

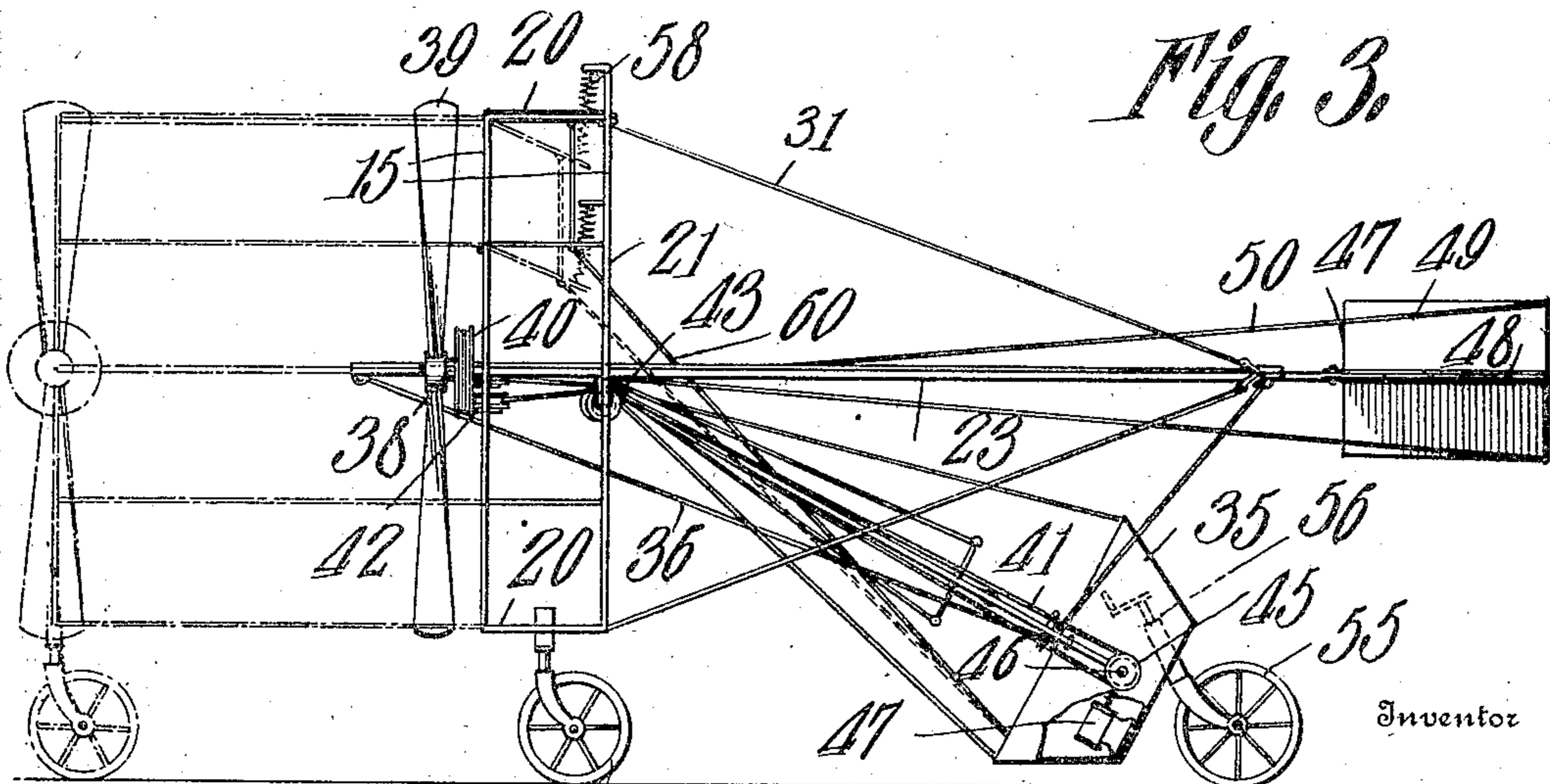
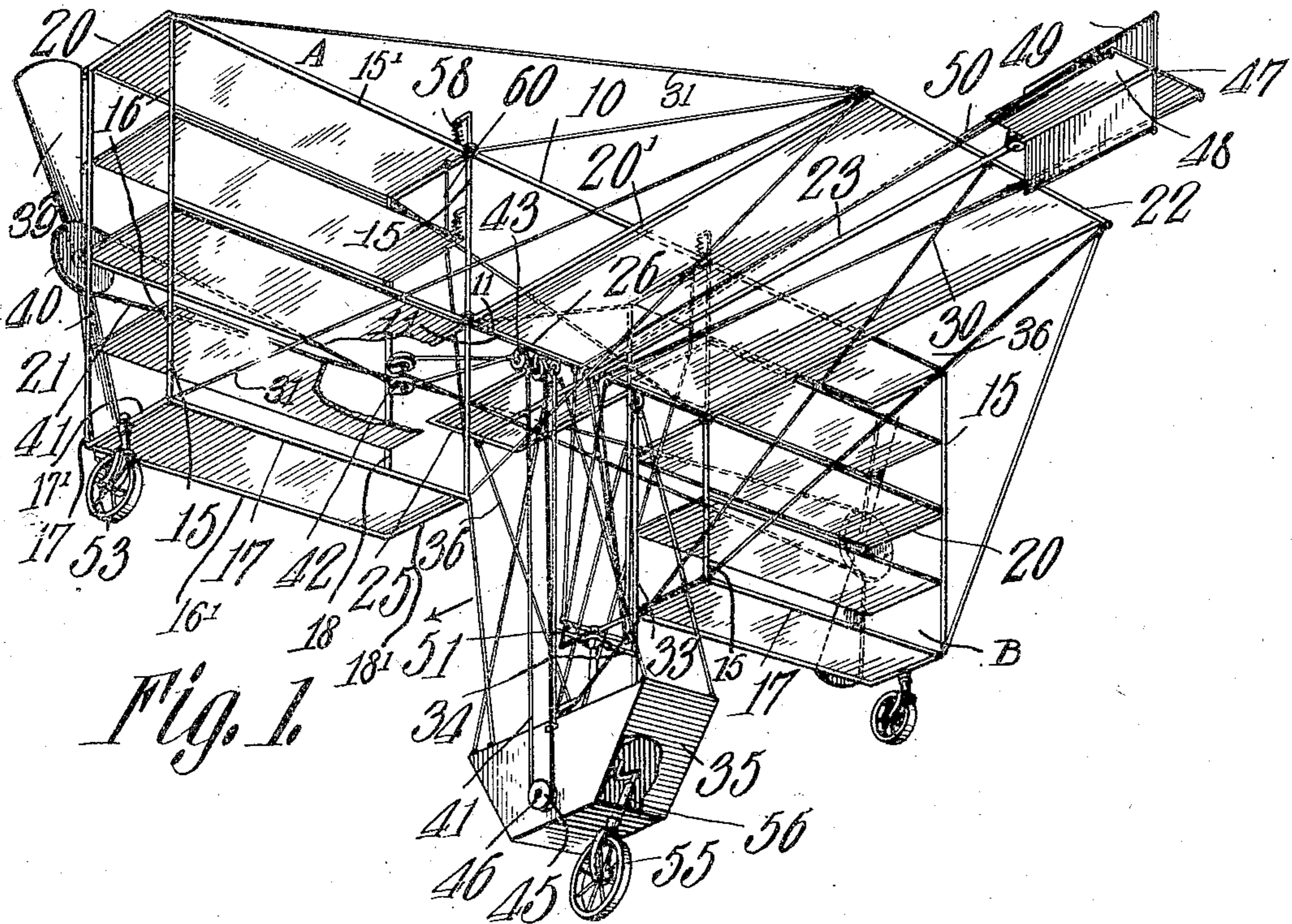
No. 889,502.

PATENTED JUNE 2, 1908.

D. D. BEATTY.  
FLYING MACHINE.

APPLICATION FILED SEPT. 20, 1907.

2 SHEETS—SHEET 1.



Witnesses  
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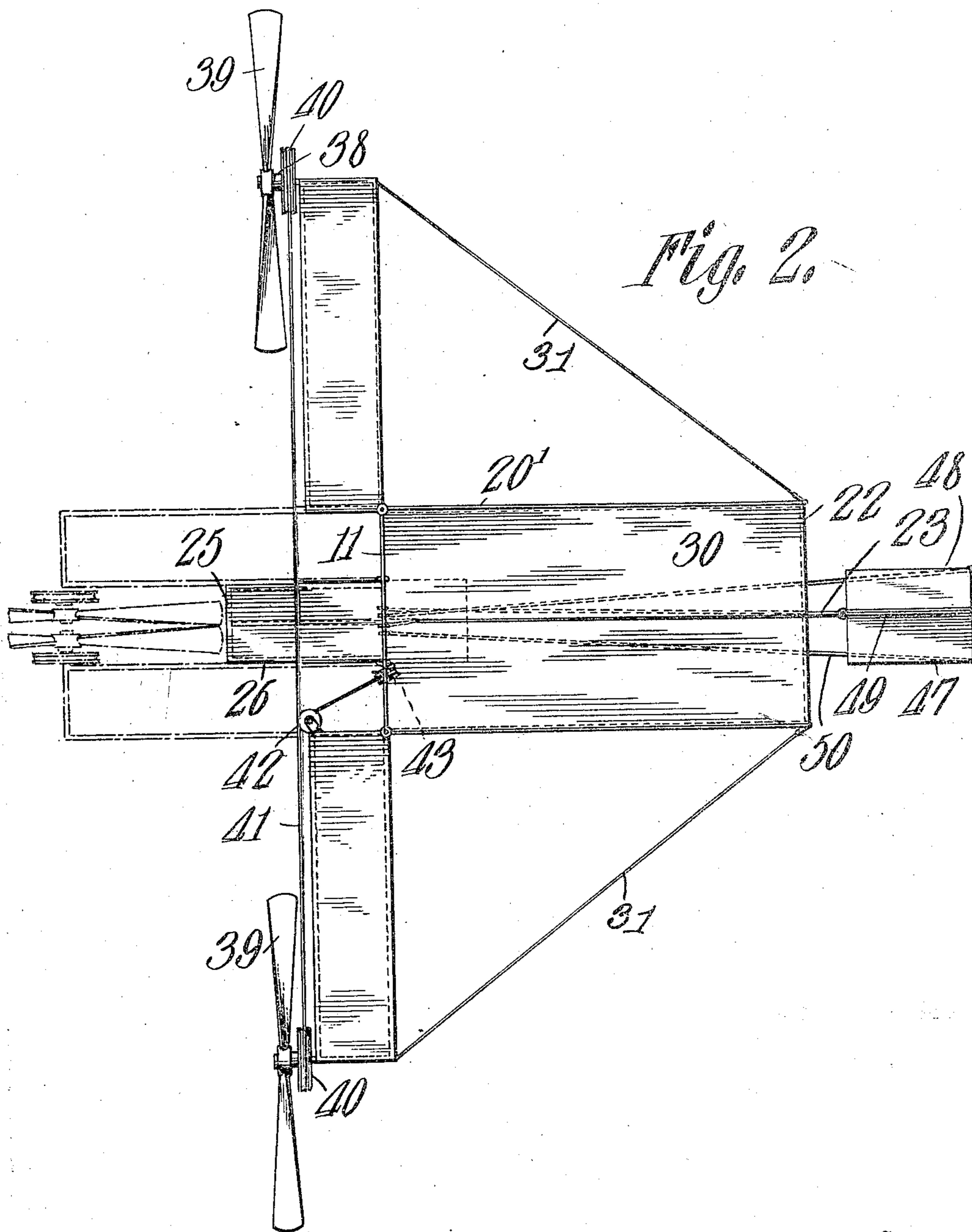
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# UNITED STATES PATENT OFFICE.

DECATUR D. BEATTY, OF SAN FRANCISCO, CALIFORNIA.

## FLYING-MACHINE.

No. 889,502.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed September 20, 1907. Serial No. 393,838

*To all whom it may concern:*

Be it known that I, DECATUR D. BEATTY, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented a new and useful Flying-Machine, of which the following is a specification.

This invention relates to flying machines, and has for its principal object to provide a device of simple construction in which a series of aeroplanes are so arranged in connection with propelling and steering mechanisms as to form a support, and which may be employed for traveling through the air without recourse to gas fields or the like.

A further object of the invention is to provide a device of this type in which a single elongated aeroplane is arranged to form a balancing means and is employed in connection with a pair of sets of aeroplanes which latter are employed for lifting purposes, provision being made for shifting the load carried to the front or rear of the machine, so that the latter may be properly directed for upward or downward flight.

A still further object of the invention is to provide a device of this type which may travel along the ground, and for that purpose is provided with supporting wheels, the operator being enabled to travel on the surface until sufficient speed is acquired to insure the rising of the vessel into the air.

A still further object of the invention is to provide a novel form of connection between the propelling devices and the motor, so that positive driving connection will be assured without regard to alteration in the position of the motor and propellers.

A still further object of the invention is to provide a novel form of rudder which may be adjusted for steering to either right or left, or either up or down.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a perspective view of a flying machine con-

structed in accordance with the invention.

Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the machine showing the carrying wheels in contact with the ground.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The skeleton frame of the machine includes a pair of parallel cross bars 10 and 11 to the opposite ends of which are hinged or pivoted two similar frames A and B. Each of the frames A and B comprises four vertical bars 15, 16, 17 and 18, the bars 15 being pivotally connected to the ends of the bars 10 and 11. The bars 15 and 16 of each frame are connected by rear bars 15' disposed in parallel relation, and the front bars 17 and 18 are connected by bars 16', also disposed in parallel relation. The outer bars 16 and 17 are connected by bars 17' and the inner bars 15 and 18 are connected by short bars 18'. There is one of these frames at each side of the machine, and each of the minor rectangular frames comprising a bar 15', a bar 16', a bar 17' and a bar 18' is covered with oiled silk or other light sheet material to form an aeroplane, and these aeroplanes while shown as flat in the present instance may be slightly inclined, or may be slightly curved. Two of the bars 18' which are disposed in the same plane with the connecting bar 11 are extended rearward in the form of bars 20' and at their rear ends are connected by a cross bar 22. This structure is further reinforced by a central rod 23 which extends some distance rearward of the cross bar 22 and at its forward end is extended to a point beyond the forward edges of the lifting aeroplanes, the forward end of this central rod 23 being connected to the central portion of a cross bar 25, and the opposite ends of the latter being connected with the main rod 15 by arms 26. The space bounded by the frame members 20', 22, 25 and 26 is covered with some sheet material to form a large single plane 30.

The frame is braced by rods or wires 31 which extend from the several corners of the series of aeroplanes to the rear corners of the large plane 30, and provision is made for disconnecting these members should it become necessary to turn the series of aeroplanes to the position indicated by dotted lines, and it is for this purpose that the rods 10 and 11 are pivoted at the points where they connect with the series of aeroplanes, so that the latter may be readily turned inward for the pur-

pose of decreasing the width of the machine in case it is necessary to travel along a narrow roadway while the machine is on the ground.

5 To the rod 11 near the point where the frame rods 26 connect are pivoted the upper ends of a pair of suspension links 33 which are connected near their lower ends by a cross bar 34, and at their extreme lower ends  
10 are firmly secured to a car 35 and the car may swing forward or rearward, so as to shift the vertical plane of the center of gravity of the entire machine, and thus influence the ascent and descent. In order to accomplish this  
15 shifting of the weight, a flexible member, such as rope 36, is provided, one end of the rope being secured to the forward end of the rod 23, and the opposite end to the rear end of such rod, while the loop of the rope passes  
20 to the car and may be used for hauling the latter in either direction after which the rope may be secured to the car in order to hold the latter in any position to which it may be adjusted.

25 At the outer edges of the series of aeroplanes, and extending forward therefrom are shafts 38 on which are mounted propellers 39, and sheaves 40. These sheaves are driven by a single belt 41 that passes over guiding  
30 sheaves 42 and 43, the latter being mounted on the rod 11. The belt passes around a driving pulley 45 at the end of a shaft 46 which latter is driven by an engine 47 from the car. It will be noted that as the belt passes over  
35 the sheaves 43 there will be no tightening or slackening of the belt no matter what position the car may assume with reference to the remaining portion of the machine.

40 Pivoted at the rear end of the rod 23 is a rudder 47 having intersecting horizontal and vertical blades 48—49, and these are connected by a series of wires or loops 50 to a tiller 51 having arms of a number corresponding to the number of wires or ropes and provided with a suitable operating handle, so  
45 that the rudder may be moved in a vertical plane, or in a horizontal plane.

It will be seen that as the rudder is placed behind the single plane 30 it will be much  
50 more effective than if placed behind two or more planes located one above the other for the reason that in passing through the air, the single plane will not disturb the air to any material extent, and the latter will therefore  
55 immediately meet resistance when moved in any direction. At the bottom of each series of planes is arranged a ground wheel 53 which comes into play when the machine touches the ground, and these wheels are mounted in  
60 pivotal supports, so that they may be turned through an angle of  $90^\circ$  in case the series of planes are adjusted to the position shown by dotted lines.

65 The car is suspended some distance below the lowermost of the planes and carries a

wheel 55 to which the steering post 56 is connected, and as the machine descends the wheel 55 will first strike the ground, and the car will be thrown rearward or rather will remain stationary, while the aeroplane is  
70 moved forward and the wheels 53 come gradually in contact with the surface.

In operation, the machine is placed on the ground resting on the three wheels, and after the machine is started it will travel along the  
75 ground until sufficient momentum is acquired to lift the aeroplane. As the aeroplanes rise, the car will gradually assume a vertical position and finally will be raised from the ground. This arrangement permits the operator to become thoroughly familiar with the working of the parts, while still on the ground, and the parts may all be thoroughly tried out before flight is attempted.  
80

In practice it is preferred to pivot the two uppermost planes of each series at their forward ends, and to employ springs 58 to retain them normally in elevated position. These springs are connected by suitable  
85 guides or cables 60 to the car and by grasping and drawing on one or other of the cables, the aeroplanes may be drawn out to a slight angular position, thus presenting additional resistance to the air and serving to correct  
90 any tendency of the machine to tilt to one side or the other.

I claim:—

1. In a flying machine, a frame, a single centrally disposed aeroplane, a rudder at the  
100 rear end thereof, a pair of sets of aeroplanes, one arranged at each side of the central plane, and propellers arranged in advance of and adjacent the ends of said sets of planes.

2. In a flying machine, a frame, a single  
105 centrally located aeroplane, a rudder at the rear end thereof, a pair of sets of aeroplanes arranged one at each side of the central plane, propellers disposed in advance of the sets of aeroplanes, a car suspended from the  
110 frame, and a motor mechanism carried by the car and connected to the propellers.

3. In a flying machine, a single centrally located aeroplane, a rudder at the rear end thereof, a pair of sets of aeroplanes located  
115 one at each side of the central plane, each set comprising a plurality of superposed planes which are disposed at a right angle to the length of the central plane, and a frame composed of hinged sections arranged to permit  
120 folding of the sets of planes into parallel relation.

4. In a flying machine, a hinged frame, a single centrally located aeroplane having its forward end of reduced width, a rudder at  
125 the rear end of said frame, a pair of sets of aeroplanes carried by hinged sections of the frame, each set comprising a plurality of superposed planes normally disposed with their length at a right angle to the length of  
130

the central plane, said sets of planes being foldable into the spaces formed at the sides of the reduced portion of the central plane.

5 In a flying machine, a frame, a single centrally arranged aeroplane carried thereby, a pair of sets of aeroplanes disposed one at each side of the central plane, each set comprising a plurality of superposed planes, hinged supports for some of said superposed  
10 planes, springs tending normally to hold the hinged planes in parallel relation with the remaining planes, a car, and a plane operating means extending from the car to the hinged planes to thereby permit alteration  
15 of the angle of the latter.

6. In a flying machine, a frame, a plurality of aeroplanes carried thereby, ground wheels disposed at the bottom of the frame, a pivotally suspended car carried by the frame, said  
20 car being free to swing rearward, and a ground wheel carried by the car.

7. In a flying machine, a frame, a plurality

of aeroplanes carried thereby, a propeller, ground wheels at the bottom of the frame, a car pivotally suspended from the frame, a  
25 steering wheel carried by the car, and a motor arranged in the car and connected to the propeller.

8. In a flying machine, a frame, a plurality of aeroplanes carried thereby, ground wheels  
30 arranged at the lower portion of the frame, a car suspended from the frame, and free to move rearward as the machine nears the ground, a steering wheel carried by the car, a motor on the car, and a propeller actuated by  
35 the motor.

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

DECATUR D. BEATTY.

Witnesses:

A. K. DAGGETT,

C. C. CUNNINGHAM.