J. H. WILSON.

FLYING MACHINE.

APPLICATION FILED MAY 26, 1909.

976,765.

Patented Nov. 22, 1910.

4 SHEETS—SHEET 1.

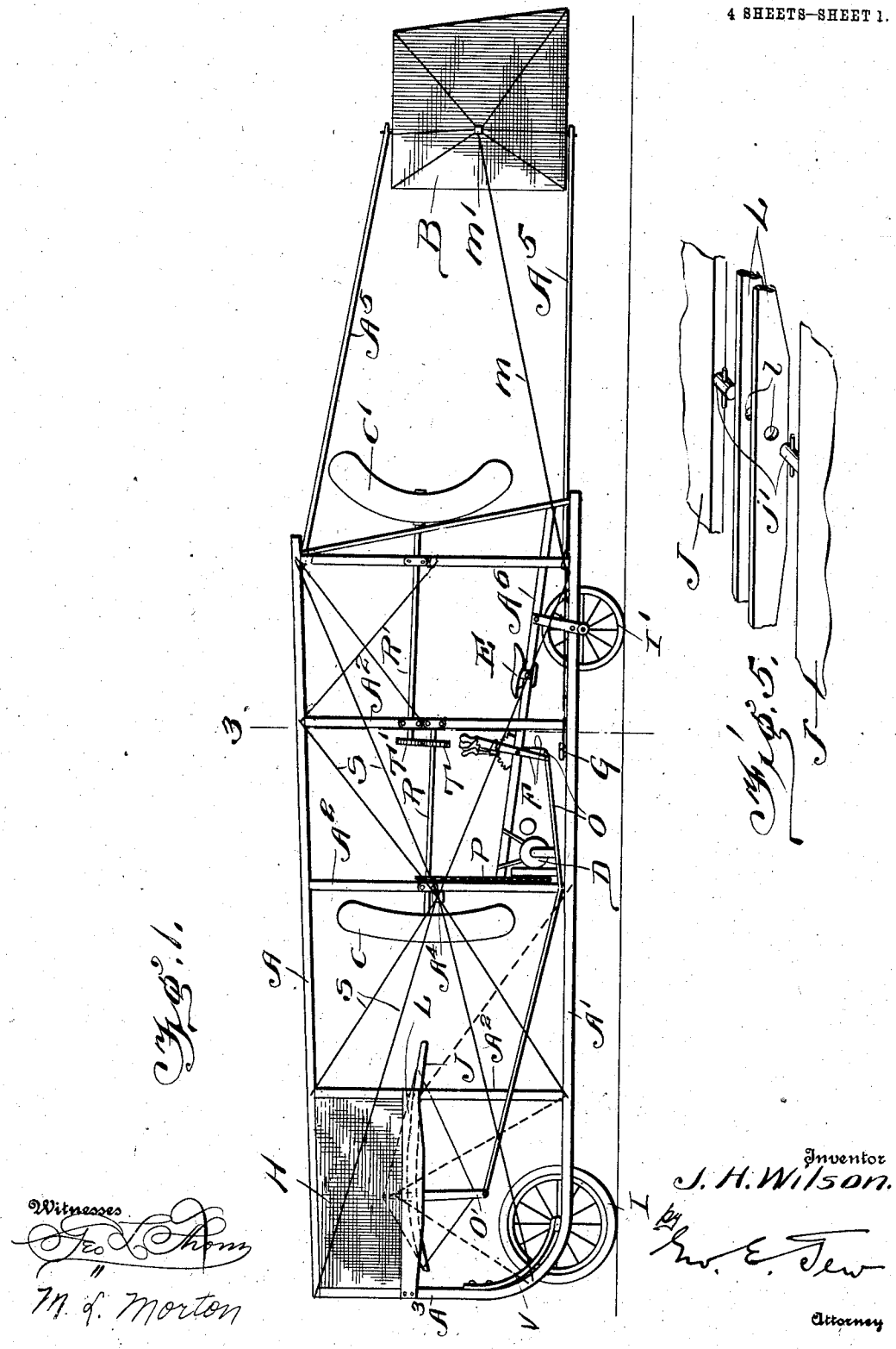

Fig. 1.

Witnesses

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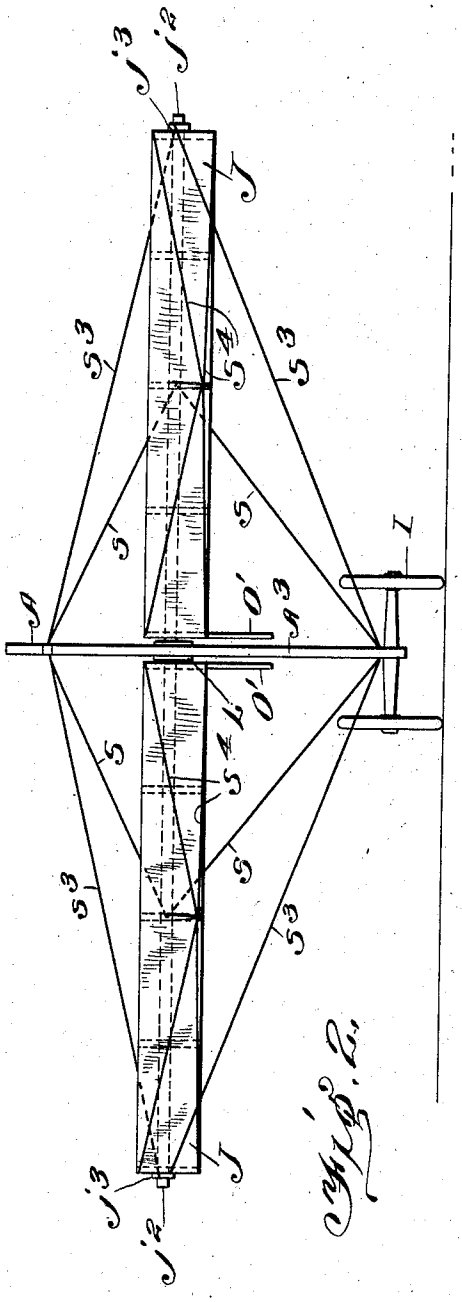

Fig. 2.

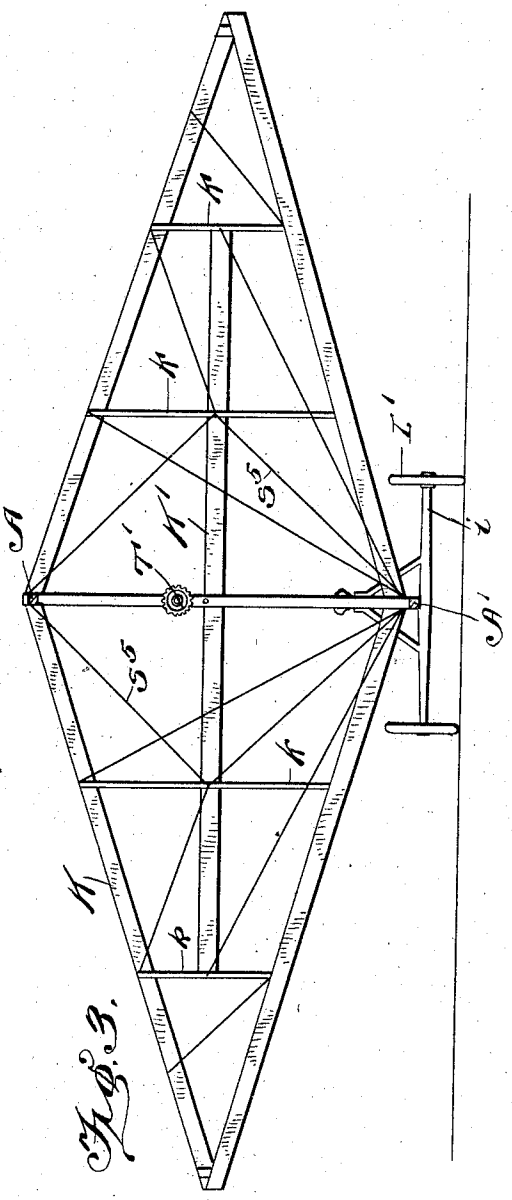

Fig. 3.

Witnesses

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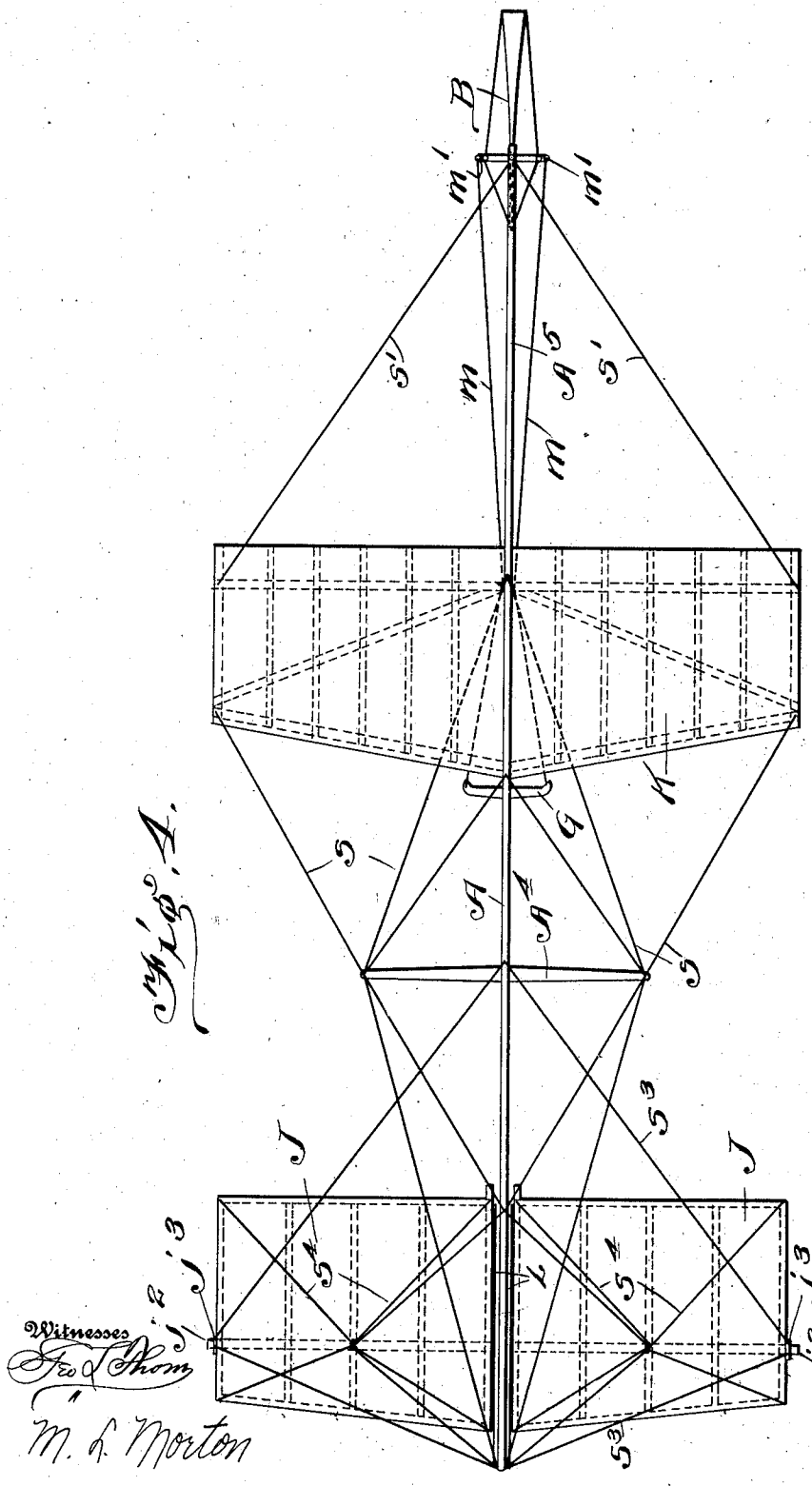
4 SHEETS—SHEET 3.



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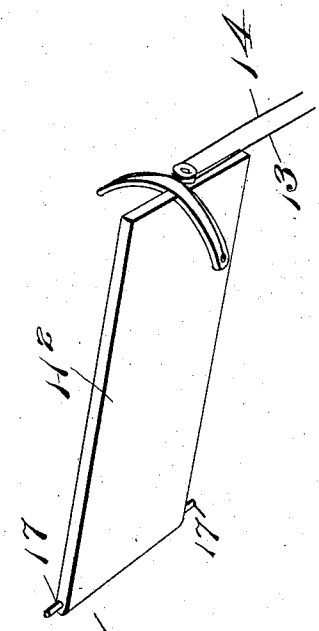

Fig. 7.

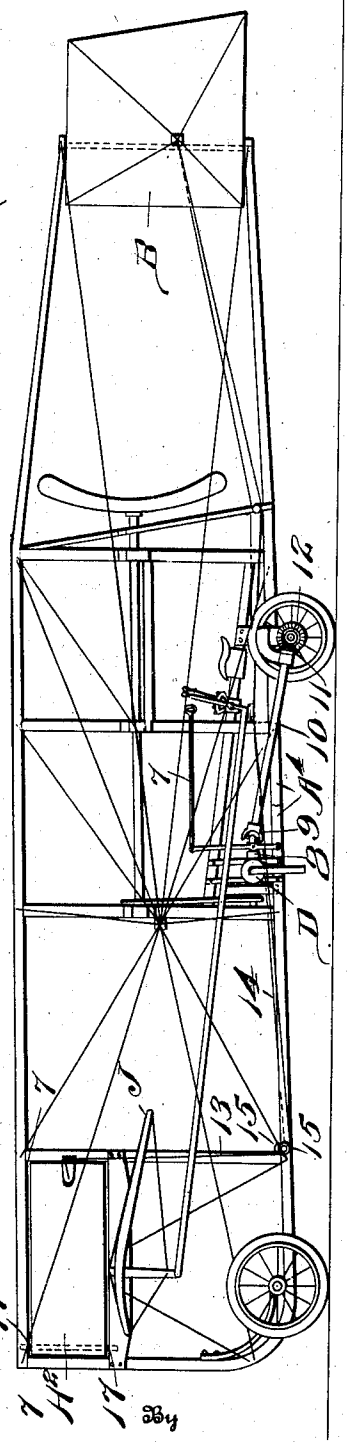

Fig. 6.

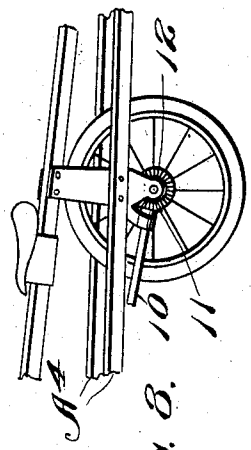

Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

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FLYING-MACHINE.

976,765. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed May 26, 1909. Serial No. 498,591.

To all whom it may concern:

Be it known that I, JOHN HOLMES WILSON, citizen of the United States, residing in Middlesex township, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to flying machines of the heavier than air type and has for its principal object to provide a machine of light and strong construction having means for elevating and maintaining the equilibrium of the machine when in the air.

A further object is to provide a device having means for elevating the machine, maintaining the horizontal equilibrium and also the sidewise equilibrium, all accomplished by the same device, a function of two devices heretofore, I believe.

A further object of the invention is to provide a diamond frame form of construction which I find is a great improvement, being stronger, lighter, more compact, and with greater lifting power.

A further object is to provide a machine that can be readily taken apart and packed for shipment, and again can be easily put together and be ready for operation.

A further object of the invention is to provide an improved machine for carrying one or more persons and other matter, depending on the size and power of the machine, as by constructing a machine of large size and of the same form and principles, and using a more powerful motor in propelling said machine, several persons or two persons and other matter may be carried through the air.

A further object of the invention is to provide a machine of this type having a steering rudder controlled by the operator in the machine, by which the machine can be steered in any direction, and which also tends or aids in maintaining the sidewise equilibrium of the machine by its position and form of construction.

A further object of the invention is to provide a machine having a frame of novel construction, very strong and light, and that will offer the least resistance to the air in traveling through the air.

It is to be understood that the invention is not limited to the described means for transmitting power to the propellers, as any kind of motor mechanism, and any form of power transmitting devices may be utilized for the purpose without departing from the spirit or scope of the invention, it being understood that various changes in the form, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation thereof, the rear aeroplanes being removed to show the frame. Fig. 2 is a front elevation. Fig. 3 is a vertical section, on the line 3—3 of Fig. 1. Fig. 4 is a plan of the frame and the aeroplanes. Fig. 5 is a detail in perspective showing the pivotal mountings of the front aeroplanes. Fig. 6 is a side elevation of a modification the rear aeroplanes being removed. Fig. 7 is a partial perspective of the modification. Fig. 8 is a detail in perspective.

Referring specifically to the drawings, a vertical skeleton frame, standing edgewise, has upper and lower longitudinal bars A and A′, connected by a series of upright struts or posts A^2, spaced apart and fastened to the horizontal longitudinal bars at top and bottom. The lower end of the front upright is curved, as indicated at A^3, to avoid a sharp corner at the front, which might be objectionable in landing. The middle upright has a cross horizontal strut A^4. The bars referred to are connected and braced by wires *s* extending in various and suitable directions to form a rigid structure, the guys or braces *s* extending to the central frame from the outer ends of the cross strut A^4 serving to prevent lateral warping or bending.

Projecting backwardly from the rear end of the main frame are upper and lower bars A^5, braced by wires *s*′, and carrying the rudder B hung on vertical pivots between the bars. The rudder has slightly curved concave surfaces made of oiled silk or the like, being as thin as possible at the front edge and wider at the rear, thus offering less at

mospheric pressure in passing through the air. The rudder is operated by cables m attached to a cross piece m' at about the middle horizontal line of the rudder and to a steering bar G on the lower longitudinal bar of the frame.

At L are indicated a pair of horizontal longitudinal bars connecting the first and second uprights of the frame, and each of these bars has a hole or socket l for the trunnion j' of the front adjustable aeroplanes J. These aeroplanes are located on opposite sides of the main frame, at the front thereof, and are adjustable with respect to their angles of presentation in order to raise or lower the machine. Above the bars L the frame is covered with oiled silk H or the like, to assist in preventing lateral dip or shift. The aeroplanes J are suitably formed of a skeleton frame covered with suitable fabric, and they are slightly dished or curved, with the concave surface presented downwardly. The axial or pivotal rods j^2 thereof fit at their inner ends in the bearings l above referred to, and at their outer ends they are mounted in rings j^3 connected by upper and lower guys s^3 extending to the main frame. Additional guys s^4 are extended to rings at or about the middle of each wing or aeroplane.

At the rear part of the frame are fixed or stationary aeroplanes of novel construction. The aeroplane K is diamond shaped in cross section or front elevation, with its longer axis extending transversely and horizontally and its shorter axis perpendicular thereto and coincident with the main frame. This diamond shaped aeroplane consists of a corresponding frame covered with fabric and braced by vertical interior struts k. As indicated by the dotted lines in Fig. 1, the wings of this aeroplane are concave, with the concavity presented downwardly, the curvature being preferably somewhat greater than that of the front planes. In addition to the struts, suitable brace wires s^5 extend between the parts of the frame, to give the necessary stiffness.

Within the diamond shaped aeroplane described is an aeroplane K', located at substantially the longer axis of the diamond, and consisting of a fabric-covered frame mounted on the struts k and concaved in a manner similar to that above described. As stated, the aeroplanes K and K' are fixed. Also, their front edges are inclined rearwardly and outwardly.

The machine is driven by two propellers C, C', the former of which is located just in front of the middle strut of the main frame and the latter of which is located behind the rear strut. They are driven by a motor D supported on the lower bar A', by means of sprockets and chain P driving shaft R of the propeller. This shaft has a gear T meshing with gear T' on rear shaft R', whereby the propellers are rotated oppositely. The shafts turn in suitable bearings on the struts A^2.

E is a seat for the operator, adjustable along an inclined longitudinal bar A^6. The angles of inclination of the front planes J are controlled by levers F connected by rods o to arms O depending from the axial rods of the planes.

For land transportation, wheels I, I' are provided. The former is carried by a forked spring v at the lower front corner of the frame, the yielding support being provided to cushion the impact of the machine when it lands. The rear wheels I are mounted on opposite ends of an axle i extending across under the rear end of the lower bar A' and braced from the bar A^6.

In the modified form shown in Figs. 6 to 8 I utilize the same frame and in the upper front part of the frame is pivotally mounted a vertical plane comprising a frame H^2 covered with oiled silk or the like. This plane is pivotally mounted at 17 on a vertical axis at its front end, so it can be moved or swung to either side at its free end, by means of the cables 13 and 14, passing over suitable pulleys 15 mounted on the main frame of the machine. This plane can be operated in connection with the rear vertical rudder B or it can be operated independently thereof. I claim a decided advantage for this device by placing it above the horizontal middle line of the machine and by placing the rear vertical rudder B mostly below the middle line and by employing the diamond-shaped aeroplanes attached to the frame as described as the operator of the machine can easily steer and also can maintain the sidewise equilibrium of the machine when traveling through the air. By employing the improved form of rudder as shown at B, and by placing it mainly below the middle horizontal line of the frame, and by utilizing the device H or H^2 above the said middle line, I am able to produce a torque or twist on the machine in either direction as desired, so as to maintain the sidewise equilibrium of the machine. In this form of my invention I employ one rear wheel for transporting the rear of the machine when on the ground and I transmit power to this wheel from the motor D in the machine. This power is to aid in starting the machine, and is transmitted from the motor by means of a friction clutch 8, and universal joint coupling 9, shaft 10, bevel pinion 11 and bevel gear 12, secured to the hub of rear ground wheel 1. The friction clutch 8 is controlled by the operator of the machine by means of the lever or pull rod 7. The friction clutch is only engaged and power transmitted when the operator pulls the rod.

In starting the machine to make a flight the motor is started up which revolves the propeller C and if the machine does not move forward over the ground fast enough, the operator pulls the rod 7 thereby transmitting power to the rear ground wheel or wheels which causes the machine to travel over the ground faster and when the machine has acquired the proper speed the operator adjusts the front adjustable aeroplanes J, J and the machine will lift itself off the ground and travel through the air. As soon as the machine leaves the ground the clutch is disengaged and no power is transmitted to the ground wheel or wheels. This effects one of the main objects of this invention, and provides a practical machine for navigating the air, that can be started up from almost any place where the ground is not too rough, without any auxiliary starting apparatus. In this modified form the main frame has two lower longitudinal bars A^4, between which the driving wheel is located, as shown in Fig. 8.

It is believed that the construction and operation of the machine will be sufficiently evident from the above description, as also the realization of the objects and advantages referred to above.

I claim:

1. In a flying machine the combination of a supporting frame standing edgewise, laterally projecting aeroplanes independently adjustable on opposite sides of the front end of the frame, laterally projecting fixed aeroplanes at the rear end of the frame, and propellers one of which is located behind the front aeroplanes and the other of which is located behind the rear aeroplanes, the axes of the propellers being in line with the frame.

2. In a flying machine, the combination of a narrow supporting frame standing edgewise, front and rear aeroplanes projecting laterally from the frame at the front and rear ends thereof respectively, said aeroplanes being located at opposite sides of the frame and below the plane of the top thereof, and front and rear propellers located respectively behind the front and rear aeroplanes and with their axes in line with the frame.

3. In a flying machine, the combination of a frame narrowed transversely to occupy substantially a single plane, and of much greater height than width, front and rear aeroplanes projecting laterally on opposite sides of said frame and in planes within the top and bottom lines of said frame, and propellers located with their axes in line with said frame and in position behind the respective front and rear aeroplanes and within the top and bottom lines of the frame.

4. In a flying machine, the combination of a narrow frame having longitudinal top and bottom bars extending from the front end to the rear end of the frame, and uprights connecting said bars, front and rear aeroplanes projecting from and beside said frame and in horizontal planes within the lines of said top and bottom bars, the front planes being adjustable and a vertical aeroplane pivoted below the top bar and above the front aeroplane, to swing laterally.

5. In a flying machine the combination of a narrow frame standing edgewise and occupying substantially a single vertical plane, adjustable front aeroplanes projecting from the sides of said frame, and a fixed rear aeroplane, diamond shaped in cross section and with its longer axis extending across the frame and its shorter axis coincident with the vertical plane of the frame.

6. In a flying machine, the combination of a narrow frame standing edgewise and occupying substantially a single vertical plane, adjustable front aeroplanes projecting from the sides of said frame, and a fixed rear aeroplane comprising upper parts inclined outwardly and downwardly on opposite sides from the top of the frame and lower parts inclined upwardly and outwardly from the bottom of the frame, said parts meeting at their outer ends, to form a diamond shaped aeroplane with the frame forming the shorter axis thereof.

7. In a flying machine, in combination, a vertical longitudinal frame standing edgewise, aeroplanes projecting laterally from said frame, upper and lower bars projecting backwardly from the rear end of said frame at the top and bottom edges thereof, a propeller located between said bars, and a vertical rudder pivotally mounted between the rear ends of said bars.

8. In a flying machine, the combination of a skeleton frame made in a single vertical plane and standing edgewise, separate laterally-projecting aeroplanes at the front and rear ends of said frame respectively, a horizontal cross strut at about the middle of said frame, between the aeroplanes, and braces connecting the outer ends of the strut and the opposite ends of the frame.

9. In a flying machine, the combination of a skeleton frame standing edgewise and extending lengthwise, and narrow transversely to occupy substantially a single plane, adjustable aeroplanes projecting laterally at the front end of said frame, a fixed aeroplane, diamond shaped in cross section and projecting with its longer axis transversely at the rear end of the frame, upper and lower bars, projecting rearwardly from the rear end of the frame, a vertical rudder between the rear ends of said bars, and braces connecting the rear ends of said bars and the outer ends of the fixed aeroplane.

10. In a flying machine, the combination

of a vertical frame standing edgewise, and an aeroplane diamond-shaped in cross section fixed at the middle to the frame, with its longer axis transverse the frame, said aeroplane having concave surfaces presented downwardly and also having its front edges inclined rearwardly and outwardly.

In testimony whereof, I affix my signature in presence of two witnesses.

JOHN HOLMES WILSON.

Witnesses:
A. HOOVER,
CHAS. McC. STEWART.