

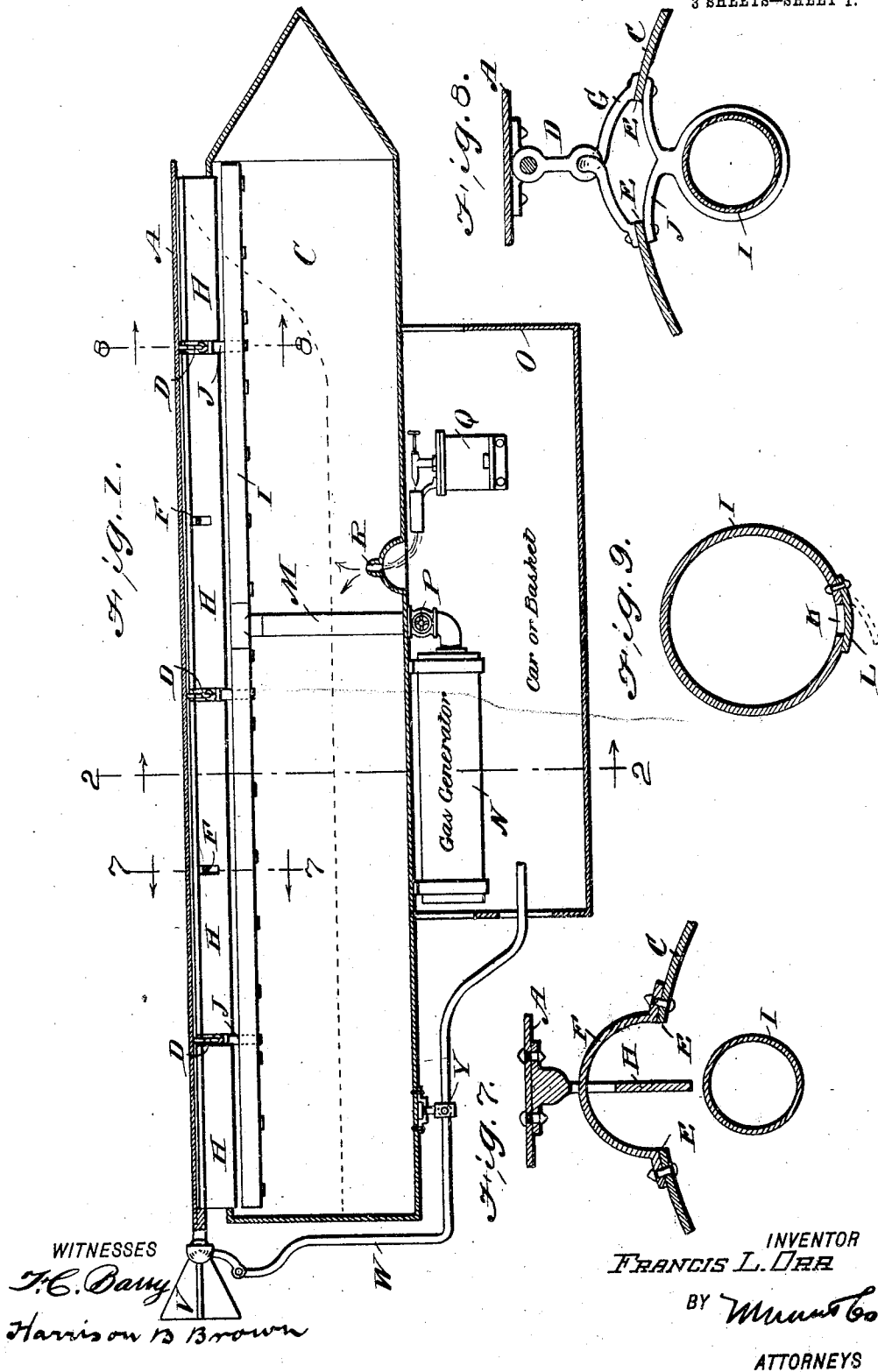
F. L. ORR.
AIR SHIP.

APPLICATION FILED SEPT. 25, 1908.

912,158.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

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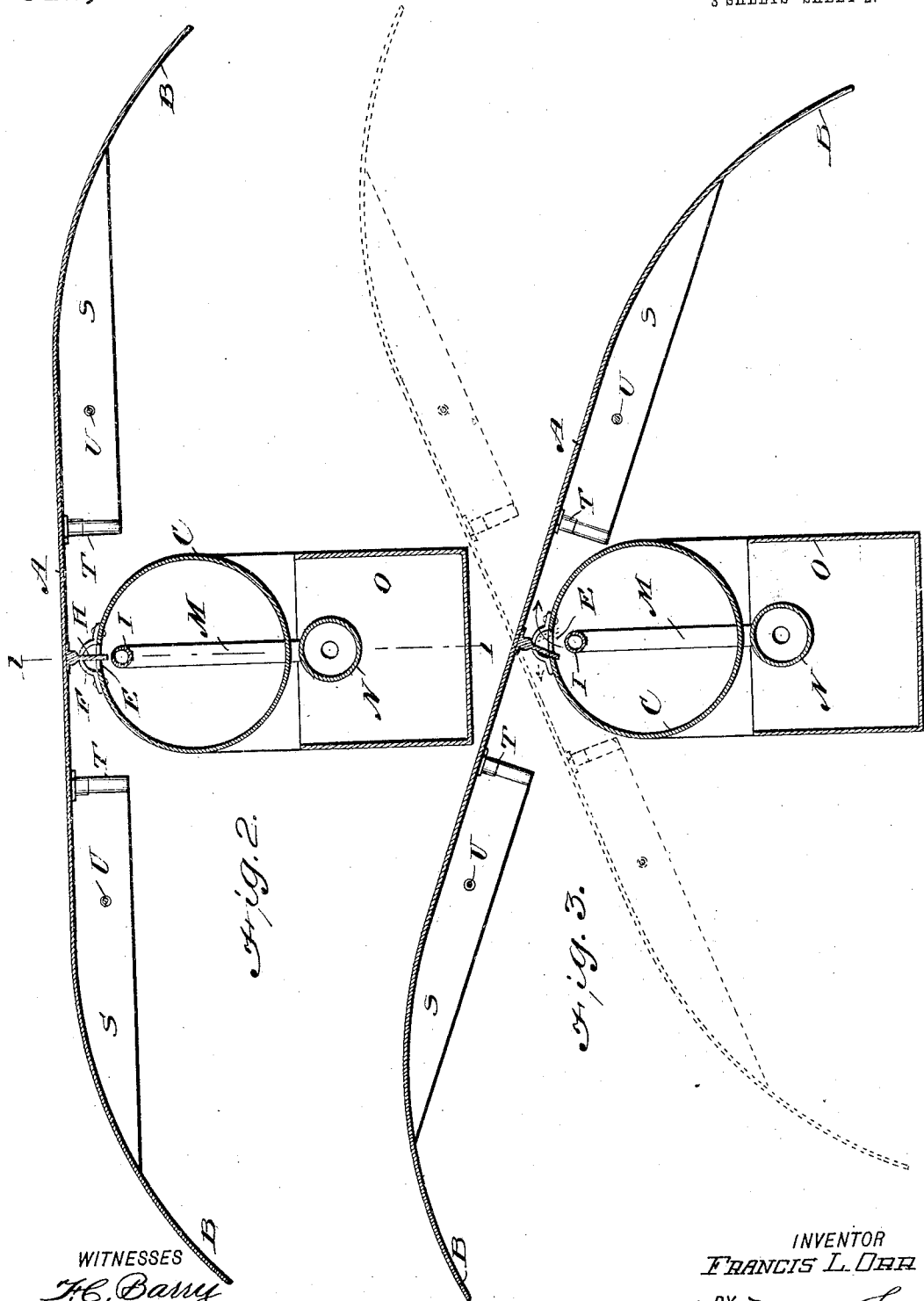


Fig. 2.

Fig. 3.

WITNESSES

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ATTORNEYS

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3 SHEETS—SHEET 3.

x, y, z

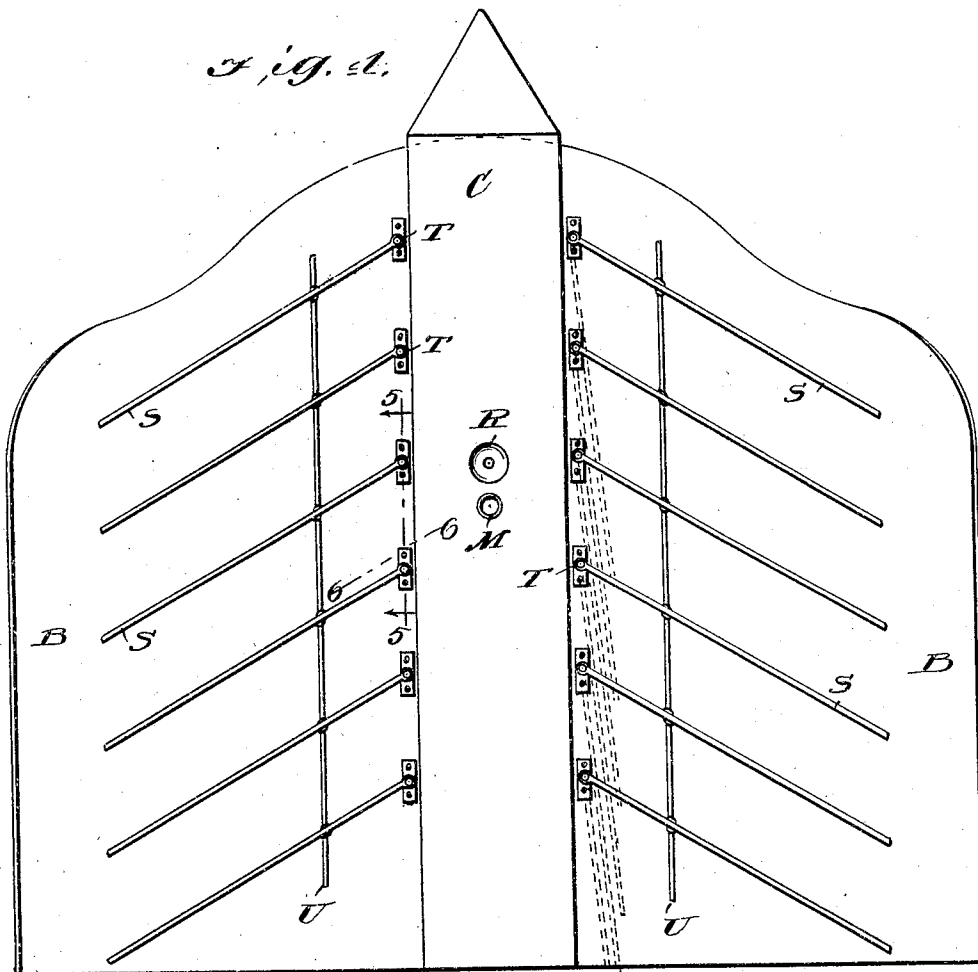
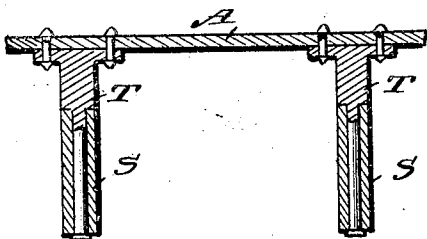
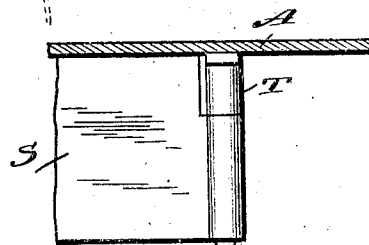


Fig. 5.



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Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANCIS LEONARD ORR, OF OMAHA, NEBRASKA.

AIR-SHIP.

No. 912,158.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed September 25, 1908. Serial No. 454,711.

To all whom it may concern:

Be it known that I, FRANCIS L. ORR, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented a new and Improved Air-Ship, of which the following is a specification.

My invention relates to aerial vessels, commonly called, air ships, and has for its object, novel, simple, and improved means whereby to effect buoyancy and propulsion of the vessel.

The invention, in its broad comprehension, comprises an aeroplane, a basket, car, or other similar means affording carrying support, and means consisting of a combustion chamber into which gas, or other fluid may be charged and the fluid charge be ignited, and the ignited charge liberated through an exhaust opening into the air, directly under the aeroplane.

The invention comprehends in details, features of peculiar construction and arrangement enabling the aeronaut to ascend, sail or descend his vessel, and hold it under perfect control.

I would have it understood that in the practice of my invention, I do not restrict myself to any particular form or arrangement of parts, since they may be variously modified and changed, without departing from my generic invention.

That my invention may be understood, I would refer to the accompanying sheets of drawing, in which the figures of illustration are diagrammatic, or nearly so, in character.

In the drawings, Figure 1 is a sectional view, taken substantially vertically and longitudinally through my invention. Fig. 2 is a transverse section, taken on line 2—2 of Fig. 1. Fig. 3 is a similar view, with the aeroplane shown in full lines canted to the right, and in dotted lines canted to the left. Fig. 4 is an inverted plan view of the aeroplane, adjustable fins or wings and the combustion chamber used by me. Fig. 5 is a detail sectional view, taken on line 5—5 of Fig. 4. Fig. 6 is a similar view, taken on line 6—6 of Fig. 4. Fig. 7 is a detail sectional view, taken on line 7—7 of Fig. 1. Fig. 8 is a similar view, taken on line 8—8 of Fig. 1, and Fig. 9 is an enlarged transverse sectional view through the charge conveying pipe used by me, the section being taken through one of the valves on the under side of the charging pipe.

In the practice of my invention I employ edges B curved downwardly as shown by an aeroplane A, constructed with its side Figs. 2 and 3.

From the under side of the aeroplane A, I suspend an elongated combustion chamber C, the same being attached to the aeroplane by flexible hangers D, shown by Figs. 1 and 8.

In the upper side of the combustion chamber C, I provide an elongated open exhaust port E, made extending substantially the whole length of the combustion chamber C, as shown by Figs. 2, 3, 7 and 8. In order to prevent spreading, or enlarging of said exhaust opening E, I tie its side edges by braces F, G, the latter being one member of the flexible hangers D, as clearly shown by Fig. 8.

On the under side of the aeroplane I arrange a rigid fin or rib H, the same being constructed adapted to extend downwardly projecting into the exhaust port E of the combustion chamber C, as shown by Figs. 1, 2, 3 and 7 of my drawings. The fin H may be secured to the aeroplane by bolts illustrated in Fig. 7, or it may consist of an integral part of the aeroplane, but obviously I would not restrict myself to any particular means for rendering the fin H rigid. The object of the fin H is to direct discharge of the exhaust or exploded gases from one to the other side, that is, directing the exit of exploded gases, from one, to the other side of the combustion chamber, according to conditions or comparative angle of the aeroplane and the depending combustion chamber, whereby when the respective positions of parts are as indicated by Fig. 3, the exhaust gases will be directed to the lowermost under side of the aeroplane, exerting buoyant action effecting to lift said lowermost side of the aeroplane and thereby restore the aeroplane and depending parts to normal or righted positions.

Inside the combustion chamber I arrange an elongated pipe I, and support it just below the exhaust port E, by hangers J, one thereof being shown by Fig. 8. In the under side of the pipe I, I provide a series of openings K, closed on the outside, by flexible valves L, see Figs. 1 and 9.

M indicates a supply pipe arranged extending from the valved pipe I to a gas generator, the generator being preferably located in a car or cage O, depending from

the combustion chamber C, substantially as shown by Fig. 1. In this figure of drawing it will be noticed that a cut-off valve P is provided in the supply pipe M.

5 In further carrying out my invention, I provide a torch Q, which may consist of any suitable igniting device, providing continuous blaze adjacent to an opening R, in the combustion chamber, substantially as shown
10 by Fig. 1. On the under side of the aeroplane, I arrange two sets of blades S, having their inner ends hinged to the aeroplane, as indicated by T, adapting them to be folded back adjacent to the combustion
15 chamber C as shown in dotted lines, by Fig. 4. Both sets of the blades S are provided with an operating rod U, adapted for working them to open position, shown by full lines, or to closed folded position indicated
20 by dotted lines. The operating rods U have flexible connection with the blades S, and it is intended that said operating rods U shall be suitably connected with means of any obvious character, located in the car O,
25 whereby the blades S may be worked by the aeronaut. I have illustrated no such means, as same will be understood. At the rear end of my ship I provide a rudder V of well known cruciform shape, and provide the rudder with lateral and vertical adjustment,
30 worked by an operating rod W made extending from the rudder into the car O, as shown by Fig. 1, the operating rod W, being supported by any suitable flexible hanger Y.
35 The construction of my improved air ship will be understood from the above detail description, but I would have it understood that the detail features may be changed or modified, without departing from my broad
40 invention.

That operation and use of my air ship may be understood, I will say; with the ship at rest, it becomes necessary to first light the torch Q, and then open the valve P, in the
45 supply pipe M. Now with the valve P open as stated, obviously gas will flow from the generator N through the pipe M and into the valved pipe I. Obviously, pressure of gas thus supplied will force open the flap valves on the under side of the pipe I permitting the gas to pass into the combustion chamber C. Obviously the chamber C will be filled with gas from its top portion downwardly, until the gas reaches the blaze of
50 the ignition torch, at which time the gas charged into the chamber will be ignited. Instantly upon ignition of the gas, its explosive force will close the flap valves L and thereby, cut off supply of gas through the
55 openings K in the pipe I. When a charge of gas in the chamber C has been ignited, the hot exploded gas will exhaust or rush out through the elongated opening E, in the upper side of the chamber C, and the hot gas
60 flow out into the air, directly under the aero-

plane with buoyant action on both sides of the chamber C adapted to effect vertical raising of the ship. The liberated hot gas is, in a measure confined under the aeroplane, by the downwardly curved side edges B on
70 the aeroplane. When the exploded gas has about all passed out of the chamber C, a degree of vacuum will be produced in the latter, and consequently thereby effect an in-rush of air, through the opening E, into
75 the chamber C. Conjointly with the above action, the valves L will again be opened by pressure of gas in the pipes M, I, and thereby again fill the chamber C with explosive charge, adapted for ignition by the torch Q,
80 as before stated.

From the above statement it will be understood that charge after charge of exploded hot gas is fed to the under side of the aeroplane, so long as the valve P, in the pipe
85 M is at open position and by buoyant action of the hot gas under the aeroplane, the ship will be lifted into the air. When the blades S are adjusted outwardly to inclined position, shown by full lines in Fig. 4, force of
90 gas exhausting from the chamber C, to the under side of the aeroplane, will effect pressure against the rear side of the blades S, thereby operating to force or urge forward movement of the ship. When it is desired
95 to return the air ship to ground, or in sailing movement thereof, the blades S are adjusted to closed position, indicated by dotted lines in Fig. 4, and the valve P closed to cut off feed of gas to the combustion chamber C.
100 Further description of the rudder or steering means used by me is deemed unnecessary, as the same is of common knowledge.

I claim:

1. An air ship comprising an aeroplane,
105 a combustion chamber and means adapted to deliver gases from said chamber into the outer air, directly under the aeroplane, a gas holder or generator and means adapted for conveying gas therefrom, into the combustion chamber, and an igniter whereby to
110 ignite gas in the combustion chamber.
2. An air ship comprising an aeroplane, a combustion chamber arranged depending from the aeroplane, the combustion chamber
115 being constructed with an exhaust opening adapted to deliver gas into the air, directly under the aeroplane, a gas holder or generator, and means for conveying gas therefrom into the combustion chamber, and
120 means for igniting gas fed into the combustion chamber.
3. An air ship comprising an aeroplane constructed with downwardly disposed side edges, a combustion chamber arranged depending from the aeroplane, means for exhausting gas from the combustion chamber
125 into the open air, directly under the aeroplane, a gas holder or generator and means including a cut-off valve for conveying gas
130

from the holder, to and into the combustion chamber, and an igniter whereby to effect ignition of gas in the combustion chamber.

4. An air ship comprising an aeroplane, a
5 gas holder or generator, a combustion chamber and means providing passageway from said generator into the combustion chamber, an igniter, means for delivery of ignited gas to the under side of the aeroplane, and
10 blades on the under side of the aeroplane, the blades being provided with means whereby to adjust them from open to folded position, substantially as described.

5. An air ship comprising an aeroplane,
15 a combustion chamber, arranged depending from the aeroplane, an exhaust port on the upper side of the combustion chamber, a rigid fin on the under side of the aeroplane, said fin being located projecting down-

wardly into the exhaust port of the com- 20
bustion chamber, a gas holder or generator, an igniter, and a valve controlled passage way leading from the generator to said combustion chamber.

6. An air ship comprising an aeroplane, 25
an explosion chamber, means for holding or generating gas and delivering the gas into the combustion chamber, means whereby to ignite gas in the combustion chamber, devices on the aeroplane located adapted to 30
receive contacting force of the exploded exhaust gases and thereby force the air ship forward.

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Witnesses:

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PAUL STEIN.