J. SINKOVITS.

AIR SHIP.

APPLICATION FILED DEC. 10, 1908.

920,675.

Patented May 4, 1909.

4 SHEETS—SHEET 1.

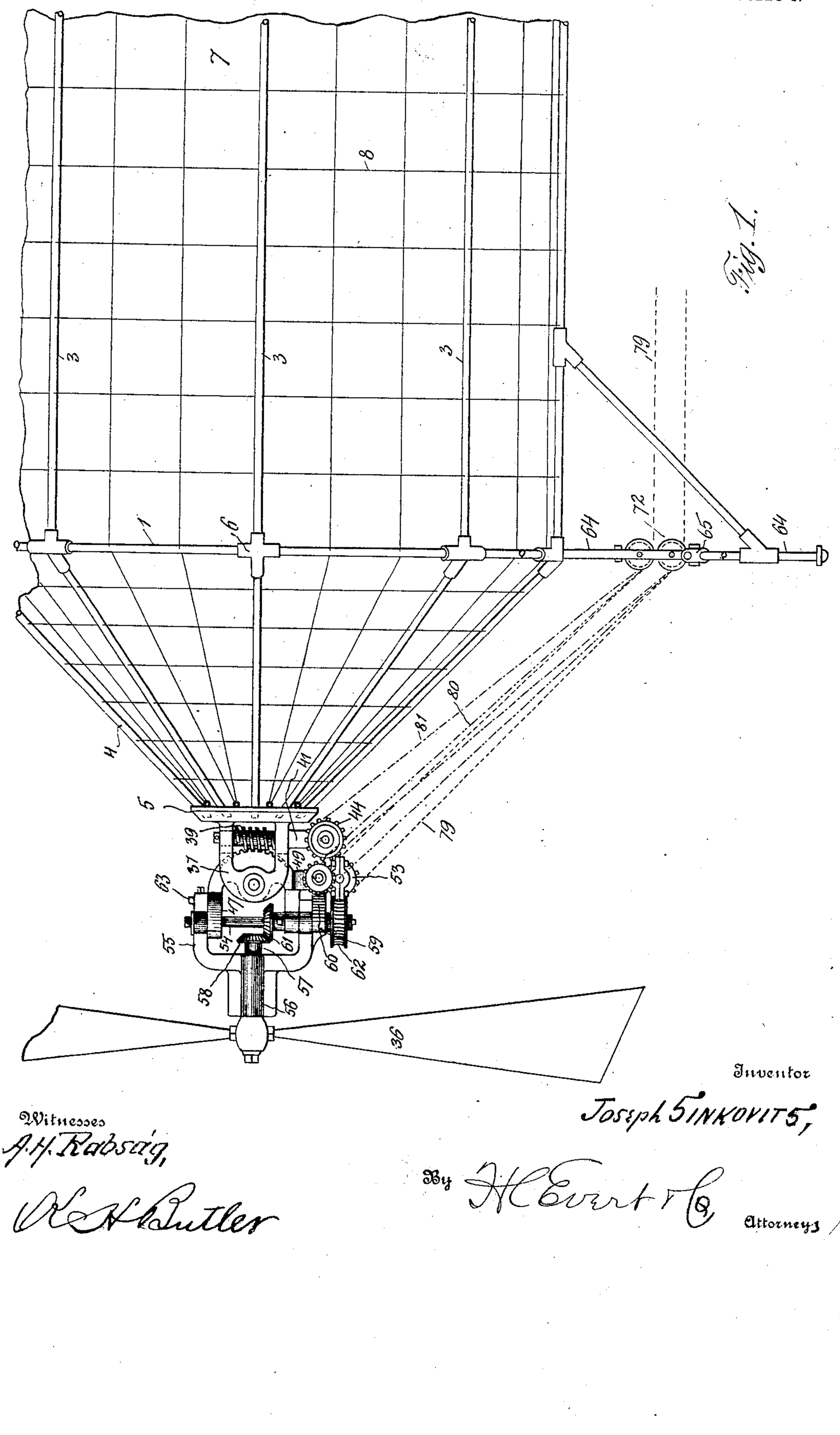

Fig. 1.

Witnesses
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4 SHEETS—SHEET 2.

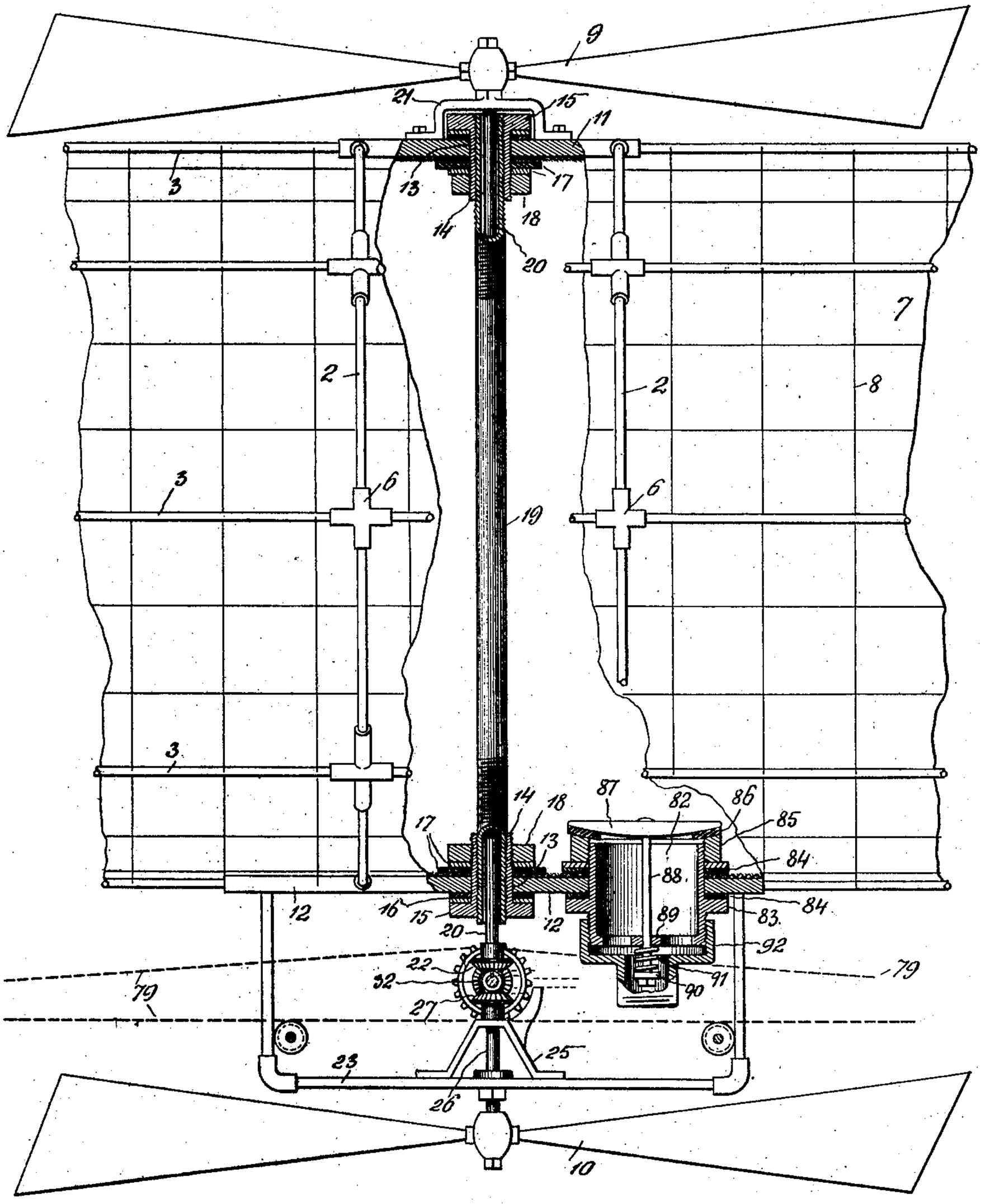

Fig. 2.

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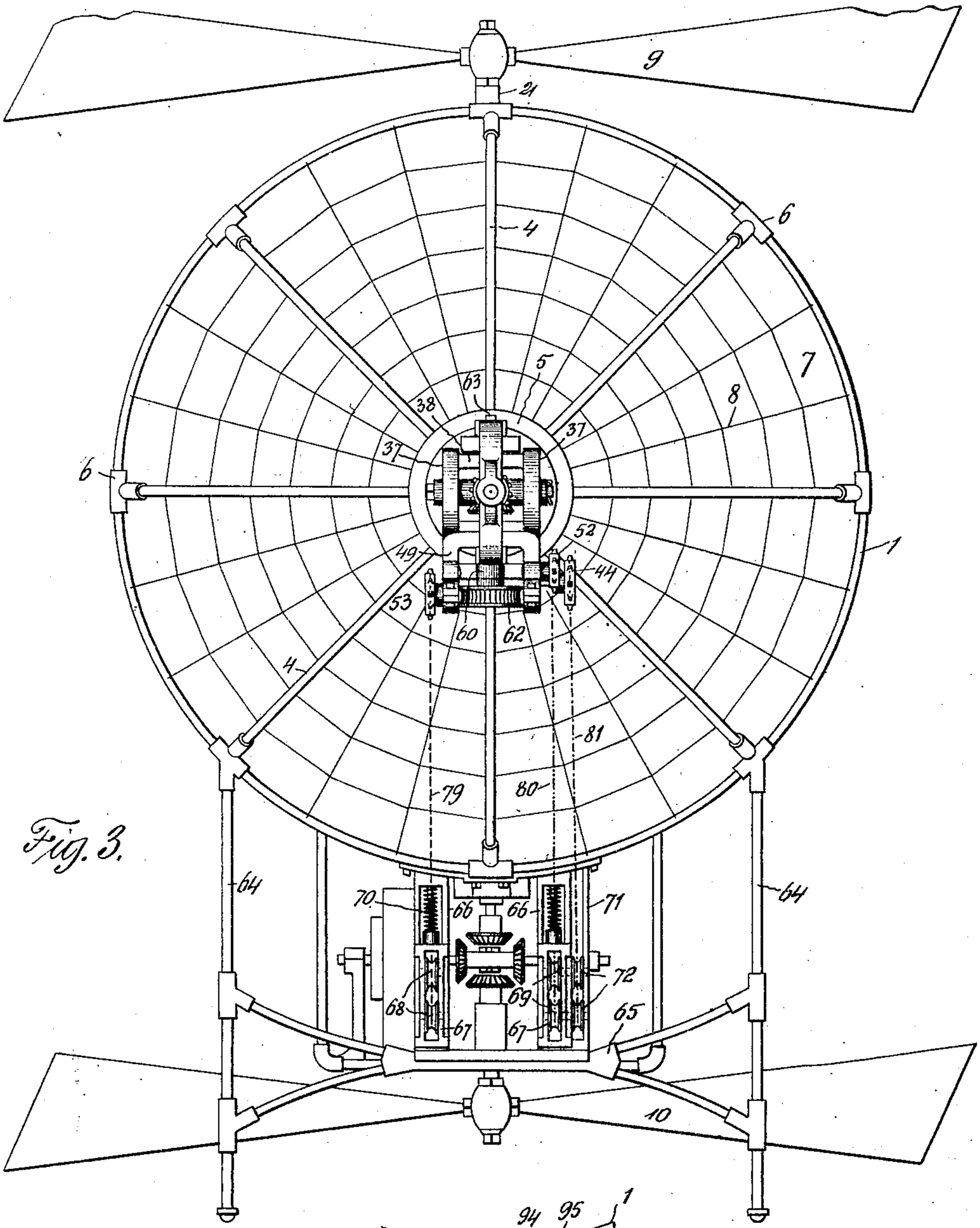

Fig. 3.

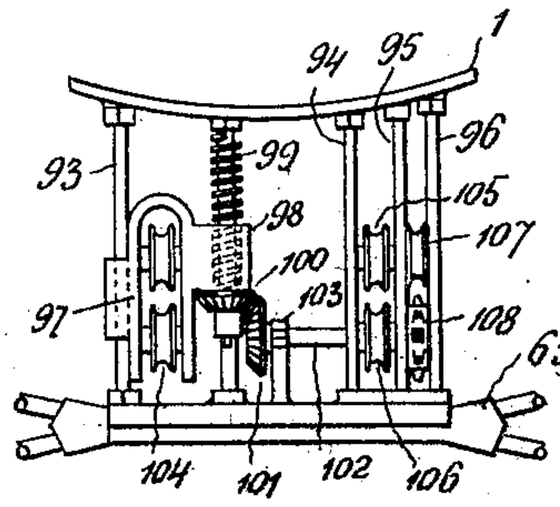

Fig. 4.

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Fig. 10.

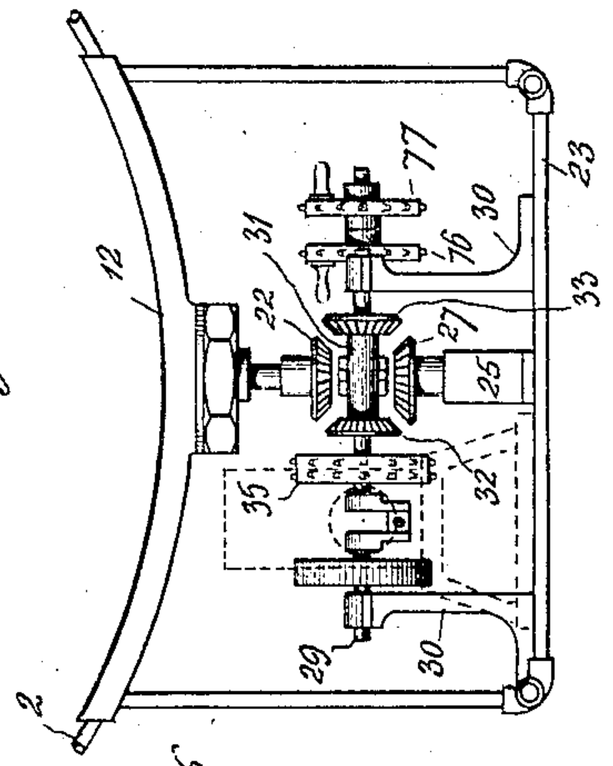


Fig. 9.

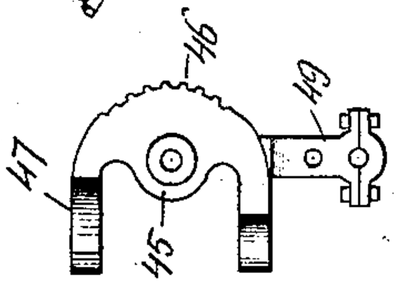


Fig. 11.

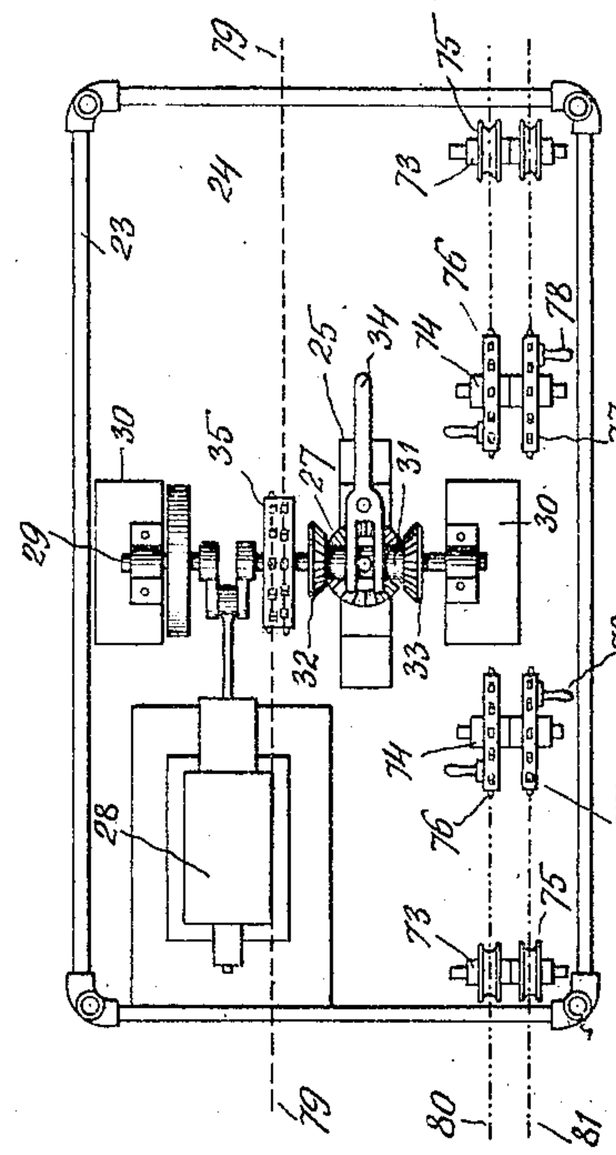


Fig. 7

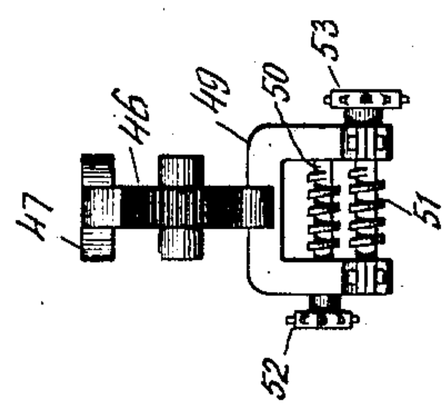


Fig. 8.

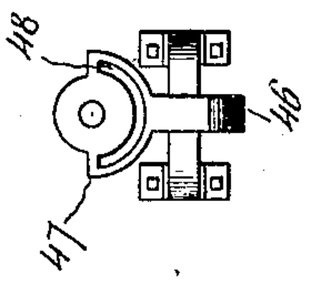


Fig. 5.

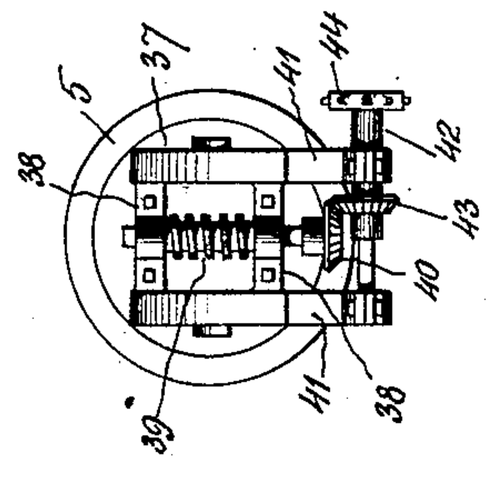
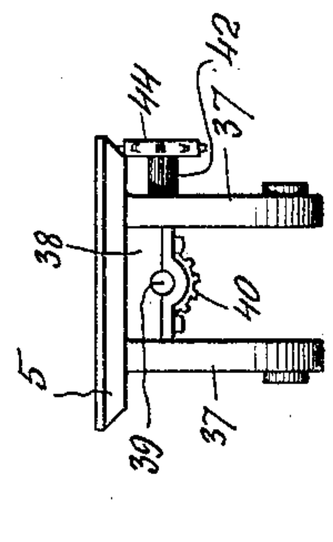


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

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AIR-SHIP.

No. 920,675. Specification of Letters Patent. Patented May 4, 1909.

Application filed December 10, 1908. Serial No. 466,798.

To all whom it may concern:

Be it known that I, JOSEPH SINKOVITS, a subject of the King of Hungary, residing at New Brighton, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Air-Ships, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to air ships, and more particularly to air ships of that type that are heavier-than-air and utilize a gas bag and propellers for elevating the same.

The primary object of my invention is to provide a novel skeleton frame for a gas bag and at the ends thereof provide propellers for driving the air ship laterally, these propellers being adjustably mounted and easily adjusted from the operator's station in the air ship.

Another object of this invention is to combine horizontal and vertical propellers for moving an air ship in any desired direction, these propellers being driven from a suitable source of power located at the operator's station of the air ship.

A further object of the invention is to provide a novel mechanism in connection with propellers for shifting the propellers laterally or vertically during the operation thereof, enabling the operator of the air ship to steer the same in any direction desired.

With the above and other objects in view, which will more readily appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts to be presently described and then claimed.

In the drawings, Figure 1 is a side elevation of one end of my air ship, Fig. 2 is a similar view of the central portion of the air ship partly broken away and partly in section, Fig. 3 is an end view of the air ship, with the end propeller thereof removed, Fig. 4 is an end view of an automatic tension device, Fig. 5 is a view of the end plate of an air ship and the mechanism carried thereby for vertically adjusting a propeller wheel, Fig. 6 is a plan of the same, Fig. 7 is a rear elevation of a detached movable bearing, Fig. 8 is a plan of the same, Fig. 9 is a side elevation of a movable bearing, Fig. 10 is a cross sectional view of the operating station of the air ship, and Fig. 11 is a horizontal sectional view of the same illustrating the operating mechanism in plan.

To put my invention into practice, I provide a skeleton frame preferably made of aluminum or a similar light and durable metal. This frame is built of numerous sections joined to form a cylindrical structure having conical ends. The frame comprises end rings 1, and intermediate rings 2 connected by a plurality of equally spaced longitudinal rods 3. The end rings 1 are provided with converging rods 4 suitably connected to end plates 5, said rods and end plates forming the conical ends of the frame. The connections between the rings 1 and 2, and rods 3 and 4 are preferably made by cross fittings 6.

Within the frame of the air ship is located a bag 7 made of silk or a similar light and durable material varnished and coated to render the same impervious. This bag is adapted to be filled with hydrogen or a gas lighter than air, and to reinforce the exterior surface of the bag a netting is used, comprising strands of piano wire 8, arranged circumferentially of the bag and longitudinally thereof, the circumferential strands passing through the rods 3, while the longitudinal strands extend through the rings 1 and 2 and are suitably connected to the plates 5.

For raising and lowering the air ship, horizontal controller wheels 9 and 10 are used, said wheels being located above and below the air ship intermediate the ends thereof. The top and the bottom of the frame of the air ship are reinforced by metallic plates 11 and 12 to which the rods 3 and rings 2 are connected. These plates are provided with vertical alining openings 13 and extending into said openings are interiorly and exteriorly threaded sleeves 14 having heads 15. Interposed between the heads 15 and the plates 11 and 12 are gaskets 16 to insure a non-leakable connection between said plates and the sleeves 14. The sleeves 14 are retained within the plates 11 and 12 by gaskets 17 and nuts 18 threaded upon the sleeves within the back 7, said back being provided with openings to receive said sleeves, as best shown in Fig. 2 of the drawings.

Threaded in the sleeve 14 is a vertical connecting tube 19 and extending through said tube is a vertical shaft 20. The upper end

of the shaft extends through a bearing 21 located upon the plate 11 and secured to the end of said shaft is the upper controller wheel 9. The lower end of the shaft 20 is provided with a beveled gear wheel 22.

Suspended from the plate 12 is a frame 23 having a floor 24, said frame and floor providing a central operating station for the air ship.

Upon the floor 24 directly beneath the lower end of the shaft 20 is a bearing 25 for a vertical shaft 26 extending downwardly through the floor 24 and supporting the lower propeller wheel 10. The upper end of the shaft 26 is provided with a beveled gear wheel 27 adapted to coöperate with the beveled gear wheel 22 in driving the propeller wheels 9 and 10.

Located upon the floor 24 is a reversible engine or motor 28 for revolving the shaft 29, journaled in bearings 30 mounted upon the floor 24. Slidably keyed upon the shaft 29 and adapted to rotate therewith is a sleeve 31 having confronting beveled gear wheels 32 and 33 adapted to alternately mesh with the beveled gear wheels 22 and 27. Said wheels 32 and 33 being shifted through the medium of a bifurcated operating lever 34 pivotally supported by the bearing 25.

Mounted upon the shaft 29 is a double sprocket wheel 35 for a purpose that will hereinafter appear.

For controlling the air ship laterally, I use a vertical propeller wheel 36 at each end of the air ship, and as these wheels are identical in construction, and similar adjusting mechanism used in connection with each wheel, I have deemed it only necessary to illustrate one end of the air ship, consequently, only one end will be described, it being understood that the propeller wheels 36 are both controlled from the central operating station of the air ship.

The end plate 5 is provided with two parallel brackets 37 connected by vertical alining bearings 38. In the bearings 38 is journaled a worm 39 having the lower end thereof provided with a beveled gear wheel 40. The brackets 37 are provided with hangers 41, for a revoluble shaft 42, said shaft having fixed beveled gear wheel 43 adapted to mesh with the beveled gear wheel 40. The shaft 42 is also provided with a sprocket wheel 44.

Trunnioned between the brackets 37 is a U-shaped bearing 45 having a segment rack 46 adapted to mesh with the worm 39. The upper end of the bearing 45 is enlarged, as at 47 and provided with a segment shaped slot 48, the object of which will presently appear. The lower end of the bearing 45 is provided with a hanger 49 and journaled in said hanger are two worms 50 and 57 having sprocket wheels 52 and 53 respectively.

Pivotally connected to the bearing 45 by a revoluble shaft 54 is a yoke 55 having a longitudinal bearing 56 for a shaft 57, the outer end of said shaft supporting the propeller wheel 46, while the inner end of said shaft is provided with a beveled gear wheel 58. The lower end of the yoke 55 is enlarged, as at 59, and provided with a sector gear 60 adapted to mesh with the worm 50 whereby when the rotary movement is imparted to said worm, the yoke can be shifted in a horizontal plane.

Upon the shaft 54 is mounted a beveled gear wheel 61 meshing with the beveled gear wheel 58, and upon the lower end of said shaft is mounted a gear wheel 62 meshing with the worm 51, whereby a rotary movement can be imparted to the shafts 54 and 57 when the worm 51 is rotated.

The upper end of the yoke 55 is provided with a detachable pin 63 adapted to extend into the segment slot 48 of a bearing 45 and limit the lateral movement of said yoke.

The end rings 1 of the air ship are provided with depending rods 64 connected by braces 65, these braces are connected to the end rings 1 by vertical guides 66 for movable housings 67, in the housings 67 are journaled sheaves 68 and 69. In the guides 66 are located compression springs 70 for normally holding the housings 67 in a lowered position.

The braces 65 and the end ring 1 are connected by a housing 71 having revoluble sheaves 72.

Upon the floor 24 of the operating station is located bearings 73 and 74 for sheaves 75 and sprocket wheels 76 and 77. The sprocket wheel sare provided with handles 78.

Mounted upon the double sprocket wheel 35 and extending under the sheaves 68 and over the sprocket wheel 53 is a sprocket chain 79, this sprocket chain being indicated by a dash line (– – – – –). This chain is adapted to transmit a rotary movement from the shaft 29 to the shaft 57 and revolve the propeller wheel 36.

Mounted upon the sprocket wheels 76, guided by the sheaves 73 and 69 and passing over the sprocket wheel 52 is a sprocket chain 80, indicated by a dash and two dot line (– . . – . . –). This sprocket chain 80 permits of an operator rotating a sprocket wheel 76 to swing the yoke 55 in a horizontal plane during the operation of the propeller 36.

Mounted upon the sprocket wheel 77, guided by the sheaves 75 and 72 and extending over the sprocket wheel 44 is a sprocket chain 81, indicated by a dash and dot line (– . – . – . –). This sprocket chain 81 permits of an operator moving the sprocket wheel 77 to tilt the bearing 45 during the operation of the propeller wheel 36.

In order that gas can be pumped into and released from the bag 7, the plate 12 is provided with a valve. This valve comprises a cylinder 82 held in engagement with the plate 12 by a peripheral flange 83, gaskets 84

and a nut 85. Said nut being provided with a resilient valve seat 86 for a flange 87, the stem 88 extends downwardly through a spider 89 provided therefor at the lower end of a cylinder 82. The protruding end of the stem 88 is provided with a nut 90 and interposed between the spider 89 and the nut 90 is a coil spring 91 for normally holding the valve 87 seated.

Screwed upon the lower end of the cylinder 82 is a nipple 92 to which a hose (not shown) can be attached for pumping gas into the bag 7, the pressure of gas entering the bag being sufficient to elevate the valve 27. When the air ship is in operation and should it be desired to allow gas to escape, a suitable instrument can be inserted in the nipple 92 to engage the valve stem 88 and elevate the same.

In Fig. 4 of the drawings, I have illustrated a modification of my invention, particularly in connection with the tension device for the sprocket chains 79, 80 and 81. Between the end ring 1 and the brace 65 are arranged vertical bearings 93, 94, 95 and 96. Slidably mounted upon the bearing 93 is a yoke 97 having an interiorly threaded sleeve 98 for a vertical screw 99, journaled between the ring 1 and the brace 65. This screw is provided with a beveled gear wheel 100 meshing with a similar wheel 101 mounted upon a shaft 102 journaled in a bearing 103 and the bearings 94, 95 and 96.

Journaled in the yoke 97 are sheaves 104, for the sprocket chain 79.

Journaled between the bearings 94 and 95 are sheaves 105 and 106, the latter being loosely mounted upon the shaft 102. These sheaves are for the sprocket chain 80.

Journaled between the bearings 95 and 96 is a sheave 107 and a sprocket wheel 108, the latter being mounted upon the shaft 102 for the sprocket chain 81, whereby when said chain is moved to adjust the propeller 36, to raise or lower the end of the air ship, the sprocket chain 79 will be maintained in a taut condition for revolving the propeller 36.

Operation: The operation of the air ship is accomplished by setting the propeller wheels 9 and 10 in operation, raising the ship to an elevation that is desirable for travel. The end propeller wheels 36 are then placed in operation to move the ship forward, backward, or in any direction desired. The elevation of the air ship can be approximately determined by the capacity of the bag 7, the lifting power of the gas within the bag, and the atmospheric conditions at the time of ascending, but the elevation of the ship can be varied according to the direction in which the propeller wheels 9 and 10 are revolved. The elevation of the ship can also be varied, by moving the sprocket chains 81, which will tilt the propeller wheels 35, whereby said wheels in operation will tend to lower one end of the ship and raise the other, and vice versa for moving the ship from one plane to another.

Swinging either end of the ship in a horizontal plane for turning to the right or left is accomplished by moving the sprocket chains 80, these chains together with the chains 81 being under the control of the operator of the air ship at the central station. The operation of the controllers 36, 9 and 10 are controlled by the starting and stopping of the engine or motor 28 and the manipulation of the lever 34.

I reserve the right to use various types of propeller wheels and position the blades thereof, whereby all of said wheels will properly coöperate for navigating in the air. The frame of the air ship can be provided with passenger carrying cars suspended beneath the bag 7.

Suitable ballast can be carried by the air ship and by discharging this ballast, the air ship will rise, and by allowing hydrogen to escape, the air ship can descend, these two movements being accomplished without assistance of the propellers, after the air ship has ascended to a desired elevation.

Having now described my invention, what I claim as new, is:—

1. An air ship embodying a cylindrical frame having conical ends, a gas bag located in said frame, a central station suspended beneath said frame, vertical shafts journaled in said station and in said frame, horizontal propeller wheels carried by said shafts, plates carried by the conical ends of said frame, brackets carried by said plates, bearings trunnioned in said brackets, worms journaled in said brackets for tilting said bearings, yokes pivotally connected to said bearings, worms journaled in said bearings, for swinging said yokes in a horizontal plane, revoluble propeller wheels carried by said yokes, worms journaled in said bearings for imparting a rotary movement of said propeller wheels, sprocket chains extending from said central station to said bearings for revolving the propeller driving worms, sprocket chains extending from said central station for moving the yoke actuating worms, sprocket chains extending from said central station for moving the bearing actuating worms, tension devices suspended from the ends of said frame for maintaining the first two mentioned sprocket chains in a taut condition, and means located at said central station for revolving said shafts and driving the sprocket chains employed for operating the end propeller wheels, substantially as described.

2. An air ship embodying a cylindrical frame having conical ends, a gas bag located in said frame, a central station suspended beneath said frame, vertical shafts journaled in said station and in said frame, horizontal

propeller wheels carried by said shafts, plates carried by the conical ends of said frame, brackets carried by said plates, bearings trunnioned in said brackets, worms journaled in said brackets for tilting said bearings, yokes pivotally connected to said bearings, worms journaled in said bearings, for swinging said yokes in a horizontal plane, revoluble propeller wheels carried by said yokes, worms journaled in said bearings for imparting a rotary movement of said pro peller wheels, sprocket chains extending from said central station to said bearings for revolving the propeller driving worms, sprocket chains extending from said central station for moving the yoke actuating worms, sprocket chains extending from said central station for moving the bearing actuating worms, and means located at said central station for revolving said shafts and driving the sprocket chains employed for operating the end propeller wheels, substantially as described.

3. An air ship embodying a frame having conical ends, a gas bag located in said frame, a central station suspended beneath said frame, vertical shafts journaled in said station and in said frame, horizontal propeller wheels carried by said shafts, plates carried by the conical ends of said frame, bearings adjustably supported by said plates, yokes pivotally connected to said bearings, revoluble propeller wheels carried by said yokes, sprocket chains extending from said central station for adjusting said bearings and said yokes, sprocket chains extending from said central station for imparting a rotary movement to said end propeller wheels, tension devices suspended from the ends of said frame for maintaining the first two mentioned sprocket chains in a taut condition, means located at said central station for revolving said shafts and driving the sprocket chains employed for operating the end propeller wheels.

4. An air ship embodying a frame having conical ends, a gas bag located in said frame, a central station suspended beneath said frame, vertical shafts journaled in said station and in said frame, horizontal propeller wheels carried by said shafts, plates carried by the conical ends of said frame, bearings adjustably supported by said plates, yokes pivotally connected to said bearings, revoluble propeller wheels carried by said yokes, sprocket chains extending from said central station for adjusting said bearings and said yokes, sprocket chains extending from said central station for imparting a rotary movement to said end propeller wheels, means located at said central station for revolving said shafts and driving the sprocket chains employed for operating the end propeller wheels.

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

JOSEPH SINKOVITS.

Witnesses:

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Max H. Srolovitz.