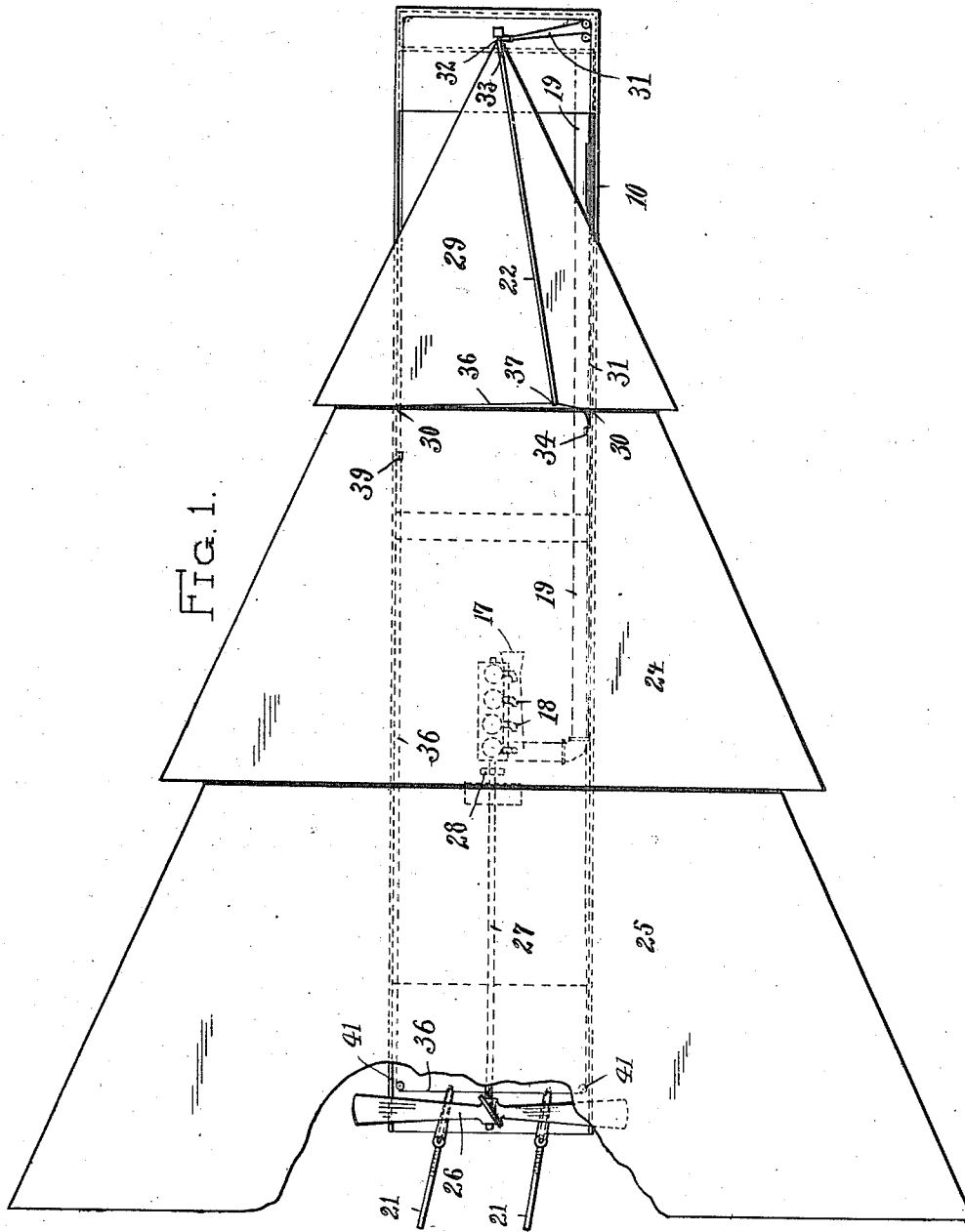


C. J. LAKE.
AEROBOAT.
APPLICATION FILED JAN. 27, 1911.

1,041,489.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

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Ruth M. Worden

INVENTOR

Christopher J. Lake

BY

Chamberlain & Newman
ATTORNEYS

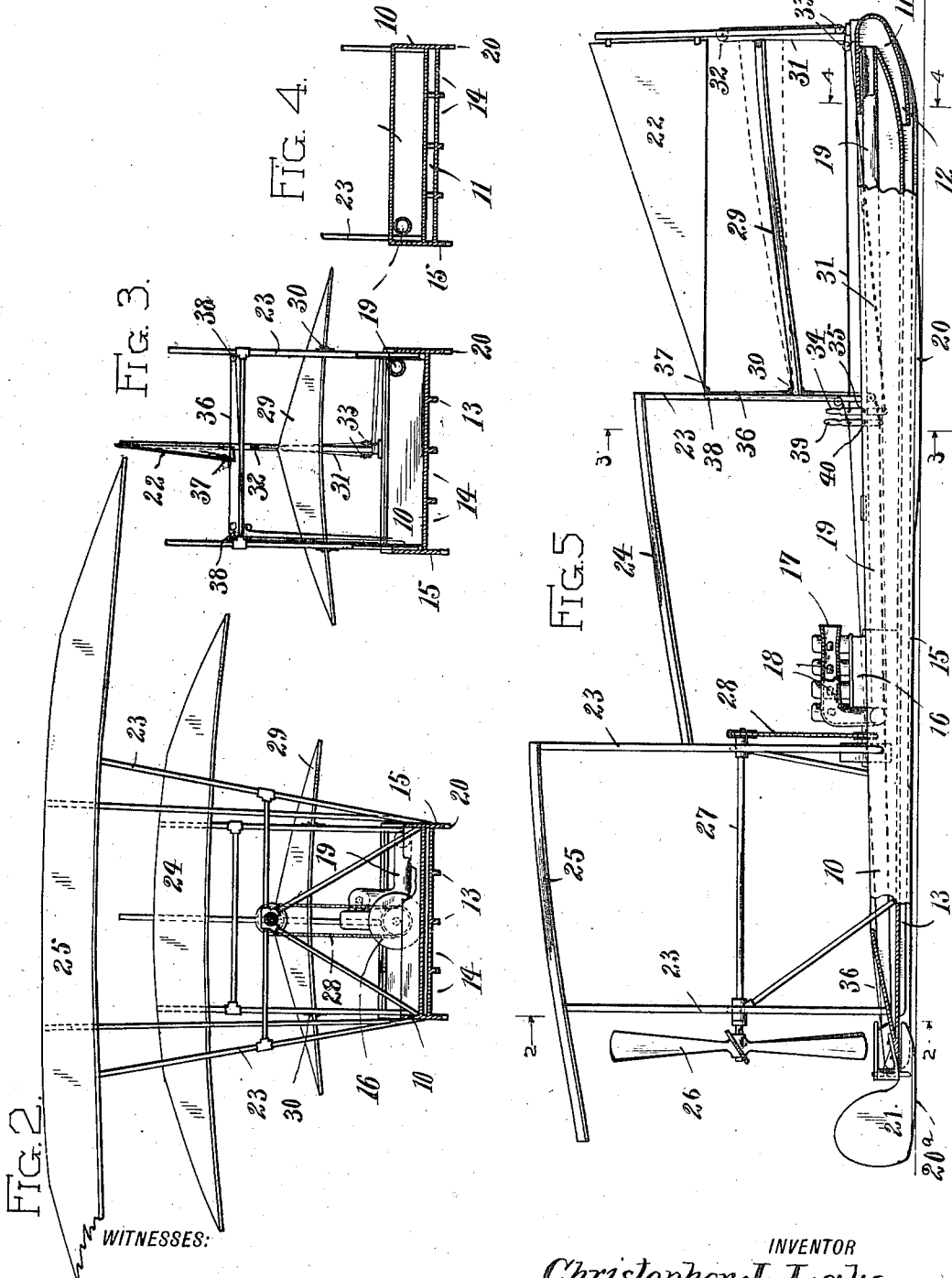
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UNITED STATES PATENT OFFICE.

CHRISTOPHER J. LAKE, OF BRIDGEPORT, CONNECTICUT

AEROBOAT.

1,041,489.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed January 27, 1911. Serial No. 605,141.

To all whom it may concern:

Be it known that I, CHRISTOPHER J. LAKE, 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 Aeroboats, of which the following is a specification.

This invention relates to means for propelling airships, aeroplanes, or flying machines upon and over the surface of the water, ice or snow and more particularly to ways and means to enable such a machine to arise and fly up from the water, ice or snow into the air which constitute a valuable improvement upon the construction shown in my former patent of February 23, 1909, and numbered 913,515. The desirability of such a device is well known, and much effort has heretofore been made to accomplish it, but owing to the great suction and adhesion of the water to the ship, it appears that the greater the power that is applied on the lines of present practice the greater becomes the suction and adhesion.

The main object of this invention therefore, is to obviate or alleviate this suction by providing means for introducing and maintaining a layer or body of air or gas between the water and the floatable bottom of the ship with sufficient force and volume to repel the water from suction, or adhesive contact with the under surface of the ship, thus breaking the suction and relieving the frictional resistance of the water, and whereby greater speed is readily obtained; to auxiliate and supplement the aerial propeller in the propulsion of the ship, by providing means for utilizing the waste energy of the exhaust gases from the motor together with energized air projected in a current of elastic fluid that is directed rearwardly between the water and the bottom surface of the ship.

A further object is to auxiliate and assist the planes of a ship in performing their function of lifting and supporting the ship, by the use of rarefied and expanding air projected in the form of elastic fluid under the ship while in motion; to provide means to enable the ship to run up out of water upon and over ice and snow, and to ascend therefrom into the air or to run from ice or snow into water without danger of injury to person or property, which obviously means a very valuable acquisition to the art of navigation and the saving of lives and

property in times of drifting ice, and finally to connect the water and aerial rudders to effect a combined steering movement when running on the water, without the use of undesirable extension of the water rudder below the bottom of the ship.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, and illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportions, and size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Upon the accompanying two sheets of drawings forming a part of this specification, similar characters of reference will be found to designate like or corresponding parts throughout the several figures, and of which—

Figure 1, shows a plan view of my improved airship complete. Fig. 2, is a cross sectional elevation taken on line 2—2 of Fig. 5. Fig. 3, is a further cross section taken on line 3—3 of Fig. 5 looking in a forward direction. Fig. 4, shows a further cross section taken on line 4—4 of Fig. 5, through the bow of the ship, looking aft. Fig. 5, shows a side elevation of my improved ship complete, except that a part of the bow and stern are broken away to better show their construction.

Referring in detail to the characters of reference marked upon the drawings 10 represents the body of the ship which as will be noted is of the usual general elongated shape though provided with a flat bottom. Immediately beneath the bottom or floor of the bow of the boat I provide a compartment 11 that extends across the width of the boat, and is provided with a contracted discharge opening 12 at its rear and lower end. A series of keels 13 extend along the central portion of the bottom of the ship from bow to stern in a way to strengthen and support the bottom, and more especially to form longitudinal channels 14 beneath the ship and intermediate of its bottom, and the water. The outer or side keels 15 are formed slightly deeper than the intermediate keels, but like the latter run the full length of the ship in a

way to properly support the edge portions thereof. The forward ends of these longitudinal channels are connected with the main compartment 11 into which an exhaust
 5 is introduced and from which it is directed into the several longitudinal channels before mentioned to the aft part of the ship and through which said current of elastic fluid must flow with the force of its energy
 10 exerted to lift and propel the ship forward in coöperation with the aerial propeller.

The ship is obviously designed to be propelled by a motor of an improved type, as for instance a gasolene motor 16, which is
 15 provided with an exhaust manifold with an open air intake 17, in its forward end and through which the air is conveyed past the several exhaust nozzles 18 from the respective cylinders and together conveyed
 20 through the pipe 19 to the compartment 11 where the said exhaust and air is discharged and directed beneath the ship through the several channels in a way to not only tend to force the boat forward, but upward as
 25 well, producing a displacement of the vessel in the water and lessening the resistance of the ship when in motion.

The two outer keels 15 are each provided with a runner or shoe 20 upon which the
 30 forward portion of the ship rests and which together with the rear runners 20^a on rudders 21 pivotally connected to the body, serve to support and guide the ship when the same is being operated on snow or ice.

35 In addition to the features before described for lightening the weight of the ship upon the water by the use of the exhaust gases from the motor employed to drive the ship, I provide a series of air planes so constructed and arranged as to coöperate with
 40 the elastic fluid and further impart a lifting tendency to the ship when driven at high speed, and in fact whereby the ship may be made to clear the water entirely,
 45 thus making it possible to rise from the water into the air. In connection with the air planes I also employ two adjustable rudders one of which is designed to raise and lower the craft while the other permits
 50 it to be guided to the right or left. This latter rudder is connected to be operated simultaneously with the rear rudders 21 and serves to assist in directing the line of travel of the ship whether in the water or
 55 upon the snow or ice.

To the body of the ship is secured a frame work 23 which includes a series of vertical, crosswise and longitudinal braces that are formed of pipe or wood, and serve
 60 to support the lateral steering rudder 22 as well as the two main air planes 24 and 25 which as will be noted are inclined from front to rear in a way to tend to lift the craft up when driven rapidly against the
 65 air.

The ship as constructed is provided with a single propeller 26 which is mounted upon a longitudinal shaft 27 journaled in the before mentioned frame 23 and provided with a chain 28 connected to the motor 18, and
 70 whereby the said propeller may be operated against the air very rapidly to drive the craft forward.

The aerial rudder 29 for raising and lowering the ship consists of a triangular
 75 shaped shield hinged at 30 to the frame and having its forward end connected with a rope 31 for raising and lowering the plane as per dotted lines (see Fig. 5) said rope being carried up, over and around a central
 80 guide roll 32 and likewise down and under the lower rolls 33 and then rearward to connect with the operating lever 34 pivoted at 35 to a suitable part of the body of the ship. The rudders 21—21 and 22 are connected
 85 by ropes 36 secured to the rear end 37 of the aerial rudder 22 and then passed out and around the guide rolls 38, then down to the lever 39 which like the before mentioned lever 34 is pivoted intermediate
 90 of its length as at 40 so that a forward thrust of the said lever will throw the rudders to one side while a reverse movement will throw them toward the other side. From this operating lever 39 the ropes are
 95 carried rearward, one from the upper and the other from the lower end portion of the lever, and directed around the guide rolls 41 located in each side of the boat and connected intermediate of said guide rolls to
 100 the operating or handle end of the rudders 21 in a way to insure them moving together and simultaneously with the movement of the forward lateral steering rudder 22.

From the foregoing it will be seen that the
 105 instant the motor is started the propeller is rotated against the air in a way to force the ship forward, the exhaust gases from the motor together with the air taken into the exhaust pipe is at the same time discharged
 110 rearward under the bow of the ship and through the several channels thus giving the boat a forward and upward impulse. With this condition it will be apparent that the ship rests but lightly upon the water and
 115 will readily rise therefrom and that the faster the ship is traveling, the greater the blast of gas beneath the ship and consequently the greater the tendency of the ship to leave the water or ice over which it may
 120 be traveling.

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

1. In a ship of the class described, the
 125 combination with a ship, of a motor contained therein, means for creating a current of intermingled air and gases by directing the discharge of the exhaust gases from the
 130 cylinders directly into and through a mixing

conduit, a conduit encircling the exhaust ports or outlets, and having its initial end open to the atmosphere forward of the inlet point of the discharging gases so that the primary impulse of the escaping gases will impinge and impel a large volume of air into and through the conduit, the other end of the conduit being arranged to convey and discharge said intermingled air and gases under the bottom of the ship.

2. The combination with a ship of the class described, of a motor for operating the same, an aerial driving propeller operated by the motor, a single pipe from the motor to the bow of the ship, having an open end at the motor to insure the exhaust drawing in a supply of air and directing it beneath the bow, a closed compartment in the said bow to receive the fluid, a series of fluid channels arranged beneath the ship and connected with the said closed compartment whereby the said fluid is directed beneath the several channels of said ship to lighten the weight of the same upon the water while the motor and propeller are being operated.

3. In a ship of the class described, the combination with a ship, of a motor contained therein, an aerial propeller operated by the motor, air planes to lift and support the ship, rudders to guide the ship, means for creating a current of intermingled air and gases by directing the discharge of the exhaust gases directly from the cylinders into and through a mixing conduit encircling the exhaust ports or outlets, said conduit having its initial end open to the atmosphere forward of said inlet point of the discharging gases so that the primary impulse of the escaping gases will impinge

and impel therewith a large volume of air through the conduit, the other end of the conduit directed to convey and discharge said intermingled air and gases under the bottom of the ship.

4. In an air-ship of the class described, the combination of a series of longitudinal channels arranged upon the under side of the ship, a compartment in the bow of the ship connected with said channels, means for creating a current of elastic fluid by the exhaust gases and directing it through said compartment and into the several longitudinal channels, an aerial propeller operated by the motor, air planes which tend to lift the ship by the operation of the propeller, shoes arranged upon the underside of the ship, and rudders to support and guide the ship and operate it upon ice or snow.

5. In a ship of the class described, the combination with a motor, of an aerial propeller operated thereby, air planes connected to the ship which tend to lift the latter by the operation of the propeller, rudders connected to the rear of the ship to direct and guide the same while operating in the water or upon the ice, an aerial rudder arranged upon the bow of the ship, means for connecting the said rudders with a single operating means whereby they are simultaneously operated to guide the ship while either in the water or in the air.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 19th day of January A. D., 1911.

CHRISTOPHER J. LAKE.

Witnesses:

C. M. NEWMAN,
RUTH M. WORDEN.