G. KUNICKE.

FLYING MACHINE.

APPLICATION FILED NOV. 4, 1910.

994,757.

Patented June 13, 1911.

3 SHEETS—SHEET 1.

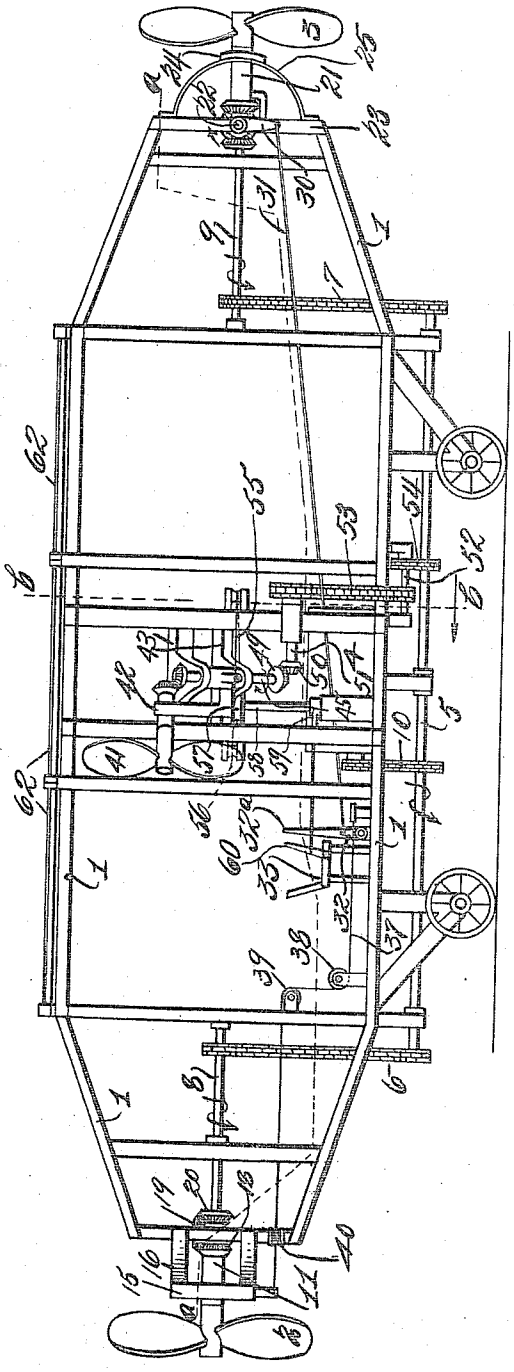

Fig. 1.

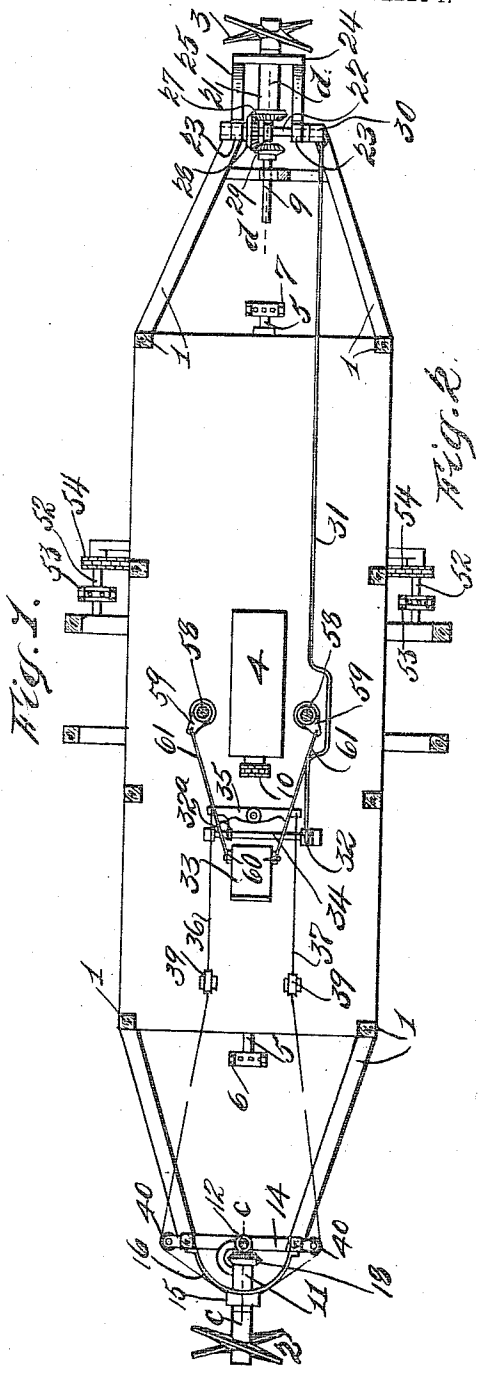

Fig. 2.

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Fig.

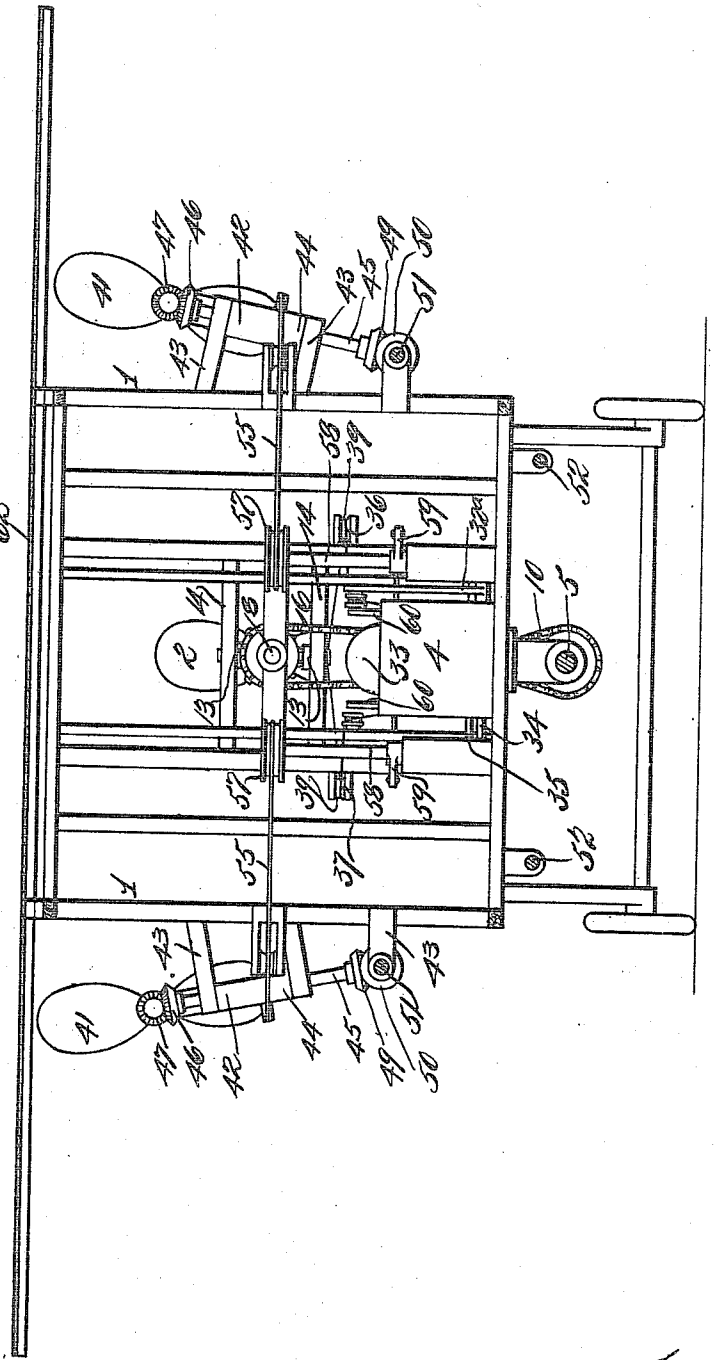

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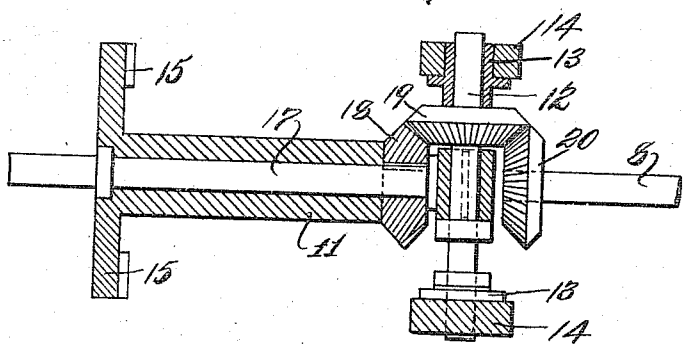
Fig. 4.



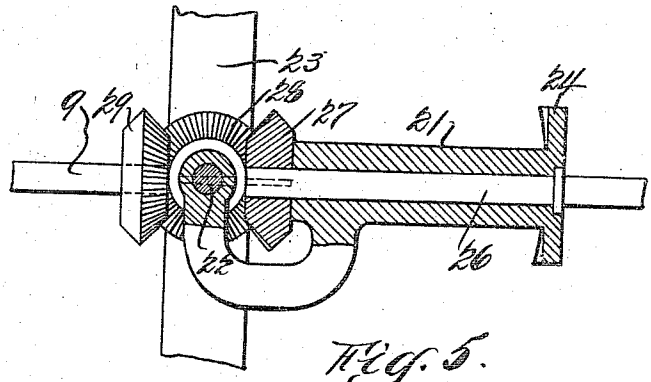


Fig. 5.

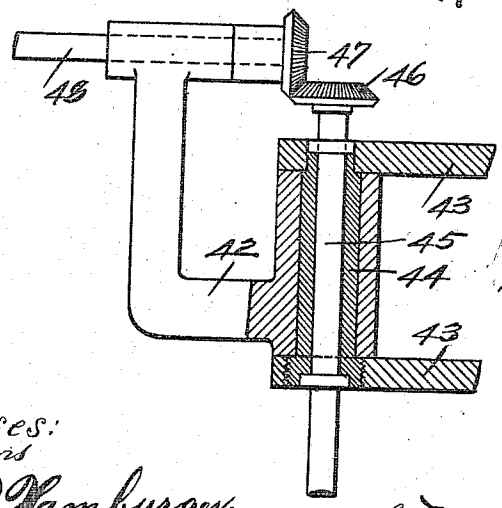


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE KUNICKE, OF NEW YORK, N. Y.

FLYING-MACHINE.

994,757. Specification of Letters Patent. Patented June 13, 1911.

Application filed November 4, 1910. Serial No. 590,632.

To all whom it may concern:

Be it known that I, GEORGE KUNICKE, a subject of the Emperor of Germany, residing in the borough of Bronx, city, county, and State of New York, have invented certain new and useful Improvements in Flying-Machines, of which the following is a full, clear, and exact description.

This invention relates to an aerial navigating apparatus, the object being to provide such a device consisting of a suitably supported plane or planes, which constitutes the means whereby the apparatus is kept in the air, and motor driven propellers which are adapted to propel, steer and keep the apparatus in a horizontal position while soaring.

I will now proceed to describe my invention in detail, the novel features of which I will finally claim, reference being had to the accompanying drawings, forming part hereof, wherein:

Figure 1 illustrates a side elevation of my improved apparatus; Fig. 2 is a sectional top plan view thereof, the section being taken on a line *a*—*a* in Fig. 1; Fig. 3 is an enlarged cross-sectional view taken on a line *b*—*b* in Fig. 1; Fig. 4 is an enlarged longitudinal sectional view of the steering propeller supporting and operating elements, certain members being shown in elevation, the section being taken on a line *c*—*c* in Fig. 2; Fig. 5 is a similar view of the driving propeller supporting and operating elements, the section being taken on a line *d*—*d* in Fig. 2; and Fig. 6 is an enlarged sectional view, partly in elevation, of the supporting and operating elements for the equilibrium maintaining propellers.

Referring to Fig. 1, the numeral 1 indicates a suitable frame provided, at one end thereof, with a steering propeller 2, and at the other end thereof with a main propelling propeller 3, the said propellers being driven by a suitable motor 4, through the main shaft 5 and sprocket chains 6 and 7. The chains 6 and 7 each in turn operate intermediate shafts 8 and 9, which in turn operate their respective propellers 2 and 3. The main shaft 5 is driven by means of a sprocket chain 10.

By referring to Fig. 2, it will be seen that the propeller 2, or rather the supporting bearing 11 therefor, is adapted for radial movement in a horizontal plane, the inner end of said bearing being secured to a pivotally mounted spindle 12. The spindle 12 is rotatably supported by bearings 13 mounted in the frame members 14 (see also Fig. 4). To prevent the thrust of the propeller from being imposed upon the spindle 12, I preferably provide the outer end of the bearing 11 with a shoe 15 (see also Figs. 1 and 2) which bears against thrust bearings or slides 16.

To operate the shaft 17, which carries the propeller 2, I provide the inner end thereof with a gear 18, having in mesh therewith an intermediate gear 19, the gear 19 being loosely mounted on the spindle 12. The gear 19 meshes with a pinion 20 carried by the intermediate shaft 8.

From the above description it will be apparent that the propeller 2 will be rotated by the shaft 8 when in motion.

By referring to Fig. 5, it will be seen that the bearing 21, which supports the propelling propeller 3, is adapted for radial movement in a vertical plane. The inner end of the bearing 21 is secured to a pivotally mounted spindle 22 (see also Fig. 2) which in turn is rotatably supported by the frame members 23. To aid in the supporting of the bearing 21, I provide the said bearing with a shoe 24, which rides in contact with the slides 25 (see Figs. 1 and 2).

To operate the shaft 26, which carries the propeller 3, I mount on the inner end thereof a gear 27, having in mesh therewith an intermediate gear 28, the gear 28 being loosely mounted on the spindle 22. The gear 28 has in mesh therewith a pinion 29 carried by the intermediate shaft 9. It is obvious that the propeller 3 will revolve when the shaft 9 is operated.

To operate or move the propeller 3 in a vertical plane, I provide one end of the spindle 22 with a lever-arm 30 which is connected by means of a rod 31 with a lever-arm 32 placed adjacent to the operator's seat 33. The lever-arm 32 is carried by a rotatable shaft 34, which in turn is actuated by an operating lever 32ª. To move the steering propeller 2 in a horizontal plane, I connect the movable bearing 11 therefor with a whiffle-tree 35 by means of cables 36 and 37, which in turn are carried over suitably positioned sheaves 38, 39 and 40, as shown. The whiffle-tree 35 is operated by the feet of the operator.

To maintain the equilibrium of the device, I mount on each side of the frame-work, a propeller 41, which in turn is carried by a

swivel frame 42 pivotally supported by suitable brackets 43, carried by the frame of the device (see Figs. 1 and 3).

By referring to Fig. 6, it will be seen that the brackets 43 are provided with a bearing member 44 upon which the frame 42 is pivotally mounted. The bearing 44 takes the thrust of its propeller 41, thereby keeping the strain from the intermediate shaft 45, which passes through the bearing 44. The upper end of the shaft 45 carries a gear 46, which meshes with a gear 47 on the shaft 48 which in turn carries a propeller 41. Each intermediate shaft 45 carries at the lower end thereof a gear 49, having in mesh therewith a gear 50, carried by a stub shaft 51, which in turn is operated by the main shaft 5 through the counter-shaft 52 and sprocket chains 53 and 54.

To turn the propellers 41, or rather the swivel frames 42, I utilize cables 55 and 56 which are connected to a drum 57 one on each side of the machine. The drums 57 are each carried by rotatable shafts 58, each carrying a lever-arm 59. In order to rotate the shafts 58, I connect the lever-arms 59 thereon to operating levers 60, one pivoted to each side of the seat 33, by links 61.

As can be seen in Fig. 1, the swivel frame 42, shown in said view, may be rotated forwardly, or toward the propeller 3 by the cable 55, and pulled backwardly by the cable 56, the propeller 41 on the opposite side of the device being operated in the same manner and likewise connected to its drum 57 (see Fig. 3).

The function of the propeller 3 is to pull the device forwardly when rotated by the motor 1, and connecting elements, the machine as a whole being kept in the air by means of planes 62 (see Figs. 1 and 3). While soaring the bearing 21 for the propeller 3 will be kept at the proper angle relative to the direction of flight, whereby the pull of the propeller 3 will cause the device to soar in a plane parallel with the earth. It will, of course, be understood that the planes 62 will lie at an angle relative to the earth, and consequently the whole device will take the same angle while soaring. When positioned at the above-mentioned angle the pull of the propeller 3, upon the angularly disposed planes, will be sufficient to overcome gravity and to exert enough force to pull the machine forwardly. As in the other forms of the so-called flying machines, the device is kept in the air by the resultant of two forces, one being the pull of the propeller, the other the upward pressure upon the inclined planes as they are pulled through the air. The device may be caused to rise or descend by varying the degree of inclination of the bearing 21, by means of the lever 32a. To steer the device, I turn the bearing 11 to the right or left by means of the whiffletree 35 and cables 36 and 37.

The function of the side propellers 41 is, as has been stated, to maintain or control the equilibrium of the device. While the device is soaring in the horizontal plane, the propellers 41 will be positioned as shown in Figs. 1 and 3, in which position they aid in propelling the device. The propellers 41 constitute auxiliary propelling means as well as lifting elements. Should for any reason the device tilt downwardly on the left in Fig. 3, I would push the lever 60 on the left to cause the left frame 42 to rotate and cause its propeller 41 to move forwardly or in the direction of flight, until it had been brought to a position at a right angle to the direction of flight, and at an angle to the surface of the planes 62. As the brackets 43 are disposed at a downward angle relative to the vertical axis of the frame 1, the propellers 41 will be caused to push upwardly when moved to the position above mentioned. Should the device tilt on the right, the right hand propeller would be operated as above described for the left propeller. The side propellers 41 are independently operable, and may be pulled back to their normal position, as shown in Fig. 1, by pulling either of the levers 60 backwardly, after the equilibrium of the device has been restored.

Having now described my invention what I claim and desire to secure by Letters Patent is:—

1. In an aerial navigating device, a frame, a plane carried by said frame, a propelling and a steering propeller, also carried by said frame, means adapted to actuate said propellers, a plurality of auxiliary propellers pivotally mounted on said frame, the axis of said auxiliary propellers being normally disposed in parallelism with the surface of said plane, means adapted to move said auxiliary propellers forwardly or in the direction of flight, the axis of said propellers when so moved being disposed at an angle to the surface of said plane, and means adapted to rotate said auxiliary propellers.

2. In an aerial navigating device, a frame, a plane carried by said frame, a propelling and steering propeller also carried by said frame, means adapted to actuate said propellers, brackets carried by said frame, bearing members rotatably mounted in said brackets, said bearing members being angularly disposed relative to the vertical axis of said navigating device, auxiliary propellers carried by said bearing members, means adapted to rotate said bearing members, and means adapted to rotate said auxiliary propellers.

3. In an aerial navigating device, a frame, a plane carried by said frame, a pro-

peller pivotally mounted on each side of said frame, the axis of said propellers being normally disposed in parallelism with the surface of said plane, means adapted to move said propellers forwardly or in the direction of flight, the axis of said propellers when so moved being disposed at a downward angle relative to the surface of said plane, means adapted to rotate said propellers, a propelling propeller located at one end of said frame, and a steering device.

Signed at New York city, N. Y., this 2nd day of November 1910.

GEORGE KUNICKE.

Witnesses:
EDWARD A. JARVIS,
ESTELLE O. HAMBURGER.