C. V. JOHNSON.

AIRSHIP.

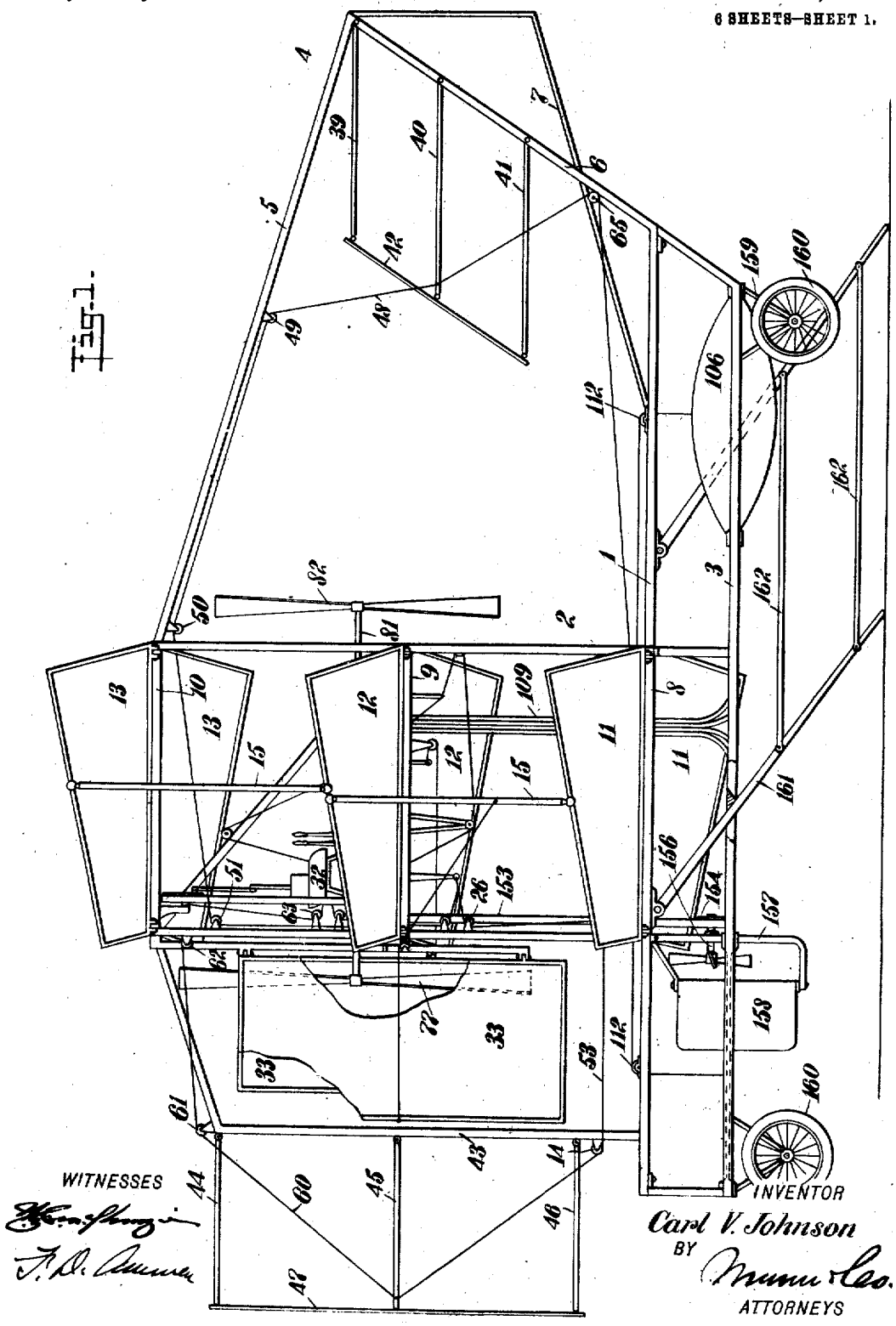
APPLICATION FILED OCT. 2, 1909.

1,005,646.

Patented Oct. 10, 1911.

6 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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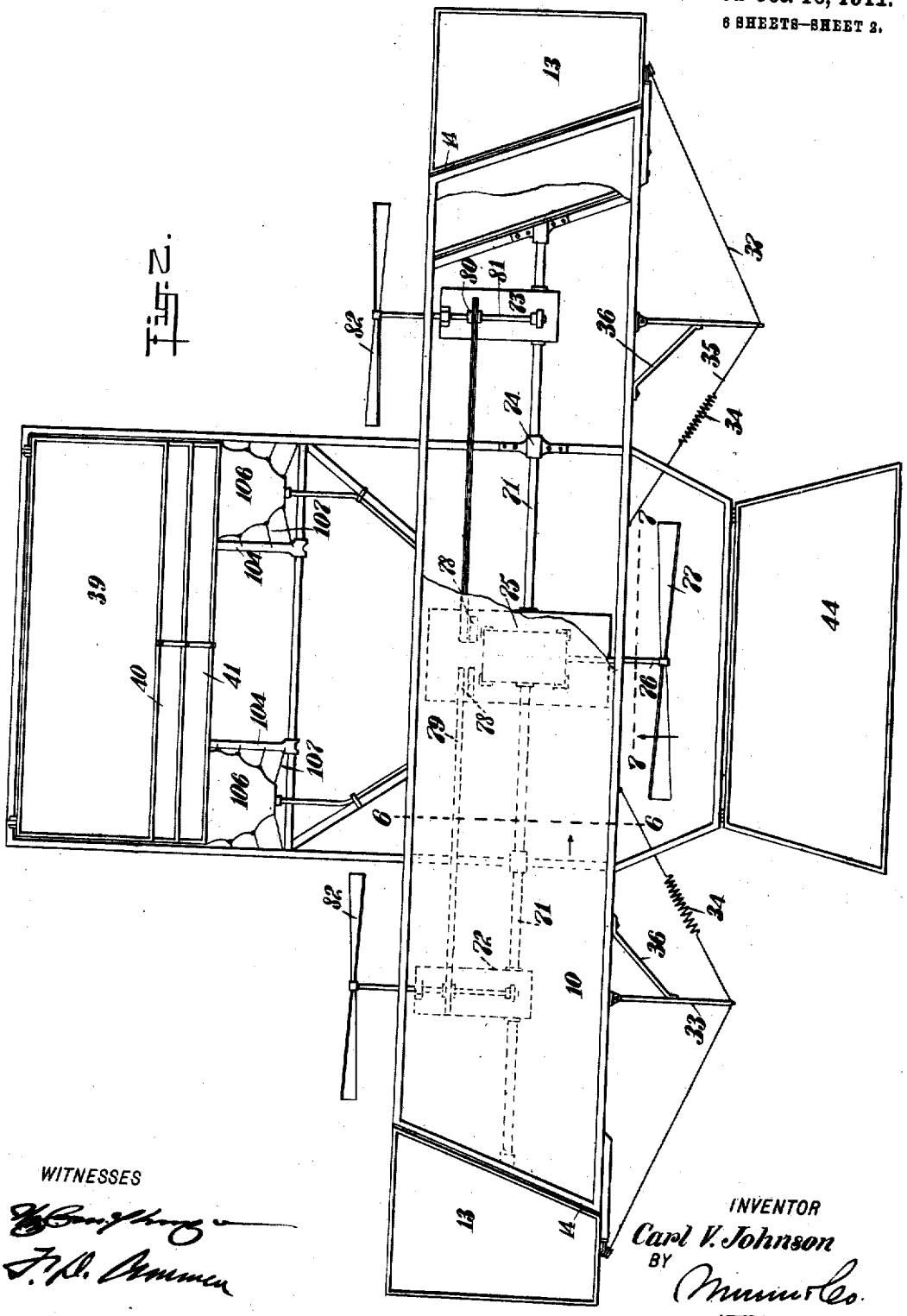
6 SHEETS—SHEET 2.

Fig. 2.



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6 SHEETS—SHEET 3.

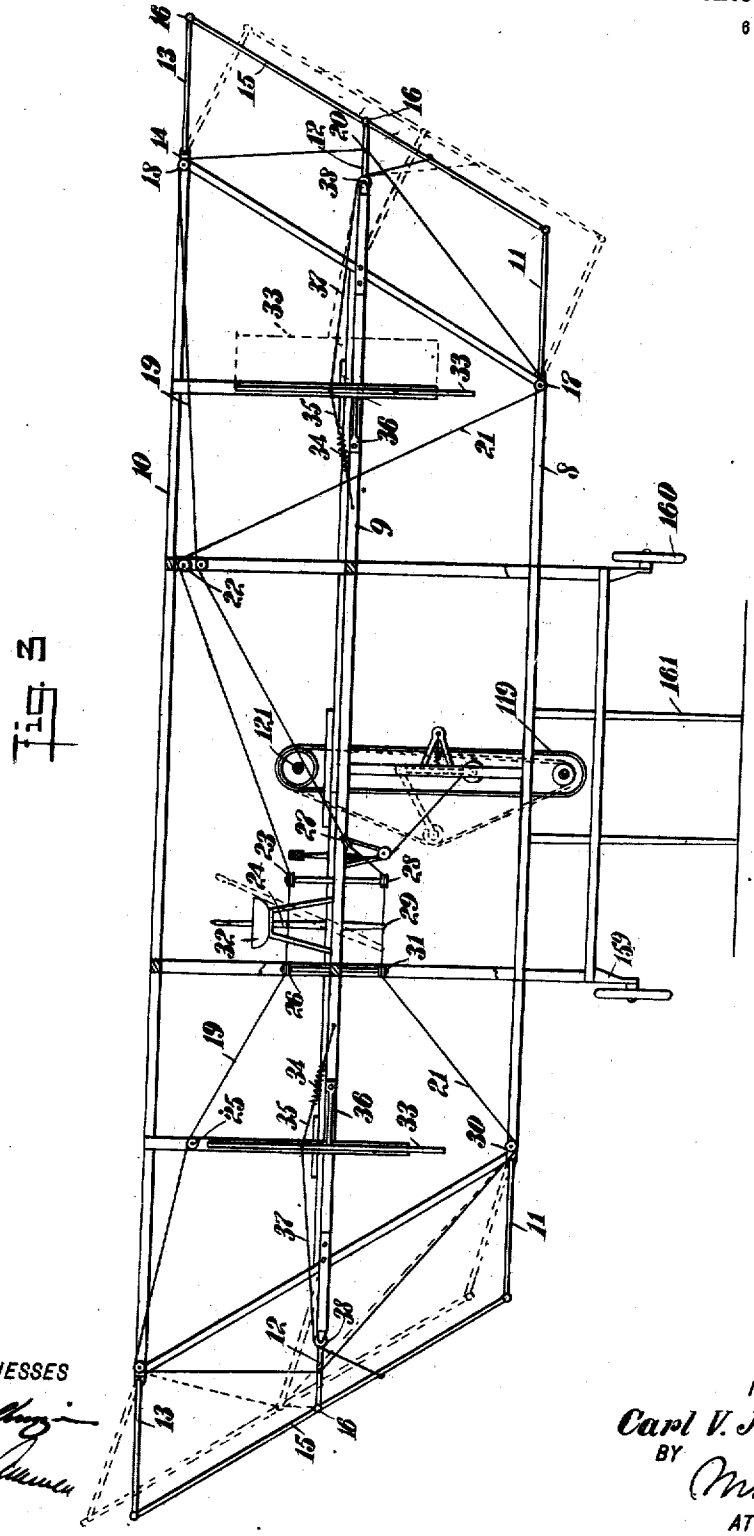

Fig. 3.

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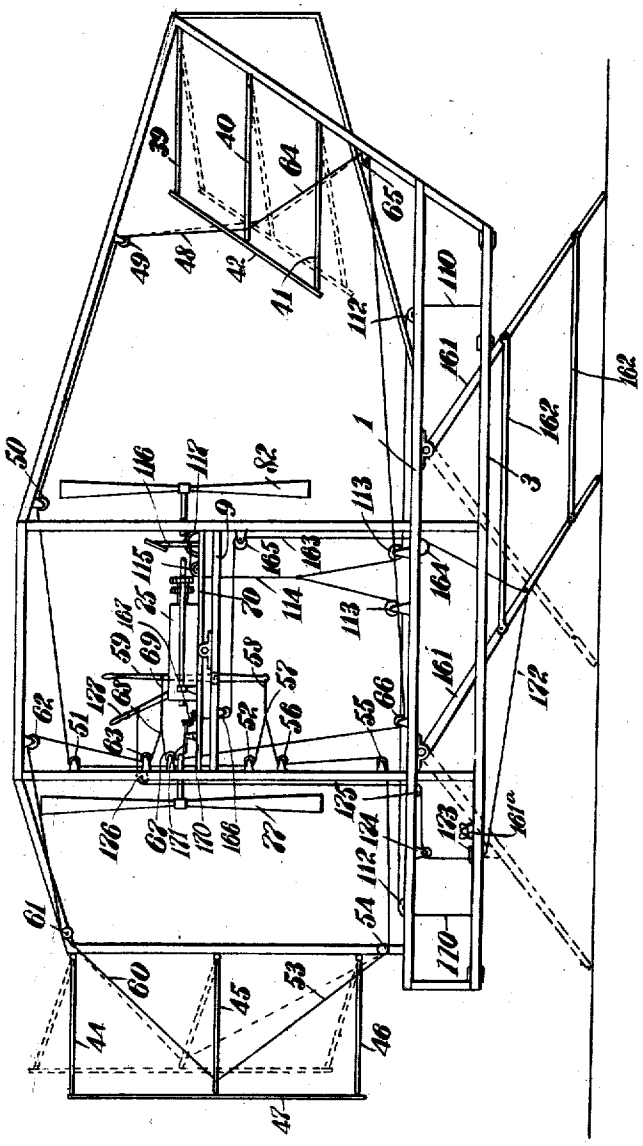
6 SHEETS—SHEET 4.

Fig. 4



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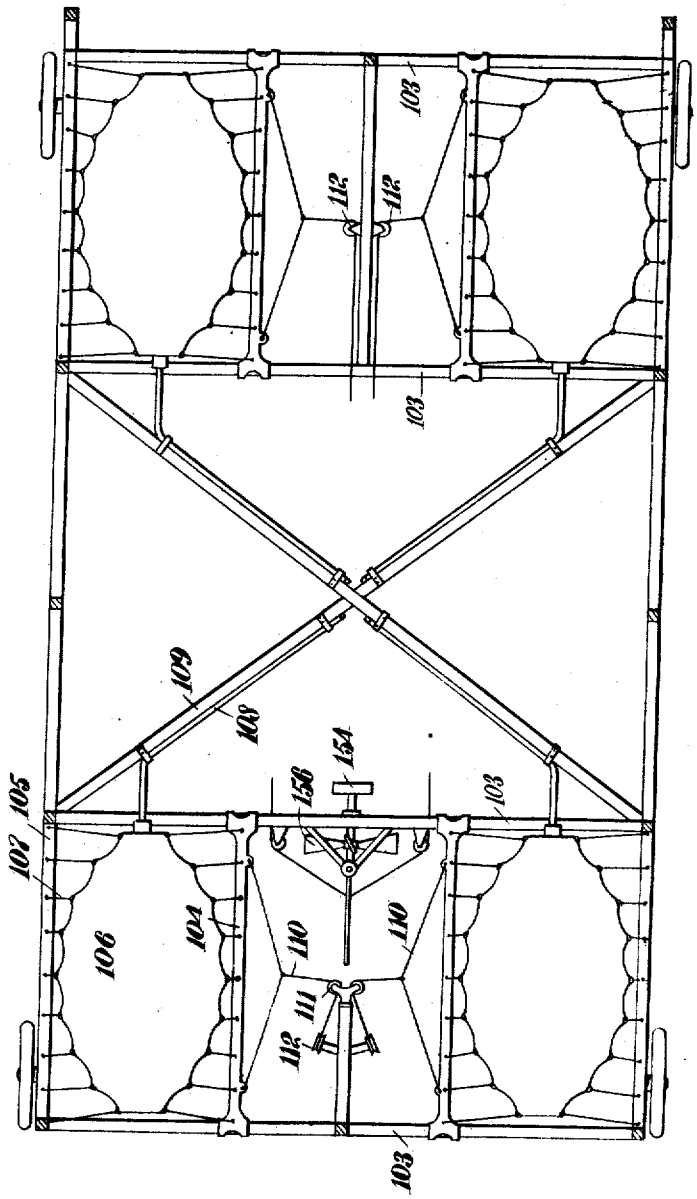
6 SHEETS—SHEET 6.

Fig. 6.



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6 SHEETS—SHEET 6.

Fig. 6.

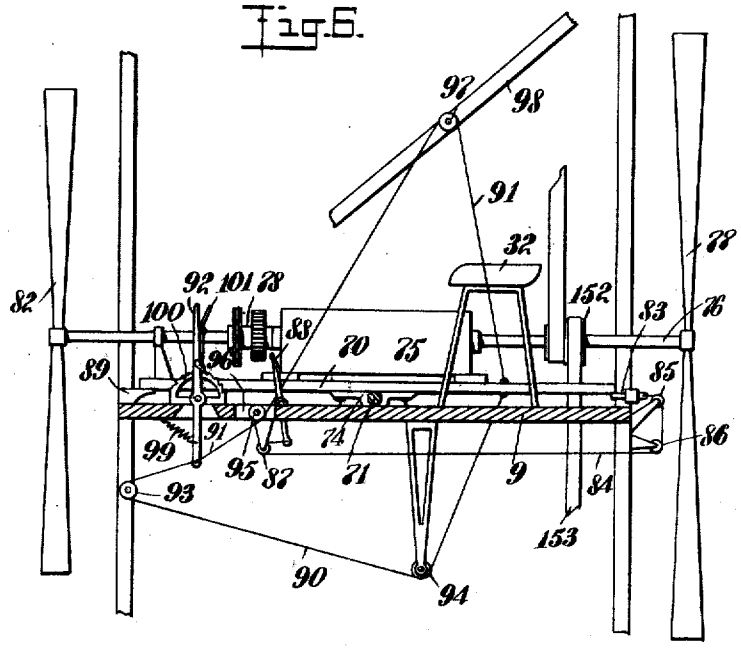


Fig. 7.

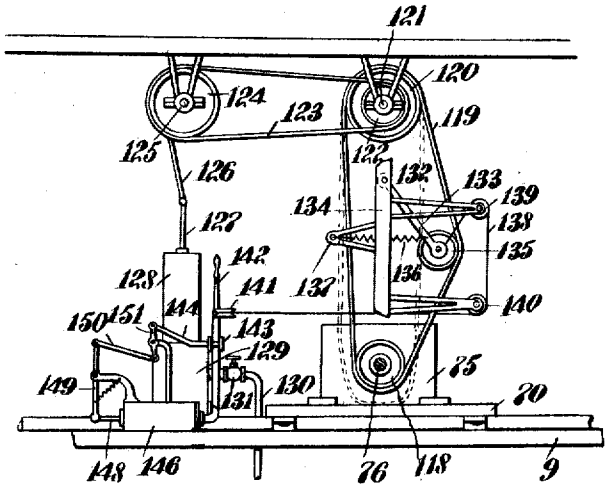
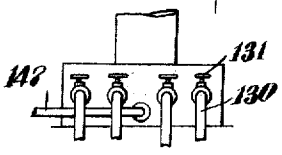


Fig. 8.



WITNESSES

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ATTORNEYS

UNITED STATES PATENT OFFICE.

CARL V. JOHNSON, OF GOLDFIELD, NEVADA.

AIRSHIP.

1,005,646. Specification of Letters Patent. Patented Oct. 10, 1911.

Application filed October 2, 1909. Serial No. 520,620.

To all whom it may concern:

Be it known that I, CARL V. JOHNSON, a citizen of the United States, and a resident of Goldfield, in the county of Esmeralda and State of Nevada, have invented a new and Improved Airship, of which the following is a full, clear, and exact description.

This invention relates to air ships of the heavier-than-air type, and an object of the invention is to produce an air ship having an improved construction rendering it easily manageable, having improved means for maintaining its equilibrium, and for directing the course of the air ship.

A further object of the invention is to provide an arrangement whereby the air ship can float and be propelled in water in case it should alight upon that medium.

A still further object of the invention is to improve the means for facilitating the launching of the air ship into the air.

A special feature of the invention is the floats by means of which the ship is kept afloat when in the water. These floats are collapsible, and when not in use as floats they are maintained in a stretched condition so as to act as supporting planes.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of an air ship constructed according to my invention, certain parts being broken away; Fig. 2 is a plan of the air ship shown in Fig. 1, certain parts being broken away; Fig. 3 is a rear elevation of the air ship; Fig. 4 is a side elevation of the air ship showing details of the operating mechanism for the forward and rear balance planes; Fig. 5 is a plan of the bottom frame of the ship, and showing the floats in a collapsed condition; Fig. 6 is a vertical section on the line 6—6 of Fig. 2 and upon an enlarged scale, certain parts being broken away, this view being presented so as to illustrate particularly the manner in which the propellers may be tilted so as to assist in raising the ship from the earth, or in rising to a higher elevation; Fig. 7 is a detail elevation showing parts of the frame and illustrating an automatic mechanism for filling the floats or air reservoirs with air, this view being considered as a section on the line 7—7 of Fig. 2; and Fig. 8 is a detail of a receiver connected with the compressor and from which the air reservoirs or floats are charged.

Referring more particularly to the parts, and especially to Figs. 1, 2, and 3, the ship comprises a main frame 1, which is disposed horizontally, and above which a super-frame 2 is secured. Below the frame 1, a lower frame 3 is secured. The super-frame 2 extends forwardly so as to form a rudimentary bow 4, comprising an upper bar 5 and a lower bar 6, which bars are connected at an angle, as indicated. The forward part of this bow is provided with a suitable angular brace frame 7, as shown. Near the middle portion of the super-frame I provide three planes 8, 9, and 10, which are disposed one above the other, as indicated. These planes are elongated in a transverse direction with respect to the front and rear line of the air ship. The lower plane 8 is of less length than the upper plane and the middle plane is midway between the other two planes, and its length is intermediate that of the upper plane and the lower plane. At the ends of the planes 8, 9, and 10, balance tips 11, 12, and 13, are attached by pivot connections or hinge connections 14. These balance tips are of greatest width at their forward end, as indicated in Fig. 2, so that the axis of the hinge joints on which they move is disposed in an inclined line, as indicated in Fig. 2. At their outer edges these tips 13 are connected by links 15 which are attached to the tips by universal connections 16, as shown. Near the ends of the planes 8 and 10, guide pulleys 17 and 18 are provided, as shown. Around the pulleys 18 cords 19 pass and the ends of these cords are attached at 20 to the intermediate tips 12. Similar cords 21 are provided which pass under the guide pulleys 17, and these cords also are attached at 20 to the middle tips. At the right side of the ship, as indicated in Fig. 3, the cords 19 and 21 are crossed so that the cord 21 passes upwardly over a

guide pulley 22, whence it passes downwardly around a suitable guide pulley 23, its end being attached to a lever 24, as shown. At the same point on the lever the cord 19 from the left is attached, this cord being suitably guided on guide pulleys 25 and 26, as shown. The cord 19 from the right side of the ship passes downwardly in an inclined direction, and passes around guide pulleys 27 and 28, and its end is attached at 29 to the lower end of the lever 24 and on the opposite side of the fulcrum of this lever. At this point 29 the cord 21 from the left side of the ship is attached, said cord passing around suitable guide pulleys 30 and 31, as indicated. Near the lever 24, a seat 32 is provided for the operator. The lever 24 is adapted to be moved from side to side, as indicated by the dotted lines in Fig. 3. On account of the fact that the cords are crossed from one side of the ship to the other, it will be evident that when the lever is moved toward the right, as indicated in Fig. 3, the tips at the left side of the ship will be raised, whereas the tips at the right side will be lowered.

At about the height of the middle plane 9, and at the rear of the ship, a pair of rudders 33 are attached, both rudders being arranged at the same distance from the central axis of the ship. These rudders are normally held in a front and rear position by means of springs 34, the ends of which are attached to cords 35; the ends of the said cords being attached to the said rudders and tending to pull the rear edges thereof inwardly, as indicated. On the inner sides brackets or bracket stops 36 are provided, which limit the inward movement of the rudders and hold them in a front and rear position. The outer edges of the rudders 33 are connected with the tips 11, 12, and 13, so that when the tips are operated the rudders will also be operated. For this purpose I provide cords 37 which are attached to the rear edges of the rudders, and these cords extend outwardly and pass around guide pulleys 38 at the ends of the middle plane. From this point the cords extend downwardly and are attached to the lower links 15. From this arrangement, when the tips at the right side are depressed, as indicated in Fig. 3, the rudder at the right will be pulled toward the right, as indicated by the dotted lines in Fig. 3. It should be understood that by regulating these tips 11, 12, and 13, and the rudders 33, the lateral balance of the air ship may be nicely controlled.

In order to balance the ship in a front and rear direction, in the bow 4 I provide three balance planes 39, 40, and 41, which are all pivotally attached at their forward edges between the forward bars 6 of the bow. These planes 39, 40, and 41, are parallel with each other and their rear edges are connected by a link 42. On account of the inclined position of the bars 6, it will be noted that these planes 39, 40 and 41 are arranged progressively in an advanced position in an upward direction, that is, the uppermost plane is the most advanced of all, while the lowest plane is disposed farthest to the rear. These planes have the same area. The rear portion of the superframe 2 presents standards 43 to which balance planes 44, 45, and 46 are attached. These planes are arranged vertically one above the other. They are of equal area and their free edges are connected by a link or bar 47.

Referring now especially to Fig. 4, the means for controlling these balance planes will be described: Near the rear end of the middle plane 40 a cord 48 is attached, which passes upwardly around guide pulleys 49, 50, and 51, from whence it passes downwardly around a guide pulley 52, as shown.

A similar cord 53 is attached near the rear end of the balance plane 45, and this cord passes downwardly around guide pulleys 54, 55, and 56. This cord is attached at 57 to the cord 48, and both of these cords form branches from a lower cord 58 which is attached to the lower end of an auxiliary balance lever 59, which is movable in a front and rear direction for controlling the front and rear equilibrium of the ship. To the middle plane 45 an upper cord 60 is attached, which passes upwardly around guide pulleys 61 and 62, whence it passes downwardly around a guide pulley 63. A similar lower cord 64 is attached to the middle plane 40 and passes downwardly around guide pulleys 65 and 66, whence it passes to a guide pulley 67, beyond which it connects with the cord 60 at 68. These cords unite to form a main or upper cord 69 which is attached to the upper end of the lever 59. From this arrangement it will be evident that when the lever 59 is moved toward the front the rear balance planes 44, 45, and 46 will be raised, while the forward balance planes will be depressed, as indicated in dotted lines. If the lever is moved in an opposite direction, an opposite effect in the balance planes is produced.

Referring now to Fig. 6, the driving mechanism for the ship will be described, and also the peculiar manner in which the driving mechanism is mounted: Referring to Figs. 1 and 2, in connection with Fig. 6, the middle plane 9 is provided near its middle point with a platform 70, which platform is rigidly attached on a rock shaft 71 which passes transversely of the ship and longitudinally of the plane 9. This shaft is mounted to rotate on the upper side of the plane and in addition to the platform 70, it has rigidly attached to it auxiliary

platforms 72 and 73. The plane is provided with suitable bearings 74 for this shaft. On the main platform 70, a motor 75 is mounted, and from the rear side of this motor a center shaft 76 extends rearwardly and projects so as to receive a main propeller wheel or center wheel 77. At the forward end of the motor 75, auxiliary shafts are provided which carry sprocket wheels 78, and these sprocket wheels are provided with chains 79 which extend in opposite directions, passing around similar sprocket wheels 80 which are attached to auxiliary shafts 81 mounted on the platforms 72, 73. These auxiliary shafts project forwardly and their forward ends are provided with propeller wheels 82, as shown. From this arrangement it should be understood that if the main platform 70 is tilted, the auxiliary platforms 72, 73 will also be tilted. These platforms may be tilted so as to incline the shafts so that the wheels will have a lifting effect upon the frame of the ship. As illustrated in Fig. 6, the rear edge of the platform 70 is normally supported on a latch or draw bolt 83, which bolt is adapted to be withdrawn by means of a latch cord 84 which passes around suitable guide pulleys 85, 86, and 87, the other end of the cord being attached to the lower arm of a foot lever 88, as indicated. The forward edge of the platform 70 is normally supported on a fixed bracket 89. After the platform has been unlatched in this manner it may be tilted to any desired angle by means of a pair of cords 90 and 91, the former of which passes from the lower end of a tilting lever 92 around guide pulleys 93 and 94, the other end of the cord being attached to the under side of the platform toward the rear. The cord 91 is also attached to the lever 92 near the same point, and passes upwardly around a guide pulley 95 arranged in an opening 96 in the platform. From this point it passes upwardly around a guide pulley 97 mounted on a fixed bar 98 of the frame. From the pulley 97 the cord passes downwardly and is attached to the upper side of the platform 70 opposite to the point of attachment of the cord 90. The lever 92 is provided with a spring 99 which tends to swing the lever back and return the platform 70 to its normal position. The lever 92 is mounted on a ratchet segment or quadrant 100, and it is provided with locking mechanism 101 for locking the lever in any adjusted position. In this way the platform 70 can be locked in any inclined position desired.

I shall now describe the means for floating the air ship in case it alights in water. In this connection, referring especially to Figs. 1 and 5, in the under frame 3, four cross bars 103 are provided, and on these cross bars, cross heads 104 are mounted to slide transversely of the ship. Between these cross heads 104 and the side bars 105 of the under frame, collapsible bags 106 are provided. The edges of these bags are connected by cords 107 with the cross heads 104 and the side bars 105, so that when the cross heads 104 are moved inwardly, the bags will be maintained in a stretched or extended condition. These bags are made of suitable air-proof material and are adapted to be inflated with air which is led into them through hose 108. Each of these hose is guided inwardly on diagonal bars 109 to a central point, whence they all pass upwardly to an air reservoir, which will be described more fully hereinafter. I provide means for pulling the cross heads 104 inwardly so as to stretch the bags 106. For this purpose I attach cords 110 to the cross heads and these cords are guided inwardly, passing around guide pulleys 111 and 112 mounted on the frame. From the pulleys 112 these cords pass toward each other along the frame, passing around suitable guide pulleys 113, as indicated in Fig. 4. Beyond the guide pulleys 113 these cords are united to a main cord 114 which passes upwardly to the main platform 70 where it passes around a guide pulley 115, its ends being attached to a foot lever 116. From this arrangement, by operating the foot lever 116, and maintaining it locked to its segment 117, the bags will be maintained in a stretched condition. In this way they perform the function of planes when the ship is in the air. When the ship is to alight in the water they may be inflated, as suggested above, and will then constitute floats, which give the air ship buoyancy.

The mechanism for inflating the floats or bags 106 will now be described: Referring especially to Figs. 6 and 7, on the main shaft 76 of the engine, a belt pulley 118 is provided, around which a belt 119 passes upwardly, the upper end of the belt running on the pulley 120 of a countershaft 121. The countershaft 121 is further provided with a pulley 122, from which a belt 123 passes over to a pulley 124 on a second countershaft 125. This pulley 124 operates a pitman 126 which drives the piston 127 of an air compressor 128. The air from the compressor 128 passes into a reservoir or receiver 129, from which pipes 130 lead, said pipes being connected respectively with the air hose 108. These pipes 130 are provided with valves 131 for controlling the flow of air to the different bags. The belt 119 normally hangs loose, as indicated by the dotted lines in Fig. 7. One side of the belt is adapted to be stretched by means of a belt stretcher 132, said belt stretcher being in the form of an arm 133 which is pivotally attached to a frame bar 134. The lower end of this arm is provided with a pulley 135

which engages one side of the belt, as indicated. A spring 136 attached to this arm and attached to a bracket 137, tends to pull this arm inwardly so as to let the belt hang loose. A cord 138 is provided which passes around suitable guide pulleys 139 and 140, and one end of this cord is attached to the end of the arm 133, the other end of the cord passing around a guide pulley 141 and being attached to a lever 142. This lever is adapted to be moved between two parallel guide bars 143, and is held against return by means of a catch or bolt 144 which bridges the space between the bars 143, being guided to slide through the left-hand bar, as viewed in Fig. 7. With the reservoir 129, a regulator cylinder 146 is connected by a suitable pipe 147, and when the pressure reaches a predetermined amount, the plunger 148 of this cylinder will move outwardly. This plunger 148 is connected with a lever 149, the opposite arm of which is connected by a link 150 with a second lever 151, and the lever 151 is connected with the latch or catch 144. From this arrangement, when the bags 106 have become inflated with air at the proper pressure, the regulator cylinder 146 operates automatically to actuate the lever 149. This withdraws the latch 144 so as to release the lever 142. The spring 136 then operates to draw the arm 133 inwardly, and the belt 119 immediately becomes loose and the compressing of air stops. The valves 131 will then be closed so as to retain the air in the bags. In Fig. 1 the bags at the front of the air ship are represented as inflated, while those toward the rear are represented deflated.

I provide means for propelling the air ship through the water. For this purpose, on the main shaft 76 I provide a belt pulley 152, around which a belt 153 passes. This construction is shown in Fig. 6. The belt 153 passes downwardly, as indicated in Fig. 1, and passes around a belt pulley 154, attached to the forward end of a propeller shaft 156. This propeller shaft 156 is mounted in a frame 157 which is attached in the under frame 3, as indicated. In the rear part of the frame 157 a water rudder 158 is mounted, which may be controlled by any suitable means, not shown.

I shall now describe the means for launching the airship into the air. Referring especially to Figs. 1 and 4, in the under side of the underframe 3, wheel forks 159 are provided, each of which carries a wheel 160, so that four wheels are provided, which may support the air ship on a level track or field. On the under side of the upper frame, four legs 161 are pivotally attached. These legs normally incline forwardly, as indicated in Fig. 1, the legs on the same side of the central axis of the machine being connected by horizontal links 162. As shown in Fig. 1, the lower ends of the legs extend below the lower faces of the wheels. When the ship is to be launched into the air the legs extend forwardly in an inclined position, as indicated, and the propellers are adjusted and driven, so that they exert an upward and forward thrust upon the frame. This thrust forces the frame upwardly, so that it rises on the legs; as this movement occurs the lower ends of the legs rest upon the ground and the upper parts of the legs swing forwardly, a slight rotation taking place on the pivots of the legs. After the legs pass their vertical position, the ship tends to fall forward suddenly and launches itself in this way. The legs are normally held in their forwardly-extended position by means of a bifurcated cord 163 which is attached to the rear end of the links 162, as shown in Fig. 4. This cord passes upwardly around guide pulleys 164, 165 and 166. From this point the cord passes upwardly to the platform 70, where it is attached to an arm 167. This arm is pivotally attached at 168 to the platform 70. This arm 167 is bent upwardly, as shown, and is formed so as to present a shoulder 170, upon which normally rests the edge of a treadle or foot lever 171. When the opposite end of this foot lever is depressed the arm 167 will be released. The tension in the cord 163 and the weight of the arm will swing the arm downwardly so as to release the end of this cord. The legs may then swing freely to permit the ship to be launched, as described above. After the airship has risen from the earth, the legs may be drawn into a rearwardly-inclined position, as indicated in the dotted lines in Fig. 4; this may be accomplished by means of a bifurcated cord 172 which is attached near the lower ends of the legs 161. This cord passes rearwardly and around guide pulleys 173, 174 and 175; thence it passes upwardly along the frame to a guide pulley 176, from which point it passes horizontally and is attached to a lever 177. By moving the lever 177 forwardly, the slack of the cord can be taken up and the legs will be pulled into their rear position. This is the position in which the legs are held when the ship is about to alight. They will then spring slightly and reduce the jar incident to alighting. A removable stay-bar 161ª is provided at each side, as indicated in Fig. 4, to form rests for the legs in alighting. After the ship has alighted these stay-bars may be removed, so as to permit the legs to swing further toward the rear, allowing the wheels to come upon the ground.

In the mode of operation of the ship, the lateral equilibrium is controlled by the lever 24, and this lever also controls the direction of advance of the ship. By moving the lever 24 to the right, as indicated by the dotted lines in Fig. 3, the right-hand rubber

33 will be moved to the right, as indicated by the dotted lines, and at the same time the right wings will be depressed. This will increase the resistance on the right side of the ship and tend to move it toward the right. If the ship should tend to tip toward the left, the movement of the lever toward the right will raise the tips at the left of the ship toward the position shown in dotted lines in Fig. 3, and they will then offer greater resistance to the air as this end of the ship descends, and this will tend to right the ship. When the motor is set in operation the propellers all move at the same time and will advance the ship. The fact that the forward ends of the tips present the greatest width, has the effect of bringing the center of pressure on the tips slightly toward the front of the ship, which gives a better equilibrium.

Special attention is called to the distance between the rudders 33 and the central axis of the ship. The fact that these rudders are disposed at a great distance apart, as shown, gives them increased effect in steering the ship.

The equilibrium of the ship in a front and rear direction is controlled by the lever 59, which raises and lowers the front and rear balance planes, as indicated by dotted lines in Fig. 4. If it is desired that the forward end of the ship should rise, the lever is moved so as to depress the forward planes, as indicated in dotted lines, and at the same time the rear planes will be raised. This will tend to raise the forward end of the ship and depress the rear end.

When it is convenient to alight on a body of water, the ship can be kept afloat by the floats or bags 106, which will be inflated with air, as described. While in the water the ship can be propelled by means of the water propeller. When it is desired to rise from the water, the air propellers and the water propeller will all be operated so as to give the ship the greatest possible speed, and the platform 70 will be unlocked and adjusted into an inclined position so that the air propellers will exert their thrust downwardly and toward the rear, and the ship will then rise out of the water and can be gradually brought to a horizontal position. The floats 106 will then be deflated and stretched by means of the foot lever 116, so that they will operate as supporting planes. If the airship is not expected to alight in the water, the lower frame 3 can be removed, together with the water propeller, and the wheels 160 can be attached by means of their forks 159 directly to the frame 1.

Special attention is called to the position of the main propeller 77 with respect to the rear balance planes 44, 45 and 46, and to the fact that these planes are disposed directly behind this propeller. This gives them an increased efficiency in directing the ship up or down.

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

1. An air ship comprising a main frame, a frame secured above the main frame and having a forward and a rearward extension, the said upper frame being provided near its middle portion with supporting planes elongated transversely with respect to the direction of advance of the ship and increasing in length progressively upwardly, said planes having movable tips attached to the ends thereof and constituting extensions of said planes, said air ship having rudders, means for normally holding said rudders in a front and rear direction, means for limiting the inward movement of the rudders, and means for simultaneously regulating said tips and said rudders.

2. An air ship comprising a main frame, a frame secured above the main frame and having planes disposed one above the other and elongated transversely of the ship, the uppermost of said planes being of greatest length, movable tips attached to the ends of said planes, means for simultaneously raising and lowering the tips at one side of said ship, rudders extending rearwardly means for normally holding said rudders in a front and rear direction, stops for limiting the inward movement of the rudders, and means for displacing said rudders actuated simultaneously with said tips.

3. An air ship having three planes disposed one above the other, elongated transversely with respect to the direction of advance of the ship, the uppermost of said planes being of greatest length, tips jointed to the ends of said planes, links connecting the tips at each side of the ship together to maintain said tips in a parallel relation, a lever, flexible connections between the tips and the lever for simultaneously raising the tips at one side of the ship and depressing the tips at the other side, rudders disposed respectively on opposite sides of the central axis of the ship and on the rear side thereof, spring devices connected with the rudders for normally holding said rudders in a front and rear direction, stops for limiting the inward movement of the rudders, and flexible connections between the rudders and the tips for automatically moving said rudders outwardly when the tips on the side adjacent thereto are depressed.

4. An air ship having a plane elongated transversely thereof, a frame extending in a front and rear direction, the forward portion of the frame forming a bow and comprising upper and lower bars connected at an angle, a plurality of forward balance planes pivotally attached at their forward edges between the lower inclined bars of the

forward part of said frame, a link connecting the rear edges of said planes to hold said planes in a parallel position, and means for raising and lowering said balance planes.

5. An air ship having a plane elongated transversely thereof and having a frame extending in a front and rear direction, the forward portion of the frame forming a bow and comprising upper and lower bars connected at an angle, a plurality of forward balance planes mounted in a parallel relation at the front of said ship, the said planes being disposed one above the other, and pivotally attached at their forward edges between the lower inclined bars of the front of the frame, the uppermost of said balance planes being disposed forwardly with respect to the other, means for maintaining said balance planes in a parallel relation, and means for raising and lowering said balance planes.

6. An air ship having a frame extending in a front and rear direction, the forward portion of the frame comprising upper and lower inclined bars connected with each other at an angle, a supporting plane, a plurality of balance planes pivotally attached at their forward edges to the lower inclined bars of said frame, and adapted to be raised and lowered at their rear edges, a link connecting the rear edges of said balance planes to maintain the same in parallel relation, rear balance planes pivotally attached to the rear portion of said frame, means for maintaining said rear balance planes in a parallel relation, means for raising or lowering said forward balance planes, and connections between said means and the rear balance planes for simultaneously lowering or raising said rear balance planes.

7. An air ship comprising a main frame, a frame above the main frame and having forward and rearward extensions, a frame below the main frame, supporting planes carried by the upper frame at about the center thereof and elongated transversely of the ship, the said planes having movable tips, rudders projecting rearwardly at the rear of the supporting planes and located on each side of the central axis of the ship, a plurality of forward balance planes, mounted in the forward part of the said upper frame, rear balance planes mounted in the rear portion of said upper plane, and inflatable floats carried by the lower frame.

8. An air ship having a frame, supporting planes mounted on said frame, a platform mounted on one of said planes to swing on a transverse horizontal axis, a driving mechanism carried by said platform, means for regulating the position of the platform, a latch for holding said platform normally in a horizontal position, and means for releasing said latch.

9. An air ship having a frame, a supporting plane elongated transversely of the ship, a main platform mounted to swing on a horizontal axis disposed transversely of the ship, auxiliary platforms mounted to swing on the same axis, the said platforms carrying the driving mechanism, means for regulating the position of said platforms, and means for holding said main platform normally in a horizontal position.

10. An air ship comprising a frame, supporting planes disposed one above the other and elongated transversely with respect to the direction of the ship, a shaft mounted to turn on one of said planes, and platforms carried by said shaft and supporting the driving mechanism.

11. An air ship, comprising a frame, three supporting planes disposed one above the other and elongated transversely with respect to the direction of advance of the ship, a shaft mounted to rotate on the upper side of the middle plane, a main platform attached to said shaft near the middle point of said plane, auxiliary platforms carried by said shaft, and adapted to move with the main platform, the platforms carrying the driving mechanism, means for holding the main platform normally in a horizontal position, means for releasing the holding means, means for tilting the main platform when released from the holding means, and means for locking the main platform in an inclined position.

12. An air ship, comprising a frame, a supporting plane, extending transversely of the ship, balance planes at the forward part of said frame, rear balance planes, the said planes being adapted to be raised and lowered, a main platform located about the central axis of the ship and in front of the rear balance planes, the said platform being mounted to swing on a horizontal axis extending transversely of the ship, and auxiliary platforms also mounted to swing on said axis and located at opposite sides of the central axis of the ship, the said platforms carrying the driving mechanism.

13. An air ship having a frame, a supporting plane for maintaining the ship aloft in the air, inflatable floats carried by said frame, means for normally stretching said floats so that they may act as supporting planes, means for inflating said floats to support the ship in water, a water propeller supported on said frame, and means for driving said water propeller.

14. An air ship having a frame, a supporting plane for maintaining said ship aloft in the air, a plurality of bags, means for normally stretching said bags so that they may act as supporting planes, and means for inflating said bags to form floats to give the ship buoyancy when in water.

15. An air ship having a frame comprising an under frame, a plurality of bags

mounted in said under frame, means attached to the edges of said bags for stretching the same to form supporting planes, while the air ship is aloft in the air, and means for inflating said bags to form floats to give the ship buoyancy while in water.

16. An air ship having a frame, a supporting plane for maintaining the ship aloft in the air, inflatable floats carried by said frame and normally acting as supporting planes while the air ship is afloat in the air, means for inflating said floats to support the airship in water, a water propeller, an air-propeller, means for mounting said air propeller so as to exert its thrust downwardly in an inclined direction, and means for driving said water propeller.

17. An air ship having a frame, a supporting plane for maintaining said ship aloft in the air, inflatable floats carried by said frame and normally acting as supporting planes while the air ship is afloat in the air, means for inflating said floats to support said frame in water, a water propeller, a plurality of air propellers, means for adjusting said air propellers so as to exert thrust in a downwardly inclined direction and toward the rear, and means for operating all of said propellers simultaneously so as to raise the ship from the water.

18. An airship having a supporting plane for maintaining the same aloft in the air, an under frame having guide bars, cross heads slidably mounted on said guide bars, inflatable bags mounted in said under frame and connected with said cross heads, means for moving said cross heads to stretch said bags, and means for inflating said bags to form floats to support the airship in water.

19. An air ship comprising a main frame, a frame above the main frame and having supporting planes for maintaining the ship afloat in the air, a frame below the main frame and having guide bars, cross heads slidably mounted on said guide bars, inflatable floats connected with the side bars of said frame and with said cross heads, a lever, and flexible connections between the lever and the cross heads for moving said cross heads to stretch the said floats.

20. An airship having a frame, a supporting plane for maintaining the ship aloft, wheels for supporting the frame above the ground line, propellers tending to advance said frame, legs pivotally attached to said frame and normally extending downwardly and forwardly, the legs being arranged in pairs at each side of the central axis of the ship, and a link connecting the legs at each side with each other, said legs affording means for raising said frame under the action of said propellers.

21. An airship having a main frame horizontally disposed, a frame secured above the main frame and provided with a supporting plane for maintaining the ship aloft, a lower horizontal frame secured below the main frame, wheels for supporting the frame above the ground line, forks secured to the underside of the lower frame and carrying said wheels, legs pivotally attached to the underside of said main frame, a horizontal link connecting the legs at each side of the central axis of the ship, means for normally holding said legs in a forwardly and downwardly inclined position, and means for drawing said legs upwardly after the ship is launched in the air, into a rearwardly and downwardly inclined position.

22. An airship having a frame, supporting planes, wheels for supporting said frame above the ground line, legs pivotally attached to said frame, the lower ends of said legs extending below said wheels, means for normally supporting said legs so that they incline forwardly and downwardly, and means for releasing said legs so that they may swing rearwardly on their pivots, means for drawing said legs in a rearwardly inclined position for alighting, and removable stay bars forming rests for the legs in alighting, the said legs being adapted to swing farther toward the rear when the stay bars are removed, to permit the said wheels to rest upon the ground.

23. An air ship having a frame, a supporting plane for maintaining the ship aloft, wheels for supporting the frame above the ground line, legs pivotally attached to said frame and arranged in pairs at each side of the central axis of the ship, a platform carried by the frame, an arm pivotally attached to said platform, a flexible connection between said arm and the legs, the arm being normally in position to hold the legs in a forwardly and downwardly inclined position, means for releasing said arm to permit the legs to swing rearwardly on their pivots, a lever, and a flexible connection between the lever and the legs for drawing the legs into a rearwardly inclined position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL V. JOHNSON.

Witnesses:
C. C. McKENZIE,
JNO. T. WALTERS.