H. VASS.

FLYING MACHINE.

APPLICATION FILED MAR. 12, 1920.

1,386,916.

Patented Aug. 9, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

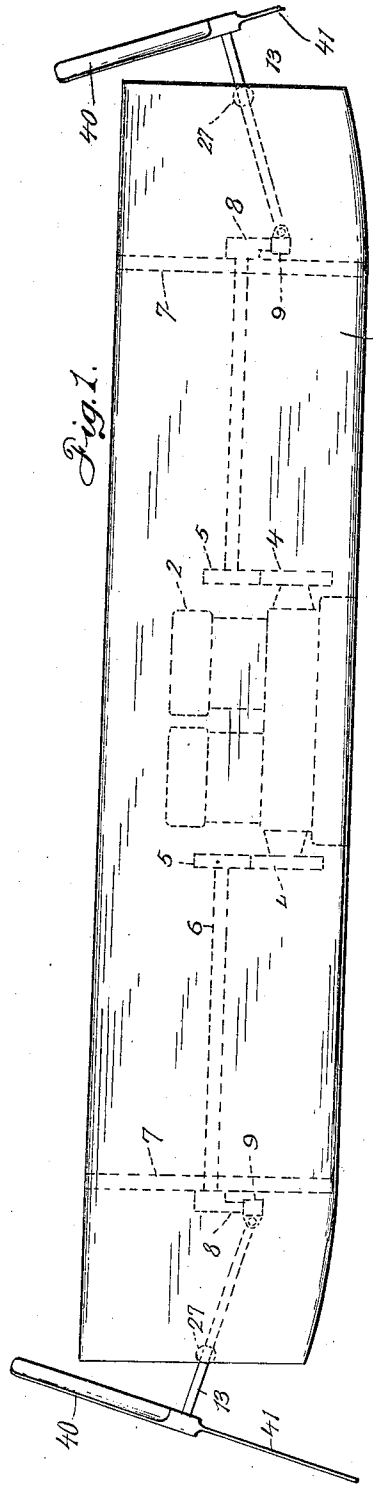
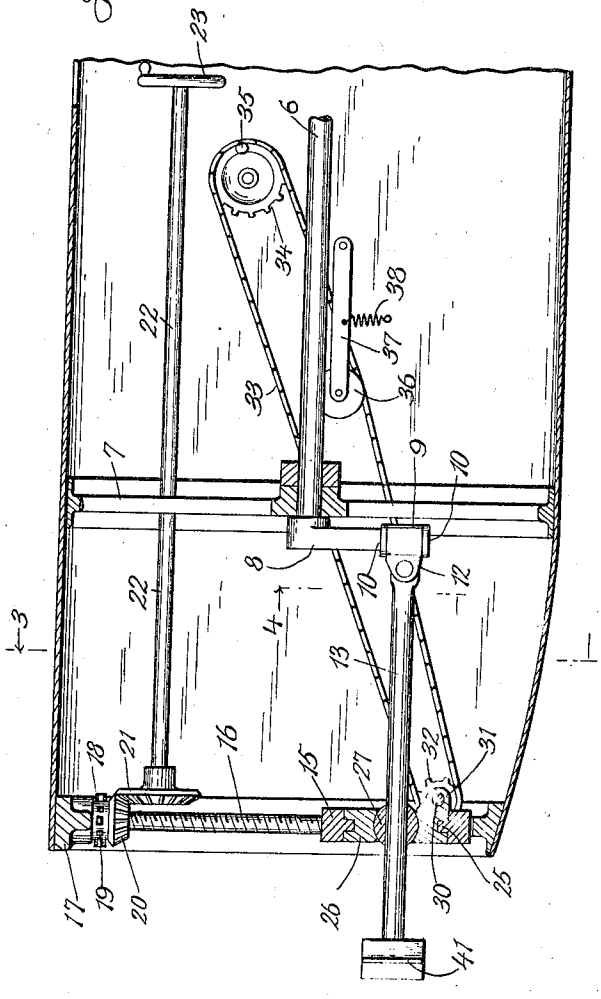


Fig. 2.



Inventor

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By his Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

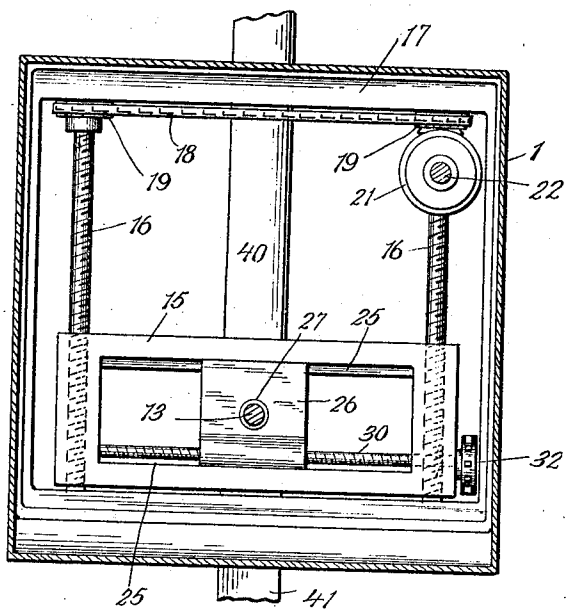
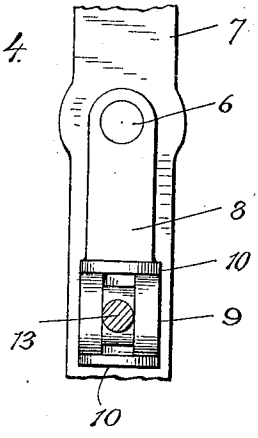


Fig. 4.



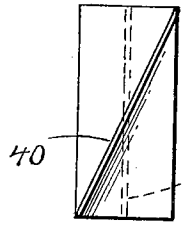


Fig. 5.

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UNITED STATES PATENT OFFICE.

HARRY VASS, OF SUMMIT, NEW JERSEY.

FLYING-MACHINE.

1,386,916. Specification of Letters Patent. Patented Aug. 9, 1921.

Application filed March 12, 1920. Serial No. 365,141.

To all whom it may concern:

Be it known that I, HARRY VASS, a citizen of the United States, residing at Summit, county of Union and State of New Jersey, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to flying machines, and it has for an object to provide a novel arrangement of propellers whereby the latter may be adjusted so as to direct the flying machine in any desired direction.

Another object is to provide an improved type of propeller which by its formation is adapted to effect a compound action, one blade of the propeller acting differently from the other.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Figure 1 of the drawings is a side elevation of a flying machine having the invention applied thereto.

Fig. 2 is an enlarged axial sectional view showing the end portion of the flying machine.

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary transverse section on the line 4—4 of Fig. 2.

Fig. 5 is a detail end view of my improved propeller.

As here shown my improved flying machine comprises an elongated hollow body 1 which may be braced in any suitable manner and arranged as desired to accommodate the pilot and passengers. Located in this body is an engine 2 of ordinary type the crank shaft whereof has gears 4 on opposite ends which mesh with gears 5 on shafts 6 whose opposite ends are suitably journaled in frames 7 near the ends of the body 1.

Fixed to the ends of these shafts 6 which project through the frames 7 are crank arms 8 and upon the end of each of these crank arms a sleeve 9 is rotatably mounted, being prevented from endwise displacement by means of collars 10 fixed on the crank arm. Projecting integrally from one side of each of these sleeves is a pair of ears 12 and to these ears are pivotally attached the inner ends of adjustable shafts 13 which carry the propellers on their outer ends, the shafts having swinging movement on the arms 8 in the plane of the latter.

The outer ends of these shafts 13 are supported in movable bearings which are adapted to have both vertical and transverse movement to bring the bearing either above or below or to either side of the axis of the shafts 6. To this end a horizontal crosshead 15 extends transversely of each end of the machine and has threaded through opposite ends thereof a pair of vertical screws 16 located adjacent the sides of the machine and swiveled in an open frame 17 located at the end of the machine. Rotation of these screws in unison is effected by means of a sprocket chain 18 looped over sprocket wheels 19 on the upper ends of the screws while one of the screws has fixed thereon a bevel pinion 20 meshed by a bevel gear 21 on the end of a longitudinal shaft 22 suitably journaled in the side of the machine and having a handwheel 23 fixed thereon at a point convenient to the operator. It will be apparent that by rotating the shaft 22 the crosshead 15 may be raised or lowered.

This crosshead 15 is in the form of an open frame and has interior horizontal guides 25 in which a block 26 is held, this block having at its center a globular bearing 27 through which the shaft 13 passes, the bearing being free to move in any direction in the block. The block 26 is adjusted in the guides 25, or transversely of the machine, by means of a screw 30 threaded through a projection 31 on the block and swiveled at opposite ends in the crosshead 15. This screw has a sprocket wheel 32 on one end thereof and a sprocket chain 33 is looped thereover and over a larger sprocket wheel 34 suitably pivoted adjacent the driver's seat, and provided with a handle 35 for rotation. To take up the slack of the chain as the crosshead approaches the horizontal line of the sprocket wheel 34 an idler 36 is mounted on the end of a swinging arm 37 and is pressed yieldingly against the chain by a spring 38. I prefer to have the screws 16 and 30 of comparatively coarse pitch to permit of rapid adjustment of the bearings 27 of the shafts 13 while the relative sizes of the gear 21 and pinion 20, and sprocket wheels 34 and 32 also accelerates the movement. Additional gear multiplication may also be provided in a well known manner if desired, or I may connect

electric motor directly to the screws or one of the screws and control the same by switches located conveniently to the operator's seat.

In constructing my improved propellers which are mounted on the end of shafts 13, one blade 40 thereof is formed in the usual helical manner while the opposite blade 41 extends transversely to the axis of the shaft, deriving its operative efficiency from the angular movement of the shaft.

It is to be understood of course that the control arrangement will adjust the bearing of each shaft and to this end the shaft may extend from end to end of the machine and have a gear 21 on each end while a second sprocket wheel may be fixed co-axially to wheel 34 and be connected by a suitable chain to adjust the block in the other crosshead.

My improved propeller as herein shown may also be used on boats.

Having thus described my invention what I claim as new and desire to protect by Letters Patent of the United States is as follows:

1. In a flying machine, a propeller, a shaft on which said propeller is fixed, a drive shaft, a crank arm on said drive shaft, and a universal joint connection between the said propeller shaft and the said crank arm.

2. In a flying machine, a pair of propellers, shafts on which said propellers are fixed, driving shafts, crank arms on said driving shaft to which said propeller shafts are fixed at one end, bearings supporting said propeller shafts near the propellers, and means for adjusting said bearings transversely of the machine in any direction.

3. In a flying machine, a pair of propellers, shafts on which said propellers are fixed, driving shafts, crank arms on said driving shaft to which said propeller shafts are fixed at one end, bearings supporting said propeller shafts near the propellers, and means for adjusting said bearings transversely of the machine in any direction said means including blocks in which said bearings are mounted, crossheads in which said blocks are slidably guided, and means for moving said crossheads transversely of the machine at right angles to the direction of movement of the said blocks therein.

4. In a flying machine, a pair of propellers located at opposite ends of the machine, and means for causing the axes of said propellers to move in conical paths as the propellers rotate.

5. In a flying machine, a propeller having one blade diagonal to the axis of the propeller and the other blade transverse to the axis of the propeller and means for causing the axis of the propeller to move in a conical path as the propeller rotates.

In testimony whereof I have affixed my signature.

HARRY VASS.