No. 624,271. Patented May 2, 1899.

J. C. WALKER.

PNEUMATIC PROPULSION MEANS.

(Application filed May 10, 1898.)

(No Model.)

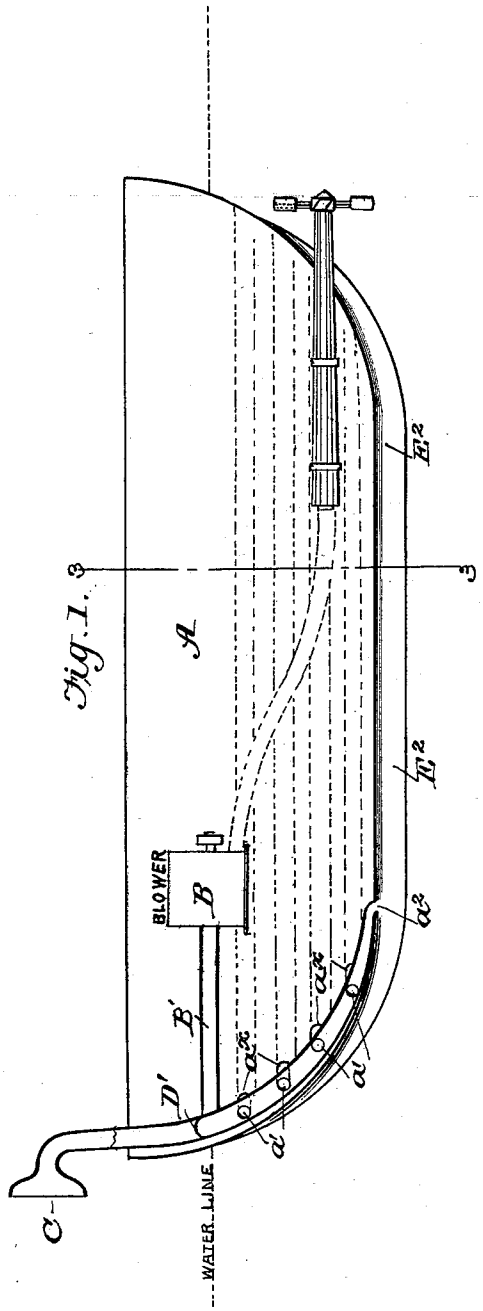


Fig. 1.

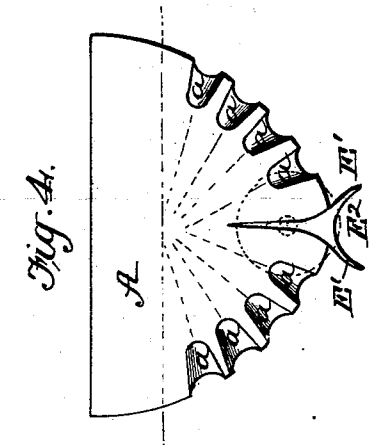


Fig. 4.

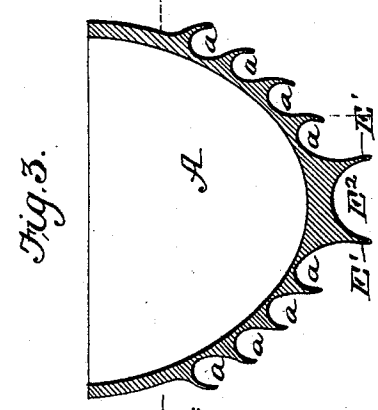


Fig. 3.

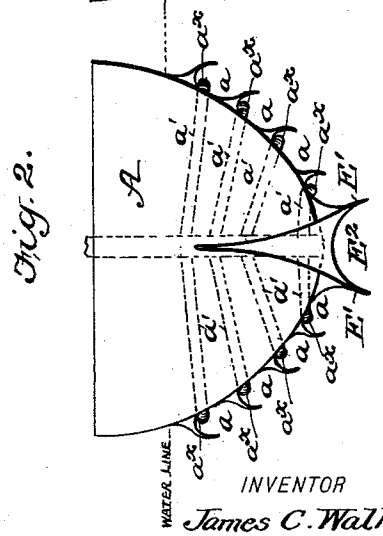


Fig. 2.

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PNEUMATIC PROPULSION MEANS.

SPECIFICATION forming part of Letters Patent No. 624,271, dated May 2, 1899.

Application filed May 10, 1898. Serial No. 680,306. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. WALKER, residing at Waco, in the county of McLennan and State of Texas, have invented a new and Improved Pneumatic Propulsion Means, of which the following is a specification.

This invention has for its purpose to provide for a direct and efficient application of currents of air to aid the propulsion of ships or boats and in the adaptation of the form of the ship or boat and its propelling means to this particular mode of propulsion.

This invention comprehends generally a construction of the hull of the vessel whereby air is capable of being so distributed as to produce a cushion on which the vessel is to float as much as possible instead of directly on the water and means provided whereby to reduce cavitation on the rear of the boat and of the propeller to a minimum.

In its subordinate features my invention embodies certain details of construction and novel combination of parts, as will hereinafter be first described in detail, and then pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a diagrammatic longitudinal section illustrating a boat or ship's hull and a propeller embodying the general features of my invention. Fig. 2 is a diagrammatic front view of the parts shown in Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 1. Fig. 4 is a rear end view.

One of the essential features of this invention is to overcome so far as possible friction and the formation of cavities or vacuum-spaces back of the propeller-blades, which have a retarding action on the propulsion of the vessel. This formation I seek to overcome by the means illustrated in a general way in the accompanying drawings, it being understood, however, that I do not confine my invention to the particular construction of the parts shown, as they may be readily modified without departing from the scope of the claims hereinafter set out.

Referring to the drawings, in which like letters indicate like parts in all the figures, A indicates the boat body or hull, which may be in its general construction of any well-known form. At a suitable point within the hull is mounted a blower B or other means for collecting air and discharging it under great pressure either in a continuous or intermittent blast. This blower connects by a pipe B′ with what I term the "main air-tube" D′, located in the bow of the boat and having a discharge end of gradually-decreasing area, which opens through a jet-outlet a^2 into the main air-chamber E^2, which extends the full length of the keel and terminates just below the water-line, while the rear end terminates at or near the propeller-line.

The channel or duct E^2 is to be strongly made of metal and preferably of semicircular form, as shown in Figs. 2, 3, and 4, the side members E′ thereof being of dimensions proportionate to the sides of the boat or ship to which they are attached.

a a indicate channels or ducts similar to the channels E^2, but of a somewhat smaller area, such channels *a a* extending from the bow to the stern and fixedly secured to the side of the hull at a point below the water-line, each of such channels *a* being connected with the air-conductor pipe D′ by laterals *a*′, which at their exit from the inside of the hull to the channels *a* make a sudden bend and extend a short distance into the air-channels, as indicated at $a^\times$, such ends projecting rearwardly, so that the water passing them serves to suck the air along the channel to the rear ends.

The air forced into the several side channels is held by the outer rims of such channels, as clearly indicated in Fig. 2, and at the stern all the air-channels *a a* turn inward toward the propeller-line, as shown in Fig. 4, so as to lead the air over and around the stern, and thereby prevent cavitation back of the same by reason of the moving of the stern forward through the water. By thus discharging air just to the rear of the stern formation of cavities, the amount of which is proportionate to the speed of the boat, is not alone avoided, but the friction along and beneath the ship is also materially so reduced that the speed of the boat is greatly increased thereby.

By arranging a number of air ducts or channels as shown cushion portions for the hull will be maintained at all times, even should the tossing or rolling of the boat cause one

or more of the side ducts or channels to rise above the water-line, it being understood that the emersion of such exposed channels admits of their being quickly filled from the constant current action of the blower B, and to facilitate this action the side channels are graduated and a little higher at the stern than at the bow.

The blower B, which can be placed at any convenient point inside the hull, may be run by a suitable motor or by gearing with the propeller-operating mechanism.

On sail-boats the air-pipe D′ is extended and terminates in a concentrator or collector C, which when turned to the wind will generally supply sufficient air for the purposes contemplated. In steam vessels the collector C is dispensed with.

In the practical application of my improved form of ship's hull the same is to be used with a peculiar construction of propeller, of which one or more may be used, and which is made with the view of also serving as an air-duct, adapted to fill any cavity or vacuum which might be created directly to the rear of the propeller, which action is augmented by the air force in the side channels and serves to positively overcome the creation of a vacuum at the rear of the propeller, thereby reducing to a minimum the danger of a retarding action of the vessel incident in the usual construction thereof, especially those driven by screw propulsion.

It should be stated that the form of propeller shown in the drawings comprises a tubular shaft arranged to discharge through the blades, and thereby fill the cavities directly to the rear of the propeller, as aforesaid. For this purpose said propeller serves as a means for discharging air at the point stated, which has a necessary correlation with the peculiar form of ship's hull. The details of construction of such propeller, however, form the subject-matter of another application filed by me on the 10th day of January, 1898, Serial No. 701,772, and such details of construction therefore form no part of this invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A vessel having a propeller and having its bottom provided with external channels discharging rearwardly and centrally toward the propeller, and supplemental means for discharging air through the stern to a point in line with the propeller, substantially as described.

2. As an improvement in ship propulsion; a ship's hull having a keel-channel extending from the forward to the rear end and terminating in an upturned tapering discharge; means for discharging an air-jet directly rearward through the stern; said hull having a series of side external channels, having their discharge ends extending rearward toward the center of the stern; an air-compressor having a main discharge-opening into the keel-channel, and a series of laterals extending into the side channels and having their ends projecting rearward in such channels, all substantially as shown and described.

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Witnesses:
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