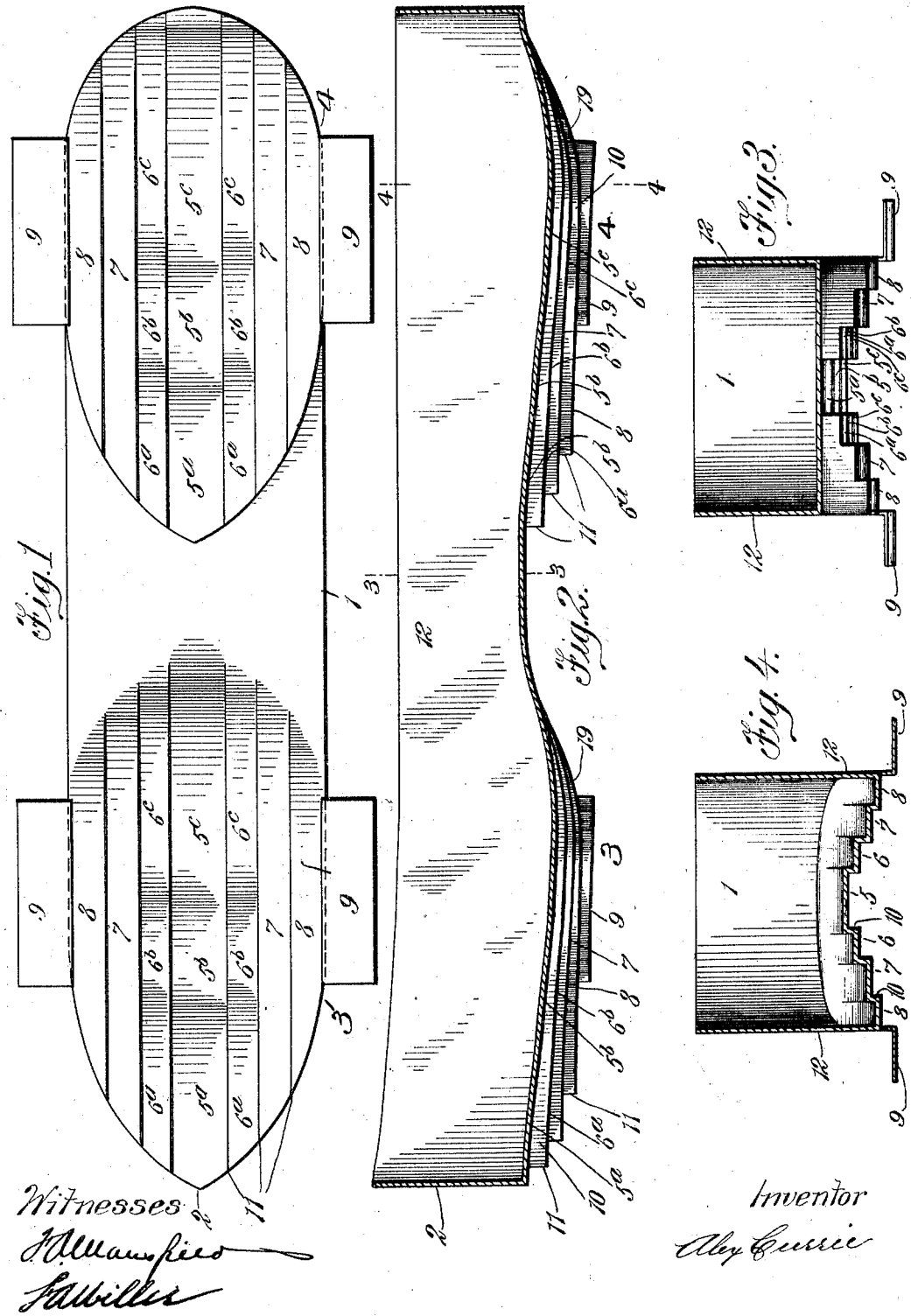
A. CURRIE.

BOAT.

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1,081,489.

Patented Dec. 16, 1913.



Witnesses

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BOAT.

1,081,489. Specification of Letters Patent. Patented Dec. 16, 1913.

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To all whom it may concern:

Be it known that I, ALEXANDER CURRIE, a subject of the King of Great Britain, residing at Los Angeles, in the county of Los Angeles, State of California, have invented a certain new and useful Boat; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to boats, and particularly to boats of the type known as hydroplanes which are designed to be raised out of the water and glide on the surface thereof when running at high speed.

The invention has for one of its objects to provide a configuration for the under surface or bottom of the boat which will be particularly adapted, by its action upon the water when the boat is running, to lift the boat.

Another object of the invention is to provide a formation for the under surface of the boat which will cause the water to offer a minimum resistance to the passage of the boat when running at high speed.

Another object of the invention is to provide a formation for the under surface of a boat in which a series of surfaces of special configuration come successively into contact with the surface of the water when the boat is lifted upon increase of speed.

Another object of the invention is to provide the under surface of the boat with a series of upwardly and forwardly inclined surfaces so arranged that the waste of power due to the forward thrust of the inclined surfaces against the water may be reduced as the speed of the boat increases.

Still another object is to provide a construction for the bottom of a boat of the described type which will cause the boat to maintain its balance both longitudinally and transversely when running at high speed.

With the above and other objects and advantages in view which will be apparent to those skilled in the art from a consideration of the following description and accompanying drawings in which a construction embodying the invention is described and illustrated, the invention may be said to consist of the construction, arrangement and combination of parts as hereinafter described and particularly pointed out in the claims.

Referring now to the drawings: Figure 1 is an underside plan view of a boat having the invention embodied therein. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a transverse sectional view taken on line 3—3 Fig. 2, and Fig. 4 is a transverse sectional view taken on line 4—4 Fig. 2.

The upper part of the hull of the boat is indicated at 1 and may be usual construction with a pointed bow 2 so that when running at low-speed and with a comparatively large amount of the hull submerged it may cut the water easily. Any suitable propelling means, not necessary to be shown, may be provided.

In order to cause the boat to rise in the water as its speed increases its bottom is preferably formed with a series of upwardly and forwardly inclined surfaces. If desired the bottom of the boat may be formed in two sections 3 and 4 arranged in tandem and each having a series of upwardly and forwardly inclined surfaces arranged adjacent to one another. These surfaces are preferably arranged in echelon and may include a central surface 5, on either side of which may be arranged any desired number of side surfaces; four of such surfaces 6, 7, 8 and 9 respectively, being shown on each side of the central surface. These surfaces are preferably arranged in stepped relation with each other as shown particularly in Figs. 3 and 4 with the central surface highest; vertical walls 10 connecting each surface with the adjacent one.

By arranging the surfaces as pointed out in the previous paragraph the boat will be kept in equilibrium when running at high speed as the surfaces farthest apart transversely will be always resting on the water while at the same time the sharp edges 11 at the juncture of the wall 10 and the converging sides of the bow 2 will tend to cut the waves and lessen the jar caused by the waves striking the boat; also the lifting action of the central surface will be increased by preventing the escape of water at the sides.

As shown here the lower surface 9 may be formed of a thin strip projecting out beyond the sides 12 of the boat so that the lifting surface can be made of considerable

width without causing the boat to present a broad front to the waves. It will be apparent, of course, that the width of the boat could be varied and any desired number of the stepped surfaces made to extend beyond the sides.

As the resistance of the water to displacement increases in a proportion much higher than the rate of increase in the speed with which it is displaced, causing the lifting action of the surface to increase in like proportion, these surfaces 5, 6, 7, 8 and 9 may be arranged to have slightly decreasing angles of inclination, from the highest surfaces 5 with the greatest angle of inclination to the lowest surface 9 with the smallest angle of inclination; the object being to reduce as much as possible the waste of power due to the forward thrust of the surfaces against the water by making the thrust of the surfaces remaining in the water when the boat is traveling at high speeds act in a direction more nearly vertical. Also, the surfaces, laterally from the center line of the boat, may be of gradually decreased length as shown. In order to make these surfaces especially adapted by their action upon the water, to lift the boat they are preferably given a particular configuration longitudinally thereof. As shown particularly in Fig. 2 these surfaces are preferably curved concavely to substantially a parabolic form. The parabolic curve is preferred because each particle of water coming in contact with the surface presses evenly against the latter throughout its entire length and is not deflected away from the surface as would be the case were surfaces not of substantially parabolic curvature employed. Also, as will be understood by those familiar with the properties of the parabola, the downward pressure due to the force of gravity tends to press the water adjacent to the surface toward a common point.

In order to minimize as much as possible any loss of lifting efficiency which might occur, in case the boat should be traveling with one of the surfaces partly out of the water, by the surface not meeting the water at the beginning of the parabolic curve any desired number of these surfaces may be formed to provide a continuous lifting surface adapted to present a plurality of surface-sections, each preferably concave in longitudinal section, arranged in series one behind the other with the front surface section highest, and each succeeding section lower than the one in front and merging into it, so that the upward inclination of the surface as a whole toward the front is preserved; the object being to cause the surface when partly out of the water to strike the latter at the beginning of a parabolic curve.

The central surface 5 and the adjacent surfaces 6 are preferably formed with a plurality of substantially parabolically curved surfaces 5^a, 5^b, 5^c, and 6^a, 6^b, 6^c, respectively, arranged relatively to each other in the manner pointed out in the preceding paragraph; the reason that the higher surfaces are shown as provided with the plurality of curves being that they are preferably as before stated of greater inclination than the lower surfaces, and are likely to be raised out of the water more frequently than the latter. For reasons already pointed out the surface sections 5^a, 5^b, 5^c, and 6^a, 6^b, 6^c, may also be arranged with the lower rear sections having smaller angles of inclination than the upper front ones. In varying the inclination of the parabolically curved surfaces the curve of the parabola is also preferably varied accordingly. As shown at 19 in the drawing the surfaces may be convexly curved at their rear ends and such curvature may also be parabolic.

It will be obvious of course that various changes and modifications might be made in the precise construction shown and the right is therefore reserved to all such changes and modifications as come within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A boat having its bottom provided with a plurality of upwardly and forwardly inclined laterally stepped surfaces having varying angles of inclination, one of said surfaces arranged substantially centrally of and above the others.

2. A boat having its bottom formed with a series of inclined surfaces, including a central surface, and side surfaces arranged in stepped relation with the central surface, the central surface being higher than the side surfaces.

3. A boat having its bottom formed with a series of inclined surfaces arranged adjacent to each other and comprising higher and lower surfaces, the higher surfaces having greater angles of inclination to the horizontal than the lower surfaces.

4. A boat having its bottom formed with a series of inclined surfaces, including a central surface, and side surfaces arranged in stepped relation with the central surface, the central surface being higher than the side surfaces and having a greater angle of inclination than the latter.

5. A boat having its bottom provided with a plurality of laterally stepped surfaces including a surface 5 formed with a plurality of curved surface-sections 5^a, 5^b and 5^c arranged one behind the other with the front surface-section 5^a highest and each succeeding surface-section lower than the one in front of it.

6. A boat having its bottom formed with a series of curved surfaces arranged side by

side in stepped relation one below the other laterally thereof, such surfaces being upwardly and forwardly inclined, the angle of inclination of the lower surface being smaller than the angle of inclination of the higher surface.

7. A boat having its bottom formed with a plurality of lifting surfaces, a portion of the surfaces each comprising a plurality of curved sections upwardly and forwardly inclined and arranged one behind the other with the front section highest and each succeeding section lower than the one in front of it, the lower rear sections having smaller angles of inclination than the upper front ones.

8. A boat having its bottom formed with a plurality of stepped lifting surfaces, the higher surfaces each formed to provide a plurality of curved sections arranged one behind the other with the front section highest and each succeeding section lower than the one in front of it, said sections connected together to form a continuous surface having an upward inclination toward the front of the boat.

9. A boat having its bottom formed in spaced sections arranged in tandem and each comprising a series of upwardly and forwardly inclined surfaces.

10. A boat having its bottom formed of a plurality of lifting surfaces arranged in stepped relation, with the higher of the surfaces arranged substantially centrally of the boat and the lower of the surfaces arranged laterally beyond the sides of the boat.

11. A boat having its bottom provided with stepped lifting surfaces and substantially vertical walls between said surfaces, the lower of the surfaces being farthest laterally from the center line of the boat.

12. A boat having its bottom formed with curved inclined lifting surfaces including a central surface and surfaces on each side thereof, said surfaces arranged in stepped relation with the central surface highest.

13. A boat having its bottom provided with stepped lifting surfaces and substantially vertical walls between said surfaces, the central surface being highest in position.

14. A boat having its bottom provided with upwardly and forwardly inclined lifting surfaces, including a central surface and side surfaces arranged in stepped relation with the central surface, the central surface being higher than the side surfaces.

15. A boat having its bottom provided with lifting surfaces having different angles of inclination, including a central surface and side surfaces arranged in stepped relation therewith, the central surface being higher than the side surfaces.

16. A boat having its bottom provided with a plurality of laterally stepped surfaces including an inclined lifting surface 5 comprising a series of curved sections 5^a, 5^b and 5^c arranged one behind the other.

17. A boat having a bow formed by converging sides thereof and provided on its bottom with a plurality of lifting surfaces, including a central surface and side surfaces below the central surface and vertical walls between the surfaces, said walls and converging sides at their juncture forming edges adapted for the purposes set forth.

18. A boat having a bow formed by converging sides thereof and having its bottom provided with a plurality of lifting surfaces including a central surface and side surfaces therebelow and vertical walls connecting each surface with the adjacent one, said walls and converging sides at their juncture forming edges adapted for the purposes specified.

19. A boat having its bottom provided with curved upwardly and forwardly inclined lifting surfaces, said surfaces, laterally from the center line of the boat, being of gradually decreased length.

20. A boat having its bottom formed with upwardly and forwardly inclined lifting surfaces arranged in stepped relation with each other, the lower surfaces having the smallest angle of inclination, said surfaces, laterally from the center line of the boat, being of gradually decreased length.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 5th day of April, A. D. 1910.

ALEX. CURRIE.

Witnesses:
ALEX. H. LIDDERS,
FRED A. MANSFIELD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."