

March 30, 1926.

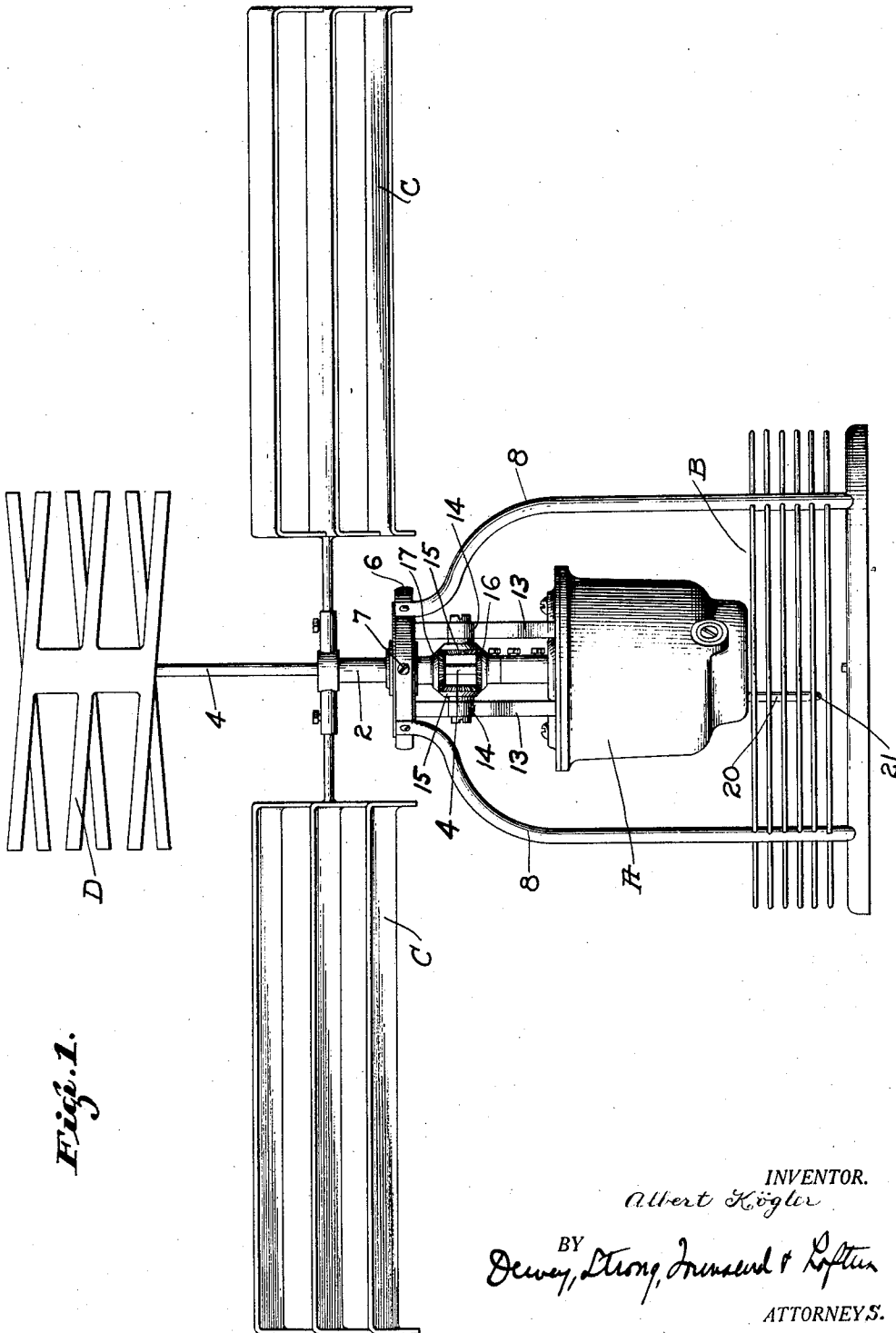
1,578,833

A. KÖGLER

FLYING MACHINE

Filed June 10, 1925

2 Sheets-Sheet 1



INVENTOR.

Albert Kögler

BY

Dewey, Strong, Innes and Loftin

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Fig. 2.

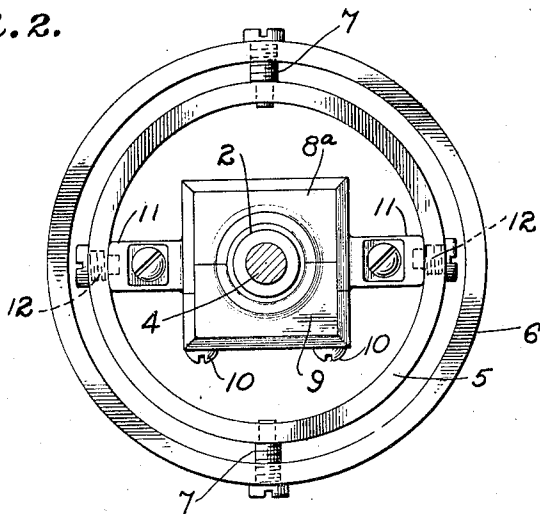
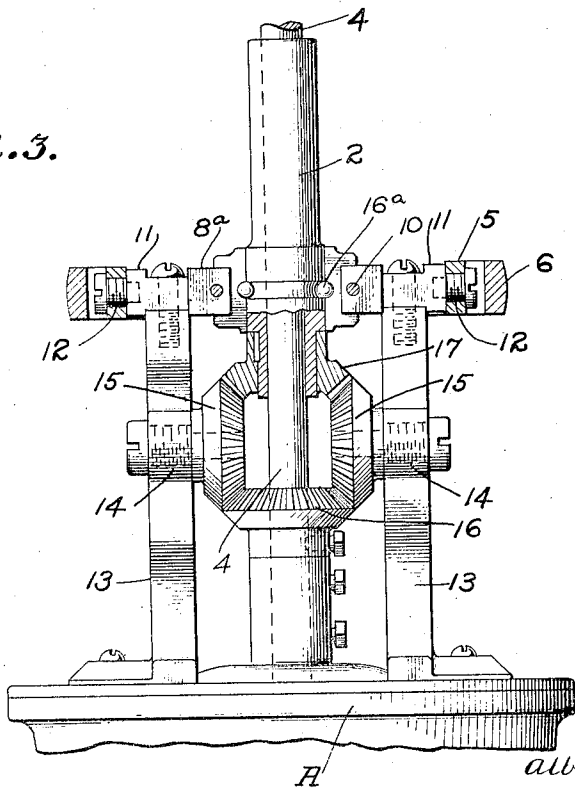


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT KÖGLER, OF SAN FRANCISCO, CALIFORNIA.

FLYING MACHINE.

Application filed June 10, 1925. Serial No. 36,075.

To all whom it may concern:

Be it known that I, ALBERT KÖGLER, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Flying Machines, of which the following is a specification.

This invention relates to flying machines, and particularly to improvements on the driving and motor suspending mechanism shown in Patent No. 954,574, issued to A. Kögler and Kamillo Stelzer, Jr., April 12, 1910.

The patent referred to discloses a flying machine of the helicopter type in which steering was effected by shifting the center of gravity of the load carried with relation to the propellers. The machine however proved more or less impractical in experimental tests as the driving motor tended to rotate with the propellers.

The object of the present invention is to generally improve and simplify the construction and operation of flying machines of the character described, and particularly to improve the driving mechanism between the motor and propellers and to provide means for securing the motor against rotation.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of the flying machine.

Fig. 2 is a plan view of the gimbal rings from which the motor and carriage is suspended.

Fig. 3 is an enlarged vertical section of the gimbal rings 5 and 6 showing the manner of attaching the motor A to the inner gimbal ring and the bearing in which shafts 2 and 4 are journaled.

Referring to the drawings in detail, and particularly Fig. 1, A indicates a casing on which may be modeled a driving motor of suitable construction, B indicates the carriage in which passengers, load, etc., may be placed, and C and D the helicopters or propellers whereby the machine is lifted. The propellers are secured to respective shafts as indicated at 2 and 4 and they are driven in opposite directions, and while any suitable form of propeller may be employed multi-main propellers as shown are preferred. The mechanism whereby power is

transmitted to rotate the propellers and the mechanism whereby the motor is suspended and secured against rotation forms the subject matter of the present application. It is perhaps best illustrated in Figs. 2 and 3.

A flying machine when in operation is of course suspended from the propellers and the carriage B together with the motor A is suspended from a pair of gimbal rings generally indicated at 5 and 6. These gimbal rings are connected as indicated at 7 and the carriage B is suspended from the outer gimbal ring by means of downwardly extending arms 8. The motor A is suspended from the inner gimbal ring 5 and this is accomplished as follows: Mounted centrally on the inner gimbal ring is a bearing member consisting of two sections 8^a and 9, these sections being secured together by means of screws or the like as indicated at 10. Formed on the side of the bearing members 8^a and 9 are arms 11, and forming a pivotal connection between the arms and the inner gimbal ring are screws or other supporting means 12, the members 7 and 12 forming a universal connection whereby movement of the motor may be obtained with relation to the carriage B and the propellers. Extending downwardly from the arms 11 is a pair of suspension arms 13 to which the motor A is secured. Journaled in these suspension arms as at 14 are bevel gears 15, and intermeshing with the bevel gears 15 are a second pair of bevel gears indicated at 16 and 17. A shaft extends through the gears 16 and 17 as indicated at 4 and this shaft is directly connected with the motor and is driven thereby. The gear 16 is secured on the shaft and it transmits power through the gear 15 to rotate gear 17 in the direction opposite to the gear 16 and shaft 4. The gear 17 is secured on the sleeve shaft 2 and as this shaft carries the propellers C and the shaft 4 the propellers B, it is obvious that propellers C will rotate in opposite directions. The shafts 2 and 4 are journaled in the bearing member 8^a and anti-friction ball races 16 are placed therein to reduce friction to a minimum. In actual operation with the motor suspended from the inner gimbal ring 5 and pivotally secured thereto, it is obvious that rotation of the motor in one direction can not transmit a turning movement to the gimbal ring about the shafts 2 and 4 as such motion is prevented by the opposed rotation of the propellers. The thrust of the propellers will

thus be in a downward direction and the carriage together with the motor will accordingly be lifted.

If it is desired to steer the machine in any direction it is accomplished as described in the patent already referred to by shifting the center of gravity of the load with relation to the motor and the propellers. This load can be moved in any direction due to the universal connection formed between the carriage, the motor, and the propellers, and flight in any direction can be obtained. The load when shifted is secured by a suspended chain 20 and an attaching hook 21. The only novel feature in the present application when comparison is made with the previous patent referred to is the transmission consisting of the gears 16, 15—15, and 17; the anti-friction bearing supporting the same; and the suspending arms 13 whereby the motor is supported and secured against rotation. No particular stress is, therefore, laid on the steering mechanism just described.

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

1. In a flying machine of the character described, an inner and an outer gimbal ring, a bearing member pivotally supported in the inner ring, an inner driving shaft and an exterior driving sleeve shaft journaled in said bearing member, a driving motor suspended from the bearing and secured against rotation with relation thereto, means for transmitting power from the motor to rotate the inner shaft and the sleeve shaft in opposite directions, and a propeller on each shaft.

2. In a flying machine of the character described, an inner and an outer gimbal ring, a bearing member pivotally supported in the inner ring, an inner driving shaft and an exterior driving sleeve shaft journaled in said bearing member, a driving motor suspended from the bearing and secured against rotation with relation thereto, a direct connection between the inner driving

shaft and the motor, a bevel gear secured on said shaft, a bevel gear secured on the driving sleeve shaft, intermediate bevel gears intermeshing with said gears and transmitting power from the motor to the sleeve shaft in an opposite direction, and a propeller on each shaft.

3. In a flying machine of the character described, an inner and an outer gimbal ring, a bearing member pivotally supported in the inner ring, an inner driving shaft and an exterior driving sleeve shaft journaled in said bearing member, a driving motor suspended from the bearing and secured against rotation with relation thereto, a direct connection between the inner driving shaft and the motor, a bevel gear secured on said shaft, a bevel gear secured on the driving sleeve shaft, intermediate bevel gears intermeshing with said gears and transmitting power from the motor to the sleeve shaft in an opposite direction, a propeller on each shaft, a pivotal connection between the inner gimbal ring and the outer gimbal ring, and a load supporting carriage suspended from the outer gimbal ring.

4. In a flying machine of the character described, an inner and an outer gimbal ring, a bearing member pivotally supported in the inner ring, an inner driving shaft and an exterior driving sleeve shaft journaled in said bearing member, a driving motor suspended from the bearing and secured against rotation with relation thereto, a direct connection between the inner driving shaft and the motor, a bevel gear secured on said shaft, a bevel gear secured on the driving sleeve shaft, intermediate bevel gears intermeshing with said gears and transmitting power from the motor to the sleeve shaft in an opposite direction, a propeller on each shaft, a pivotal connection between the inner gimbal ring and the outer gimbal ring, a load supporting carriage suspended from the outer gimbal ring, and an anti-friction means in the bearing member.

ALBERT KÖGLER.