

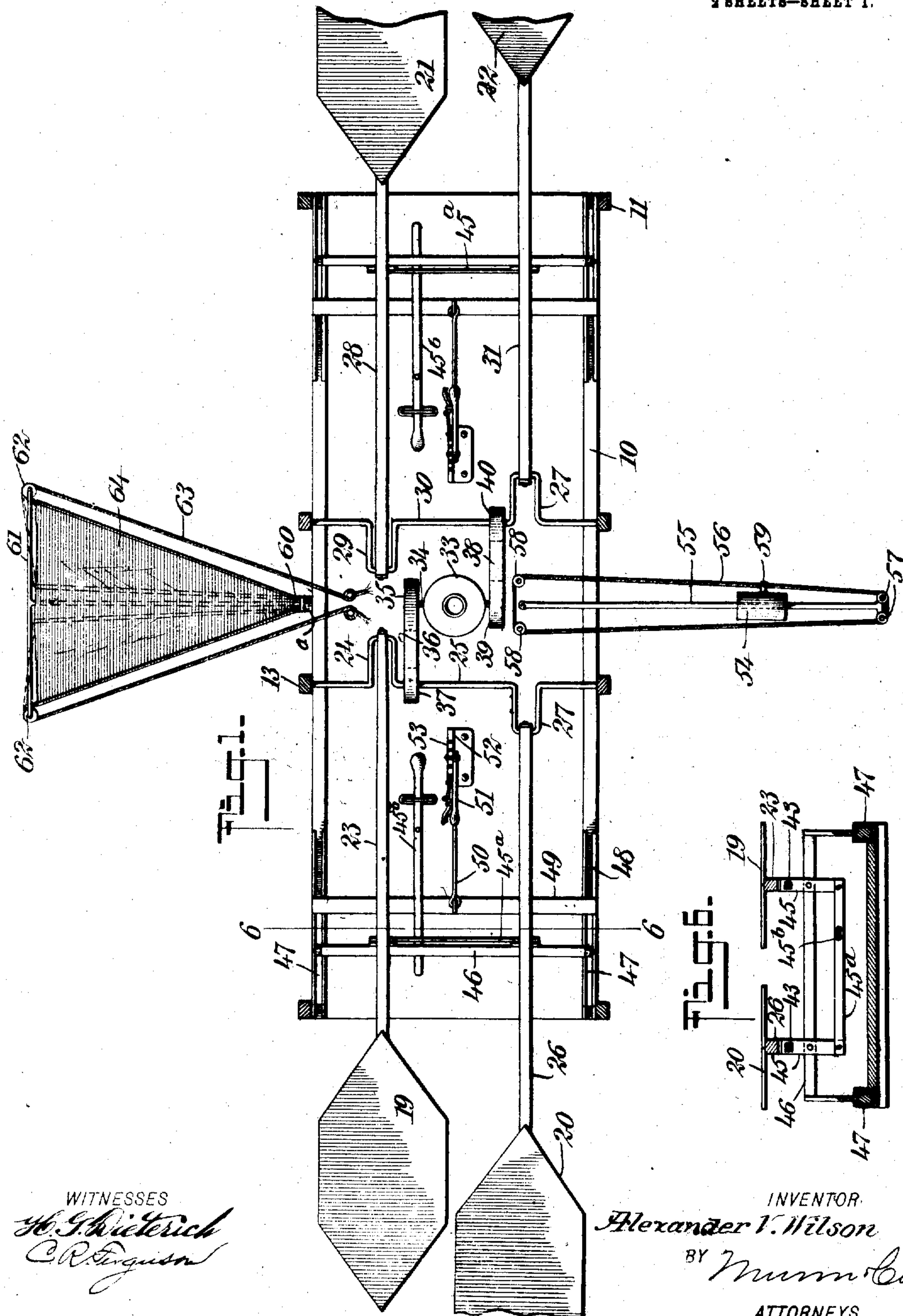
No. 897,504.

PATENTED SEPT. 1, 1908.

A. V. WILSON.
FLYING MACHINE.

APPLICATION FILED OCT. 31, 1906.

2 SHEETS—SHEET 1.



WITNESSES
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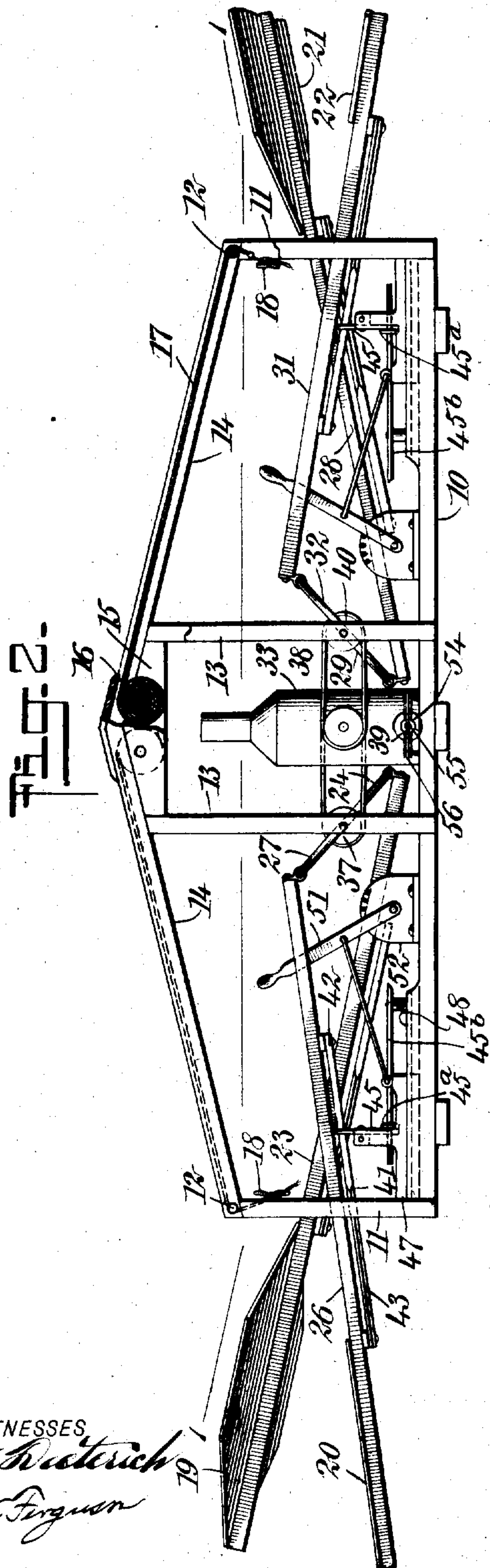
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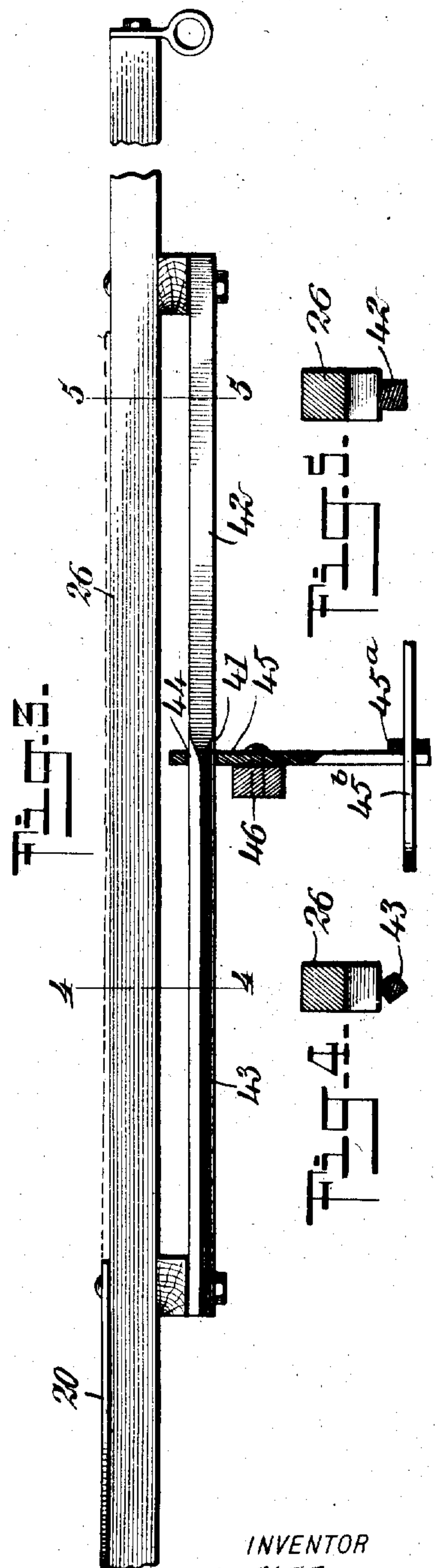
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ALEXANDER V. WILSON, OF BAR HARBOR, MAINE.

FLYING-MACHINE.

No. 897,504.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed October 31, 1906. Serial No. 341,418.

To all whom it may concern:

Be it known that I, ALEXANDER V. WILSON, a citizen of the United States, and a resident of Bar Harbor, in the county of Hancock and State of Maine, have invented a new and Improved Flying-Machine, of which the following is a full, clear, and exact description.

This invention relates to improvements in flying machines, the object being to provide a flying machine of simple and comparatively inexpensive construction, so arranged that it will operate with or against the wind and that may be readily directed laterally and also up and down.

Other objects of the invention will appear in the general description.

I will describe a flying machine embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan, partly in section on the line 1—1 of Fig. 2, of a flying machine embodying my invention; Fig. 2 is a side elevation thereof; Fig. 3 is a detail showing a means for causing oscillatory movements of the wings or blades; Fig. 4 is a section on the line 4—4 of Fig. 3; Fig. 5 is a section on the line 5—5 of Fig. 3; and Fig. 6 is a section on the line 6—6 of Fig. 1.

Referring to the drawings, 10 designates the car platform having end uprights 11 connected at the top by rollers 12, and intermediate uprights 13 and side rails 14 connect the several uprights of a side, said side rails being inclined downward from the center. Between the intermediate uprights 13 is a housing 15 in which spring rollers 16 are placed, and to the spring rollers roofing curtains 17 are attached. These roofing curtains of course may be drawn downward over the rollers 12 and secured by means of ropes to cleats 18 on the uprights 11. Upon releasing the ropes the spring rollers will wind up the roofing curtains.

To cause the flying movements of the machine, I employ a series of wings or blades. I have here shown two blades 19, 20 at one side of the machine and two blades 21, 22 at the opposite side of the machine. The blade 19 is attached to the outer end of a stem 23 the inner end of which engages with a crank 24 on a crank shaft 25. The stem 26 of the

blade 20 engages with a crank 27 on the crank shaft 25 and the cranks 24, 27, are extended in opposite directions so that the wings or blades will be alternately moved inward and outward. The stem 28 of the blade 21 connects with a crank 29 on a crank shaft 30, while the stem 31 for the wing or blade 22 engages with a crank 32 on said crank shaft 30; these cranks 29, 32 are also arranged or extended in opposite directions for the purpose before described.

Any suitable motor carried by the machine may be employed to impart rotary motion to the crank shafts. I have here indicated a motor 33 on the shaft 34 of which is a band wheel 35 from which a band 36 extends to a band wheel 37 on the crank shaft 25. The crank shaft 30 is operated from the shaft of the motor through the medium of a belt 38 engaging with a band-wheel 39 on the motor shaft and with a band wheel 40 on the crank shaft 30.

I will now describe means for causing lateral deflecting or oscillatory movements of the wings or blades. As this means is common to all the wings or blades a description of one will answer for all. Secured along the under side of the wing-carrying stems is a metal rod 41 which at its inner portion, that is, substantially from the center to the inner end, is rectangular in cross section as indicated at 42. The forward portion is also rectangular but this portion has its corners turned at right angles to the corners of the portion 42, as indicated at 43. The rod is slidable through a rectangular opening 44, which is slightly larger than the rod, this opening being formed in a plate 45 extended upward from the cross-bar 46, to which it is pivoted and which of course extends across the car-platform to control the operation of the opposite blade of the pair. The plates 45 are extended downward and connected by a bar 45^a, which may be shifted by a lever 45^b, to move the fulcrums either backward or forward with relation to the body. The bar 46 is connected to slides 47, movable in guides 48 arranged on the base or platform, and also connected to the slides is a cross-bar 49 from which a rod 50 extends to connection with an adjusting lever 51 pivoted to a standard 52 which has at its top a segment-rack 53 for engaging a spring-pressed pawl carried by the lever. By this means the speed or vertical movement of the wings or blades may be regulated by adjusting the fulcrum—that is,

the plates 45 carried by the bar 46—inward or outward, and by this adjustment the time of oscillatory movement of the blades may be adjusted. It will be understood that the bar 46 has a slight rocking movement so that the rods 41 may pass readily through the openings in the plates 45.

In the operation of this portion of my flying machine, as the crank shaft rotates, the wings of a pair will be alternately moved inward or outward that is to say one blade of each pair of blades makes an upward and outward stroke while the other blade of the pair is making an inward and upward stroke. During a portion of the movement both inward and outward of the wing, the rectangular part 42 of the bar 41, in passing through the opening 44, will maintain the wing on a practically horizontal plane. When, however, the part 43 of said rod passes through the opening the wing will be oscillated at both inward and outward movements. By this arrangement, the movements of the wings of a bird are closely simulated and the machine is caused to ascend and to be propelled. The ascensional power of the machine can also be increased by adjusting the fulcrums of the blades, so that the blades will have alternate long and short strokes at opposite sides of the machine. This adjustment of the fulcrums of the blades also permits the machine to be kept on an even keel.

The machine may be deflected upward or downward by means of a weight 54 slidable on a rod 55 extended upward from the front of the platform. By moving the weight outward on the rod the machine will be deflected downward, and by moving the weight inward along the rod the machine will move upward. As a means for adjusting the weight I here show an endless rope 56 which at the outer portion passes around pulleys 57 carried on the end of the rod, and at the inner portion passes around pulleys 58 on the platform of the machine. The rope it will be noted is attached to the weight as indicated at 59. It is to be understood, however, that other means may be employed for adjusting the weight without departing from the spirit of my invention.

The rudder consists of a rod 60 extended outward from the rear side of the car and having rotary movement, and on the outer end of the rod 60 is a transverse bar 61 having pulleys 62 at the ends. An adjusting rope 63, secured to the operating handle *a* passes over the pulleys 62 and thence to the car and is secured thereto. The inner stretches of the rope 63 are secured to the edges of the flexible material 64 which forms the body of the rudder. It will be noted that this rudder is of triangular shape. When the rudder is extended as indicated in Fig. 1 the air-ship will float on an even keel. When it is desired to steer the ship laterally, the rod

60 is manipulated by means of the handle *a* to turn the body in vertical direction or at an angle. It is to be understood that the wings may be made of any desired length or extended inward as indicated by the dotted line 70 in Fig. 3.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. An air-ship comprising a car or body portion, wings or blades extended outward from both sides of the body portion, means for causing lengthwise reciprocating motion of the blades, and means for causing oscillatory movements of the blades on both their inward and outward movements.

2. An air-ship comprising a body portion, wings or blades extended from opposite sides of the body portion, there being a pair of blades at each side, stems extended inward from the blades, crank shafts, with the cranks of which the stems have connection, the cranks of a shaft being so arranged as to impart alternate longitudinal movements to the blades of a pair, a motor for operating the crank shafts, and means for causing oscillatory movements of the wings or blades.

3. In an air-ship, a body portion, a crank shaft thereon, a wing or blade, a stem extended inward from the wing or blade and having connection with the crank of the crank shaft, a rod connected to the under side of the stem, said rod through a portion of its length being rectangular in cross section with its planes respectively horizontal and perpendicular, and another portion of said rod being triangular in cross section with its planes arranged at an angle to the planes of the first-named section, and a fulcrum plate having a rectangular perforation through which said rod is movable.

4. An air-ship comprising a body portion, a crank shaft thereon, a stem having connection with the crank of the crank shaft, a wing or blade on the outer end of the stem, a rod connected to the under side of the stem, the said rod having one portion of its length rectangular in cross section with the planes thereof horizontal and vertical, the other portion of the rod being also rectangular in cross section but having planes arranged at an acute angle with relation to the planes of the first-named section, a fulcrum plate having a rectangular opening through which said rod is movable, and means for adjusting said plate to change the fulcrum point.

5. An air-ship comprising a body portion, a pair of wings or blades extended outward from each side of the body portion, a crank shaft for each pair of blades, the cranks thereon being extended in opposite directions, stems extended inward from the wings or blades and connecting with the cranks, rods connected to the under sides of the stems, and adjusting fulcrums for said rods,

said rods and fulcrums being so formed as to permit not only of the longitudinal movement of the stems but to impart a rocking or oscillatory movement thereto.

- 5 6. In an air-ship, the combination with a body or car and wings extended outward from the sides thereof, of a rudder consisting of a rod extended outward from the rear of the car and having rotary movement, a trans-
10 verse bar at the outer end of said rod, pulleys on the ends of said transverse bar, a rope

passing over said pulleys and extended to the car, and a flexible material connected to the inner stretches of the rope.

In testimony whereof I have signed my 15 name to this specification in the presence of two subscribing witnesses.

ALEXANDER V. WILSON.

Witnesses:

JNO. M. RITTER,
C. R. FERGUSON.