H. R. MORRIS.

FLYING MACHINE.

APPLICATION FILED SEPT. 14, 1916.

1,236,741.

Patented Aug. 14, 1917.

2 SHEETS—SHEET 1.

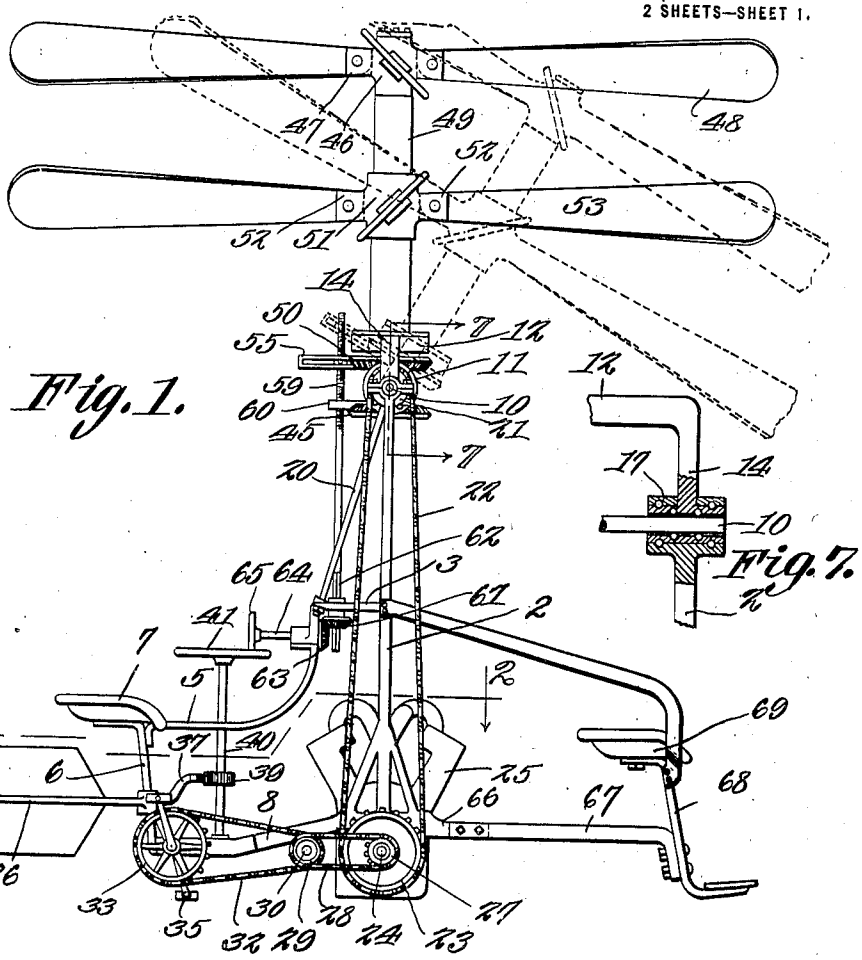


Fig. 1.

Fig. 7.

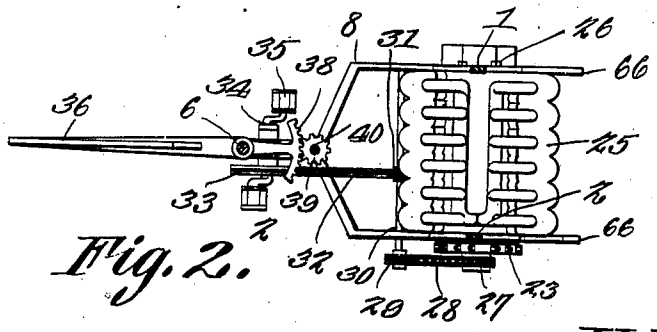


Fig. 2.

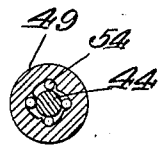


Fig. 8.

H. R. Morris

Inventor,

Witnesses

J. R. Fowler

R. L. Parker

by C. A. Snow & Co.

Attorneys.

H. R. MORRIS.

FLYING MACHINE.

APPLICATION FILED SEPT. 14, 1916.

1,236,741.

Patented Aug. 14, 1917.

2 SHEETS—SHEET 2.

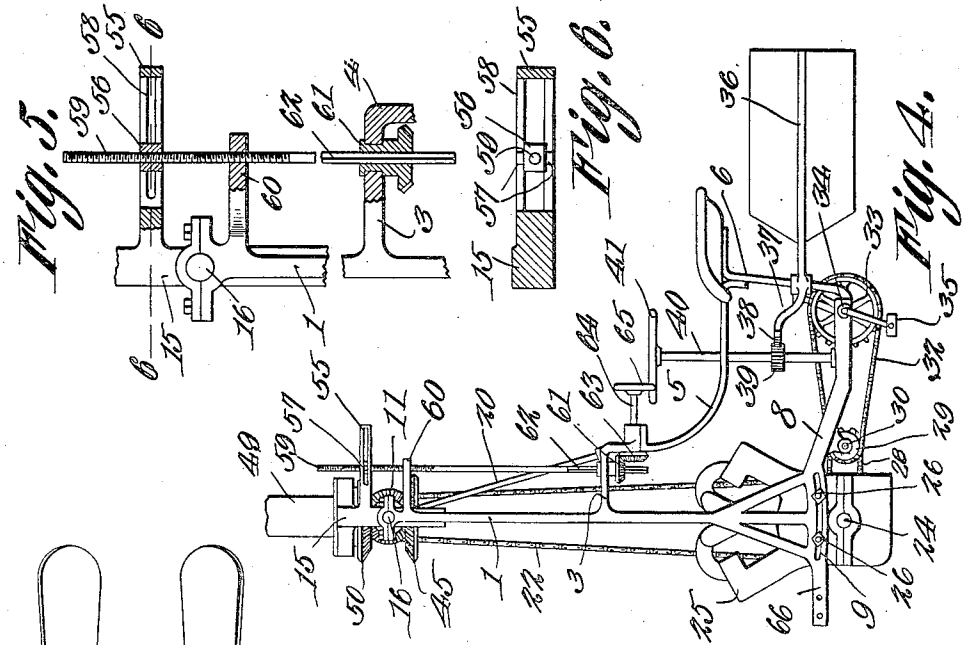


Fig. 4.

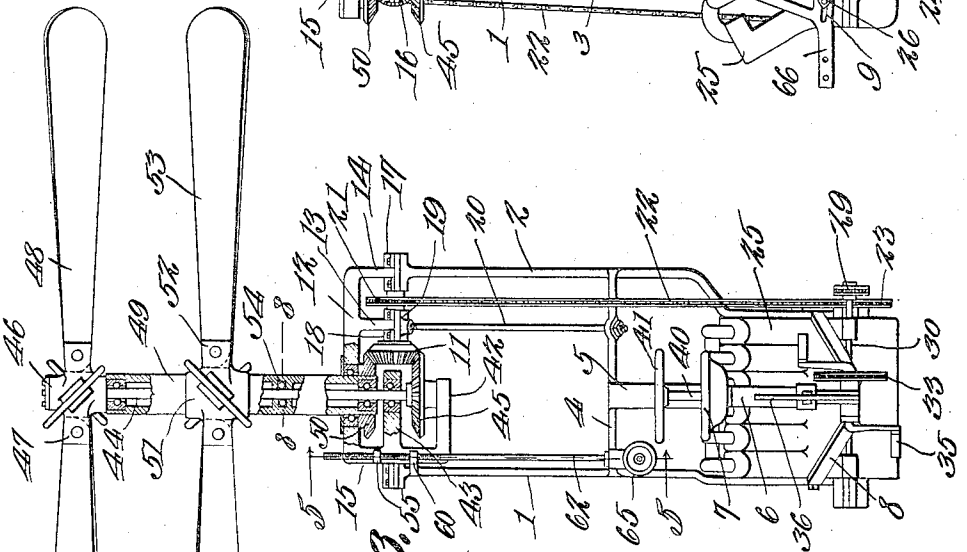


Fig. 3.

Fig. 5.

Fig. 6.

Witnesses

J. P. Fowler

R. L. Parker

H. R. Morris

Inventor,

by C. A. Snow & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

HARRISON R. MORRIS, OF MAPLETON, KANSAS.

FLYING-MACHINE.

1,236,741. Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed September 14, 1916. Serial No. 120,165.

To all whom it may concern:

Be it known that I, HARRISON R. MORRIS, a citizen of the United States, residing at Mapleton, in the county of Bourbon and State of Kansas, have invented a new and useful Flying-Machine, of which the following is a specification.

This invention relates to flying machines of the heavier-than-air type, one of its objects being to provide a helicopter of simple and compact construction which can be easily controlled and which utilizes wheels which serve both to elevate the machine and to carry it forwardly while maintained at a desired elevation.

A further object is to provide simple and efficient means for controlling the rotation of the lifting and propelling wheels, for adjusting the axis of rotation of said wheels relative to the car, and for steering the machine while in flight.

A still further object is to provide an attachment whereby a passenger can be carried, the passenger being supported at such a point as to balance the machine while in flight.

Another object is to provide means whereby the motor may be adjusted relative to the car so as to substantially counterbalance the aviator when riding alone.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—

Figure 1 is a side elevation of the machine.

Fig. 2 is a section on line 2—2 Fig. 1.

Fig. 3 is a rear elevation of the machine.

Fig. 4 is an elevation of that side of the car of the machine opposite to that illustrated in Fig. 1.

Fig. 5 is a section on line 5—5 Fig. 3.

Fig. 6 is a section on line 6—6 Fig. 5.

Fig. 7 is a section on line 7—7 Fig. 1.

Fig. 8 is an enlarged section on line 8—8 Fig. 3.

Referring to the figures by characters of reference, 1 and 2 designate side members of the frame of the car, these members being provided between their ends with rearwardly extending arms 3 connected by a cross beam 4. From this cross beam extends a downwardly and rearwardly curved brace 5 attached, at its rear end, to the upper end of a standard 6 on which the seat 7 to be occupied by the aviator is located. Standard 6 extends upwardly from and is connected to rearwardly converging frame members 8 which project from the lower ends of the side members 1 and 2. Those portions of the frame members 8 adjacent the side members 1 and 2 are formed with slots 9 which are concentric with a shaft 10 journaled in the upper end of the side member 2. Shaft 10 is provided at its inner end with a pinion 11 and mounted to swing on this shaft is a yoke 12 having arms 13 and 14 which engage the shaft, while another arm 15 carried by said yoke has a gudgeon 16 which is journaled in the upper end of the frame member 1. The arm 14 of the yoke extends through a slotted cap 17 which forms the upper member of the bearing at the top of the frame member 2 and the arm 13 extends through a slotted cap 18 which forms the upper member of a bearing 19 provided at the upper end of a rod 20. The lower end of this rod is attached to the bar 4. A sprocket 21 is secured to the shaft 10 between the caps 17 and 18 and is designed to receive motion through a chain 22 from a sprocket 23 secured to the drive shaft 24 of a motor 25. This motor is arranged between the lower ends of the side members 1 and 2 of the frame and is held thereto by bolts 26 or the like extending into the slots 9. Thus it will be seen that the motor can be adjusted longitudinally of the slots to shift the center of gravity.

The sprocket 23 is preferably connected to the drive shaft 24 by a suitable friction clutch not shown, this clutch operating to transmit motion from the shaft 24 to the sprocket 23 during the operation of the motor, but permitting the sprocket 23 to rotate on the shaft 24 when the motor is not in operation. The clutch may be one of a number of types such, for example, as the well known ball clutch. Secured to sprocket 23 by a similar clutch is a sprocket 27 designed when driven in a clockwise direction to transmit motion to the sprocket 23 but, when held against rotation, will not

interfere with the rotation of the sprocket 23. Mounted on the sprocket 27 is a chain 28 designed to receive motion from a sprocket 29 secured to a shaft 30 which extends transversely of and is journaled within the braces 8, this shaft having a sprocket 31 adapted to receive motion from a chain 32, from a sprocket 33 secured to a shaft 34 having foot pedals 35 whereby said shaft can be rotated by the occupant of the seat 7.

A rudder 36 is mounted to swing laterally about the seat post or standard 6 and has an arm 37 extending forwardly therefrom and provided with a toothed segment 38 which meshes with a gear 39. This gear is secured to a steering post 40 mounted on front of the seat 7 and having a hand wheel 41 or the like by means of which it can be rotated readily.

The arm 15 of yoke 12 extends below the gudgeon 16 and has inwardly extending superposed fingers 42 and 43 in which is journaled a shaft 44 provided, near its lower end, with a pinion 45 which constantly meshes with the pinion 11. Secured to the upper end of shaft 44 is the hub 46 of a lifting wheel, this hub being preferably provided with radial ears 47 to which the blades 48 of the wheel are pivotally connected. These blades are so disposed relative to the hub as to be capable of swinging downwardly to position alongside the shaft 44 when the wheel is not in use. However, when the wheel is to be used, the blades 48 can be swung upwardly so as to radiate from the hub as shown in Figs. 1 and 3.

Mounted for rotation on the shaft 44 is a tubular shaft 49 which is journaled at its lower end within the yoke 12 and has a pinion 50 disposed oppositely to the pinion 45 and constantly meshing with the pinion 11. Secured to this tubular shaft is a hub 51 of a lifting wheel, this hub having radial ears 52 to which are connected blades 53. The blades 53 are pitched oppositely to the blades 48 but are mounted in the same manner as said blades 48. Thus it will be seen that when the pinion 11 is rotated, the two shafts 44 and 49 will be rotated in opposite directions respectively, carrying with them the oppositely pitched wheels which will operate to displace air downwardly and elevate the machine bodily. The tubular shaft 49 is preferably provided with a friction clutch of the well known ball type such as indicated at 54, this clutch operating during the rotation of the shaft in elevating the machine, to permit independent rotation of the shafts without interference. However, should the shafts begin to rotate in directions opposite to those in which they are driven during the elevation of the machine, the ball clutch 54 will couple the shafts together and prevent independent rotation so that the blades 48 and 53 will remain stationary relative to each other and, consequently, retard the downward movement of the machine somewhat in the manner of a parachute.

As the yoke 12 swings about an axis extending through the center of the gear 11, it will be obvious that angular adjustment of the yoke and the parts carried thereby is permitted without interfering with the transmission of motion to the shafts 44 and 49 from the pinion 11. Nor will this angular adjustment interfere with the transmission of motion to the shaft 10 from the motor.

Extending rearwardly from one of the arms of the yoke 12 is a longitudinally slotted arm 55, there being a block 56 slidably mounted within the slot in this arm and said block having oppositely extending gudgeons 57 which slide within slots 58 formed in the sides of the arm. Engaging and extending through the block 56 is an adjusting screw 59. This screw has oppositely pitched threads, one series of threads engaging the block 56 while the other series engages in a finger 60 extending from the side member 1 of the frame of the car.

Journaled in the cross bar 4 is a pinion 61 and slidably mounted in this pinion is the angular end portion 62 of the adjusting screw. Thus the pinion when rotated will rotate the screw but said screw will be free to shift longitudinally relative to the pinion. When the screw is rotated in one direction the oppositely pitched threads thereon engaging block 56 and finger 60 will serve to draw the arm 55 toward the finger 60. When the screw is rotated in the opposite direction, arm 55 will be shifted upwardly. Thus the yoke 12 will be adjusted angularly and the wheels can be tilted at any desired angle relative to the car.

Pinion 61 is engaged by a pinion 63 secured to a controlling shaft 64 having a hand wheel 65 or the like which can be easily reached by the occupant of the seat 7. Thus by rotating shaft 64 in one direction the elevating wheels will be pitched forwardly out of normal position, while by rotating the shaft in the opposite direction, said wheels will be shifted back toward or past their normal positions.

An arm 66 may be extended forwardly from each of the slotted portions of the car frame and these arms may be detachably engaged by bars 67 carrying a standard 68 on which is arranged a seat 69 for holding a passenger. When a passenger is carried, the center of gravity will be along the center of the frame of the car from top to bottom. However, should the passenger carrying attachment be dispensed with, the motor 25 could be shifted away from the seat 7, thus to counterbalance said seat and its occupant.

In using the machine, the motor is started

and motion will be transmitted therefrom in the manner described to the shafts 44 and 49 so that the lifting wheels will be simultaneously rotated at high speed in opposite directions respectively. Thus the machine will be elevated after the manner of an ordinary helicopter and after a desired altitude has been attained the operator can, by means of wheel 65, tilt the yoke 12 so as to cause the shafts 44 and 49 to swing forwardly relative to the car and as shown by dotted lines in Fig. 1. Thus the lifting wheels will not only operate to sustain the machine at a desired elevation but will also pull the machine forwardly. The direction of flight can be controlled by the rudder 36 operated through the hand wheel 41.

Should the motor become stalled or stop for any reason, the wheels can be driven by the foot pedals 35.

What is claimed is:—

The combination with a car frame, a seat post, a seat thereon, and a connection between the post and the frame, of a motor adjustably connected to the frame and constituting a counterbalance for the seat and its occupant, a structure tiltably mounted upon the upper portion of the car frame, oppositely rotating lifting wheels movable with said tiltable structure, means for transmitting motion from the motor to said wheels to rotate them simultaneously in opposite directions respectively, and means under the control of the occupant of the seat for tilting said structure and the wheels, a rudder mounted to swing laterally upon the seat post, and means under the control of the occupant of the seat for shifting the rudder.

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

HARRISON R. MORRIS.

Witnesses:

OWAN M. HESSONG,

DORCAS C. HESSONG.