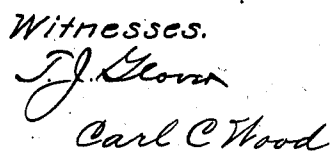


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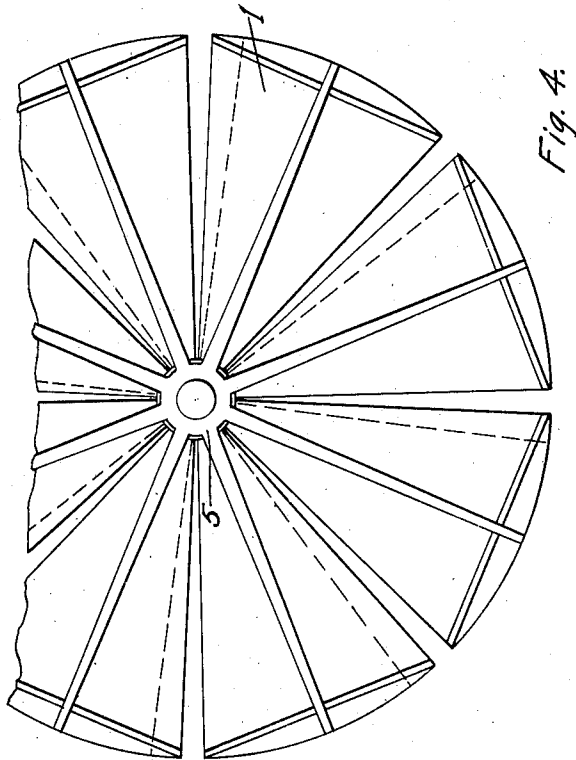
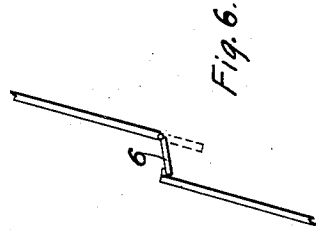
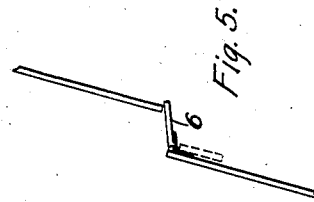
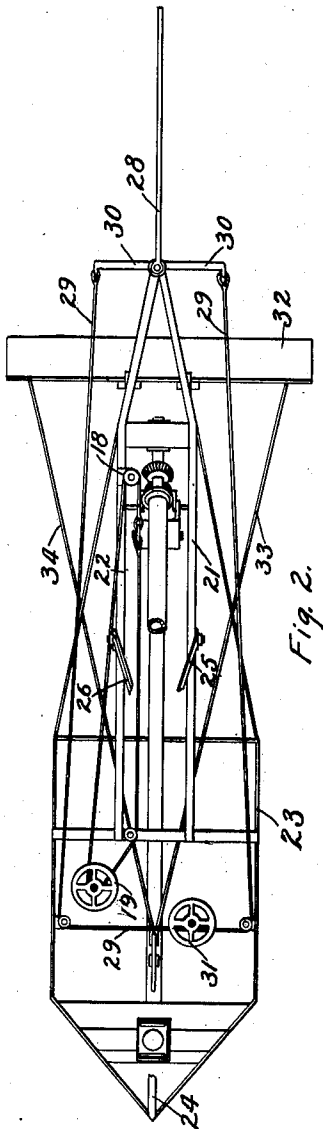
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FLYING MACHINE.
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

IRA LEE MARTIN, OF PORTLAND, OREGON.

FLYING-MACHINE.

1,021,877.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, IRA LEE MARTIN, a citizen of the United States, residing in the city of Portland, county of Multnomah, and State of Oregon, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

My invention relates to flying machines, and more particularly to that type of flying machines adapted to be carried into and through the air by means of one or more revolving propellers or carrier members moving upon the air, and adapted to be controlled as to its position in the air and its general direction of travel through the air by the tilt or position of said carrier members relative to the boat or car of the machine, assisted by the use of rudders or the like.

Among the salient objects of my invention are: to provide in a flying machine of the character referred to an improved lifting and carrying mechanism for supporting and carrying said machine through the air; to provide in a flying machine a combination lifting and carrying mechanism adapted to be adjusted as to its axial position to determine the height and general direction of travel of the machine; to provide in a flying machine one or more series of revolving planes adapted to travel in opposite directions; to provide in a flying machine a combination lifting and carrying mechanism adapted to be converted into a parachute mechanism when not running and the machine is descending; to provide in a flying machine a boat or car for the power developing mechanism and for the passengers, adjustably supported below the lifting or carrying mechanism, whereby the weight thereof operates to keep the machine in upright position and assists in maintaining its equilibrium; and, in general, to provide a flying machine of the character referred to having a combination lifting and propelling mechanism, with driving means therefor, and having means for regulating the position of the lifting and propelling mechanism relative to the car, whereby to assist in determining

and regulating the general direction of travel of the machine.

My invention will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the invention; Fig. 2 is a top plan view of the invention with the lifting and propelling mechanism removed; Fig. 3 is an enlarged view of the driving connections for driving the lifting and propelling mechanism; Fig. 4 is a top plan view of one of the revoluble lifting and propelling members; Figs. 5 and 6 are fragmentary detail views, showing two forms of closures or flap members for closing the space between the plane members of the lifting members, being adapted to close when the machine is descending, and thereby converting said member into a parachute.

Referring now to the drawings, 1 and 2 designate two carrier or propeller members, each consisting of a series of plane members arranged concentrically about and mounted upon an axle or driving shaft, as 3 and 4, respectively, the shaft 3 being mounted within the shaft 4, which is made hollow for that purpose. The plane members of each are made of thin sheet material, being broadest at their outer ends and narrowing as they approach the center. Each of said plane members are slightly tilted or pitched so that the forward or advancing edge of each is a little higher than the rearward edge thereof, whereby, as said plane members are revolved their movement through and upon the air causes them to rise or move in the direction in which their axle or shaft is pitched. The plane members of the member 1 are pitched and arranged to travel in one direction, as indicated by the arrow, while those of the member 2 are pitched and arranged to travel in the opposite direction, as indicated by the arrow. Said plane members may be of any desired and suitable material and attached and anchored to their respective driving shafts in any practicable and effective manner. The pitch of the several plane members, that is, the position of the forward or advancing edge of each rela-

tive to the rearward edge thereof, may be such as will most effectively lift and carry the weight to be carried, according to the breadth of each, without too great speed.

5 The carrier or propeller members 1 and 2 are preferably much larger in proportion to the boat or car of the machine, than indicated in the drawings, the member 1 being preferably somewhat smaller in diameter

10 than the member 2. I desire that the propeller members be made as large relative to the machine proper, as can be conveniently or practicably handled, in order that so great speed be not required to lift and carry

15 the machine.

In Fig. 4 I have shown a form of skeleton brace member 5, which may be used to reinforce the plane members, there being an arm for each plane member, secured thereto in

20 any desirable and suitable manner.

Attached to one or the other of the adjacent edges of the several plane members is a swinging flap or closure member 6, Figs. 5 and 6, also indicated in dotted lines, Fig.

25 4. The flap in Fig. 5 is shown attached to the forward or advancing edge of the plane member, while in Fig. 6, it is shown attached to the rearward edge of the plane member, Figs. 5 and 6 being end edge views

30 of two of the plane members. In either position the flap or closure member 6 is adapted to move into the position shown when the carrier members are not revolving and the machine is descending, being closed by

35 the action of the air thereupon, as the machine descends, thus converting said carrier member into a parachute. For this reason, also, it is preferable that said carrier and propeller members 1 and 2 be as large in

40 proportion to the size of the machine as can be handled. When said carrier members are revolving, said flap members will, if attached to the forward or advancing edge

45 of the plane member, swing back and rest flatly against the plane member, as indicated in Fig. 5. If attached to the rearward edges of the plane members, as shown in Fig. 6, they will assume the position indicated by the dotted lines in said figure.

50 In either case, said flaps or closures are in such position that when the machine stops and descends, the air will cause them to move into closing position, thus forming a parachute mechanism. Said carrier and

55 propeller members 1 and 2 are driven in opposite directions through shafts 3 and 4, said shafts carrying at their lower ends a pair of beveled gears 7 and 8, as indicated in Fig. 3, which gears are driven in opposite

60 directions by an intermediate gear 9, driven through a universal joint connecting gear 10 with gear 9, the gear 10 being driven by a gear 11. The gear 11 is slidably mounted upon and is driven by a shaft

12, which is in turn driven from power developing mechanism, designated as a whole

13, Fig. 1. The gears 7, 8, 9, 10 and 11 are mounted within and carried by the frames 14 and 15, adjustably connected through

70 the knuckle joint, in any common and well known manner. Said frames 14 and 15 are adapted to be moved forwardly along the shaft 12 from the position shown in solid lines, Fig. 1, until the driving shafts 3 and

75 4 assume the vertical position as indicated in dotted lines, Fig. 1. This movement is effected and controlled by means of a cable 16 attached at its ends to a ring 17 upon the frame 14 and extending thence around a

80 pulley 18 and thence forwardly to a hand wheel 19, by means of which the position or pitch of the driving shafts 3 and 4 can be determined and regulated. As a further anchorage or bearing for supporting

85 the frame of the machine, a track wheel 20 is provided at each side of the gear mechanism shown in Fig. 3, which said wheels 20 are adapted to engage and lift upon the underside of a pair of side bars or members

90 21 and 22, Figs. 1, 2 and 3.

23 designates a boat or car supported at the lower end of the driving shafts 3 and 4, through the shaft 12 and the frame members 21 and 22, as indicated, and at its forward end by means of a brace member 24

95 and a pair of rear brace members 25 and 26, all of said brace members being attached to an adjustable collar 27, through which the shafts 3 and 4 work, whereby to permit of their adjustment from the inclined to the

100 vertical positions.

28 designates a rudder, controlled through a cable 29 attached to the ends of arms 30—30, transversely affixed to the sleeve of said rudder and manipulated by means of a

105 hand wheel 31, mounted in the boat or car, as indicated in Figs. 1 and 2.

The weight of the car or boat, supported on the ends of the driving shafts 3 and 4 and the brace rods 24, 25 and 26, tend to keep

110 the machine in upright position and to maintain its equilibrium, that is, to keep the boat or car level. In order to aid in this, however, I have provided a downwardly depending vane or rudder 32 controlled through cables 33 and 34, attached

115 to the hand lever 35, or other suitable controlling mechanism, in the boat or car and within reach of the operator. This vane or rudder can be allowed to swing backwardly into a horizontal position beneath

120 the rudder 28, or it can be drawn forwardly into the position shown in Fig. 1, thus catching the air and causing a downward tension upon the front end of the car

125 through the cables 34—35, thus being used to assist in maintaining the car or boat in level position.

The operation of the device will be readily understood from the foregoing description, but may be briefly restated as follows: The driving shafts 3 and 4 are drawn into the vertical position, as indicated in dotted lines, Fig. 1. The power developing mechanism, which may be of any desirable and suitable character, is started and the carrier members are revolved in opposite directions through their shafts 3 and 4, and the connecting mechanism, whereby the machine is lifted or raised vertically into the air. When a desired height is reached, the driving shafts and carrier members are drawn into an inclined position, whereby the machine is not only maintained in the air, but is given a forward movement in the direction in which the propellers are pitched. The weight of the car under the carrier members keeps the machine in proper upright position. The general direction of travel may be changed and controlled by means of the rudder 28, while the machine is moving, in the usual manner. The tilt or horizontal position of the car may be partially controlled by means of the downwardly depending vane or rudder 32 adjusted to catch the air and exert a downward pull upon the forward end of the car through the cables 34 and 35.

I am aware that modifications of the invention can be made without departing from the spirit thereof, and I do not, therefore, limit the invention to the particular showing here made for purposes of illustration only, but intend that the claims herein shall be considered broadly.

I claim:

1. In a flying machine, a plurality of revoluble plane members upon a carrying shaft, a car supported adjustably to the lower end of said carrying shaft, fixed brace-like supporting members from said car pivotally and slidably connected at their upper ends with said carrying shaft intermediate its ends and below said plane members, whereby said shaft may be tilted through said pivotal connection and its lower end moved within said car forwardly or rearwardly to give incline to said revoluble plane members, and power mechanism in said car having adjustable driving connections for driving said carrying shaft and plane members.

2. In a flying machine, concentrically disposed revoluble carrier or propeller members, driving shafts therefor adapted to drive said members in opposite directions, a car adjustably supported to the lower end of said driving shafts, fixed brace-like supporting members pivotally and slidably connected at their upper ends to said shafts intermediate their ends, whereby the said shafts may be tilted through said pivotal

connection and their lower ends moved rearwardly or forwardly in said car, for the purpose described, and power mechanism for driving said shafts and having an adjustable driving connection therewith.

3. In a flying machine, concentrically disposed revoluble carrier or propeller members, driving shafts therefor adapted to drive said members in opposite directions, a car with power mechanism therein, a power shaft from said mechanism, adjustable driving connections between said power shaft and the lower ends of said driving shafts, whereby the lower ends of said driving shafts are movable longitudinally of said power shaft, and fixed supporting brace members from said car, pivotally and slidably connected at their upper ends to said driving shafts at a point intermediate their ends, whereby when the lower ends of said driving shafts are moved longitudinally of said power shaft, said driving shafts are slidably tilted through said supporting brace members, for the purpose described.

4. In a flying machine, concentrically disposed carrier or propeller members, driving shafts therefor adapted to drive said members in opposite directions, a car with power mechanism therein, a power shaft extending in said car from said power mechanism, adjustable driving connections between the lower ends of said driving shafts and said power shaft, whereby the lower ends of said driving shafts can be moved longitudinally of said power shaft, supporting brace members from said car having pivotal and slidably connections at their upper ends with said driving shafts, whereby said driving shafts may be tilted at will through said connections by moving their lower ends upon said power shaft, and means for moving said driving shafts at their lower ends upon said power shaft, substantially as and for the purpose described.

5. In a flying machine of the character described, revoluble carrier or propeller members upon driving shafts, a car or boat supported by the lower ends of said driving shafts, and by rigid brace members therefrom having pivotal and slidable connections at their upper ends with said driving shaft below said carrier or propeller members, means for moving the lower ends of said driving shafts in said boat or car for the purpose of tilting the propeller members, and means for converting the carrier or propeller members into a parachute when not revolving, substantially as shown and described.

6. A flying machine comprising in combination, a pair of carrier wheels composed of a plurality of plane members tilted to catch the air, carrying shafts therefor whereby to drive said carrier wheels in opposite direc-

tions, a car or boat, power mechanism therein with a power shaft therefrom and extended longitudinally of said car or boat, supporting brace members from said boat
5 having pivotal and slidable connections at their upper ends with the carrying shafts of said carrier wheels, adjustable driving connections between the lower ends of said carrying shafts and said power shaft,
10 whereby the lower ends of said carrying shafts can be moved longitudinally of said power shaft and driven therefrom in various positions, means for moving said carrier shafts into and out of inclined positions, and means for steering said flying machine, substantially as described. 15

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