J. N. THOMPSON.

AIRSHIP.

APPLICATION FILED AUG. 30, 1911.

1,031,597.

Patented July 2, 1912.

4 SHEETS—SHEET 1.

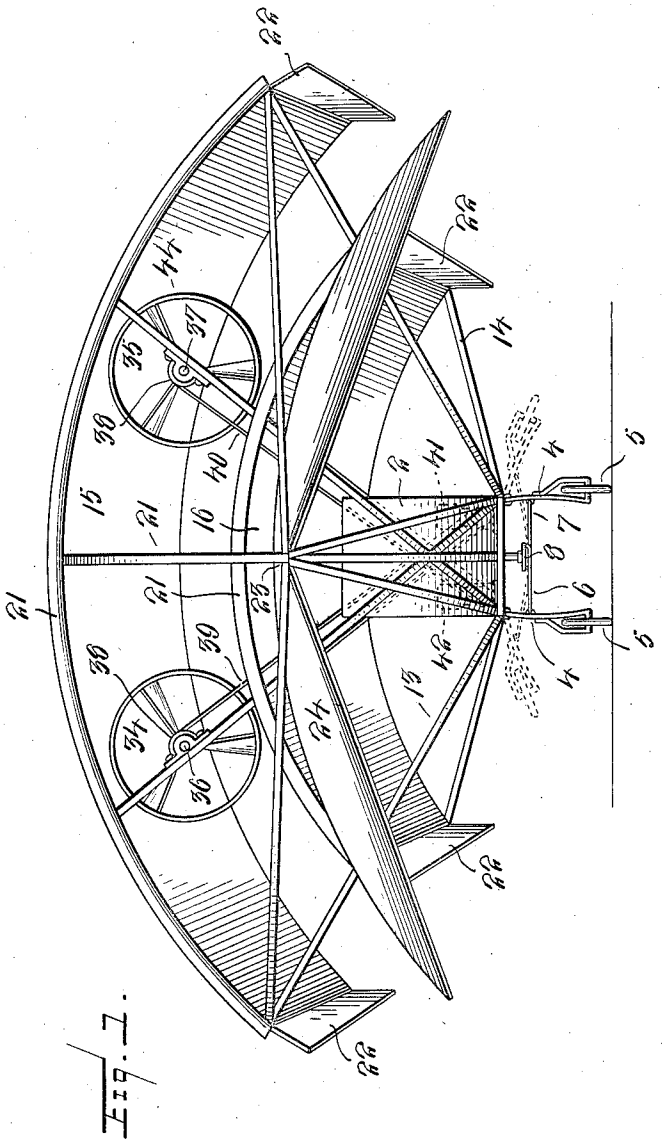

Fig. 7.

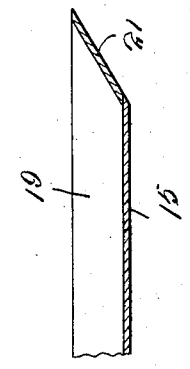

Fig. 5.

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Witnesses

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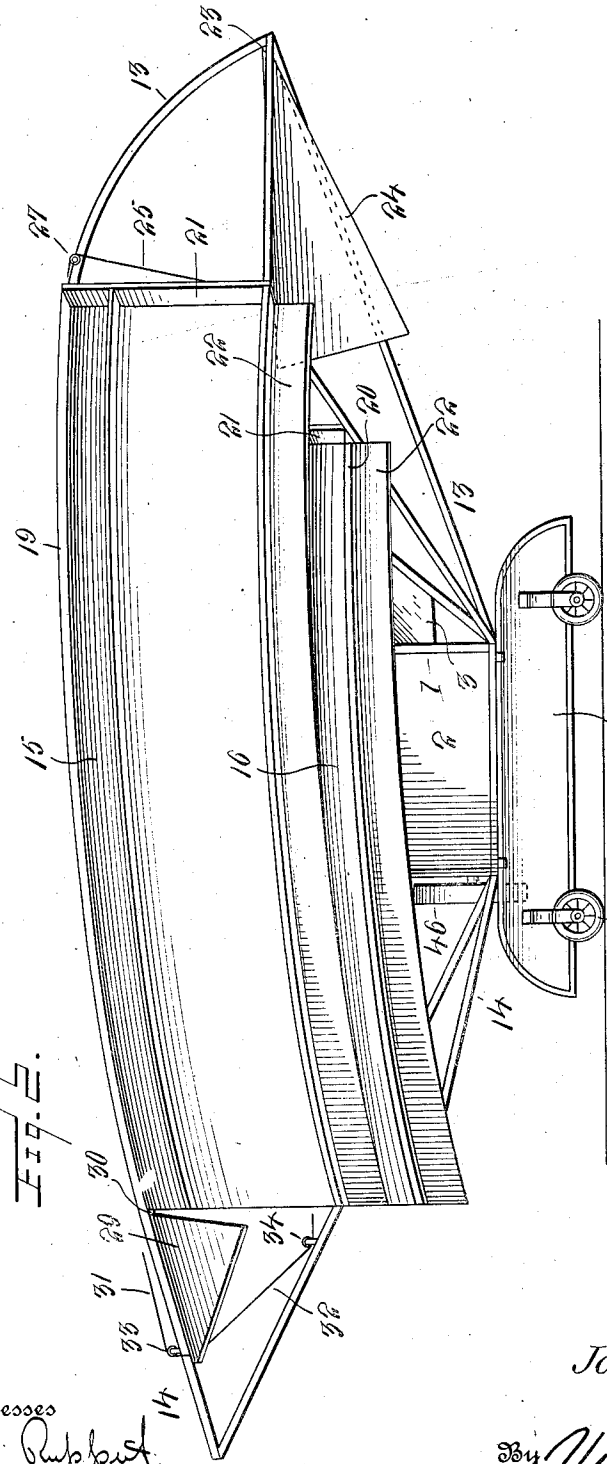

Fig. 2.

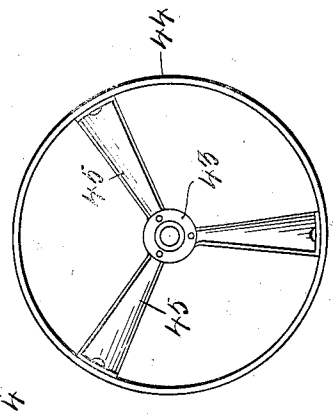

Fig. 5.

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4 SHEETS—SHEET 3.

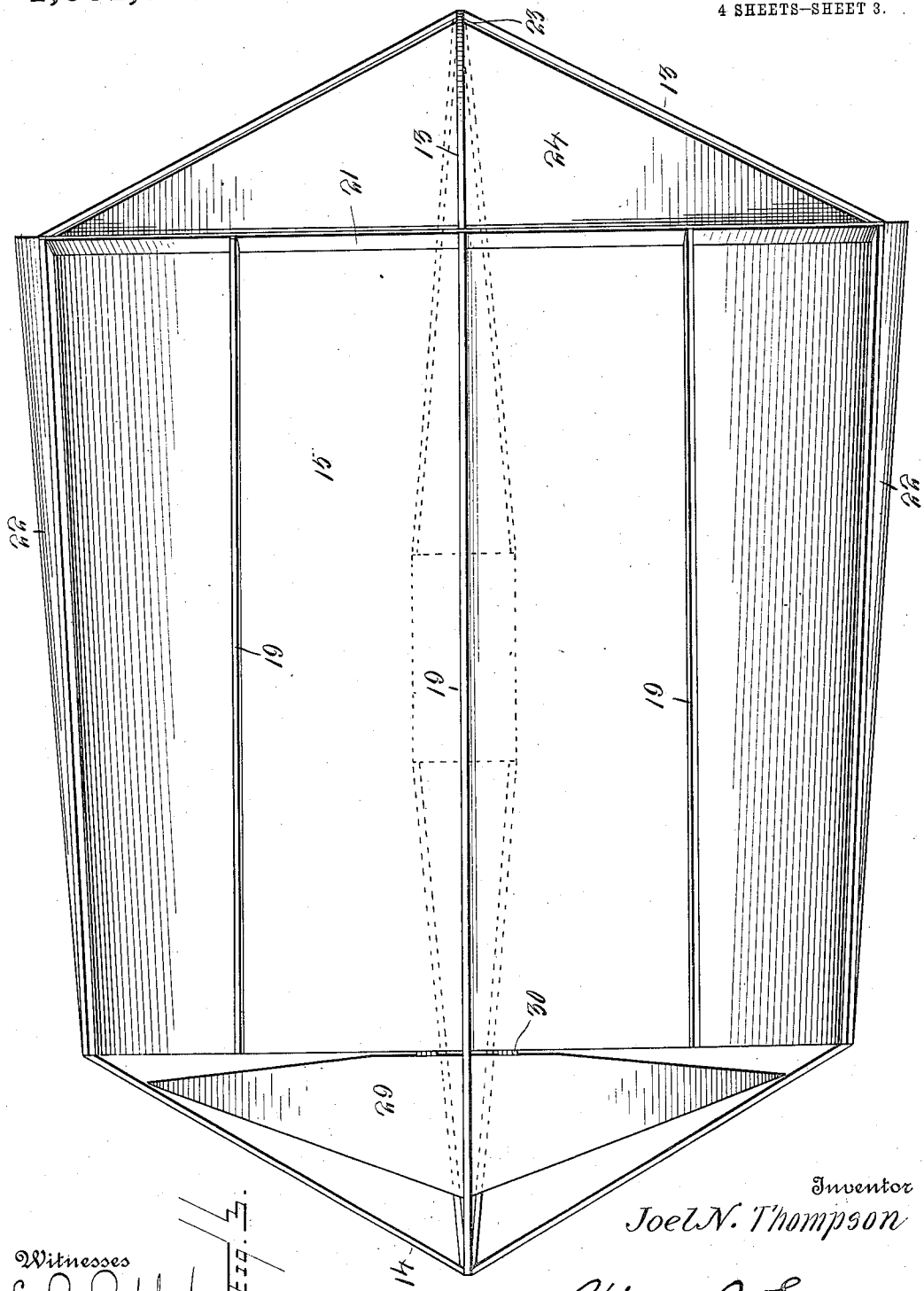

FIG. 3.

Witnesses

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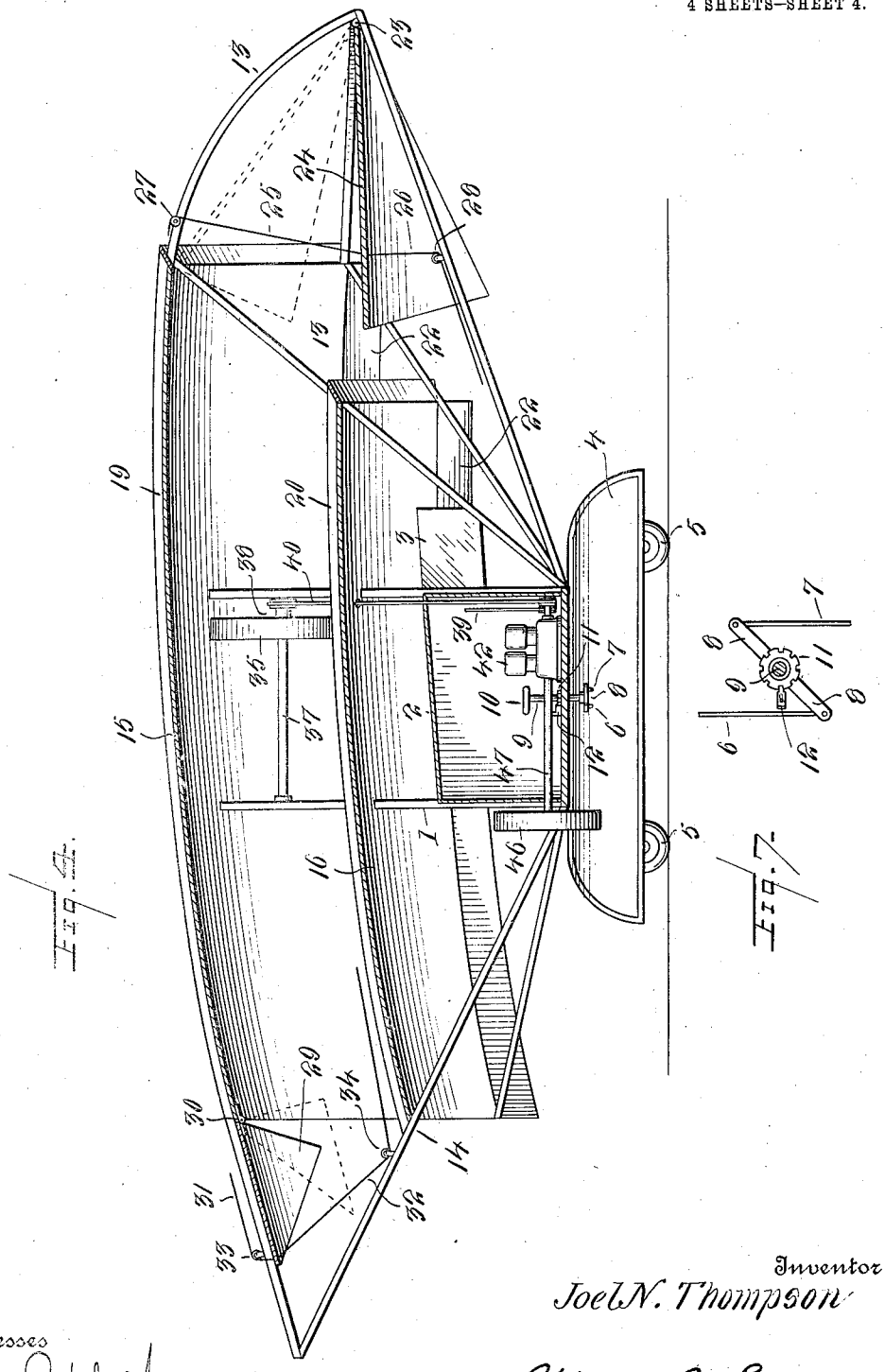

Fig. 4.

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOEL N. THOMPSON, OF NEW MADRID, MISSOURI.

AIRSHIP.

1,031,597. Specification of Letters Patent. Patented July 2, 1912.

Application filed August 30, 1911. Serial No. 646,785.

To all whom it may concern:

Be it known that I, JOEL N. THOMPSON, a citizen of the United States, residing at New Madrid, in the county of New Madrid and State of Missouri, have invented new and useful Improvements in Airships, of which the following is a specification.

This invention relates to certain new and useful improvements in airships of the heavier-than-air class, the object of the invention being to provide an airship which combines strength and durability with efficiency of flotation in the air, which embodies a large area of supporting surface, which will automatically balance itself or maintain its equilibrium under variations of air pressure thereon, and which is adapted to be converted into a parachute to insure a slow and safe descent to the ground in the event of the failure of the motive power.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a view in front elevation of an airship constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a top plan view of the airship. Fig. 4 is a vertical longitudinal section of the same. Fig. 5 is a detail view of one of the propellers. Fig. 6 is a detail section through one of the flotation surfaces. Fig. 7 is a detail view of the means for holding the wheel frame wings in launching or landing position.

Referring to the drawings, 1 designates the main frame, which supports a car or cabin 2 designed to be occupied by the pilot and passengers, if any, said car or cabin having a front transparent wall or window 3, for the convenience of the pilot in looking ahead and directing the course of the ship. Hinged or pivoted to the sides of the car or cabin are wing frames 4, carrying launching and landing wheels 5, each of said wing frames being arranged to extend fore and aft and longitudinally and transversely curved. Each wing frame consists of a marginal frame structure proper, provided with a body or filling of fabric, or metal or other suitable material, the construction being such as to adapt said wing frames to serve as supporting or flotation planes, when the ship is in flight. The wing frames are adapted to depend vertically to support the wheels 5 in proper position for the launching and landing operations, and are adapted to be held in such position by cords or cables 6 and 7 connected with oppositely extending crank arms 8 on a vertical shaft 9 carrying a hand wheel 10, whereby said shaft may be turned to take up or let out the cables, for holding the wing frames in a vertical position or releasing them for an upward swinging movement. On the shaft 9 is a toothed locking wheel 11 adapted to be engaged by a suitable locking device 12, whereby the cables may be held in a taut condition to hold the wing frames vertically disposed. When the cables 6 and 7 are slackened, the wing frames are free to swing upwardly under air pressure to the dotted line position shown in Fig. 1, when the ship is in flight, in which, owing to their form and curvature, they are adapted to serve as flotation planes or supporting surfaces, increasing the area of the supporting surface of the ship.

Projecting from the main frame are head and tail frame structures 13 and 14, and carried by the said main frame and head and tail frames are upper and lower supporting or flotation surfaces 15 and 16, the frames of which respectively include bars or ribs 19 and 20 extending fore and aft or parallel with the line of flight, the bars or ribs 19 of the upper surface having extensions 21 forming a part of the head and tail frames and serving to stay and reinforce the same. These bars or ribs 19 and 20, in addition to strengthening the frame structures in a rigid manner, operate also as fins to assist in preventing lateral deflection of the ship from its straight course of travel.

The two flotation surfaces 16 and 17 are alike in general construction and contour, each being curved both horizontally and transversely, or both parallel with and at right angles to the line of flight, said surfaces being arched or substantially hood-shaped in front elevation and in vertical section taken at right angles to the line of flight at any point in their width or between their fore and aft edges. By this construction the two surfaces are adapted to effectually confine columns of air between their lateral extremities for the full dynamical reaction of the air thereon, as well as to impinge upon the air currents in such manner as to prevent the ship from having lateral leeway or skidding, the curvature of the marginal

portions of said surfaces also operating to deflect transverse currents of air to prevent them from exerting their full forces and tilting the ship at either side to a sufficient degree to affect the lateral equilibrium of the ship to a dangerous extent.

In practice, each supporting surface may be of rectangular, octagonal or other suitable shape in plan, but preferably has its lateral extremities converging slightly between its fore and aft edges so as to gradually and increasingly confine the column of air to a sufficient extent to get a full effect of the supporting action resulting from the uplift of the air under compression. Each supporting surface is provided around its front and side edges with an obliquely disposed coaming board or deflector 21, operating to divide the air at the point of entry, deflecting a portion of the air downwardly and a portion upwardly, giving an increased supporting action on the under side of the flotation surface and an increased rarefaction of the air above the upper side of the flotation surface, with an obvious increase of lifting power in the propulsion of the ship at a determined rate of speed.

Arranged at the sides of each flotation plane are substantially vertical, depending stabilizing vanes or flaps 22, rigid against bending or deflection, and extending fore and aft the full width of the flotation surface. These vanes or flaps are perpendicular at their forward edges, and thence converge inwardly and rearwardly to conform to the converging lines of the lateral margins of the flotation surface, by which said vanes or flaps are caused to act as antiskidding devices, as well as air retainers to assist in confining the volume or column of air acting upon the flotation surface from escaping at the lateral margins of said surface, whereby further provision is made for securing the full supporting pressure of the air upon the flotation surfaces. It will thus be seen that the form and construction of the supporting surfaces and stabilizing vanes or flaps is such as to provide great lifting power, enabling the ship to be made comparatively heavy or to carry a comparatively heavy load without the necessity of attaining high speed in flight to overcome gravity.

Hinged or pivoted at its vertex, as at 23, to the head frame 13 is a vertically movable steering plane or rudder 24, curved both longitudinally and transversely and approximately of triangular form in plan. By means of this rudder or steering plane, the ship may be steered vertically, or caused to ascend and descend, and at the extreme of its upward movement it is adapted to conform to and constitute a continuation of the upper flotation surface 15, to close the space at the front of said surface when it is desired to convert said surface into a parachute for a safe descent as hereinafter described. Cords or cables 25 and 26 are connected with the rudder 24 and pass upwardly and downwardly, respectively, over guide pulleys or sheaves 27 and 28 back to the car or cabin 2, and are connected in practice with a suitable operating or controlling device (not shown) in said cabin or car, whereby said rudder may be readily and conveniently adjusted. A similar rudder or steering plane 29 is hinged or pivoted at its vertex to the rear portion of the flotation surface 15, as at 30, for movement in a vertical plane, and has connected therewith cords or cables 31 and 32 leading upwardly and downwardly, respectively, over guide pulleys or sheaves 33 and 34, and thence to a suitable operating or controlling device (not shown) in the car or cabin, whereby said plane 29 may be adjusted. Normally the plane 29 forms a part of the flotation surface 15, and operates as a stabilizing tail, while the plane 24 is employed for steering purposes, but in the event of derangement of the plane 24 or of its controlling devices the plane 29 may be employed for steering purposes in an obvious manner. If at any time when the ship is in flight the motive power should fail, or it should become necessary from any cause to bring the ship easily and safely to the ground, by adjusting the plane 24 to the limit of its upward movement and tilting the plane 29 down to the dotted line position shown in Fig. 4, the upper supporting surface 15 will be converted into a substantially inverted saucer-shaped parachute, which will retain the air sufficient for a supporting action as the ship slowly descends, thus insuring its easy descent to the ground without damage.

Mounted upon the main frame between the two flotation surfaces 15 and 16, on opposite sides of the longitudinal center of the ship are propellers 34 and 35 carried by longitudinally extending shafts 36 and 37, each provided with a pulley 38, connected by ropes, belts or chains 39 and 40 with pulleys upon the shafts of motors 41 and 42 arranged within the cabin or car 2 on opposite sides of the longitudinal center of the ship. Each propeller comprises a suitable hub 43, a rim 44, and a series of blades 45 extending between and detachably connected with the hub and rim, the construction being such as to secure great strength and rigidity, with a high degree of propulsive action. The belts 39 and 40 are arranged in crossed relation, so that the right hand driving propeller 34 will be driven from the left hand motor 41, said propellers being driven in reverse directions and connected with the motors in the manner described in order that the side thrust of each will be counteracted by the other, to maintain the stability of the ship

and further provide for its propulsion in a straight line. If desired, a third propeller 46 of the type described may be arranged in the central longitudinal line of travel of the ship in rear of the car or cabin 2 so that its propulsive action will compensate for the resistance to propulsion offered by said car or cabin. This propeller 46 is mounted upon a longitudinally extending shaft 47, which may be driven from either one or both of the motors 41 and 42, or from a third motor, as desired. The ship may be turned or steered horizontally to the right or left by means of the propellers 34 and 35, through a reduction in the speed of either relative to that of the other, as will be readily understood, or a vertical rudder of any suitable form and type may be suitably arranged upon the ship for such purpose.

From the foregoing description, taken in connection with the drawings, the construction and mode of operation of my improved airship will be readily understood and it will be seen that the invention provides an airship having great lifting power and possessing the advantages hereinbefore enumerated, and which provides for the conversion of the upper supporting surface into a parachute, to enable a safe landing to be made whenever the motive fails or it is desired to make a straight descent in a secure manner.

Having thus described the invention, what I claim as new is:

1. An airship comprising a suitable frame structure, a supporting surface carried thereby, wings hinged or pivoted to swing downwardly to a vertical position and upwardly to a substantially horizontal position, launching and landing gear carried by said wings, and means for holding the wings in the first-named position.

2. An airship comprising a suitable frame structure, a supporting surface carried thereby, wings hinged or pivoted to tilt vertically below the frame structure upwardly to a substantially horizontal position, launching and landing gear carried by said wings, a controlling device, and connections between said controlling device and the wings, whereby said wings may be held in vertical position or released for upward movement.

3. An airship comprising a suitable frame structure, a supporting surface carried thereby, wings hinged or pivoted to the frame structure for movement to a substantially vertical position beneath the frame structure and to a substantially horizontal position, launching and landing gear carried by said wings, a controlling device on the frame including a shaft provided with crank arms, and cables connecting said arms with the wings, whereby said wings may be held in a vertical position or released for upward movement.

4. An airship including a frame, a supporting surface curved downwardly and rearwardly in a fore and aft direction and arched in a lateral direction, depending stabilizing vanes or flaps at the limital margins of said surface, a coaming rail around the front and side edges of said surface, longitudinal ribs upon the top of the surface, and steering and stabilizing planes at the front and rear of the frame adjustable into and out of the plane of said surface.

5. An airship including a frame, a supporting surface curved downwardly and rearwardly in a fore and aft direction and arched transversely, depending stabilizing vanes or flaps at the lateral margins of said surface, longitudinal ribs or vanes on the upper side of said surface, a coaming rail secured to the ribs and extending around the front and sides of said surface, steering and stabilizing planes mounted to swing vertically at the front and rear of said surface and into and out of the plane thereof, and means for adjusting said steering and stabilizing planes.

6. An airship including a frame, upper and lower flotation surfaces curved downwardly and rearwardly in a fore and aft direction and arched transversely, depending stabilizing vanes or flaps at the lateral margins of said surfaces, coaming rails around the front and side edges of said surfaces, steering ring and stabilizing planes pivotally mounted upon the frame to swing into and out of the plane of the upper flotation surface and curved to conform to the curvature thereof, and means for adjusting said steering and stabilizing planes.

7. An airship including a frame, a car or cabin mounted thereon, upper and lower flotation surfaces curved downwardly and rearwardly in a fore and aft direction and arched transversely, depending stabilizing vanes or flaps at the lateral margins of said surfaces, propellers arranged between the surfaces on opposite sides of the longitudinal center of the ship, a propeller mounted upon the frame in rear of the car or cabin, steering and stabilizing planes at the front and rear of the frame curved to conform to the flotation surfaces and movable into and out of the plane thereof, and means for adjusting said steering and stabilizing planes.

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

JOEL N. THOMPSON.

Witnesses:
W. C. NEWSUM,
CLAY DANNER.