

June 16, 1964

H. C. NOE
BOAT HULL

3,137,261

Filed May 17, 1962

2 Sheets-Sheet 1

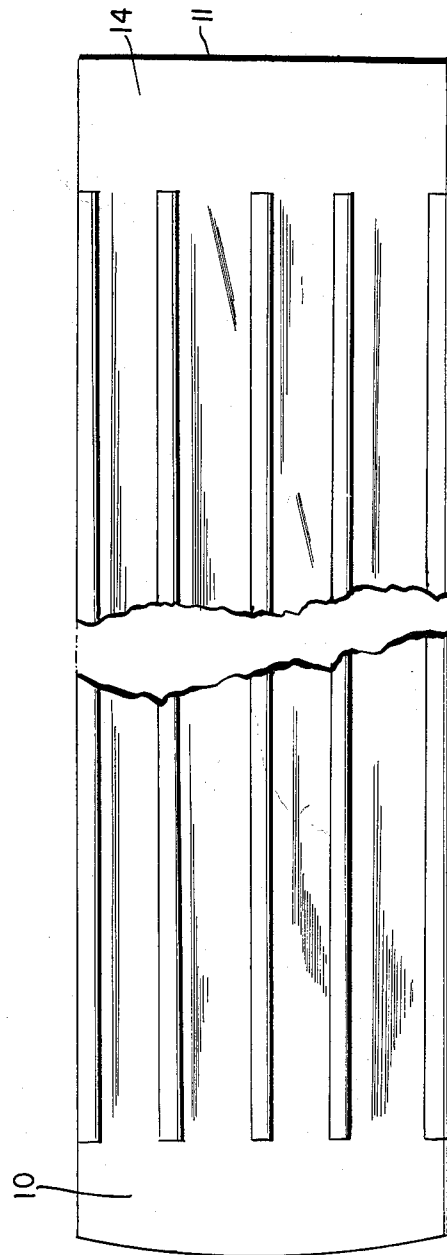
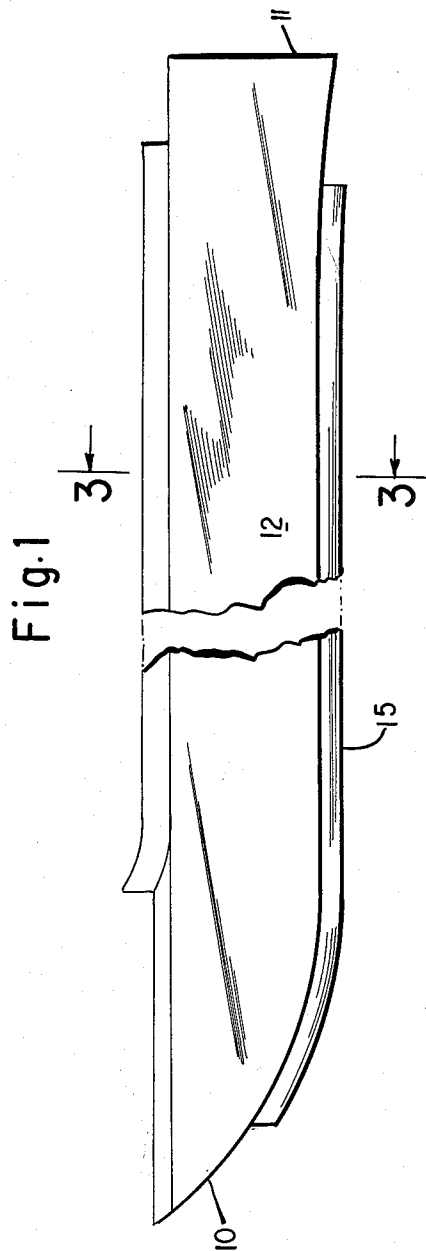


Fig.2

INVENTOR
HAROLD C. NOE

BY *Ernest J. Green*
ATTORNEY

June 16, 1964

H. C. NOE

3,137,261

BOAT HULL

Filed May 17, 1962

2 Sheets-Sheet 2

Fig. 3

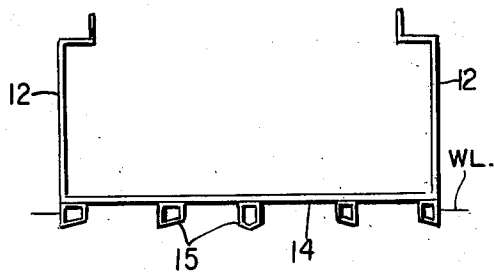


Fig. 4

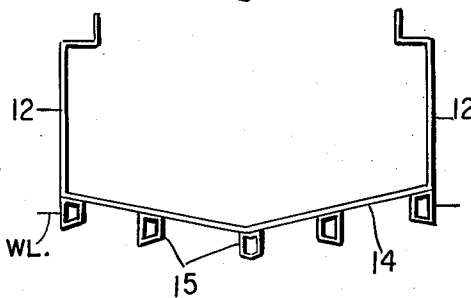


Fig. 5

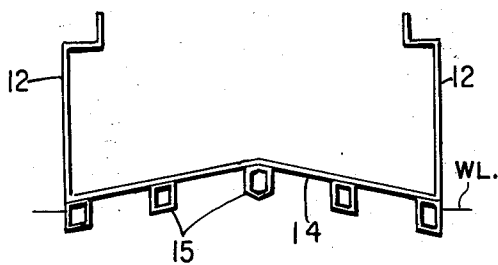


Fig. 6

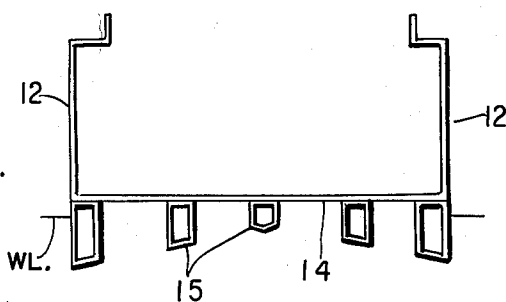


Fig. 7

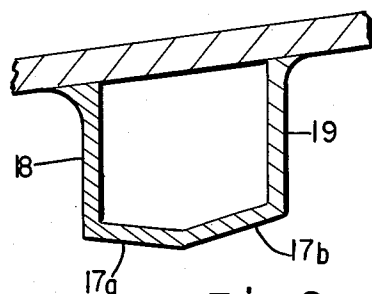
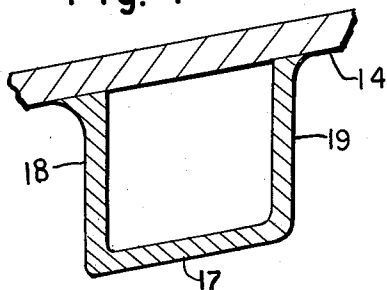
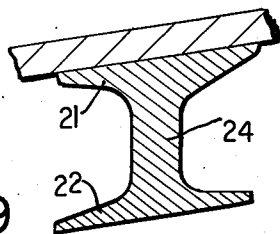


Fig. 8

Fig. 9



INVENTOR
HAROLD C. NOE

BY
Ernest J. Green
ATTORNEY

1

3,137,261

BOAT HULL

Harold C. Noe, 127 Buckingham Road,
Upper Montclair, N.J.

Filed May 17, 1962, Ser. No. 195,538

9 Claims. (Cl. 114-66.5)

The present invention relates to hulls for boats and the like, and, more particularly, to an improved hull which minimizes friction between the water and the bottom of the hull.

Heretofore, numerous attempts have been made to minimize the friction between the water and the bottom of the hull of a boat to enable the boat to move faster without increasing the power to propel the boat.

A general belief has been that this could be accomplished by injecting a film of air between the boat hull and the water. This however is not practical because an air film cannot be maintained under the bottom of the boat hull except in smooth water to serve any useful purpose. It has also been proposed to introduce a mist-like mixture of air and water beneath the hull, but this again is not practical because the power required to produce the air and water mist is greater than an increase in power which would normally propel the boat faster without an air and water mist being supplied. In addition, many special forms of hulls have been devised to reduce friction but such hulls invariably are applicable to only one type of boat and have no utility for all types of hulls.

Accordingly, an object of the present invention is to provide a configuration on the bottom of the hull which will reduce friction between the bottom of the hull and the water by producing a foamy or frothy mixture of air and water beneath the bottom of the hull as the boat moves through the water.

Another object is to provide such a configuration which causes the hull to ride more smoothly.

Another object is to provide such a configuration which is applicable to all general forms of boat hulls whether they be flat V-shaped or inverted U or W-shaped.

Another object is to provide such a configuration which can be readily applied to existing boats and can be readily incorporated in newly constructed boats.

Another object is to provide such a configuration which does not require any additional power to propel the boat.

A further object is to accomplish the foregoing in a simple, practical and economical manner.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

In accordance with the present invention, the foregoing objects are generally accomplished by providing the bottom of the hull with a series of crosswise spaced, fore and aftwise extending, rail-like projections having surfaces thereon for creating sprays of water and waves and for directing at least certain of the sprays and waves inwardly towards the center-line of the bottom of the hull.

In the drawings:

FIG. 1 is a side view of a generally flat bottom boat provided with rails in accordance with the present invention.

FIG. 2 is a bottom view of the boat shown in FIG. 1.

FIG. 3 is a sectional outline view taken along the line 3-3 on FIG. 1.

FIG. 4 is a view similar to FIG. 3 illustrating the rails on a V-shaped bottom.

FIG. 5 is a view similar to FIG. 3 illustrating the rails on an inverted V-shaped bottom.

2

FIG. 6 is a view similar to FIG. 3 illustrating rails on a flat bottom boat which are profiled to provide the effect of an inverted V-shaped bottom equipped with rails.

FIG. 7 is an enlarged fragmentary sectional view of one form of rails.

FIG. 8 is a view similar to FIG. 7 illustrating another form of rails.

FIG. 9 is a view similar to FIG. 7 illustrating still another form of rails.

Referring now more particularly to FIGS. 1 to 3 of the drawings, a boat is shown which has a scow-shaped hull comprising a bow 10, a stern 11, sides 12, and a generally flat bottom 14 provided with a series of rails 15 in accordance with the present invention.

The rails 15 are spaced crosswise, extend fore and aftwise parallel to each other, and project downwardly from the bottom. The rails or rail-like projections 15 having surfaces thereon which will be described in greater detail hereinafter for creating sprays of water and waves and directing such sprays and waves at least inwardly towards the center-line of the bottom and thereby admix air with the sprays which mixture is supplied between the rails at the forward end of the bottom as the boat hull is propelled forwardly through the water. The air admixed and entrapped by the sprays produced by the rails provides a froth or foam under the wetted surfaces of the bottom which has a sufficient viscosity and density to stay under the bottom and which reduces friction between the bottom and the water whereupon the boat rides.

The amount of froth or foam produced can be increased by providing at least certain of the rails intermediate the rails at the respective sides of the bottom with surfaces for also directing sprays and waves of water outwardly under the hull bottom which impinge upon the inwardly directed sprays and waves in a turbulent manner and to thereby place a medium between the boat bottom and the water which is even more effective to reduce friction. Such an arrangement also increases the upward component of the sprays and waves which tends to lift the hull to thereby decrease the wetted surface and the friction drag on the bottom. Such sprays and waves also have a forward component with respect to still water which enables the bottom to ride over a turbulent surface having same movement in the same direction as in which the boat is moving whereby resistance to the forward movement of the boat is decreased and the speed of the boat is increased with the same power supplied.

The number of the rails 15, the size of the rails and the cross wise spacing thereof depend upon the length and width of the bottom and the weight of the boat. For example, it is recommended that at least five rails be applied to a bottom having a width of about three feet and a length of about ten feet. Also, it is recommended that these rails project downwardly at least about two inches and have a width of about two inches, whereby the combined width of the five bottom surfaces of the rails is at least about 28% of the width of the boat bottom. These rails may extend lengthwise in an aftwise direction from the forward end of the bottom which is contacted by the water when the boat is in forward motion to the stern or to a point short of the stern.

As shown in FIG. 4, the rails 15 are applied to a V-shaped bottom with the outer rails being deeper in the water than the intermediate rails nearer the keel to assure that the sprays and waves of water are retained under the bottom.

As shown in FIG. 5, the rails 15 are applied to an inverted V-shaped bottom.

In FIG. 6, a flat bottom is shown which is provided with rails 15 progressively increasing in downward extent from the center-line to the sides of the hull to there-

by provide the effect of an inverted V-shaped bottom equipped with rails.

In FIGS. 3 to 6, the waterline of the boat when moving at considerable speed is indicated at WL.

In FIG. 7, one form of rails is shown which has surfaces including a flat bottom section 17 and substantially vertical side sections 18 and 19 for directing sprays of water in opposite crosswise directions so that the sprays and waves created by a section 18 of one rail impinge upon the sprays and waves created by a section 19 of an adjacent rail.

Preferably, the bottom section 17 slants downwardly from the center-line towards the sides of hull as shown, the rails are hollow and may be formed of a plastic resin to maintain the weight of the rails at a minimum value. Such rails can also be readily adhesively secured to boats already in use. Similarly, the bottom of newly built boats can be fabricated in a manner to embody the rails. Since the rails are hollow from end to end with the forward ends positioned to extend above the water when the boat is in forward motion air is allowed to enter and be delivered under the bottom forwardly of the stern.

In FIG. 8, rails 15 are shown which have a bottom section provided with converging surfaces 17a and 17b for inducing sprays and waves to be directed in opposite lateral directions.

In FIG. 9, another form of rails is shown. These rails are in the shape of an I beam with the upper flange 21 secured to the bottom of the boat and the lower flanges 22 and the web 24 cooperating to produce the sprays. Such rails are particularly applicable to the bottom of boats having a metallic hull formed of aluminum or lightweight steel to which I beams of similar metal can be welded or otherwise secured.

From the foregoing description, it will be seen that the present invention provides a simple, practical and economical configuration for the bottom of boat hulls adapted to create a mixture of air and water between the wetted surface of the boat bottom and the water as the boat rides on the water and air mixture which minimizes frictional resistance to forward movement of the boat. This also cushions the impact of a boat bouncing from wave to wave at high speed. The rails further stiffen the bottom of the boat to prevent torsional effects, and minimize skidding on turns which may cause tripping. Another advantage is that smaller waves are produced by forward motion of the boat whereby less power is required to drive the boat at a given speed.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

I claim.

1. A hull for a boat comprising a bow, a stern, a bottom, and a series of at least five crosswise spaced, parallel fore and aftwise extending, rail-like projections on the underside of said bottom, said projections progressively increasing in downward extent from the centerline towards the sides of said bottom, said projections extending downwardly from said bottom a sufficient distance and being spaced apart a sufficient distance to allow air to enter between adjacent projections and having bottom surfaces thereon of a width for creating sprays and waves of water and for directing the sprays and waves inwardly towards the center-line of said bottom to cause air to be admixed therewith.

2. A hull according to claim 1, wherein said surfaces are inclined crosswise with respect to horizontal.

3. A hull according to claim 1, wherein portions of said surfaces are inclined crosswise in opposite directions to direct sprays and waves of water inwardly and outwardly with respect to the center-line of said bottom.

4. A hull according to claim 1, wherein said projections are on the section of said bottom supported by water when the boat is in forward motion and terminate forwardly of said stern.

5. A hull according to claim 1, wherein said projections are hollow from end to end thereof and the forward ends are positioned to extend above the water when the boat is in forward motion.

6. A hull according to claim 5, wherein said projections terminate forwardly of the stern.

7. A hull according to claim 1, wherein said hull has a flat bottom.

8. A hull for a boat comprising a bow, a stern, sides, a bottom, and a series of at least five fore and aftwise extending parallel rail-like projections depending from said bottom, said projections having parallel upright sides and predominantly horizontal downwardly facing surfaces the combined width of said surfaces being less than half the width of said bottom and being sufficient to sustain said surfaces on the water when the boat is moving at considerable speed, the downward extent of said upright sides being about at least equal to the width of said surfaces, said surfaces creating sprays and waves of water and directing the same in opposite cross-wise directions and said projections being of a length and spaced apart cross-wise a sufficient distance to provide channels between each pair of adjacent projections defined by said upright sides and intermediate downwardly facing normal portions of said boat bottom, said channels having a width greater than said surfaces of said projections and thus being dimensioned for receiving and filling the same with the sprays and waves of water to enable the normal bottom of said hull between said projections to ride thereon.

9. A hull according to claim 8, wherein the combined width of said surfaces is at least about 28% of the width of said bottom.

References Cited in the file of this patent

UNITED STATES PATENTS

7,449	Andrews	June 25, 1850
251,793	Pictet	Jan. 3, 1882
364,638	Forward	June 14, 1887
859,693	Roe	July 9, 1907
1,033,662	Blake	July 23, 1912
1,050,517	Chase	Jan. 14, 1913
2,422,818	Bamberger	June 24, 1947
2,815,730	Horsdal	Dec. 10, 1957
2,875,720	Hupp	Mar. 3, 1959
2,900,945	Canazzi	Aug. 25, 1959
2,938,490	Martin	May 31, 1960
3,038,179	Wagemaker	June 12, 1962
3,077,172	Dornak	Feb. 12, 1963
3,077,851	Bamberger	Feb. 19, 1963

FOREIGN PATENTS

383,514	Germany	Sept. 15, 1924
388,407	Germany	Jan. 19, 1924
191,612	Great Britain	Jan. 18, 1923
651,064	Great Britain	Mar. 7, 1951
762,452	France	Jan. 22, 1924