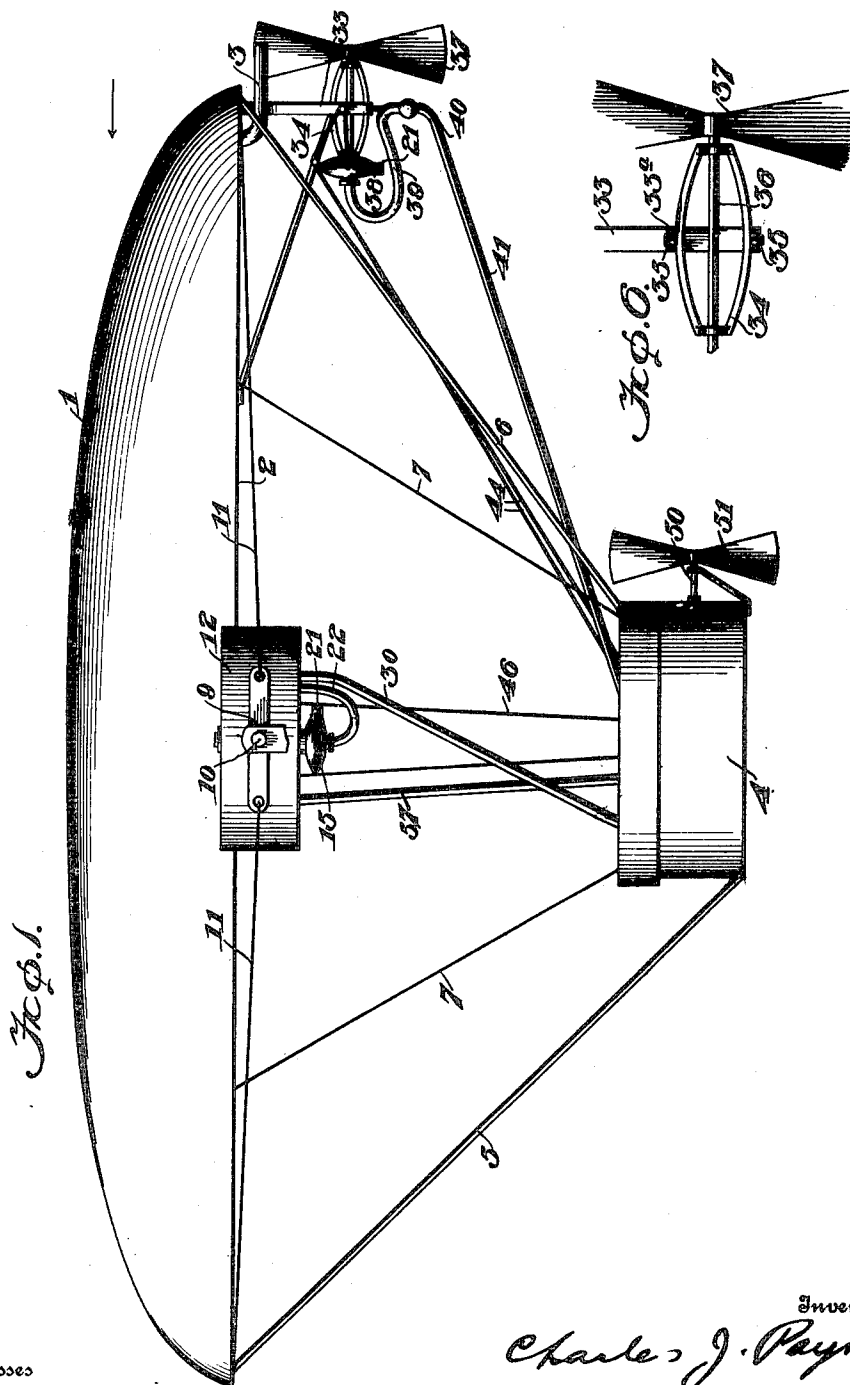


1,032,699.

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AERIAL VESSEL.
APPLICATION FILED APR. 24, 1908.

Patented July 16, 1912.

5 SHEETS-SHEET 1.



Witnesses

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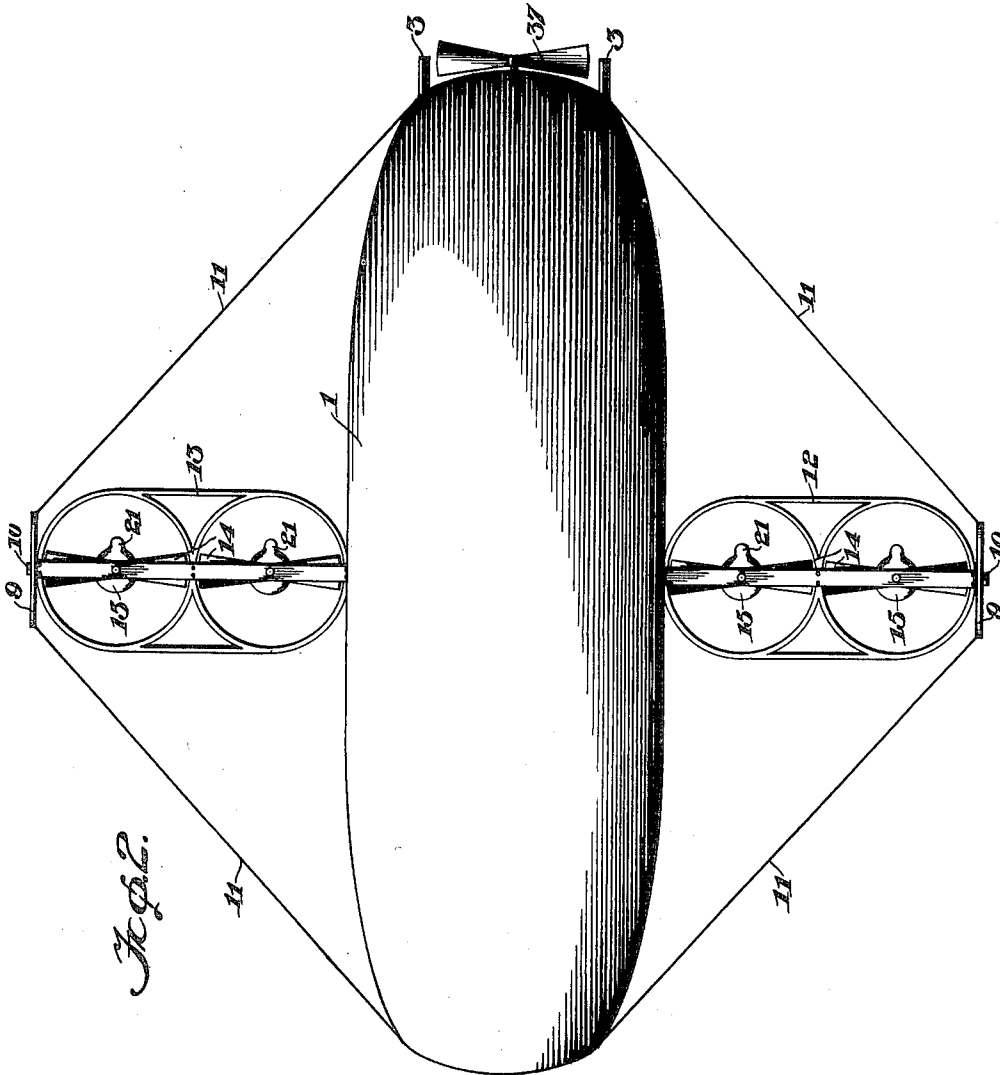
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5 SHEETS—SHEET 2.

1,032,699.



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5 SHEETS—SHEET 3.

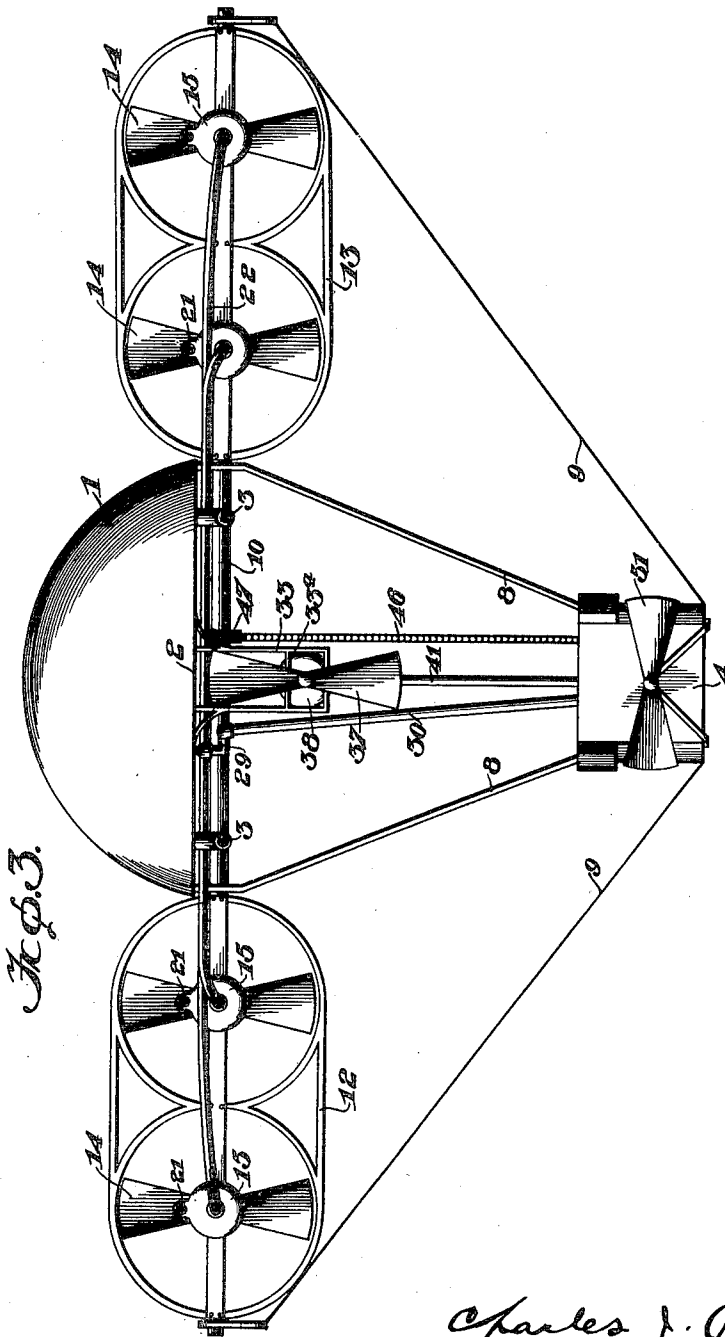


Fig. 3.

Witnesses
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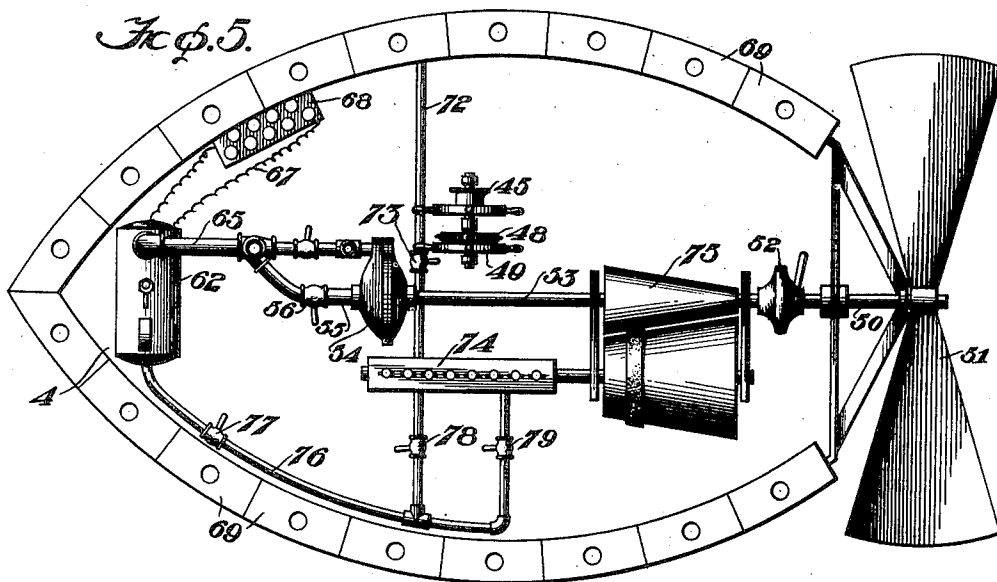
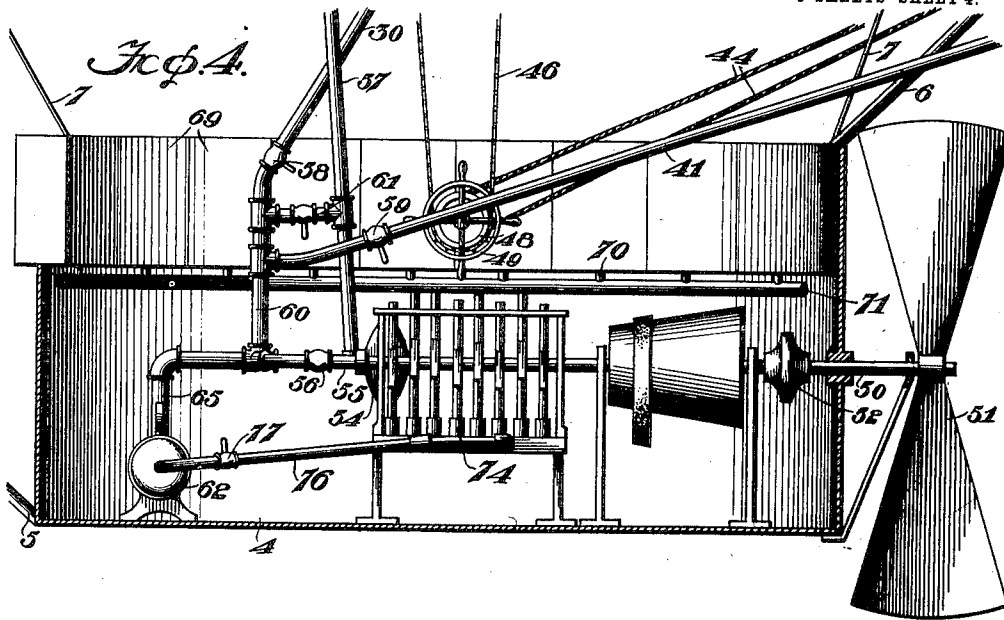
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APPLICATION FILED APR. 24, 1908.

Patented July 16, 1912.

1,032,699.

6 SHEETS—SHEET 4.



Witnesses

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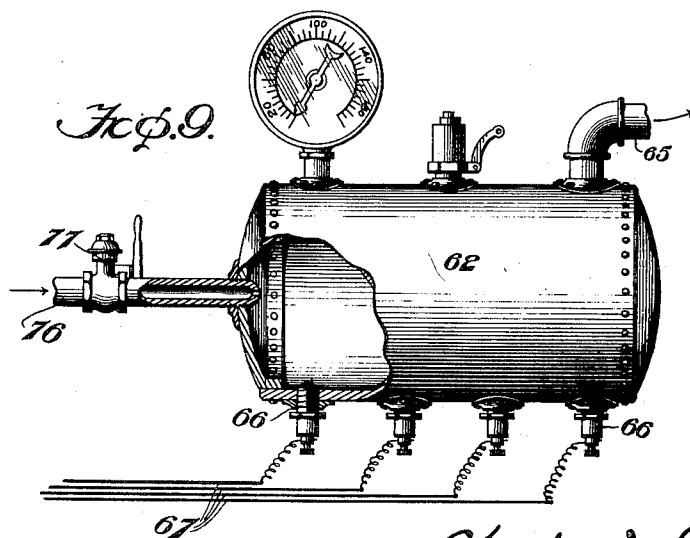
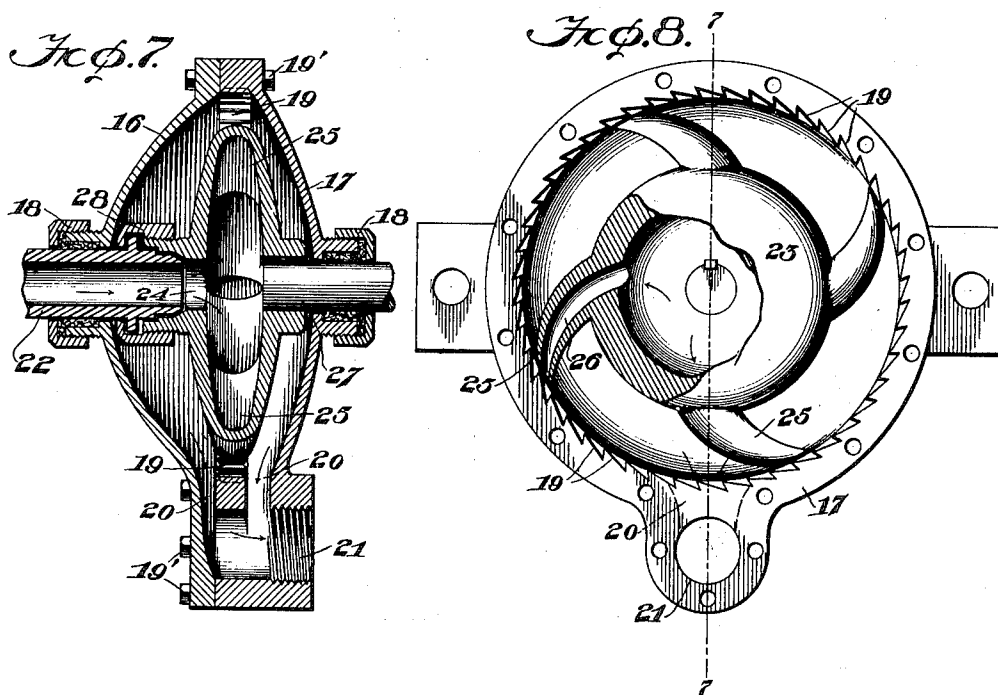
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Patented July 16, 1912.

5 SHEETS—SHEET 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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1,032,699.

Specification of Letters Patent.

Patented July 16, 1912.

Application filed April 24, 1908. Serial No. 428,944.

To all whom it may concern:

Be it known that I, CHARLES J. PAYNE, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Aerial Vessels, of which the following is a specification.

This invention relates to aerial vessels.

The invention has for its objects the provision of an aerial vessel having a novel hollow body to contain a buoyant element; means carried by the vessel for supplying the body with a buoyant element; propelling and maneuvering means of novel construction and arrangement; and, generally, to provide an aerial vessel of novel construction and provided with novel instrumentalities whereby it may be made to ascend or descend, propelled, and maneuvered with facility, have capacity for great speed, be of light construction, economical to operate, and safe in operation.

In carrying out the invention a hollow metallic or distended body having a flat under surface is employed, propelling and maneuvering fans or propellers of novel arrangement and operation are used, novel gas or gasoline turbines are utilized for driving the fans or propellers and whose exhaust may supply the heated air and gases to the interior of the body to afford the requisite buoyancy to the vessel, the fans or propellers are arranged in a new manner, a novel device is utilized for the exploding of the air and gasoline mixture subsequently supplied to the turbine, and a novel arrangement of gasoline containing compartments is employed, together with other improved and novel features, all of which as thus far developed are set forth fully hereinafter and embodied in the appended claims.

In the accompanying drawings: Figure 1 is a side view of my aerial vessel; Fig. 2, a plan view thereof; Fig. 3, an end elevation looking in the direction of the arrow of Fig. 1 but with the combined elevating and propelling fans turned into an upright position; Fig. 4, a sectional view of the car, showing the devices carried thereby; Fig. 5, a plan view of the car; Fig. 6, a detail side view, certain parts being in section, of the mounting for the steering fan or propeller; Fig. 7, a section on line 7-7 of Fig. 8 through one of the turbines; Fig. 8, a side view of the turbine of Fig. 7 with one-half

of the shell removed, the turbine wheel being shown partly in section; and Fig. 9, a detail view, partly broken away, of the combustion chamber or cylinder.

The body 1 is a hollow metal shell, preferably of aluminum, having a convexed top and a flat under surface 2, the latter constituting an aeroplane, enabling the vessel to be readily directed upward or downward or maintained at the desired level besides acting somewhat in the nature of a parachute when the vessel is descending. The body 1 is provided with discharge pipes 3 for discharging the surplus gaseous contents of the body rearwardly and, in a measure, aiding in the propulsion of the vessel.

The car 4 (Fig. 5) is pointed at its forward end and is more or less of the shape of the hull of a boat to minimize its resistance to the air and wind and is readily secured to the body 1 by front and rear braces 5 and 6; stays 7 are also employed and center braces 8 suspend the car at its central part from the body 1, additional center braces 9 passing underneath the central part of the car, and in the upper ends of said braces 9 and in the upper ends of the braces 8 there is journaled a shaft 10 which extends transversely of the body along the minor axis thereof, tie rods or cables 11 staying the ends of the shaft 10 to the ends of the body 1. Secured to the shaft 10 are the fan or propeller frames 12 and 13. Journaled in suitable bearings carried by the frames 12 and 13 are the shafts of the fans 14 and to these frames there are secured the casings of turbines 15 which are of the construction shown in Figs. 7 and 8. These turbines embrace shell sections 16 and 17 provided with suitable packed boxes or glands 18, one of the sections being provided with serrations or pockets 19 arranged peripherally interiorly thereof, the sections being secured together by bolts 19 and having ports 20 leading to the exhaust 21. The supply pipe 22 which brings the exploded gases to the turbine passes through one of the boxes 18 and leads into the shell section 16. The piston 23 has a hollow body in communication by port 24 with pipe 22 and is provided with curved blades or arms 25 which are hollow as shown at 26 and disposed to revolve closely adjacent to the serrations or teeth 19 to jet or direct the gases against said serrations or pockets and thereby cause rotation of the piston which

is provided with a shaft 27 journaled in the remaining box 18 and is also revolvably mounted on the pipe 22 by the employment of the gland or coupling 28. The fans 14 are secured on the shafts 27 and the pipes 22 lead from the respective turbines 15 to a universal pipe joint or coupling 29 which connects them to the supply pipe 30.

The exhaust from the outlets 21 may be carried by a pipe to the body 1 via a universal joint or coupling or discharge into the air, as shown.

Depending from the rear of the body 1 is a hanger 33, a frame 34 (Figs. 1 and 6) being journaled in the cross-pieces 33^a of the hanger 33 by the trunnions 35. The frame 34 has bearings in which the shaft 36 of the steering propeller 37 is journaled. A turbine 38, in all respects similar to the turbine disclosed in Figs. 7 and 8 is secured to the frame 34 and its shaft connected to or formed in one piece with the shaft 36, said turbine having a supply pipe 39 connected by a swivel coupling 40 to the main supply pipe 41, while the exhaust passing through the discharge 21 of the turbine may be carried by a pipe to the body 1 via a swivel coupling or discharge into the air, as shown. The frame 34 may be swung laterally by steering ropes or cables 44 leading to a steering wheel 45 in the car 4, whereby the steering propeller wheel 37 may be turned laterally to any desired angle and thus both act as a propeller and rudder to steer the vessel.

The shaft 10 and the propellers 14 and supply pipes carried by said shaft may be swung from the horizontal position shown in Figs. 1 and 2 to the vertical or other inclined positions such as shown in Fig. 3 by a sprocket chain 46 running over a sprocket 47 carried by shaft 10 and a sprocket 48 connected to a hand-wheel 49 carried by the car 4. The propellers 14 will be disposed in the position shown in Figs. 1 and 2 when the vessel is ascending or descending or in some inclined position, according to circumstances but when the vessel is to travel forwardly or rearwardly, the shaft 10 will be turned to bring the propellers into the upright position shown in Fig. 3. By this arrangement I dispense with separate lifting or descending and propelling fans or propellers which have heretofore been employed.

Carried by a shaft 50 suitably journaled in the car 4 is a propeller 51 which is controlled by a clutch 52 from a shaft 53 connected to the rotary piston of a turbine 54 of the construction hereinbefore set forth, said turbine having a supply pipe 55 controlled by a valve 56 and having an exhaust pipe 57 leading to the interior of the body 1.

The supply pipes 30 and 41 have controlling valves 58 and 59, said pipes leading to a

trunk pipe 60 which is also connected to the exhaust pipe 57 by a short pipe 61 having a suitable controlling valve, this arrangement permitting the exploded gases to be fed direct into the interior of the body 1 when it is desired to initially fill the body or to supplement the gaseous products received therein from the turbines.

A combustion chamber or cylinder 62 (Fig. 9), which is equipped with a pressure gage and a safety valve, is carried by the car 4 and has its exhaust pipe 65 connected to the trunk pipe 60. This combustion chamber or cylinder will be made of suitable material capable of safely sustaining a high pressure and which may be safely brought to a high temperature without damage thereto. The combustion cylinder is provided with any desired number of spark plugs 66 of any preferred pattern, the same being in circuit by suitable wires 67 to a suitable battery and spark coil 68 carried by the car 4.

The car 4 carries a number of independent gasoline tanks 69, each having its own filling opening and all of which are connected by branch pipes 70 (Fig. 4) to a main pipe 71 which is continued as pipe 72 (Fig. 5) having a suitable controlling valve 73. There is an independent air and gasoline pump 74 which is operated from shaft 53 by the variable speed gear 75 which controls the supply of gasoline and air pumped into a pipe 76 having a controlling valve 77, said pipe leading to the combustion cylinder 62 (Fig. 9). Other controlling valves 78 and 79 may be employed.

In the event of injury to any one of the gasoline tanks or compartments, the supply of gasoline is not lost as sufficient will remain in the other compartments to properly operate the vessel until repairs can be made.

The gasoline and air are pumped into the combustion chamber or cylinder 62 and the mixture is exploded by the spark plugs but as the explosions continue the combustion chamber will rise in temperature until it gets so hot that it will automatically explode the gasoline and air without resort to the spark plugs, the repeated explosions bringing the gases to the requisite pressure for their supply to any or all of the turbines, the various turbines being under control of the occupants of the car so that all or such of the propellers may be operated as desired, according to the maneuvers the vessel is required to make, the exhaust from the turbine 54 passing into the body and, on account of extremely rarefied character of the same, furnishing a buoyant element which sustains the vessel after it has reached the desired height for horizontal travel. In ascending or descending, the propellers 14 are used, while the steering propeller 37 aids in the propulsion of the vessel and also acts as

a rudder to guide the course of travel although the main propelling effect is obtained by the propellers 14 after they have been turned to the position shown in Fig. 3.

5 The propeller 51 imparts a direct propulsion to the car and hence balances the propelling action and assists in maintaining the car in upright position.

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

15 1. In an aerial vessel, the combination with supporting means therefor, of propellers located on opposite sides of said supporting means and mounted so that they may be simultaneously disposed in horizontal, vertical, or any intermediate position, a self-contained gas turbine for each propeller and mounted to swing therewith, and a gas
20 generator carried by the vessel adapted for supplying gas to all of the turbines.

25 2. In an aerial vessel, the combination with a hollow buoyant metallic body, of a rotary propeller therefor, a rotary gas turbine for operating the propeller, a pipe connecting the turbine exhaust with the interior of the hollow buoyant body whereby the heated exhaust gas is admitted thereto, and gas generating means carried by the body
30 and having a connection with the turbine to supply the gas thereto.

3. In an aerial vessel, the combination with supporting means therefor, of a rotary swinging propeller therefor, a gas turbine mounted to swing bodily with the propeller 35 and connected to it and adapted to rotate said propeller, means carried by the vessel for supplying gas to the turbine, and a pipe composed of rigid pipe sections connected respectively to the turbine and to the gas
40 producing means aforesaid, the said rigid pipe sections being connected together by a swivel joint.

4. In an aerial vessel, a car pivoted along its sides on opposite sides of its center and
45 at its end parts on opposite sides of said center with a plurality of independent motive fluid containing compartments, a power generating device having pipe connections with the different compartments, and ar-
50 ranged so that it will receive motive fluid therefrom without regard to the position of the car by the gravital action of the motive fluid flowing from some of the compartments thereto. 55

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

CHARLES J. PAYNE.

Witnesses:

CHARLES W. PAYNE,
SAMUEL J. FISHER.