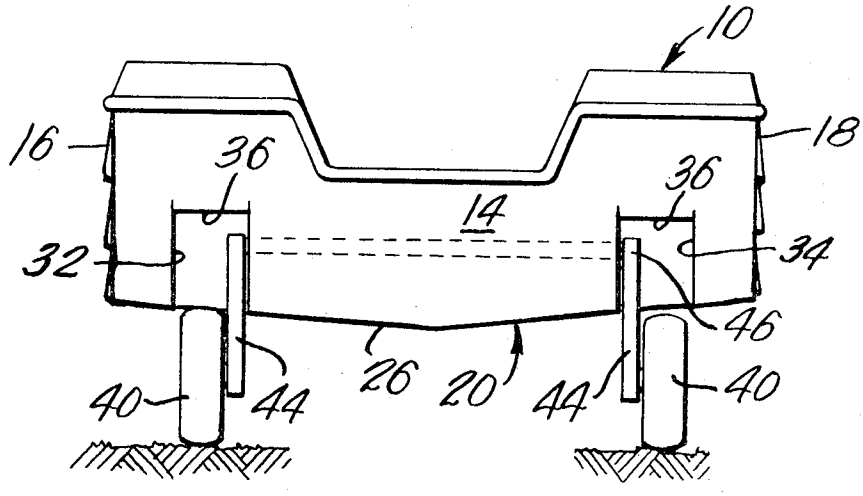
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Primary Examiner—Milton Buchler
Assistant Examiner—F. K. Yee
Attorney—Alan Swabey

[57] **ABSTRACT**

A boat construction having a pair of spaced-apart slots near the stern open to the bottom of the boat and the stern wall of the boat and a retractible running gear pivotally mounted in the slots between a land transport position and a retracted position. A detachable hitch having a three-point connection to the bow of the boat and a universal joint connection to a holding vehicle.

7 Claims, 10 Drawing Figures



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SHEET 1 OF 3

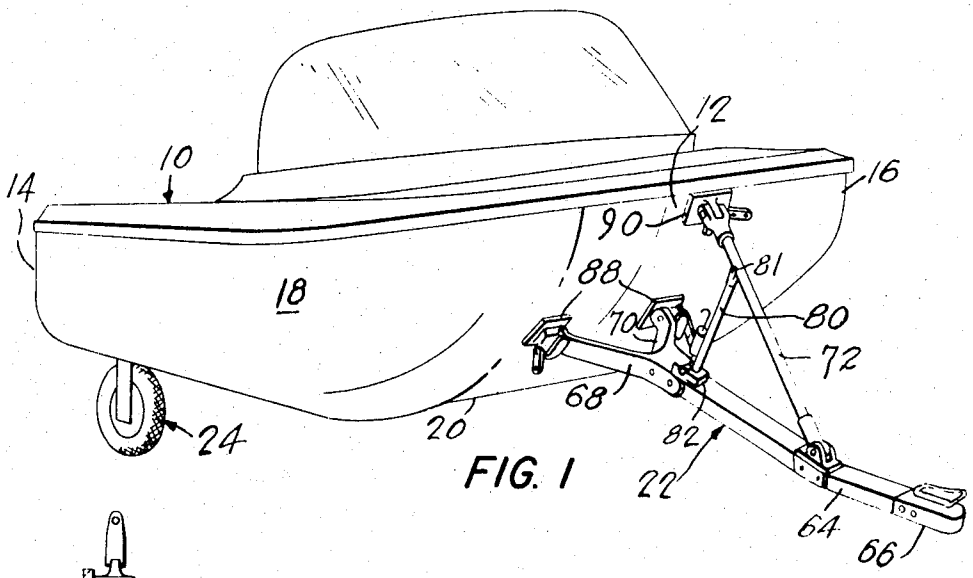


FIG. 1

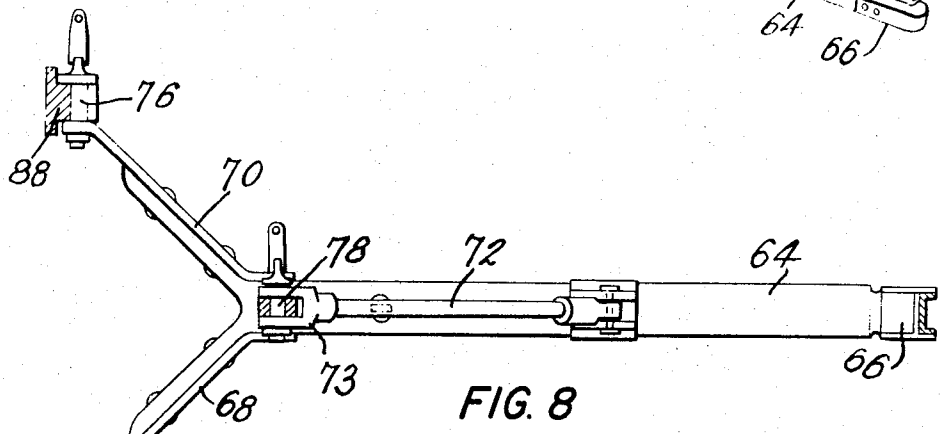


FIG. 8

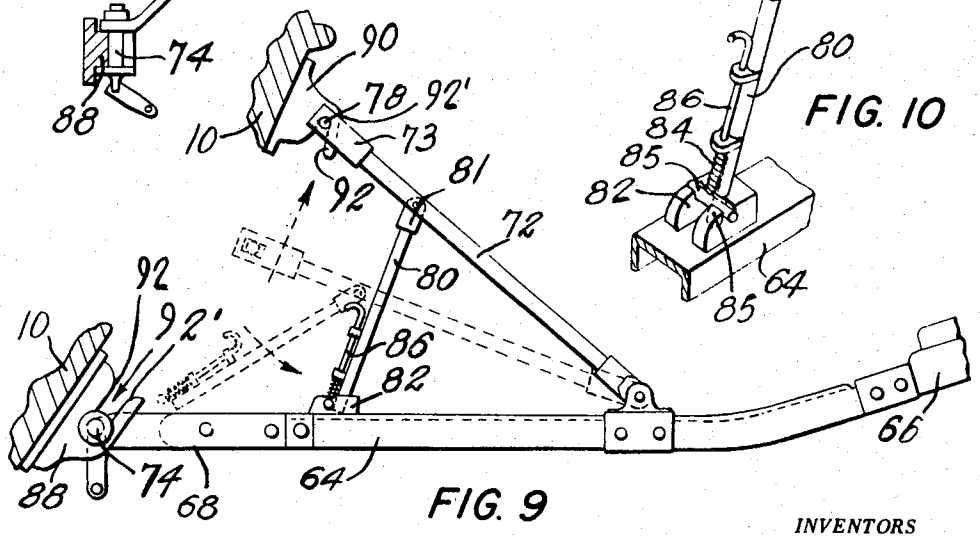


FIG. 9

FIG. 10

INVENTORS
Jerzy George JALOWIECKI
Jan METELSKI

ATTORNEY

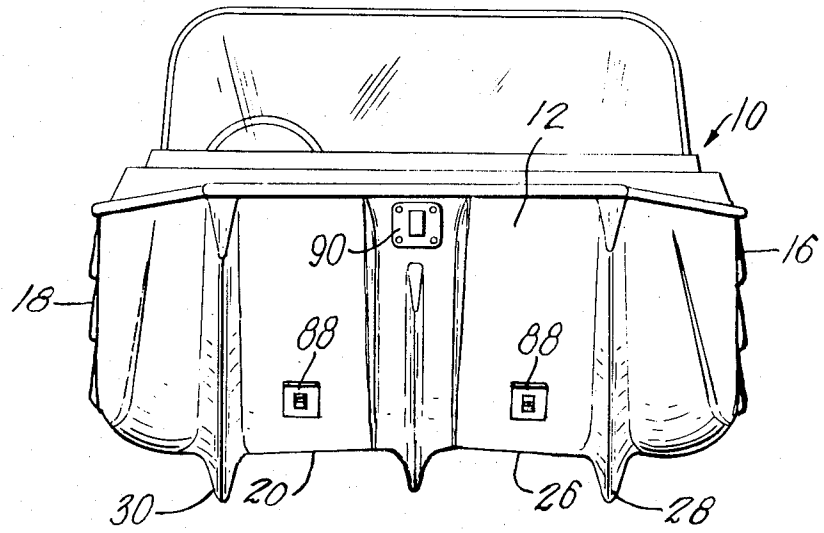
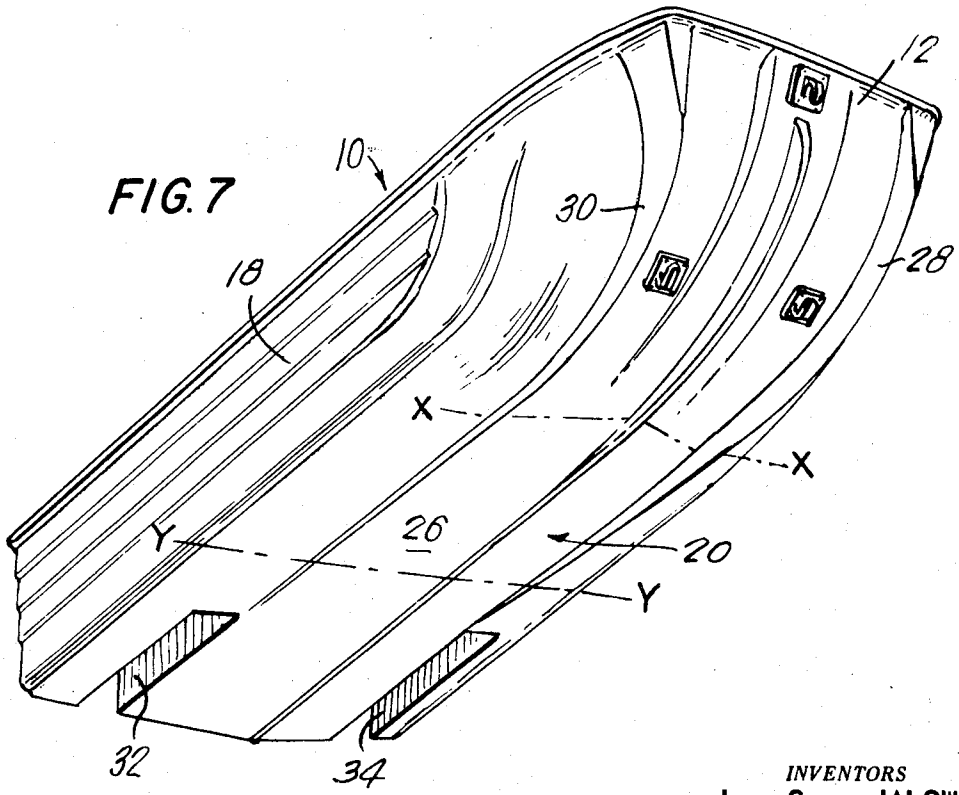


FIG. 2

FIG. 7



INVENTORS
Jerzy George JALOWIECKI
Jan METELSKI

Allan Swabey

ATTORNEY

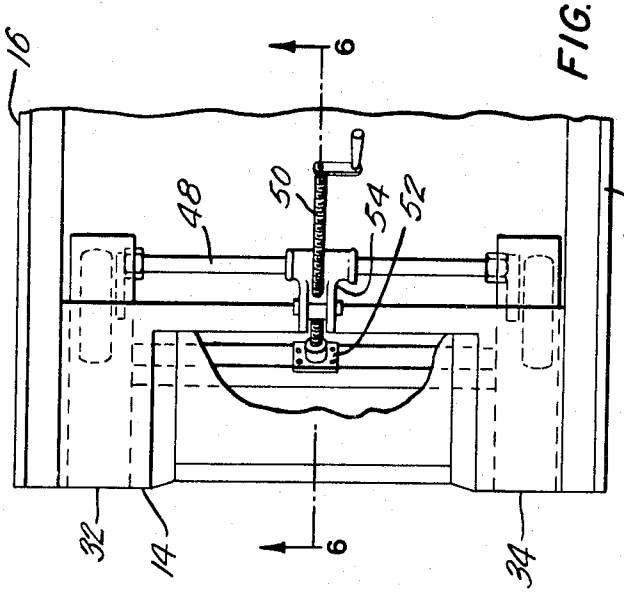


FIG. 5

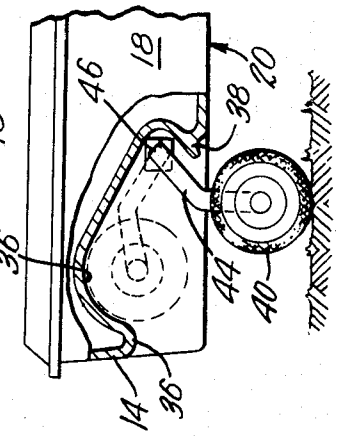


FIG. 3

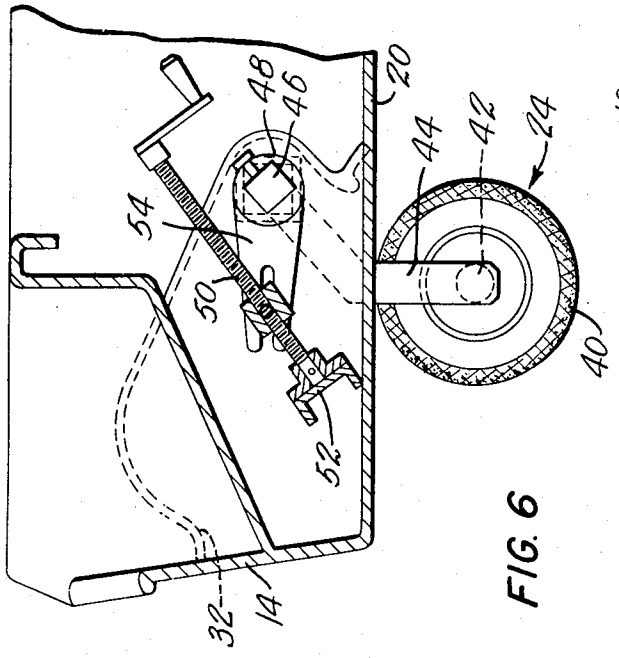


FIG. 6

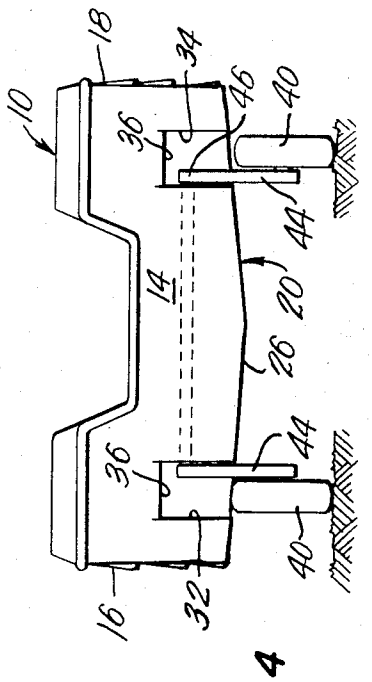


FIG. 4

INVENTORS
Jerzy George JALOWIECKI
Jan METELSKI

ATTORNEY

COMBINATION BOAT TRAILER

BACKGROUND OF INVENTION

1. Field of Invention

The present invention relates to improvements in hulls of boats particularly to a hull for a boat suitable for receiving a retractible running gear and the combination thereof and a detachable hitch for pulling such a boat or similar vehicle.

2. Description of Prior Art

Reference is made to U.S. Pat. No. 3,154,799 issued Nov. 3, 1964, inventor J. G. Jalowiecki. In this patent, a combined boat trailer having a retractible running gear was described.

OBJECTS OF INVENTION

It is an aim of the present application to provide an improved hull for a boat for receiving a retractible gear of the general type as shown in the above-mentioned patent. It is a further aim of the invention to provide an improved retractible running gear.

It is yet a further aim of the present invention to provide a hitch for pulling a boat behind an automobile or the like, wherein the hitch can be detached from the boat as well as the automobile when it is required to float the boat on water.

A construction in accordance with the present invention includes a hull for a boat comprising a bow, a stern and a bottom; the bottom including a central longitudinal supporting surface, a pair of longitudinal parallel slots extending a predetermined distance in the bottom from the stern and a predetermined distance in the stern from the bottom of the hull, said central supporting surface being defined between said slots. Retractible running gear can be arranged so that it is pivoted in the gears for movement from a boat floating position wherein the slots are within the limits of the hull, and to a land transport position wherein the running gear protrudes downwardly from the slots.

A hitch construction in accordance with the present invention comprises a hitch member adapted to be connected at one end to a hauling vehicle, the other end of the hitch including at least a pair of members having connecting means on the ends thereof, the pair of members being provided in hinged relationship one relative to each other, at least a pair of bracket members adapted to be mounted to the boat, each bracket having hook-shaped seats, the brackets being mounted so they are open towards each other in a spaced-apart opposed relation on a front portion of the boat, the connecting means of the pair of hinged members being adapted to fit in the open seat of the respective spaced-apart brackets, means for maintaining the hinged members in a spaced-apart relation whereby the connecting means are locked in the respective brackets.

In a more specific construction, the central supporting surface portion is defined forward of the slots between a pair of longitudinal ribs.

IN THE DRAWINGS

Having thus generally described the nature of the invention, particular reference will be made to the accompanying drawings showing by way of illustration preferred embodiments thereof and in which:

FIG. **1** is a perspective view showing one embodiment of the hitch mounted to the front of the boat, having a retractible running gear;

FIG. **2** is a front elevation of a typical boat hull embodying certain features of the invention;

FIG. **3** is a partial side elevation of the stern end of the boat hull partly in section to show yet another feature of the invention;

FIG. **4** is a rear elevation taken from the stern end of the boat showing the boat with the running gear in the land transport position;

FIG. **5** is a partial top plan view of the stern end of the boat hull shown in FIG. **2**;

FIG. **6** is a vertical cross section taken along line **6**—**6** of FIG. **4**; and

FIG. **7** is a perspective view taken from the bottom of the boat;

FIG. **8** is a top plan view of the hitch shown in FIG. **1**;

FIG. **9** is a side elevation of the hitch showing the movement of one of the hinge members in dotted lines; and

FIG. **10** is a perspective view of the detail of the hitch shown in FIGS. **1** and **9**.

The boat hull is referred to generally by the reference numeral **10** in the drawings. The boat hull includes a bow **12**, a stern **14** a port side **16** and a starboard side **18** as well as a bottom **20**. At the bow of the boat **10** a detachable hitch **22** is shown while the retractible running gear **24** is near the stern **14**.

A central portion of the bottom **20** is designated as a support area **26**. This support area **26** is in effect that portion of the bottom which normally is supported on the water when the boat is cruising. In such a condition, normally the bow of the boat will be raised out of the water and in most boats the rear central portion is what is supporting the boat on the water.

In the present embodiment shown, particularly in FIGS. **2** and **7**, the support area **26** has been found to extend between the areas defined by projections of the ribs **28** and **30** such as shown. These ribs have also been found to enhance the speed of the boat. Towards the bow **12** of the boat, the central portion between the ribs **28** and **30** is slightly concave or has a slightly upwardly extending "V"-shaped portion along line *x*—*x*. However, this tapers gradually until the central portion is flat such as shown along line *y*—*y*. Finally, at the stern **14** of the boat, there is a slight downwardly extending "V"-shape at the central portion of the bottom.

It is believed that as the boat cruises on the water air is trapped between walls defined by the ribs **28** and **30** and with the slight concave shape of the bottom this helps to lift the boat out of the water particularly in the support area **26**. From the stern **14** of the boat **10**, as seen in FIGS. **4**, **5**, **6** and **7**, slots **32** and **34** are provided on either side of the general support area **26** which are in the path of longitudinal projections of the ribs **28** and **30**.

Since the slots **32** and **34** are on either side of what has been found to be the boat support area **26**, it does not appear to reduce the buoyancy effect on the boat **10**. The slots **32** and **34** have been made such that not only are they open to the bottom at **32**–**34** but they are also open to the stern at **36**. Thus any water streaming upwardly into the slots **32** and **34** does not have a detrimental effect on the speed of the boat since streaming

water is allowed to pass through the opening **36** in the stern of the boat. Of course, if the well or slots were closed, the water streaming into the well would hit the rear wall of the well and oppose the forward movement of the boat. It has also been found that the provisions of slots **32** and **34** increase the performance of the boat in that they reduce unnecessary friction area of the bottom **20** in areas which are not needed to support the boat, that is outside of the support area **26**.

Certain limitations must be given the slots **32** and **34**. These are particularly determined by the size and structural aspects of the boat. For instance, if these slots were made to extend too far forward, the structure of the boat would be weakened. Also, it would reduce the accommodations in the cockpit area.

The slots are also provided with a wheel well and an aerodynamic lip **38**. The aerodynamic lip **38** reduces the streaming of water into the slot and also provides a small amount of aerodynamic lift to the boat.

The slots **32** and **34** may also be used to house the retractible running gear **24**. In the present embodiment, retractible running gear **24** includes a wheel **40** freely rotating on a shaft **42** mounted to a crank arm **44**. In the drawings, suspension **46** is shown to which the crank arm **44** is connected. This suspension could be the torsion type or of the type known as "NEIDHARDT" as shown.

The suspension includes a suspension housing **48** which passes through the cockpit of the boat. Housing **48** connects the crank arms **44** with both slots **32** and **34** shown in FIG. **4**. In the cockpit of the boat is provided a screw jack **50** connected to a bracket **52** in the boat and a connecting bracket **54** mounted to the suspension housing **48** is associated with the screw jack. By hand rotating the screw jack **50**, the connecting bracket **54** and the suspension housing **48** can be rotated so as to pivot the retractible wheels **40** into the wheel well **36** of the slot **32** and **34** or to rotate it in a position as shown in FIG. **6** where the wheels are in a land transport position.

The location of the axis of the suspension housing **48** is substantially coincident with the longitudinal center of gravity of the boat **10** when an outboard motor is mounted to the stern **14**. This is to improve the balance of the boat **10** when being trailed in a land transport position. The angle provided in crank arms **44** is a compromise to locate the wheels **40** in relation to the axis of housing **48** and to keep the length of slots **32** and **34** to a minimum.

Referring now to FIG. **1**, and **8** through **10** the boat **10** with the hitch **22** is shown having a hitch beam **64** of a box member or channel construction. On one end of the beam **64** is a universal connecting joint **66** which is adapted to connect to a hauling vehicle such as an automobile.

In the embodiment shown, a pivoting member **72** is provided which is pivotally mounted to the beam **64** and pivots relative to the other end of the beam **64**. The other end of the beam **64** of the present embodiment is shown having two leg members **68** and **70** connected to the end of the beam **64** and is reinforced.

Each end of the leg members **68** and **70** as well as the pivoting member **72** is provided with rigidly mounted connecting pins **74**, **76** and **78**. Pins **74** and **76** extend outwardly from the legs **68** and **70** respectively. Pin **78** is subtended between a U-shaped bracket **73** on the end of pivoting member **72**. A locking strut **80** is pivoted to the pivoting member **72** at **81**. A locking bracket **82** is mounted to the beam **64** and is adapted to receive the locking strut **80**.

A locking device such as shown in FIG. **10** can be used to lock the locking strut **80** in position in the bracket **82**. The locking device shown in FIG. **10** includes a locking T rod **86** passing through guide lugs **85** and a spring **84** normally urging the locking T rod **86** downwardly to the seat in the bracket **82**.

Brackets **88** are mounted as shown in FIGS. **1**, **2** and **7**, to the front end of the hull of the boat and bracket **90** is mounted in a spaced-apart relationship from brackets **88**. Each of brackets **88** and **90** have hook-shaped seat members **92**, and the hook-shaped seat members **92'** of the bracket **88** are open towards the bracket **90**, and the hook-shaped seat member **92** of the bracket **90** is open towards the brackets **88**.

In operation, when it is required to attach the hitch to the boat, the beam member **64** is placed so that the locking pins **74** and **76** of the legs **68** and **70** are seated in the hook-shaped seat **92** of brackets **88**. Pivoting member **72** is pivoted upwardly from the beam **64** so that the pin **78** engages the hook-shaped seat **92** of bracket **90** on the boat. Locking strut **80** is then pivoted downwardly so that the locking rod **86** engages the bracket **82** on the beam **64** and locks the pivoting member **72** in a fully opened position so that the distance between the connecting pins **74** and **76** on the legs **68** and **70** to the connecting pin **78** on pivoting member **72** is greater than the distance between the edges of the openings in hook-shaped seats **92** of brackets **88** to the edge of the opening of the hook-shaped seat **92** in bracket **90**. Thus, a three-point lock structural unit is provided which is rigid to the boat.

The universal connector **66** of the beam **64** can now be connected to a suitable attachment to an automobile and the boat can be trailed about. When it is required to float the boat, one disengages the locking unit comprising the locking rod **86** from the locking bracket **82** so that the strut **80** no longer retains the pivoting member **72** in an extended position. Once the pivoting member **72** is pivoted downwardly towards the beam **64** the connecting pins **74** and **76** of legs **68** and **70** simply slide out of the hook-shaped seat **92** of brackets **88**.

We claim:

1. A boat hull comprising a bow and a stern and a bottom wall, the bottom wall defining a central longitudinal boat supporting surface, a pair of longitudinal parallel slots in said bottom wall and opening vertically therefrom and extending a predetermined distance from and opening into the stern from the bottom wall and extending toward said bow a predetermined distance in the bottom wall and each defining a rearwardly-opening, enclosed well within the span of said bottom wall for reducing the drag at the stern of the hull, a central supporting surface in said bottom wall being defined between said wells and substantially immediately flanked by said wells; and retractible running gear provided in the wells for pivoting movement between a position with the running gear in the well substantially within the limits of the hull and to a position pivoted beneath the wells to a land transport posi-

tion wherein the running gear protrudes downwardly from the wells to support the boat.

2. A boat hull as defined in claim 1 wherein longitudinal ribs extend forwardly on the bottom wall as the projection of the slots and the central supporting surface is defined between the slots and the longitudinal ribs.

3. A boat hull as defined in claim 1, wherein the supporting surface of the bottom wall near to the bow defines an inverted shallow V shape while the supporting surface near the stern of the boat between the wells defines a shallow V shape.

4. A boat hull as defined in claim 1, wherein the slots defined in the stern of the boat extend less than half the height of the stern.

5. A boat hull as defined in claim 1, wherein an aerodynamic lip is provided at the leading edge of the slots in the bottom wall of the boat.

6. A boat hull as defined in claim 1, wherein the running gear includes a wheel mounted to a resiliently mounted pivoting member for pivoting movement between a retracted position and a land transport position whereby the wheel protrudes from the bottom slot.

7. A boat hull as defined in claim 6, wherein the wheel supporting member includes a crank arm resiliently mounted to a rotating shaft member extending laterally across the boat and each crank arm fixed to said shaft provided in each well mounts a freely rotating wheel.

* * * * *