A. HELFER.

FLYING MACHINE.

APPLICATION FILED MAY 6, 1910.

999,560.

Patented Aug. 1, 1911.

2 SHEETS—SHEET 1.

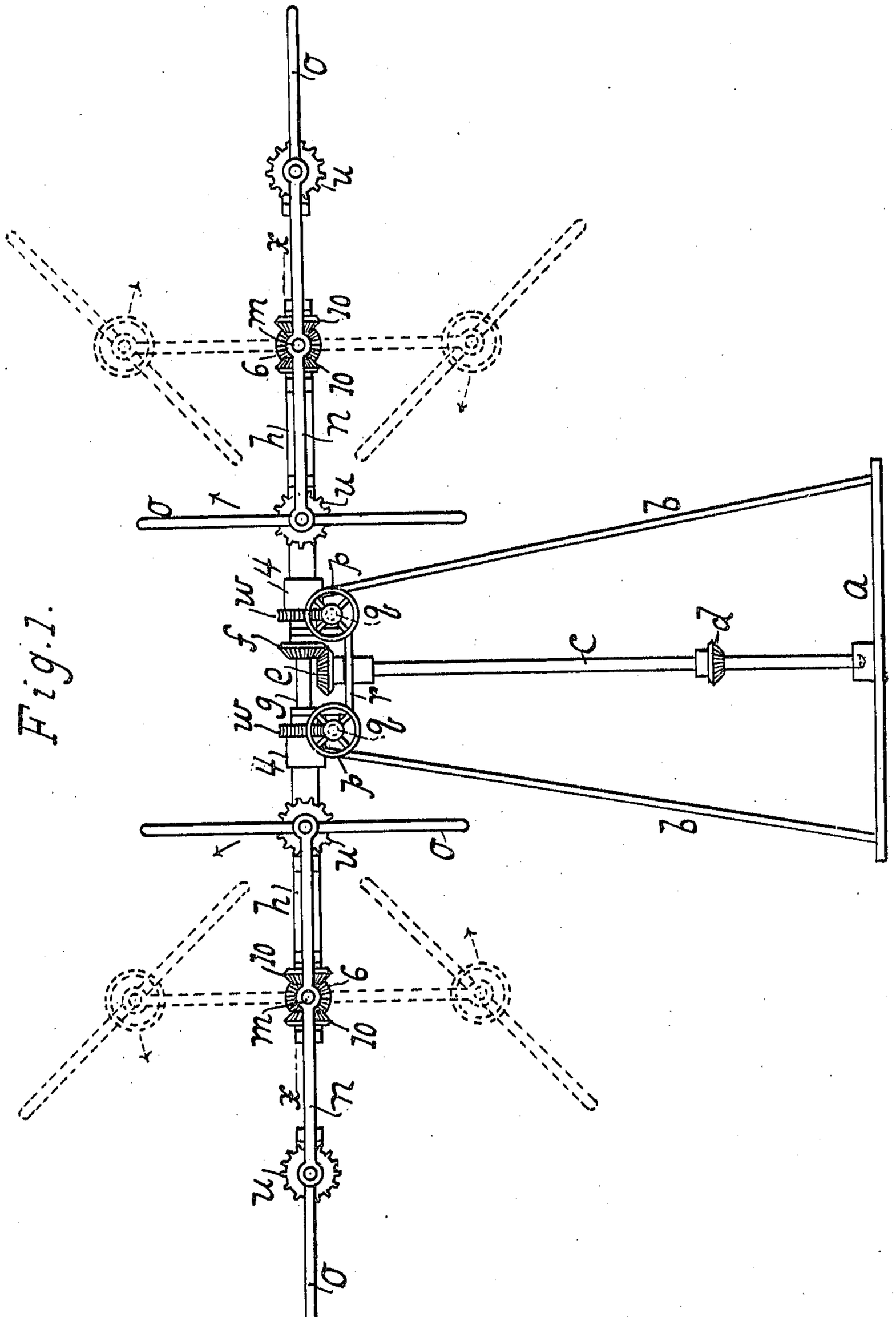

Fig. 1.

Witnesses:
William Miller
Christian H. Almstaedt

Inventor
Armin Helfer
By his Attorneys
Hauff & Harland.

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2 SHEETS—SHEET 2.

Fig. 2.

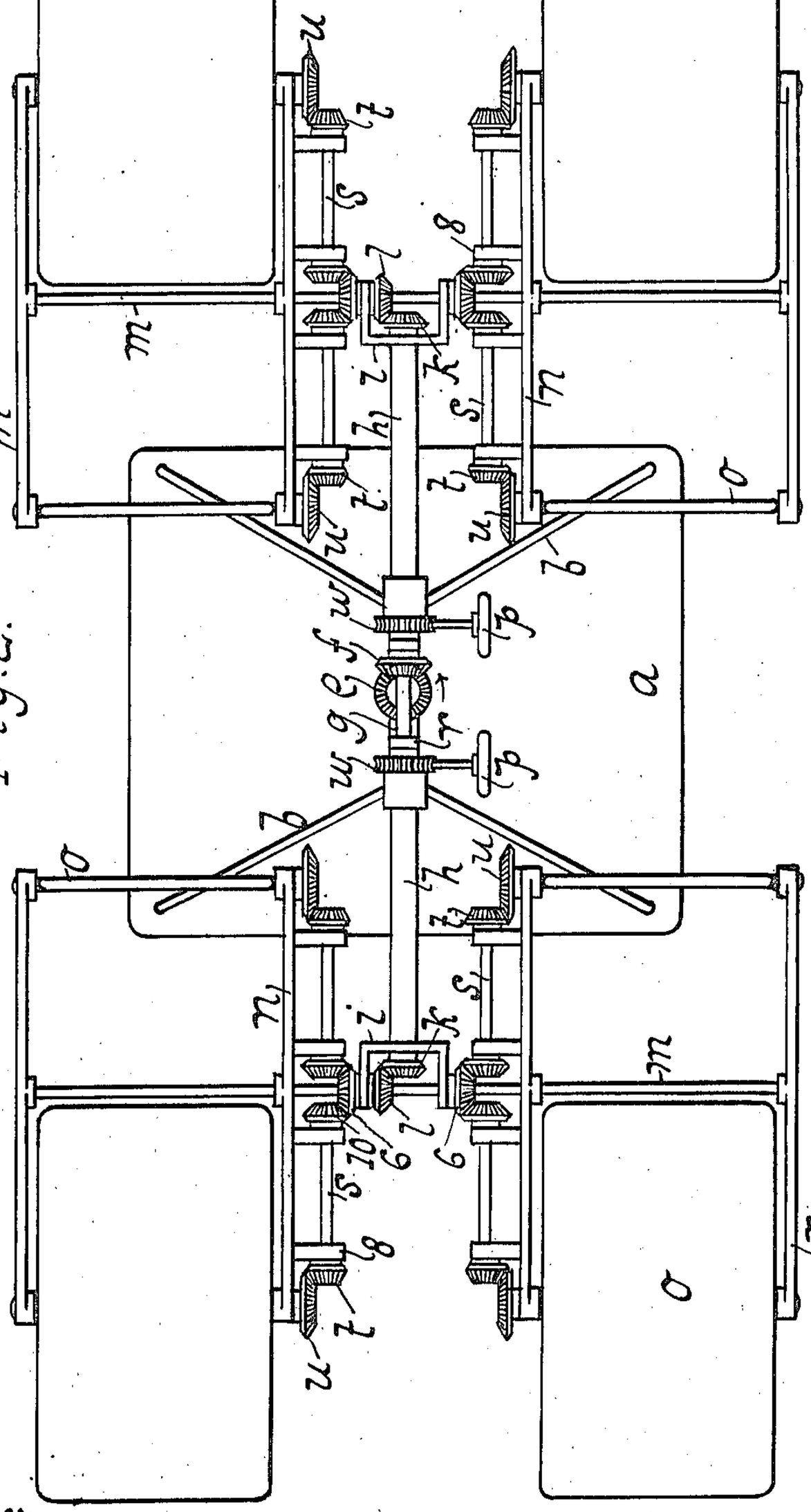
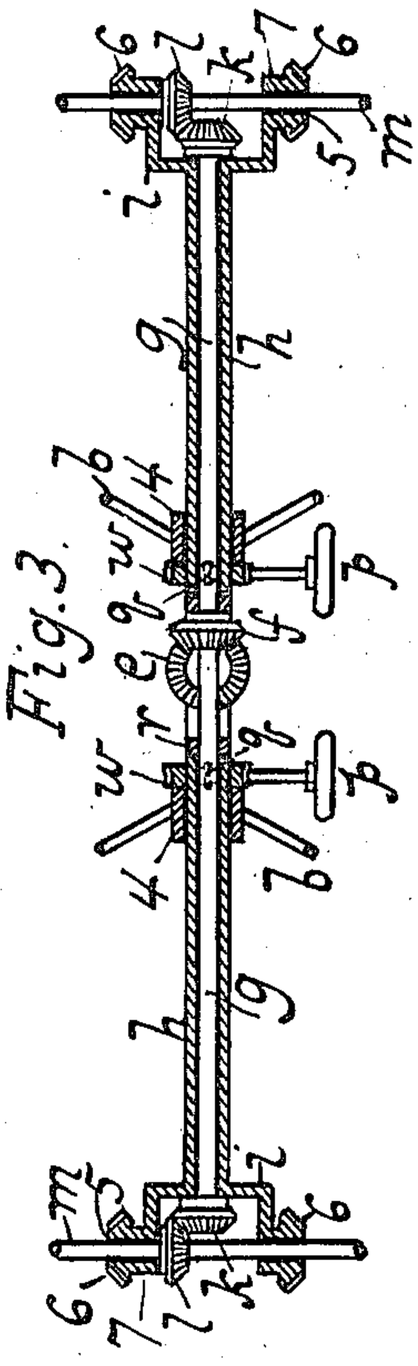


Fig. 3.



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Christian H. Ahnstaedt

Inventor
Armin Helfer
By his Attorneys
Hauff & Borland

UNITED STATES PATENT OFFICE.

ARMIN HELFER, OF NEW YORK, N. Y.

FLYING-MACHINE.

999,560. Specification of Letters Patent. Patented Aug. 1, 1911.

Application filed May 6, 1910. Serial No. 559,786.

To all whom it may concern:

Be it known that I, ARMIN HELFER, a citizen of the Swiss Republic, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

My invention consists of a new and improved flying machine.

The invention relates to that type of airship or flying machine which is heavier than air.

My device is constructed by having a number of revolving frames with a series of revolving planes or blades pivotally connected thereto.

The machine has a driving shaft adapted to be rotated by a suitable motor or any other desirable motive power. This driving shaft is connected by means of gears to a transmission shaft which revolves a number of frames or arms having a series of planes or blades. The transmission shaft by a system of gears of different ratios rotates the planes on slower speed than the frames or arms. Each of the revolving frames or arms with its planes can be tilted and set to any angle by means of a handwheel with a worm and gear connection. The frames or arms with their planes can thus be adjusted and set independently of each other to any required position, either for the purpose of raising the machine, or one of the planes may be tilted as a rudder when steering, or they can be set on a proper angle to balance the machine, or the blades can be reversed to stop the machine and used as a brake.

In the accompanying drawings Figure 1 is a rear view of my machine. Fig. 2 is a top or plan view. Fig. 3 is a horizontal sectional view taken on the line *x x* Fig. 1.

The device consists of a platform which may be of any desired construction, either a flooring or a basket or a frame like body constructed of tubing, etc. In the construction shown I have indicated at *a* a platform or flooring.

The driving shaft is designated at *c* and may be connected to a motor at *d*. Any suitable motive power may be used. The motor is not shown.

In the construction shown there are four uprights or standards *b*. At the top of the driving shaft *c* is a beveled gear *e* meshing with a corresponding gear *f* on a transmission shaft *g*. The transmission shaft *g* has sleeves *h* surrounding it, and these sleeves *h* pass through and rest in bearings 4. The bearings 4 form a part of the uprights *b* shown in Fig. 1. These sleeves *h* have at each end a bifurcated frame *i*. These bifurcated frames *i* have openings 5 and through these openings 5 passes a shaft *m* carrying frames or arms *n* and to which are pivotally fastened the planes or blades *o*. These planes or blades may be constructed of a metal frame, rectangular in shape and covered with canvas or suitable material, or the planes or blades may be made entirely of metal if desired with the pivots attached directly to the blades.

Motion is transmitted to the frames or arms carrying the planes or blades and also to the planes or blades themselves in the following manner, viz:—The bifurcated arms *i* of the sleeve *h* have exteriorly formed hubs 7 rigidly secured thereto and to each hub 7 is rigidly secured a gear 6. Through the hubs 7 and openings 5 therein extends the shaft *m* carrying the arms or frames *n* which in turn carry the planes or blades *o*. On this shaft *m* is secured a gear *l* meshing with the gear *k* which gear *k* is rigidly secured on the transmission shaft *g*. It will thus be seen that motion of the transmission shaft *g* is by means of the gears *k* and *l* transmitted to the shafts *m* on which the frames hang and the frames are thus rotated.

I will now describe the rotation of the planes or blades themselves. This latter result is attained by the arm of the frame *n* which is nearest to the transmission shaft *g*, having a series of bearings 8 thereon. Revolving in these bearings 8 are shafts *s*, there being one shaft for each blade or plane *o* as shown in Fig. 2. Each of these shafts *s* has a gear 10 rigidly secured thereto which gears 10 co-act with the steady or rigid gear 6 on the hub 7 and the bifurcated frame *i* of the sleeve *h*. On the farther end of each of the shafts *s* is a gear *t* meshing with a larger gear wheel *u* and this gear *u* is rigidly secured to the pivot of the plane or blade *o*. This gear *u* is larger than gear *t*, preferably twice the size, so that the planes or blades revolve more slowly than the arms or frames *n*.

The planes or blades are so arranged in the frame or arms carrying them that they are always at right angles to each other, as

shown for instance in Fig. 1. The dotted lines in Fig. 1 indicating the position of the blades when the arms or frames are revolving. In other words each pair of blades in one pair of arms or frame *n* is set so that one blade of the pair is a quarter turn in advance of the other blade of the pair.

The top of the driving shaft *c* has a frame like housing *r* shown in Fig. 1 in which are mounted steering wheels *p* having a worm *q* as shown in Figs. 2 and 3, meshing with a worm wheel *w* on the sleeve *h*. By turning these steering wheels *p* the sleeve *h* is turned on the shaft *g* and the revolving frames *n* with planes or blades *o* are correspondingly tilted to any desired angle to obtain the forward motion of the machine, and by means of these wheels *p* the action of the machine may be reversed and the planes or blades used to give the machine a backward motion or to act as a brake, and the machine may also be steered, by changing the position or the operation of one of the steering wheels to work in one direction and the other steering wheel to work in the opposite direction or to remain stationary.

In the accompanying illustrations I have only shown one driving shaft with one transmission shaft carrying two frames or arms on each end and each frame and arm has two planes or blades making four planes or blades in all. Of course, if necessary or desirable, I may have more than one series of driving shafts and transmission shafts so that the machine may carry as many planes or blades as desired.

I do not wish to be confined to the construction of the gears which I have shown. Instead of the beveled gears shown on the arms or frame, I may use if desired, in lieu thereof, a series of chains and sprockets.

I claim:—

1. A flying machine comprising a driving shaft, a transmission shaft rotatively connected to the driving shaft, a rotative frame coupled to the transmission shaft, a series of planes rotatively mounted in the frame, a sleeve loosely mounted on the transmission shaft, planetary devices connected to and rotated by the frame for revolving the planes at a slower rate of speed than the frame, and means operatively connected to the sleeve for tilting the frame to any desired angle.

2. A flying machine comprising a driving shaft, a transmission shaft rotatively connected to the driving shaft, a plurality of rotative frames coupled to the transmission shaft, a series of planes mounted in the frames, sleeves loosely mounted on the transmission shaft, planetary devices connected to the planes and rotated by the frames for revolving the planes at a slower rate of speed than the frames, and means operatively connected to the sleeves for independently tilting the frames to any desired position.

3. A flying machine comprising a driving shaft, a transmission shaft rotatively connected to the driving shaft, rotative frames geared to the transmission shaft, a series of planes mounted in the frames, sleeves loosely mounted on the transmission shaft and connected to the frames, devices carried by the frames to engage the planes and having planetary motion about the axis of the frames for revolving the planes at a slower rate of speed than the frames, and means operatively connected to the sleeves for tilting the frames to any desired angle.

4. A flying machine comprising a driving shaft, a transmission shaft rotatively connected to the driving shaft, rotative frames geared to the transmission shaft, a series of planes having gears mounted in the frames, sleeves loosely mounted on the transmission shaft and connected to the frames, planetary devices geared to the planes and adapted to engage the sleeves for revolving the planes at a slower rate of speed than the frames, and means operatively connected to the sleeves for tilting the frames to any desired angle.

5. A flying machine comprising a driving shaft, a transmission shaft rotatively connected to the driving shaft, rotative frames geared to the transmission shaft, a series of planes mounted in the frames, sleeves loosely mounted on the transmission shaft and connected to the frames, planetary devices carried by the frames to engage the planes and rotated by the frames for revolving the planes at a slower rate of speed than the frames, and mechanism including steering wheels with worm connections to the sleeves for tilting the frames to any desired angle.

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

ARMIN HELFER.

Witnesses:
CHRISTIAN H. ALMSTADT,
BERTHA WILLER.