

CHRISTOPHER JOHN LAKE (NAME CHANGED FROM JOHN CHRISTOPHER LAKE
BY JUDICIAL ORDER).
FLUID PROPELLED VESSEL.

APPLICATION FILED JUNE 17, 1907.

Patented Feb. 23, 1909.

913,515.

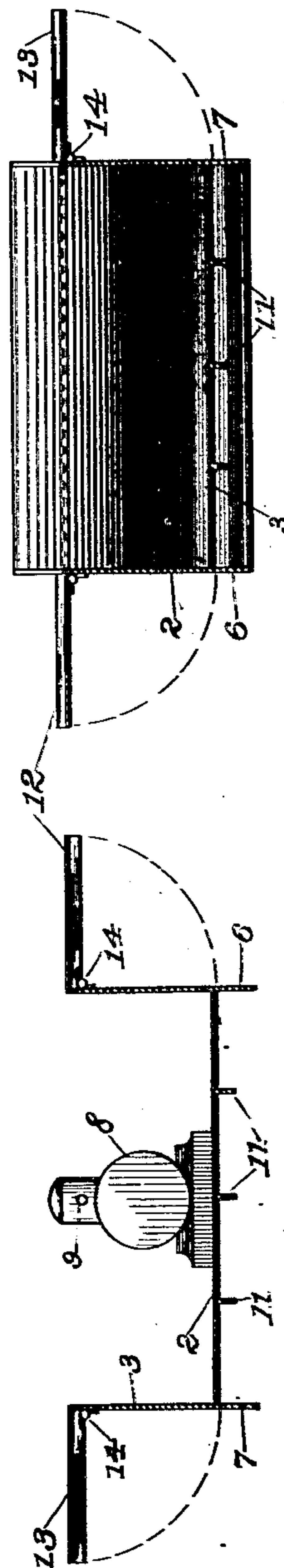
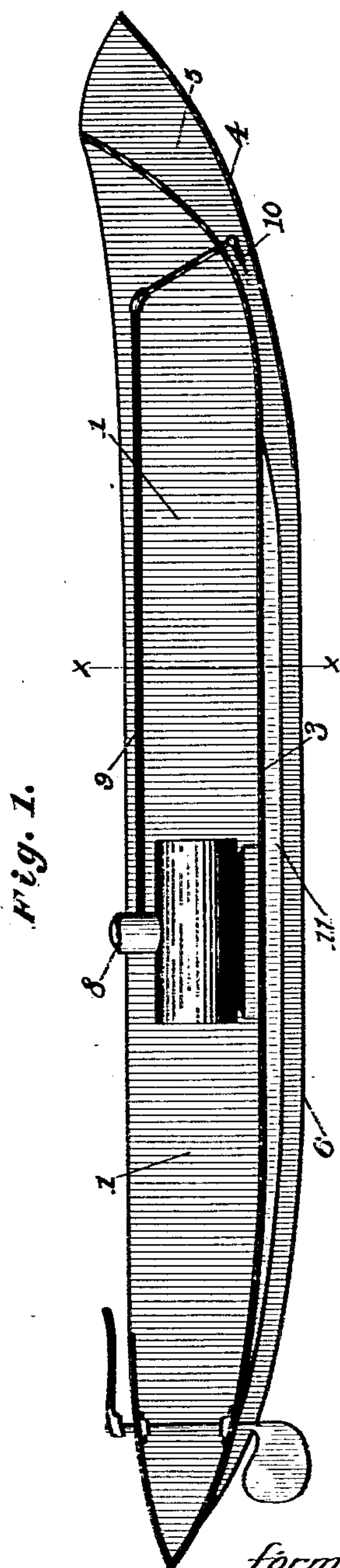


Fig. 3.

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WITNESSES

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UNITED STATES PATENT OFFICE.

CHRISTOPHER JOHN LAKE, (NAME CHANGED FROM JOHN CHRISTOPHER LAKE BY JUDICIAL ORDER,) OF BRIDGEPORT, CONNECTICUT.

FLUID-PROPELLED VESSEL.

No. 913,515.

Specification of Letters Patent.

Patented Feb. 23, 1909.

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To all whom it may concern:

Be it known that I, CHRISTOPHER JOHN LAKE, (formerly JOHN CHRISTOPHER LAKE,) a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Fluid-Propelled Vessels, of which the following is a specification.

My invention relates to the propulsion of vessels for water navigation by expelling a gas, vapor or other elastic fluid beneath the forward part of the vessel in such manner as to impinge against the water and at the same time draw with it a current of air beneath the boat, the mixture of gas or vapor and air thus interposed between the boat and the water serving the double purpose of propelling the boat and also reducing the water contact and hence the resistance or skin friction.

The main object of my invention, therefore, is to improve and simplify the propulsion of vessels by providing means for introducing a large volume of air and gas beneath the forward portion in such manner that it will give the vessel a forward impulse and at the same time provide a cushion of gas and air between the water and the under side of the boat. I provide also the further feature of wings or planes extending outwardly from the sides of the vessel in such a manner as to produce a lifting effect by contact with the air when moving at high speed or against the wind. These wings or planes may be so attached to the boat that they may be extended or folded against the side of the boat at will.

A further object of the invention is to provide means whereby the air used for propelling the vessel shall be removed from above and in front of the vessel so as to produce in that direction a tendency towards vacuum which will tend to draw the vessel forward and upward, thus aiding in propelling the boat and in causing it to glide over the surface of the water.

The annexed drawing shows one of the

forms in which my invention may be embodied.

Figure 1 is a longitudinal section through the boat. Fig. 2 is a transverse section on the line $x x$ looking aft. Fig. 3 is a transverse section on the line $x-x'$ looking forward.

Similar numerals refer to similar parts in the several figures.

1 is the interior of the hull or body of the boat, and 2 and 3 represent respectively the bottom and sides of the hull; 4 represents a forward apron or false bow forming the passage 5, which is inclosed at the sides by continuations or extensions of the sides of the boat, which continuations also extend backward to form the two side keels 6 and 7; 8 is a generator for producing under pressure a gas, vapor or other elastic fluid to be conveyed through the pipe 9 to a series of jets or projectors 10 in the passage 5. This passage 5, is made larger at its upper end and relatively small where the projectors 10, are placed. The arrangement of the projectors 10, in the passage 5, is such that the gas or vapor escaping from them will clear the passage of water and draw in and through it a current of air from above and in front of the vessel. The gas and air thus expelled rearward from the lower end of the passage pass backward under the vessel and finally escape at the stern, escape from the sides being prevented by the side keels 6 and 7. The false bow or apron 4 forms a nozzle casing surrounding the projectors 10 which discharge into the most contracted portion of the passage formed by the casing so as to operate on the well-known nozzle-projector principle. A current of air is thus drawn from above and in front of the vessel and forced, by the energy of the elastic fluid issuing from the projectors or nozzles, into the conduits or passages formed by the longitudinal keels beneath the boat.

11 represents additional keels that may be used where necessary to prevent the gas and air beneath the boat from collecting at one side when the boat is in imperfect trim, thus

insuring an air contact over the whole surface of the bottom of the boat.

12 and 13 are wings or planes which may be secured by the hinges 14, or other equivalent device whereby they may be folded against the sides of the vessel when not in use. The function of these wings or planes is to produce a lifting effect by their pressure on the air, thereby reducing the displacement of the vessel in the water and thus still further reducing the resistance of the water at high speed.

It will be seen that the gas and air escaping rearward from the passage 5, will give the boat a forward impulse; that the water resistance to be overcome will be greatly reduced by the layer of gas and air interposed between the water and the bottom of the boat and confined thereunder by the keels 6 and 7, and that the forward resistance will be still further diminished by the action of the wings or planes 11 and 12 bearing upon the air and thus reducing the water displacement and frictional resistance and also by the reduction of atmospheric pressure resulting from the removal of atmosphere from above and in front of the vessel.

Having now described one embodiment of my invention, what I claim and desire to protect by Letters Patent is:

1. The combination with a boat or vessel of a false bow or apron and means for projecting rearward a current of elastic fluid from a passage formed by the said false bow or apron.

2. The combination with a boat or vessel of a false bow or apron, means for projecting a current of elastic fluid from a passage formed by said false bow or apron; and keels to direct the said current of elastic fluid and prevent its escape except at or near the stern.

3. The combination with a boat or vessel of a false bow or apron forming a passage, a generator for producing an elastic fluid under pressure, pipes leading from said generator to the passage, projectors in the said passage for discharging rearward the said elastic fluid and drawing air through the said passage, and a series of longitudinal keels to direct the said current of elastic fluid and the entrained air and prevent their escape except at or near the stern.

4. The combination with a boat or vessel of a false bow or apron forming a passage, a generator for producing an elastic fluid under pressure, pipes leading from said generator to the passage formed by the said false bow or apron and projectors in the said passage for discharging rearward the said elastic fluid and drawing air through the said passage.

5. The combination with a boat or vessel, of means for discharging rearwardly under the vessel an elastic fluid to propel the ves-

sel and draw air thereunder and form a cushion between the vessel and the water to increase the buoyancy and diminish the water resistance of the vessel, said means comprising rearwardly directed nozzles, and air-impinging planes or surfaces to aid in causing the boat to rise on the water and still further relieve the water resistance.

6. The combination with a boat or vessel of means for discharging rearwardly under the vessel an elastic fluid to propel the vessel, and also to form a cushion between the vessel and the water to increase the buoyancy and diminish the water resistance of the vessel, said means comprising rearwardly directed nozzles, and air-impinging planes or surfaces to aid in causing the boat to rise on the water and still further relieve the water resistance.

7. The combination with a boat or vessel of means for steering the vessel, air-impinging planes or surfaces for reducing its water displacement when in motion and means for propelling the vessel, said means comprising an elastic fluid generator, rearwardly discharging nozzles for projecting the elastic fluid and mixing air therewith, pipes leading from said generator to said nozzles, and means for confining the elastic fluid and air under the vessel.

8. The combination with a boat or vessel of air-impinging planes or surfaces, a false bow or apron and means for projecting rearwardly a current of elastic fluid from a passage formed by the false bow or apron.

9. The combination with a boat or vessel of means for withdrawing atmosphere from in front and above the vessel so as to give the vessel a forward and upward tendency by atmospheric pressure.

10. The combination with a boat or vessel of means for projecting a generated elastic fluid rearwardly beneath the vessel; means for withdrawing atmosphere from above and in front of the vessel; and means for mingling the said atmosphere beneath the vessel with the said fluid.

11. The combination with a boat or vessel of means for withdrawing atmosphere from in front and above the vessel so as to give the vessel a forward and upward tendency by atmospheric pressure, said means comprising a nozzle casing, a nozzle therein and a longitudinal conduit beneath the boat, the nozzle being adapted to project a jet of elastic fluid into and through the conduit and draw air therethrough.

12. In a propelling apparatus for vessels, the combination of means for generating under pressure a gas or vapor, means for discharging said gas or vapor rearwardly under the bow of the vessel and combined means for diminishing the forward resistance of the vessel by drawing air from in front thereof and for aiding propulsion of

the vessel by forcing air with the gas or vapor thereunder, the energy of said gas or vapor being employed in said means.

13. In a propelling apparatus for vessels, the combination of means for withdrawing air from in front of the vessel to diminish pressure at that portion, means for conducting the air thus withdrawn longitudinally beneath the vessel to reduce the skin friction

thereof, and means for expelling the said air 10 at the rear of the vessel to augment the pressure at that portion.

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Witnesses:

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