W. C. ZIMMERMAN.

AIRSHIP.

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1,050,415.

Patented Jan. 14, 1913.

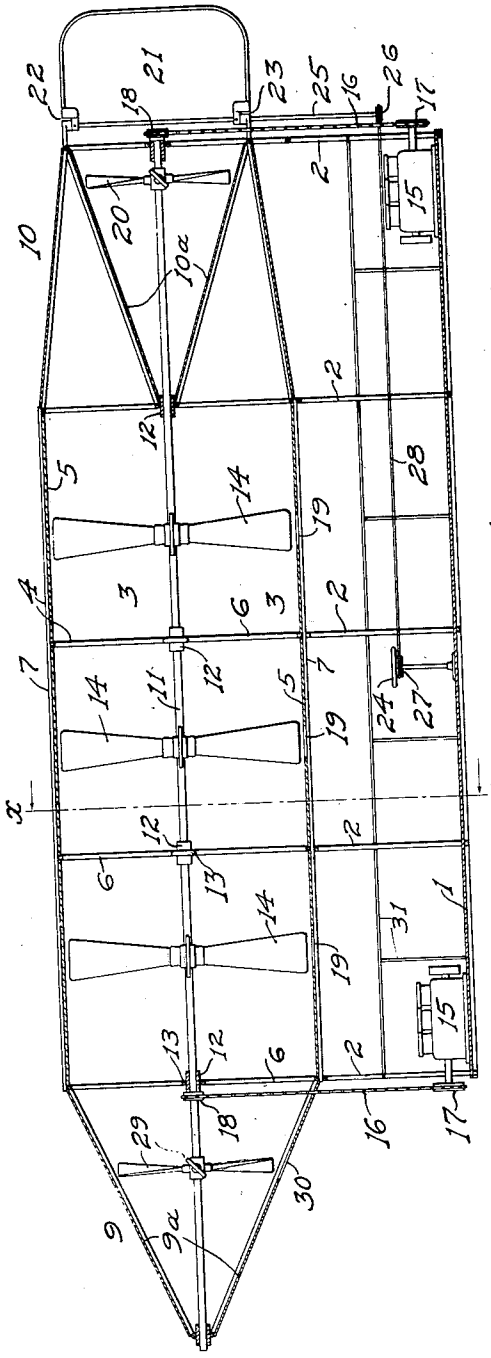

Fig. 1.

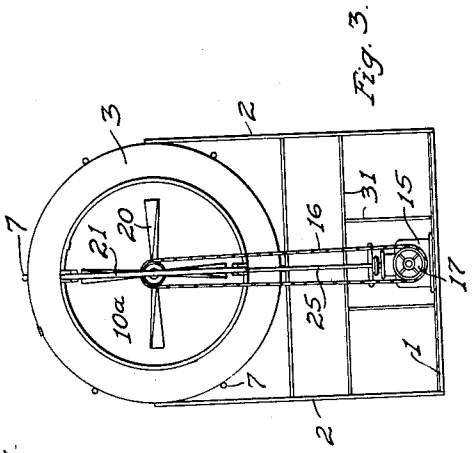

Fig. 3.

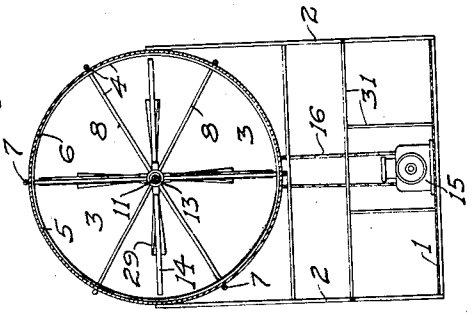

Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM C. ZIMMERMAN, OF NEW YORK, N. Y.

AIRSHIP.

1,050,415. Specification of Letters Patent. Patented Jan. 14, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM C. ZIMMERMAN, a citizen of the United States, and resident of the city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Airships, of which the following is a specification.

This invention relates to air ships, particularly to the heavier-than-air type, and its principal object is to provide an improved and efficient air ship which will be safe, reliable, simple of operation, and readily controlled by the operator.

Another object is to provide improved means for raising and maintaining air ships aloft.

In carrying out my invention, I provide a platform for the operators and passengers, and a cylindrical shell closed at both ends is fixed to said platform; said shell being over the platform and its axis normally horizontal. A rotatable shaft along said shell-axis carries blades and is driven by a motor or engine whereby said blades are revolved at a high speed. The revolving of said blades causes the air in said shell to gyrate about its axis, which creates centrifugal pressure against the walls of said shell. Openings at the underside of said shell opposite said blades admit and discharge air; and since the air finds exit at the under side of the shell, said centrifugal pressure is diminished thereat and the centrifugal pressure against the upper side of the shell causes it to rise, thereby raising and maintaining the air ship aloft. Suitable means for propelling and steering the air ship are provided.

Other objects and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a sectional elevation of the air ship, taken longitudinally, and shows the mechanism in full. Fig. 2 is a transverse section of the air ship taken on the line x—x in Fig. 1. Fig. 3 is an elevation of the stern end of the air ship.

A platform 1 for carrying the operators, passengers, machinery, etc., is suitably constructed of light and strong material and uprights 2 are fixed thereupon which support a large cylindrical shell 3, the axis of which is horizontally disposed; said uprights serving as posts for said shell when the air ship is on the ground and as suspenders for said platform when the ship is aloft, as will be seen. Said shell consists of a frame-work 4 sheathed with canvas 5 or other suitable material.

The frame-work as shown here comprises rings 6 fixed to supports 2, rods 7 joining said rings, and radial braces 8; all being braced and fastened properly with the uprights 2 and platform 1, and constituting a light and strong structure. The canvas 5 constituting the walls of said shell is mounted upon said rings 6 and rods 7, and the shell is closed at both ends 9 and 10.

A drive shaft 11 extending along the axis of shell 3 is mounted rotatably in bearings 12 fixed in rings 13, to which rings said braces 8 are joined. Sets of vanes or blades 14 are fixed rigidly to shaft 11, and engines or motors 15 upon platform 1 being connected to said shaft by means of chains 16, and sprocket-wheels 17, 18, drive the shaft and revolve said blades 14 at a high speed. Air openings 19 are provided at the under side of the shell opposite each set of blades.

The rapid revolving of blades 14 causes the air in shell 3 to gyrate rapidly about its axis, which creates a centrifugal pressure against the walls 5 of the shell. The pressures against the sides of the shell are opposite and equal and produce no effect. The openings 19 on the under side admit and discharge air as the blades 14 pass by them, new air necessarily entering to take the place of the discharged air by creating a counter incoming current at one side of said openings, and said blades passing by said openings aiding the new air to be drawn in, and since the air finds an exit at the underside of the shell it results in a diminution of the centrifugal pressure thereat, whereby the greater upward centrifugal pressure against the upper side of wall 5 causes the shell to rise and the entire structure to be lifted therewith and the air ship maintained aloft.

Propeller blades 20 fixed to shaft 11, at the stern end 10 of shell 3, are revolved by said shaft and propel the air ship. An ordinary rudder 21 is hinged to frame-work 4 at 22, 23, at the stern end 10 of the shell,

and is connected with a steering wheel 24 by means of a rock-shaft 25, sprocket-wheels 26, 27, and a chain 28 connecting said sprocket-wheels, whereby shaft 25 may be rocked and the rudder swung by the operator manipulating said wheel, and the ship thus steered at his will.

The bow end 9 of the shell 3 is conically formed, as shown at 9^a, to cut the air and overcome its resistance when the air ship is being propelled. Preferably, an additional propeller 29 is fixed on shaft 11 within said conical end, and an opening 30 is provided at the under side of said end, which aids in the propulsion of the air ship and forces air in the cylindrical portion of the shell, whereby the gyrating air is given additional pressure. The stern end 10 of the shell may be funnel-shaped and tapering within the shell 3, as shown at 10^a, and the propeller 20 disposed within said funnel-shaped end to make the structure compact and to force the air directly against the rudder 21 for improved steering. A rail 31 is provided around the platform for convenience of the riders.

Normally the platform 1 rests on the ground and wheels may be provided for said platform for moving the air ship along the ground. When it is desired to rise, the engines 15 are started running, and, the blades 14 having attained the proper speed, the air ship will rise and be maintained aloft at a certain elevation, depending upon the speed of said blades and upon the load carried on platform 1. To rise higher, the engines 15 are run faster to revolve blades 14 at a higher speed, and to descend, said engines are slowed down.

Clutching mechanism may be provided for stopping the propellers when the air ship is aloft.

Variations may be resorted to within the scope of the invention.

Having thus described my invention, I claim:

1. In an air ship, means for raising and maintaining the ship in the air including the combination of a cylindrical shell closed at its ends, revoluble blades therein formed to be adaptable to cause gyration of the air about the axis of said shell, the gyrating air causing centrifugal pressure against the walls of said shell, and the underside of said shell having openings adapted to admit and discharge air; said discharge of air reducing said centrifugal pressure on said underside whereby the centrifugal pressure upon the upper side of said shell raises and maintains the ship in the air.

2. In an air ship, means for raising and maintaining the ship in the air including the combination of a cylindrical shell closed at its ends, means adaptable to cause gyration of the air therein about the axis of said shell, said gyrating air causing centrifugal pressure against the walls of said shell, and the underside of said shell having openings for the admission and discharge of air; said discharge of air reducing said centrifugal pressure on said underside whereby the centrifugal pressure upon the upper side of said shell raises and maintains the ship in the air.

3. In an air ship, means for raising and maintaining the ship in the air including the combination of a cylindrical shell closed at its ends, a rotatable shaft extending along the axis thereof, sets of blades on said shaft having their sides parallel to its axis adaptable to cause gyration of the air in said shell, the gyrating air causing centrifugal pressure against the walls of the shell, and the underside of said shell having an opening opposite each of said sets of blades adapted to admit and discharge air; said discharge of air reducing said centrifugal pressure on said underside whereby the centrifugal pressure upon the upper side of said shell raises and maintains the ship in the air.

4. In an air ship, the combination of a cylindrical shell closed at its ends, a rotatable shaft extending along the axis thereof, sets of blades on said shaft having their sides parallel to its axis adaptable to cause gyration of the air in said shell, the gyrating air causing centrifugal pressure against the walls of said shell, the underside of said shell having an opening opposite each of said sets of blades adapted to admit and discharge air, said discharge of air reducing said centrifugal pressure on said under side whereby the centrifugal pressure upon the upper side of said shell raises and maintains the ship in the air, a platform for riders depending from said shell, an engine driving said shaft, the stern end of said shell tapering within said shell, and propeller blades mounted upon said shaft within said stern end.

5. In an air ship, the combination of a cylindrical shell, a rotatable shaft extending along the axis of said shell, sets of blades mounted on said shaft and revolved thereby to cause the air in said shell to gyrate, said gyrating air pressing centrifugally against the walls of said shell, the under side of said shell having an opening opposite each set of blades for the admission and discharge of air, said discharge of air reducing said centrifugal pressure on said under side whereby the centrifugal pressure upon the upper side of said shell raises and maintains the ship in the air, a platform for riders depending from said shell, an engine or engines driving said shaft, propelling means for the air ship, the bow end of said shell being conical to overcome air resistance when the air ship is propelled, propeller blades mounted on said

shaft within said conical end of the shell to aid propulsion of the air ship and to increase said pressure in the cylindrical portion of said shell, and said conical end having an opening at its under side below said propeller blades to admit and discharge air thereat.

Signed at the city of New York, in the county of New York, and State of New York, this 17th day of February, A. D. 1912.

WILLIAM C. ZIMMERMAN.

Witnesses:

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B. ROMAN.