

No. 871,164.

PATENTED NOV. 19, 1907.

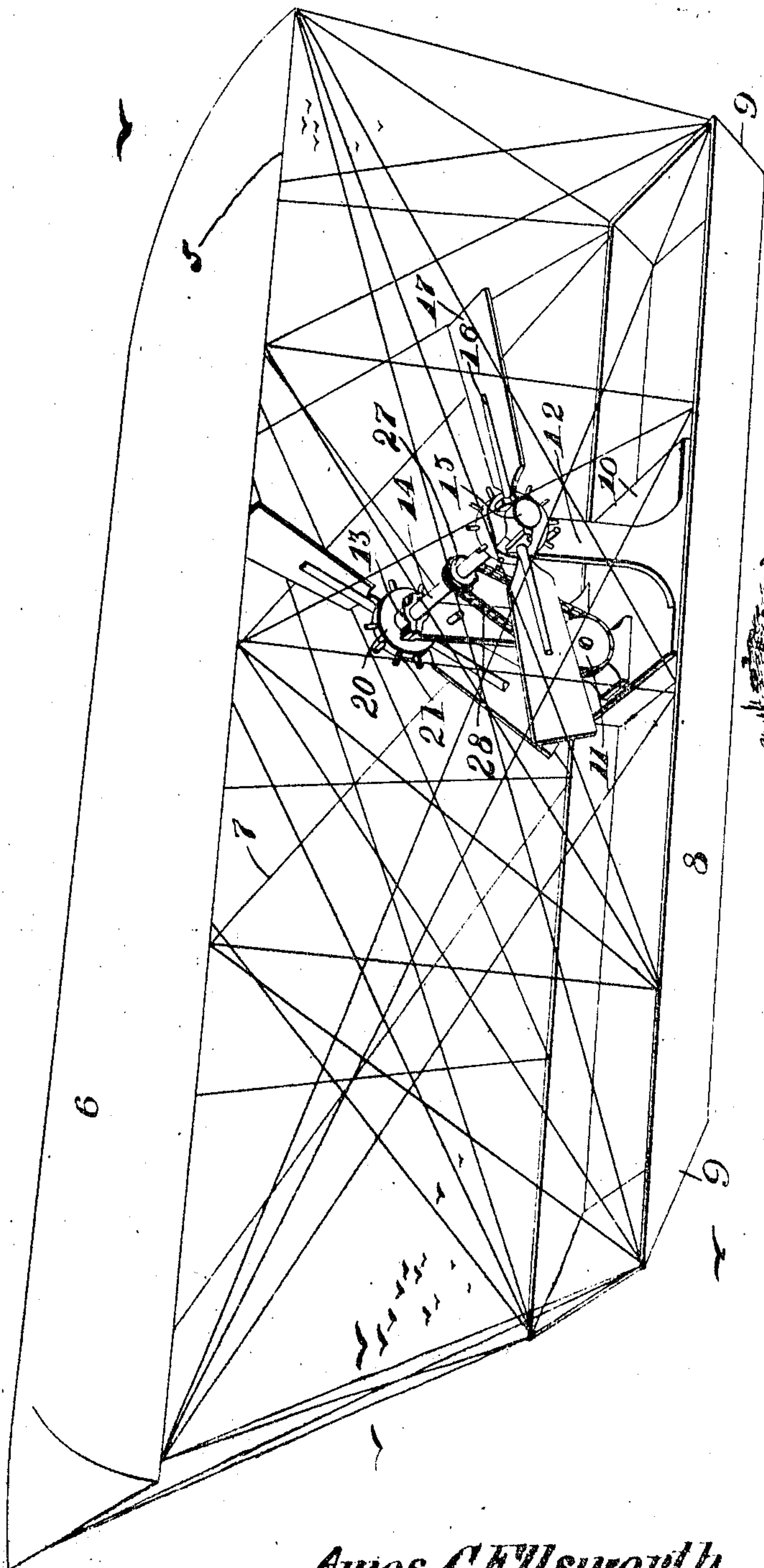
A. C. ELLSWORTH.

AIR SHIP.

APPLICATION FILED APR. 3, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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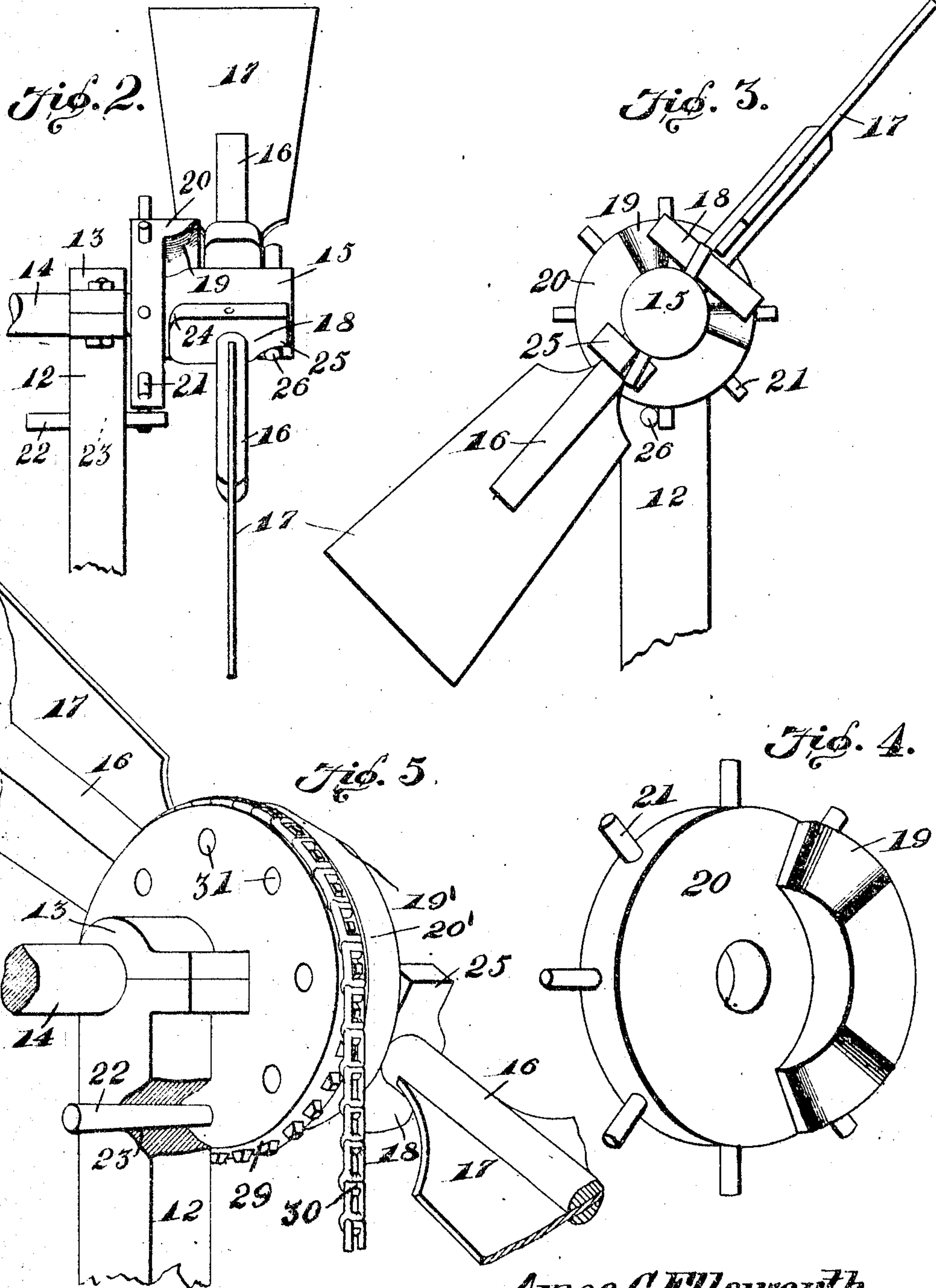
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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AIR-SHIP.

No. 871,164.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed April 3, 1906. Serial No. 309,622.

To all whom it may concern:

Be it known that I, AMOS C. ELLSWORTH, a citizen of the United States, residing at Newport, in the county of Orleans and State of Vermont, have invented a new and useful Air-Ship, of which the following is a specification.

This invention relates to air-ships and has for its object to provide a dirigible ship of the character described which is comparatively simple in construction, light in weight, and one in which the direction of flight of the vessel is completely under the control of the operator.

A further object of the invention is to provide an air-ship embodying an aeroplane having a gas bag or receiver secured thereto and provided with side propellers for elevating and directing the course of the vessel.

A further object is to provide means for varying the angle or inclination of the feathering propeller blades so as to change the thrust of said blades and thereby cause the latter to pull in any desired direction.

A still further object of the invention is to generally improve this class of devices so as to increase their utility, durability and efficiency.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, and illustrated in the accompanying drawings it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification: Figure 1 is a perspective view of an air-ship or vessel constructed in accordance with my invention. Fig. 2 is a side elevation of one of the propelling blades and a portion of the operating shaft. Fig. 3 is a front elevation of the same. Fig. 4 is a detail perspective view of the rotating collar or cam, and—Fig. 5 is a perspective view of a portion of the operating shaft and one of the propelling blades illustrating a modified form of the invention.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The improved ship or vessel consists of an aeroplane 5 of an suitable length and width and to the upper face of which is secured in any suitable manner a gas bag or receiver 6

to assist in elevating the ship and supporting the same in the air. Suspended from the aeroplane 5 and secured thereto in any suitable manner as by braces 7 is a basket or car 8 the latter having its opposite ends inclined or beveled as indicated at 9 and its intermediate portion reinforced at 10 to form a platform adapted to receive a gas-engine, motor or other source of power 11. Arranged on opposite sides of the car or basket 8 and secured in any suitable manner to the platform 10 are uprights or standards 12 provided with terminal bearings 13 in which is journaled a transversely disposed shaft 14 the opposite ends of which project beyond the bearings 13 and are provided with enlarged heads 15. Extending transversely through the heads 15 and mounted for rotation therein are stub shafts 16 carrying propeller blades or fans 17, the latter being preferably disposed at right angles to each other as shown. Keyed or otherwise rigidly secured to the transverse shaft 16 on each side of the head 15 are tappet arms 18 adapted to engage a cam face 19 on the collar 20. The collar 20 is mounted for rotation on the shaft 14 and is provided with a plurality of peripheral pins or projections 21 by means of which the collar may be rotated so as to change the location or position of the cam face 19. As a means for locking the collar 20 against rotation there is provided a suitable pin 22 which extends through a transverse opening 23 in the standard 12 and projects in the path of movement of the collar 20 so that the pins or finger pieces 21 will engage the projecting end of the locking member 22 and thus lock the collar against rotation on the operating shaft. The tappets 18 are provided with curved portions 24 for engagement with the cam 19 and are also formed with reduced extensions 25 adapted to engage suitable stop-pins 26 extending laterally from the head 15. The tappets 18 are so disposed that when in engagement with the cam 19 they will turn the blades 17 through a quarter of revolution and thereby feather said blades, the stop-pins 26 serving to limit the rotary movement of the latter. It will thus be seen that by rotating the collars 20 the cam 19 may be positioned as to change the angle or thrust of the fans or blades and thereby cause the latter to pull up or down or impart a forward or rearward motion to the vessel while by locking one of the collars 20 against rotation on the shaft

14 and partially rotating the opposite collar the ship may be turned side wise or caused to make a complete revolution in a horizontal plane. Keyed or otherwise rigidly secured to the shaft 14 is a sprocket wheel 27 connected through the medium of a sprocket chain 28 with the motor 11 and by means of which motion is imparted to said driving shaft.

10 In Fig. 5 of the drawings there is illustrated a modified form of the invention in which the terminal pins or finger pieces 21 are dispensed with and the collar 20' formed with spaced peripheral teeth or lugs 29 adapted to engage a sprocket chain 30, the latter being connected to a sprocket wheel disposed within the car and rotated by a suitable crank so that by operating the crank the collar 20' may be rotated to change the position of the cam 19' without the necessity of manually turning said collar. In this form of the device the flat surface of the collar 20 is pierced by a plurality of spaced transverse holes 31 adapted to receive the locking pin 22', the construction being otherwise practically the same as that shown in Fig. 1 of the drawings.

From the foregoing description it is thought that the construction and operation of the device will be readily understood by those skilled in the art and further description thereof is deemed unnecessary.

Having thus described the invention what is claimed is:

1. In aerial vessels, the combination with an aeroplane, of a gas receiver secured to the upper surface thereof, a car suspended from the aeroplane, standards secured to the car, an operating shaft journaled in the standards and extending transversely of the car, feathering propeller blades carried by the shaft and mounted for rotation in a vertical plane on each side of the car, cams mounted for rotation on the operating shaft and provided with terminal finger pieces, tappets secured to the blades and adapted to engage the cams for varying the angles of the blades, and means engaging the finger pieces for locking the cams against rotation.

2. In aerial vessels, an aeroplane, a gas receiver secured thereto, a car suspended from the aeroplane, standards secured to the car, a shaft journaled in the standard and extending transversely of the car, feathering blades carried by the shaft and mounted for rotation in a vertical plane on each side of the car, collars mounted for rotation on the shaft and provided with cam faces, tappets carried by the blades and adapted to engage the cam faces for varying the angle of the blades, finger pieces projecting laterally

from the collars, and pins extending transversely across the standards and engaging the finger pieces for locking the collar against rotation.

3. In aerial vessels, the combination with an aeroplane, of a gas receiver secured thereto, a car suspended from the aeroplane, an operating shaft provided with terminal heads, feathering blades mounted for rotation in said heads, cams mounted for rotation on the operating shaft, tappets carried by the blades and adapted to engage the cams, stop-pins secured to the heads for limiting the movement of the tappets, and means for locking the cams against rotation.

4. In aerial vessels, the combination with an aeroplane, of a gas receiver secured thereto, a car suspended from the aeroplane, an operating shaft extending transversely of the car and provided with terminal heads, feathering propelling blades mounted for rotation in the heads, collars mounted for rotation on the operating shaft and each provided with a cam face, tappets carried by the blades and adapted to engage the cam faces, pins carried by the heads for limiting the movement of the tappets, finger pieces extending laterally from the periphery of the collars, and means engaging the finger pieces for locking the collars against rotation.

5. In aerial vessels, the combination with an aeroplane, of a relatively flat gas receiver secured to the upper surface thereof, a car suspended from the aeroplane and having its opposite ends inclined or beveled, standards secured to the car and provided with terminal bearings, an operating shaft journaled in said bearings and provided with enlarged heads, feathering blades carried by the heads and mounted for rotation in a horizontal plane on each side of the car, collars mounted for rotation on the operating shaft and each provided with a cam face, tappets secured to the blades and adapted to engage the cams, pins carried by the heads for limiting the movement of the tappets, finger pieces extending laterally from the periphery of the collars, locking pins extending transversely through openings in the standards and adapted to engage the adjacent finger pieces for locking the collar against rotation, and means for operating the shaft.

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

AMOS C. ELLSWORTH.

Witnesses:

C. A. WHEELER,

H. G. BLANCHARD.