

Nov. 20, 1962

D. G. ENGLE

3,064,611

PONTOONS

Filed Feb. 23, 1961

2 Sheets-Sheet 1

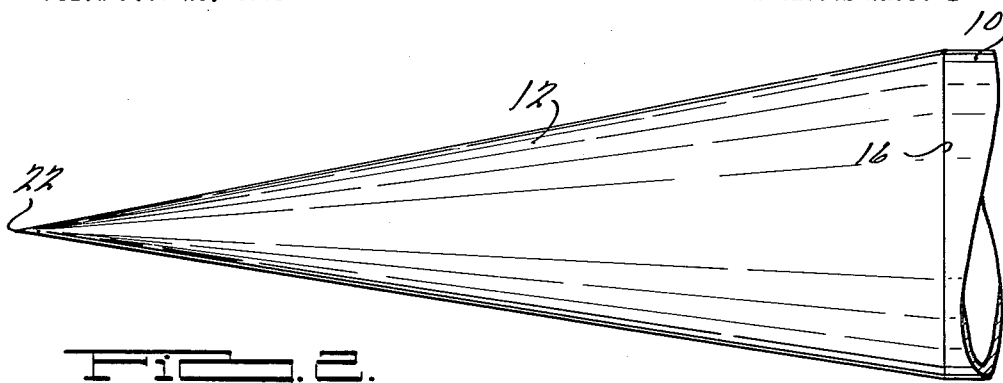


FIG. 2.

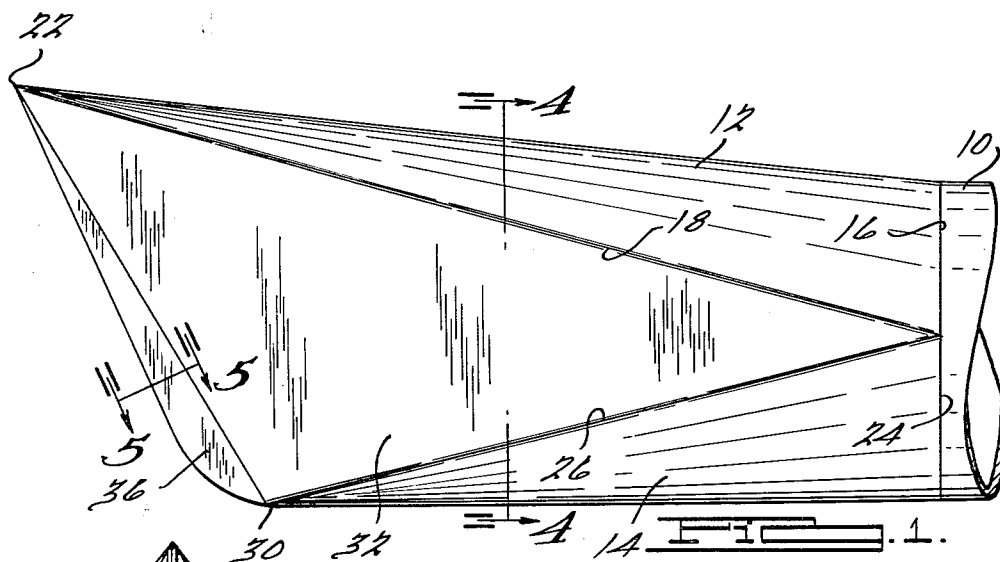


FIG. 1.

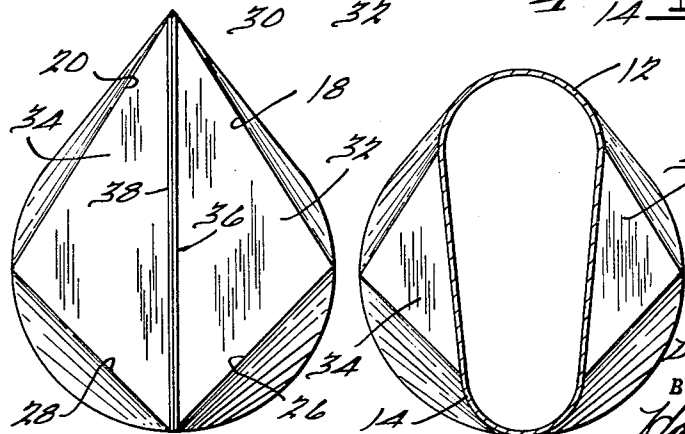
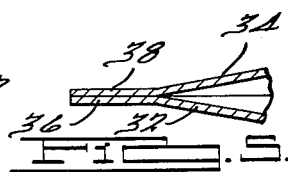


FIG. 3.

FIG. 4.



INVENTOR.

Darrell G. Engle.

BY

Harnes, Dickey, & Purdie
ATTORNEYS.

Nov. 20, 1962

D. G. ENGLE

3,064,611

PONTOONS

Filed Feb. 23, 1961

2 Sheets-Sheet 2

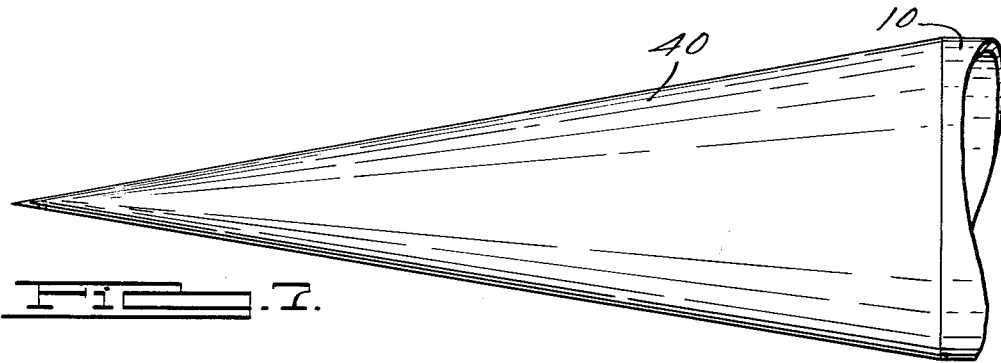


FIG. 7.

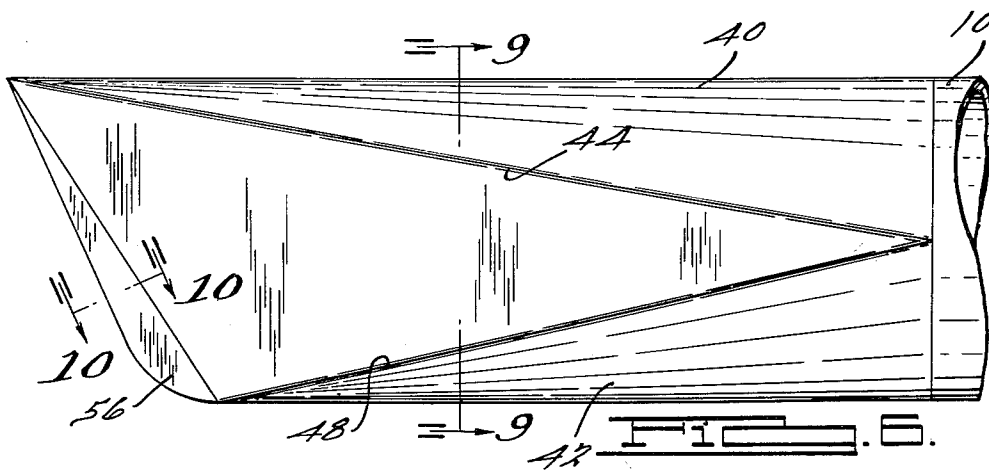


FIG. 6.

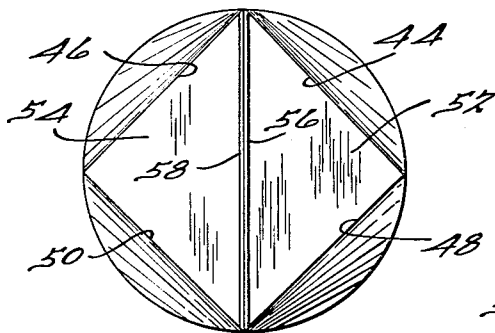


FIG. 8.

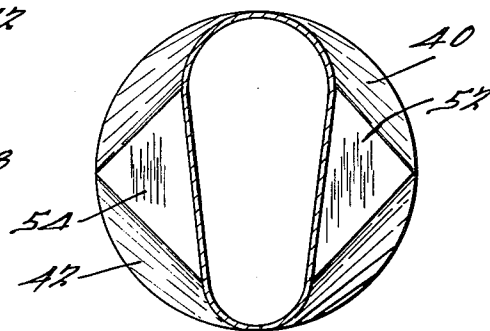


FIG. 9.

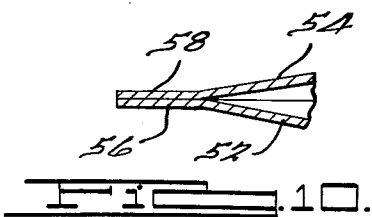


FIG. 10.

INVENTOR.

Darrell G. Engle.

BY

Harniss, Pichay & Purvis.
ATTORNEYS.

1

3,064,611
PONTOONS

Darrell G. Engle, Detroit, Mich., assignor to Brown-Hutchinson Iron Works, Detroit, Mich., a corporation of Michigan

Filed Feb. 23, 1961, Ser. No. 91,187
7 Claims. (Cl. 114—66.5)

The present invention relates generally to pontoons or the like, and more particularly to an improved bow construction therefor adapted to be formed from sheet material and having a fully developable contour.

It is a primary object of the present invention to provide an improved bow section of extremely simple and novel design for use with presently available pontoons having conventional cross-sectional shapes, which bow section is so designed as to have hydrodynamic and performance characteristics greatly surpassing those of commonly used bow sections, such as those having shapes derived from either single cones or hemispheres, yet which is readily adapted to be simply and inexpensively fabricated from sheet material in either one or several pieces by means of readily available existing general purpose equipment. A related object resides in the provision of a bow section of the above type having a fully developable contour and thus being particularly suited for fabrication upon an ordinary press brake or the like using conventional general purpose forming dies, although stamping operations with specially shaped dies may be used, if desired.

These and other objects of the present invention will become apparent from consideration of the specification taken in conjunction with the accompanying drawing, in which there are shown several embodiments of the invention by way of example, and wherein:

FIGURE 1 is a side elevational view of a bow section for a pontoon or the like constructed according to the principles of the present invention;

FIGURE 2 is a top plan view thereof;

FIGURE 3 is a front elevational view thereof;

FIGURE 4 is a transverse sectional view taken along line 4—4 in FIGURE 1;

FIGURE 5 is an enlarged fragmentary sectional view taken along line 5—5 in FIGURE 1;

FIGURE 6 is a side elevational view of a modified form of a bow section according to the present invention;

FIGURE 7 is a top plan view thereof;

FIGURE 8 is a front elevational view thereof;

FIGURE 9 is a transverse sectional view thereof taken along line 9—9 in FIGURE 6; and

FIGURE 10 is an enlarged sectional view taken along line 10—10 in FIGURE 6.

The bow design of the present invention is readily adapted for use in conjunction with conventional pontoons of ordinary cross-sectional shape, however, since for simplicity and economy of fabrication most pontoon structures are of a cylindrical shape, for purposes of illustration the bow section of this invention will be described in conjunction with a cylindrically shaped pontoon body. Generally speaking, the bow design of this invention comprises an upper section of conical configuration arranged symmetrically about a vertical plane and having the vertex thereof extending forwardly, a lower section of conical configuration arranged symmetrically about the same vertical plane and having the vertex thereof extending forwardly to a point rearwardly of the vertex of the upper section, a first substantially flat side panel joining the edges of the upper and lower section disposed on one side of the vertical plane, and a second substantially flat side panel joining the edges of the upper and lower sections on the other side of the vertical plane, these two side panels being joined at the forward edges thereof

2

along a line extending between the two vertexes. Since a bow constructed according to the present invention comprises a combination of conical and flat shapes, its contour is fully developable and therefore may be easily formed upon conventional general purpose press brake equipment using ordinary forming dies. In addition, as will be more apparent hereinafter, the bow section may be formed from either one or more separate pieces, if desired.

Referring more particularly to the drawings, there is illustrated in FIGURES 1 through 5 a preferred embodiment of a bow section incorporating the principles of this invention secured to a conventional pontoon body 10 of hollow cylindrical shape. This embodiment comprises an upper bow portion 12 having the shape of a downwardly open circular scalene conical section, and a lower bow portion 14 having the shape of an upwardly open circular scalene conical section. The conical section defining upper bow portion 12 includes a base 16, lower side edges 18 and 20, and a vertex 22. The base 16 lies in a vertical plane perpendicular to the axis of body 10, and lower side edges 18 and 20 lie in a plane defined by the axis of the conical section and a horizontal line perpendicular to and intersecting this axis, which axis is a line extending from the midpoint of the base of the cone from which the section is taken to the vertex thereof. The conical section defining lower bow portion 14 includes a base 24, upper side edges 26 and 28, and a vertex 30. Base 24 lies in the same plane as base 16 of the upper bow portion, and upper side edges 26 and 28 lie in a plane defined by the axis of the conical section defining the lower bow portion and a horizontal line perpendicular to and intersecting this axis.

As can be seen, upper bow portion 12 and lower bow portion 14 are arranged symmetrically about the same vertical plane, which plane includes the axis of the entire pontoon. Because of this arrangement, bases 16 and 24 of the two bow portions define a circular edge at the rear of the bow section to be secured to cylindrical pontoon body 10. The scalene cone, a section of which defines lower bow portion 14, is one in which the vertex lies on a line perpendicular to the plane of base 24 and intersecting the peripheral edge thereof. The scalene conical section defining upper bow portion 12, however, is such that the vertex 22 thereof lies on a line perpendicular to the plane of base 16 but intersecting this plane at a point outside the periphery of the base. As is also clearly evident, the axial length of upper bow portion 12 is greater than the axial length of lower bow portion 14. This arrangement has been found to yield particularly satisfactory hydrodynamic performance.

To complete the bow section there is provided a first substantially flat side panel 32 joining edges 18 and 26 of the upper and lower bow portions, respectively, disposed on one side of the aforementioned central vertical plane. On the opposite side of this plane there is provided a second substantially flat side panel 34 joining edges 20 and 28 of the upper and lower bow portions, respectively. In theory, if side panels 32 and 34 were perfectly flat they would necessarily be of triangular shape, the forward edges thereof extending along a straight line between the two vertexes 22 and 30. However in this embodiment, in order to increase the performance characteristics of the design the side panels are only generally triangular in shape, being provided at the forward edges thereof with forwardly disposed bent portions 36 and 38 respectively. These bent portions are of the shape illustrated clearly in FIGURE 1, and are bent slightly out of the plane of the respective side panels in the manner illustrated in FIGURE 5, the juncture of the two bent

portions lying in the aforementioned central vertical plane.

The bow section may be formed from sheet metal or the like in a number of different ways. For example, it may be formed of a single piece of sheet metal, as by means of an ordinary press brake or the like, in such a way that the resulting single seam will extend along the very lower edge of the bow and then upwardly along the forward edge thereof, between bent portions 36 and 38. To assemble and seal the final structure the edges thereof along the seam may be welded together, and the circular base defined by edges 16 and 24 welded to a sheet metal, or the like, cylinder 10 to form a completed pontoon. Alternately, if desired, the edges along the seam may be joined by rivets or the like. On the other hand, if it is so desired the single piece may be stamped out by a press or the like using suitably shaped dies, instead of being formed by bending, with final assembly being achieved in any one of the above manners.

Alternately, the bow section may be formed from a number of separate pieces, either welded or riveted together in any suitable manner. In such a case, the upper and lower bow portions and the two side panels may be four separate pieces, or they may be combined into any number of pieces desired, based on manufacturing considerations. Regardless of the number of pieces from which the bow section is constructed, an ordinary general purpose press brake may be used to form the developable surfaces which constitute the bow contour. The necessary cutting operations may of course be performed in the usual manner using conventional general purpose equipment.

In FIGURES 6 through 10 there is illustrated a modified form of the present invention. In this second embodiment, cylindrical pontoon body 10 is provided with a bow section comprising an upper bow portion 40 having the shape of a circular scalene conical section, and a lower bow portion 42, also having the shape of a circular scalene conical section, both the upper and lower bow portions being symmetrical about the same vertical plane. As in the previous embodiment, lower edges 44 and 46 of the upper bow portion lie in a plane defined by the axis of the conical section defining the upper bow portion and a horizontal line perpendicular to and intersecting this axis, and the upper side edges 48 and 50 of the lower bow portion lie in a plane defined by the axis of the conical section defining the lower bow portion and a horizontal line perpendicular to and intersecting this axis. The bow section is enclosed by a pair of side panels 52 and 54 in exactly the same manner as in the previous embodiment, these side panels being provided with forwardly disposed bent portions 56 and 58, respectively, just as in the preceding embodiment. The only difference between these embodiments is that in the second embodiment the lines of intersection of the upper and lower bow portions with the central vertical plane are parallel to each other, whereas in the preceding embodiment the line of intersection of the upper bow portion with the central vertical plane is inclined upwardly and forwardly while the line of intersection of the lower bow portion with the vertical plane extends parallel to the axis of the pontoon. The mode of construction and assembly of the two embodiments is identical in all respects.

These two modifications described will suggest a number of other possible arrangements to those skilled in the art. For example, the scalene conical sections need not be circular, but may be elliptical if desired, depending upon the shape of the pontoon body with which it is intended to be used, as well as the hydrodynamic characteristics which are desired. Alternately, the upper and lower sections may be circular, but spaced apart vertically a greater distance than shown in the drawings, whereby four-sided side panels would be utilized to fully enclose the bow section, in which case the cross-sectional shape of the rearward edge of the bow would not be

circular. Other possible modifications will be readily apparent.

Insofar as the present invention is concerned, it is immaterial what design or shape pontoon body is utilized or what type stern portion is provided on the pontoon, since the bow section may be readily adapted to fit any shape pontoon body. Furthermore, if desired, bow sections according to this invention may be used also as stern portions, such as in applications wherein the pontoons are to be moved both forwardly and rearwardly without being turned around.

As will be appreciated, presently available pontoons of the general type described, which may be used on houseboats or the like, are not at all streamlined and serve only to keep the vessel afloat. Streamlined shapes, with their attendant improved hydrodynamic characteristics, have not been used primarily because of the costs involved. However, the present invention overcomes this obstacle. Pontoons provided with bows of the present invention have been found to be manufacturable at competitive costs, when the tremendous improvement in hydrodynamic characteristics is considered. It has been found in actual tests that pontoons having bows constructed according to the present invention may be driven through the water at much greater speeds than conventional pontoons, and even much greater speeds than were originally anticipated with the improved design. In addition, the pontoons cut very well through the water and leave a minimum of wake, contrary to presently used pontoons, so that relatively high speeds may be obtained for a given horsepower motive source. Unexpectedly low drag in the water is a related feature.

The present invention as herein described is concerned only with the basic structure and shape of an improved bow construction for pontoons, wherein the final shape is derived from the combination of two opposed conical sections joined by substantially flat side panels. Any of the accessories commonly used with conventional pontoons may be used in conjunction with pontoons of the present invention. For example, horizontally disposed splash rails or the like may be secured to or formed on the side panels of the bow section. Other similar modifications are likewise possible.

Thus, there is disclosed in the above description and in the drawing two exemplary embodiments of the present invention which fully and effectively accomplish the objects thereof. However, it will be apparent that variations in details of construction may be indulged in without departing from the sphere of the invention as herein described, or the scope of the appended claims.

What is claimed is:

1. A bow for pontoons or the like adapted to be formed from sheet material and having a fully developable contour, comprising: an upper section of conical configuration arranged symmetrically about a vertical plane and having the vertex thereof extending forwardly; a lower section of conical configuration arranged symmetrically about the same vertical plane and having the vertex thereof extending forwardly to a point rearwardly of the vertex of said upper section; a first substantially flat side panel joining the edges of said upper and lower sections disposed on one side of said plane; and a second substantially flat side panel joining the edges of said upper and lower sections on the other side of said plane, said two side panels being joined at the forward edges thereof along a line extending between said two vertexes.

2. A structure as claimed in claim 1, wherein said conical sections are sections of scalene cones.

3. A structure as claimed in claim 1, wherein said conical sections are sections of circular scalene cones.

4. A bow for pontoons or the like adapted to be formed from sheet material and having a fully developable contour, comprising: an upper section of scalene conical configuration arranged symmetrically about a vertical

5

plane and having the vertex thereof extending forwardly, the line of intersection of said upper section with said plane extending forwardly and upwardly; a lower section of scalene conical configuration arranged symmetrically about the same vertical plane and having the vertex thereof extending forwardly; a first substantially flat side panel joining the edges of said upper and lower sections disposed on one side of said plane; and a second substantially flat side panel joining the edges of said upper and lower sections on the other side of said plane, said two side panels being joined at the forward edges thereof along a line extending between said two vertexes.

5. A bow for pontoons or the like adapted to be formed from sheet material and having a fully developable contour, comprising: a downwardly open first conical section having a forwardly extending vertex defining an upper bow portion, the lower side edges of said upper bow portion lying in a plane defined by the axis of said first conical section and a horizontal line perpendicular to and intersecting said axis; an upwardly open second conical section having a forwardly extending vertex defining a lower bow portion, the upper side edges of said lower bow portion lying in a plane defined by the axis of said second conical section and a horizontal line perpendicular to and intersecting said axis, said upper and lower bow portions being symmetrical about the same vertical plane; a first substantially flat side panel joining the edges of said upper and lower bow portions disposed on one side of said vertical plane; and a second substantially flat side panel joining the edges of said upper and lower bow portions on the other side of said vertical plane, said two side panels being joined at the forward edges thereof along a line extending between said two vertexes.

6. A structure as claimed in claim 5, wherein said conical sections are sections of circular scalene cones.

6

7. A bow for pontoons or the like adapted to be formed from sheet material and having a fully developable contour, comprising: a downwardly open first scalene conical section having a forwardly extending vertex defining an upper bow portion, said upper bow portion being symmetrical about a vertical plane and having the lower side edges thereof lying in a plane defined by the axis of said first conical section and a horizontal line perpendicular to and intersecting said axis, the line of intersection of said upper bow portion with said vertical plane extending forwardly and upwardly; an upwardly open second scalene conical section having a forwardly extending vertex defining a lower bow portion, said lower bow portion being symmetrical about the same vertical plane and having the upper side edges thereof lying in a plane defined by the axis of said second conical section and a horizontal line perpendicular to and intersecting said axis; a first substantially flat side panel joining the edges of said upper and lower bow portions disposed on one side of said vertical plane; and a second substantially flat side panel joining the edges of said upper and lower bow portions on the other side of said vertical plane, said two side panels being joined at the forward edges thereof along a line extending between said two vertexes.

References Cited in the file of this patent

UNITED STATES PATENTS

1,021,294	Antoniades	Mar. 26, 1912
1,263,899	Johannessen et al.	Apr. 23, 1918
1,854,992	Kinoshita	Apr. 19, 1932
2,724,358	Harris et al.	Nov. 22, 1955
2,725,027	Brandon et al.	Nov. 29, 1955
2,960,957	Eddy	Nov. 22, 1960
2,984,845	Gregoire	May 23, 1961
3,025,537	Rasmussen	Mar. 20, 1962