

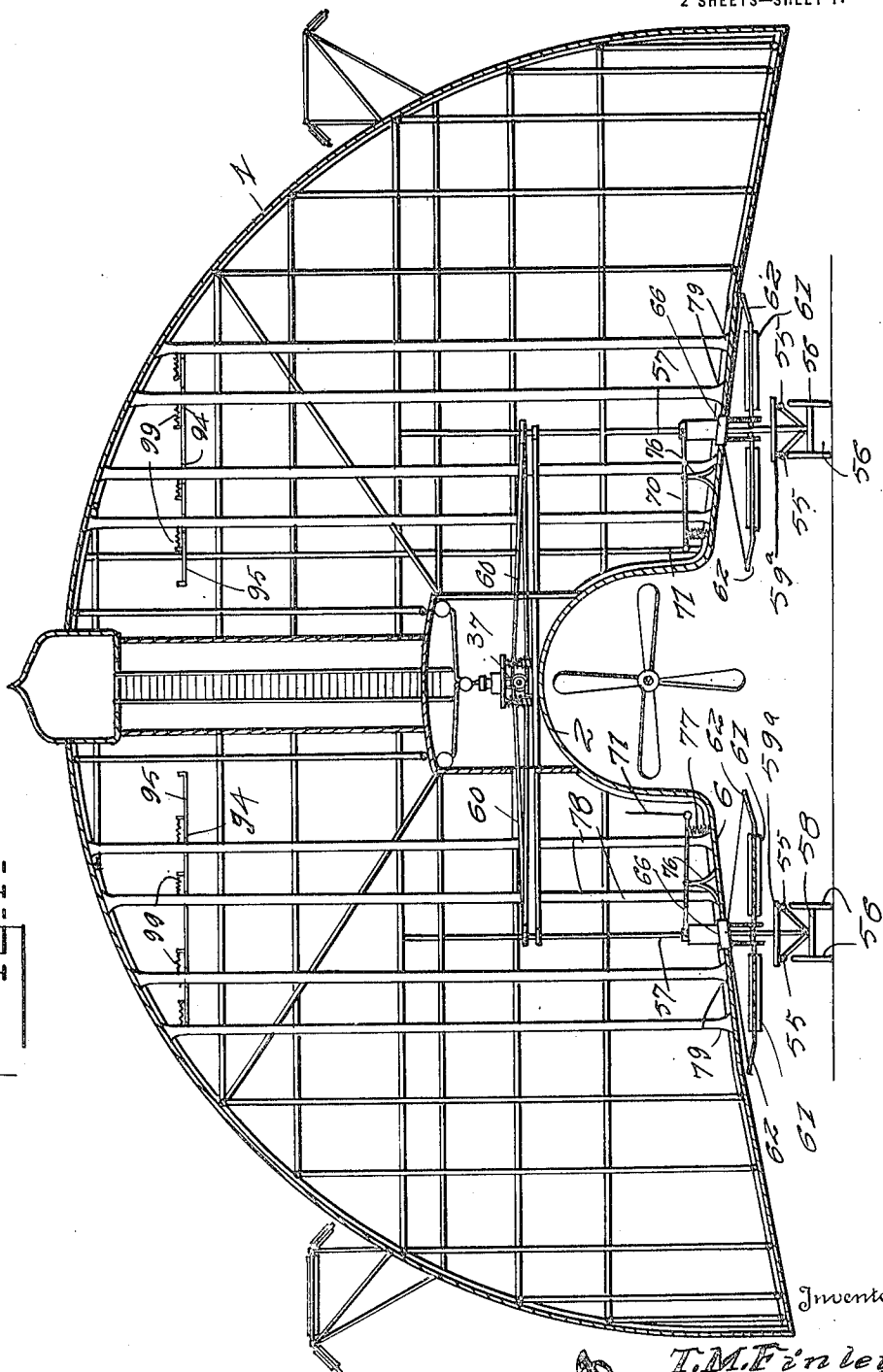
T. M. FINLEY.
 GYRATORY STABILIZER AND LIFTING PROPELLER.
 APPLICATION FILED APR. 10, 1917.

Patented Jan. 21, 1919.

2 SHEETS—SHEET 1.

1,291,817.

Fig. 1—



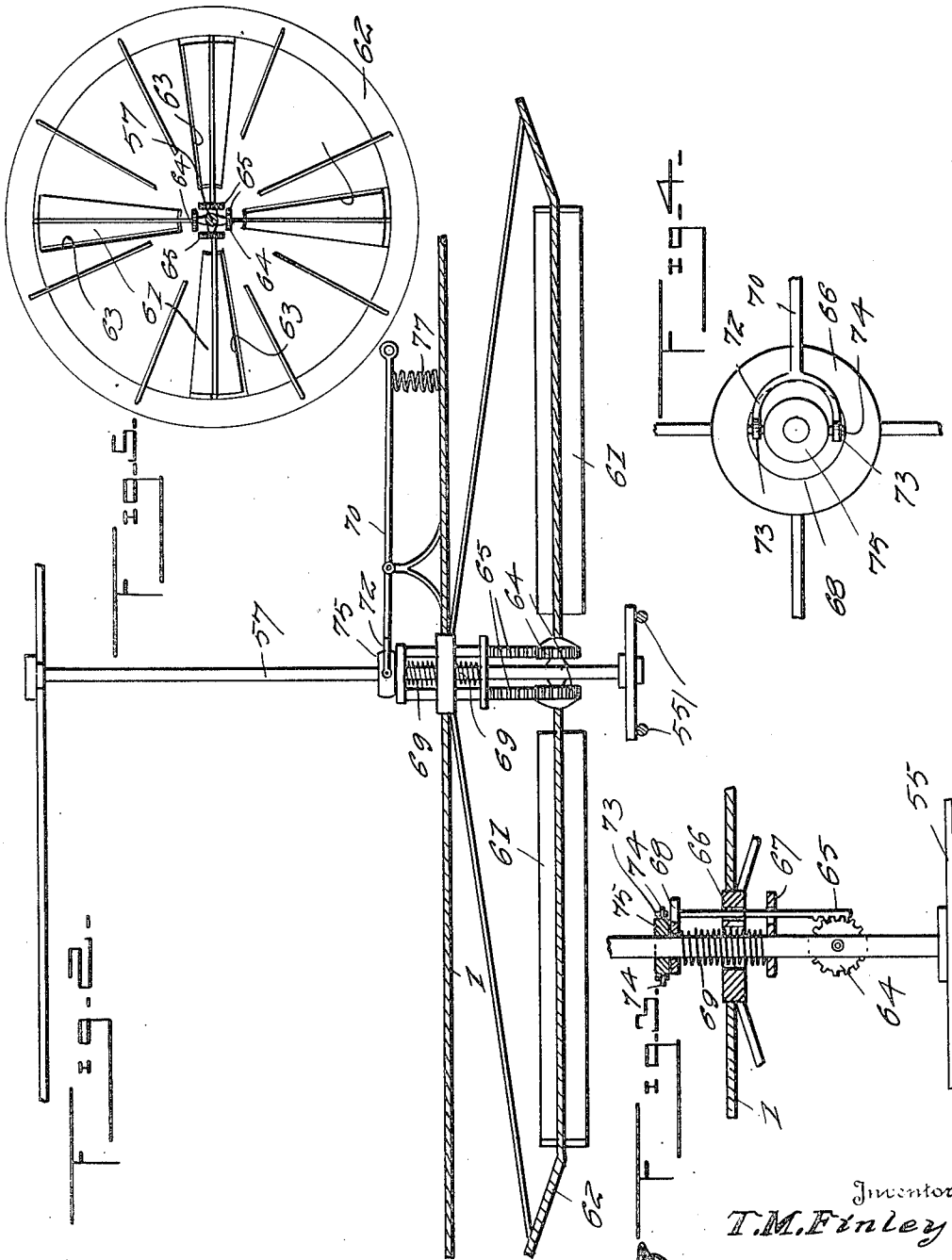
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GYRATORY STABILIZER AND LIFTING-PROPELLER.

1,291,817.

Specification of Letters Patent.

Patented Jan. 21, 1919.

Original application filed April 10, 1917, Serial No. 160,978. Divided and this application filed April 10, 1917. Serial No. 160,980.

To all whom it may concern:

Be it known that I, Rev. THOMAS M. FINLEY, a citizen of the United States, residing at Westplains, in the county of Howell and State of Missouri, have invented certain new and useful Improvements in Gyratory Stabilizers and Lifting-Propellers; and I do hereby 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.

The invention relates to a gyratory stabilizer and lifting propeller, and the present application is a division of an application executed of even date herewith, and an improvement on the construction shown and described in Patent No. 1,233,210, granted to me July 10, 1917.

The object of the present invention is to improve the construction of the lifting propeller of the gyratory stabilizing element of the said patent, and the operating mechanism for moving the propeller blades into and out of operative position and to enable the propeller blades, when not in operation, to constitute a portion of the rotary gyratory plane or element and thereby eliminate the resistance of the propeller to the progress of the airship when the lifting propeller is not required to assist the machine in ascending, descending or hovering.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Figure 1 is a transverse sectional view of an airship provided with gyratory stabilizers and lifting propellers constructed in accordance with this invention.

Fig. 2 is an enlarged view of one of the gyratory stabilizers and lifting propellers.

Fig. 3 is a detail view of the means for opening and closing the blades of the lifting propellers.

Fig. 4 is a detail view of the actuating

lever for opening the blades of the lifting propellers.

Fig. 5 is a plan view of a portion of the rotary plane and propeller, partly in section.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In the accompanying drawings, in which is illustrated the preferred embodiment of the invention, 1 designates the body of the airship constructed as shown and described in the first mentioned application and designed to be braced or reinforced at the bottom by longitudinal truss rods 55 arranged in pairs and located at opposite sides of the trough 2 approximately centrally of the inner section 6 of the bottom portion of the body and forming means for mounting the wheels 56 and also for supporting the lower ends of the vertical shafts 57 of the rotary planes or gyratory members and the lifting propellers. The wheels 56 are mounted on suitable axles 58 which are connected by suitable springs with the truss rods 55. The lower ends of the vertical propeller shafts 57 are stepped in suitable bearings of transverse plates or bars 59^a, which extend across the space between the truss rods and are suitably secured to the same. The vertical propeller shafts are connected by suitable gearing 60 with an engine 37, and suitable compartments are provided in the body for the reception of the mechanism for controlling the blades 61 of the lifting propellers. Any desired number of rotary planes may be employed and each consists of a central horizontal portion and an inclined upwardly extending marginal portion 62, forming a saucer shaped plane or gyratory element, as shown and described in the aforesaid applications. The blades 61 of the lifting propeller are pivoted at one side of the median line and are journaled in openings 63 of the planes and they are equipped at their inner ends with pinions 64 meshing with vertically movable rack bars 65, operating in upper and lower guides 66 and 67 and adapted to move downwardly to open the blades of the lifting propeller and upwardly to close the same. The rack bars are connected at their upper ends to a suitable head 68, and a coiled spring 69, which is disposed on the vertical propeller shafts, is interposed between the head 68 and the lower guide 67, so as to be

compressed when the rack bars and the head 68 are moved downwardly by a lever 70 to open the blades. When the blades are opened their lower portions are of greater
 5 area than the upper portions, so that the pressure of the air against the lower portions of the blades will be greater than the pressure of the air against the upper portions of the blades and will assist the closing move-
 10 ment of the said blades when the latter are free to close, the pressure of the air tending to urge the blades to their closed position. Also the coiled spring 69 is adapted to posi-
 15 tively move the rack bars and the head 68 upwardly when the operating mechanism 71 for controlling the lever 70 is released. This will enable the operator, when it is desired to close the blades, to simply release or unlatch the operating means without actually
 20 moving the operating lever by hand to close the blades.

The lever 70, which has a forked portion 72 to straddle the shaft, is provided with eyes 73 for the reception of pivots 74 of
 25 a collar 75 slidably arranged on the propeller shaft and located above the head 68 and adapted to move the lever 70 into the closing position to force the head and the rack bars downwardly. The lever 70 is ful-
 30 crumed intermediate of its ends on a suitable support 76 and a coiled spring 77 is connected with the outer end of the lever for maintaining the collar normally elevated. The operating mechanism 71, which
 35 may be of any desired construction, is designed to extend to the cab or pilot house of the airship and any suitable means such as an operating lever and a pawl or detent and toothed segments may be employed for
 40 operating and locking the blades in their open position.

The openings 63 are of a size to fit the blades 61 when the latter are closed, and by
 45 mounting the lifting propellers in this manner they may be brought into operation when the machine is ascending or descending or hovering, to control the upward and downward movement of the machine, and
 50 after the airship has reached the desired elevation and has attained a speed sufficient to enable it to maintain its flight, the lifting propellers may be closed and they will then
 55 complete the body portion of the gyratory planes or elements and close the openings of the same. The lifting propellers will then be practically eliminated and will offer no resistance to the progress of the airship, but in coöperating with and forming a part
 60 of the rotary planes or gyratory elements, will assist in maintaining the airship in a stable condition.

In order to supply the necessary air to the lifting propellers, the body is provided with an arcuate series of vertically disposed
 65 tubes 78, located above each of the gyratory

planes and lifting propellers and having tapered or flared terminal portions 79. The tubes 78 will permit a sufficient passage of the air through the body to enable the lifting propellers to operate with a maximum effect, and when the lifting propellers are not in use the vertical tubes 78 may be closed at the top to form air pockets to assist the body in maintaining its elevation. Any suitable means may be employed for closing the upper ends of the vertical tubes, such as slidable cut-offs 94, operating rods 95 and springs 99 arranged to move the cut-offs automatically to their closed positions. The springs are shown connected with the
 80 vertical tubes and with the operating means, but any other desired arrangement may of course be provided. The springs are adapted to move the cut-offs to their closed positions as soon as the operating means is released by the operator.

What is claimed is:

1. An airship including a rotary plane constituting a gyratory member and provided with radial openings and having pro-
 90 peller blades pivotally mounted in the said openings and adjustable to open and close them, said blades substantially filling the openings when in their closed position and being pivoted at one side of the median line
 95 so as to present unequal areas above and below the rotary plane to cause the pressure of the air to tend to close the blades automatically, and a spring connected with the blades for urging the same to a closed
 100 position.

2. In an airship, in combination a gyratory radially recessed member, transversely oscillating blades pivoted intermediate their
 105 median lines and the blade edges and within said recesses of the gyratory member and on axes extending longitudinally of said recesses, whereby said blade in the open position presents unequal acting
 110 areas above and below the plane of the gyratory member, and pinions at the inner ends of said axes, and rack bars in engagement with said pinions, and means for actuating the rack bars.

3. An airship including a rotary plane
 115 constituting a gyratory element, propeller blades pivotally mounted on the said plane and provided with pinions, rack bars meshing with the pinions, and means for actuating the rack bars to open and close the
 120 blades, and a spring also connected with the blades for urging the same to their closed position.

4. An airship including a rotary plane
 125 constituting a gyratory member and provided with openings, propeller blades pivotally mounted in the said openings and provided with pinions, a central shaft on which the said plane is mounted, rack bars
 130 slidable with respect to the shaft and mesh-

ing with the pinions, a spring for urging the rack bars in one direction, and operating means including a lever for moving the rack bars in the opposite direction.

- 5 5. An airship including a rotary plane constituting a gyratory member, a vertical shaft on which the plane is mounted, propeller blades pivotally mounted on the plane and carried by the same, pinions connected
10 with the said propeller blades, spaced guides carried by the shaft, rack bars operating in the guides and meshing with the pinions and having a connecting portion or

head, a coiled spring disposed on the shaft and interposed between the connecting portion or head and one of the guides, an operating mechanism including a lever for moving the rack bars downwardly against the action of the spring. 15

In testimony whereof I affix my signature 20
in presence of two witnesses.

THOMAS M. FINLEY.

Witnesses:

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BENNETT S. JONES.