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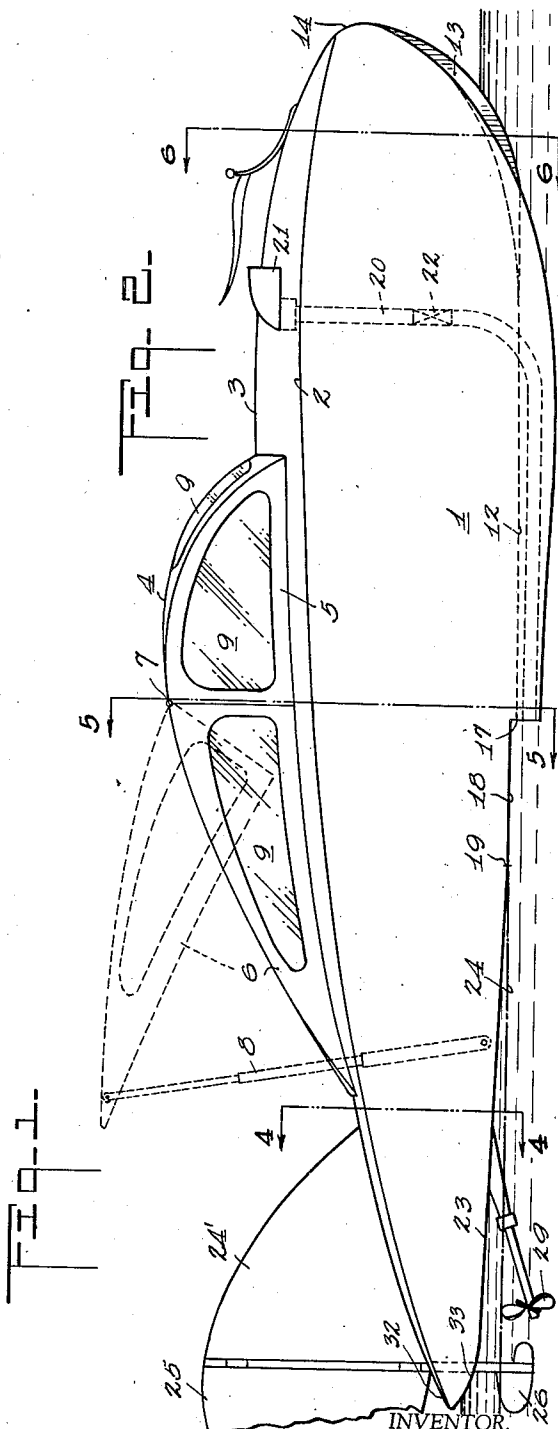
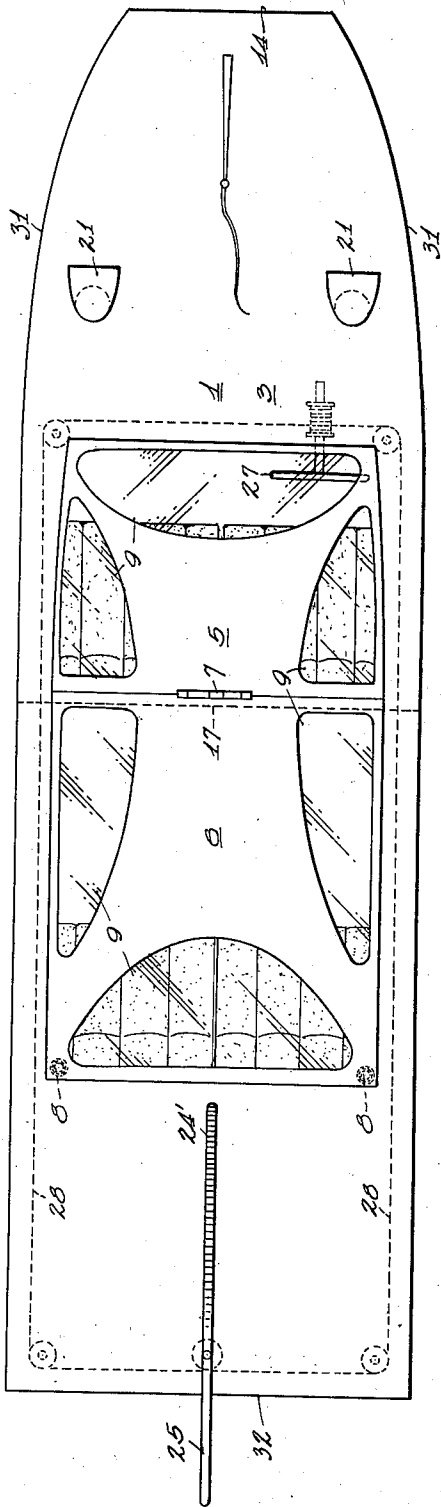
R. W. FROST

2,172,674

SPEED BOAT

Filed April 25, 1936

2 Sheets-Sheet 1



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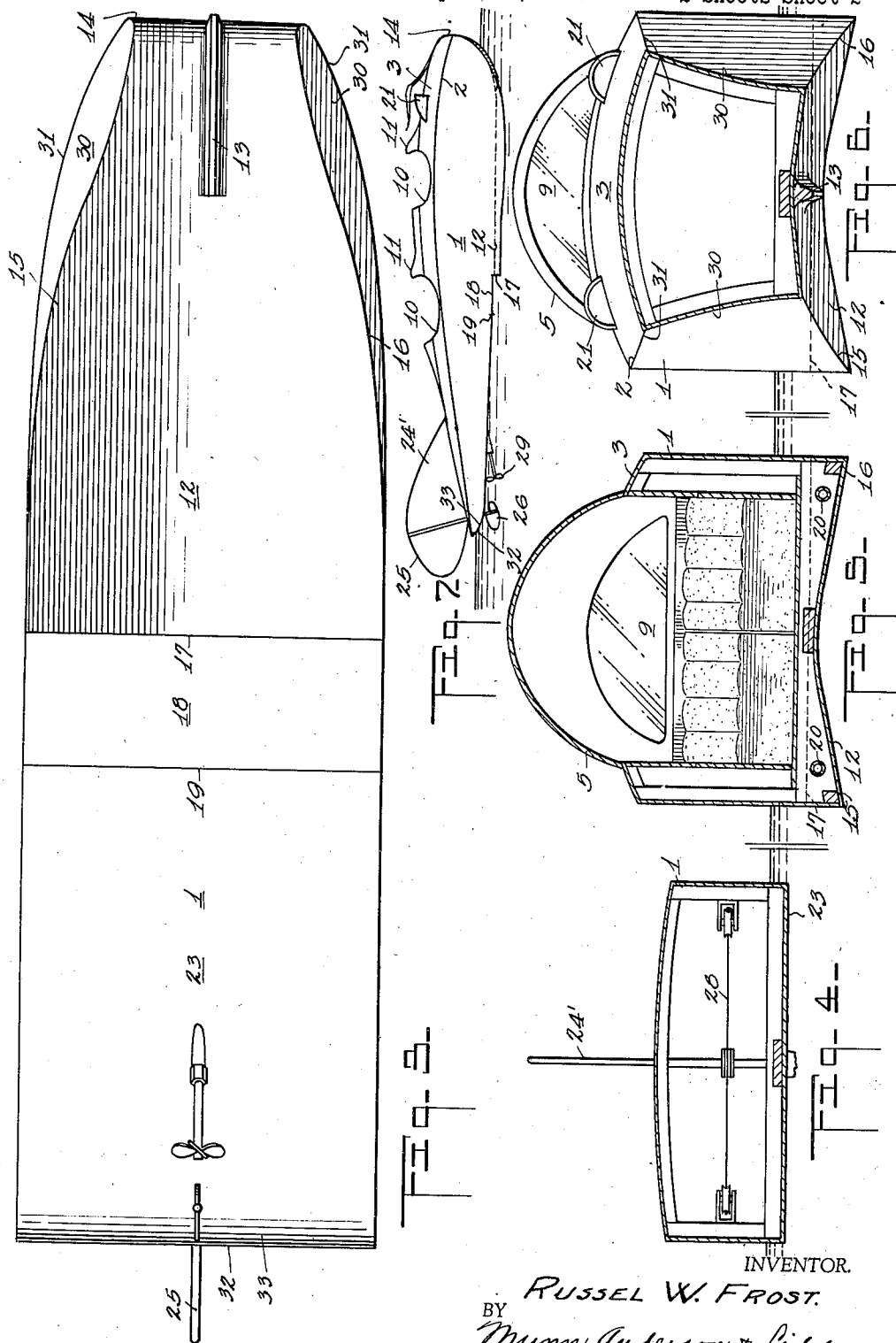
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UNITED STATES PATENT OFFICE

2,172,674

SPEED BOAT

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Application April 25, 1936, Serial No. 76,417

7 Claims. (Cl. 114—66.5)

My invention relates to improvements in speed boats, and it consists of the combinations, constructions and arrangements hereinafter described and claimed.

5 An object of my invention is to provide a speed boat designed to reduce the resistance of the boat to a minimum when the boat is in the water, or when the boat is speeding along and is practically entirely in the air. The hull of the boat above the water line is stream-lined to reduce air resistance. 10 In order to accomplish this the top of the boat is curved from bow to stern in the same manner as the upper surface of an airplane wing. The top of the boat in addition is provided with a transverse curve in order that the hull will take the shape of a boat. This shape of the top of the boat is designed to give a lift when the boat is speeding over the water in much the same manner as an airplane wing is lifted when moved. In the open 15 type of boat cockpits are provided with wind deflectors and in the closed or cabin type the upper surface of the closed portion for the passengers is curved and makes a compound curve with the upper surface of the boat hull.

25 As a further aid for lifting the boat when speeding over the surface of the water I provide a V-shaped bottom that extends from the bow to approximately the midportion of the boat. A bow piece cooperates with the V-shaped bottom and causes the water to be deflected against the sides of the V, and this will aid in lifting the boat. The boat also is provided with a step that creates a vacuum for holding the boat steady during the initial movement of the boat over the water. I 30 provide novel means for relieving this vacuum after the boat attains sufficient speed.

As a further means for lessening water resistance the bottom of the boat hull is provided with a flat surface adjacent to the step, and an inclined flat surface extends rearwardly from the end of the first flat surface for lying flat on the water when the boat attains speed. In other words, the inclined flat surface extends at such an angle that 45 it will parallel the surface of the water when the boat is in full flight. The stern of the boat is provided with an upwardly curved portion for permitting the boat to back up without causing water to be forced up over the top of the boat.

50 A vertical air stabilizer is used for guiding the boat and an air rudder cooperates with a water rudder and both are turned as a unit for controlling the movement of the boat.

Other objects and advantages will appear in the following specification, and the novel features of 55

the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming a part of this application, in which

Figure 1 is a top plan view of the boat;

Figure 2 is a side elevation;

Figure 3 is a bottom plan view;

Figures 4, 5, and 6 are sections along the lines 4—4, 5—5, and 6—6 of Figure 2; and

Figure 7 is a side elevation of a slightly modified form of the boat.

In carrying out my invention I provide a boat whose hull, indicated generally at 1, is curved along its upper surface from bow to stern as shown at 2. This curve is in the same shape as the upper surface of an airplane wing except that the top 3 of the boat is also curved transversely so that the shape of the hull will partake of the same shape as a boat.

Figures 1 and 2 show a closed cabin type of boat, and in this form the upper surface 4 of the closed portion 5 is provided with a second curve that cooperates with the curved portion 2 for reducing air resistance. If desired the rear portion 6 of the closed top may be hinged at 7 and may be lifted into the dotted line position shown in Figure 2 and temporarily supported by telescoping legs 8 disposed at the rear corners of the portions 6. In this way access to the interior of the boat is provided. Windows 9 are provided in the sides, front and back of the closed top 4.

In the open type of boat shown in Figure 7 two cockpits 10 are provided and wind deflectors 11 are positioned at the fronts of the cockpits. The rear cockpits may be provided with head rests in much the same manner as in an airplane. Passengers sitting in the cockpits 10 are protected from the wind and the boat can attain a faster speed because the bodies of the passengers will not offer any resistance to the wind.

The bottom of the boat is V-shaped in cross section from the bow to a point substantially midway between the bow and the stern. This V-shaped portion is shown at 12 in Figures 2, 5 and 6. A bow piece 13 is placed midway between the sides of the boat and extends from the bow 14 a slight distance toward the rear of the boat, see Figure 3. This bow piece is wedge-shaped in cross section and is designed to deflect the water to the sides of the inverted V bottom. This will aid the lifting force of the boat when moving through the water and the speed of the boat therefore can be materially increased. The

bow piece 13 may extend rearwardly to the step if desired.

The V-shaped bottom provides side keels 15 and 16 and these are utilized when the boat is making a right or left-hand turn. The side keels will aid in preventing the boat from slipping laterally through the water during the actual turning of the boat.

The boat is provided with a step 17 disposed at the rear of the V-shaped portion 12 and the bottom of the boat is made flat at 18, this flat portion extending from the step 17 to a line 19. The step creates a vacuum during the initial movement of the boat, and this is utilized for steadying the boat while the boat is attaining speed. I provide novel means for relieving this vacuum after the boat has attained sufficient speed, and this means is shown in Figure 2. Two or more air ducts 20 extend from the upper surface 3 of the boat and terminate at the step 17. Louvres 21 are placed at the entrances of the air ducts, and are used for directing the air into the conduits. A valve 22 is placed in each conduit and normally is closed. After the boat has attained sufficient speed the valves 22 are opened, and this permits air to enter the conduits and be delivered to the step 17, and this air will relieve the vacuum or suction created adjacent to the step.

Figure 2 also shows the boat being provided with a second flat portion 23 extending from the line 19 rearwardly. This second flat portion is inclined with respect to the first flat portion 18, and I have found that the inclination should be approximately one-quarter of an inch rise to each foot of length. The angle made by the flat portion 23, and the broken line 24 extending from the flat portion 18 is called the angle of flight. In other words, when the boat is moving across the water at full speed it will ride on the flat portion 23, and this flat portion will be parallel to and resting upon the surface of the water. This will cause the bow of the boat to project above the water at an angle. Since the surface 23 is flat very little water resistance will result, and this flat surface will permit the boat to practically slide over the surface of the water.

In order to keep the boat in an upright position I provide a vertical air stabilizer 24', and I further provide an air rudder 25 that works in unison with a water rudder 26. Figure 1 shows a steering wheel 27 operatively connected to the air and water rudder by steering cables 28. The turning of the steering wheel 27 will simultaneously turn the air and water rudder.

The boat may be powered by any means desired, and I show a propeller 29 projecting below the flat surface 23. This propeller may be actuated by an engine not shown. If desired the boat may be propelled by an outboard motor, and in this case the propeller would operate through a tunnel not shown.

Figures 3 and 6 show the front portion of the boat provided with sides 30 that are curved inwardly from the gunwale 31 to the keels 15 and 16. The sides also are curved inwardly a slight distance as indicated in Figure 3. Figure 2 shows the bow provided with a curved portion that merges into the top 3 and also into the inverted V 12. The stern 32 of the boat is provided with an upwardly curved portion 33 extending from the flat portion 23. The curved portion 33 disposes the stern above the water line, and this permits the boat to be backed up without causing the water to flow over the top 3.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

The speed boat is handled in much the same manner as a standard speed boat. The boat, however, will attain far greater speeds because the upper surface of the boat 3 is formed in the shape of an airplane wing in order to cut down air resistance. The under surface of the boat is provided with a V-shaped portion that cooperates with a central piece 13 and this causes water to be deflected against the sides of the V for aiding in lifting the boat out of the water. The vacuum created at the step 17 is relieved when the valves 22 are opened, and this permits the boat to move over the surface of the water at a faster speed. Finally the flat portion 23 is inclined at the angle of flight, and this will cause the boat to ride on this flat portion after the boat attains its speed. The water resistance therefore will be reduced to a minimum.

The shape of the boat hull above the water line is such that the air resistance will be reduced to a minimum. The combined results will cause the boat to move rapidly over the water. Although I have shown the sides of the boat 30 made convex from the middle of the boat toward the bow, these sides are made straight from the middle of the boat toward the stern as shown in Figures 3 and 4.

The angle between the flat surfaces 18 and 23 causes the surface 18 to extend at an angle to the water surface when the surface 23 is planing over the water. In other words, the flat portion 18 acts as a secondary bow when the boat is riding on the flat portion 23 and this aids in keeping the boat on the surface of the water, and thus reduces the water drag to a minimum.

It is obvious that the boat may be covered with wood or metal. The bottom of the boat should be lined with metal in order to withstand the high speed.

While I have shown only the preferred forms of my invention, it should be understood that various changes or modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A speed boat comprising a hull provided with a V-shaped channel bottom extending from the bow to the middle of the boat, the top of the V extending in a straight line from the bow rearwardly, and a bow piece disposed midway between the sides of the boat and having its edge merging into the straight central portion of the V near the bow, the outer edges of the V being inclined slightly so that the V shaped bottom becomes more pronounced from the middle of the hull and forwardly.

2. A speed boat comprising a hull provided with but a single step disposed substantially midway between the bow and the stern, the bottom of the hull to the rear of the step having a flat portion of small area and a second flat portion of a large area and inclined upwardly at a slight angle to the first area, the second flat portion being large enough to constitute the sole support of the boat as it rides on the top of the water when the boat attains speed.

3. In a speed boat, a hull provided with a V-shaped bottom extending substantially from the middle of the boat and forwardly to the prow, the central longitudinal portion of the V-shaped bottom paralleling the surface of the water on which the boat rests, the sides of the V-shaped

bottom constituting side keels for the boat and being inclined downwardly for a short distance to increase the depth of the V channel near the prow of the boat, the prow of the boat being curved and the V channel disappearing in the curve, and a centrally disposed bow piece extending from the prow and projecting beyond the curved portion, said piece merging into the central portion of the V-shaped bottom near the prow.

4. A speed boat comprising a hull provided with a step disposed substantially midway between the bow and stern, the portion of the bottom extending in front of the step being in the form of a V-shaped channel with the central longitudinal portion of the V paralleling the surface of the water when the boat is at rest, the greater portion of the bottom rearward of the step normally extending upwardly at an angle to the surface of the water, the upwardly extending portion having a single flat surface that is moved into parallel arrangement with the water surface when the boat attains speed.

5. In a speed boat, the combination with a hull having a water planing bottom, including an intermediate transverse step, said hull being generally stream-line in plan outline, of an upwardly inclined integral section upon said bottom disposed near said step and terminating in a rear

extremity which is curved upward toward the water line, said first-named upwardly inclined section comprising a single flat plane and arranged to make contact with the water when the hull is propelled forwardly and to plane on top of the water.

6. In a stream-line boat having a step, a water planing bottom which consists of a plurality of consecutive rigidly arranged water sleds extending rearwardly from the step, said water sleds being so formed and arranged that neither sled extends downwardly and the last sled is inclined upwardly to form a single flat surface that will constitute a planing bottom for the boat at high speed, this last sled terminating in an upwardly curved extremity that ends above the water line to permit the boat to be moved backward.

7. In a streamline boat, the combination with a hull having a water planing bottom, including an intermediate transverse step, of an integral rear section in said bottom beginning at said step, and having no downwardly inclined portion, said section having a single flat surface inclined upwardly toward the rear and then curving upward to above the water line, the single flat surface portion of the section riding flat on the water surface when the boat attains speed.

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