

A. HORTON.
AERIAL AND OTHER VESSEL.
APPLICATION FILED AUG. 4, 1911.

1,019,646.

Patented Mar. 5, 1912.

3 SHEETS—SHEET 1.

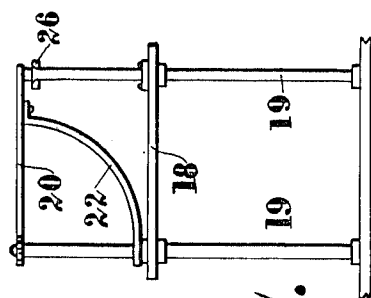
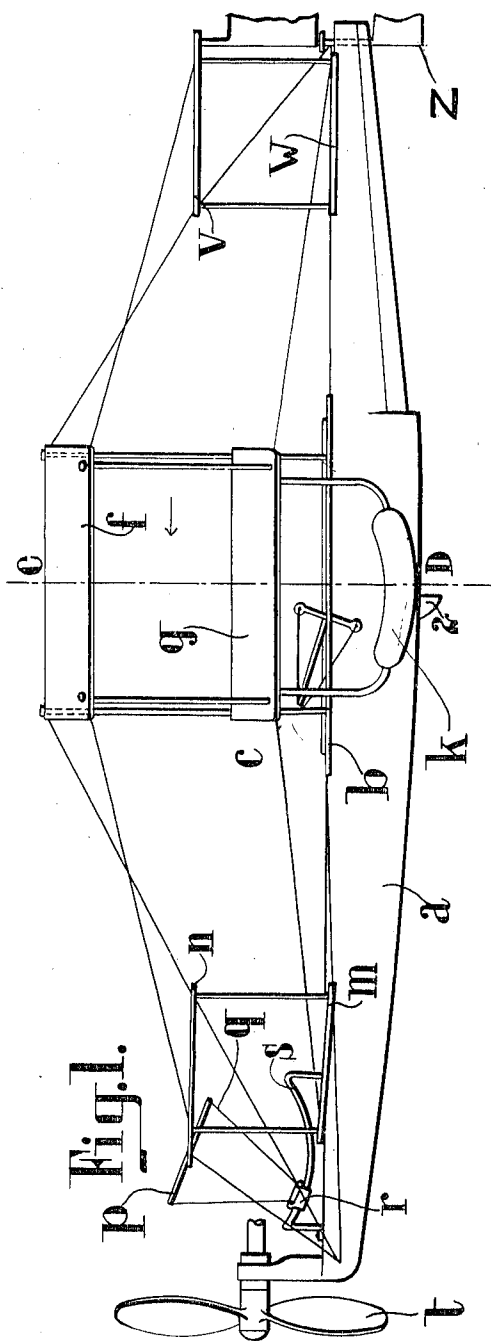


Fig. 7.

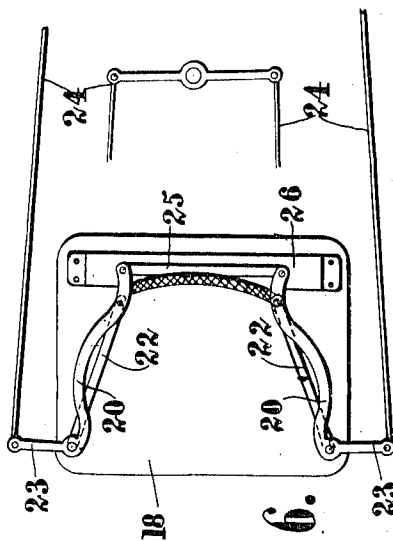


Fig. 6.

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H. W. Primmer

Inventor:
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3 SHEETS—SHEET 2.

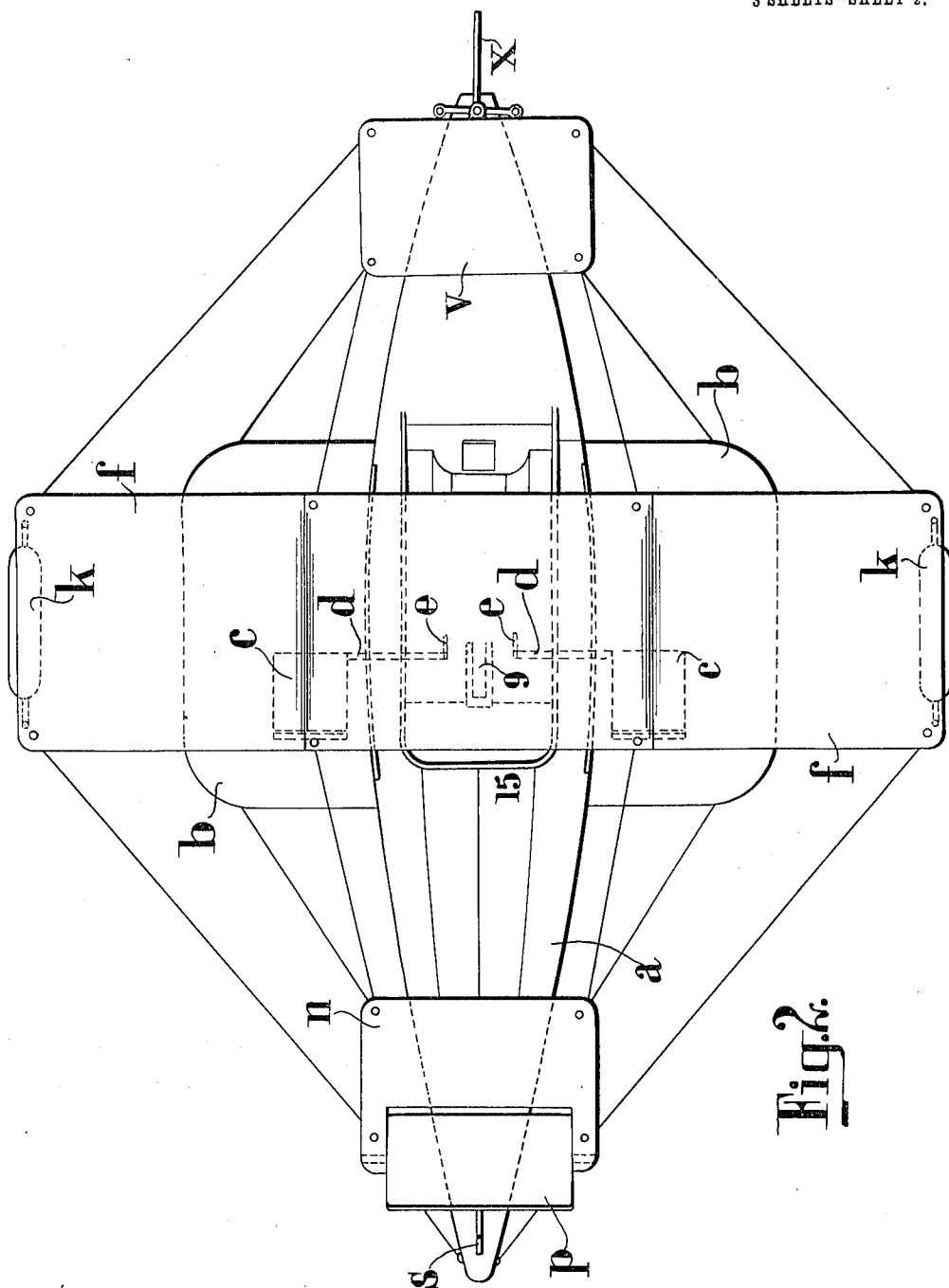


Fig. 2.

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3 SHEETS—SHEET 3.

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Fig. 3.

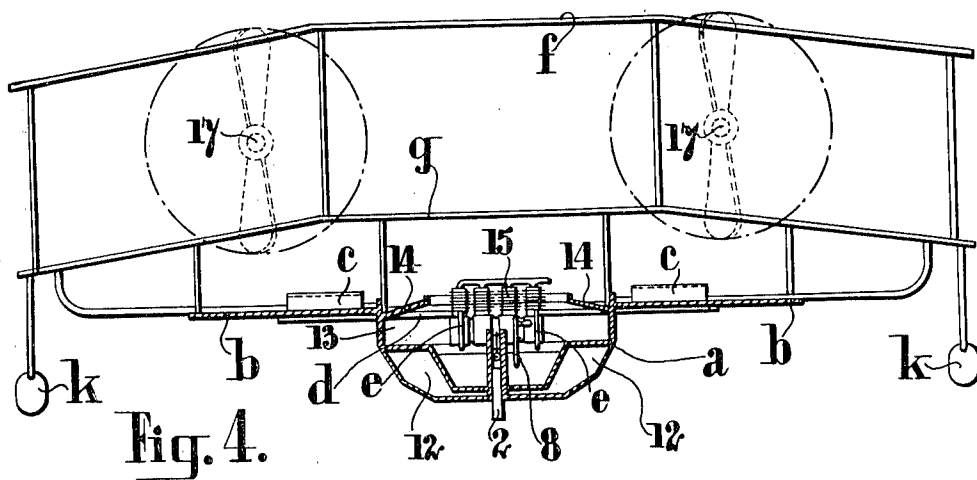
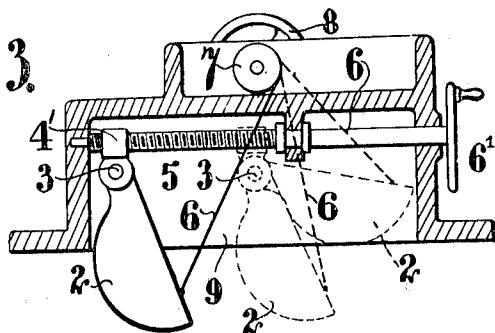


Fig. 4.

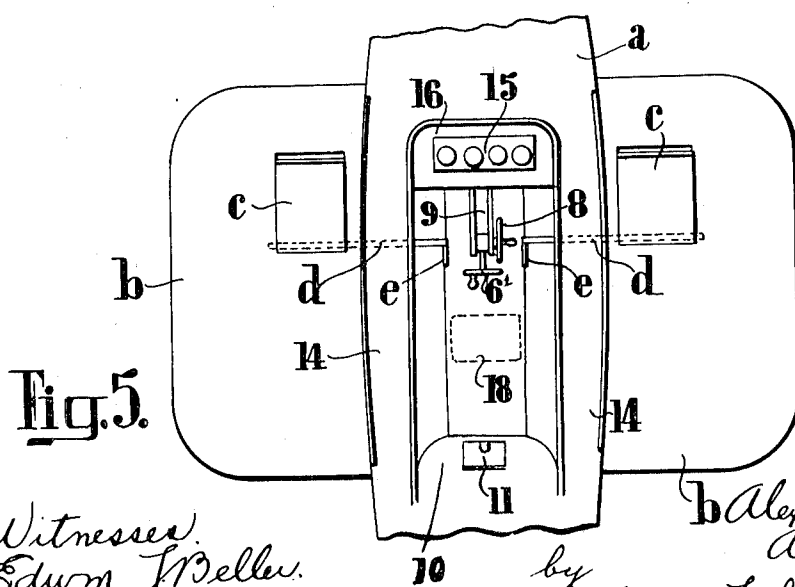


Fig. 5.

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UNITED STATES PATENT OFFICE.

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AERIAL AND OTHER VESSEL.

1,019,646.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed August 4, 1911. Serial No. 642,393.

To all whom it may concern:

Be it known that I, ALEXANDER HORTON, a subject of the King of England, residing at 38 Marmion road, Portsmouth, Hampshire, England, have invented certain new and useful Improvements in Aerial and other Vessels, of which the following is a specification.

This invention relates to airships and refers more especially to improvements on that type of such vessels as are suitable for use either upon the water or in the air, being provided with a boat-shaped body, adapted to float on the water, supporting 15 planes for suspending the vessel in the air, and furnished with suitable floats, elevators and rudders, which rudders may in some cases be actuated by the movements of the body of the pilot.

According to my present invention, I provide in connection with the body of the aerial vessel a weight which is adapted to slide longitudinally and to be raised and lowered with respect to the body of the vessel and I 25 form the side planes of the vessel with flaps which may be operated together or independently for steering the vessel with respect to the horizontal or vertical directions. I further prefer to combine with my aerial 30 vessel means for enabling the rudders to be actuated by means of the movement of the body, a device which has been already adapted to other classes of aerial vessels and to boats.

In the preferred method of constructing an aerial vessel according to my invention, I build the boat preferably of extremely light material, which boat is provided on the port and starboard sides with two planes 40 coming preferably at about the height of the gunwale connected thereto, which planes are so constructed that the whole or a portion of them can be set at any desired angle.

Attached in any suitable way to the boat are supporting planes so arranged that they are suitable for supporting the vessel in the air when it leaves the water, and adapted also to sustain more or less of the weight when the vessel is skimming over the water. 50 Mounted at the bow of the boat is an auxiliary plane or auxiliary planes which are fitted with elevators. At the stern of the boat are mounted two other planes and rudders. At the bottom of the boat is fitted a

weight which is adapted to slide longitudinally with respect to the boat and to be lowered or raised into and out of the water as may be required in order to increase the stability of the vessel when skimming the water. In order to further increase the stability on the water I provide hollow metal cylinders mounted in a known manner in connection with the side planes for dipping into the water when there is a tendency for the vessel to heel over to one side and for 65 counteracting such tendency. The vessel is provided with one or more suitable propellers or tractors.

In order to facilitate the steering of the vessel and to leave the pilot free to attend 70 to the management of the engine and to other details, I so arrange that the steering can be controlled by the natural motions of the body without it being necessary to utilize the hands for this purpose and without it 75 being necessary for the pilot to give his mind to the steering. To effect this, I provide a frame fitting more or less closely to the trunk of the pilot. This frame is provided with side levers which control the rudder 80 lines as hereinafter explained.

The engines are suitably disposed in the body of the boat, which body is provided with airtight or other compartments such as can be used for storing of petrol, provisions or the like, and suitable sleeping accommodation may be provided for the members of the crew. And in order that my said invention may be better understood, I will now proceed to describe the same with 90 reference to the drawings accompanying this specification which show by way of example merely one method of carrying my invention into effect as applied to a hydro-aeroplane.

In the drawings:—Figure 1 is a side elevation of the complete vessel; Fig. 2 is a plan of same; Fig. 3 shows details of the shifting keel weight. Fig. 4 shows a section on line C, D, Fig. 1, looking in the direction of the arrow. Fig. 5 shows a part plan of 100 Fig. 4 the main planes being removed; Figs. 6 and 7 show details hereinafter referred to.

The same letters and numerals of reference are employed to denote the same parts in all the views.

a shows the boat which is preferably of very light construction and built on such lines that it presents a flat surface at the

bottom with progressively inclined sides as shown at Fig. 4. Attached to the gunwale of the boat on either side are the planes *b, b*. These planes are provided with shutters *c*. These shutters are mounted upon spindles *d* furnished at the ends with handles or levers *e*. In the normal position the shutters *c* form a portion of the planes *b*, but when it is required to steer or elevate they may be raised more or less to suit requirements as shown at Fig. 1.

Mounted on suitable supports above the boat are the main supporting planes *f* and *g*. These planes are of the ordinary construction well known in connection with aeroplanes, but are preferably inclined downward toward the outer ends as shown clearly at Fig. 4.

Depending from the ends of the under main plane *f* are hollow cylinders of metal *k*, which are adapted to dip into the water on either side. *m* and *n* are planes mounted at the bow of the vessel and *p* is an elevator pivoted to the front of the plane *n*. To the corners of this elevator *p* are suitably attached stays *q* which pass to a sliding sleeve *r* adapted to slide along an arc-shaped guide *s*. The curvature of the arc is such that it is struck from the center of rotation of the elevator plane *p*. Suitable means not shown on the drawings, are provided for enabling the pilot to alter the position of the sliding sleeve *r*. This elevator and its fittings are shown merely by way of example in connection with the present vessel as any known kind of elevator may be employed but I prefer to use the elevator just described.

t is a tractor mounted at the bow of the vessel and suitably driven from the engine. *v* and *w* are planes at the stern of the vessel.

x is a large rudder mounted between the planes *v* and *w*, and *z* is a small rudder adapted to work in unison with the rudder *x*, and dip into the water.

Referring to Fig. 3, 2 is a heavy weight pivoted at 3 to a screw threaded sleeve 4' which is mounted upon a screw threaded shaft 5, operated by means of a handle 6'. This weight has attached to the lower portion thereof a cable 6 passing over a drum 7 operated from a handle 8. The weight 2 is disposed in a casing 9 in the body of the boat. The weight is intended for increasing the stability of the vessel when in the water and can be lowered for this purpose. It can also be slid longitudinally in order to facilitate the balance of the vessel according to the load being carried or other conditions.

10, Fig. 5, is a compartment furnished with an airtight door 11.

12 are compartments or tanks at the sides of the boat, which are adapted to contain a supply of petrol in cans or otherwise. 13 are spaces above these compartments 12 and

beneath the weather boards 14, which can be used as sleeping bunks for the crew or passengers.

15 is the engine which may be of any suitable construction and is mounted upon the engine platform 16, which is carried by suitable brackets or spring supports.

At Fig. 1 the vessel is shown fitted with a single tractor *t* while in Fig. 4 the vessel is shown fitted with an alternative method of driving in which two propellers 17 are provided, shown dotted in the drawing.

Referring now to the steering mechanism which is shown more particularly at Figs. 6 and 7, in which Fig. 7 is a side elevation of the steering seat and Fig. 6 is a plan, 18 is a seat, which is mounted upon supports 19. 20 are right-angled levers bent as shown at Fig. 6. These are mounted at the top of the bent lever 22, the other end of which is pivoted to the supports 19. Arms 23 of the levers 20 have attached to the ends thereof rudder lines 24. 25 is a rod pivoted to the ends of the levers 20 which works upon a rest 26. The action of this steering mechanism will be easily understood:—When the pilot desires to turn the vessel in any particular direction or to counteract the vessel's tendency to turn in any direction, it is only necessary to turn his body to a certain extent when the levers 20 are actuated causing the rudder lines 24 to alter the position of the rudder to the desired extent.

The general action of the vessel will be readily understood:—It will be observed that whether it is traveling in the air or skimming the water, the motion is communicated to it by the tractor or propeller, which is always working in the air. Assuming that the vessel is at rest on the water in which position the displacement is practically *nil*, when the tractor or propeller is started the vessel commences to skim along on the water. In order to steer upon the water the rudder lines are actuated actuating the rudder *z* and if desired a corresponding shutter *c* may be operated to assist in the steering. If it is desired to leave the water, the front elevator *p* and if desired the elevating shutters *c*, are turned into the position, say, that shown at Fig. 1, and the resistance of the air beneath these elevators and shutters lifts the front of the vessel. When the air catches under the boat, owing to the formation of the lower portion thereof, this lifting effect is accentuated by the pressure coming on the bottom of the boat in such a way that the vessel leaves the water and rises into the air. When in the air the steering can still be effected by swaying the body or by the operation of the shutters *c* as required. The stability of the vessel may be regulated, whether in the water or in the air, by suitably raising or sliding the weight 2.

Although I have shown my vessel for

gliding over the water and for flying in the air as fitted with bi-planes it may be fitted with a mono-plane or with more than two planes. Again the details of construction may be varied to suit requirements, for instance I may vary the number of propellers and shutters, the disposition and number of the auxiliary planes, the shaping of the body and the device for increasing buoyancy. It will be further understood that the invention may be applied to vessels of any dimensions, from the largest sizes for practical use, down to the smallest models.

What I claim as my invention and desire to secure by Letters Patent of the United States of America is:—

1. In a flying machine, the combination of a boat, supporting planes extending laterally from the upper portion of the boat, a rudder pivoted to the boat, a seat for the operator, a pair of right angle levers pivoted to the seat, the levers having one of their legs extending in the same direction and their other legs in opposite directions, a rod pivotally connecting the first mentioned legs of the levers, and means connecting the oppositely extending legs of the levers with the rudder whereby the rudder may be actuated

by the operator leaning against the first mentioned legs of the levers, substantially as described.

2. In a flying machine, the combination of a boat, supporting planes extending laterally from the upper portion of the boat, a rudder pivoted to the boat, a seat for the operator, vertical supports projecting from the seat, right angle levers pivoted to the supports, the levers having one of their legs extending rearwardly and their other legs laterally in opposite directions, a brace pivotally connected to the supports and fixed to the rearwardly extending legs of the levers, a rod pivotally connecting the rearwardly extending legs of the levers, a rest slidably supporting the rod, and means connecting the laterally extending legs of the levers with the rudder whereby the rudder may be actuated by the operator leaning against the rearwardly extending legs of the levers, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

ALEXANDER HORTON.

Witnesses:

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