J. LEMIRE.

AERIAL NAVIGATION.

APPLICATION FILED APR. 3, 1919.

1,356,534.

Patented Oct. 26, 1920.

2 SHEETS—SHEET 1.

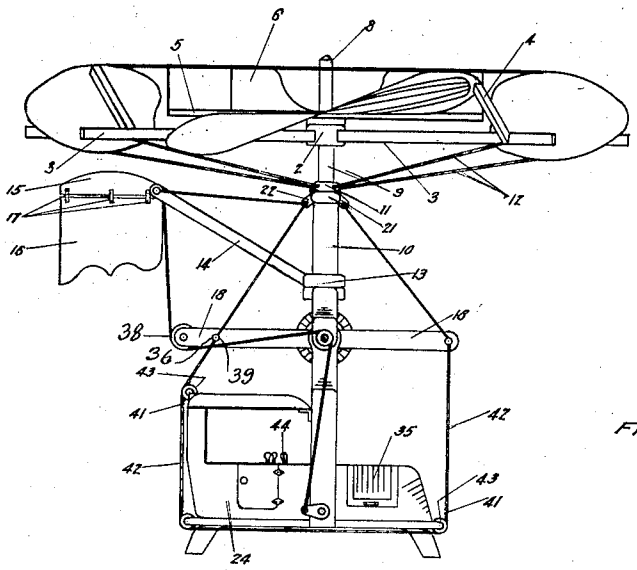


FIG. 1

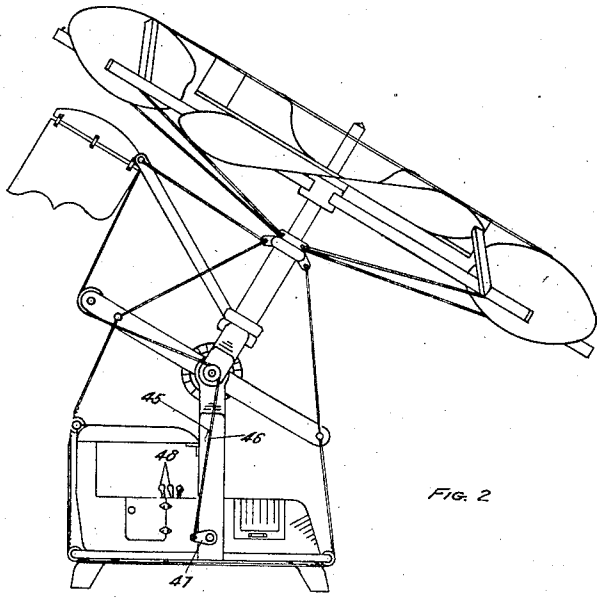


FIG. 2

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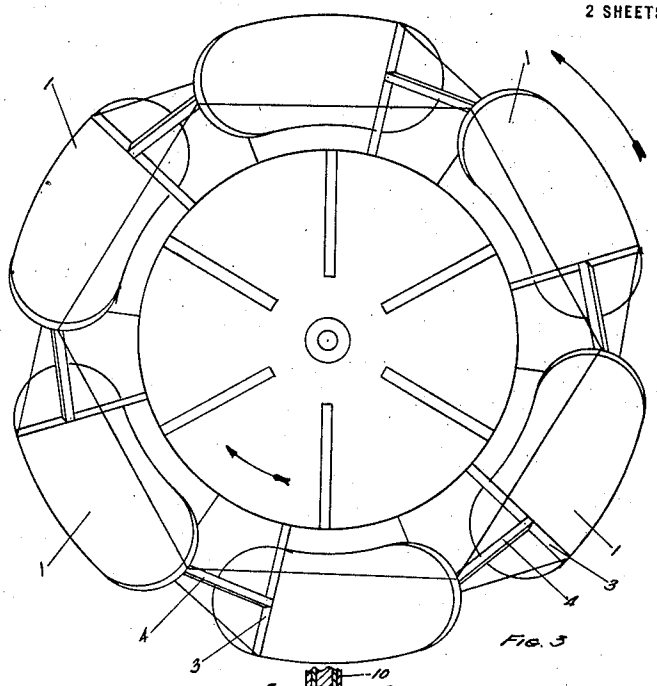


FIG. 3

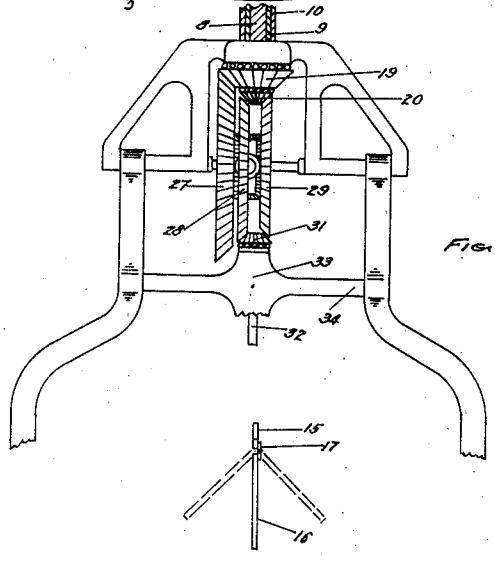


FIG. 4

FIG. 5

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UNITED STATES PATENT OFFICE.

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AERIAL NAVIGATION.

1,356,534. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed April 3, 1919. Serial No. 287,309.

To all whom it may concern:

Be it known that I, JOSEPH LEMIRE, a subject of the King of Great Britain, and residing at the town of Drummondville, in the Province of Quebec, in the Dominion of Canada, have invented a new and useful Improvement in Aerial Navigation, of which the following is the specification.

The invention relates to aerial navigation as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel means employed, whereby the machine is drawn through the air by the rotary action of the impelling mechanism which deflects and utilizes the air in passage to such advantage as to increase the volume of air in the path of the impellers and to reduce the resistance by the natural suction due to the same force.

The objects of the invention are to minimize the extent of the wings, planes or other floating medium by the creation of a condition in the air at and about the impelling mechanism favorable to the travel of the machine or to the poising of the same; to facilitate the operations of landing and starting of flying machines, whereby particular preparations need not be made for either, but on the contrary departures and arrivals may be made in much the same way as in the use of a motor car; to furnish a machine for universal use throughout the world; to increase the margin of safety in aerial navigation by the elimination of wrecks due to the upsetting and diving of plane supported or dirigible machines in tornadoes or adverse currents of air; and generally to provide a simple, cheap and durable flying machine.

In the drawings, Figure 1 is a side elevation of the machine in the position of poising.

Fig. 2 is a side elevation of the machine in the position of driving ahead.

Fig. 3 is a plan view of the elevating and driving members.

Fig. 4 is a detail of one form of gear mechanism employed in the drive.

Fig. 5 is a rear view showing the three operating portions of the rudder.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, the impellers 1 are preferably of petal form slightly twisted and are rigidly secured in circular arrangement.

The hub 2 supports the radial arms 3 and therewith forms a rotating frame, to which the impellers 1 are secured by the braces 4.

The rotary fan 5, having the outstanding radial vanes 6 extending inwardly part way toward the center from the outer edge of the disk 7, is journaled and turns in a plane at right angles to the axis of the hub 2 and within the circular space bounded by the annular path, in which said impellers 1 travel.

The fan shaft 8 turns within the impeller shaft 9 and the sleeve 10 contains both the shaft 8 and the shaft 9.

The collar 11 is fixedly mounted on the shaft 9 and is joined to the impellers 1 by the guy rods or wires 12 for the purpose of stabilizing said impellers in relation to said shaft 9, which also carries the hub 2 at its upper end, said impellers rotating with said shaft 9.

The fan 5 is mounted on the shaft 8 and rotates therewith in an opposite direction to the shaft 9 and this deflects the air drawn to the fan by natural causes, wherefrom it is thrown by centrifugal force into the annular path of the said impellers, thereby increasing the density of the air in the space occupied by the impellers and incidentally the pressure, besides disposing efficiently of the resistance, which would otherwise be the case if the air were caught and trapped instead of being drawn in and deflected.

The collar 13 is mounted on the sleeve 10 and the arm 14 extends rearwardly therefrom and is rigid therewith.

The arm 14 is rigidly secured to the rudder base 15, and the rudder 16 is suspended from said base 15 by the universal hinges 17.

The arms 18 are rigid with the lower end of the sleeve 10.

The shaft 8 at its lower end carries the driven pinion 19 and the shaft 9 at its lower end carries the driven pinion 20 just below the pinion 19.

The collar 21 is mounted at the upper end of the sleeve 10 and is formed with the lugs 22.

The arms 18 at their inner ends are pivotally secured to the frame 23 of the car or carriage 24, the pivot bar 25 extending inwardly from each side and joining the

braces 26 forming bearings for the shafts of the gears 27, 28 and 29, the latter being operatively connected to the gear 28 by the pinion 30, the gear 29 coacting with the pinion 20.

The bearing 33 is supported by the bracket 34 extending from side to side of the frame 24 and holds the shaft 32, which turns in the bearing 33. The lower end of said shaft is operatively connected to the shaft of the motor 35.

The forked arms 36 and 37 project outwardly from the braces 26, the rear arm 36 having the cable pulleys 38 journaled at the end thereof and a cable guide 39 intermediate of its length, and the front arm 37 having a cable guide 40 at the extremity thereof.

The chains 41 form links in the length of the cable 42 and this cable is secured at its upper ends to the lugs 22 of the crown 21. The chains 41 engage the sprockets 43, which are journaled respectively at the lower corners of the carriage 24 and at the rear upper corner.

The forward, neutral and reverse pivoted operating lever 44 is connected to the cable between forward and rear pulleys, therefore by moving said lever forward the cable 42 is drawn back and as it must remain in a permanent position in relation to the crown 21, the relative positions of the carriage and the impelling mechanism must change but the carriage being weighted by the motor and persons, said carriage remains vertical, notwithstanding any change in the position of the impelling mechanism, which must take a forward inclination in driving ahead.

The reverse of the lever 44 has the effect of slanting the impelling mechanism rearwardly, which would bring about a rear movement of the machine, quite rare in use and not liable to be put in practice, except under exceptional conditions. The neutral position however is very important and in this the lever is central and the impelling mechanism is straight overhead in the form of a parachute and by running the motor at a good speed, the machine will rise without difficulty and by running slowly the machine will poise though if desired it may be very slowly dropped to the ground or other base in the chosen spot.

The motor is on the forward platform of the carriage and is arranged to be unshipped in cases of great emergency and dropped to the earth below in order to increase the parachute effect in descending.

The machine is guided by the rudder and this is operated by the cables 45 and 46, which extend around the cable pulleys 38 to the extended guides and around intermediate pulleys to cranks 47, which are operated by the levers 48 to raise or lower said rudder at one side or the other and provide the resistance necessary to change the direction of the machine and thereby guide its course.

The operation of the machine has been described in explaining the details, but it may be broadly stated that the person sits in the car or carriage of the machine and starts the motor running, which has the effect of turning the gear mechanism referred to. This operates the impeller shaft, and the fan shaft, so that they turn in opposite directions, in consequence of this there is an indrawing of air and the air behind the impeller elements is increased in density of the air and by the rapid movement of the same is utilized in the impeller path, thereby augmenting the air resistance for said impellers in their driving movements.

The manipulation of the mechanism has already been explained but it must be understood that this description is only intended to set forth the parts broadly, as many changes may occur in the construction without departing from the spirit of the invention, so long as they are within the scope of the claims for novelty following, and in this connection it may again be mentioned that the general endeavor in this device is to eliminate the wings or planes, certainly as at present known, though the present construction may be applied successfully to both aeroplane and dirigible machines.

What I claim is:—

1. In aerial navigation, a plurality of impelling members, each in the form of a petal slightly twisted and arranged in circular form and firmly supported from a central driven hub, a rotary fan journaled independently of said impelling members and formed of a deflecting disk carrying radial vanes, means for driving said fan and said impelling members in opposite directions, a suspended member and means for adjusting the impelling mechanism in relation to said suspended member.

2. In aerial navigation, a plurality of impelling members circularly arranged, a frame formed of hub and radial arms secured by braces to said members, a fan having vanes and a deflecting plate carrying said vanes and clear of said impellers and arranged above said arms, an inner shaft carrying said fan, an outer shaft carrying said hub, a sleeve receiving said shaft, pinions at the lower ends of said shafts, a gear mechanism coacting with said pinions and driving said fan and impelling members in opposite directions, a carriage pivotally suspended from said sleeve, a motor in said carriage operatively connected to said gears and means in said carriage for adjusting

the impelling members in relation to said carriage.

3. In aerial navigation, a carriage, sprockets journaled at the outside of said carriage, a cable having chain portions engaging said sprockets, extension arms pivotally supporting said carriage, a sleeve rigidly secured to said extension arms and having the upper ends of said cable secured thereto, an impelling mechanism supported above said sleeve, a guiding mechanism supported from said sleeve, a lever operatively connected with said cable, and means for driving said impelling mechanism.

Signed at the city of Montreal, Quebec, Canada, this 26th day of March, 1919.

JOSEPH LEMIRE.