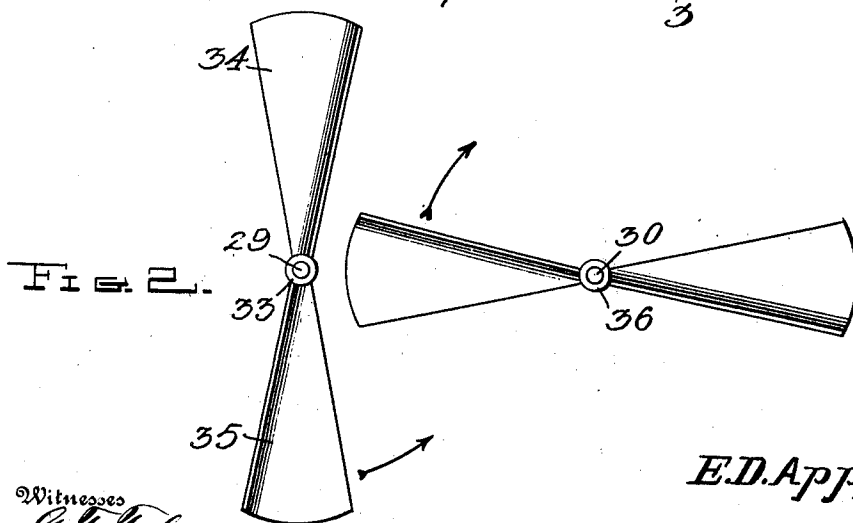
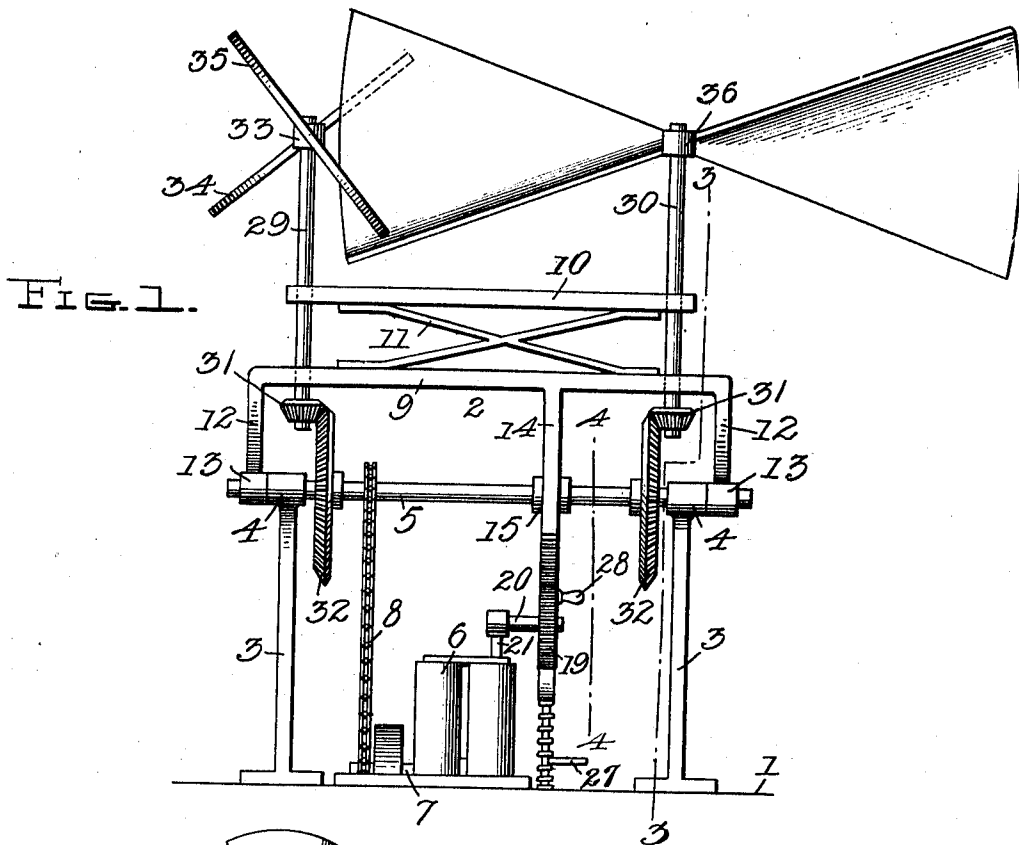


982,700.

E. D. APPLEY.  
FLYING MACHINE.  
APPLICATION FILED JUNE 7, 1909.

Patented Jan. 24, 1911.

3 SHEETS—SHEET 1.



Witnesses  
G. F. Tolson  
W. B. McHowell

Inventor  
*E. D. Appley*  
By *James A. S. Koehl*  
Attorney

982,700.

E. D. APPLEY.  
FLYING MACHINE.  
APPLICATION FILED JUNE 7, 1909.

Patented Jan. 24, 1911

3 SHEETS-SHEET 2.

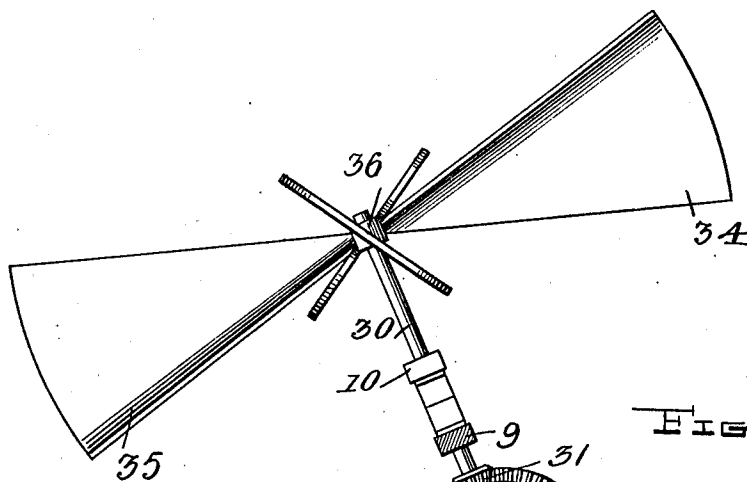
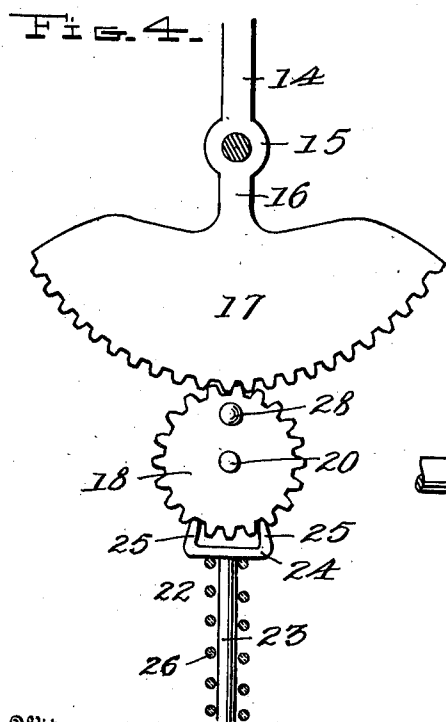


FIG. 3.



Witnesses  
*G. F. Tolson*  
*W. S. McHowell*

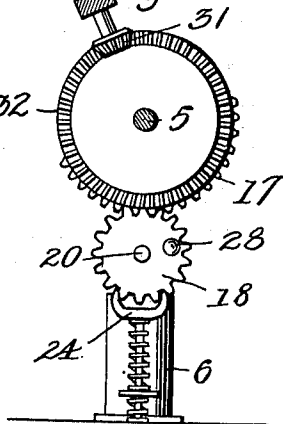
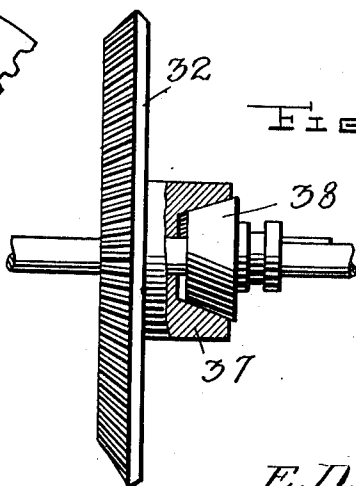


FIG. 5.



Inventor  
*E. D. Appley*

By *James A. S. Koch*  
Attorney

982,700.

E. D. APPLEY.  
FLYING MACHINE.  
APPLICATION FILED JUNE 7, 1909.

Patented Jan. 24, 1911.

3 SHEETS-SHEET 3.

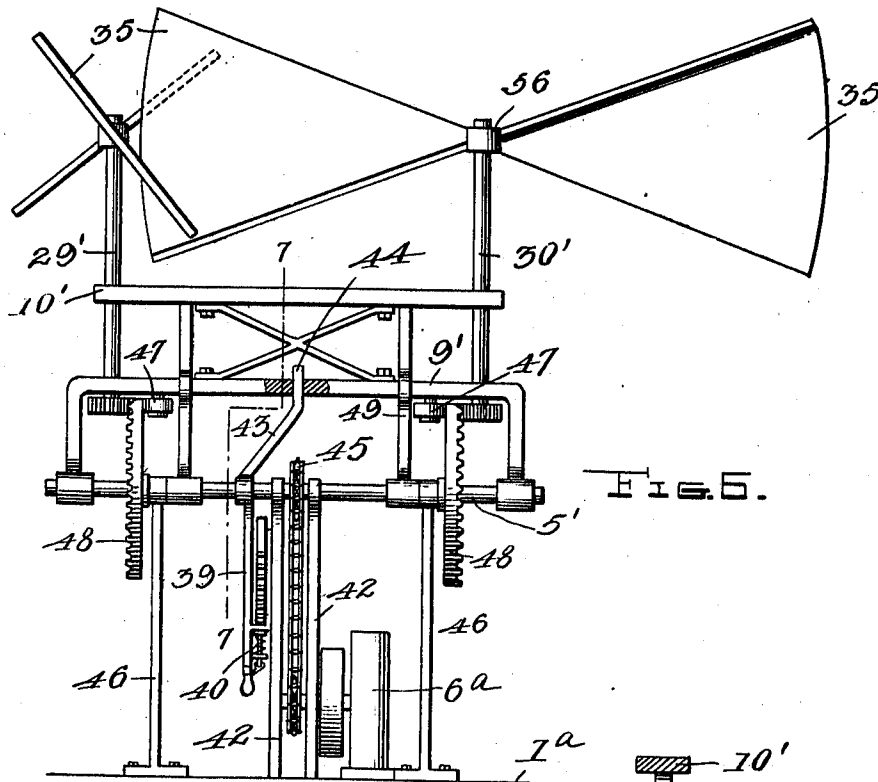


FIG. 6.

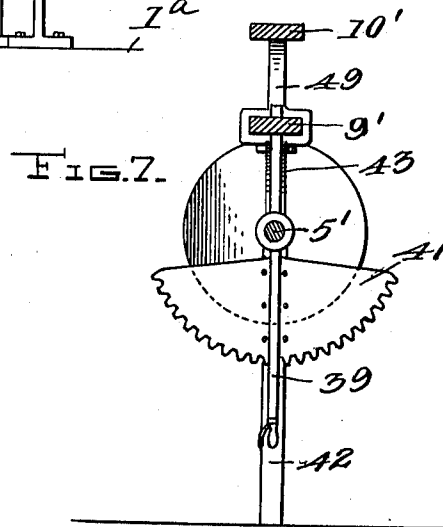


FIG. 7.

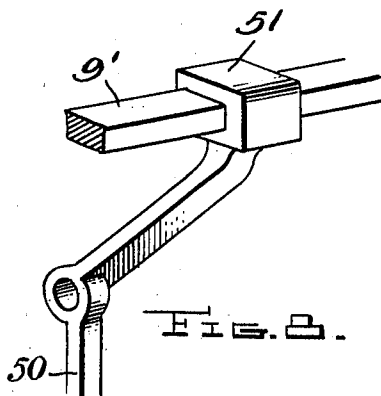


FIG. 8.

Witnesses

*G. F. Johnson*  
*W. S. McHowell*

Inventor

*E. D. Appley*

By

*James A. S. Koehl*

Attorney

# UNITED STATES PATENT OFFICE.

ELISHA D. APPLEY, OF LIBERTY, NEW YORK.

FLYING-MACHINE.

982,700.

Specification of Letters Patent.

Patented Jan. 24, 1911.

Application filed June 7, 1909. Serial No. 500,665.

*To all whom it may concern:*

Be it known that I, ELISHA D. APPLEY, a citizen of the United States, residing at Liberty, in the county of Sullivan and State of New York, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to flying machines and particularly to one in which a plurality of revoluble vane carrying members are employed for elevating and sustaining the machine, and an object of my invention resides in the provision of main and supplemental frames, the latter having mounted thereon the hereinbefore mentioned vane carrying members and mounted upon the main frame for angular adjustment with respect to the vertical axis of the machine so that the latter can be directed in the desired course at the will of the operator.

A still further object of my invention resides in the arrangement of the vane carrying members wherein the vanes of one member are disposed in such relation with those of the other member that they alternately follow each other in their movements so that the pressure of the vanes against the atmosphere will be very great when the machine is rising vertically, hence causing the machine to ascend rapidly and evenly, the tendency of the vanes at this movement of the machine being to exert their pressure against the atmosphere at a point immediately in line with the vertical axis of the machine.

Other objects and advantages will be apparent from the following description and it will be understood that changes in the specific structure shown and described may be made without departing from the spirit of the invention.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views:—Figure 1 is a front elevation of the machine. Fig. 2 is a top plan view of the vane carrying members. Fig. 3 is a section of the machine taken on the line 3—3 of Fig. 1, the vane carrying shafts being tilted in propelling position. Fig. 4 is a detail section taken on the line 4—4 of Fig. 1. Fig. 5 is a detail view of a slightly modified form of my invention. Fig. 6 is a view similar to

Fig. 1 of a further modified form of my invention. Figs. 7 and 8 are detail views.

It will of course be understood that I may employ in connection with my machine any suitable well known form of car or the like but as this forms no essential part of the invention I have not shown such.

The machine shown in the drawings consists of main and supplemental frames 1 and 2, the former being shown somewhat diagrammatic and need not be of any particular type, but is preferably provided with a pair of spaced supports or standards 3. Each support is provided at its upper end with a horizontally disposed bearing box 4, and as illustrated these boxings receive portions of a revoluble driven shaft 5 which is located in proper spaced relation to the main frame 1. The frame 1 supports a motor 6 which may be of any suitable well known form. The motor is herein shown as being provided with a horizontal driving shaft 7 which is geared by means of a chain belt 8 to the shaft 5.

The supplemental frame 2 comprises horizontal members or bars 9 and 10 spaced from each other and braced by a truss frame 11. The bar 9 is provided at its ends with depending arms 12 which have formed thereon at their lower ends journal boxes 13. The boxings 13 are arranged outwardly of the boxings 4 but are disposed in line therewith and receive the outer extremities of the shaft 5. This construction is such that the supplemental frame is pivoted to the main frame and is adapted for horizontal angular adjustment relative thereto. The bar 9 is provided with a depending arm 14 which carries a bearing box 15 mounted upon the shaft 5. Upon reference to Fig. 4 of the drawings, it will be seen that the arm 14 has a portion 16 which extends below the box 15 and this portion is provided with an arcuate rack member 17, the teeth of which are in mesh with the teeth of a combined gear and crank wheel 18. The wheel 18 is loosely mounted upon a shaft 20 which is mounted in a bracket 21 carried by the frame 1. A dog or locking member 22 is slidably engaged with the frame 1 and comprises a shank or stem 23 and a head 24. The head 24 is provided with a plurality of

teeth 25 which are normally held in engagement with the teeth of the wheel 18 by means of a spiral spring 26. The spring surrounds the shank or stem 23 and is confined at its ends between the head 24 and the upper portion of the frame 1. The shank 22 is provided with a foot engaging lip 27 which when moved downwardly throws the dog out of engagement with the wheel 18 whereby the latter can be rotated to change the angular position of the frame 2. A crank handle 28 is secured to the wheel 18 whereby the latter can be rotated.

The supplemental frame carries a pair of vertical revoluble shafts 29 and 30 which are journaled in the bars 9 and 10. The shafts have fixed thereto, at their lower ends small bevel pinions 31 or other suitable gear means, and as shown the said pinions are in mesh with large pinions 32 secured to the driving shaft 5. The shaft 29 has fixed thereto a member 33 which carries a pair of oppositely extending and oppositely inclined vanes 34 and 35. The shaft 30 carries a member 36 identical in construction with the member 33 and as shown, vanes 37 and 38 extend from said member. The members 33 and 36 rotate in opposite directions, and due to the arrangement of the shaft 29 and 30 it will be seen that the vanes of said members alternately pass each other in their travel, whereby at least one vane always exerts its pressure against the atmosphere at a point directly in line with the vertical axis of the machine, hence equal distribution of energy is exerted by said vanes as will be understood.

From the foregoing description, it will be seen that when the supplemental frame has been adjusted with respect to the main frame so that the shafts 29 and 30 lie vertical, the pressure or force exerted by the vanes against the atmosphere will cause the machine to ascend. When it is desired to move the machine in other directions, the supplemental frame can be accordingly adjusted at the will of the operator.

Should it be found desirable, I may use, a gas bag of well known form in connection with the above described elements.

I do not desire to limit myself to the exact manner of mounting the gears 32 upon the drive shaft 5 as, upon reference to Fig. 5 of the drawings it will be seen that if I desire the gears can each be provided with a clutch member 37 adapted for interlocking engagement with a clutch member 38. In this instance means of well known construction can be employed for simultaneously operating the clutch members so that the gears can be simultaneously thrown into or out of operation. When clutch mechanism is employed it will be understood that

the engine upon starting the machine can be first put into perfect operation and run to suit the operator, after which the gear wheels for operating the propelling shafts can be thrown into their operative positions.

In the form of my invention shown in Figs. 6 and 7, the driven shaft 5' has pivotally mounted thereon a lever 39 which is provided with a dog 40 adjustably connected with a rack segment 41. The segment is secured to one of a pair of standards 42 which extend upwardly from the main frame 1<sup>a</sup>. The lever 39, from its point of bearing with the shaft 5' is provided with an angularly extending portion 43 which carries at its outer end, a finger 44. The finger 44 is mounted in a passage formed at the center of the bar 9'. The standards 42 are provided at their upper ends with bearings in which the central portion of the shaft 5' is mounted, and between said bearings, the shaft has secured thereto a driven gear 45 which is geared to a motor 6<sup>a</sup>. The main frame 1<sup>a</sup> supports a pair of standards 46 which are provided with shaft bearings at their upper ends. The bar 9' has mounted thereupon guide rollers 47 which are frictionally engaged with the inner flat faces of the gears 48 whereby they are effectively held in engagement with the gears 48 upon the shafts 29' and 30'. The bar 10' of the supplemental frame in this form of my invention carries brace members 49 which are engaged with the bar 9' and with the shaft 5', as shown.

In lieu of the lever 39, I may employ a lever 50 as shown in Fig. 8, and in this instance, it will be seen that a head 51 is formed at the upper end of the lever and is provided with a square passage 52 adapted to receive the bar 9'.

I claim:—

1. In a flying machine, a main frame, a driven shaft supported by the frame, driving means for the shaft, a supplemental frame mounted for angular adjustment on the said driven shaft, a pair of shafts mounted on the supplemental frame and geared to the said driven shaft, sustaining and propelling vanes mounted on the shafts of the supplemental frame and arranged in intermeshing relation with each other, a steering member loosely mounted on the driven shaft and operatively connected with the said supplemental frame, and actuating means operatively connected with the said steering member.

2. In a flying machine, a main frame, a driven shaft supported by the frame, a supplemental frame mounted loose on the driven shaft, a pair of parallel shafts supported by the supplemental frame and

geared to the said driven shaft and movable  
in opposite directions, propelling and sus-  
taining blades supported by the parallel  
shafts, the said blades having overlapping  
5 paths, a member mounted for rocking move-  
ment on the driven shaft and connected with  
the said supplemental frame, and means on  
the main frame coöperating with the said

member for holding the supplemental frame  
against movement on the driven shaft. 10

In testimony whereof I affix my signature,  
in presence of two witnesses.

ELISHA D. APLEY.

Witnesses:

JOHN L. FLETCHER,  
J. H. CRAWFORD.