No. 859,274. PATENTED JULY 9, 1907.

J. H. WILSON.

FLYING MACHINE.

APPLICATION FILED MAY 1, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

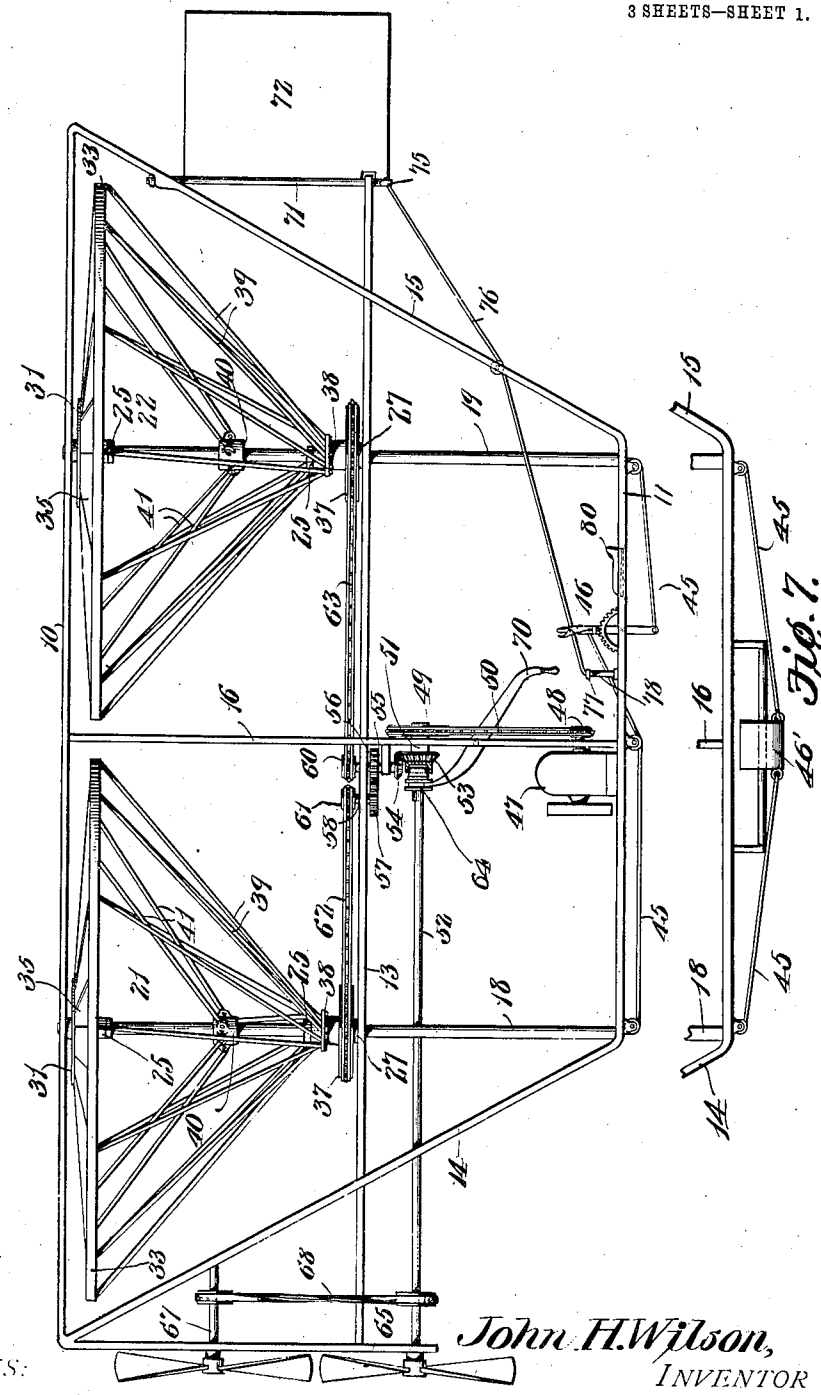

Fig. 7.

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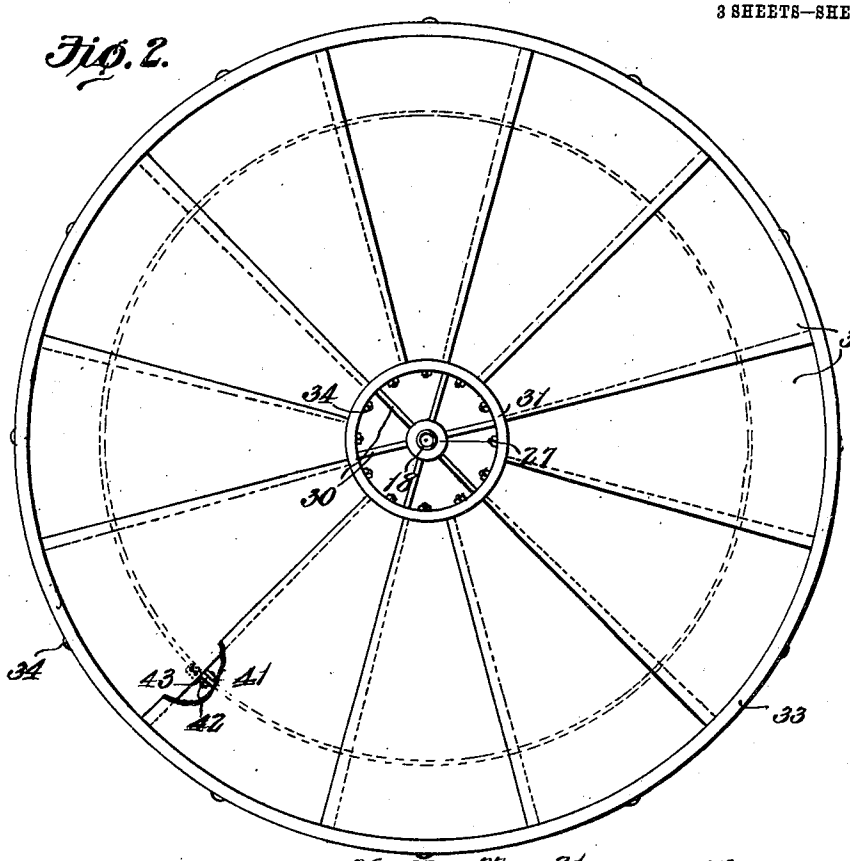
3 SHEETS—SHEET 2.

Fig. 2.



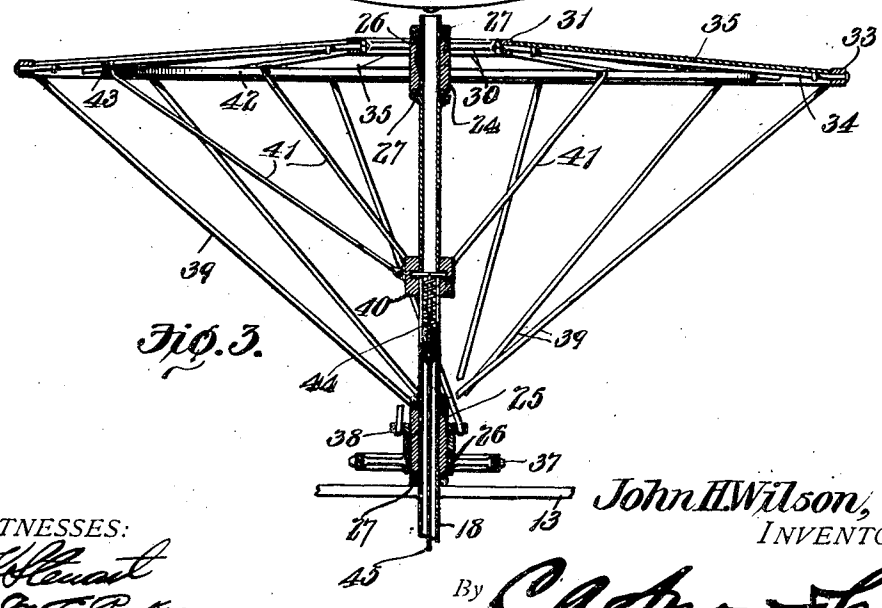


Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

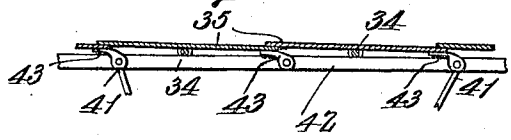


Fig. 5.

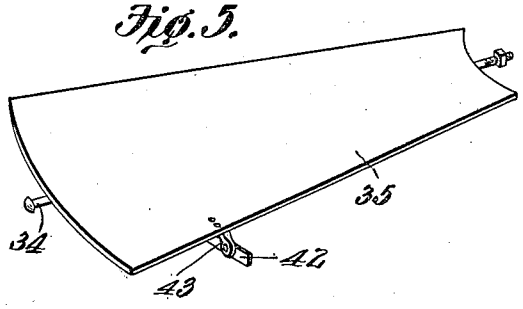
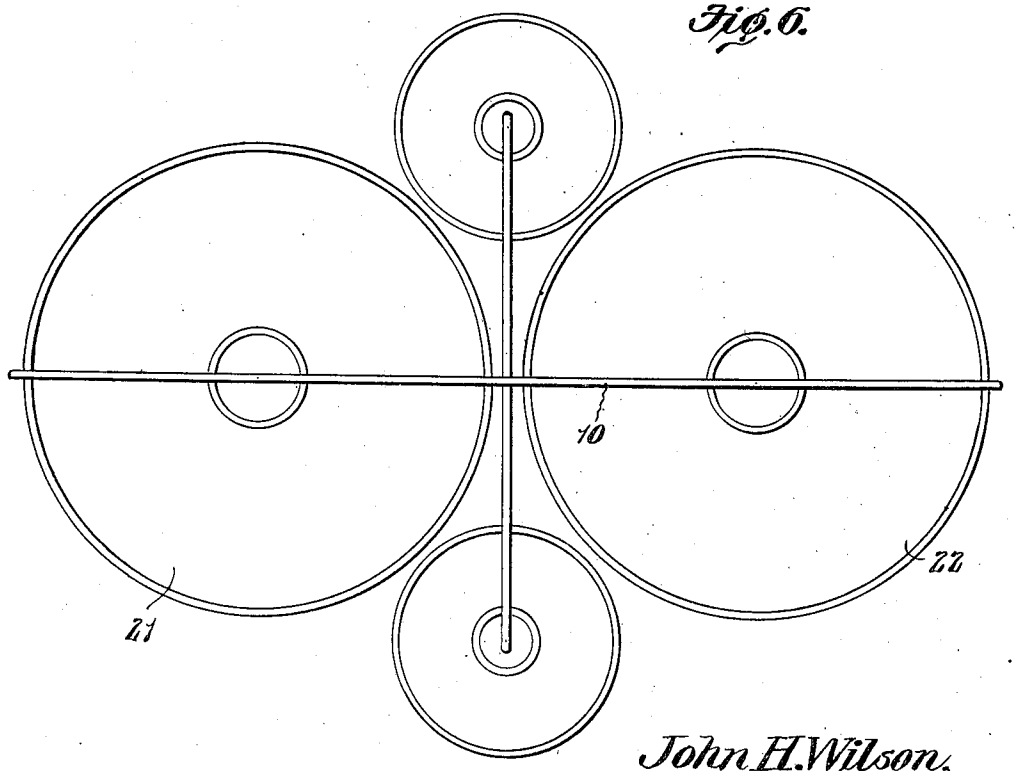


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN HOLMES WILSON, OF CARLISLE, PENNSYLVANIA.

FLYING-MACHINE.

No. 859,274. Specification of Letters Patent. Patented July 9, 1907.

Application filed May 1, 1906. Serial No. 314,697.

To all whom it may concern:

Be it known that I, JOHN HOLMES WILSON, a citizen of the United States, residing at Carlisle, in the county of Cumberland and State of Pennsylvania, have invented a new and useful Flying-Machine, of which the following is a specification.

This invention relates to flying machines, and has for its principal object to provide a machine of light and strong construction having a rotative means for elevating and maintaining the equilibrium of the machine by gyroscopic action, and which at the same time may form a parachute during the descent of the machine.

A further object of the invention is to provide an elevating device having adjustable fans which, when opened, may be utilized for raising the vessel, and when closed may form a rotary aeroplane to maintain equilibrium, and which may, also, form a parachute.

A still further object of the invention is to provide a device of this type in which the angle of the vessel to the horizontal may be readily adjusted and the machine maintained in horizontal position, or at any angle thereto by the employment of a shiftable weight for the purpose of altering the center of gravity of the machine, or altering the degree of inclination of the blades of the respective aeroplanes and lifting devices.

A still further object of the invention is to provide a machine of this type with a constantly revoluble member which is placed under the control of the aeronaut or operator, and which may be adjusted to open position for the purpose of forming a lifting device, or may be moved to closed position to present a smooth surface, so that it may act as a revoluble aeroplane.

A still further object of the invention is to provide a machine of this type with lifting and propelling devices, in which the lifting devices are constantly operated, but are adjustable as to effectiveness while the propelling devices are intermittently operated under the control of the operator.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit, or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a side elevation of a flying machine constructed in accordance with the invention. Fig. 2 is a plan view of one of the aeroplanes or lifting fans showing the blades in closed position to form a parachute. Fig. 3 is a vertical section through the aeroplane or lifting fan. Fig. 4 is a transverse sectional view through a number of the blades, showing the manner in which they overlap. Fig. 5 is a detail perspective view of one of the blades detached. Fig. 6 is a plan view, showing the employment of four aeroplanes or lifting fans. Fig. 7 is an elevation of the lower portion of the frame illustrating a slight modification of the invention.

Similar numerals of reference are employed to indicate corresponding parts throughout the several, figures of the drawings.

In carrying out the invention the frame is constructed of some light but strong material, such for instance as bamboo, aluminum tubes, or the like. This frame in the present instance comprises an upper bar 10, a lower bar 11, and central bars 13, all of which are arranged in parallel relation, and these are connected by inclined end bars or tubes 14 and 15 and a centrally disposed central bar or tube 16. In addition to these, auxiliary hollow tubes 18 and 19 are arranged between the upper bar 10 and the lower bar 11.

The tubes 18 and 19 extend through the central portions of rotary members which serve as aeroplanes, lifting and equilibrium maintaining devices and parachutes. Two of these members 21 and 22 are shown in the present instance.

Each of the revoluble members is of the same construction and includes a hub formed of sections 24 and 25, which are provided with ball races 26 arranged to receive anti-friction balls supported in part by sleeves or collars 27 that are rigidly secured to the vertical tubes 18 and 19. To the upper hub member 24 are secured radiating strips 30 which at their outer ends form supports for a ring 31 that is formed of strong, light material and this ring forms an opening at the center of the revoluble member in order to permit the passage of a current of air when the device is closed to form a parachute, so that the downward movement will be steady and pitching from side to side will be prevented. The outer ring 33 of the aeroplane or fan is, also, formed of strong light weight material, and is arranged in a plane somewhat below the horizontal plane of the ring 31. The frame and ring are connected by solid spokes 34, formed of steel or other strong material, and on these spokes are pivoted blades 35. The blades 35 may be formed of sheet aluminum or of light frames covered with silk or the like, and these are so arranged as to slightly overlap at their meeting edges when closed. The blades may be adjusted to open position, the angular position of the blade being under the control of the aeronaut, or being connected with an automatically operated adjusting member, the position of which changes in accordance with the angle of the machine to the horizontal.

To the lower hub bearings 25 is secured a spoked wheel 37 and a disk 38, and said disk is connected to

the outer rim 33 by means of spokes 39 which are tangentially disposed. This permits the lower disk 38 to transmit considerable driving force to the combined rotary aeroplanes, equilibrium maintaining device, lifting fans and parachute, and the latter will receive constant movement from both its center and its periphery.

Mounted slidably on the tubes 18 and 19 is a collar 40 which is connected by rods 41 to a ring 42, the latter being connected to small ears or lugs 43 on the several blades 35, and by moving the collar in the direction of the length of the tube, the angular position of the blades may be adjusted, or the blades may be closed to form a rotary aeroplane or parachute. The blades being all connected to the ring 42, all receive exactly the same movement, and are maintained at the same angle.

The slidable collar 40 is arranged to be moved in one direction by a spring 44, and in the opposite direction by a flexible cord or chain 45 which is connected to an operating lever 46 arranged immediately in front of the aeronaut, and by moving this lever the blades of both of the aeroplanes or fans may be simultaneously adjusted to precisely the same extent, so that the lifting force exerted will be precisely the same at both ends of the machine, or, as shown in Fig. 7, the member 45 may be connected to a slidable weight or collar member 46, which may be moved by gravity, or may be shifted by the aeronaut for the purpose of decreasing the angle of one set of blades and increasing the angle of the other set of blades, so as to render the lifting forces unequal. This, in some cases, proves of advantage when it is desired to automatically retain the vessel in horizontal position, or if one end should be depressed, the slidable weight moving downward by gravity toward the depressed end will effect slight closing of the blades at the higher end, and corresponding opening of the blades at the lowermost end, so that as the lifting force is increased at the lowermost end, that end will rise and the level will be automatically restored.

At the lower central portion of the frame is arranged a motor 47, the motor being preferably of the internal combustion type, and the main shaft of the motor carries a sprocket wheel 48, which transmits motion to a sprocket wheel 49 by means of a link belt 50. The sprocket wheel 49 is secured to a hollow shaft 51 that is mounted on the horizontally disposed shaft 52, the latter being supported in suitable bearings in the frame. The inner or forward end of the hollow shaft carries a bevel gear 53, the hub of which is arranged to form a friction clutch, and this gear intermeshes with a bevel pinion 54 mounted on a short vertically disposed shaft 55 that is also mounted in bearings on the frame. The shaft 55 carries a gear 56 which meshes with a gear 57 on a second shaft 58, the gears being of equal size, so that the two shafts are turned at the same speed, but in opposite directions. At the upper ends of the shafts 55 and 58 are small sprocket wheels 60 and 61, respectively, and these are connected by link belts 62 and 63 to the sprocket wheels 37 of the revoluble members, so that the latter will be turned at equal speeds, but in opposite directions to each other, said rotary members being constantly driven so long as the motor is in operation.

The shaft 52 carries a slidable friction clutch 64 which may be moved into and out of engagement with the clutching member carried by the bevel gear 53, and at the front of the machine, the shaft 52 is provided with a propeller 65 and above the propeller 65 is a second propeller 66 mounted on a suitable shaft 67, the shafts 52 and 67 being connected by suitable belt wheels and a crossed belt 68.

The shafts of the propeller are driven in opposite directions to each other, and the propelling blades are of equal diameter, so that any tendency to sidewise movement is corrected. The propeller driving connection is under the control of a lever 70 that connects with the friction clutch, so that when the machine has risen to the proper height, the clutches may be brought into play to gradually start the movement of the propellers.

At the rear of the machine, the bars 15 and 13 serve as supports for a rudder post 71 carrying a suitable rudder 72 which generally is formed of a light frame covered with oiled silk or like material. The rudder post carries steering arms 75 which are connected by flexible cords or chains 76 to steering handles 77 that are disposed at the upper end of a steering post 78 immediately in front of the aeronaut.

The aeronaut's seat 80 is slidably mounted on the lower bar or tube 11, so that the aeronaut may shift his position, and by thus altering the center of gravity of the machine may change its angle to the horizontal, or this may be done by causing the adjustable vanes or blades in one or other of the rotary aeroplanes to open wider than the other, thereby causing one to exert a greater lifting power than the other.

The method of operating this flying machine is as follows:—The apparatus is so arranged as to assume a horizontal position. The rotary aeroplanes are caused to revolve by means of the motor 47. The adjustable vanes or blades of the rotary aeroplanes are preferably closed when starting the motor, and when the rotary aeroplanes have attained a speed of say one hundred and twenty-five or more revolutions per minute, the vanes or blades are caused to open by the aeronaut operating the lever 46, and the machine will rise. When the desired height has been attained, the adjustable vanes in the rotary aeroplanes or lifting devices may be gradually closed by the lever 46, and lever 70 is then moved to engage the friction clutch, so that power is transmitted through the shaft 52 to the two propellers, causing them to revolve and draw the machine forward. The aeronaut by shifting his weight somewhat to the rear may cause the front of the machine to be tilted upward slightly, so that the rotary aeroplanes when closed will act to maintain the machine in elevated position while the propellers draw the same forward. The rotary aeroplanes are in constant motion, while the machine is in flight, and by their gyroscopic action tend to maintain the equilibrium of the machine in the air, keeping the machine from rolling or diving, and causing it to travel steadily in the desired course.

In practice, any even number of rotary aeroplanes may be employed, and in Fig. 6 a slight modification of the invention, including four rotary aeroplanes is illustrated.

The apparatus may be employed for carrying a passenger or other load, or may be used for raising and maintaining at any desired elevation the antenna of a wireless telegraph station, or for the wireless trans-

mission of electrical energy for any purpose, or for the discharge of electrical energy in the atmosphere, or for the purpose of raising recording instruments to ascertain the condition of the atmosphere at high altitudes.

It is to be understood that the invention is not limited to the described means for transmitting power to the rotators and propellers, as any kind of motor mechanism, and any form of power transmitting devices may be utilized for the purpose, and the vanes may be adjusted in different manner, without departing from the spirit or scope of the invention.

I claim:—

1. In a flying machine, the combination with a frame, of a plurality of rotary aeroplanes, means for revolving the same in opposite directions, respectively, each device including in its construction a series of pivotally mounted vanes, and means for automatically adjusting the angular positions of such vanes.

2. In a flying machine, the combination with a frame, of a rotary aeroplane having a central opening to permit the passage of a current of air, said aeroplane including in its construction a series of pivotally mounted vanes, and means for automatically adjusting the angular positions of such vanes.

3. In a flying machine, a revoluble hub or sleeve, a spoked ring secured to the upper portion thereof, a rim arranged in a horizontal plane somewhat below the plane of the ring, radial spokes connecting the ring and rim, vanes pivoted on the spokes and arranged to overlap when in closed position to form an aeroplane, a disk secured to the lower portion of the hub, tangent spokes extending from the disk to the rim, a slidable collar, a ring to which all of the valves are connected, and arms extending between said ring and the collar, substantially as described.

4. In a machine of the class described, a frame, a slidable weight thereon, a plurality of rotary aeroplanes, each having angularly adjustable vanes, and means connecting such vanes to the slidable weight to automatically adjust the angular positions of the vanes in accordance with the angle of the machine to the horizontal.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN HOLMES WILSON.

Witnesses:
M. M. DOUGHERTY,
G. B. BIXLER.