April 30, 1929. J. M. FARRELL 1,710,869

SPEED VESSEL

Filed Jan. 20, 1928 2 Sheets-Sheet 1

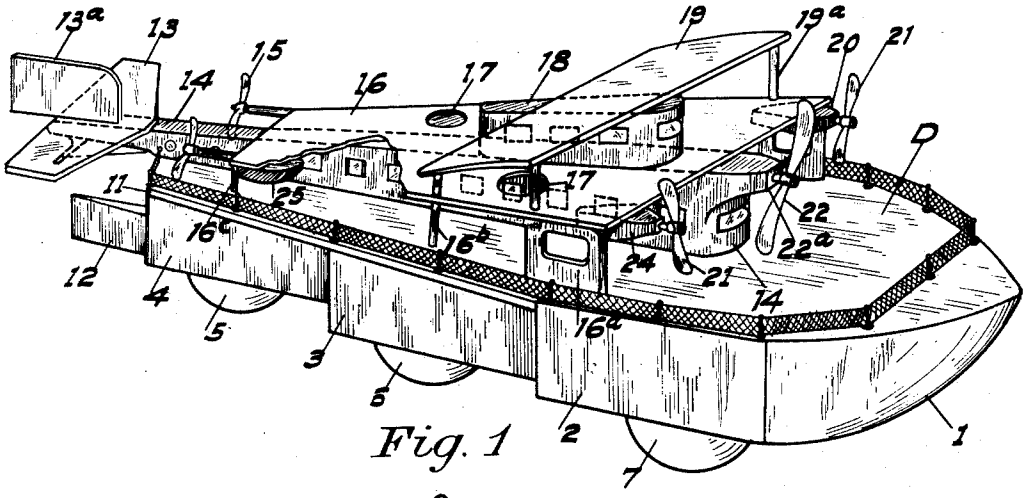


Fig. 1

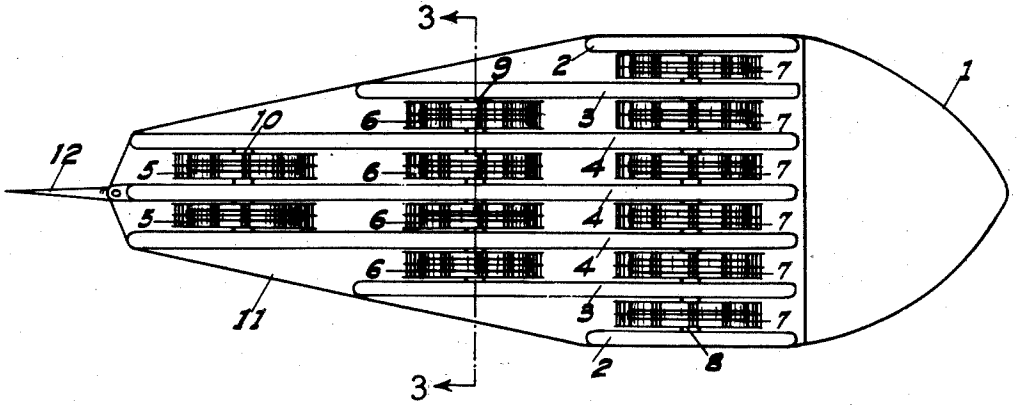


Fig. 2

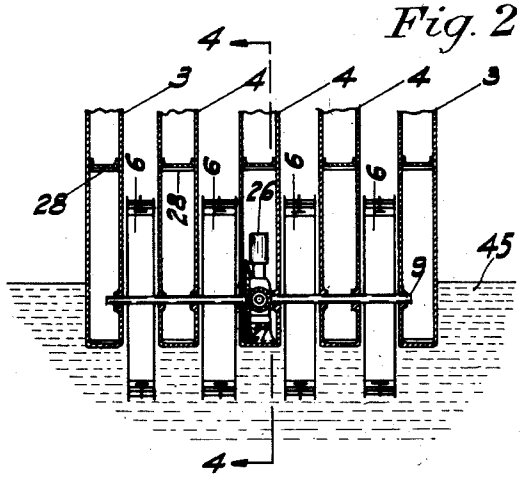


Fig. 3

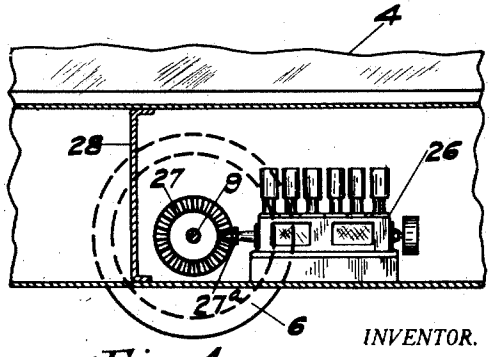


Fig. 4

INVENTOR.

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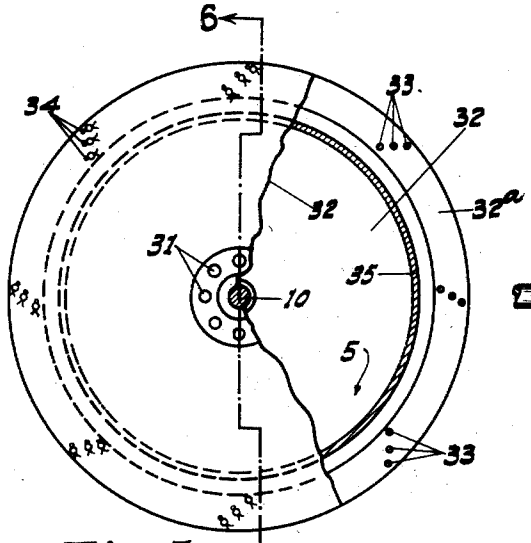


Fig. 5

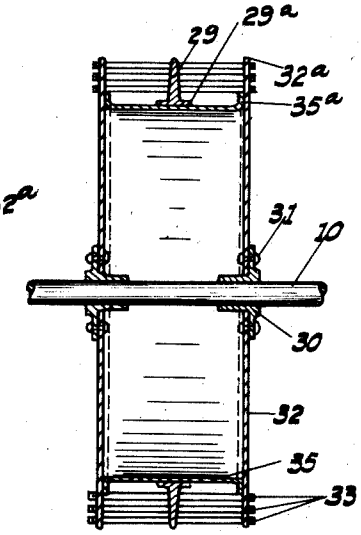


Fig. 6

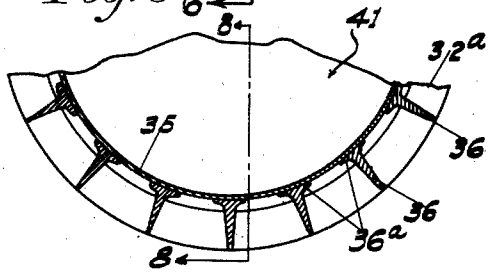


Fig. 7

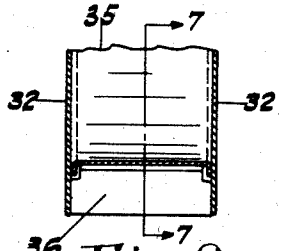


Fig. 8

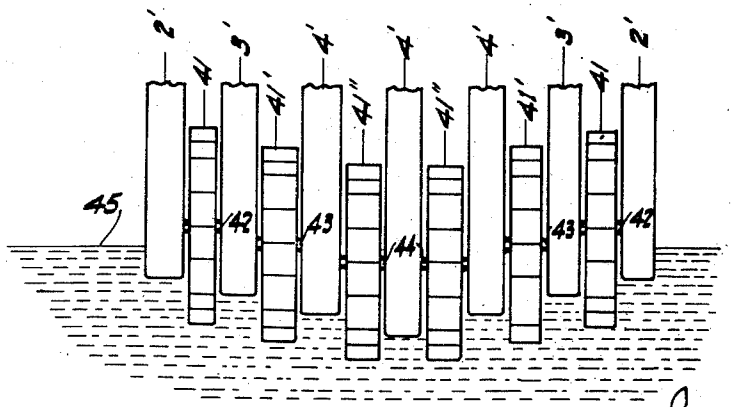


Fig. 9

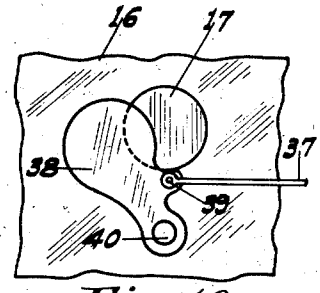


Fig. 10

INVENTOR

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Patented Apr. 30, 1929. 1,710,869

UNITED STATES PATENT OFFICE.

JAMES M. FARRELL, OF LOS ANGELES, CALIFORNIA.

SPEED VESSEL.

Application filed January 20, 1928. Serial No. 248,063.

Among the objects of the invention are to provide a vessel, the construction of which will enable avoidance of diving at low speeds, secure better seaworthiness, stability at high speeds on the water, ability to turn fore and aft and to operate forwardly and backwardly, cushioned surface riding, a high degree of hydrodynamic efficiency and increased buoyancy with less water resistance.

With increasing speed the lifting power is greater and the resistance with the water is minimized.

The vessel is intended for surface contact with the water at extremely high speed, yet the multiplicity of wings permit of it rising and they together with the pontoons will insure cushioned alighting, and the forward compartment provides adequate protection for the pontoon hull in case of collision.

Novel features are contained in the hull construction, wherein longitudinal pontoons or floats are alternatively placed with lifting and propulsion means, said pontoons and propulsion means being so arranged as to emerge from the water in a novel manner for the purpose of accelerating the take off.

Additional novel features are contained in the cabin arrangement which is such as to provide elimination of noise from the engines by separating cabins from the engines by means of a watertight bulkhead.

Lateral stability is provided for by the multiplicity of wings; and the wings together with the buoyantly cupped wheels greatly enhance the dynamic lifting effect.

There is a minimum displacement at maximum speed, and the combination of wheels and pontoons combine in high degree to aid in a quick getting off. Furthermore the vessel will be light as well as of strong construction.

In the drawings affixed to this specification is shown a preferred embodiment of my invention, yet I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, since various modifications can be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of my invention.

Referring to the drawings:

Fig. 1, is a perspective view of a speed vessel illustrating the principles of my invention.

Fig. 2, is a bottom view of the same.

Fig. 3, is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4, is a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5, is a side and part sectional view of one of the wheels.

Fig. 6, is a sectional view taken on the line 6—6 of Fig. 5.

Fig. 7, is a partial sectional view of a modified form of the water wheel.

Fig. 8, is a sectional view on the line 8—8 of Fig. 7.

Fig. 9, is a fragmentary sectional view through the lower portion of the pontoons taken at the junction of the bulk head and body of the hull and showing a modification.

Fig. 10, is a fragmentary plan view showing one of the control apertures in the wing of the vessel.

Referring in detail to the drawings, in the perspective view illustrated in Fig. 1, is shown a vessel having a hull composed of an alternate arrangement of pontoons and water wheels with a forward collision compartment 1, arranged beneath a water tight bulkhead 11. Upon the water tight bulkhead 11 is mounted a plurality of wings 16 and 19, there being two cabins 14 and 18 between which is wing 16, said cabins being superposed one above the other.

Immediately forward of the wing 16 are twin engine housings 20 and 24 with propellers 21 projecting therefrom, and midway between the two engine housings 20 and 24 is an engine housing 22^a with its propeller 22.

The bow 1 of the boat is desirably constructed with an alcove astern thereof so as to protect the rearward elongated buoyant compartments 2, 3 and 4 which are formed as parallel runners or pontoons in spaced relation to each other. These pontoons have their structure reinforced by internal stiffening partitions 28. Between said runners are the lifting and propelling water wheels 5, 6 and 7, preferably grouped as shown in Fig. 2. The lower surface of said runners are preferably on substantially the same level as the bottom of the bow portion 1.

Referring now in detail to the construction of the propelling water wheels 5, 6 and 7, as shown in Fig. 5, each of said wheels comprises a pair of circular side plates 32 having at each side a central hub member 30 secured in place by rivets 31. Said hub members 30 are rigidly secured to the driving shaft 10.

A circular rim plate 35 secured in place between plates 32 completes the drum like formation of each of the water wheels.

To the periphery of the rim plate 35, preferably at its mid width, is secured a circular rib 29, desirably having base flanges 29ª which may be welded to said rim member 35.

The periphery of each end plate 32 projects radially beyond the rim plate 35, thus providing an annular rim space or channel which is bridged by a series of propelling rods 33. Said rods are by preference and as shown arranged in sets of three, each of these sets forming a propelling element which functions similarly to a forwardly inclined blade on a water wheel but possesses the advantage of not forming a pocket which retains the water during its up stroke. In each set of three rods shown in Fig. 5, the rods are placed close together and arranged in a row, said row being inclined with respect to the periphery of the wheel as shown. The peripheral mid-rib 29, is perforated for the rods 33 and reinforces said rods against the stress of rapid rotation of the wheel. The peripheral rim plate 35, upon which the mid rib 29 is mounted, is desirably provided at each edge with an attaching flange 35ª whereby said plate 35 is secured to and between the side plates 32. Rods 33 are held in place by any suitable means such as cotter pins 34.

As shown in the drawings the front row of water wheels 7 is provided with a common propelling shaft 8, the middle row of wheels 6 has a propelling shaft 9, and the two rear wheels 5 have a propelling shaft 10. Each of these shafts are driven by its own engine, the engine 26 for the middle shaft 9 being shown in Figs. 3 and 4. 27 is a gear upon shaft 9 in mesh with the driving pinion 27ª.

From the foregoing description the mode of operation, where not specially described will be readily understood. The synchronizing of the speeds of the engines which control the rotation of the water wheels with the engines which drive the aeroplane propellers, in order to make these various propellers cooperate in the most efficient manner comes well within the skill of those versed in the art to which the invention pertains.

The general construction of alternating buoyant runners and water wheels may be applied with advantage to bring about a water-gliding effect thereby augmenting the possibilities for high speeds in all ships to which it may be applicable.

Upon the flat deck D is mounted a lower cabin 14, and above it an upper cabin 18, the lower plane or wing 16 being interposed between said cabins, while an upper wing or plane 19 is mounted above said upper cabin 18. The front corner portions of the lower wing 16, are supported at each side of the deck by a standard 16ª, said wing 16 being supported at each side rearwardly of this point by means of the posts 16ᵇ and 16ᶜ. The post 16ᵇ extends up through the edge portion of wing 16 to form also a support for the rear corner of wing 19, at that side, the front corners of wing 14 being supported by posts 19ª. Passengers emerging from the upper cabin 18 may utilize the lower plane 16 for a deck.

The front end of the lower cabin 14 is provided at its top with a forwardly projecting portion 22ª which supports the driving shaft of the centrally located main propeller 22. At each side of the main propeller 22 is an auxiliary propeller 21, the driving shaft of which is supported by a housing 24. At the stern are provided the retarding propellers 15, which may be used to retard the ship preparatory to effecting a quick landing. Said propellers 15 also aid in propelling the boat rearwardly and at the same time aid in maintaining equilibrium during turning movements. 13 designates elevator wings, and 13ª designates the aeroplane rudder. 12 designates the rudder of the hull of the boat.

The lower lifting plane 16 is provided with altitude control apertures 17, the opening and closing of some of which is governed by shutters 38 (see Fig. 10). Each shutter is pivoted to the wing at 40 and is operated by a rod 37 pivotally connected with said shutter at 39.

A modified form of water wheel is shown in Figs. 7 and 8. In these views the rim flange 32ª and plates 32 and 25 are similar to what is shown in Fig. 6, but upon the rim plate 25 are mounted a series of radially projecting circumferentially spaced blades 36 having flanged bases 36ª which are welded or otherwise secured to said rim plate 35. These radial blades 36 extend from side to side of the wheel and thus provide between them a series of buoyant air pockets which aid in lifting the device above the surface of the water when starting upon a flight.

In Fig. 9 is shown a modification wherein the series of parallel longitudinally extending runners is provided with central runners 4′ which extend to a greater depth than the other step runners of the series. The central water wheels 41″ also extend to a greater depth than the other water wheels 41′ and 41 shown in this figure. In Fig. 9, 2′, 3′ and 4′ correspond to the parts 2, 3 and 4 of Fig. 2.

The construction shown in Fig. 9 necessitates the provision of separate shafts 42, 43 and 44 for mounting the respective water wheels 41, 41′ and 41″, owing to the various levels at which said wheels are mounted. It is to be understood that when the modification shown in Fig. 9 is used the middle (with respect of fore and aft) set of water wheels 6 will be arranged in a correspondingly stepped fashion.

In consequence of the objects hereinbefore specified I again reiterate that according to the present arrangement, I attain a positive

lifting effect of the vessel exerted through the pontoons, whence as they gradually emerge from the water, frictional resistances are overcome and in a state of rest they minimize displacement. As the vessel increases in speed the load resting on the wheels and pontoons diminishes, therefore the resistance in the bow is diminished. With these objects and advantages brought to view it will be obvious that a vessel constructed in this manner, when brought to hydroplaning position will become self carrying through the pontoons, skimming on the water and its speed will be increased through the rapid rotation of the wheels synchronized with the speed of the aeroplane motors. In this connection it is to be understood that in order to secure efficiency in operation, the water wheels must be rotated at a sufficiently high speed to prevent them from retarding the ship while the latter is being driven forward through the water 45 under the urge of the aerial propellers.

I claim:

1. In a device of the character described, a ship body having a bow portion which extends to a greater depth than the remainder of the hull body thus providing a relatively large alcove behind said bow portion, a series of longitudinally extending buoyant runners occupying said alcove, and propelling devices adapted to act upon the water between said runners.

2. In a device of the character described, a hull having a bow portion which extends to a greater depth than the remainder of the hull, and having a substantially vertical wall at its sternal end, a series of longitudinally extending buoyant runners abutting said bow portion, the central runners of said series extending to a greater depth than the remainder of the series, and propelling means located between said runners.

3. In a device of the character described a hull having a bow portion which extends to a greater depth than the remainder of the hull body, thus providing a relatively large alcove behind said bow portion, a series of longitudinally extending buoyant runners arranged side by side in spaced relation to each other occupying said alcove, the central runners of said series being longer than the other runners and extending to a greater depth than the latter, and propelling water wheels located in the spaces between said runners, all of said runners being rearward of said bow portion.

4. In a device of the character described, a hull having a bow portion which extends to a greater depth than the remainder of the hull body thus providing a relatively large alcove rearward of said bow portion, a series of longitudinally extending buoyant runners arranged side by side in spaced relation to each other occupying said alcove, the central runners of said series being longer than the other runners and extending to a greater depth than the latter, and propelling water wheels located in the spaces between said runners, the water wheels between the central runners extending to a greater depth than the other runners.

JAMES MARTIN FARRELL.