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3,259,092

BOAT HULLS

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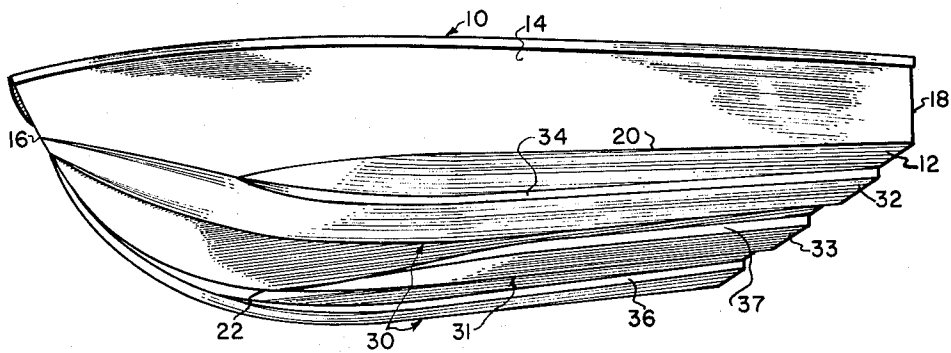


FIG. 1

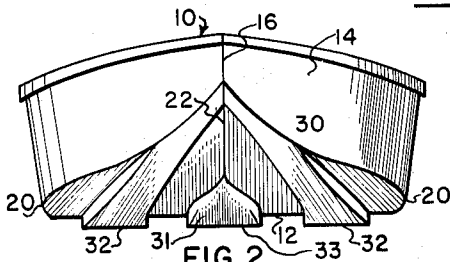


FIG. 2

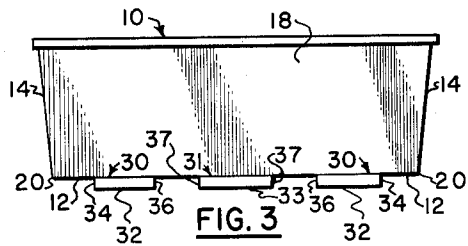


FIG. 3

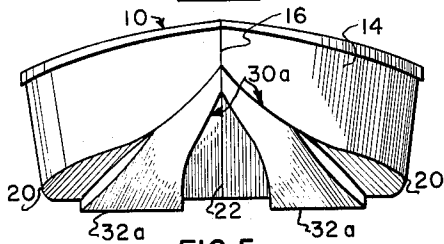


FIG. 5

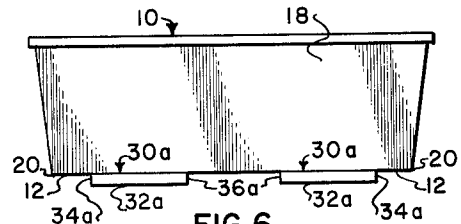


FIG. 6

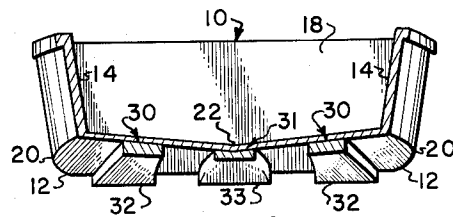


FIG. 4

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BOAT HULLS

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2 Claims. (Cl. 114—66.5)

This application is a continuation-in-part of my earlier application, Serial Number 348,998, now abandoned, filed March 3, 1964, and bearing the title "Boat Hulls."

The present invention relates generally to boat hulls and pertains more specifically to improvements in the configuration of power boat hulls for attaining greater speed and more efficiency with a minimum increase in complexity over currently accepted boat hull constructions.

For a long while the majority of small, general utility power boat hulls were limited in their configurations to relatively simple shapes due to the methods of construction available for such boats. While it was recognized that bottom configurations could be developed to provide greater speed at higher efficiency along with added stability and comfort, such configurations were not easily fabricated and the industry was satisfied with the relatively mundane flat-bottom, round-bottom and V-bottom forms. With the advent of glass reinforced polyester hulls, the earlier restraints on bottom configurations were swept away and a seemingly limitless variety of possibilities became available. While the availability of molded hulls now allows a greater freedom in design, the older methods of construction still offer advantages in allowing fabrication with low cost materials and less elaborate equipment, and are still prevalent, particularly among manufacturers of a relatively low volume of hulls. It would be advantageous to have available a boat hull configuration which would provide increased performance of the more sophisticated forms available in molded hulls yet which could be fabricated without a wide departure from the older more familiar methods.

In addition, many hulls of standard design are now in service and it would be advantageous if some means were available whereby these hulls could be converted readily to more efficient hulls exhibiting significantly better performance characteristics.

It is therefore an object of the invention to provide a power boat hull configuration having increased performance characteristics over the more familiar hull configurations, but which may be fabricated with a minimum departure from well known fabrication techniques.

Another object of the invention is to provide a readily fabricated boat hull configuration which may be easily applied to well known hull forms to increase the performance characteristics over those of the original hull forms.

A further object of the invention is to provide a stable high speed bottom contour for relatively small, high speed power boats of the planing variety.

A still further object of the invention is to provide means by which existing hulls of well known forms can be converted easily to a configuration providing higher speed, higher efficiency and better stability.

The invention may be described briefly as providing, in a boat hull capable of planing upon the surface of the water, the hull having a bottom and sides intersecting the bottom and running longitudinally along the bottom from a stem to a lateral stern, at least a pair of strakes extending longitudinally along the hull from stem to stern thereof, the strakes each having a longitudinal inner and outer edge and a planing surface, the forward portions of the strakes converging toward the stem so that the inner edges will serve to cushion the hull at speeds below the planing speed and the after portions of the inner and outer edges will define the lateral boundaries

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of the planing surfaces, the thickness of the strakes being such that the planing surfaces are displaced downwardly from the bottom a relatively short distance great enough to raise the remainder of the hull above the surface of the water into a planing position at planing speed, each strake having a lateral width between inner and outer edges less than the lateral distance between the center line of the bottom of the hull and the intersection of a side and the bottom but great enough to support the weight of the hull in the planing position at the planing speed, the inner edges of each strake being adjacent the center line and displaced therefrom and the outer edges of each strake being adjacent the intersection of a corresponding side and the bottom and displaced therefrom.

The invention will be more fully understood and further objects and advantages will become apparent in the following detailed description of embodiments of the invention illustrated in the accompanying drawings in which:

FIGURE 1 is a perspective view of a boat hull constructed in accordance with the invention;

FIGURE 2 is a front elevational view of the hull;

FIGURE 3 is a rear elevational view of the hull;

FIGURE 4 is a transverse cross-sectional view taken through the hull forward of the stern and looking aft;

FIGURE 5 is a front elevational view of an alternative hull; and

FIGURE 6 is a rear elevational view of the alternative hull.

Referring now to the drawings and particularly to FIGURE 1, a boat hull 10 is shown having a bottom 12 and sides 14 which run longitudinally from stem 16 to stern 18 of the hull 10. As best seen in FIGURES 2 through 4, as well as in FIGURE 1, hull 10 is basically a V-bottom design flattening out toward the stern, the sides 14 intersecting the bottom 12 along well defined lines or chines 20 and the bottom 12 extending downwardly from the chines 20 to the vertex of a "V" located along a longitudinal center line 22 which generally coincides with the keel of the hull. The vertex angle of the V increases from stem 16 to stern 18, at which latter location the angle approaches approximately 180°, the forward portion of the bottom thus ordinarily acting as a cutwater and serving to cushion shocks and tending to eliminate pounding when the forward portion is in the water during forward motion of the hull, and the after portion of the bottom normally providing flat planing surfaces upon which the hull is supported when traveling at planing speeds.

In order to increase the efficiency of hull 10 at planing speeds, a pair of outer strakes 30 is fixed to the bottom 12 of the hull, each running continuously longitudinally from stem 16 to stern 18, and a central strake 31 is similarly fixed to the bottom of the hull to establish planing surface 32 and 33, respectively, toward the after portions, which surfaces 32 and 33 are displaced downwardly a relatively short distance from bottom 12, the short distance being a distance great enough so that when hull 10 is at planing speed only outer surfaces 32 and central surface 33 will be in contact with the surface of the water, the remainder of the hull being raised clear of the surface of the water. Since the total lateral width of outer surfaces 32 and 33 is substantially less than the total lateral width of the bottom, less wetted area is present at planing speeds with the employment of strakes 30 and 31 than without strakes 30 and 31 and the resulting decrease in frictional resistance between the planing surfaces and the water gives rise to increased efficiency and higher top speed.

The strakes 30 and 31 are generally parallel to one another at the after portions and strakes 30 converge toward the forward portions. Each strake 30 is located

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between the center line 22 and a chine 20 with the outer edge 34 of each strake displaced inwardly of the chine 20 and the inner edge 36 displaced outwardly of the center line 22. Strake 31 is located along the center line starting aft of the stem, tapering outwardly and continuing to the stern. Outer edges 37 of central strake 31 are laterally displaced from the center line to establish planing surface 33. By choosing the proper lateral width for the strakes and the proper lateral orientation, the strakes will not only provide planing surfaces 32 and 33 as aforesaid, but strakes 30 will tend to eliminate pounding and shocks when the forward portion of hull 10 contacts the water at planing speeds, particularly in rough water, since the forward portion of the strakes 30 will break the water prior to the forward portion of the hull to which the strakes are fixed. Thus, the employment of strakes 30 will enhance the stability and smoothness of performance of the hull. The inward displacement of the strakes 30 tends to defeat tripping of the strakes during sharp turns, while also preventing slipping of the hull sideways during turns thereby imparting directional stability at high speeds. In addition, surfaces 32 and 33 are generally parallel to the original bottom contour so that the transition from the original bottom to surfaces 32 and 33 can be accomplished smoothly. This particularly apparent in V-bottom hulls, as illustrated, since in such hulls the water displaced by portions of the bottom adjacent center line 22 is driven outwardly when the hull is driven forward and the outward rushing water will interact with inner edges 36 to achieve a greater measure of directional stability as well as a cushioning effect.

In the configuration illustrated in FIGURES 1 through 4, the three strakes 30, 30 and 31 provide surfaces 32 and 33 of sufficient area to raise the hull above the surface of the water at planing speeds as described above. Each of the three strakes is readily fixed to a hull of standard configuration to attain greater speed with good stability.

An alternative configuration utilizing only two strakes 30a is shown in FIGURES 5 and 6. In the alternative configuration, the strakes 30a are somewhat wider than strakes 30 of the three-strake configuration to provide a total area in surfaces 32a capable of raising the hull above the surface of the water at planing speeds. While the two-strake configuration will exhibit adequate performance, the relatively wider strakes 30a are somewhat more difficult to install in certain hull configurations. The narrower strakes 30 and 31 achieve the desired results, are easier to install and additionally improve directional stability to some extent. The three-strake construction also improves the handling characteristics of the hull at transition speeds below the minimum planing speed where water is tunnelled between the strakes to react upon the edges of the strakes for greater directional stability.

It has been determined that the strakes 30a operate effectively when the lateral width of each surface 32a, that is the width between edges 34a and 36a, is at least one-third the width of the hull between center line 22 and chine 20. An effective orientation of each strake has been found to be a central location between the center line 22 and chine 20. While these proportions represent ideal conditions, it is noted that deviations from the ideal will still provide the above advantages, but to a lesser degree, as long as the outer and inner edges 34a and 36a are displaced from the chines and the center line, respectively.

It will be apparent that strakes 30 and 31 or 30a can be applied to a wide variety of boat hulls of different construction to attain a bottom configuration having distinct advantages over conventional designs. For example, hull 10 could be constructed of sheet plywood in a well known manner and the strakes could also be fabricated of plywood and fixed to the hull. Since the strakes do not require compound curvatures or other design com-

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plexities to attain improved performance characteristics, the invention allows the attainment of such characteristics in a simple and effective manner without resorting to more elaborate and expensive techniques such as required in the construction of molded hulls.

It is to be understood that the above detailed description of embodiments of the invention is provided by way of example only and is not intended to restrict the invention. Various details of design and construction may be modified without departing from the true spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. In a boat capable of planing upon the surface of the water and having a single-hull configuration including a bottom, sides intersecting the bottom and running longitudinally along the bottom from a stem to a lateral stern, and a center line extending along the bottom from stem to stern of the hull, the bottom extending continuously from the center line toward each intersection of a side and the bottom and at least a portion of the bottom between the center line and each said intersection being planar, at least two strakes joined to the bottom of the hull, depending downwardly from the planar portions of the bottom and extending longitudinally along the hull from stem to stern thereof, said strakes each having a longitudinal inner and outer edge and a longitudinally continuous bottom surface, the forward portions of the strakes converging toward the stem and the center line of the hull extending downwardly between the converging portions of the strakes and below the converging portions so that the forward portions of the inner edges serve to cushion the hull at speeds below the planing speed and the after portions of the inner and outer edges define the lateral boundaries of portions of the bottom surfaces providing planing surfaces, the thickness of the strakes being such that the planing surfaces are displaced downwardly from the bottom a relatively short distance great enough to raise the remainder of the hull above the surface of the water into a planing position at planing speed, each strake having a lateral width between inner and outer edges less than the lateral distance between the center line of the bottom of the hull and the intersection of a side and the bottom but great enough to enable the strakes to support the weight of the hull in said planing position at said planing speed, the inner edge of each strake being adjacent the center line and displaced therefrom and the outer edge of each strake being adjacent the intersection of a corresponding side and the bottom and displaced therefrom.

2. In a boat capable of planing upon the surface of the water and having a single-hull configuration including a bottom, sides intersecting the bottom and running longitudinally along the bottom from a stem to a lateral stern, and a center line extending along the bottom from stem to stern of the hull, the bottom extending continuously from the center line toward each intersection of a side and the bottom and at least a portion of the bottom between the center line and each said intersection being planar, a pair of outer strakes joined to the bottom of the hull and depending downwardly from the planar portions of the bottom and extending longitudinally along the hull from stem to stern thereof, said strakes each having a longitudinal inner and outer edge and a longitudinally continuous bottom surface, the forward portions of the strakes converging toward the stem and the center line of the hull extending downwardly between the converging portions of the strakes and below the converging portions so that the forward portions of the inner edges serve to cushion the hull at speeds below the planing speed and the after portions of the inner and outer edges define the lateral boundaries of portions of the bottom surfaces providing outer planing surfaces, a central strake joined to the bottom of the hull, depending downwardly therefrom and extending longitudinally along the hull from aft of said stem to said stern, the central

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strake having longitudinal outer edges laterally displaced from the center line of the bottom and a central planing surface defined by said outer edges, the thickness of the strakes being such that the planing surfaces are displaced downwardly from the bottom a relatively short distance great enough to raise the remainder of the hull above the surface of the water into a planing position at planing speed, each outer strake having a lateral width between inner and outer edges less than the lateral distance between the respective outer edge of the central strake and the intersection of a side and the bottom, the lateral width of the central and outer strakes being great enough to enable the strakes to support the weight of the hull in said planing position at said planing speed, the inner edges of each outer strake being adjacent the corresponding outer edges of the central strake and displaced therefrom and the outer edges of each outer strake being

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adjacent the intersection of a corresponding side and the bottom and displaced therefrom.

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