

J. MEANS.

EMERGENCY APPARATUS FOR CONTROLLING FLYING MACHINES.

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Variable

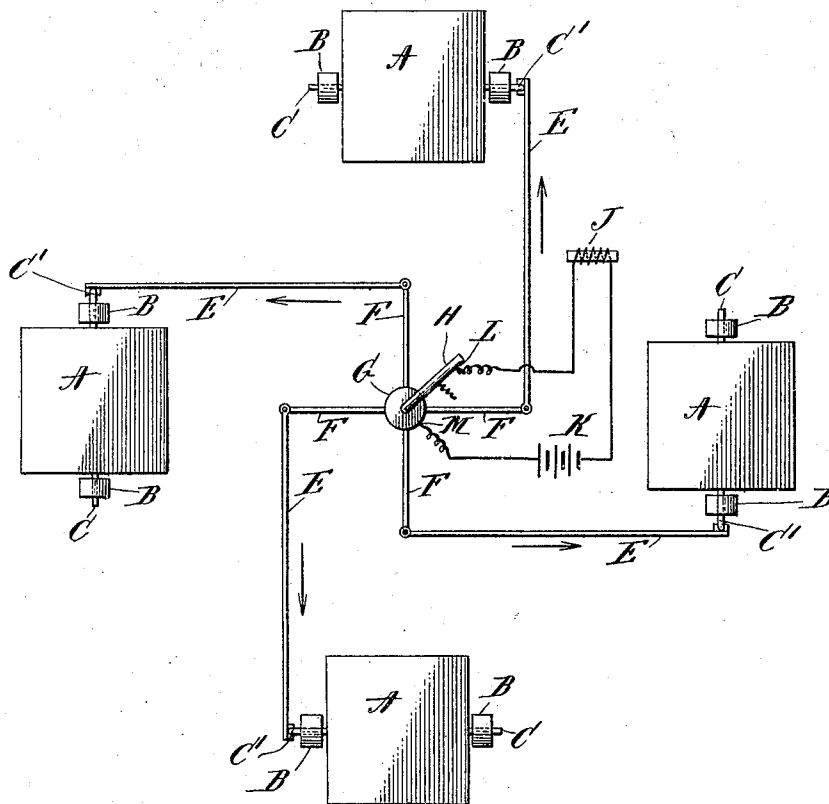


Fig-1.

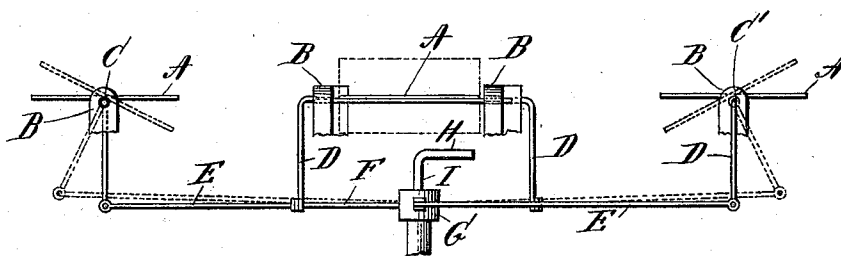


Fig. 2.

WITNESSES:

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EMERGENCY APPARATUS FOR CONTROLLING FLYING-MACHINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES MEANS, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Emergency Apparatus for Controlling Flying-Machines, of which the following is a specification.

My invention relates to emergency apparatus for controlling flying machines.

It is well known that a flying machine having its sustaining-planes parallel to the geometric plane of the machine (*i. e.* any plane which is parallel to both the longitudinal and lateral axes of the machine) is "inert" as distinguished from automatically self-righting; and that one having its sustaining planes forming a dihedral angle with the outer edge of the planes uppermost with reference to said plane of the machine is automatically self-righting, as more fully set forth in a paper by Sir George Cayley, reprinted in *The Aeronautical Annual*, No. 1, published at Boston, Massachusetts, 1895. A flying machine which has its planes forming such dihedral angle is subject to certain limitations as more fully explained in a paper by Orville and Wilbur Wright in the *Century Magazine*, published at New York, N. Y., September, 1908,—see pp. 642 and 643.

The object of my invention is to provide an emergency apparatus for controlling flying machines whereby the operator by a single motion of hand or foot is enabled to convert an inert flying machine into an automatically self-righting machine.

With this object in view my invention consists essentially in a flying machine having sustaining-planes normally parallel to the plane of the machine and to the direction of flight and means under the control of the operator for simultaneously moving all said planes into positions inclined to said plane of the machine with their outer edges uppermost with respect thereto whereby said planes pair by pair form dihedral angles.

In the drawings which accompany and form a part of this application, Figure 1 represents a plan view of one embodiment of my invention and Fig. 2 is a side view thereof.

In that particular embodiment of my invention herein selected for illustration A, A represent two pairs of sustaining-planes which may have any suitable size and shape and which are placed some distance above

the center of gravity of the flying machine, one pair being fore-and-aft planes and the other pair being lateral planes, as shown in Fig. 1. The axles C C' of each plane have bearings in the journals B B and said journals are supported to the frame work of the machine, extending upwardly therefrom.

As shown in full lines in Fig. 2, the planes A, A normally are parallel to the geometric plane of the machine and to the direction of flight. When they are so positioned the machine is inert. By suitable apparatus, herein shown as the controlling lever H and the levers and rods D, E and F, the operator is enabled simultaneously to move all the planes A A into positions inclined to the plane of the machine, with the outer edges of said planes uppermost, as shown in dotted lines in Fig. 2, so that the machine is automatically self-righting.

Any suitable means may be provided for changing the position of the planes, and in the particular form of my invention herein described, the levers F F are rigidly secured to the block G, to which the lever H is connected by the rod I, and each is pivotally connected with the connecting rod E which in turn is pivoted to an arm D secured to and depending from the axles C' which are rigidly connected with said planes. It will be obvious that when the lever H is rotated in a counter-clockwise direction, the rods E will move in the directions indicated by the arrows in Fig. 1, and consequently the planes A, pair by pair, will form dihedral angles. It will be understood that the lever H or other operating means may if desired be moved by a released spring or other suitable device.

If the aeroplane is motor-actuated, it is desirable that the means employed to shift the positions of the plane should simultaneously stop the motor, and this may be effected by arranging a motor-control circuit, for instance the circuit of the sparker, so as to be closed by the lever when the latter is in normal position and to be opened when the lever is moved out of normal position.

In the drawings J represents the sparker, K is a battery, M is a connection of the sparker-circuit to the conducting block G, and L is the contact formed between the sparker-circuit and the lever H when the latter is in normal position.

The operation is as follows: When the apparatus is in its normal position, the planes

are parallel to the geometrical plane of the machine shown in Fig. 1 and as they encounter the air edgewise, the machine is therefore inert. If the operator, who will

5 be assumed to be strapped to his seat, for any reason loses control of the flying machine and the latter is overturned in the air, a single movement of the controlling lever H will stop the motor by breaking the motor-control circuit, and throw all the planes 10 into the position shown in dotted lines in Fig. 2, so that said planes pair by pair form dihedral angles with the outer edges of the planes uppermost relatively to the machine. 15 This brings into play the principle now commonly called the dihedral angle principle above referred to and the flying machine upon that principle rights itself and slowly descends, thereby giving the operator the 20 option of landing or resuming flight; it being assumed of course that the machine is operated at a sufficiently great altitude to permit said principle to come into play.

Although I have described one particular 25 embodiment of my invention in order to more fully disclose the principle thereof, it will be understood that I do not limit myself to said embodiment inasmuch as many modifications may be made therein by those 30 skilled in the art without departing from said principle.

I claim:

1. A flying machine having a pair of fore-and-aft sustaining planes and a pair of 35 lateral sustaining-planes, all said planes being parallel to a given geometric plane, and means under the control of the operator for simultaneously changing the positions of all said planes so that each pair will form a 40 dihedral angle with the outer edges of each plane uppermost with respect to the machine.

2. A flying machine having sustaining-

planes normally parallel to the geometric plane of the machine, means under the control 45 of the operator for simultaneously moving all said planes into positions inclined to said plane of the machine with their outer edges uppermost with respect thereto, and a motor-control circuit arranged to be opened 50 and closed by said means.

3. A flying machine having sustaining-planes normally so positioned as to render said machine inert, means under the control 55 of the operator for simultaneously changing the positions of all said planes so as to render the machine automatically self-righting and a motor-control circuit arranged to be opened and closed by said means.

4. A flying machine having a plurality of 60 pairs of sustaining-planes, all parallel to a given geometric plane, means under the control of the operator for simultaneously changing the positions of all said planes so that each pair will form a dihedral angle 65 with the outer edges of each plane uppermost with respect to said machine and a motor-control circuit arranged to be opened and closed by said means.

5. A flying machine having sustaining- 70 planes normally parallel to the geometric plane of the machine, a controlling lever, means actuated thereby for simultaneously moving all of said planes into positions inclined to said plane of the machine with 75 their outer edges uppermost with respect thereto and a motor-control circuit arranged to be opened and closed by said lever.

In testimony whereof, I have hereunto subscribed my name this 5th day of Oct. 80 1908.

JAMES MEANS.

Witnesses:

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GEO. K. WOODWORTH.