

J. T. RICE.

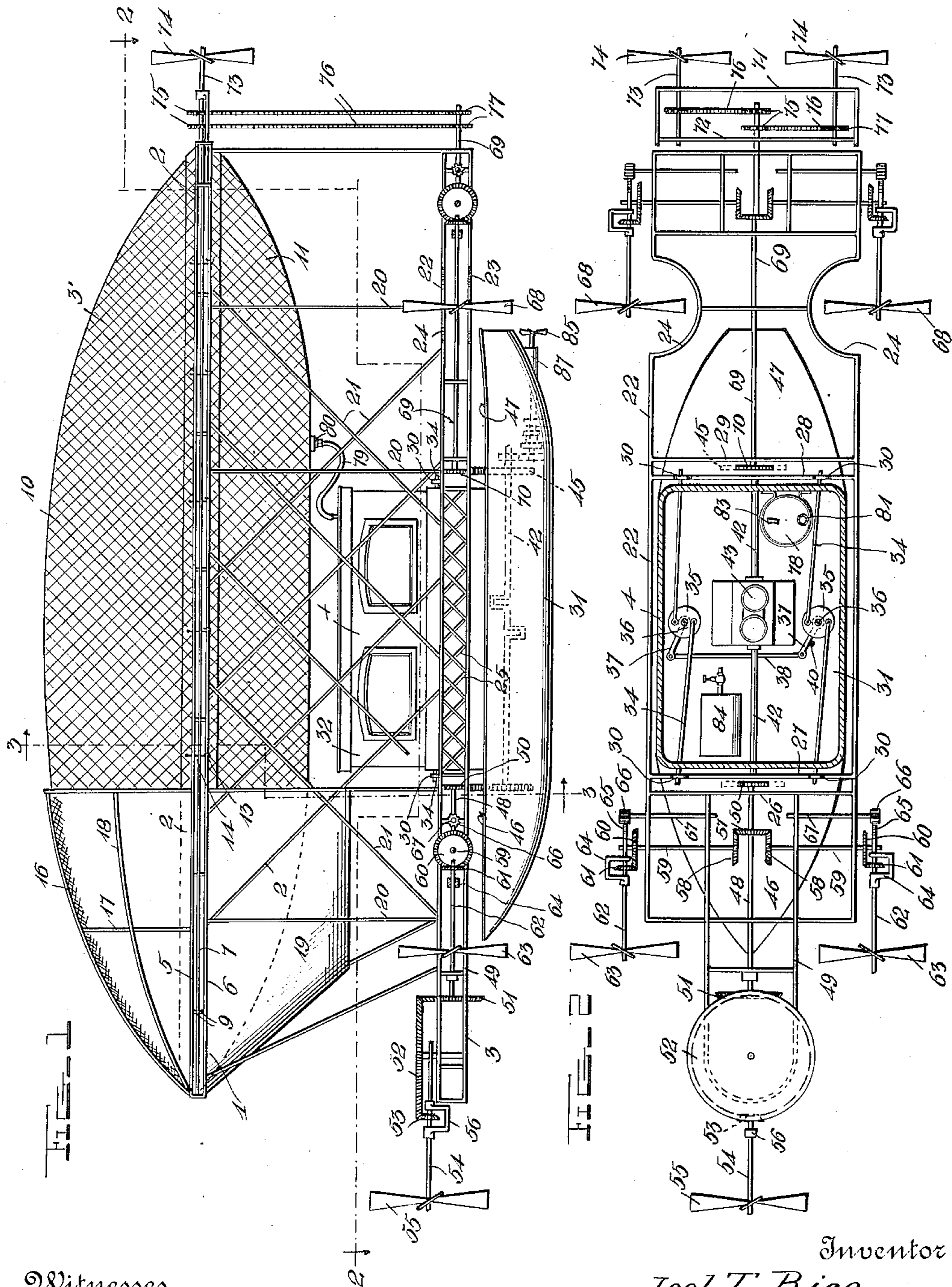
AIR SHIP.

APPLICATION FILED JAN. 30, 1908.

Patented Mar. 9, 1909.

2 SHEETS—SHEET 1.

914,511.



Witnesses

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Inventor

Joel T. Rice

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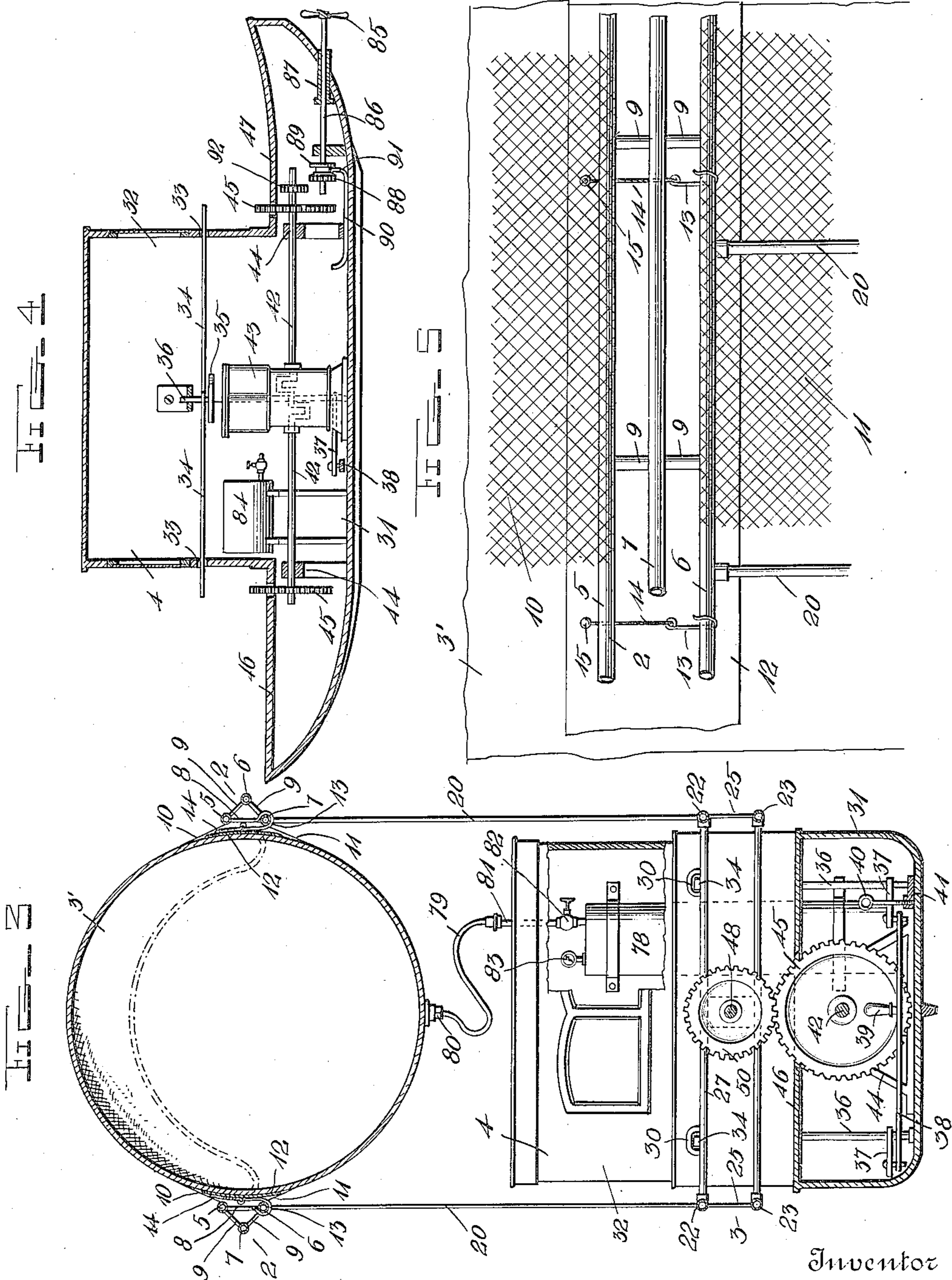
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UNITED STATES PATENT OFFICE.

JOEL T. RICE, OF HOT SPRINGS, ARKANSAS.

AIR-SHIP.

No. 914,511.

Specification of Letters Patent.

Patented March 9, 1909.

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To all whom it may concern:

Be it known that I, JOEL TROUT RICE, a citizen of the United States, residing at Hot Springs, in the county of Garland and State of Arkansas, have invented certain new and useful Improvements in Air-Ships; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to air ships and has for its object to provide an air ship having special means by which the car thereof may be quickly released from the balloon part in case of accident.

Another object is to provide a specially constructed air ship having the balloon and the upper and lower coverings therefor so constructed that when the balloon is deflated, the lower part thereof will nest upwardly in the upper part thereof, forming a parachute by which the air ship is prevented from descending too rapidly.

For these and other objects which will appear as the description proceeds, my invention consists of certain novel arrangements and combination of parts of which the herein described air ship is one of many possible embodiments.

While herein I have described minute details, I do not limit myself to these, as the details of arrangements and parts may be greatly varied without departing from the spirit and scope of the invention.

In the annexed drawings forming part of this specification, which are for illustrative purposes only, and, therefore, not drawn to any particular scale, and in which like reference characters represent like parts throughout the several views, Figure 1 is a side elevation of the air ship; Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a longitudinal sectional view of the car of the air ship; and Fig. 5 is an enlarged view showing a portion of the upper section of the frame.

The herein described embodiment of my air ship comprises a frame 1, having an upper section, 2, and a lower section, 3, to which frame is attached the balloon, 3', and the car, 4. The upper section, 2, comprises upper, lower and outside members, 5, 6 and 7, passing entirely around the balloon, 3', and closely fitting around the same. The sections, 5, 6 and 7, are held in spaced relation

as shown in Fig. 3 by means of vertical and diagonal braces, 8 and 9.

The balloon, as stated, lies within the frame, 2, and is held in place by means of upper and lower netting, 10 and 11, wrapped around the upper and lower members, 5 and 6, of the upper frame section, 2. To protect the balloon 3' from wear which might be occasioned by rubbing against the frame members 5 and 6 I provide a canvas belt, 12, which extends horizontally entirely around the balloon and is fastened to the lower member, 6, by means of hooks, 13, as shown in Fig. 5, said hooks being secured to a cord or the like, 14, securely riveted, as at 15, to the belt, 12; the parts, 12 to 15 also serve to hold the upper and lower parts of the balloon, 3, in place when said parts are serving as a parachute.

The upper forward end of the balloon is provided with a shield, 16, held in the shape shown in Fig. 1 by means of parallel and meridian braces, 17 and 18. The lower forward end of said balloon is provided with a lower shield, 19, said shield serving to relieve the balloon of the wind-pressure on the forward end thereof when the same is in motion.

The lower frame section, 3, is secured to the upper section, 2, by means of vertical and diagonal braces, 20 and 21. The lower section, 3, comprises upper and lower parallel spaced members, 22 and 23, forming a rectangular frame, but being bent inwardly as at 24, for a purpose which will hereinafter appear. The mid portions of said members, 22 and 23, are provided with diagonal braces, or struts, 25, to strengthen the same. Considerably removed from the middle point thereof the opposite upper members are connected by four cross bars, an outer forward cross bar, 26, an inner forward cross bar, 27, an inner rear cross bar, 28, and an outer rear cross bar, 29. The bars, 27 and 28 are provided near each end with upwardly projecting closed U-shaped pieces, 30, for a purpose which will hereinafter appear.

The car, 4, comprises a lower portion which forms the hull of a boat, 31, and an upper portion forming a cabin, 32. The cabin, 32, is provided at each end with openings, 33, which are disposed to register with the U-shaped pieces, 30, when the car, 4, is in operative relation with the frame section, 3. Projecting from said cabin and passing through said openings, 33, and said U-shaped

pieces, 30, and to near the middle point of each side of said cabin are the locking bolts, 34. The inner ends of said locking bolts are pivoted to rotatable disks, 35, mounted for rotation with vertical shafts, 36, the upper and lower ends of which shafts are secured to the sides of said cabin. Rigidly secured to each of said shafts are the projecting cranks, 37, connected to each other by means of a cross bar, 38, provided with a handle, 39. The cross bar, 38, and the cranks, 37, are disposed near the bottom of the boat and may be covered if desired.

It will be seen on reference to Fig. 2 that if the bar, 38, be moved to the left, that the bolts, 34, will all be withdrawn from the U-shaped pieces, 30, whereby the car, 4, may be dropped from the air ship, or the upper part of the air ship may be allowed to ascend, leaving the car, 4, behind. A pin, 40, may be placed in a suitable recess, 41, to bear against the crank, 37, to hold the same in the position shown in Fig. 2, lest the car, 4, should be suddenly released from the frame, 3.

Extending longitudinally centrally of the boat, 31, is a main shaft, 42, which is rotated by a gasoline engine, 43, or any source of power desired. The forward and rear ends of the shaft, 42, are provided with suitable bearings, 44, and gear wheels, 45, said gear wheels projecting upwardly through the decks, 46, 47. Centrally longitudinally mounted in the forward end of the frame section, 3, is the forward central shaft, 48, rotatably mounted in suitable bearings fastened to the outer forward cross bar, 26, and the forward end pieces, 49. The rear end of the shaft, 48, is provided with a gear wheel, 50, adapted to intermesh with the forward gear wheel, 45. The forward end of the shaft, 48, is provided with a bevel gear, 51, adapted to intermesh with a horizontal bevel gear, 52, which is in turn adapted to intermesh with a smaller bevel gear, 53, rigidly secured to a propeller shaft, 54, carrying the forward propeller, 55. The shaft, 54, is supported by a horizontally movable pivoted supporting member, 56, all of said parts being supported by the forwardly projection portion of the supporting frame section 3, forming a part of the frame 1. The part, 56, may be pivotally adjusted from side to side to guide the air ship in a horizontal direction. Intermediate the ends of the shaft 48, is the intermediate bevel gear, 57, adapted to intermesh with the bevel gears, 58, rigidly secured to the laterally projecting shafts, 59, secured to suitable bearings fastened to the side members, 22 and 23, and the frame, 56. The outer ends of the shafts, 59, are provided with bevel gears, 60, intermeshing with smaller bevel gears, 61, rigidly secured to the side propeller shafts, 62, to which are fastened the

propellers, 63. The shafts, 62, are rotatably mounted in the bearing supports, 64, pivoted upon the shafts, 59, to move in a longitudinal vertical plane, whereby the air ship may be guided vertically. The rear ends of the supports, 64, are provided with segmental racks, 65, adapted to be moved by pinions, 66, carried on the shaft, 67, when said last named shaft is rotated. The cooperating parts of the propellers, 55 and 63 are shown in my former United States patent, No. 704,375, and for this reason are not further described. The frame section, 3, is provided with rear side propellers, 68, adapted for rotation in the space around which members, 22 and 23, are bent at 24. The propellers, 68, are operated and adjusted by mechanism exactly similar to that for operating the propellers, 63, and receive their power from the rear longitudinal shaft, 69, provided with an end gear, 70, adapted to intermesh with the rear gear, 45. The upper frame section, 2, is provided at its rear end with an end cross piece, 71, and a cross piece, 72, spaced parallel with the cross piece, 71. Rotatably mounted in suitable bearings fastened near the ends of said last-named cross pieces, are the upper propeller shafts, 73, provided with propellers, 74, and intermediate sprocket wheels, 75, rotatably connected by means of sprocket chains, 76, with sprocket wheels, 77, at the rear end of the shaft, 69.

It will be noticed that when the car, 4, is in the position shown in Fig. 1, that the gear wheels, 45, will intermesh with the gear wheels, 50, and 70, but in such manner that when the car, 4, is released from the frame 1, that the gear wheels, 45, 50 and 70, easily disengage from each other.

If desired, I may provide in the car, 4, a tank, 78, in which may be stored compressed or liquefied hydrogen, or other gases, with which to charge the balloon. The same is connected with the balloon by means of tubes, 79, suitably fastened to the lower part of the balloon, as at 80, and secured to the pipe, 81, in any well known manner, said pipe communicating with the tank, 78, and being provided with a valve, 82, by which the flow of hydrogen from the tank is controlled. The tank, 78, may also be provided with a pressure gage, 83.

The car, 4, may be so arranged that when desired it can be made air tight, and I may provide therein a storage tank, 84, in which may be stored oxygen for the occupants of the car when the air ship rises to heights where the air is too rare to support respiration.

The boat, 31, is provided with an ordinary rear propeller, 85, mounted to rotate with the shaft, 86, on the bearing, 87. Slidably secured on the forward end of the shaft, 86, but constrained to rotate therewith, is the gear,

88, provided with a rear grooved extension, 89. An actuating piece, 90, is longitudinally slidably mounted in the bottom of the boat, 31, the rear end thereof being provided with an encircling piece, 91, adapted to fit in the groove of the extension, 89, said piece, 90, serving to slide said gear, 88, in or out of gear with a smaller gear, 92, rigidly secured to the rear end of the shaft, 42. When the engine is used to propel the air ship, the propeller, 85, is allowed to remain at rest by throwing said gears out of mesh.

If the balloon, 3, should through accident become suddenly deflated before the air ship has time to descend while it is supported by the gas in the balloon, the air pressure on the lower part of the balloon will force the same upwardly to nest in the upper part, thus forming a downwardly convexed portion which serves as a parachute to cause the air ship to descend slowly enough not to be damaged when it lights.

As described, the lower part of the car, 4, comprises a boat, and the whole car is provided with means whereby the car can be suddenly detached from the balloon in case of accident and then can be propelled as desired by means of the propeller, 85.

It is thought that the operation and advantages of my air ship will be understood without further explanation.

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

1. In an air ship a supporting frame, a balloon secured to said frame, means to protect the balloon from being worn by contact with the frame, a floatable car, connecting devices to secure said car to the frame, and means whereby said devices are operated to disconnect the car from the frame, substantially as described.

2. In an air ship, a supporting frame comprising an upper balloon attaching section and a lower car attaching section, means to attach said balloon to the upper section of the frame, a protecting belt around said balloon, a floatable car in the lower section of said frame, connecting devices to secure said car to said section of the frame, means whereby said connecting devices are operated to disconnect the car from the frame, and means whereby said car may be propelled in the water, substantially as described.

3. In an air ship, a supporting frame comprising an upper balloon attaching section and a lower car attaching section, braces arranged between and connecting said sections of the frame, a balloon in said upper frame section, a protecting belt around said balloon, flexible fastening devices adapted to secure said balloon in said upper section of the frame, a floatable boat-shaped car in said lower section of the frame, connecting devices arranged in said car and adapted to be

engaged with said lower section of the frame, whereby the car is detachably secured thereto, means to operate said connecting devices to detach the boat from the frame, a propeller to drive said car when floating in the water, and a series of propellers to drive and steer said ship when in the air, substantially as described.

4. In an air ship, a supporting frame comprising an upper balloon attaching section and a lower car attaching section, brace rods arranged between and connecting said upper and lower frame sections, a balloon in said upper section of the frame, means to protect the balloon from wear by contact with the frame, a wind shield to cover the forward end of said balloon, upper and lower netting sections secured to the upper portion of the frame and arranged around said balloon, a floatable car in the lower section of the frame, and means to detachably connect said car to the frame, substantially as described.

5. In an air ship, a supporting frame comprising an upper balloon attaching section and a lower car attaching section, said upper frame section comprising spaced parallel members, a balloon arranged in said upper section, a flexible protecting belt arranged on the balloon, balloon attaching cords secured to said belt, hooks arranged on the free ends of said cords and adapted to be engaged with one of said parallel members of the upper frame section whereby said balloon is fastened to said section, and upper and lower netting sections arranged around said balloon and fastened to said frame section, substantially as described.

6. In an air ship, a supporting frame comprising an upper balloon attaching section and a lower car attaching section, brace rods to secure said sections together in operative position, a balloon in said upper section of the frame, a floatable car in said lower frame section, slidably mounted connecting bolts arranged in said car and adapted to be projected into and out of engagement with the lower sections of said frame whereby said car is detachably secured thereto, bolt-operating shafts, disks mounted on said shafts and operatively connected to said bolts, operating cranks connected to said shafts, means to connect said cranks whereby they are operated in unison to simultaneously retract said bolts and thereby disconnect said car from the frame, and means to propel the car in water when disconnected from the frame, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOEL T. RICE.

Witnesses:

BENJ. G. COWL,

D. M. KILPATRICK.