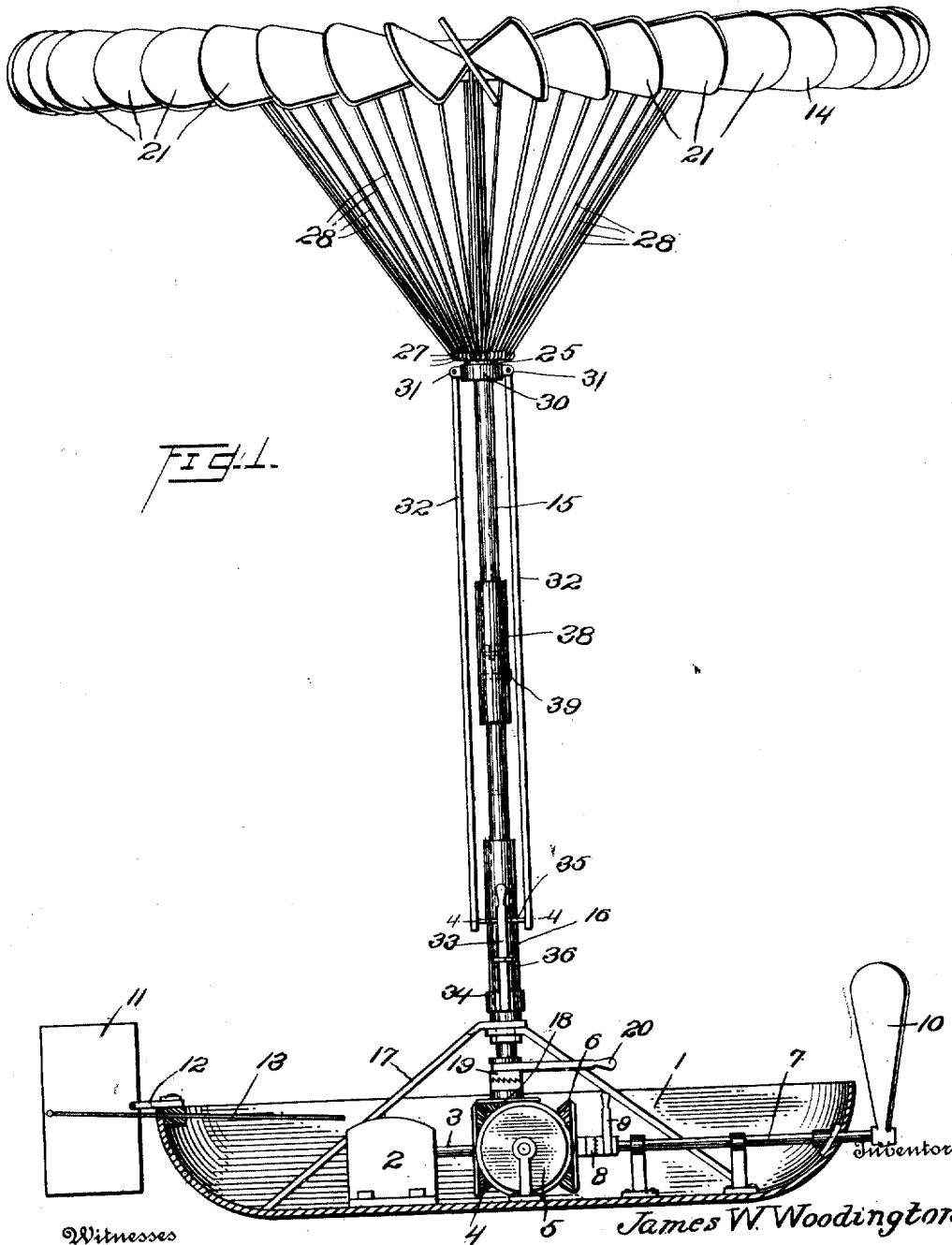


994,966.



Witnesses

H. Strauss
 R. H. Krenkel

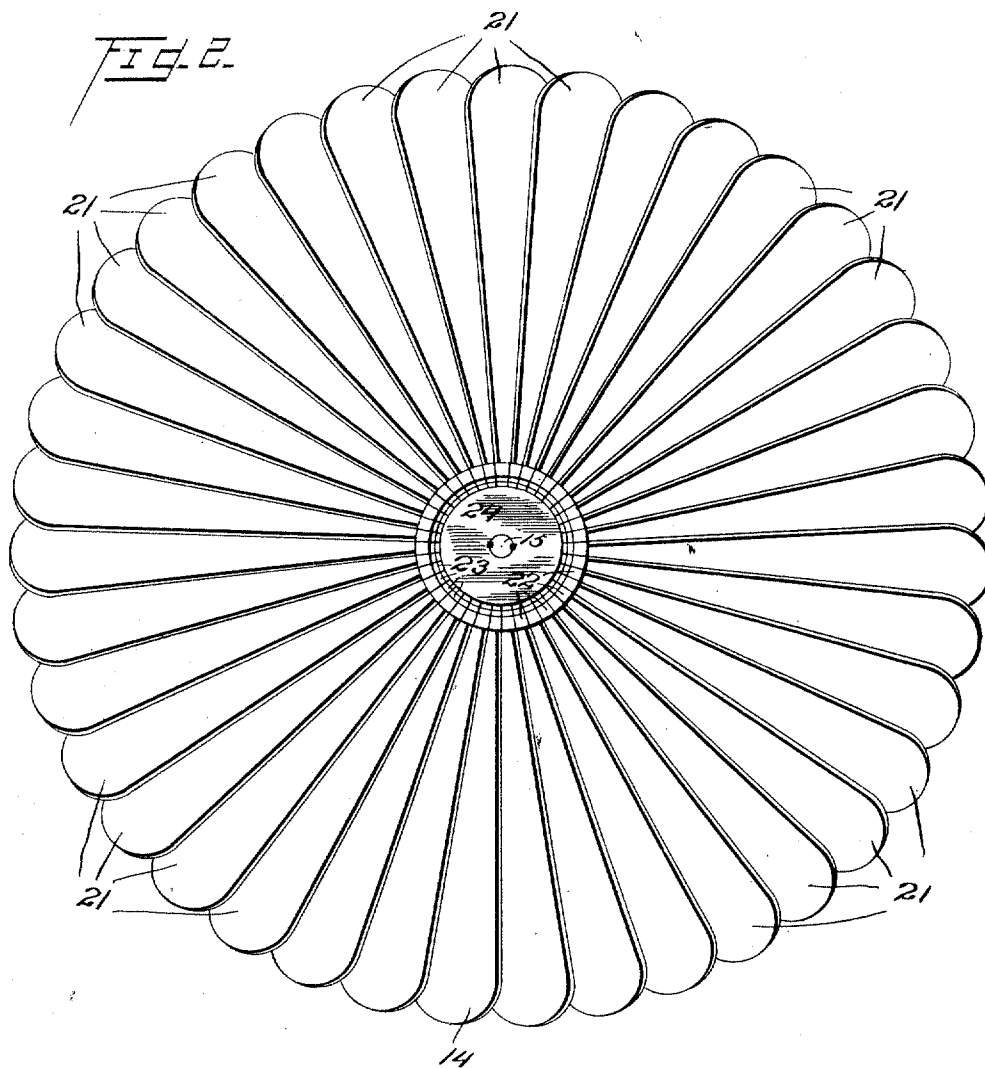
By Joshua R. F. Potts, Attorney
 James W. Woodington, Inventor

J. W. WOODINGTON.
FLYING MACHINE
APPLICATION FILED NOV. 14, 1910.

Patented June 13, 1911.

3 SHEETS-SHEET 2.

994,966.



Inventor

James W. Woodington,

Witnesses

H. Strauss
R. H. Krenkel

By

Joshua R. F. Potts,
Attorney

994,966.

3 SHEETS—SHEET 3.



H. Strauss
R. H. Krenkel.

Inventor

James W. Woodington,

डेप्यु

By Joshua R. V. Potts. Attorney

Attorney

UNITED STATES PATENT OFFICE.

JAMES W. WOODINGTON, OF FOLCROFT, PENNSYLVANIA.

FLYING-MACHINE.

994,966.

Specification of Letters Patent. Patented June 13, 1911.

Application filed November 14, 1910. Serial No. 592,155.

To all whom it may concern:

Be it known that I, JAMES W. WOODINGTON, a citizen of the United States, residing at Folcroft, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

My invention relates to improvements in flying machines, the object of the invention being to provide a flying machine with a lifting propeller positioned horizontally above the body of the machine, and comprising a plurality of inclined blades or vanes, so that when rotary motion is imparted to this propeller it will exert a lifting action upon the machine to move the same to any desired elevation, and maintain it at such elevation and permit it to lower at will.

A further object is to provide an improved propeller of this character which may be folded into comparatively small space, which is operated by a vertical shaft, the latter also capable of being folded so as to allow the machine to be packed and occupy a comparatively small space.

A further object is to provide a flying machine with an improved elevating propeller, a driving propeller, a steering mechanism, both of said propellers driven by the same engine and thrown into and out of operation by suitable mechanism.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1, is a view partly in side elevation and partly in section illustrating my improvements. Fig. 2, is a plan view of the lifting propeller. Fig. 3, is a view in vertical section through the lifting propeller and its operating means. Fig. 4, is an enlarged section on the line 4-4 of Fig. 1. Fig. 5, is an enlarged longitudinal section of the collar 25.

1, represents the body of the flying machine which is in the form of a boat supporting a motor 2, of any desired structure, the latter driving a shaft 3. The shaft 3 is provided with a beveled gear 4, turning an idler 5, the latter transmitting motion to a beveled gear 6 on a propeller shaft 7. Gear 6 is loose on shaft 7, and is locked to the shaft by means of a clutch 8 operated by

hand lever 9. Shaft 7 projects through the end of the body 1, and is provided with a propeller 10 to drive the machine through the air, and on the opposite end of the body a horizontal steering rudder 11 is pivotally mounted in a bracket 12, and operated by cords or ropes 13.

To move the machine vertically, I provide an improved propeller 14 which is turned by means of a vertical shaft 15, the latter supported in a bearing sleeve 16, and said bearing sleeve connected by braces 17 to the body 1, compelling the body to be elevated and supported by the sleeve 16, when the propeller 14 turns. On shaft 15 a beveled gear 18 is loosely mounted and locked to the shaft 15 by means of a clutch 19 operated by hand lever 20, so that the shaft 15 may be revolved or not as desired. The propeller 14 comprises a plurality of radially disposed blades or vanes 21, each blade or vane positioned at an angle, and connected at its inner end to a small block 22. Each block 22 is connected by a hinge 23 with a center block 24, and the latter is secured centrally on the shaft 15.

25, represents a collar which is keyed to slide on shaft 15 and compelled to turn therewith, and the upward movement of this collar is limited by a stop ring or shoulder 26. Collar 25 is provided with a plurality of perforated ears 27, which are pivotally connected by ribs 28 with the blades or vanes 21, so that when this collar 25 is moved downward on shaft 15, the propeller blades will be folded downward moving on their hinges 23. Collar 25 is made with an annular groove 28, into which pins 29 on a collar 30 project. This collar 30 is provided at its opposite sides with perforated ears 31 to which the upper ends of rods 32 are connected.

33, represents a hand lever which is fulcrumed in a split collar 34 on the sleeve 16, and is provided near its free end with a cross pin 35 connecting the two rods 32 so that the movement of the lever vertically causes the collars 30 and 25 to move vertically, and raise or lower the propeller blades 21, hence folding the propeller or moving it into operative position. A suitable catch 36 is provided to lock this lever 33 against accidental movement.

In order to economize space in shipping, shaft 15 is preferably made in two sections, one section bifurcated to receive a tongue 40

and the other section pivotally secured by means of a pin 37.

A sleeve 38 is mounted to slide on the shaft, and when positioned over the joint 5 and held by a pin 39, the shaft will be perfectly rigid, but when this pin 39 is removed and sleeve 38 slid downward, the shaft sections may be folded so as to move the propeller downward, and permit the machine to be transported in a relatively small space. 10

While I have shown no particular position for the operator in the body 1, he may position himself wherever desired, and have all of the several operating levers in ready reach of his hand. He will, of course, first start his motor or engine 2, and then as he throws in the clutch 19, the propeller 14 will revolve, lifting the machine into the air the desired height. When he reaches the desired height, he throws in the clutch 8 to turn the propeller 10 to drive the machine forwardly, and by increasing and decreasing the speed of his engine, he may maintain the desired elevation and speed, and by reducing the speed he may slowly descend to earth at any convenient point. When the ship is at rest, the operator draws the lever 33 downward so as to fold the propeller 14, and he may quickly raise the propeller to operative position whenever desired. 25

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention and hence I do not limit myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims. 30

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

1. In a flying machine, the combination with a body, of a vertical shaft secured to the body, a block fixed to the upper end of the shaft, diagonal blades hinged to said block, a sliding collar on said shaft, rods connecting said collar with said blades, said shaft comprising two sections hinged together, and a sliding sleeve normally inclosing the hinged portion of said shaft sections, substantially as described. 35

2. In a flying machine, the combination with a body, of a vertical shaft projecting upwardly from the body and secured to the body, a block secured on the upper end of said shaft, a circular series of small blocks, hinges connecting the small blocks with the first-mentioned block, radially projecting blades or vanes secured to said smaller blocks and located at an angle, a collar keyed to slide on said shaft, rods connecting said collar with said blades or vanes, means for moving said collar vertically, said shaft comprising two sections hinged together, 40

and a sliding sleeve normally inclosing the hinged portion of said shaft sections, substantially as described.

3. In a flying machine, the combination with a body, of a vertical shaft projecting upwardly from the body and secured to the body, a block secured on the upper end of said shaft, a circular series of small blocks, hinges connecting the small blocks with the first-mentioned block, radially projecting blades or vanes secured to said smaller blocks and located at an angle, a collar keyed to slide on said shaft, rods connecting said collar with said blades or vanes, said collar having an annular groove therein, an outer collar, pins on the outer collar projecting into the groove, means for moving said outer collar, said shaft comprising two sections hinged together, and a sliding sleeve normally inclosing the hinged portion of said shaft sections, substantially as described. 70

4. In a flying machine, the combination with a body, of a vertical shaft projecting upwardly from the body and secured to the body, a block secured on the upper end of said shaft, a circular series of small blocks, hinges connecting the small blocks with the first-mentioned block, radially projecting blades or vanes secured to said smaller blocks and located at an angle, a collar keyed to slide on said shaft, rods connecting said collar with said blades or vanes, said collar having an annular groove therein, an outer collar, pins on the outer collar projecting into the groove, a bearing sleeve for said shaft, a lever pivoted at one end on said bearing sleeve, rods connecting said lever with said outer collar, said shaft comprising two sections hinged together, and a sliding sleeve normally inclosing the hinged portion of said shaft sections, substantially as described. 75

5. In a flying machine, the combination with a body, of a vertical shaft projecting upwardly from the body and secured to the body, a block secured on the upper end of said shaft, a circular series of small blocks, hinges connecting the small blocks with the first-mentioned block, radially projecting blades or vanes secured to their inner ends to the outer faces of said smaller blocks and located at an angle, a collar keyed to slide on said shaft, rods connecting said collar with said blades or vanes, said collar having an annular groove therein, an outer collar, pins on the outer collar projecting into the groove, a bearing sleeve for said shaft, a lever pivoted at one end on said bearing sleeve, and rods connecting said lever with said outer collar, substantially as described. 80

6. In a flying machine, the combination with a boat shaped body, of a vertical bearing sleeve, stays securing said sleeve to said body, a vertical shaft supported in said 85

sleeve, a block secured on the upper end of said shaft, a circular series of small blocks, hinges connecting the small blocks with the first-mentioned block, radially projecting
5 blades or vanes secured at their inner ends to the outer faces of said smaller blocks, and located at an angle forming a horizontal propeller on the upper end of said shaft,
10 of a motor in said body, a shaft driven by said motor, a gear on said shaft, a gear on the vertical shaft meshing with the first-mentioned gear, a clutch connecting said last-mentioned gear with the vertical shaft,
a horizontal propeller shaft projecting through one end of said body, a propeller
15 on the outer end of said shaft, means for transmitting motion from said first-mentioned gear to said propeller shaft, and steering mechanism at the opposite end of
20 said body, substantially as described.

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

JAMES W. WOODINGTON.

Witnesses:

R. H. KRENKEL,
C. E. POTTS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
