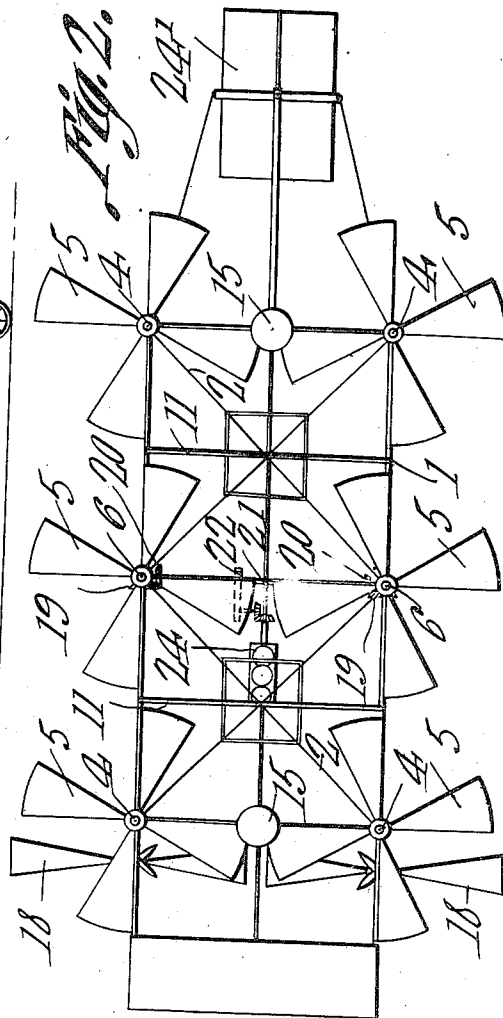
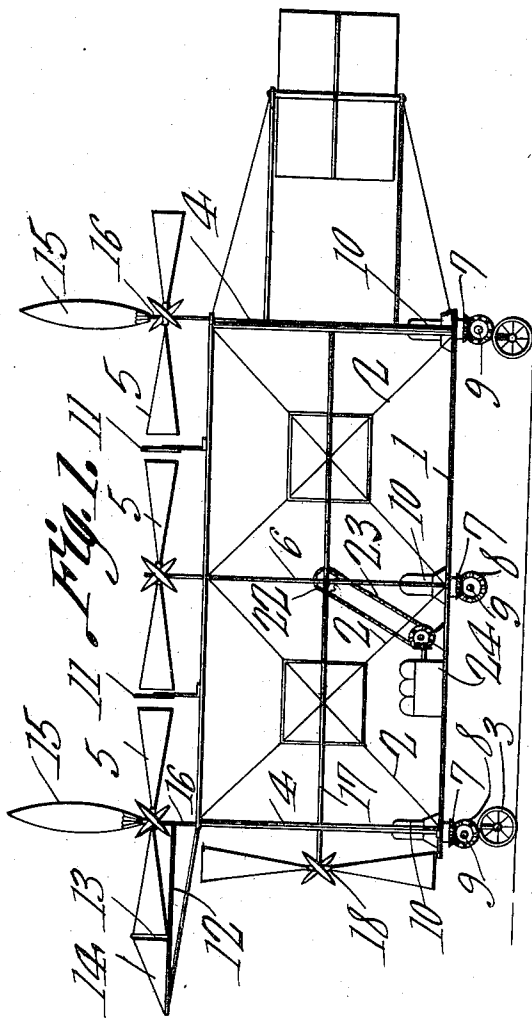


P. P. CARMICHAEL.
AERODROME.
APPLICATION FILED JUNE 7, 1911.

1,009,048.

Patented Nov. 21, 1911.

2 SHEETS—SHEET 1.



Witnesses

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L. H. Wilcox

Peter P. Carmichael

Inventor

by

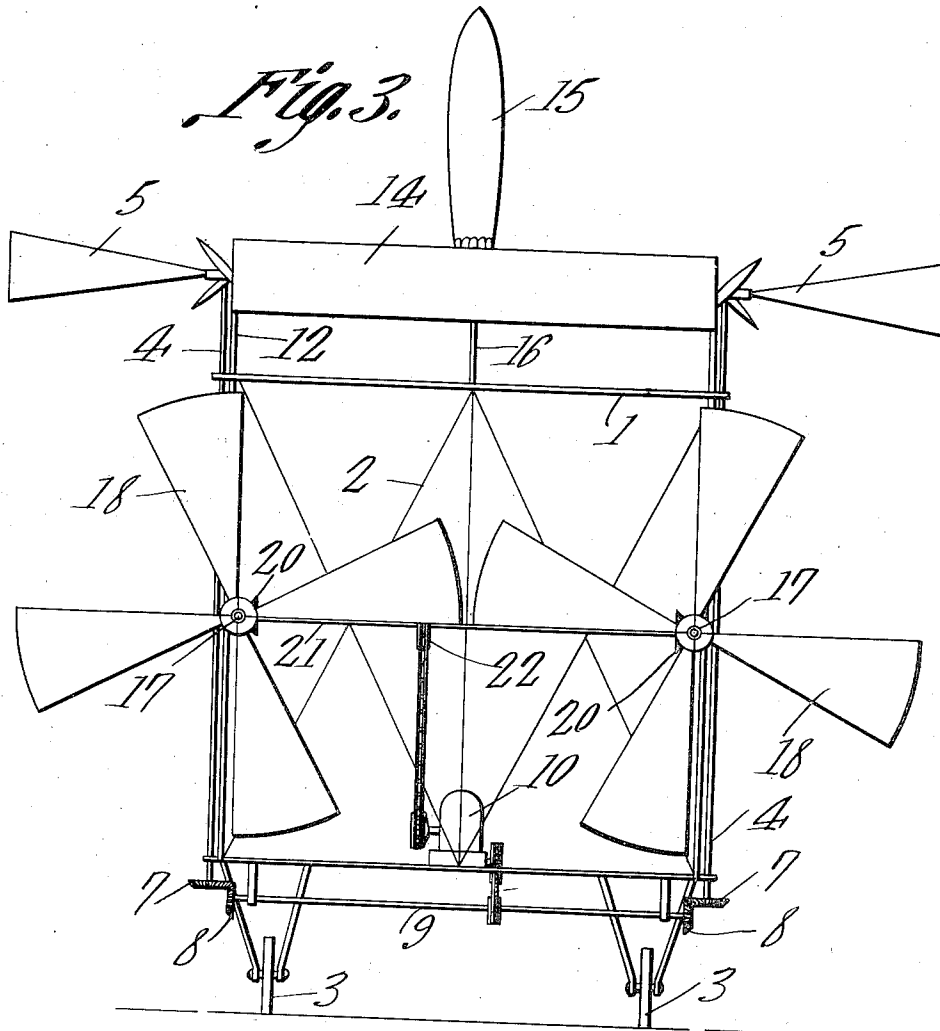
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UNITED STATES PATENT OFFICE.

PETER P. CARMICHAEL, OF DAHLONEGA, GEORGIA.

AERODROME.

1,009,048.

Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed June 7, 1911. Serial No. 631,851.

To all whom it may concern:

Be it known that I, PETER P. CARMICHAEL, a citizen of the United States, residing at Dahlonega, in the county of Lumpkin and State of Georgia, have invented a new and useful Aerodrome, of which the following is a specification.

This invention relates to aerodromes or flying machines, of the heavier than air type, the principal object being to provide a helicopter the elevating wheels of which are arranged in pairs, a separate motor being provided for driving the wheels of the several pairs.

A further object is to provide means whereby the inner portions of the elevating wheels or, in other words, those portions of the wheels directly above the frame of the machine are caused to work in a substantially "dead" body of air whereas the laterally projecting portions of the elevating wheels operate both to lift the machine and to propel it in a forward direction.

A still further object is to provide a machine of this type which is light and durable in construction and which is equipped with parachutes whereby a descent may be made with safety should the elevating wheels become ineffective from any cause.

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 plan view thereof. Fig. 3 is a front elevation on an enlarged scale.

Referring to the figures by characters of reference 1 designates a rectangular frame preferably formed of light angle strips of steel or other suitable metal, said frame being provided at its top, bottom, sides and ends with any suitable arrangement of brace wires 2 or the like. The said frame is sup-

ported by wheels 3 and shafts 4 are journaled upon the corner portions of the frame and extend to points above said frame, all of the shafts being parallel and each of them carrying, at its upper end, an elevating wheel 5. Additional shafts 6 may be journaled upon the sides of the frame and are parallel with the shafts 4, these shafts 6 being also provided at their upper ends with lifting wheels 5. The shafts 4 are arranged in pairs and the shafts 6 are similarly arranged, one shaft of each pair being located at each side of the frame. The lifting wheels are so proportioned as to rotate close together, one half of each wheel being extended over the frame 1 while the other half is extended laterally therebeyond.

Each shaft 4 and 6 has a gear or other power transmitting element 7 at its lower end and these elements mesh with corresponding power transmitting elements 8 secured to the ends of transverse shafts 9 mounted on the lower portion of the frame 1. A motor 10 is arranged upon the frame 1 adjacent each of the shafts 9 and is geared thereto. In other words one motor is provided for each shaft 9 so that, should one of the motors become disabled the other motors will continue to operate the shafts to which they are connected. The gears 7 and 8 are so arranged as to rotate the shafts at one side of the frame 1 oppositely to the shafts at the other side. In other words, the laterally projecting portions of the wheels 5 move rearwardly during the rotation of said wheels while those portions of the wheels arranged over the frame 1 move forwardly during the rotation of the wheels.

Wind shields 11 are mounted on the frame 1 between the several pairs of wheels and constitute means for protecting the elevating wheels from the force of the air current set up by the forward movement of the machine. An extension frame 12 is mounted upon the upper portion of the frame 1 at the front thereof and supports another wind shield 13 arranged in front of the front wheels 5 and having an inclined plane 14 extending from the upper edge of said shield forwardly to the front end of the frame 12.

Parachutes 15 may be mounted upon suitable standards 16 extending upwardly from the ends of the frame 1 at the centers there-

of and these parachutes may be provided with any suitable means for releasing them in the event of a too rapid descent of the machine so that said parachutes will open outwardly automatically and thereby retard the downward movement of the machine.

Propelling shafts 17 extend longitudinally of the frame along the sides thereof and are provided at their front ends with propellers 18. These shafts have gears 9 meshing with gears 20 secured to a shaft 21 which extends transversely of the machine and has a sprocket 22 receiving motion, through a chain 23, from a motor 24. The propellers are designed to rotate at the same speed in opposite directions. A combined vertical and horizontal rudder 24' is supported in rear of the frame 1 and any suitable means, not shown, may be employed for tilting this rudder either about a vertical or a horizontal axis to steer the machine while in flight.

In operating the machine the various motors are set in motion and the wheels 5 are thus caused to rotate at a sufficiently high speed to elevate the machine from the ground. All portions of the wheels will operate simultaneously to displace air downwardly and those portions of the wheels which project beyond the sides of the frame 1 and move rearwardly relative to the frame exert, in addition to their lifting force, a propelling force tending to drive the machine bodily in a forward direction. This function of the elevating wheels as a propelling medium is obtained by reason of the use of shields 11 and 13 which prevent the inner portions of the wheels from displacing air forwardly during the rotation of the wheels. The propellers 18, however, constitute the principal means for driving the machine forwardly.

Any suitable gearing may be provided for coupling up all of the motors to the various shafts so that should one of the motors become disabled, the remaining motors can be used for driving all of the propellers or elevating wheels. Moreover, if desired, the shields can be lowered or otherwise shifted from in front of the elevating wheels so that, by leaving the propellers 18 stationary, the wheels 5 will only exert a lifting force, because the inner and outer portions of the wheels 5 will displace air in opposite directions, no portion of the air being confined or retarded, as is the case where the shields are employed. By thus lowering the shields it becomes possible to sustain the machine above a fixed point.

What is claimed is:—

1: A helicopter including a frame, elevating wheels thereabove and arranged in series along the sides thereof, the wheels of the two series being disposed in pairs, and being extended beyond the sides of the

frame, and wind shields disposed in front of the wheels of each pair, said wheels extending laterally beyond the shields.

2. A helicopter including a main structure, elevating wheels arranged in parallel series along the sides of the structure, the wheels of the two series being arranged in pairs, and a wind shield supported in front of those portions of the wheels extended over the structure, each wheel having a portion thereof extended laterally beyond the shield.

3. A helicopter including a main structure, a series of elevating wheels arranged along each side of and above the structure, the wheels of each series projecting laterally beyond one side of the frame, means for rotating the wheels of the two series in opposite directions, the projecting portions of the wheels of each series being moved backwardly during the rotation of the wheels, and a wind shield supported in front of those portions of the wheels extending over the structure.

4. A helicopter including a main structure, parallel series of elevating wheels connected to and supported above the sides of the structure, the wheels of each series extending laterally beyond one side of the structure, means for simultaneously rotating the wheels of the two series in opposite directions respectively, the wheels of each series having their laterally projecting portions moving rearwardly during the rotation of the wheels, and a wind shield supported in front of each elevating wheel, the laterally projecting portions of the wheels being extended beyond the ends of the shield.

5. A helicopter including a main structure, parallel series of elevating wheels supported thereabove and projecting laterally therebeyond, the laterally projecting portions of the wheels being movable rearwardly during the rotation of the wheels, the wheels of the two series being arranged in pairs, a wind shield supported in advance of the wheels of each pair and in front of those portions of the wheels extending over the main structure, and a separate motor for driving the wheels of each pair.

6. A helicopter including a main structure, spaced parallel wind shields supported on said structure, a pair of elevating wheels back of each of said shields, said wheels being located adjacent the respective sides of the structure, each wheel being projected laterally beyond one terminal of the wind shield, and means for simultaneously rotating the elevating wheels in opposite directions.

7. A helicopter including a main structure, elevating wheels arranged in pairs thereabove and projecting beyond the sides thereof, a wind shield supported in front of each pair of wheels, the wheels of each pair

being extended laterally beyond the terminals of the shields, the inner portions of the wheels being disposed back of the shields, parallel propelling shafts extending longitudinally of the main structure, propellers carried thereby, and separate motors for driving the respective pairs of elevating wheels and the propellers.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature 10 in the presence of two witnesses.

PETER P. CARMICHAEL.

Witnesses:

W. F. SUMMERVILLE,
R. M. WOOD.