A. R. MALASOMMA.

FLYING MACHINE.

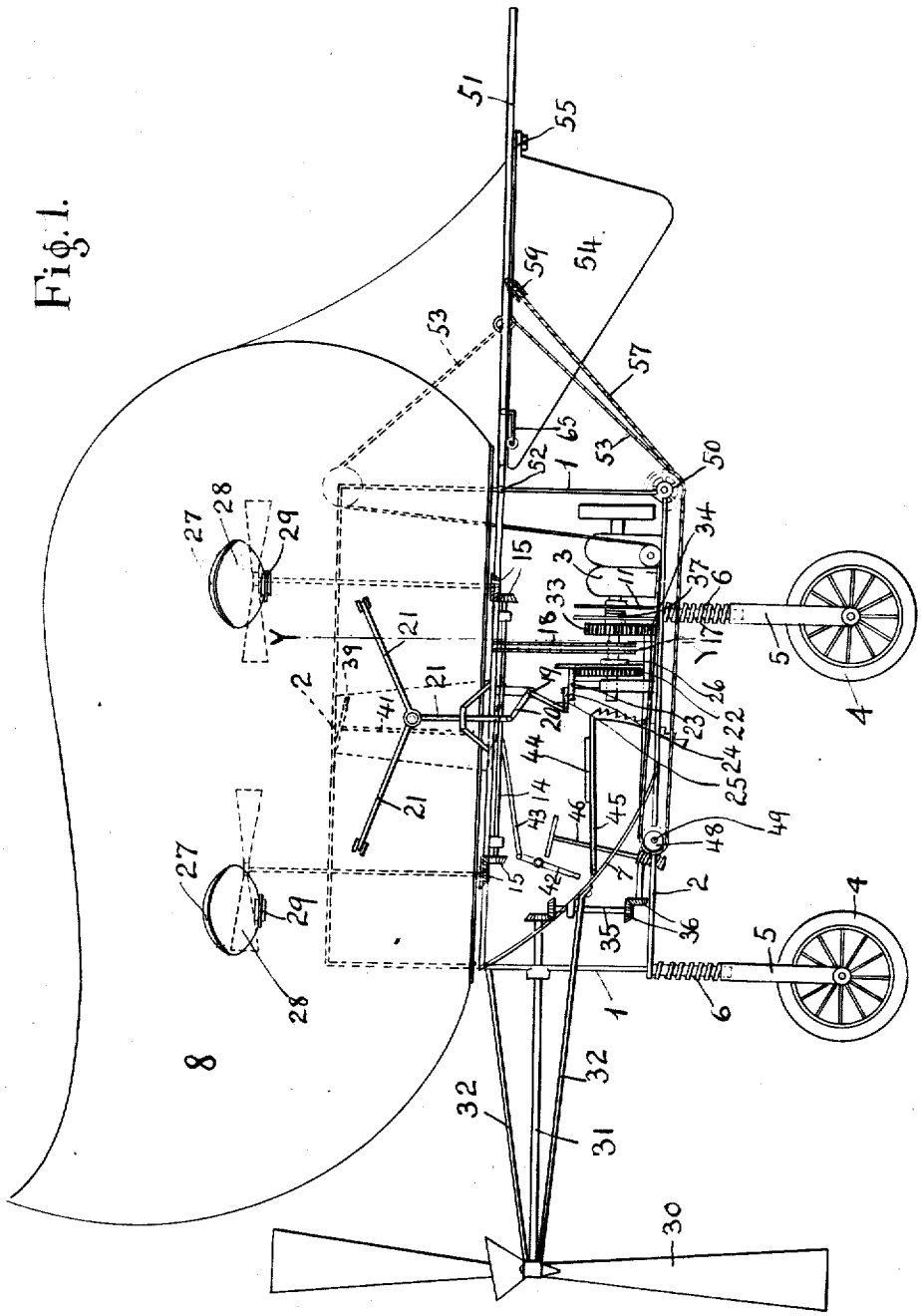
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935,039.

Patented Sept. 28, 1909.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Irene Lefkowitz

Edward M. Jellinek

INVENTOR

Alberto Riccardo Malasomma

BY

Townsend & Seehen

ATTORNEYS

A. R. MALASOMMA.

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5 SHEETS—SHEET 2.

Fig. 2.

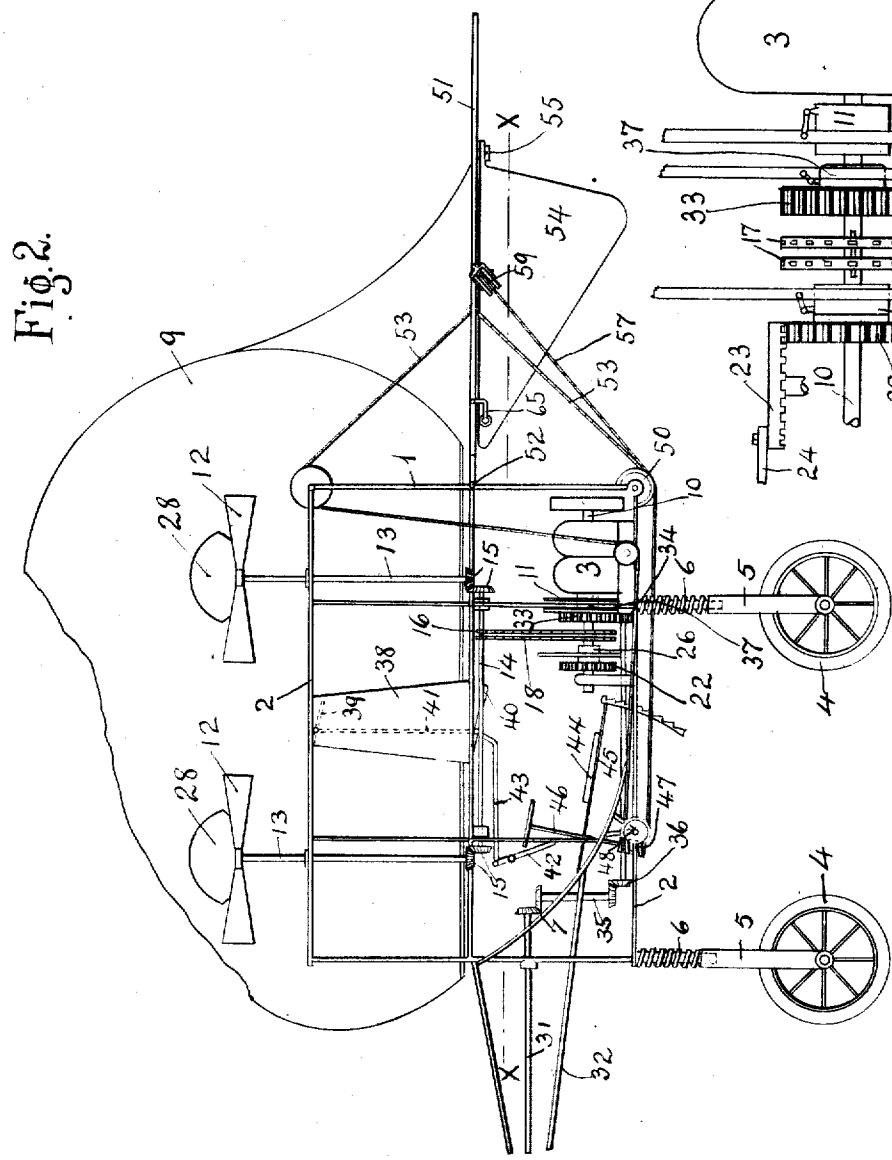


Fig. 11

WITNESSES:

Irene Lofton

Edward M. Jellinek

INVENTOR

Alberto Riccardo Malasomma.

BY

Townsend & Sutton

ATTORNEYS

A. R. MALASOMMA.

FLYING MACHINE.

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5 SHEETS—SHEET 3.

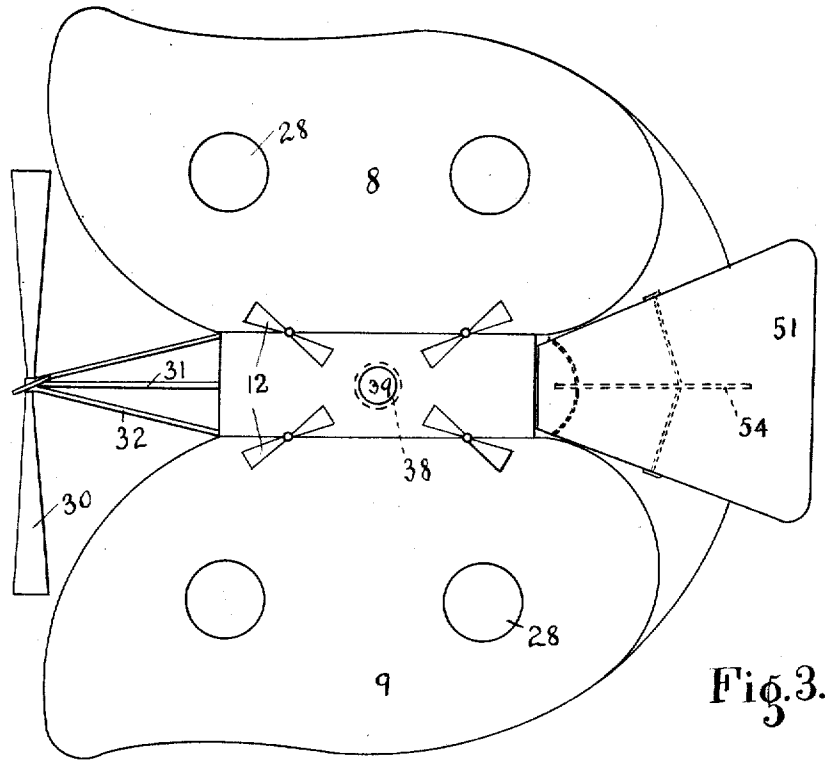


Fig. 3.

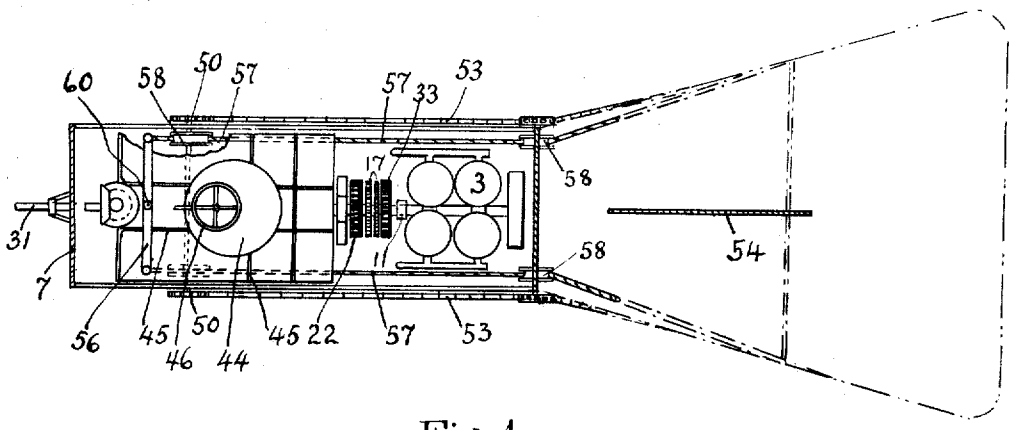


Fig. 4.

WITNESSES

Irene Loftsworth

Edward M Jellinek

INVENTOR

Alberto Riccardo Malasomma.

BY

Townsend & Sutter

ATTORNEYS

A. R. MALASOMMA.

FLYING MACHINE.

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935,039. **Patented Sept. 28, 1909.**

5 SHEETS—SHEET 4.

Fig. 5.

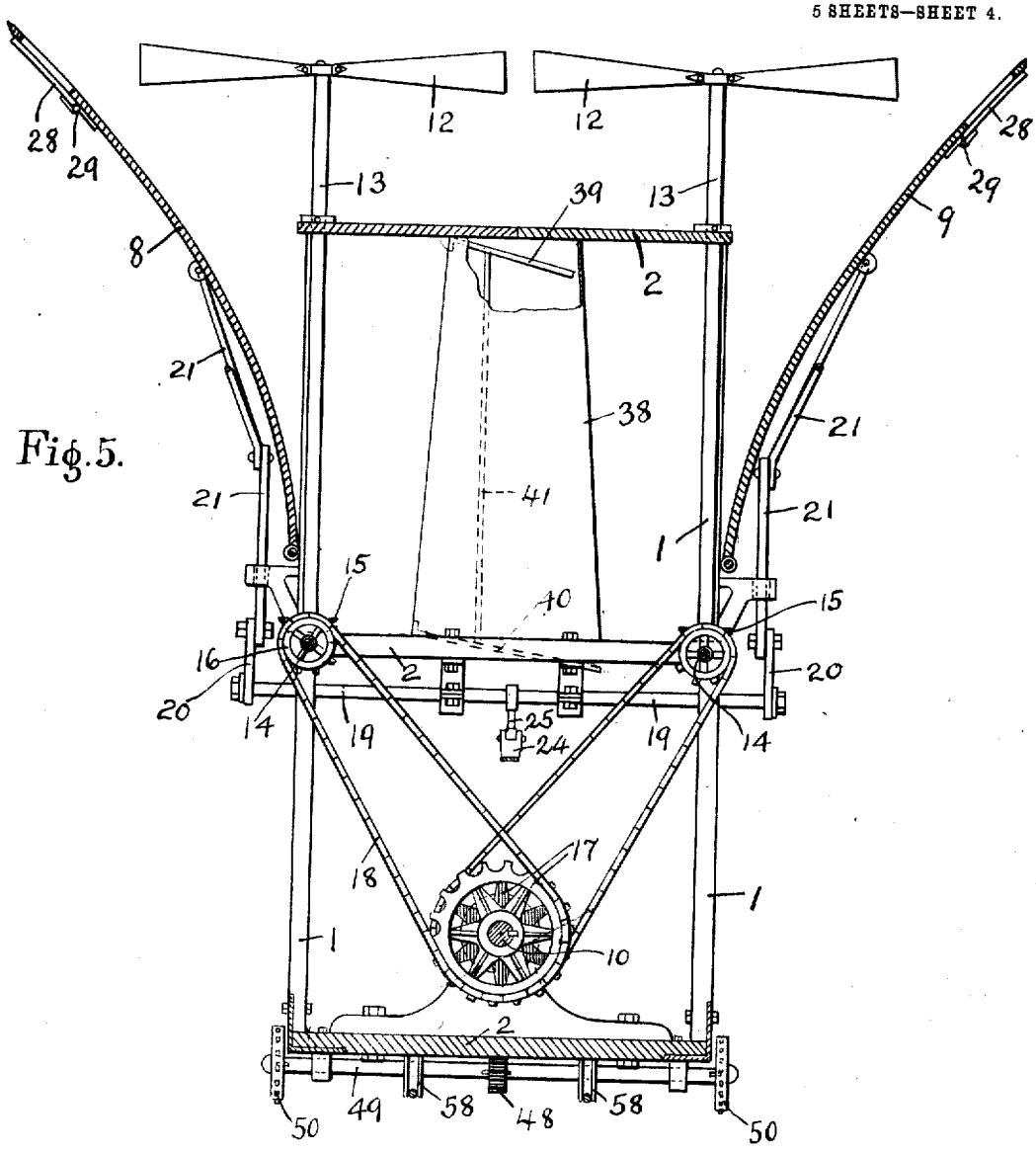
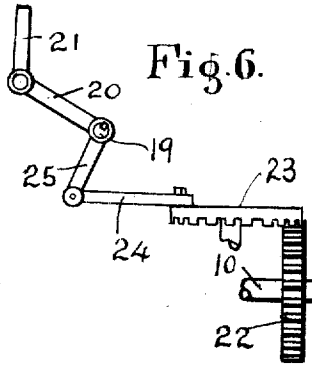


Fig. 6.



WITNESSES:

Irene Lafkowitz

Edward M Jellinek

INVENTOR

Alberto Riccardo Malasomma.

BY

Townsend & Seckel

ATTORNEYS

A. R. MALASOMMA.

FLYING MACHINE.

APPLICATION FILED APR. 2, 1909.

935,039. **Patented Sept. 28, 1909.**

5 SHEETS—SHEET 5.

Fig. 7.

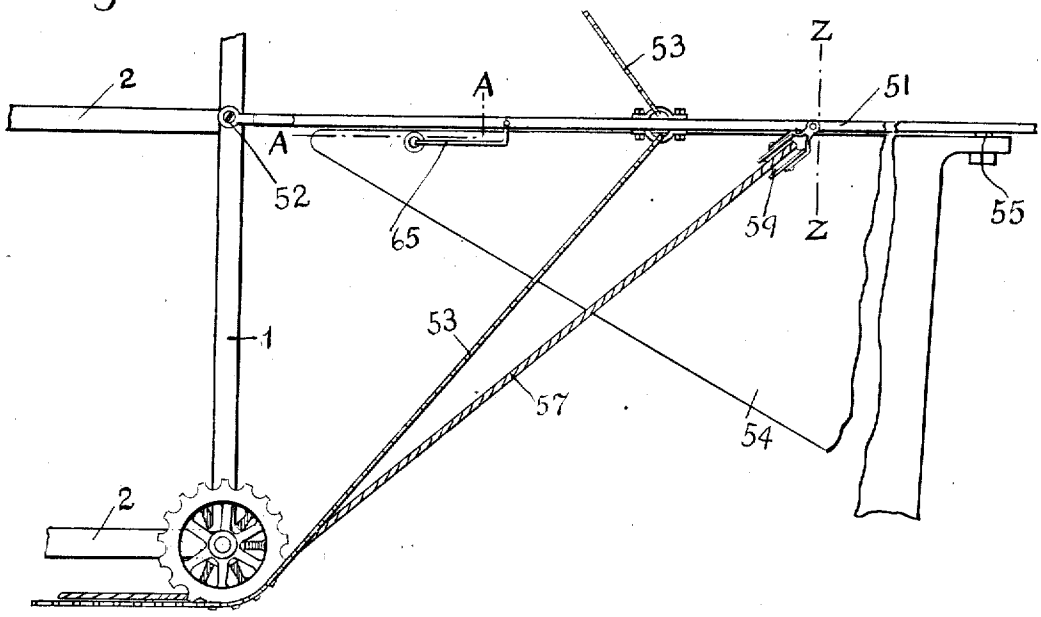
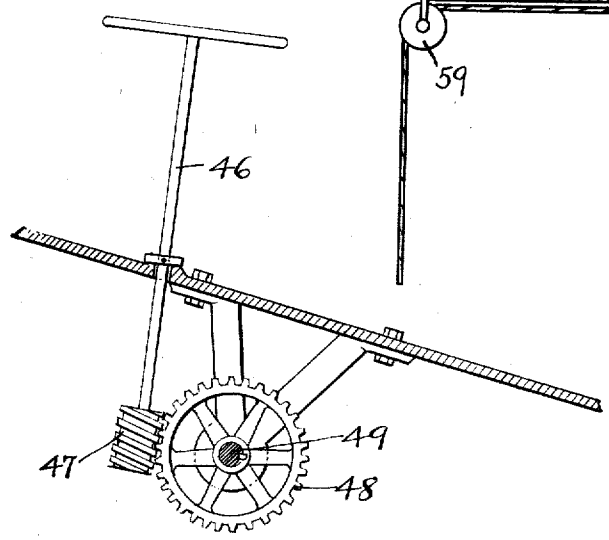


Fig. 8.



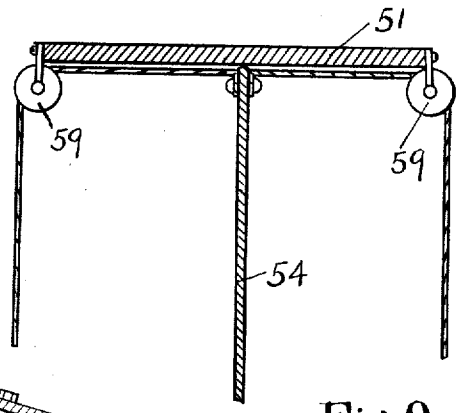
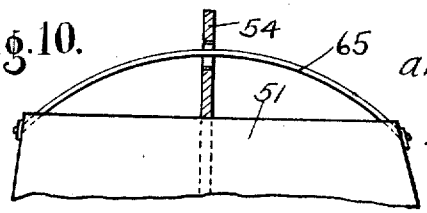


Fig. 9.

Fig. 10.



WITNESSES:

Irene Lefkowitz

Edward M. Gellner

INVENTOR

Alberto Riccardo Malasomma

BY

Townsend & Sicker

ATTORNEYS

UNITED STATES PATENT OFFICE.

ALBERTO RICCARDO MALASOMMA, OF NEW YORK, N. Y.

FLYING-MACHINE.

935,039. Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed April 2, 1909. Serial No. 487,442.

To all whom it may concern:

Be it known that I, ALBERTO RICCARDO MALASOMMA, a subject of the King of Italy, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

My invention relates to aerial propulsion apparatus in which the principles of the helicopter and aeroplane are both employed.

One of the objects of my invention is to provide a machine which will rise without the necessity of having a runway for the machine in order to permit it to get up sufficient speed to rise.

Another object is to provide means for causing the machine to rise and be propelled forward together with wings and aeroplanes which support the apparatus in the air, and also assist in its flight, the object further being to have the different propelling devices separately controlled so that all or only part of the propellers can be actuated at will and the flight easily controlled.

A further object is to construct the machine to represent a bird whereby large surfaces are provided for supporting and sustaining the apparatus when in the air.

A still further object is to provide means whereby a quick vertical descent may be attained.

A still further object is to construct an efficient machine of the above character which will be light in weight and easily controllable.

To these ends my invention consists in an apparatus of the above character provided with revolving vertical and horizontal propellers in combination with oscillating wings which assist in sustaining the apparatus and also assist in its flight, the propellers and wings being both driven from a common source of power and capable of being operated separately or all together.

My invention consists further in providing a vertical chute or air space, valve controlled, which will, to a great extent, destroy the sustaining power of the aeroplane body and whereby the apparatus may be caused to descend quickly when the valves are opened and the air permitted to pass vertically through the chute.

My invention consists still further in the means for controlling the steering of the machine, both vertical and horizontal, hereinafter more particularly described.

My invention consists still further in the novel parts, combinations of parts and details of construction hereinafter more particularly described and then specified in the claims.

In the accompanying drawings Figure 1 illustrates a side elevation of an apparatus constructed in accordance with my invention. Fig. 2 is a similar view, one of the wings or aeroplanes being removed. Fig. 3 is a plan view of the apparatus. Fig. 4 is a horizontal section taken on the line x x Fig. 2. Fig. 5 is an enlarged vertical section taken on the line y y Fig. 1. Fig. 6 is a detached view of a detail, namely the wing oscillating mechanism. Fig. 7 is an enlarged side elevation of the steering device. Fig. 8 is an enlarged detached view of the steering wheel which controls the horizontal steering of the apparatus. Fig. 9 is a transverse section taken on the line z z Fig. 7. Fig. 10 is a section on the line A A Fig. 7 and illustrates the support for the forward part of the vertical rudder and on which the rudder travels when steering. Fig. 11 is an enlarged detached elevation of the motor and driving mechanism for the various parts of the apparatus.

The apparatus consists of three main parts, the central body or framework which supports the operating parts, the two wings, and the rudder or tail, and the whole is preferably constructed to resemble a large bird.

The central body consists of a framework comprising vertical bars 1 and horizontal bars 2. The framework is preferably divided longitudinally into three stories, the lower one being provided with a suitable platform upon which the motor 3 of any desired type is mounted. A partition or surface of any suitable light material is also formed on the intermediate story and one on the top of the frame. The bars 1 and 2 are preferably made of aluminum and the partitions or surfaces of any suitable light material, the whole forming a box-like aeroplane structure to assist in sustaining the apparatus as is now well known in this art. The front part of the lower story is preferably curved upward as at 7 to join the second story whereby the forward part of the framework or body will resemble the breast of a bird.

The apparatus is provided with roadwheels 4 depending from the central body and mounted in forks 5, springs 6 being provided between the forks and the body to cushion the apparatus as is well known. By means of these wheels the apparatus is supported on the ground and can be hauled or driven thereon when desired.

8 and 9 indicate two wings longitudinally disposed and pivotally secured to the sides of the central body in any suitable manner approximately midway between the upper and lower surface of the central body. These wings might be of any desired contour and are here shown as provided with an upturned point to resemble somewhat the wings of a butterfly, they being constructed of suitable light strong material.

The motor 3 is provided with a shaft 10 connected to the motor through a clutch 11 as is usual so that the motor can be run without revolving the shaft.

12 indicates the horizontal propellers of any suitable design, located above the upper story of the central framework and mounted on vertical shafts 13 journaled in suitable bearings secured to the framework. There are preferably four of these horizontal propellers located two on either side of the central body.

14 indicates a horizontal longitudinally disposed shaft secured to the framework and connected to the vertical propeller shafts 13 by bevel gears 15. One of these shafts 14 is provided on either side of the body and each gears with the two propellers located on that side.

16 indicates a sprocket wheel secured to the shaft 14 which is connected to a sprocket wheel 17 keyed to the motor shaft 10 by a chain 18. Preferably these driving sprockets and chain are duplicated for each shaft 14 and set of propellers 12. The sprockets 17 are preferably keyed to the motor shaft 10 so that when the motor is coupled to the shaft the propellers 12 will immediately rotate and cause the apparatus to rise.

19 indicates a rock-shaft supported by the framework and located transversely with respect to the central body. The rock-shaft 19 has an arm 20 secured to each end thereof, said arms being pivotally connected by a number of pivoted links 21 to the wings 8 and 9 at a point or points located outwardly beyond the pivotal mounting of said wings whereby the power is applied to the wings direct.

The rotary motion of the shaft 10 is converted into a rocking motion of the shaft 19 by any suitable mechanism such as a gear wheel 22 on the shaft 10 meshing with a face gear 23. A link 24 pivotally mounted on the gear 23 is pivoted at its other end to an arm 25 fixed to the rock-shaft 19 whereby the rotary motion of the gear 23 is caused to rock the shaft 19 which motion causes the wings 8 and 9 to flap up and down. The arm 25 is preferably made up of two parts, one adapted to swivel within the other so as to allow for the angular movement of the link 24 in following the rotation of the gear 23. This motion of the wings adds to the propelling of the apparatus and also assists in sustaining it in the air. Preferably the gear 22 is loosely mounted on the shaft 10 and provided with a clutch 26 for coupling it to the shaft when it is desired to operate the wings and whereby, if it is desired to have the wings remain stationary, the gear wheel 22 can be disconnected from the shaft.

Each wing 8 and 9 is provided with openings 27, said openings being closed by a clap valve 28 secured to the wings by a spring hinge 29 which normally tends to cause the valve to close the opening in the wing, although other means for keeping the valve closed might be employed. When the wing is on its up stroke the valves will open and permit the air to rush through, but when making the down stroke the valves will close and permit the wings to have the full effect on the air.

30 indicates a vertical propeller of any suitable design and material and located preferably in front of the apparatus. The propeller 30 is mounted on a shaft 31 and supported by a framework 32 secured to the central body of the apparatus. Motion is transmitted from the motor shaft 10 to the propeller 30 by means of gear wheel 33 on the motor shaft, pinion 34 in mesh with said gear wheel, shafts 35 and bevel gears 36. The gear wheel 33 is also preferably loosely mounted on the shaft 10 and connected thereto by a clutch 37 so that the propeller 30 can be thrown in and out when desired.

38 indicates a truncated cone-shaped cylinder located between the upper and middle platforms or partitions and with its widest part at the bottom. The said cylinder communicates with openings in the platforms so that there is a free passage for air through the body of the apparatus. Normally this passage is closed by valves 39, 40 located at the upper and lower parts respectively. The two valves are connected by a bar 41 which is connected to a pivotally mounted operating lever 42 by a link 43. When it is desired to descend quickly the power is shut off and the valves 39, 40 are opened by the lever 42. A great part of the effective aeroplane surfaces 2 is thus removed and the buoyancy or sustaining power thereof decreased due to the fact that the aeroplane surfaces are broken and do not present as much surface upheld or sustained by the surrounding air which is permitted to pass vertically through the cylinder 38 and freely through the aeroplane surfaces 2.

44 indicates the seat for the operator which is adapted to be shifted on longitudinal and transverse tracks 45. Said tracks are adjustable vertically if desired to meet the position taken by the apparatus when in flight.

46 indicates a steering wheel located in front of the seat 44 and is provided with a worm 47 in mesh with a gear wheel 48 keyed to a transverse shaft 49. The shaft 49 is provided with a sprocket wheel 50 fixed to each end thereof. (See Fig. 5.)

51 indicates a horizontal rudder or tail by which the apparatus is steered vertically and is hinged to the framework as at 52. Chains 53 passing over the sprocket wheels 50 and over pulleys or sprockets at the back of the framework are secured to the tail or rudder 51, one end being secured to the upper surface and one end to the lower surface of said tail at or near either edge. Thus upon rotating the wheel 46 the chains 53 will cause the tail 51 to either raise or lower about the hinge 52 and cause the apparatus to be steered vertically.

Beneath the tail. 51 is mounted a vertically depending rudder blade 54 secured to the horizontal rudder as at 55. The pivot 55 is preferably located at the rear of the tail or rudder so that the front end of the rudder 54 will swing in an arc to steer the machine horizontally. The forward end of the rudder 54 is supported by segment bar 65 secured at its ends to the edges of the horizontal rudder 51. The bar 65 is arranged in an arc of a circle from the pivot 55 as a center and passes loosely through a hole or opening in the rudder 54 whereby said rudder will be free to travel on said rod.

The blade 54 is adapted to turn about its mounting 55 as a pivot and ride on the bar 65 to horizontally steer the apparatus by the following mechanism: A centrally pivoted foot bar 56 mounted forward of the seat 44 (see Fig. 4) is connected by means of cables or wires 57 to either side of the blade or rudder 54 between the pivot 55 and bar 65. The wires 57 pass over suitable sheaves 58 and over pulleys 59 secured to the edge of the horizontal rudder 51 after which they are secured to the vertical rudder 54. The foot-lever 56 is so located that the operator can operate the same by placing one foot thereon on either side of its central pivotal mounting 60. It will thus be seen that the vertical steering is effected by the wheel 46 and the horizontal steering by the foot-lever 56.

My invention, it will be understood, is capable of various modifications in the devices employed for operating the different parts, without departing from the spirit thereof.

What I claim as my invention is:

1. In an apparatus of the class described, the combination with an aeroplane body having a number of horizontal partitions one above the other, of a motor mounted in said body, vertical and horizontal propellers secured to said body and driven by said motor, means for separately coupling and uncoupling said propellers with said motor, wings pivotally secured to the sides of said body, a rock shaft mounted transversely in said body, links connecting the ends of said rock shaft with said wings at a point between the mounting of said wings and their ends, and means for connecting said rock shaft to said motor independently of said propellers.

2. In an apparatus of the class described, the combination with an aeroplane body, of a motor carried thereby, vertical and horizontal propellers driven by said motor, wings secured to the sides of said body and oscillated by said motor, a vertical rudder secured to said body and a horizontal rudder depending from said vertical rudder and secured thereto by a fixed pivot at one end and by a loose mounting at the other end and hand and foot mechanism for independently operating said rudders.

3. In an apparatus of the class described, the combination with an aeroplane body, of means for propelling the same, a vertical rudder secured to the rear of said body, a horizontal rudder depending from and secured to said vertical rudder at one end by a fixed pivot and at the other end by a guide secured to said vertical rudder and means whereby said horizontal rudder may be operated independently of any movement of said vertical rudder.

4. In an apparatus of the class described, the combination with an aeroplane body having a plurality of horizontal partitions or planes, a vertical central cylinder connecting openings in said partitions, valves at both ends of said cylinder and means for simultaneously opening said valves to permit a free passage of air through said partitions.

Signed at New York in the county of New York and State of New York this 30th day of March A. D. 1909.

ALBERTO RICCARDO MALASOMMA.

Witnesses.

IRENE LEFKOWITZ,

EDWARD M. JELLINEK.