

W. H. McKEEN.
 FLYING MACHINE.
 APPLICATION FILED APR. 27, 1909.

1,004,058.

Patented Sept. 26, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

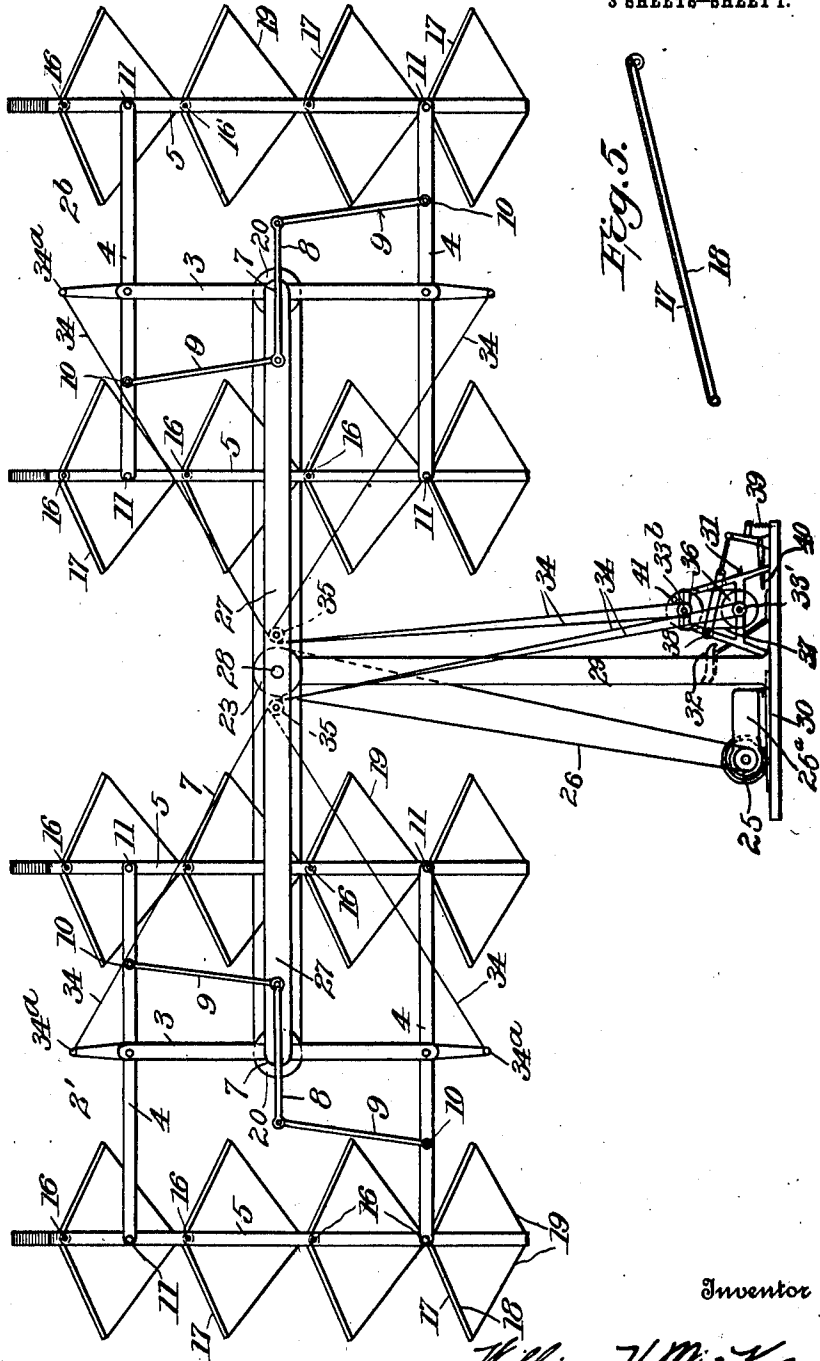


Fig. 5.

Witnesses
C. H. Baker
Ernest R. Hutchinson

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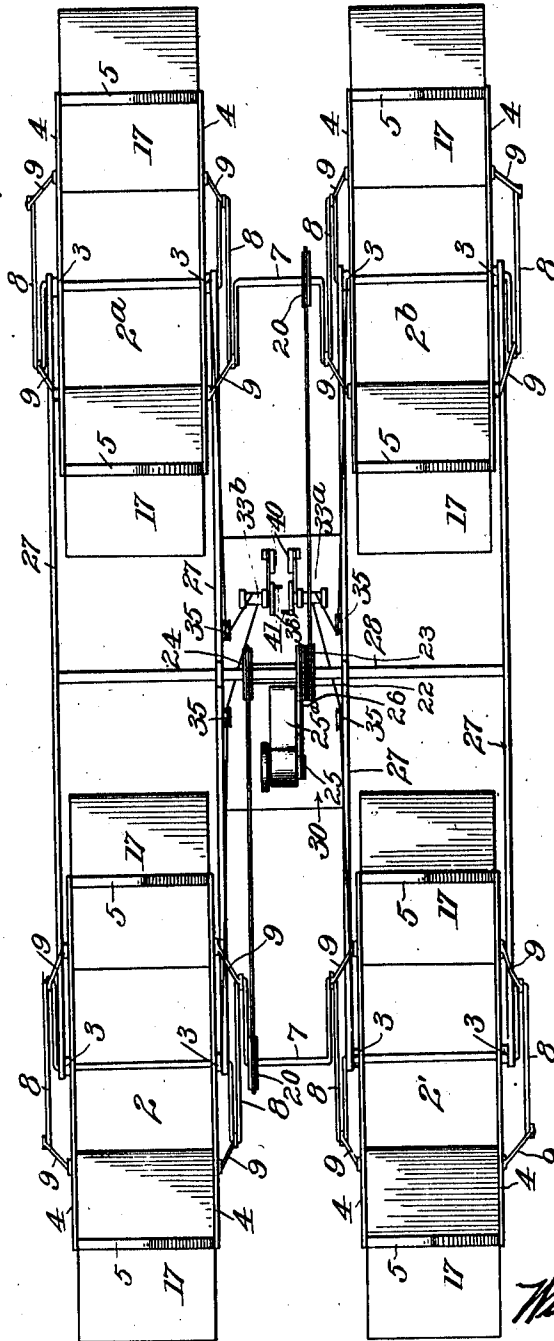
Inventor
William H. McKeen
 By *Joseph R. Eden*
 Attorney

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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses

C. H. Walker
Ernest R. Hutchinson

Inventor

William H. McKeen

Joseph R. Edison
 Attorney

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3 SHEETS—SHEET 3.

Fig. 3.

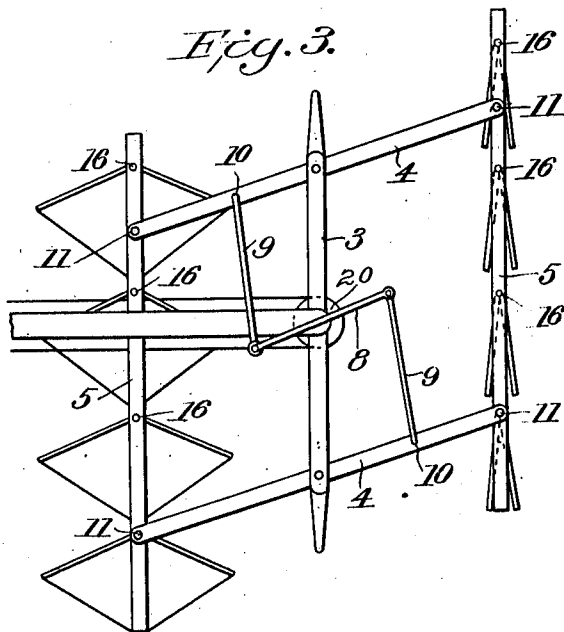
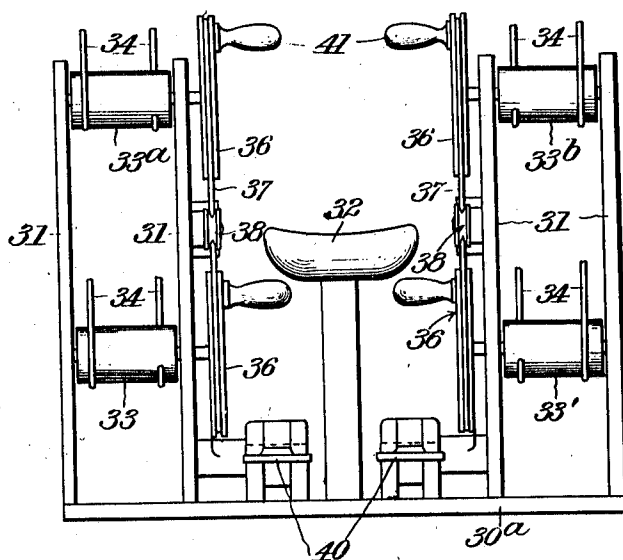


Fig. 4.



Inventor

Witnesses

C. H. Walker
Ernest R. Hutchison

By

William H. McKeen
Joseph R. Eden
 Attorney

UNITED STATES PATENT OFFICE.

WILLIAM H. McKEEN, OF DENVER, COLORADO.

FLYING-MACHINE.

1,004,058.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed April 27, 1909. Serial No. 492,564.

To all whom it may concern:

Be it known that I, WILLIAM H. McKEEN, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to improvements in flying-machines and the object is to provide a simple, safe, and efficient machine for aerial navigation which may be readily guided to travel in any direction, to the right or left, in a straight line or a circle, and either up or down.

With the above object in view, the invention consists in the novel features of construction hereinafter fully described, particularly pointed out in the claims, and clearly illustrated by the accompanying drawing, in which:—

Figure 1 is a side elevation of a machine constructed in accordance with my invention. Fig. 2 is a plan view thereof. Fig. 3 is a detailed view of one of the oscillating sections showing how the sails on one end thereof are spread while those on the other end are closed during each movement of said section. Fig. 4 is an enlarged rear elevation of the mechanism for varying the angles of the oscillating sections with respect to the main frame of the machine; and Fig. 5 is a detail of one wing of a sail.

Referring now more particularly to the drawings, 27 indicates longitudinally-extending beams, of which there are four, arranged parallel and connected intermediately of their ends by a shaft 28 rigidly secured thereto. Secured to and depending from the central pair of beams 27, are the standards 29 carrying at their lower ends, longitudinally-extending arms or supports 30 to which the platform 30^a is attached and forming a support for the engine which may be of any suitable type.

Mounted in the outer ends of the beams 27 are shafts 7, there being two of these shafts, one for each end of the machine. These shafts are formed adjacent to each beam with a double crank 8.

The numeral 3 designates vertical standards, of which there are four at each end of the machine, said standards being pivotally mounted upon and held in place by the shafts 7. These standards extend both above and below the beams 27.

Pivotally supported at the upper and

lower ends of the standards 3 are what I term "walking-beams" 4. These walking-beams are arranged parallel with each other and form, with the standards 3, four sections, designated on the drawing by the reference numerals 2, 2¹, 2^a and 2^b. The upper and lower pairs of walking-beams are connected at their ends by bars 5 which are pivotally attached thereto at 11. Connecting-rods 9 pivotally connect one of each of the double-cranks 8 with one of the upper walking-beams, and the other of each double-crank with one of the lower walking-beams, the pivotal connection of the connecting-rods with the walking-beams being indicated by the numeral 10.

Connecting each pair of bars 5 at intervals, are the shafts 16, arranged one above the other. Pivoted to these shafts are the frames 18, over which the canvas sails 17 are spread. These sails are arranged on opposite sides of the shafts, and open and close like leaves of a book.

19 designate cord braces for the sails. Said sails may be opened or closed by the operator in the operation of the machine.

Loose on shaft 28, but connected to revolve in unison, are the sprocket-wheels 22, 23 and 24. A sprocket-chain 26 connects one of these sprocket-wheels with a sprocket-wheel 25 driven by the engine or motor 25^a. Sprocket chains connect the other wheels with sprocket-wheels 20 on the shafts 7, thus imparting a rocking movement to the walking-beams.

All the sails are shown in Fig. 1 open or spread which would be the case were the machine descending. In operation, each of the four sections would be in motion, that is, the walking-beams would be rocking, the same movement being imparted to the walking-beams of each section. If rising, the sections would be in vertical position relative to the beams 27, as shown in the drawing. The sails however, would be closed on one side of the center of each section when that side was on its upward movement, and open or spread when on its downward movement, as illustrated in Fig. 3, and the same would be true of the sails on the opposite side of the center of each section during the up and down movement of that end.

When moving in a horizontal direction each of the four sections would be drawn forward by the operator to such angle as might be required to cause the machine to

travel in the desired direction. When the engine is working at full speed and the desired elevation is attained, should the machine continue to rise, the angle of the sections would be increased by the operator, which increases the horizontal motion and decreases the vertical, which operation may be repeated until the proper balance is secured.

When it is desired to change direction, that side of the machine which will be the outside of the curve is drawn around by accelerating the speed thereof by increasing the angle of the sections on that side. Or the same result may be obtained by decreasing the angle of the sections on the other side of the machine, or one side may be increased and the other decreased.

If it is desired to stop the machine the angle of the sections are decreased or reversed, according to circumstances. If reversed in full, the machine will stop almost at once, and if left in this position will at once begin to travel backward in the same line. The machine will rise direct from the ground to any desired elevation, remain stationary and travel in any desired direction, and descend when desired.

The means above referred to for varying the angles of the various sections with respect to the main frame of the machine includes two pairs of drums mounted to revolve on suitable supports 31 secured to the platform 30^a. These supports are preferably arranged at either side of said platform leaving room between them for the operator for whom the seat 32 is provided. One of the four drums 33, 33¹, 33^a and 33^b corresponds with each of the oscillating sections 2, 2¹, 2^a and 2^b. The drums 33 and 33^a are arranged at one side, the left of the operator, while the drums 33¹ and 33^b are positioned on the other or right side of him. Ropes, lines or chains 34 are connected, as at 34^a, to the opposite ends of the inner standard 3 of each of the oscillating sections, and are passed over a pulley or roller bearing 35 whence they extend down to and are connected to opposite sides of one of the drums mounted on the platform, whereby the rotation of each drum will cause one of the lines attached thereto to wind up while the other unwinds causing the corresponding oscillating section to assume an annular position with respect to the main frame of the machine. The lines 34 connected to the two oscillating sections on the same side of the machine are attached to the drums on the same side of the operator. Band wheels 36 are arranged on the inner ends of the shafts of the drums and the two band wheels of the two drums on either side of the operator are connected by bands 37. Tension rollers 38 are normally held pressed against said bands by means of the springs 39 or other

suitable device. Foot levers 40 may be provided for releasing the tension rollers from the bands, when desired. Each of the band wheels carries a handle 41 by means of which the corresponding drum may be revolved in either direction. It will be noted that when the band which passes over two of the band wheels is tightened by the tension roller the turning of one of said wheels will revolve the other with it. This enables the operator to adjust both of the oscillating sections on the same side of the machine at the same time and to the same degree. When it is desired to move these two sections separately the band may be loosened by pressure upon the foot lever and each band wheel adjusted independently to suit the requirements.

It should be understood that the means which I have illustrated and described for adjusting or varying the angles of the oscillating sections with respect to the main frame of the machine is only one of the numerous methods which might be employed for accomplishing the desired result. I, therefore, do not limit myself to this precise mechanism, nor do I make any specific claim thereto.

The engine and freight being placed low, it forms a ballast which causes the machine to ride smoothly, and prevents capsizing, if the engine stops. Should the engine stop, the machine spreads twice its working canvas and settles slowly to the earth.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is;

1. In a flying machine, the combination, with a supporting frame, of a plurality of vertical standards pivotally connected to said frame, horizontal oscillating members carried by said standards, sails mounted at the respective ends of said members, means for imparting movement to the oscillating members, and means for varying the angles of said standards with respect to the frame for the purposes specified.

2. In a flying machine, the combination, with a supporting frame, of a plurality of vertical standards carried thereby and having intermediately-pivoted upper and lower horizontal members, vertical bars pivotally connecting said upper and lower members, a plurality of sails carried by said bars and arranged one above another, and means for oscillating said intermediately-pivoted members.

3. In a flying machine, the combination, with a supporting frame, of a plurality of standards carried thereby and having intermediately-pivoted upper and lower members, bars pivotally connecting said upper and lower members, a plurality of sails carried by said bars and arranged one above an-

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other, means for oscillating said intermediately-pivoted members, and means to vary the angles of said standards with respect to the frame for the purposes specified.

5 4. In a flying machine, the combination, with a horizontal frame, of oscillating sections disposed at the respective ends of said frame, sails carried by said sections, a support depending from the central part of the frame, a motor carried by said support, operative connections between said motor and sections for imparting oscillatory movement thereto, and means to vary the angles of said sections with respect to the frame and
10 to retain the sections at the desired angles without interfering with the oscillation of said sections for the purposes specified.

5 5. In a flying machine, the combination, with a horizontal frame, of standards mounted on the respective ends of said frame, oscillating sections pivotally mounted on said standards, sails carried by said sections, a support depending from the central part of the frame, a motor carried by said support, operative connections between said motor and sections for imparting oscillatory movement to the latter upon said standards, and means to vary the angles of said standards with respect to the frame for the purpose
30 specified.

6. In a flying machine, the combination, with a horizontal frame, of standards mounted on the respective ends of said frame, oscillating sections pivotally mounted on said standards, sails carried by said sections at the respective ends thereof and so constructed and mounted as to spread on the down stroke and fold on the up stroke, a support depending from the central part of the frame, a motor carried by said support, operative connections between said motor and sections for imparting oscillatory movement to the latter upon said standards, and means to vary the angles of said standards with respect to the frame for the purposes specified.
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7. In a flying machine, the combination, with a supporting frame consisting of longitudinally-extending beams, of pairs of vertically disposed intermediately-pivoted supports at the respective ends of the beams, horizontally-disposed walking beams intermediately pivoted to the respective ends of the supports, bars pivotally connecting the corresponding ends of the upper and lower walking beams, sails carried by said connecting bars and arranged one above the other, crank shafts mounted in the beams and operatively connected to the walking beams, a motor and operative connections between said motor and crank shafts.
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8. In a flying machine, the combination, with a supporting frame consisting of longitudinally-extending beams, of pairs of vertically disposed intermediately-pivoted sup-
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ports at the respective ends of the beams, horizontally-disposed walking beams intermediately pivoted to the respective ends of the supports, bars pivotally connecting the corresponding ends of the upper and lower walking beams, sails carried by said connecting bars and arranged one above the other, crank shafts mounted in the beams and operatively connected to the walking beams, a motor and operative connections between said motor and crank shafts, and means for varying the angles of the vertically disposed supports relative to the beams for the purposes specified.
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9. In a flying machine, the combination, with a supporting frame consisting of longitudinally-extending beams, of pairs of vertically disposed intermediately-pivoted supports at the respective ends of the beams, horizontally-disposed walking beams intermediately pivoted to the respective ends of the supports, bars pivotally connecting the corresponding ends of the upper and lower walking beams, sails carried by said connecting bars and arranged one above the other, said sails being so constructed and mounted as to spread on the down stroke and fold on the up stroke, crank shafts mounted in the beams and operatively connected to the walking beams, a motor, operative connections between said motor and crank shafts, and means for varying the angles of the vertically disposed supports relative to the beams for the purposes specified.
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10. In a flying machine, the combination, with a supporting frame, of two pairs of standards arranged side by side at each end of said frame, and pivotally mounted transversely thereof, separate oscillating members carried by each of said pairs of standards, sails carried by said members, means for oscillating said members, and means for varying the angles of the pairs of standards on each side of the frame with respect to said frame independently of the pairs of standards on the other side of said frame for the purposes specified.
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11. In a flying machine, the combination, with a supporting frame, of two pairs of standards arranged side by side at each end of said frame and pivotally mounted transversely thereof, separate oscillating members carried by each of said pairs of standards, sails carried by said members, means for oscillating said members, and means for varying the angles of each of said pairs of standards with the supporting frame independently of the other pairs for the purposes specified.
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12. In a flying machine, the combination, with a supporting frame, of vertical standards carried by the respective ends of said frame, horizontal oscillating members pivotally connected to said standards, sails mounted on the ends of said oscillating
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members, each sail comprising two wings pivotally connected at their upper edges and having their lower edges secured by guy ropes whereby said sails are adapted to open
5 on the down stroke and close on the up stroke, and means to oscillate said members.

13. In a flying machine, the combination, with a supporting frame, of standards arranged at the respective ends of said frame,
10 oscillating members pivotally connected to said standards, sails arranged at the opposite ends of said members, each sail comprising two wings pivotally connected on a line running transversely to its carrying member,
15 guy ropes secured to the free ends of said wings for holding them in their spread positions on the down stroke of the sail, and means for oscillating said sections.

14. In a flying machine, the combination, with a horizontal supporting frame, of vertical standards pivotally secured to the ends of said frame, oscillating members secured to the ends of said standards, sails mounted at the ends of said members, each sail comprising two wings pivotally connected on a
20 line running transversely to its carrying member, guy ropes secured to the free edges of said sails for holding them in their spread positions on the down stroke of the sail,

means to oscillate said members, and means
30 to vary the angles of said standards with the supporting frame for the purposes specified.

15. In a flying machine, the combination, with a horizontal supporting frame, of two sections arranged side by side at each end of
35 said frame and pivotally connected transversely thereof, each section comprising an intermediately-pivoted vertical standard, walking beams intermediately-pivoted at the ends of said standard, vertical bars connecting the corresponding ends of said walking-
40 beams, and a plurality of sails arranged one above another on each of said connecting bars, each sail comprising two wings pivoted together transversely of said connecting bars,
45 guy ropes secured to the free edges of said wings and to said connecting bars whereby said wings are held in a spread position on the down stroke of the sail, means to oscillate
50 said walking beams and means to vary the angles of said standards with the supporting frame for the purpose specified.

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

WILLIAM H. McKEEN.

Witnesses:

O. B. LOWE,

LEWIS G. HASELTON.