

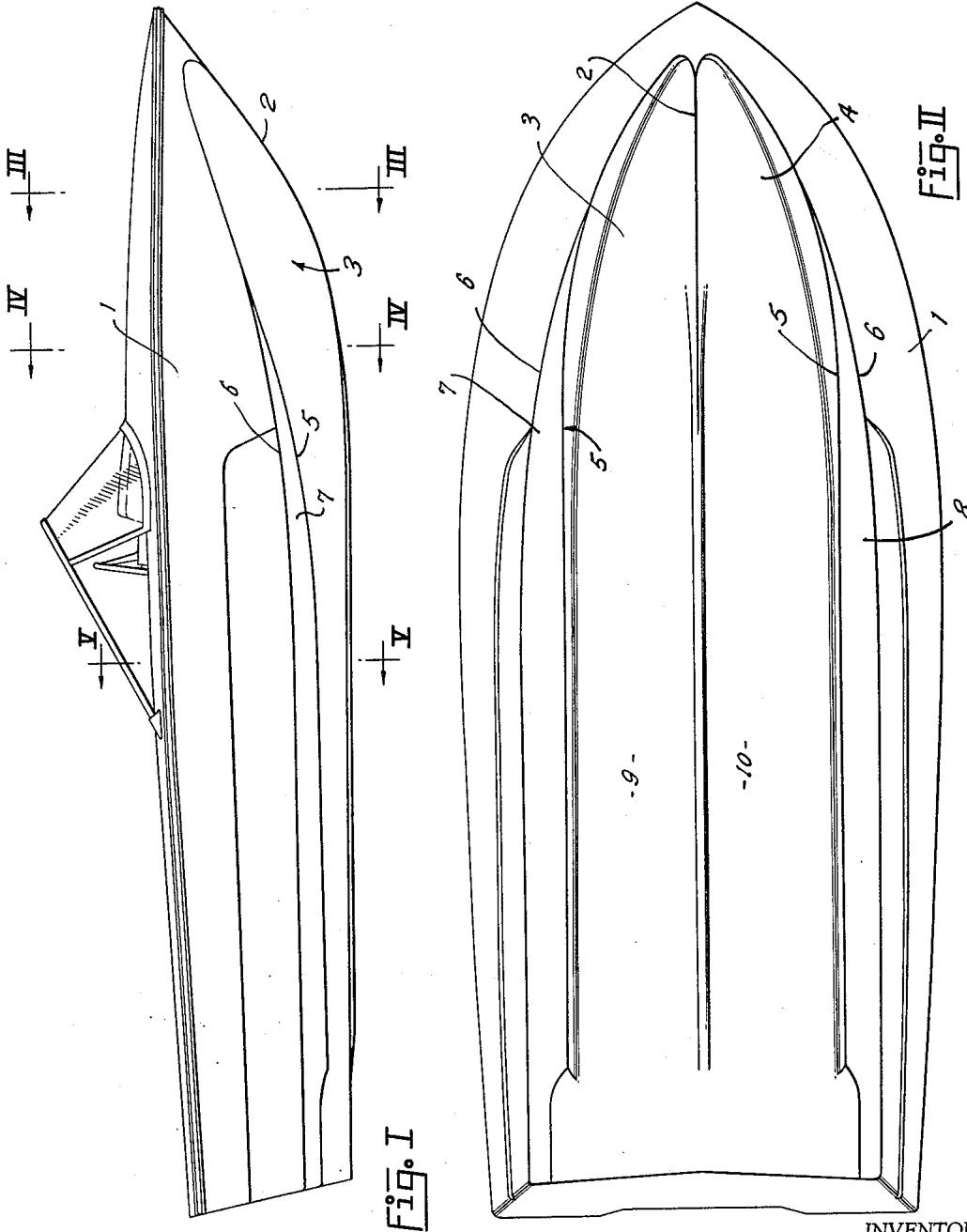
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T. L. FAUL ETAL
BOAT HULL DESIGN

3,167,792

Filed May 16, 1963

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

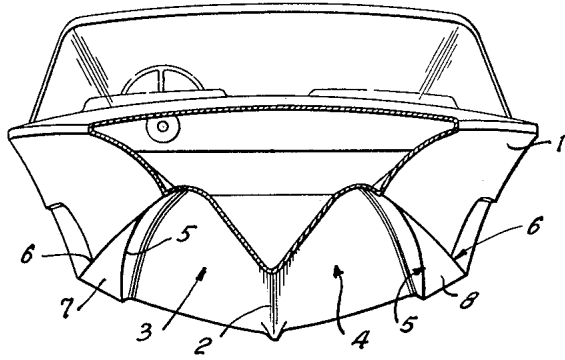


Fig. III

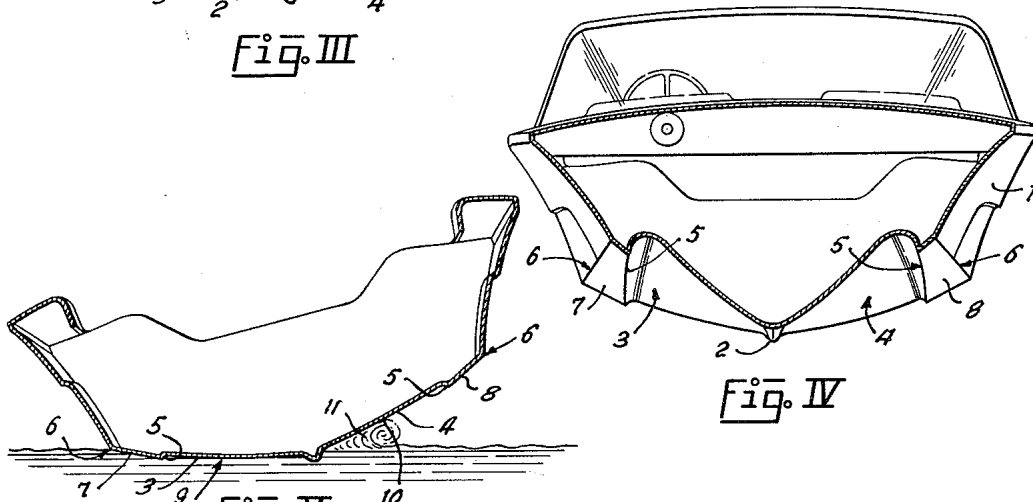


Fig. IV

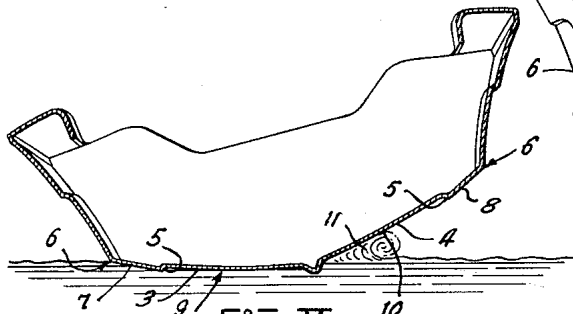


Fig. V

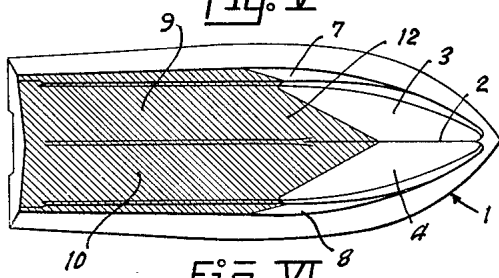


Fig. VI

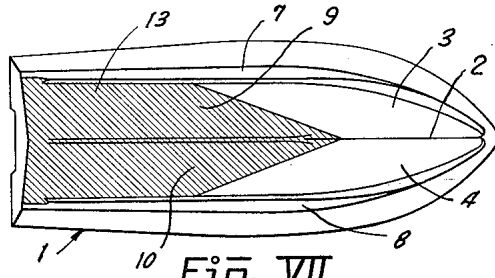


Fig. VII

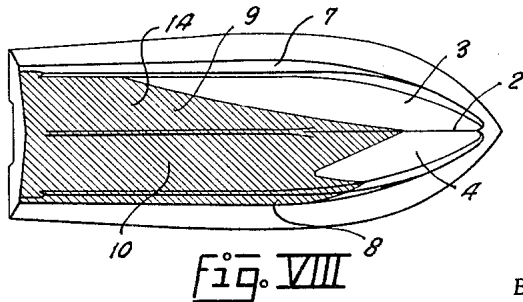


Fig. VIII

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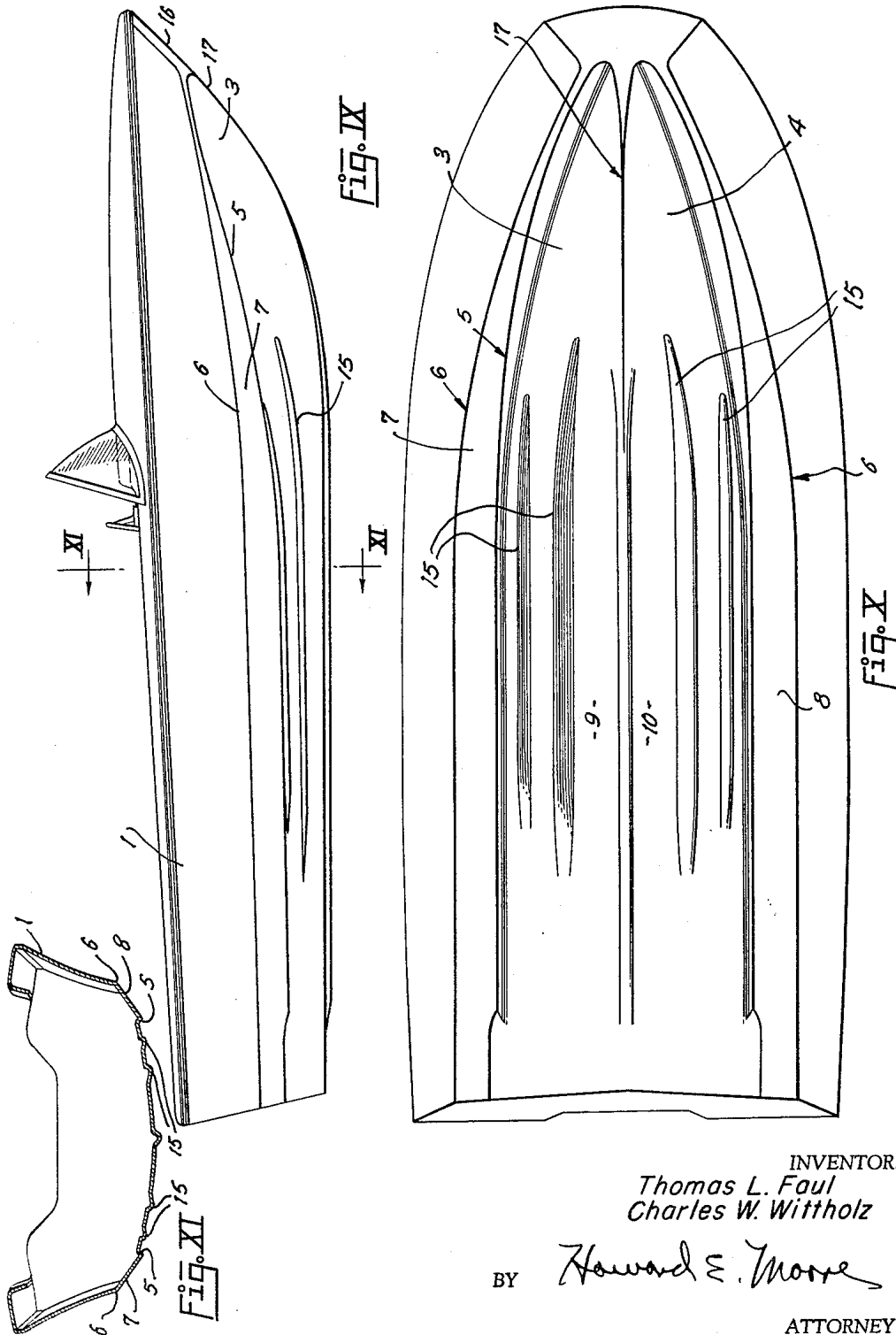
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BOAT HULL DESIGN

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3 Sheets-Sheet 3



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BOAT HULL DESIGN

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This invention has to do with boats and is particularly concerned with a novel boat hull form and configuration.

The hull design which is the subject matter of this application is primarily applicable to relatively small boats, such as pleasure boats.

In relatively light pleasure boats which are intended to run at high speeds, it is desirable to have a hull with non-pounding characteristics, in order to reduce to a minimum the shock impact against waves or swells in order to make the boat more comfortable to the occupants at both low and high speeds.

In order to secure this non-pounding characteristic, it is necessary to have a high dead rise angle at the bow to split the waves without shock, and to have a generous but more gradual dead rise on the running bottom of the hull at higher speeds. Preferably at high speeds the width of the running bottom should be considerably less than the desirable beam or width for required passenger accommodation.

However, a hull of such general design has low stability on high speed turns, causing a diving action at the bow, as well as creating a possibility of the boat turning over if a turn is taken too fast.

The present invention is intended to provide the desirable features mentioned above, and at the same time provide such a hull which does not have the undesirable features of low stability, tendency to dive at the bow, and the possibility of turning over in a turn taken at high speed.

This object is accomplished by providing corresponding auxiliary planing surfaces beginning at the bow on each side of the hull, and running longitudinally toward the stern of the boat.

Such auxiliary planing surfaces act as planing areas during turns at high speed, stabilize the hull, minimize the lean of the hull into the turn to an acceptable and safe angle, and prevent increase in trim angle during a high speed turn.

By employing such auxiliary planing surfaces, the boat goes through a turn much in the same attitude that it goes on a straight course but without losing speed, without raising or lowering the bow, and with a moderate lean into the turn.

When the hull runs on a straight course at a moderately high speed, the auxiliary planing surfaces are free of the water and ride above the water level.

Longitudinal channels are formed along the bottom of the boat on each side of the keel which are rather deep at the bow but become shallower as they continue along the bottom of the boat. These channels contain all spray and convert it into diverging masses of water split by the bow and keel, adding dynamic lift to the boat, as will be hereinafter explained.

Spray to each side of the boat is virtually eliminated.

Other and further objects of the invention will become apparent upon reading the detailed specification hereinafter following, and by referring to the drawings annexed hereto.

Suitable embodiments of the invention are shown in the attached drawings, wherein:

FIGURE I is a side elevational view of a boat having a hull incorporating the novel design;

FIGURE II is a bottom plan view of the boat shown in FIGURE I;

FIGURE III is a transverse cross-sectional view taken along the line III—III of FIGURE I;

FIGURE IV is a transverse cross-sectional view taken along the line IV—IV of FIGURE I;

FIGURE V is a transverse, cross-sectional view taken along the line V—V of FIGURE I;

FIGURE VI is a bottom plan view of the boat employing the novel design, illustrating by cross lines the wetted area of the bottom of the boat running on a straight course at relatively low speed;

FIGURE VII is a bottom plan view of the boat illustrating the wetted area of the bottom of the boat running on a straight course at a medium speed;

FIGURE VIII is a bottom plan view of the boat showing the wetted area of the bottom of the boat while turning at a relatively high speed;

FIGURE IX is a side elevational view of a modified form of the novel hull design;

FIGURE X is a bottom plan view of such modified form; and

FIGURE XI is a transverse, cross-sectional view taken along the line XI—XI of FIGURE IX.

Numerical references are employed to designate the various parts shown in the drawings, and like numerals indicate the like parts through the various figures of the drawings.

The numeral 1 indicates the general hull of the boat which may be made of fiberglass impregnated plastic, wood, aluminum or any other suitable material.

The hull includes a relatively sharp keel 2 at the bow which is bordered on each side by relatively deep downwardly deflecting channels 3 and 4, which are of curved cross section.

The channels 3 and 4 terminate at their exterior sides in auxiliary planing surfaces 7 and 8, which begin as a narrow band near the bow and widen out to their maximum width just forward of the mid-section of the hull.

As the auxiliary planing surfaces are widened, they also gradually drop lower along the hull side from the point of beginning near the bow to amidships. Thereafter the planing surfaces continue in a constant horizontal level relative to the keel all the way to the stern of the boat.

It will be noted that the dead rise or vertical angle of auxiliary planing surfaces 7 and 8 are greater than the dead rise angle of the inner planing surfaces 9 and 10 of the hull and are less than the dead rise angle of the sides of the hull thereabove.

The inner planing surfaces 9 and 10 are the basic planing surfaces of the boat when running at high speed.

The channels 3 and 4 are bounded on each side by inner chine lines 5 which also provide the inner edges of the auxiliary planing surfaces 7 and 8. The auxiliary planing surfaces 7 and 8 are bounded on the outsides by outer chine lines 6.

It will be noted in FIGURE V that the inner chine lines 5 are lower, usually about 1 inch lower, than the adjoining surfaces of the high speed running bottoms 9 and 10. Thus the inner chines 5, which are deeper as they progress toward the bow of the boat, form spray gathering walls or strips from stem to stern of the boat. The heavy deep spray tunnel at the bow fades out ahead of midships into relatively narrow longitudinal spray chines.

When running forwardly through the water, the sharp bow 2 encounters waves and neatly splits them. The water runs up the sides of the bow into the channels 3 and 4 and is turned through 170° to 180° as it enters the bow channels 3 and 4. In so doing the deflected water is confined within the channels and gives up a large amount of its dynamic energy to the hull, which assists in lifting the bow over the waves smoothly and gently.

The transverse turning motion induced into the spray, together with the forward motion of the hull relative to

the spray, results in a spiral action imparted to the spray, such as indicated in 11, which is contained inside the inner chines 5 and the channels 3 and 4 as the spray progresses toward the stern of the boat.

When the spray leaves at the transom, the resulting appearance is one of no side spray along the hull, but a finely divided cloud of spray, and a small rooster tail behind the hull.

As the boat reaches a speed of about 20 miles per hour, the wetted surface is substantially that shown in FIGURE VI in diagonal lines, as indicated by the numeral 12. It will be noted that the wetted surface extends above the inner chine line 5, and include the auxiliary running surfaces 7 and 8.

As the speed increases to about 35 miles per hour, the wetted surface of the bottom of the hull is indicated by the numeral 13 in FIGURE VII. The outer chines 6 and the auxiliary planing surfaces 7 and 8 run clear of the water, and substantially all water is passed backwardly along the channels 3 and 4 to confine the dynamic force of the water within the said channels to increase the lift of the boat and prevent side spray.

As the speed of the boat increases to a higher speed, the hull will be lifted out of the water more, but the main planing surfaces 9 and 10 will still contact the water and the force of the water will be confined between the inner chines 5.

Should the boat make a turn at high speed, the auxiliary planing surfaces 7 or 8 would contact the water in the direction of the turn as shown in FIG. VIII, wherein the wetted surface of the bottom of the hull is indicated in cross lines at 14. This stabilizes the hull and minimizes the lean into the turn to an acceptable angle and prevents increase in trim angle during such turn. At the same time spray to the sides is virtually eliminated.

At high speeds the auxiliary planing surfaces 7 and 8 are out of the water, and rise above the water level, and the channels 3 and 4 contain all spray and convert the diverging masses of water split by the bow and keel into dynamic lift, thus raising the hull in addition to the raising forces obtained from the planing action of the hull bottom.

Thus this design substantially increases the speed of the boat at given power and at the same time provides for stability.

No pounding or slapping is experienced when the boat encounters waves running even as high as 12 to 24 inches.

A modification is shown in FIGURES IX and X, wherein the design hereinbefore described is employed with the addition of one of more longitudinal spray rails 15 provided along the running surfaces 9 and 10 of the bottom of the hull. These auxiliary outwardly extending ribs

15 are provided to make the hull less sensitive to off-center loading conditions, such as is encountered when one person is driving the boat or when the load carried in the boat is placed off-center, causing a list to the side on which the load is concentrated.

When the hull lists to one side due to an imbalance in weight, an additional list is created by the spray rails 15 on the side of the hull which is deeper in the water, causing this side of the hull to generate extra lift, thus improving the balance and resulting in a more level ride in a transverse sense. The spray rails 15 are so placed that the greater the list, the greater the lift, so that when the hull is running in a level condition, the spray rails on both sides create an equal amount of lift, thus causing no interference to the normal running of the hull.

It will be understood that other and further forms of the invention may be devised without departing from the spirit and scope of the appended claim.

Having described our invention, we claim:

In a boat having a hull, a bow and a stern; a pair of parallel forward channels on the bottom of the hull beginning at a point near the bow, said channels being bordered on the outer edges by relatively steep walls; a central longitudinal keel disposed centrally of the hull separating the channels, the bottom of the hull on each side of the keel within the channels being sloped upwardly from the keel to intersect the relatively steep walls; the said channels becoming progressively shallower and flatter from the front to a point near the center of the length of the hull at which point they merge into substantially flat, shallow, inner planing surfaces which extend along the bottom of the hull to a point near the stern, the said inner planing surfaces being of uniform width from a point forward of the mid-point of the length of the hull; a pair of auxiliary planing surfaces, each beginning at a point on the outer side of one of the channels near the rear end thereof and extending along and parallel to the channels and inner planing surfaces, said auxiliary planing surfaces being disposed angularly upwardly and outwardly with reference to the channels and inner planing surfaces, and extending from a point forward of the mid-point of the length of the hull to the stern thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,176,446	Hayman	Mar. 21, 1916
3,063,069	Brummer	Nov. 13, 1962
3,077,172	Dornak	Feb. 12, 1963
3,077,851	Bamberger	Feb. 19, 1963
3,108,561	McNeil	Oct. 29, 1963