W. C. HENDERSON.

AIRSHIP.

APPLICATION FILED FEB. 3, 1910.

1,002,516.

Patented Sept. 5, 1911.

4 SHEETS—SHEET 1.

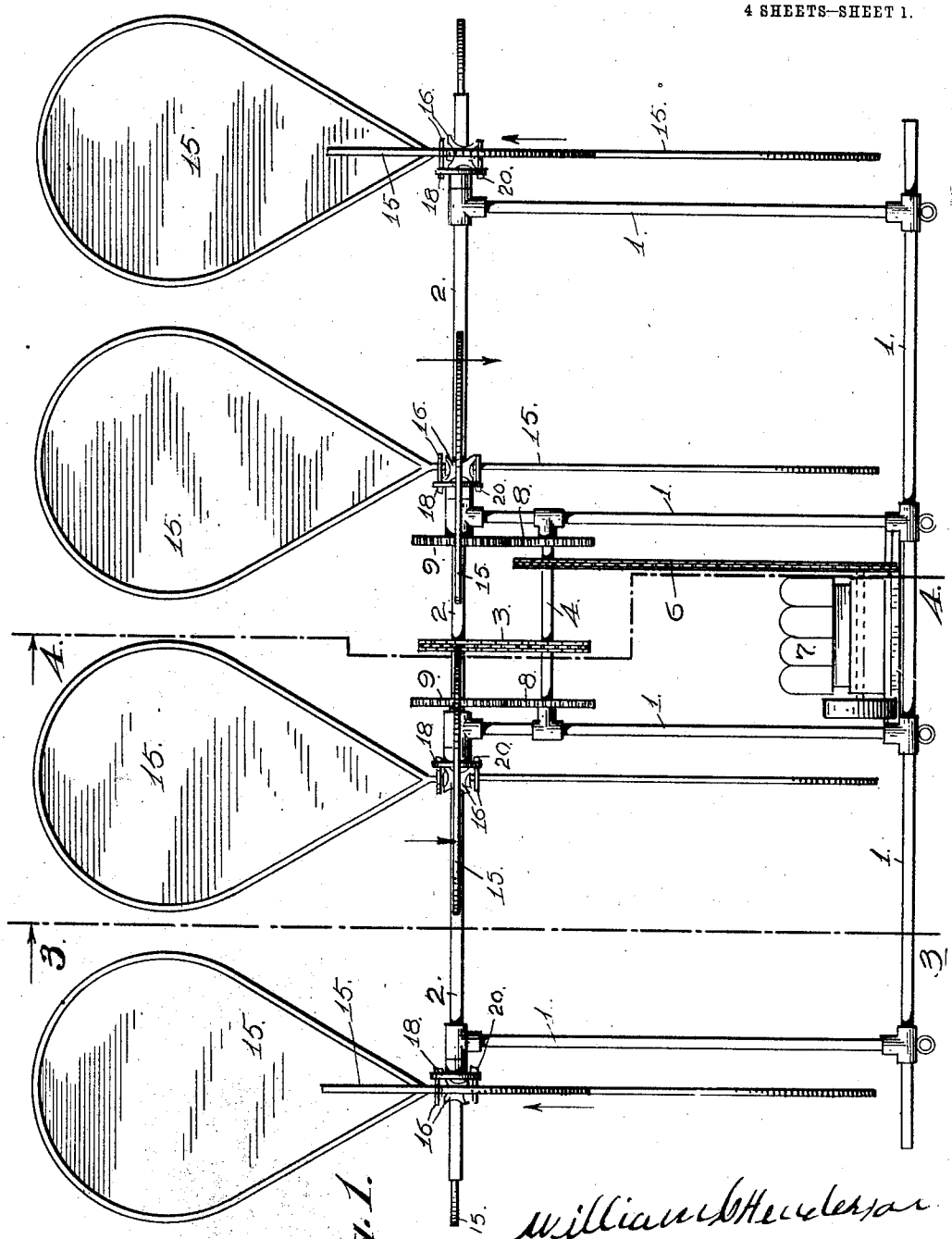

Fig. 1.

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4 SHEETS—SHEET 2.

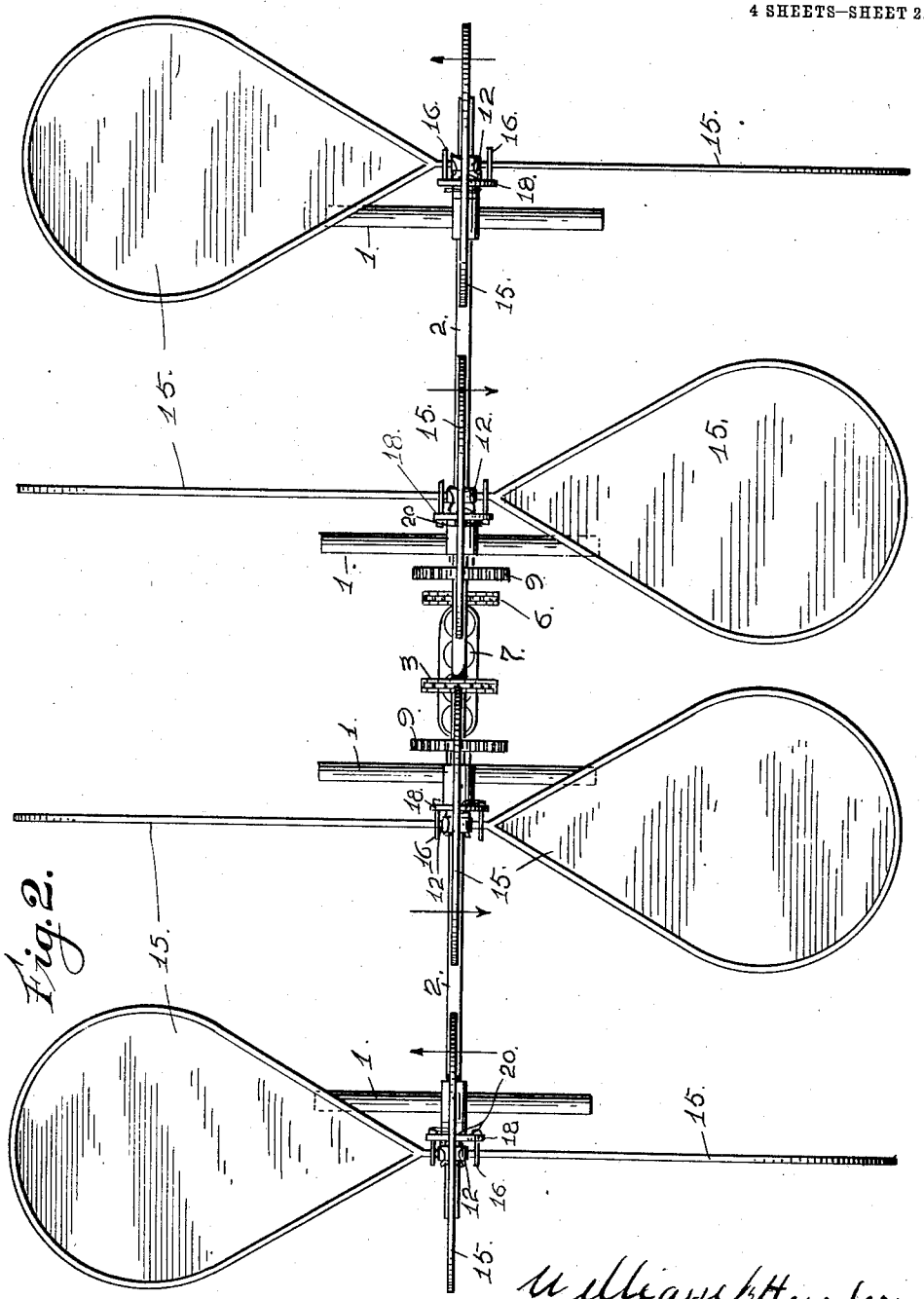

Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 3.

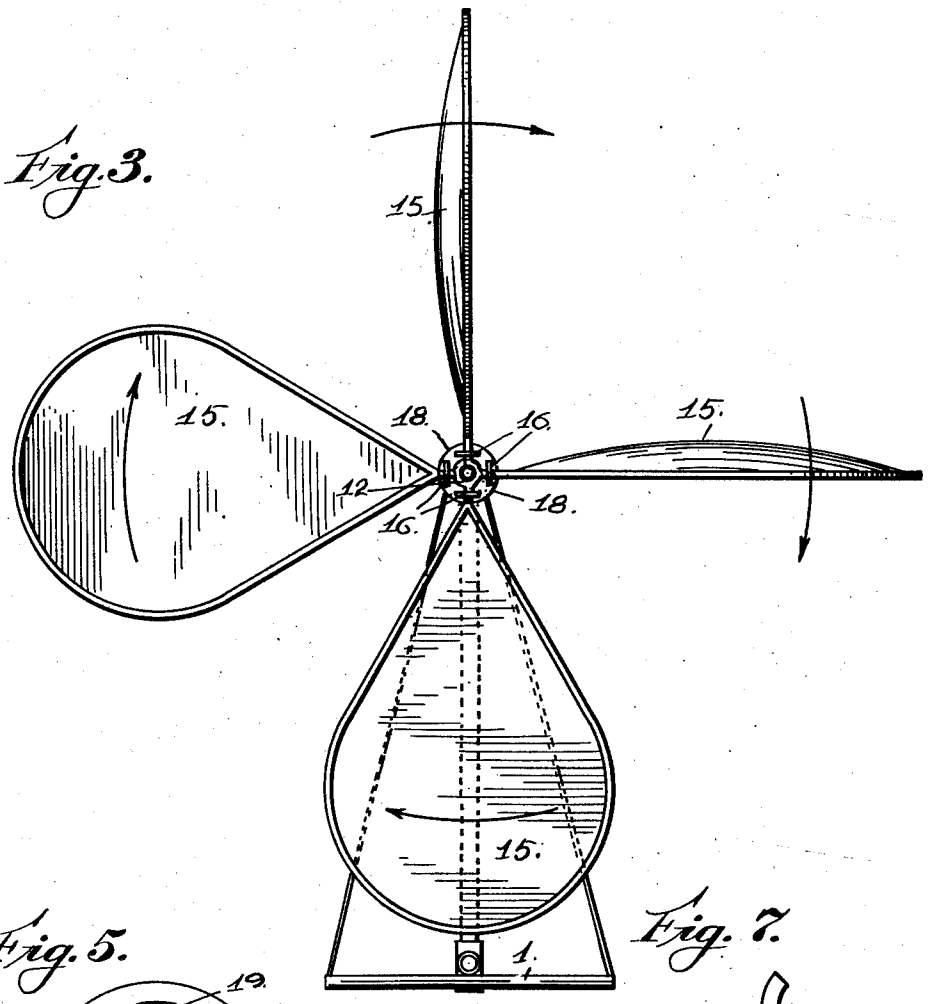


Fig. 5.

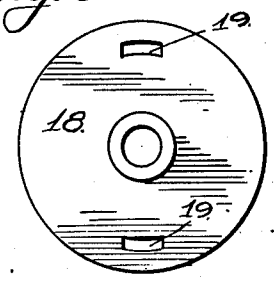


Fig. 6.

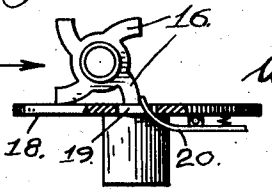
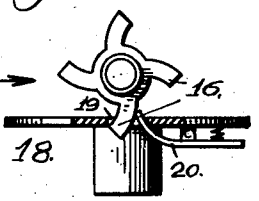


Fig. 7.



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4 SHEETS—SHEET 4.

Fig. 4.

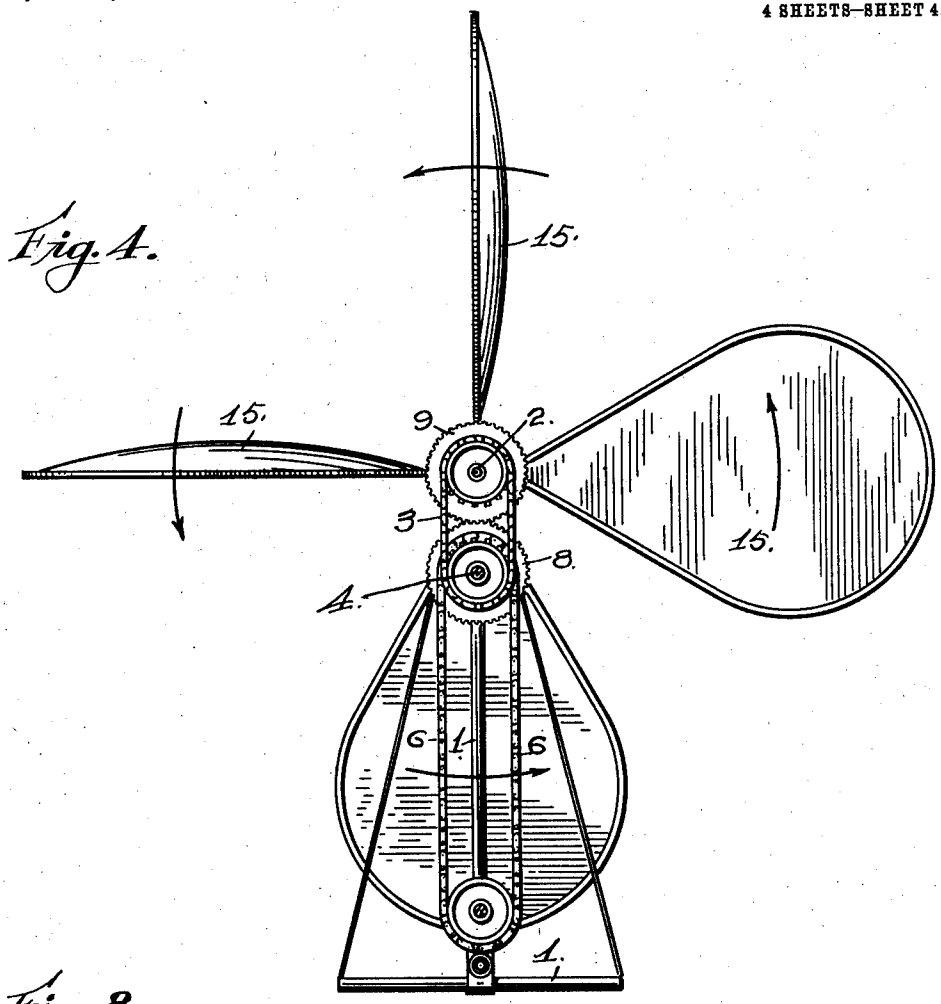


Fig. 8.

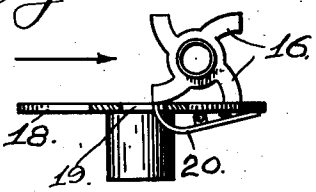
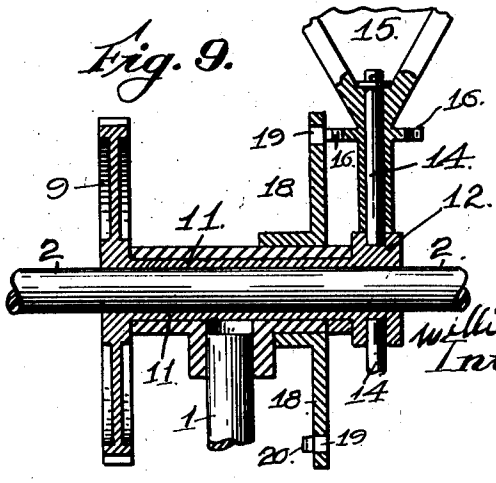


Fig. 9.



Witnesses.

Arthur L. Slee.

Elmer J. Ballinger

William C. Henderson

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UNITED STATES PATENT OFFICE.

WILLIAM C. HENDERSON, OF PASO ROBLES, CALIFORNIA.

AIRSHIP.

1,002,516. Specification of Letters Patent. Patented Sept. 5, 1911.

Application filed February 3, 1910. Serial No. 541,954.

To all whom it may concern:

Be it known that I, WILLIAM C. HENDERSON, a citizen of the United States, residing in the city of Paso Robles, and county of San Luis Obispo, and State of California, have invented certain new and useful Improvements in Airships, of which the following is a specification.

My invention relates to that class of air ships, that are operated by propellers, and has for its object, flight through the air, this being accomplished by means of propellers that are adapted to exert a downward and backward pressure upon the atmosphere and not being dependent upon any horizontal current or currents of air for its support, the object being, rather to break up and destroy such currents, said currents being detrimental to the equilibrium of air crafts, in the present state of the art. I accomplish these ends by mechanism described in this specification and shown in the accompanying drawings, in which,

Figure 1, is a side elevation of my airship. Fig. 2, is a plan view thereof. Fig. 3, is a vertical section on line 3—3 of Fig. 1. Fig. 4, is a vertical section on line 4—4 of Fig. 1, looking in the direction of the arrow. Fig. 5, is a detail view of one of the cam plates on an enlarged scale. Figs. 6, 7, and 8, are detailed views, showing the progressive movements of the trippers in connection with the cam plate shown in Fig. 5. Fig. 9, is a sectional view on an enlarged scale, showing the construction and arrangement of parts of the bearing for the reverse movements.

1, is a suitable frame, supporting a horizontal drive shaft 2, which is constantly rotated in one direction through the medium of a chain drive 3, counter shaft 4, and suitable connections, preferably a chain drive 6, connected to a motor 7.

On the counter shaft 4, are rigidly attached gears 8, meshing with gears 9, integral with revolving sleeves 11, (Fig. 9). This arrangement provides a driving shaft 2, rotating in one direction and two sleeves 11, rotating in the opposite direction.

Rigidly mounted on the drive shaft 2, and the rotary sleeves 11 respectively, are hubs or spiders 12, and pivotally mounted on the arms 14, of the hubs 12, are propeller blades 15, said blades having mounted on their stems the trippers 16, which are adapted to change the plane of the propeller blades 15, at two points during one revolution of said blades, in the following manner: Rigidly attached to the framework 1, are stationary circular disks or cam plates 18, having two openings 19, in the direct path of the trippers 16, both of the openings being provided with spring latches 20. Upon any of the propeller blades 15, reaching the extreme top or bottom points of the revolution, one of the tripper arms 16, is obstructed by the end of the spring latch 20, projecting through the opening 19. This forces the arm of the tripper 16, to enter the opening 19 (Fig. 7) and turn the propeller blade 15, through an angle of 90° (Fig. 8) or into a plane approximately at right angles with its previous position. Continuing, the tripper 16, presents its inclined edge to the end of the spring latch 20, depressing same back through the opening 19, until the tripper 16, has passed, when the spring latch 20, is again protruded through the opening 19, in the cam plate 18, ready to obstruct and turn the next succeeding tripper.

The resulting action of the foregoing arrangement is as follows: At the start, four propeller blades 15, are at the top of their cycles, perpendicular and in a plane parallel to the driving shaft which runs fore and aft. The arrangement of the chain drive 3, and gears 8 and 9, causes the two propellers amidships to rotate in an opposite direction from that of the two remaining propellers fore and aft (Fig. 1). Traveling in opposite directions, the propeller blades present their flat surfaces to the atmosphere, in rapid succession, in a downward direction. This action, starting from the top, has a tendency to break up or destroy any horizontal air currents that might exist. Also to create a partial vacuum above the center of the ship, which vacuum, acting on the propeller blades in conjunction with the downward pressure on the atmosphere, tends to hold the entire apparatus in suspension. The propeller blades continue their revolutions until just before they reach the bottom of their paths when they are again affected by the action of the cam plate 18, and trippers 16, which returns them to the plane at right angles to the driving shaft and completes the movement to the top of the revolution with the vanes traveling edgewise. It will thus be seen, that while the vanes are traveling downward, their flat surfaces are

presented to the atmosphere and the consequent reaction tends to lift the airship. While the vanes are traveling upward, they have their edges only, presented to the atmosphere, thus meeting with no appreciable resistance.

The foregoing, describes the means whereby the machine is lifted or held suspended in the air.

In order to force or propel the ship forward, it is only necessary for the operator to shift his weight to the front or forward part of the framework. This causes the depression of the forward part and the elevation of the after part. The vanes are then forcing the air backward as well as downward and the resulting reaction drives the ship ahead. While in this position, should the operator lean or shift his position to the right or left, the acting portion of the revolution of the vanes will be shifted accordingly, by reason of the ship being moved out of perpendicular in relation to the earth. The tripping mechanism being shifted accordingly, the vanes will not be brought into bearing position until after they have passed the perpendicular (in relation to the earth) and having necessarily to complete a half revolution before being turned edgewise again, will continue to exert a pressure on the atmosphere to a point beyond the said perpendicular, thus forcing the atmosphere to the elevated side of the ship and causing the same to turn in the opposite direction. To steer the ship in the other direction, the opposite of the above will suffice.

If it is desired to reverse the ship and go backward, the operator will shift his weight to the after portion of the framework, thus causing that portion to be depressed and thereby causing the propellers to resist a forward movement and sail to the rear.

It is obvious from the foregoing description, that the suspension of the apparatus is not dependent upon any current or currents of air.

From the action of the vanes rotating in opposite directions, exerting a lifting pressure on the atmosphere on their downward stroke and traveling edgewise on their upward stroke, it is apparent that the ship will be lifted by its own mechanism and cannot be capsized or upset from traveling air currents, the center of gravity being below the center of support.

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

1. In combination with an air-ship, a plurality of pivotally mounted rotating vanes, arms rigidly secured to the stems of said vanes, spring latches at two predetermined points in the revolution of the vanes adapted to engage said arms, and to turn the said vanes through an angle of 90 degrees in the manner described and for the purpose set forth.

2. In combination with an air ship, a plurality of pivotally mounted rotating vanes, arms rigidly secured to the stems of said vanes, a circular disk having apertures near the periphery at its upper and lower points, spring latches on the said disk near and projecting through said apertures and adapted to engage the arms rigidly secured to the stems of the said vanes and to turn the vanes by means of the arms through an angle of 90 degrees in the manner set forth and for the purpose described.

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

WILLIAM C. HENDERSON.

Witnesses:
M. R. VAN WORMER,
ELMER T. BOLLINGER.