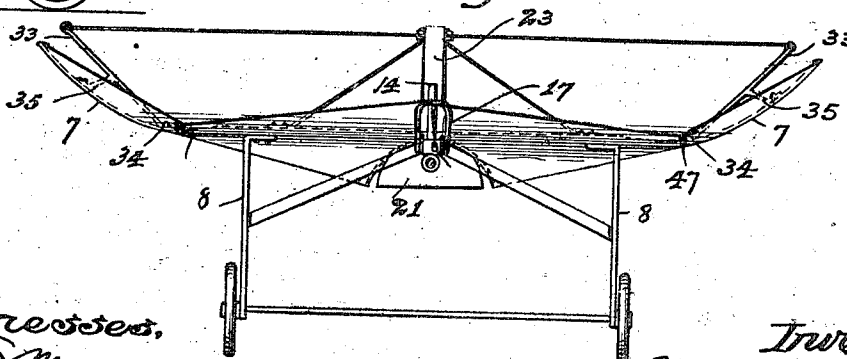
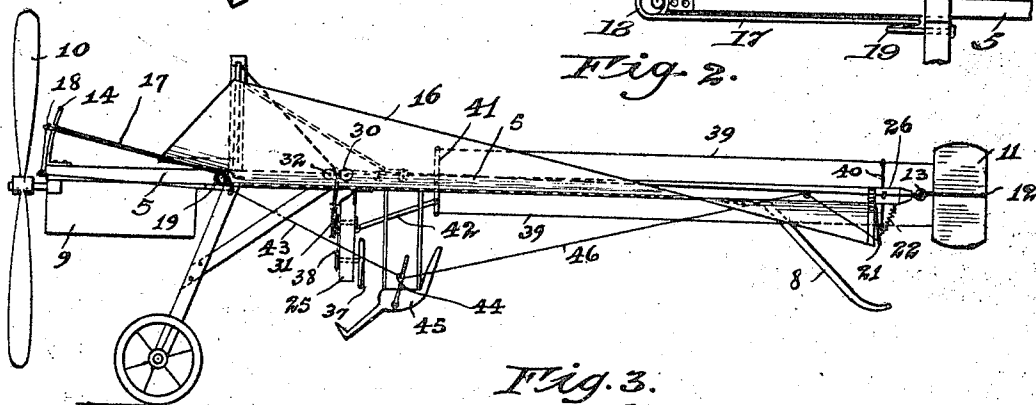
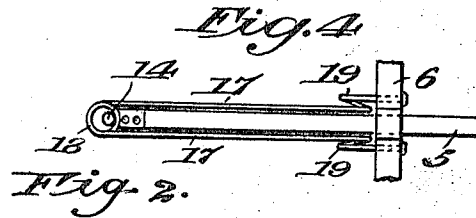
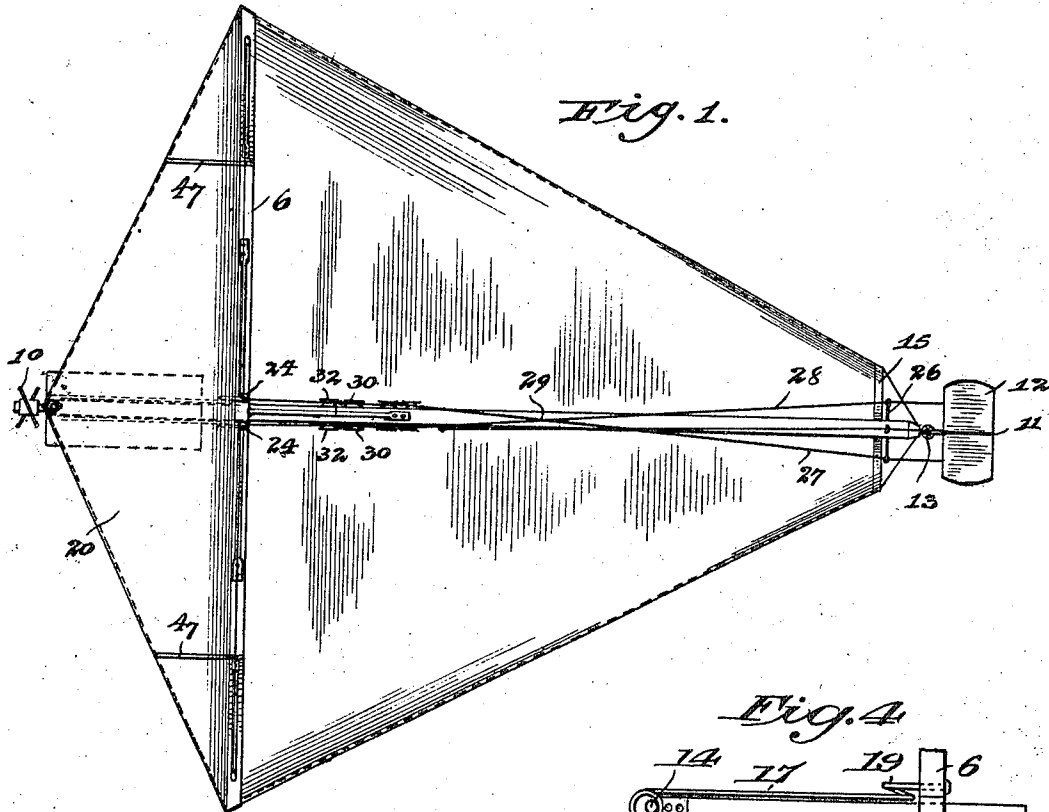


H. J. KRAFT.
AEROPLANE.
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AEROPLANE.

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To all whom it may concern:

Be it known that I, HENRY J. KRAFT, of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

The invention relates in general to aeroplanes and is particularly applicable to a monoplane for the purpose of giving greater stability; one of the general objects of the invention, however, being to provide novel means of control whereby the operation of a single member will control several members simultaneously.

Further objects of the invention will appear throughout the specification, the preferred form of construction being shown in the accompanying drawing, in which—

Figure 1 is a top plan view of my improved aeroplane; Fig. 2 is a side elevational view of Fig. 1; Fig. 3 is a front elevational view of Fig. 1; Fig. 4 is an enlarged plan view of the spring shown in plan in Fig. 1.

Referring now more particularly to the drawings, the aeroplane consists of a base member 5 to which there is secured, near one end, a transverse fabric supporting member 6 which may be made of any suitable material and which is preferably made of wood and having its ends 7 suitably thinned so that they are rendered flexible and may assume either a curved or straight position. A suitable running gear 8 is secured to the frame members for landing purposes.

The engine is represented at 9 which is preferably secured to the forward end of the base 5 driving the usual propeller 10.

The steering planes consist of two planes 11 and 12 arranged at right angles to each other and suitably secured together, the planes being arranged vertically and horizontally, respectively. These planes are secured to the base member 5 by a universal joint 13.

At the forward end of the longitudinal base member 5 a post 14 is secured. A rear support 15 having downwardly curved ends is secured to the base member 5 and the covering 16 extends from the ends of the rear support 15 to the ends of the frame member 6 and then converges forwardly of the member 6 to the post 14. A suitable spring 17, which is bent upon itself so as to form an eye 18, slidably engages the post 14, and is

formed with parallel sides projecting rearwardly from the post 14, each side being formed with coils 19 and the free ends are secured to the frame 6. This spring serves to normally hold the forward surface 20 of the covering in the angular position best shown in Fig. 2.

Within the bow or end piece 15 is a tail plane 21 suitably hinged to the frame member 5 and normally held in a substantially horizontal position by the spring 22.

In the construction so far described the movable parts other than the engine and running gear consist of the flexible ends 7; the forward plane 20, the tail piece 21 and the steering planes 11 and 12. The object in making the ends of the frame member 6 flexible is to give better stability to the aeroplane upon making turns.

When the steering planes 11 and 12 are operated, such as by giving a different vertical angle to the plane 11, the device may be turned either to the right or left. In the event that the device is turned to the right, it is desirable to allow the right flexible end of the frame member 6 to assume a position substantially parallel with the straight section of the member 6 so that the angular tip of the plane is decreased, thereby cutting down the head resistance upon the turn and the opposite end of the frame is bent upward slightly more to balance the plane and thereby neutralize the effect of the decrease in the angle at the other end.

Since it is desirable to have simultaneous movement between the steering mechanism for turning the device to either the right or left and the flexing of the ends of the plane, the following mechanism is provided to accomplish this result: Mounted centrally of the frame member 6 is a post 23 provided with suitable guide pulleys 24 on opposite sides and near its upper end. Below the base member 5 a steering post 25 is hinged to the base member 5, said steering post being so designed that it can be moved upon its hinge in an arc longitudinally of the base member 5 in either direction. A spreader 26 extends through the base member 5 and is provided with suitable eyes at both ends. Suitable cables 27 and 28 are secured to the steering plane 12 upon opposite sides of the universal joint, these cables extending longitudinally of the frame 5 crossing each other at the point 29 and then riding over the guide pulleys 30 where

they turn around a drum 31 rotatably mounted on the steering post 25. After making one or more convolutions around the drum 31 they extend vertically riding over the guide pulleys 32 and thence around the pulleys 24 to the angle braces 33. Each end of the frame member 6 is provided with an angle brace 33, one end 34 of each brace being secured to the member 6 at a suitable point, while each angle brace is also provided with a brace 35 that is secured to the flexible ends of the member 6. The steering wheel 37 is connected to the drum 31 by means of a suitable chain and sprocket mechanism 38. It will thus be seen from the foregoing description that upon turning the steering wheel 37 in one direction the cable 27 will be pulled down over the guide pulley 30 and paid out over the guide pulley 32; thus the angle of the plane 11 will be changed so that the major portion of the plane is to one side of the universal joint 13, thereby causing the plane to turn to the left and at the same time giving a greater curve to the right hand end of the base member 5. The same turning action of the steering wheel pays out on the cable 28 so that the left hand end of the frame member 6 will straighten under the natural spring of the material from which it is made. Upon giving a reverse turn to the steering wheel the left hand end of the frame member 6 will be curved and the right hand end straighten simultaneous with the movement of the steering plane 11 to the other side of the universal joint so as to turn the machine to the right.

The horizontal plane 12 is controlled by means of two cables 39 which pass through eyes in a spreader 40, said cables being secured on opposite sides of the universal joint 13 to the plane 11 and at their other ends to the cross-bar 41 which is pivotally mounted on the frame member 5. The cross-bar 41 is connected to the steering post 25 by means of a link 42 whereby the movement of the post 25 will rock the cross-bar 41 thereby changing the angle of the plane 12 so as to move it in a vertical arc, whereby the device may be guided in a vertical direction.

As the speed of the machine increases it is desirable to change the angle of the front section 20 of the covering which is accomplished by means of a cable 43 connected to the eye 18 of the spring 17 at one end and to an operating lever 44 pivotally mounted on the operator's chair 45. Another cable 46 leads from the lever 44 to the tail piece 21 whereby as the angle of the forward portion 20 of the plane is changed the angle of the tail piece will be also changed to neutralize and balance the device.

As a means for supporting the forward ends of the front portion 20 of the plane,

I provide rigid braces 47 that are secured to the frame member 6 and extend upwardly thereof to the front edge of the covering.

Having now described my invention, I claim:

1. An aeroplane comprising a frame having a longitudinal base member and a forward transverse fabric-supporting member having flexible and upwardly curved ends, a support secured to the forward end of said base member, a covering secured to said frame members and having one edge thereof slidably connected to said support, means for flexing the ends of said transverse members, means for vertically shifting the edge of said covering along said support and means for propelling and guiding said aeroplane.

2. An aeroplane comprising a frame having a longitudinal base member and a forward transverse fabric-supporting member having upwardly curved and flexible ends, a covering for said frame member, a supporting post secured to the forward end of said base member and to which the forward edge of said covering is slidably secured, a movable rear tail piece secured to said base member, means for simultaneously moving said covering on said support and said movable tail piece, means for flexing the ends of said transverse frame member and means for propelling and guiding said aeroplane.

3. An aeroplane comprising a frame having a longitudinal base member and a forward transverse fabric-supporting member having flexible and upwardly curved ends, a support secured to the forward end of said base member, a covering secured to said frame member and having one edge thereof slidably connected to said support, a tail piece movably connected to the rear end of said base member, a lever, connecting means between the edge of said covering that is slidably connected to said support and said lever and between said lever and said tail piece whereby the movement of said lever simultaneously changes the angle of both the forward edge of said covering and said tail piece, and spring means for returning both the forward edge of said covering and said tail piece to normal position and means for propelling and guiding said aeroplane.

4. An aeroplane comprising a frame having a longitudinal base member and a forward transverse fabric-supporting member having flexible and upwardly curved ends, a support secured to the forward end of said base member, a covering secured to said frame members and having its forward edge slidably connected to said support, steering planes connected to the rear of said base member for giving both vertical and horizontal direction to said aeroplane, a steering post hinged to said base member and capable of being swung longitudinally of said

base member in either direction, a steering wheel carried by said steering post, means connecting said steering planes with said steering wheel, means connecting said steering wheel with said flexible and upwardly curved ends whereby a single movement of said steering wheel simultaneously operates said curved ends and guides said aeroplane in a horizontal direction and means connecting said steering planes with said steering post whereby a swinging movement of said steering post guides said machine in a vertical direction.

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