

G. H. LOOSE.
AEROPLANE.

APPLICATION FILED JUNE 30, 1910.

1,015,045.

Patented Jan. 16, 1912.

2 SHEETS-SHEET 1.

Fig. 1.

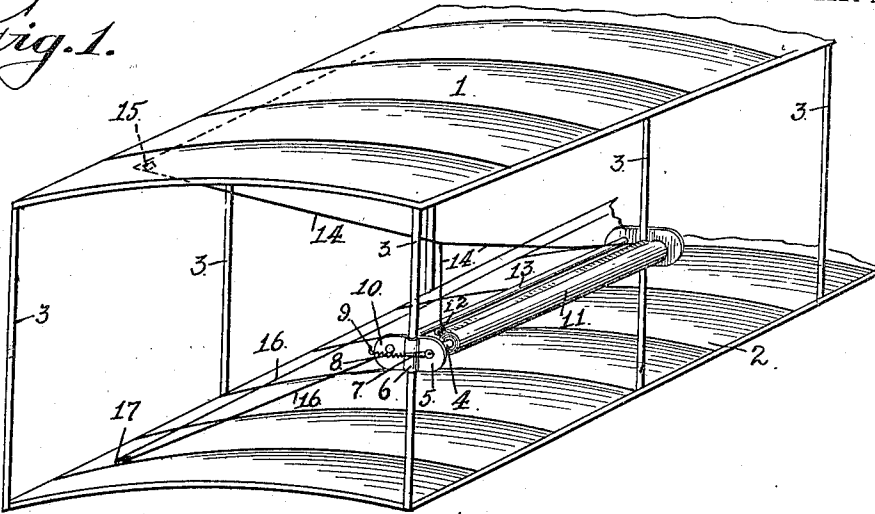


Fig. 2.

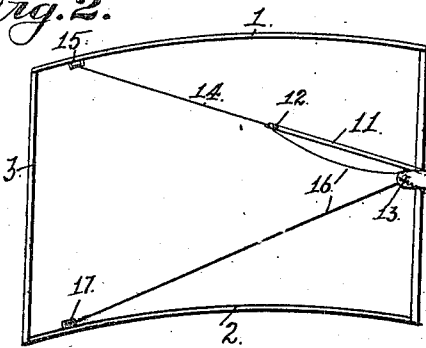


Fig. 3.

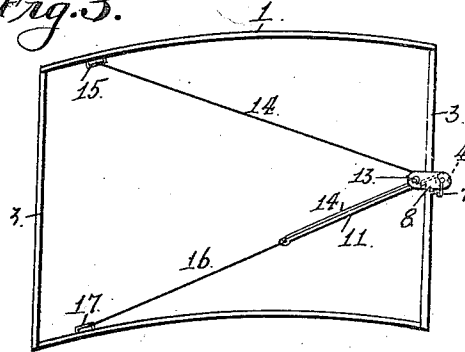
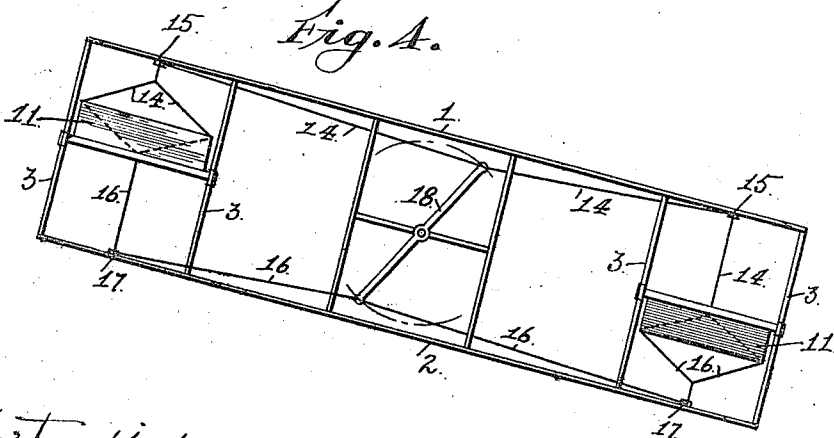


Fig. 4.



Witnesses:

Arthur L. S. Lee

S. Constance

Inventor

George H. Loose

by Wm. F. Booth
his Attorney.

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2 SHEETS—SHEET 2.

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Fig. 5.

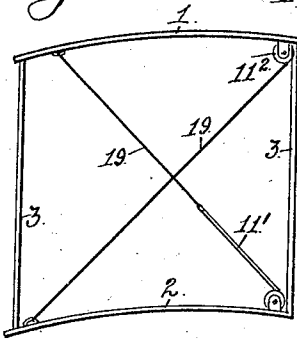


Fig. 6.

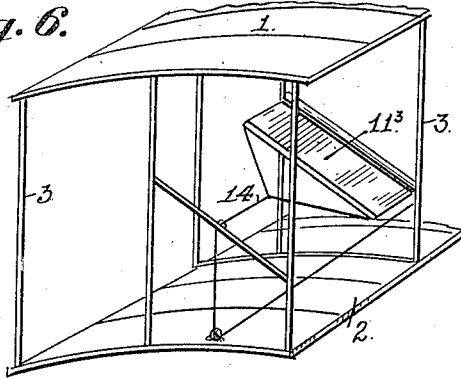


Fig. 7.

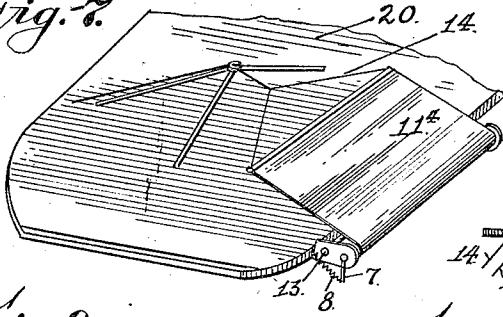


Fig. 8.

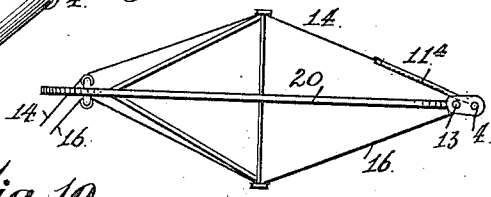


Fig. 9.

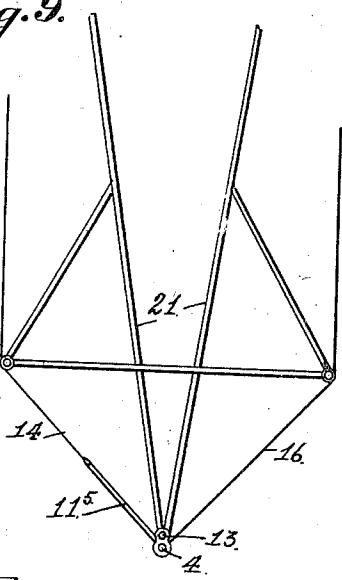
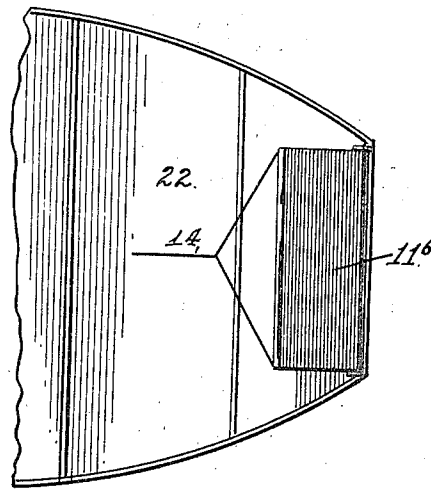


Fig. 10.



Witnesses:

Arthur L. Slee.
S. Constance

Inventor:

George H. Loose
by Wm. F. Booth
his Attorney.

UNITED STATES PATENT OFFICE.

GEORGE H. LOOSE, OF SAN FRANCISCO, CALIFORNIA.

AEROPLANE.

1,015,045.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed June 30, 1910. Serial No. 569,741.

To all whom it may concern:

Be it known that I, GEORGE H. LOOSE, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

My invention relates to the class of aeroplanes, in which the weight is sustained by the reactions resulting when one or more planes are moved through the air edgewise at an angle of incidence, either by mechanical power or by utilizing the force of gravity.

The object of my invention is to provide a means for controlling the aeroplane by maintaining or restoring its equilibrium or lateral balance, both vertically and horizontally.

In machines of the aeroplane type, the device is supported by reason of the impingement of the air upon the under surface of one or more planes, the impingement surface being presented at an angle of incidence. The relative movements of the air and the aeroplane can be derived from the motion of the air in the form of wind blowing in a direction opposite to that in which the device is going or by a combined downward and forward motion of the machine, as in starting from an elevated position. In either case the action is that of soaring. Power being applied to the machine to drive it forward will cause the air to support it in a like manner. In all cases, owing to the varying conditions to be met with, there are numerous disturbing forces which tend to shift the machine from the position which it should occupy to obtain the desired results. By my invention this difficulty is remedied, and I am able to change the position of the machine at will, thereby restoring and maintaining equilibrium.

My invention consists in the novel controlling plane, its mounting and connections, as I shall now fully describe by reference to the accompanying drawings in which—

Figure 1 is a perspective view of one end of a bi-plane aeroplane showing the application of my invention, the controlling plane or curtain being in a rolled up position out of use. Fig. 2 is an end view of the same; the controlling plane or curtain being shown drawn from its roller at an upward angle. Fig. 3 is an end view, similar to Fig. 2, but with the controlling plane drawn at a downward angle. Fig. 4 is a front view of a bi-plane in full, showing the controlling planes

at each end, one being at an upward angle and the other at a downward angle, the positions being such as to right the machine. Fig. 5 is an end view of a bi-plane showing the use of two controlling planes at one end and reversely operating. Fig. 6 is a view showing a different position of the roller of the controlling plane, but resulting in the presentation of the plane at an angle to the direction of travel of the machine. Fig. 7 is a view showing the application of my invention to one end of a mono-plane. Fig. 8 is an end view of the same. Fig. 9 is a plan view showing the application of my invention as a rudder in a vertical plane. Fig. 10 is a view showing it as a rudder in a horizontal plane.

In Fig. 1, are shown the sustaining planes 1 and 2, and the uprights 3 of one end of a bi-plane aeroplane. Between two of the front uprights is mounted a roller 4. A good way of mounting this roller is by journaling its ends in one of the wings 5 of a tubular bracket 6 secured on the upright. This roller 4 is a spring controlled one of any suitable kind. A good way to keep it under rotative tension is to attach an arm 7 to its journal end, the other end of the arm being connected with a spring 8, which is fastened to a hook 9 on the other wing 10 of the bracket 6. Mounted upon this roller 4 so that it may wind upon it and be unwound from it, is a flexible sheet or curtain 11, of suitable nature, fabric or other material, the free end of the curtain being hemmed and a stiffening bar 12 inserted. Mounted in the other wing 10 of the bracket 6 is a guide roller 13 which lies parallel with and separated from the curtain carrying roller 4, in such position as to direct the curtain 11, either up over said guide roller or down under it. Wire or other connections 14 extend from the free edge of the curtain upwardly and backwardly to a guide pulley 15 in the upper rear portion of the device and thence to the operator's control. Other similar connections 16 extend from the curtain downwardly and backwardly to a pulley 17 in the lower rear portion of the device and thence to the operator's control. The connections of these wires should best be such that by the movement of a lever, one of the wires is pulled upon and the other paid out by a single movement. If it be desired to present the control-plane or curtain 11, at an upward angle as shown in Fig. 2, the upper wires 14 are pulled upon, so that

the curtain is unwound from its roller, while the lower wires pay out and over the guide roller 13. When released the curtain will rewind upon the roller 4, under the power of the spring control. If the control-plane is to be presented at a downward angle, as shown in Fig. 3, the lower wires 16 are pulled upon, and the curtain will follow, under the guide roller and will rewind again when released. Thus the control-plane or curtain may be presented at an angle on either side of the direction or axis of travel of the machine, that is, at opposite angles to said axis and to any desired extent of functional surface, and it will be observed that on account of the wire connections and their directions and the tension of the roller 4, these angles of presentation will be invariable. When the curtain is presented at an upward angle as in Fig. 2, the effect will be to lower that end of the machine. When presented at a downward angle, as in Fig. 3, its effect is to raise said end. These curtain-controls will, of course, be at each end of the machine. This I show in Fig. 4, wherein the aeroplane is shown as tilted laterally and the curtains set relatively oppositely, that on the left or higher end of the figure being at the upward angle, and that at the right or lower end being at the downward angle, which positions are those required to right the machine. In this view are shown the wire connections 14 and 16, so arranged, and connected with a single operating lever 18, that when the lever is moved in one direction one of the curtains will be presented at an upward angle and the other at a downward angle and vice versa. It is not essential, though I deem it the best arrangement, that the same curtain be presented at either angle. Thus in Fig. 5, I show two separate curtains one below designated by 11' and one above by 11². These are operated by suitable connections 19, the lower one being arranged to be presented at an upward angle and the upper one at a downward angle. Nor is it essential that the curtain move from front to rear. It may be mounted as shown at 11³ in Fig. 6, in which arrangement the curtain moves lengthwise of the device but at the required angle to the direction of travel of the machine.

Although I have, thus far, described my invention as applied to bi-planes, it is evident that it is equally applicable to monoplanes, as I show in Figs. 7 and 8. In these figures 20 is the sustaining plane of the device. The curtain 11⁴ is here mounted on the forward edge of one end of the plane, it being understood that another similar curtain is to be mounted on the other end of the plane. The curtain is here adapted to be presented above the plane 20 at an up-

ward angle and below it at a downward angle.

In Fig. 9, I show the curtain-control 11⁵ as applied for use with a vertical rudder 21 being here adapted to be presented at either side.

In Fig. 10 I show the curtain-control 11⁶ as applied for use with a horizontal rudder 22.

Having thus described my invention what is claimed as new and desired to be protected by Letters Patent is—

1. In an aeroplane, and in combination with the sustaining plane or planes of the device, a controlling plane adapted to be presented at a fixed angle either above or below the direction of travel of the device, and means for augmenting and diminishing the functional surface of said controlling plane.

2. In an aeroplane, and in combination with the sustaining plane or planes of the device, a controlling plane adapted to be presented at a fixed angle either above or below the direction of travel of the device, and means for extending and contracting said controlling plane to augment or diminish its functional surface.

3. In an aeroplane, and in combination with the sustaining plane or planes of the device, a controlling plane adapted to be presented at a fixed angle either above or below the direction of travel of the device, and means for furling and unfurling said controlling plane to diminish or augment its functional surface.

4. In an aeroplane, and in combination with the sustaining plane or planes of the device, a controlling plane adapted to be presented at a fixed angle either above or below the direction of travel of the device, and means for rolling up and unrolling said controlling plane to diminish or augment its functional surface.

5. In an aeroplane, and in combination with the sustaining plane or planes of the device, a controlling means comprising a spring controlled roller, a flexible sheet carried by said roller, connections to unwind the sheet from the roller in a plane at an angle on either side of the direction of travel of the device, and a guide roller parallel with and separated from the sheet-carrying roller to direct the unwinding of the sheet to either angle.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE H. LOOSE.

Witnesses:

WM. F. BOOTH,
D. B. RICHARDS.