

W. E. GOBLE.
AERIAL MACHINE.
APPLICATION FILED DEC. 8, 1908.

945,514.

Patented Jan. 4, 1910.

Fig. 1.

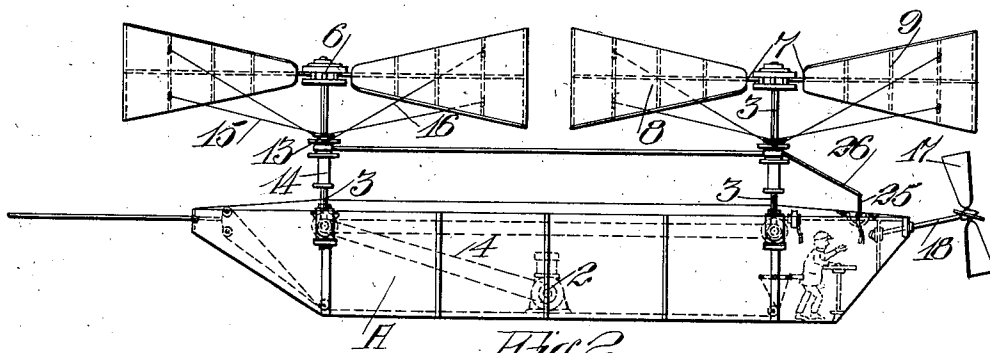


Fig. 2.

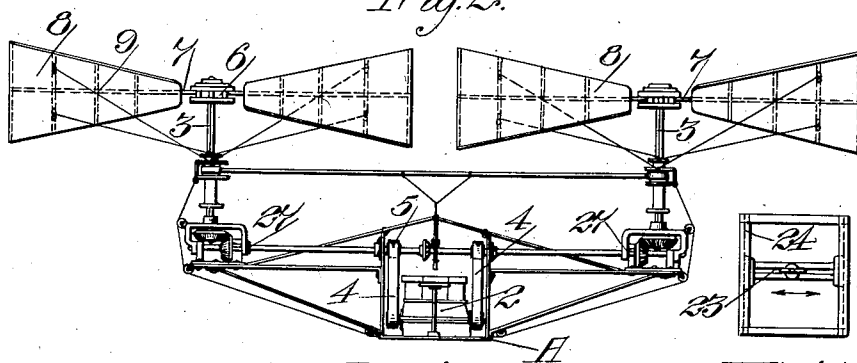


Fig. 3.

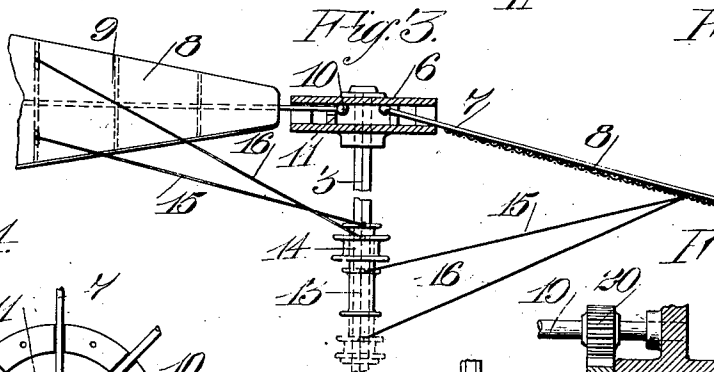


Fig. 4.

Fig. 5.

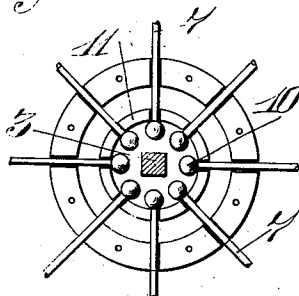
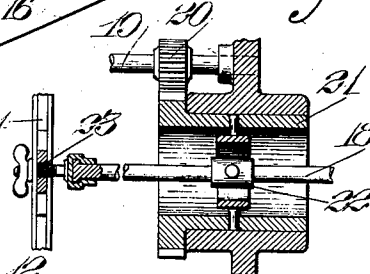


Fig. 6.



Fig. 7.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM E. GOBLE, OF DINUBA, CALIFORNIA.

AERIAL MACHINE.

945,514.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed December 8, 1908. Serial No. 466,467.

To all whom it may concern:

Be it known that I, WILLIAM E. GOBLE, citizen of the United States, residing at Dinuba, in the county of Tulare and State of California, have invented new and useful Improvements in Aerial Machines, of which the following is a specification.

My invention relates to improvements in aerial machines, and especially of that class in which propellers are depended upon to lift and sustain as well as propel the machine.

It consists in the combination of parts, and in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is an end elevation. Fig. 3 is an enlarged view showing a means for adjusting the propellers. Fig. 4 is a plan of the inner ends of propeller arms and connections. Fig. 5 is a section of the steering mechanism. Fig. 6 is a detail of the propeller arm supporting ring. Fig. 7 is a front elevation of the steering-frame.

It is the object of my invention to provide an apparatus in which propellers turning in a horizontal plane, act to lift the machine, and one or more propellers are depended upon to propel and steer the machine; the horizontally revoluble propellers being so adjustable that in case of accident, or for other reason, they may be incidentally converted into parachutes to prevent a too sudden descent of the apparatus.

A is a body or frame-work within which may be located a motor 2 of any desired description.

3 are vertically journaled shafts to which power may be transmitted in any usual or suitable manner. In the present case I have shown belts or chains at 4 passing over suitable pulleys 5, through which the shafts 3 may be driven in unison. These shafts carry upon the upper ends boxes 6 within which the arms 7 which carry the propeller blades are adjustably mounted. The propeller blades 8 may be made in any desired manner, and of any suitable light material. Preferably, the shafts 7 form rigid backbones for the propeller blades, and these may be crossed by suitable transverse bars 9 upon which may be stretched a fabric which will form a resisting surface to act upon or be acted upon by the air as required. The

inner ends of the arms 7 are here shown with globular heads 10. The hubs 6 have the periphery slotted vertically, and through these slots the arms 7 extend radially outward.

11 is a ring having formed in it vertical slots 12 within which the arms 7 lie with the globular head 10 interior to the ring.

Each shaft 3 may be made rectangular or in other ways disposed so that the hubs fitting upon them will be revolved in unison with the shaft.

Beneath the propeller blades are sleeves 13 and 14. The innermost sleeve 13 is slidable upon the vertical shaft 3, which may be rectangular, or may have a feather upon which the sleeve may slide without turning in unison with the shaft. The outermost sleeve 14 is in like manner capable of vertical movement without turning upon the innermost sleeve. To the innermost of these sleeves cords 15 are connected. These cords extend outwardly and have their outer ends secured to the propeller blades below the axes 7 of the propellers. Other cords 16 have their inner ends connected with the sleeves 14, and their outer ends to the propeller blades above the axes 7. These cords are so disposed as to maintain the propellers at the best angle to exert the desired power to lift the apparatus when the propellers are revolved. The sleeves are slidable with relation to each other, and the angle of the propeller blades may thus be adjusted at will. These sleeves are also slidable bodily upon the shaft, and by moving them up or down, the radial angle of the propellers may be changed so that the blades may either diverge upwardly from their central attachment to the hubs, or they may be caused to diverge downwardly like the ribs of an umbrella or parachute.

The slots 12 in the ring 11 allow of the vertical movements of the ribs 7, and the knobs or globular inner ends 10 retain the ribs within the hub.

In case the apparatus is descending, and it is desired to check its descent, the propeller blades are drawn downward as shown in full lines in Fig. 3, and at the same time the blades are turned by the action of the cords 15 and 16 so that they stand substantially flat, and approximately close in spaces between the blades. In this position and condition, each propeller forms a parachute,

acting upon the air in such a manner that the descent of the machine will be controlled and greatly checked.

The vertical movements of the sleeves 13 and 14 may be effected by connections of any suitable character, extending into the car, and within reach of an operator.

17 is a driving propeller mounted upon a shaft 18 which is suitably journaled at the end of the car. If a plurality of such propellers are employed, they may be journaled at opposite ends of the car. The propeller shaft extends into a sleeve 21, plainly shown in Fig. 5, to which power may be transmitted through a shaft 19, and gearing as at 20. Within this revoluble sleeve is a universal joint here shown as consisting of rings or supports 22, pivoted at right angles with each other, and through which the shaft is propelled. This shaft extends inwardly beyond the propelling mechanism, and its inner end is fixed to a slide 23 which is movable in guides as shown, and by the movement of which the shaft may be turned to right or left. In conjunction with this is another guide 24 slidable in guides at right angles with the first named slide, and by means of these two the angle of the shaft may be changed up, down, right, or left, or to any intervening point between. This propeller thus serves as a rudder, and in addition to its action in providing a forward propeller, it also serves to steer the machine in any desired direction. Suitable mechanism may be disposed within reach of an operator, so that the control of the driving propeller, or the lifting propellers may be within easy reach. The vertical propeller shafts are so mounted that they may be inclined from a strictly vertical position, and when so inclined toward the front, the propellers will act to assist in propulsion as well as in raising the apparatus.

At 25 I have shown a lever, connecting through the link 26 with the vertical propeller shafts 3. These shafts being mounted on hinged bearings as at 27, it will be seen that when the lever is operated, the propeller shaft may be thrown forward into any desired angle.

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

1. In an apparatus of the character described, a body and motor, vertically journaled shafts, means for transmitting motion to revolve said shafts, hubs carried upon the upper shaft ends, propellers flexibly connected with said hubs, and means by which the propeller blades may be raised or depressed with relation to the hubs.

2. In an apparatus of the character described, a body and motor, vertically jour-

naled shafts, means for transmitting motion to revolve said shafts, hubs fixed to the upper ends of said shafts, propeller blades radiating from said hubs and flexibly connected therewith, and means by which said blades may be raised and lowered in a vertical plane about their hub ends.

3. In an apparatus of the character described, a body and motor, vertically journaled shafts, means for transmitting motion to revolve said shafts, hubs fixed to the upper ends of said shafts, radially slotted rings carried by the hubs, propellers having axial ribs extending through the slots and capable of vertical and revoluble movement in the slots, said ribs having knobs at the inner ends to maintain a flexible connection with the hubs.

4. In an apparatus of the character described, a body and motor, vertically journaled shafts, means for transmitting motion to revolve said shafts, hubs fixed to the upper ends of said shafts, propeller blades having radially axial ribs, the inner ends of which are flexibly and turnably connected with the hubs, sleeves slidable upon the vertical axes, connections between said sleeves and the propeller blades whereby said blades may be raised or depressed in a vertical plane with relation to the hubs.

5. In an apparatus of the character described, vertically journaled revoluble shafts, hubs at the upper ends of the shafts, propellers radiating therefrom, said propellers having axial ribs flexibly and turnably connected with the hubs, slidable sleeves mounted upon the shafts, connections between said sleeves and the propeller blades whereby the angles of said blades may be changed with respect to the direction of rotation and also with respect to the axes of the shafts, and means for propelling and steering the apparatus.

6. In an apparatus of the character described, revoluble lifting and supporting propellers, a driving propeller, a shaft upon which said propeller is mounted, a sleeve and means to revolve said sleeve, a universal joint mechanism carried within said sleeve, and through which joint the propeller shaft passes, and guides slidable at right angles with each other with which the inner end of the shaft is connected whereby the angle of said shaft may be changed to steer the apparatus.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM E. GOBLE.

Witnesses:

C. G. SNYDER,
E. C. SNELL.