

No. 723,068.

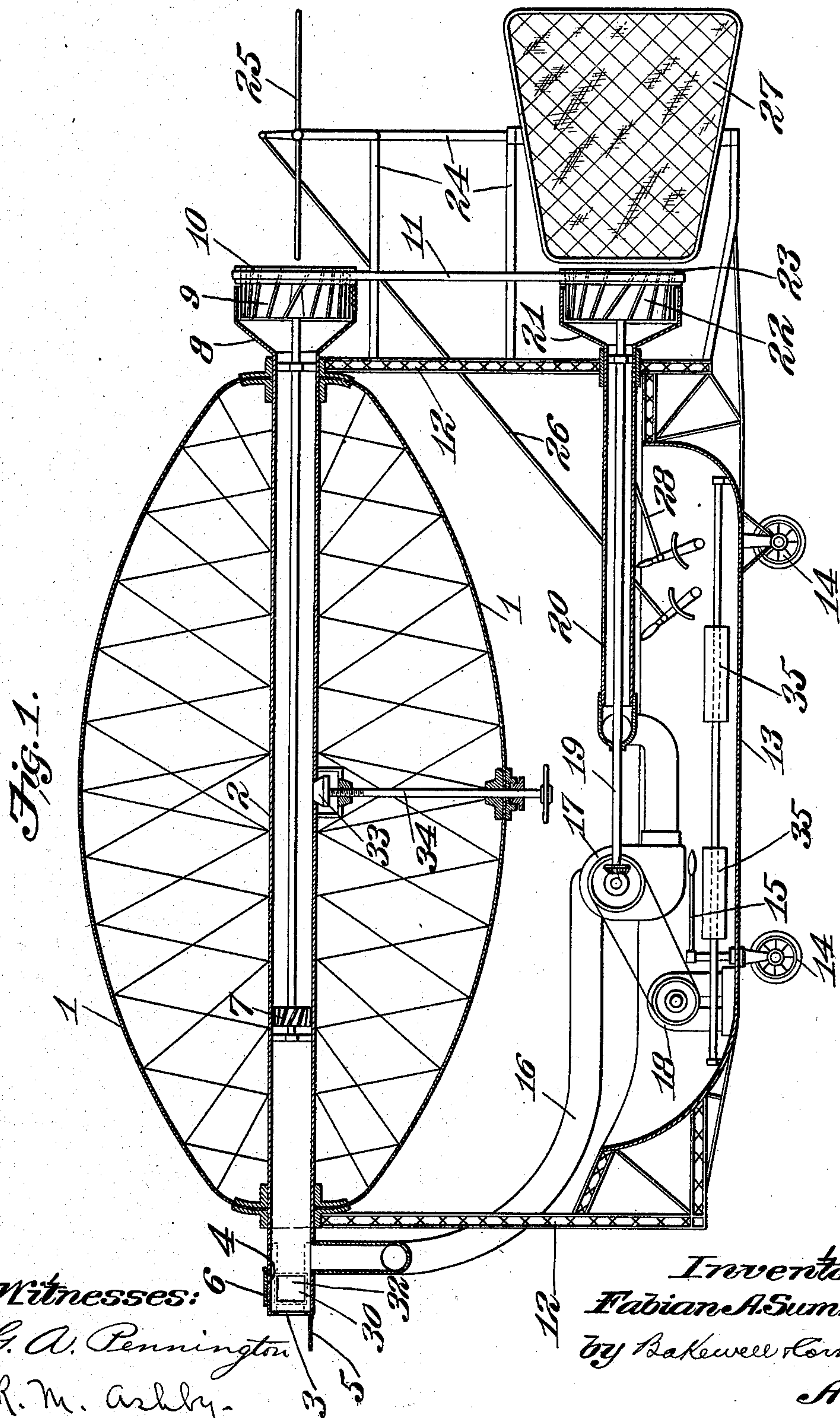
PATENTED MAR. 17, 1903.

F. A. SUMMERS.
AIR SHIP.

APPLICATION FILED APR. 17, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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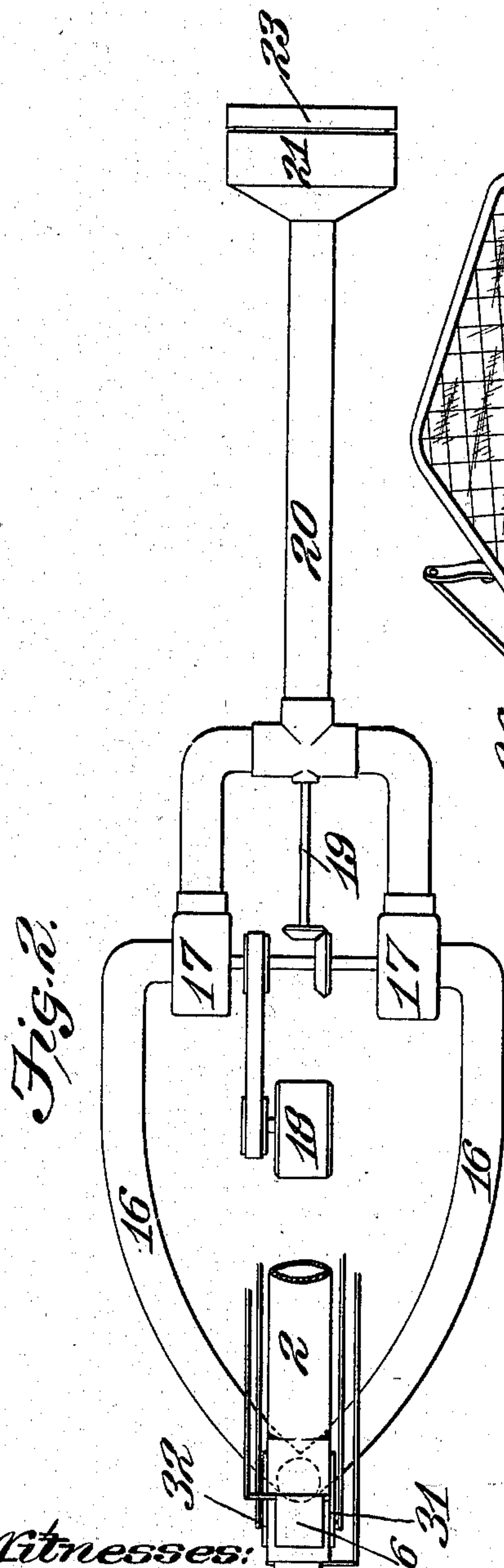
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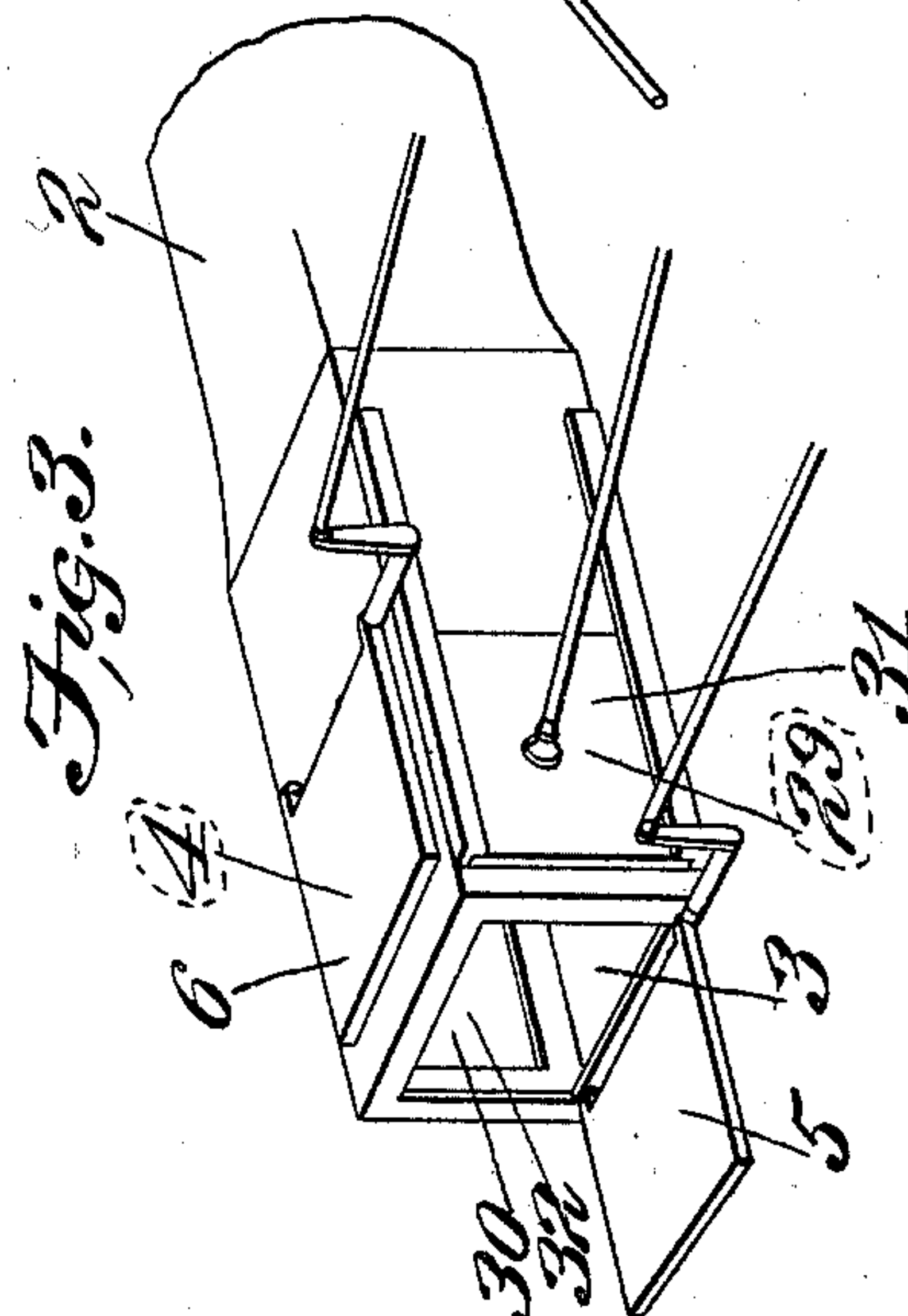
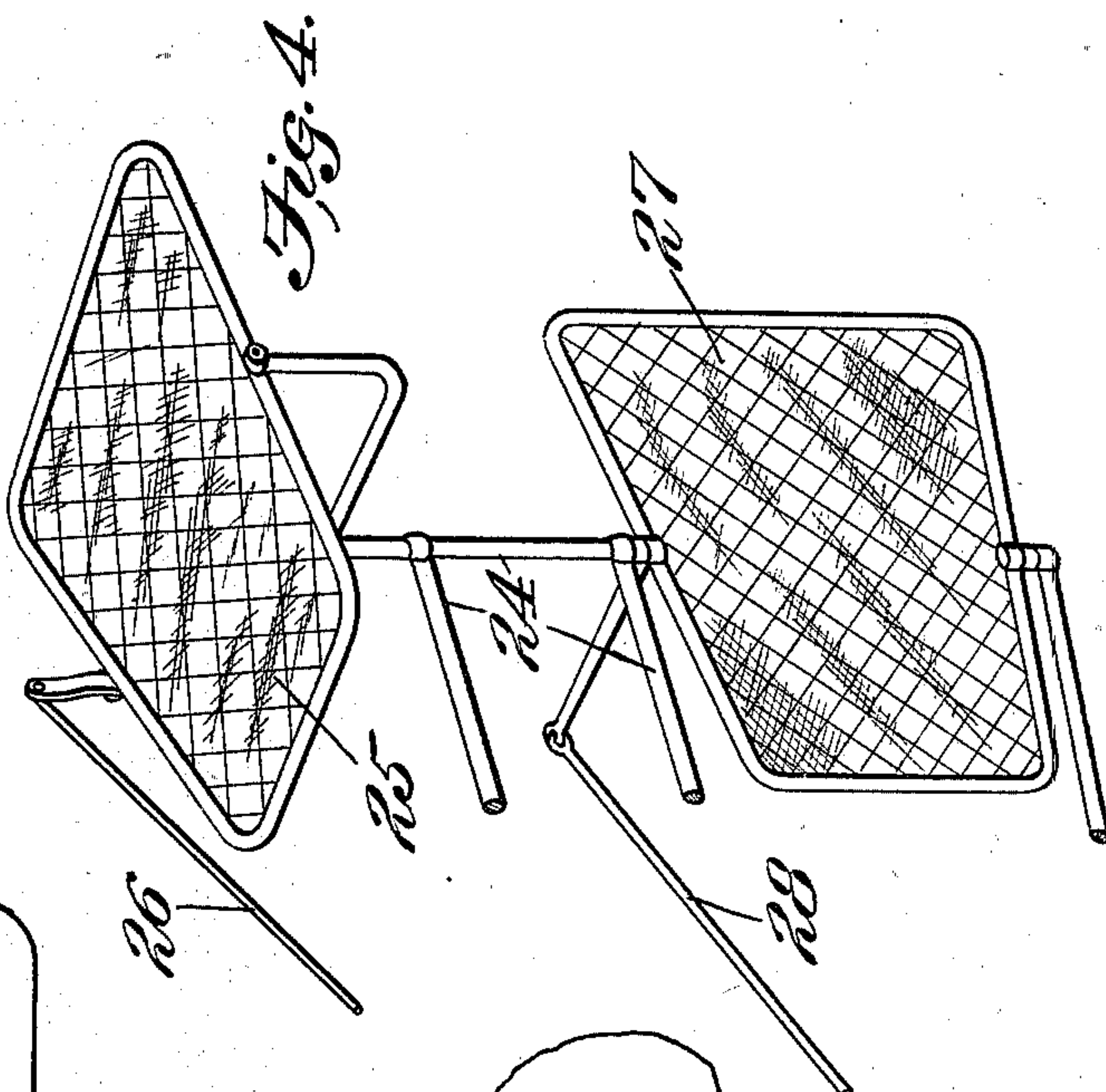
APPLICATION FILED APR. 17, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

FABIAN A. SUMMERS, OF WASHINGTON, INDIANA.

AIR-SHIP.

SPECIFICATION forming part of Letters Patent No. 723,068, dated March 17, 1903.

Application filed April 17, 1902. Serial No. 103,278. (No model.)

To all whom it may concern:

Be it known that I, FABIAN A. SUMMERS, a citizen of the United States, residing at Washington, county of Daviess, Indiana, have invented a certain new and useful Improvement in Air-Ships, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view through my improved air-ship. Fig. 2 is a plan view thereof, the gasometer and certain parts being removed. Fig. 3 is a detail view of the forward end of the hollow shaft, and Fig. 4 is a detail view showing the horizontally and vertically movable rudders and their means of operation.

This invention relates to a new and useful improvement in air-ships, the object being to utilize a gasometer inflated with hydrogen or other gas to give it buoyancy, the device being directed through the air by means of mechanism which displaces the air at the forward end of the apparatus and discharges the air at the rear end thereof. The currents of air so sucked in are directed against vanes or rudders, whereby the direction of the vessel may be changed at will.

My invention consists of the novel construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings, 1 indicates an inflated gasometer constructed as usual and of such capacity as to float the attached parts and the occupants of the car.

2 is a hollow axle passing axially through the gasometer and whose forward end protrudes beyond the gasometer and is open, as at 3. An opening 4 is provided in the upper side of this protruding end. A valve 5 is arranged so as to close the front opening, and when said opening is free the air is displaced by being sucked in a horizontal direction into the axle and forced out at the rear end thereof, thus causing the ship to travel in a horizontal direction. When the valve 5 closes the front opening and the air is drawn through the upper opening 4, by opening a valve 6

the tendency is to lift the front end of the ship, so that it will ascend, at the same time going in a forward direction.

7 indicates a wheel or exhaust-fan located in the hollow shaft for displacing air in the front end thereof and forcing the same rearwardly. This hollow shaft terminates at its rear end into a bell-shaped casing 8, in which is located a displacing or exhaust fan or wheel 9 for assisting wheel 7 in displacing the air in the hollow shaft and forcing the same rearwardly. Wheel 9 projects rearwardly beyond the casing 8 and is provided with a band forming a pulley-face 10, over which passes a belt 11.

12 indicates a suitable framework suspended from the axle and carrying a car 13, preferably in the shape of the hull of a boat. This car is provided with supporting-wheels 14 for elevating it above the ground, the forward one of said wheels being provided with a steering-handle 15 for well-understood purposes.

16 indicates a pipe leading from the lower portion of the protruding end of the hollow axle, said pipe having two branches which lead into the eyes of exhaust-fans 17. These exhaust-fans are driven by a belt from a motor 18, and both are designed to work together. Through suitable miter-gearing a shaft 19 is driven from the motor 18, said shaft being mounted in and passing through a pipe 20, into which both discharge-pipes from the fans 17 lead. The rear end of this discharge-pipe is provided with a bell-shaped housing 21, in which is located a wheel 22 for assisting the pumps in the displacement of the air and forcing the air rearwardly. The outer end of this wheel 22 is provided with a band forming a pulley-face 23, over which the belt 11 passes. In this manner the pumps as well as the displacing means of the apparatus are operated from the motor 18.

24 indicates a framing extending rearwardly from the apparatus, in which is mounted a horizontally-placed rudder 25, manipulated by a rod 26. This rudder is preferably in the plane of the wheel 7 and assists in directing the ascent and descent of the ship.

27 indicates a vertically-disposed vane or rudder controlled by a suitable rod 28. This rudder 27 is arranged beyond the wheel 22 and

directs the course of the vessel. This rudder might be termed a "steering-rudder."

From the above it will be obvious that displacing the air at the front end of the apparatus through the opening 3 and discharging the same through the rear end thereof will cause the vessel to move through the air in a horizontal direction, assuming, of course, that it is suspended in space by the buoyancy of its gasometer. When the valve 5 is manipulated to close the opening 3 and valve 6 is raised to expose the opening 4, the air is caused to rush in from above through the opening 4, and by this suction a lifting tendency is exerted on the forward end of the vessel, causing the said forward end to be elevated and the vessel to take an upward instead of a horizontal course, as was the case when the opening 3 was exposed and the opening 4 closed.

In order that the vessel may be steered, I provide what I will term "larboard" and "starboard" ports 29 and 30 in the protruding forward end of the hollow shaft, which ports are controlled by valves 31 and 32, respectively, suitable means being provided for manipulating said valves. These valves 31 and 32 are closed when the air is being drawn through the opening 3 or 4. However, when it is desired to steer the vessel openings 3 and 4 are closed, and, depending upon the direction it is desired the vessel shall take, the opening 29 or 30 is exposed, so that a lateral suction or pull is the result, which suction or pull tends to swing the head of the vessel in the desired direction. In this manner it is possible to use the larboard and starboard ports to steer the front of the vessel, and as the air is forced against the vertically and horizontally movable rudders it is obvious that these rudders can be adjusted so as to cause the vessel to coincidentally take an upward or downward course, the rudder 27 assisting the steering of the vessel laterally. By the use of the larboard and starboard ports and the rudder 27 the vessel can be turned in a smaller circle than would be possible merely by the use of the rudder 27 alone.

33 indicates a valve which is operated by a rod 34, whereby gas in the gasometer may be opened to the hollow shaft for the purpose of reducing the buoyancy in the event that it is desired to have the apparatus descend under certain conditions.

35 indicates sliding weights mounted upon a suitable rod placed horizontally, so that the apparatus may be balanced by adjusting said weights longitudinally, as is well understood.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. The combination with a gasometer hav-

ing a hollow shaft extending through the same, the rear end of said shaft terminating in a bell-shaped housing, of an exhaust-fan in the forward portion of said shaft, a displacing-wheel on the shaft therewith and situated in said housing, a projecting portion on said wheel extending beyond said housing forming a pulley-face, an auxiliary displacing-wheel on a lower plane with an extension forming a pulley-face, a belt around said pulley-faces, pipes leading forward and upward from said lower displacing-wheel, exhaust devices therein, a motor adapted to operate the same, and a car, all combined substantially as described.

2. The combination with a gasometer having a hollow shaft extending through the same, a car suspended therefrom, exhaust-fans arranged in said car side by side and driven by the same shaft, pipes leading from said hollow shaft to the eyes of said exhaust-fans, discharge-pipes from said exhaust-fans leading into a common discharge-pipe, a displacing-wheel in said common discharge-pipe, and means for driving said displacing-wheel; substantially as described.

3. The combination with a gasometer having a hollow shaft extending horizontally therethrough, of displacing-fans arranged therein, auxiliary exhaust-pipes leading from the forward end of said hollow shaft, exhaust-fans into which said pipes lead, said exhaust-fans discharging into a common discharge-pipe, a displacing-wheel in said common discharge-pipe, a belt connecting the displacing-wheel in the common discharge-pipe with the displacing-fans 7 and 9 in the hollow shaft, and an engine for driving said fans and said displacing-wheel; substantially as described.

4. The combination with a gasometer provided with a hollow shaft, of an exhaust-fan rotatable therein, a displacing-wheel at the discharge end of said hollow shaft, a vertically-movable rudder in the plane of said hollow shaft, auxiliary discharge-pipes communicating with the interior of said hollow shaft, an exhaust-fan for discharging air rearwardly from said auxiliary discharge-pipes, an engine for driving said exhaust-fan, a displacing-wheel at the discharge end of said auxiliary discharge, and a horizontally-movable rudder in the plane of the air discharged therefrom; substantially as described.

5. The combination with a gasometer, a car-supporting means therefor, a longitudinal hollow shaft extending through said gasometer and extending some distance forward thereof at which point said shaft is provided with laterally-opening larboard and starboard ports, of means for controlling said ports, and means for exhausting the air in said hollow shaft; substantially as described.

6. The combination with a gasometer, a car-supporting means therefor, a longitudinal hollow shaft extending through said gasometer and extending some distance forward thereof at which point said shaft is provided with lat-

erally-opening larboard and starboard ports, of means for controlling said ports, and a suction-fan for exhausting the air in said hollow shaft; substantially as described.

5 7. The combination with a gasometer, of two air-exhaust pipes or shafts having a series of common ingress-ports beyond the forward end of said gasometer, valves for said ports; exhaust-fans in said shafts and displacing-
10 wheels at the rearward termini thereof in connection with said exhaust-fans, connecting means between said displacing-wheels, and driving means therefor and for said exhaust-fans, all combined substantially as described.

15 8. The combination with a gasometer with hollow shaft extending therethrough and for some distance beyond the same at both ends, of a car-supporting framework connected to said hollow shaft at each end, a car connected
20 to said framework, auxiliary exhaust-pipe connected to said hollow shaft, common ingress-ports and valves therefor in proximity to said exhaust-pipe, exhaust-fans and displacing-wheels in said hollow shaft and said
25 exhaust-pipe, and actuating means therefor, all combined substantially as described.

9. The combination with a gasometer provided with a continuous hollow shaft, a forward extension on said hollow shaft provided
30 with end port and top port, an exhaust-fan in said hollow shaft, a displacing-wheel on the same driving-shaft with said exhaust-fan, pipes connected with the lower side of said hollow shaft terminating at the rear in a bell-
35 shaped housing, exhaust-fans in said pipes, a displacing-wheel in said housing, a motor, and connecting means whereby said exhaust-fans and displacing-wheels are driven therefrom; substantially as described.

40 10. The combination with a gasometer provided with continuous hollow shaft therethrough, a forward extension of said shaft having open outer end and ingress-ports at top and sides thereof, closures for said ingress-
45 ports, diverging pipe connected to the lower side of said shaft, exhaust-fans in said pipe, a bell-shaped housing at the rear extremity thereof, a displacing-wheel in said housing

operable from the shaft which drives said fans, and a displacing-wheel in the rear end 50 of the hollow shaft of the gasometer driven from said first-mentioned displacing-wheel; substantially as described.

11. The combination with a gasometer provided with a hollow shaft extending longitudinally therethrough, a forwardly-protruding 55 portion of said hollow shaft extending some distance in front of said gasometer having open outer end and an opening in its upper side, of valves for closing said open end and 60 said upper opening, means for operating said valves, exhaust-fan in said longitudinal hollow shaft, pipes connected with said shaft at its under side back of said upper opening, exhaust-fans adapted to exhaust air through 65 said pipes, vertically-movable rudder in the plane of the air discharged from said hollow shaft, and a horizontally-movable rudder in the plane of the air discharged from said lower pipe; substantially as described. 70

12. The combination of a gasometer, hollow shaft extending entirely through the same and protruding for a short distance at both ends, with a series of ingress-ports at one end, one of said ports at the front end, one at the top, 75 and one at each side, a bell-shaped housing at the rear extremity of said hollow shaft, a displacing-wheel in said bell-shaped housing, an exhaust-fan in the forward end of said hollow shaft on the same shaft with said displacing-wheel, pipes leading from the bottom 80 of said hollow shaft diverging from the connection-point therewith and terminating in exhaust-fans, and converging pipes extending from said exhaust-fans rearwardly, a bell-shaped housing at the rear end thereof, a displacing-wheel therein, and vertically and horizontally movable rudders in proximity to said displacing-wheels; all substantially as shown. 85

In testimony whereof I hereunto affix my 90 signature, in the presence of two witnesses, this 10th day of April, 1902.

FABIAN A. SUMMERS.

Witnesses:

PARIS A. HASTINGS,
WM. HEFFERNAN.