

J. W. FAWKES.  
CENTRIFUGAL AEROPLANE.  
APPLICATION FILED SEPT. 28, 1909.

998,683.

Patented July 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

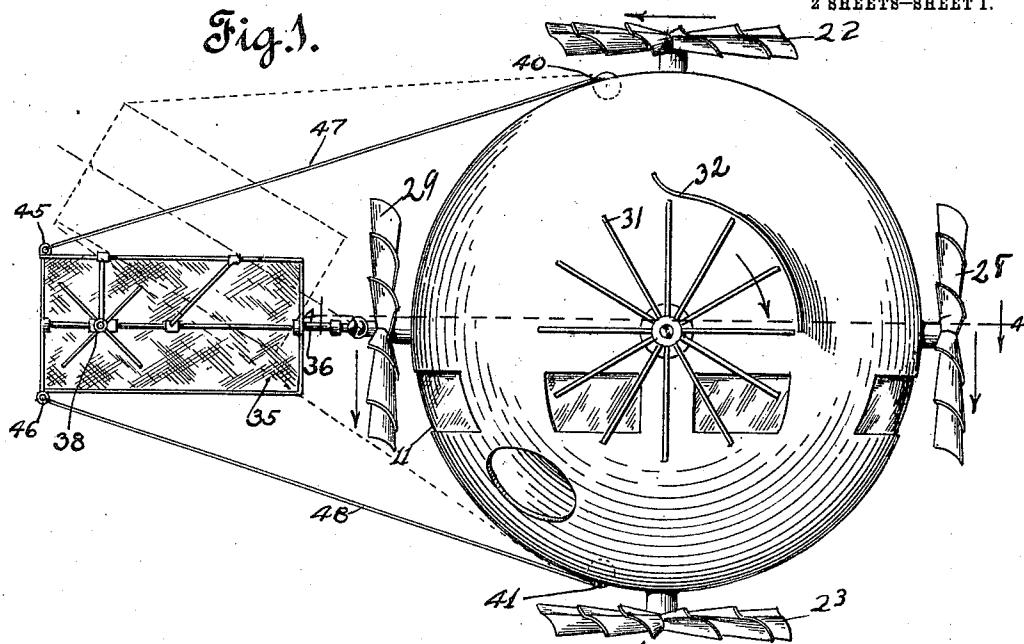
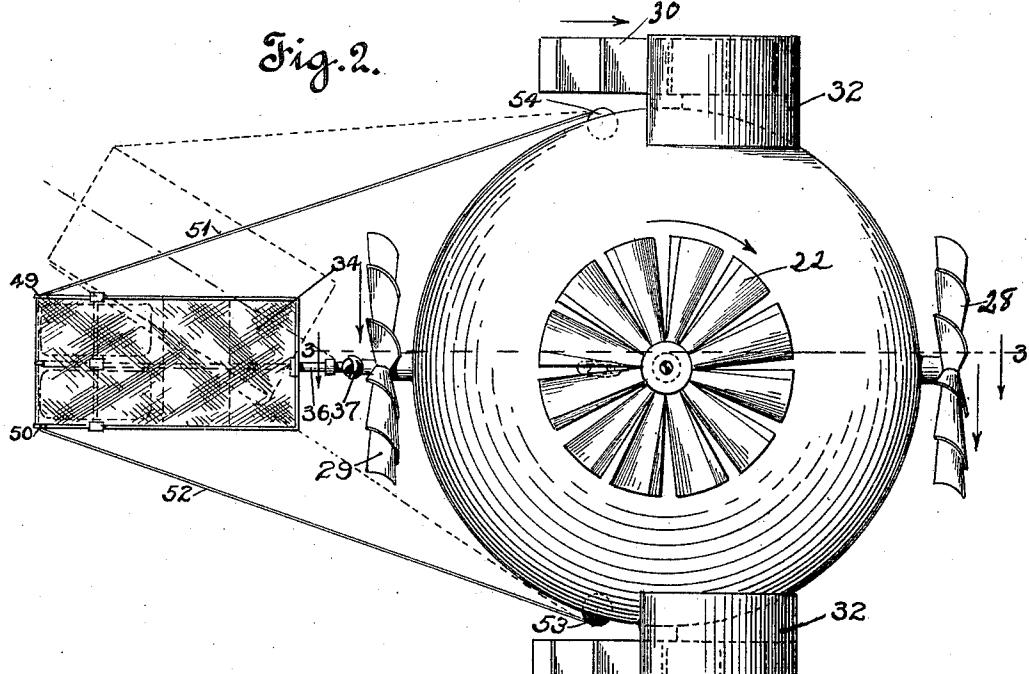


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

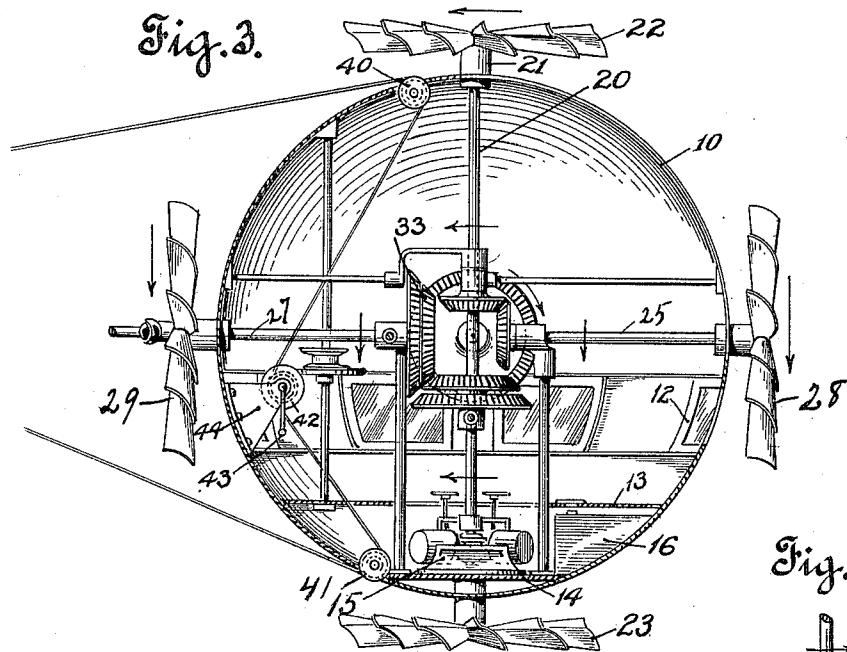


Fig. 5.

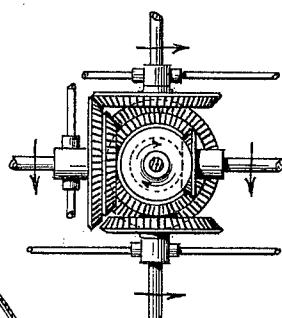
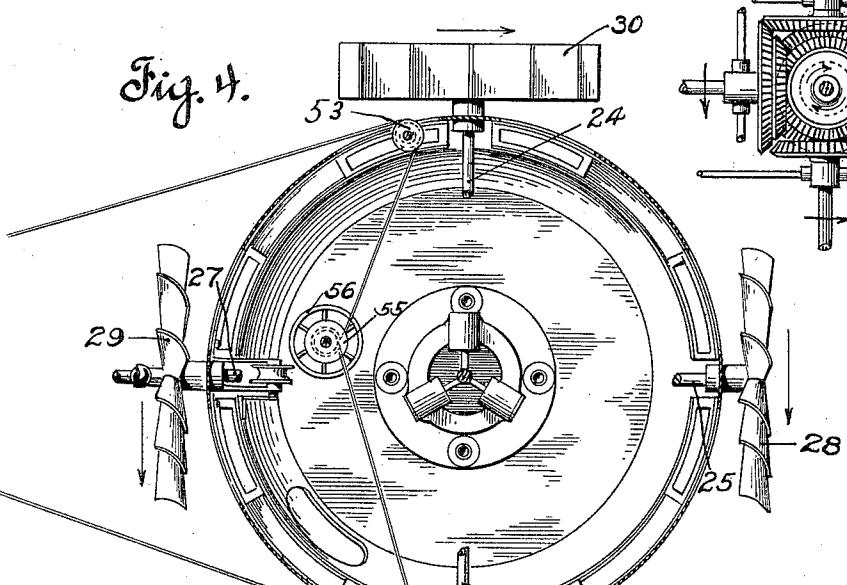


Fig. 4.



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# UNITED STATES PATENT OFFICE.

JOSEPH W. FAWKES, OF BURBANK, CALIFORNIA.

## CENTRIFUGAL AEROPLANE.

998,683.

Specification of Letters Patent. Patented July 25, 1911.

Application filed September 28, 1909. Serial No. 520,005.

To all whom it may concern:

Be it known that I, JOSEPH WESLEY FAWKES, a citizen of the United States, residing at Burbank, in the county of Los Angeles and State of California, have invented new and useful Improvements in Centrifugal Aeroplanes, of which the following is a specification.

This invention relates more particularly to that class of flying machines which are maintained in a balanced position during a flight through the air by the action of their propelling and lifting mechanism, and a main object thereof is to provide a machine whose novel configuration offers the least resistance to the atmosphere while the machine is passing rapidly therethrough.

Another and important object is to provide a machine whose novel construction will permit of an easy descent from its position in the air to the earth should an accident occur to its motive or propelling mechanisms.

A further object is to provide a simple and efficient propelling and balancing mechanism, whereby the machine may be effectively controlled during its passage through the air.

I accomplish the above objects by means of the device described herein and illustrated in the accompanying drawings, in which:—

Figure 1— is a side elevation of my complete machine. Fig. 2— is a top plan view of the same. Fig. 3— is a sectional side elevation taken on line 3—3 of Fig. 2. Fig. 4— is a sectional plan view taken on line 4—4 of Fig. 1. Fig. 5— is a top plan view of the gear driving mechanism.

Referring more particularly to the drawings 10 designates a hollow spherical body preferably constructed of aluminum or other light and durable material, the frame work of the body being omitted for clarity of illustration. This body contains the motive mechanism which will be more particularly described hereinafter.

The lower half of the hollow body is provided with a plurality of openings 11 closed 50 by window frames 12 for the purpose of admitting light and ventilating the interior of the machine. These windows or openings are also intended to be utilized to admit a large volume of air to the interior of the body when for any reason the machine should become inoperative during a flight,

the air entering the body and causing it to act as a parachute, and thus enabling a comparatively easy descent. These windows may also be utilized effectually to assist in 60 propelling the machine through the air as well as a lifting power, some of the windows being opened and some closed depending entirely upon the direction in which the wind or air is moving. When the windows 65 are closed, the body will be watertight, thus enabling it to float should the machine descend upon a body of water.

In descending to the earth from the air, the machine could be provided with a satisfactory landing means such as pneumatically tired wheels, but as this feature is well known I have not deemed it desirable to illustrate such a mechanism.

The lower portion of the hollow body is 75 preferably provided with a floor 13 and below this floor at the axis of the body is a motor base 14 upon which is mounted a gasoline explosion motor 15 of any usual type, the motor being supplied with gasoline from 80 a tank 16 located beneath the floor 13. Around the inner periphery of the hollow body and just below the windows, seats may be arranged for the accommodation of the 85 operators and passengers.

The driving mechanism of the machine consists of a main continuous driving shaft 20 which extends vertically from the motor upwardly and is secured in a bearing 21 formed on the hollow body, the ends of the shaft have secured thereto top and bottom propellers 22, 23, the blades of which may be of any preferred form, but preferably of the configuration illustrated in Figs. 1 and 3 of the drawings, to fully utilize the force of the 90 air. It will be observed from the foregoing that by rotating the propellers rapidly in the directions indicated by the arrows in Figs. 1 and 3 that the thrust force generated by the revolving propellers will force the 95 machine upwardly into the air. The remaining right angled diameters of the machine are also provided with counter driving shafts 24, 25, 26 and 27, the outer ends of which are supplied with propellers 28, 29, 30, and 31, which serve to drive the 100 machine through the air during the flight. The configuration of the blades 28 and 29 are spoon shaped so that the force generated by the revolving blades may be utilized to 105 the fullest extent. The propellers 30 and 31 at the sides of the machine, which are ro-

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tated by shafts 24 and 26, are in gear connection with the main driving shaft 20 of the machine. The blades of propellers 30 and 31 are flat and are provided with shields 32 which are attached to the body of the machine directly above and forwardly of the propellers. This disposition of shields 32 effectually prevents the wind from contacting with the blades while the machine is in flight.

The shafts 20, 24, 25, 26, 27, are provided with a plurality of bevel gears 33, which mesh with each other and drive the shafts in the directions indicated by the arrows in Figs. 1 and 5 of the drawings. As I do not limit myself to this specific form of driving mechanism, I have not deemed it expedient to amplify the directions in which the gears rotate, as the arrangement of gearing illustrated in the drawing sufficiently indicates to a person skilled in the art the direction of shaft rotation.

The steering apparatus consists essentially of a pair of vanes 34, 35, arranged at right angles to each other, vane 35 being provided with a shaft 36 the inner end of which is connected to one end of shaft 27 by a universal coupling 37 so that the vanes may be adjusted in any desired position, as clearly illustrated in Figs. 1 and 2 of the drawings. These vanes are preferably formed of aluminum or other suitable material and on the outer end thereof and each side of vane 35 are mounted propeller wheels 38, these wheels assisting in the propulsion of the machine through the air. The spherical body of the machine is provided with a plurality of grooved pulleys 40, 41 journaled in the shell thereof, and the interior is provided with a grooved pulley or winding drum 42 having a handle 43 and journaled in a bearing 44 secured to the inner face of the body of the machine. Vane 35 is provided with eyes 45, 46 to which are secured cables 47, 48, which pass over pulleys 40 and 41 and are wound on drum 42. By rotating drum 42 the vanes may be inclined upwardly or downwardly from the horizontal position shown in Fig. 1 of the drawings, to the dotted inclined position. By means of these various inclinations the machine may be steered upwardly or downwardly at the will of the operator. The outer end of vane 34 is also provided with eyes 49, 50, to which are attached cables 51, 52, which pass over pulley sheaves 53, 54, which are journaled in the shell of the machine body similar to the sheaves 40, 41. The inner end of these cables are attached to a winding reel or drum 55, which is operated by a hand wheel 56. It will be observed that when the steering apparatus is swung to the right or left the course of the machine through the air will be instantly changed to the desired direction. Although

I have illustrated a specific steering mechanism any other similar mechanism that will control the course of the machine during its flight through the air would answer the purpose equally as well.

By means of the spherical configuration of the machine body the utilization of the machine in military operations would be entirely feasible as it would be almost impossible to pierce the shell with projectiles or bullets as they would glance off the spherical surface. If desired a steel sheet might also be employed beneath the machine to provide for the above contingencies.

It will be apparent from the foregoing description that I have provided a flying machine of a novel configuration which will accelerate the flight of the machine through the air, and also by means of the openings in the body of the machine the danger of a sudden and unexpected descent would be reduced to the minimum, the machine acting as a parachute. It will be further observed that by means of the rapidly moving propellers mounted on the right angled axes of the machine, that I am enabled to maintain the machine in a balanced position during its flight, as the propellers act as gyroscopic balances, controlling the machine at all times during its operation.

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

1. An air ship having a hollow spherical body, a rear shaft extending horizontally through the rear wall of said body, a propeller carried thereby for advancing said body, a steering vane having a universal connection at the rear end of said shaft, and means for adjusting said steering vane to steer the air ship.

2. An air ship having a hollow spherical body, a rear shaft extending horizontally through the rear wall of said body, a propeller carried thereby for advancing said body, a steering vane having universal connection at the rear end of said shaft, cords connecting with the end of said steering vane and passing through the wall of said body on opposite sides thereof and substantially at the same level, means for operating said cords to move said vane to the right or left of said horizontal shaft, a pair of cords connected with said vane and passing through the walls of said body on the upper side thereof and on the under side thereof, means for adjusting said last pair of cords for elevating or depressing said last steering vane, and means for driving said propeller.

3. An air ship having a hollow spherical body, a vertical shaft passing therethrough and projecting through the wall of said body on the upper side and projecting through the wall of said body on the under side, propellers carried by said vertical shaft tend-

ing to raise said body when said shaft is rotated, a rear shaft extending through the wall of said body through the rear side thereof, a propeller carried thereby for advancing said body, a steering vane having universal connection with the rear end of said rear shaft, a pair of cords attached to said steering vane near the rear end thereof and passing through the wall of said body on opposite sides thereof, means within said body for actuating said cords to move said vane toward the left or right, a second pair of cords attached to the rear end of said vane and passing through the walls of said body on the upper and lower sides thereof, means for adjusting said last pair of cords to depress or elevate said vane, and means for driving said rear shaft and said vertical shaft.

20 4. An air ship having a hollow body, horizontal shafts extending laterally through the side walls of said body on opposite sides thereof and in axial alinement with each other, wheels carried by said shaft on the exterior of said body and having radial blades, shields covering the forward and rear

sides of said wheels and lying near the path of the extremities of said blades, a vertical shaft passing through said body and projecting above the upper wall thereof, propeller wheels carried by said shaft and adapted to elevate said body when rotated, a forward shaft extending through the forward wall of said body, a propeller wheel carried thereby tending to draw said body forwardly when rotated, a rear shaft extending through the rear wall of said body in alinement with said forward shaft, a steering vane having universal connection with the rear end of said rear shaft, means for elevating and depressing said steering vane, means for adjusting said steering vane toward the right and toward the left, and a motor within said body for driving all of said shafts.

25 In witness that I claim the foregoing I have hereunto subscribed my name this 17th day of September, 1909.

J. W. FAWKES.

Witnesses:

EDMUND A. STRAUSE,  
ETHEL COLEMAN.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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