

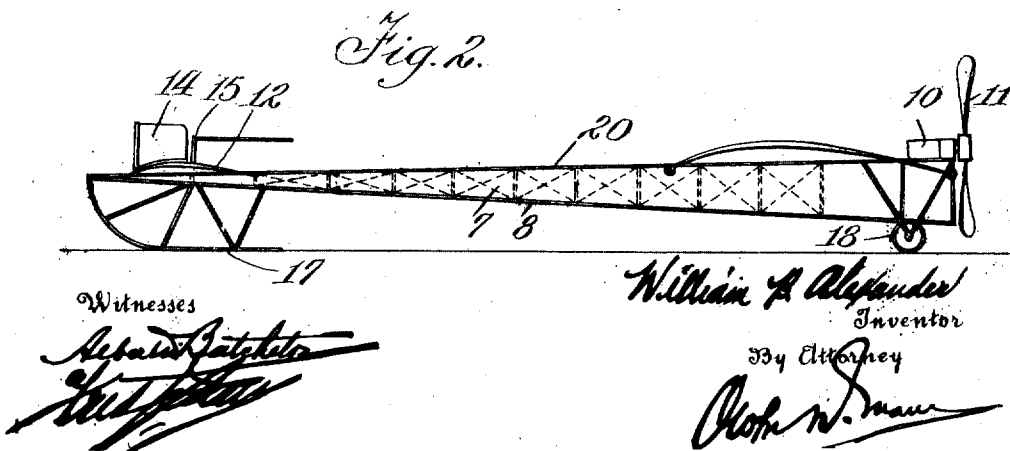
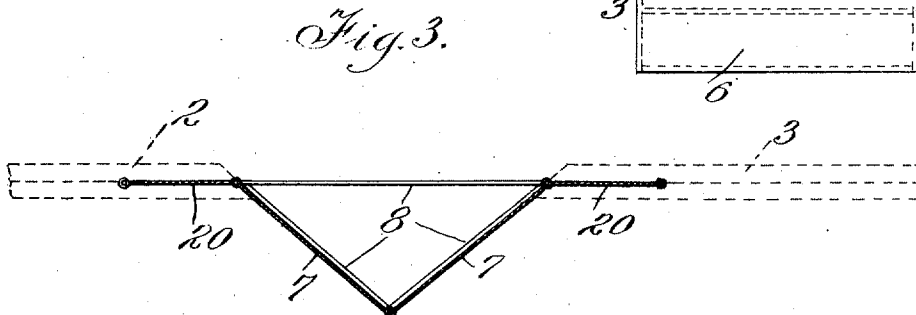
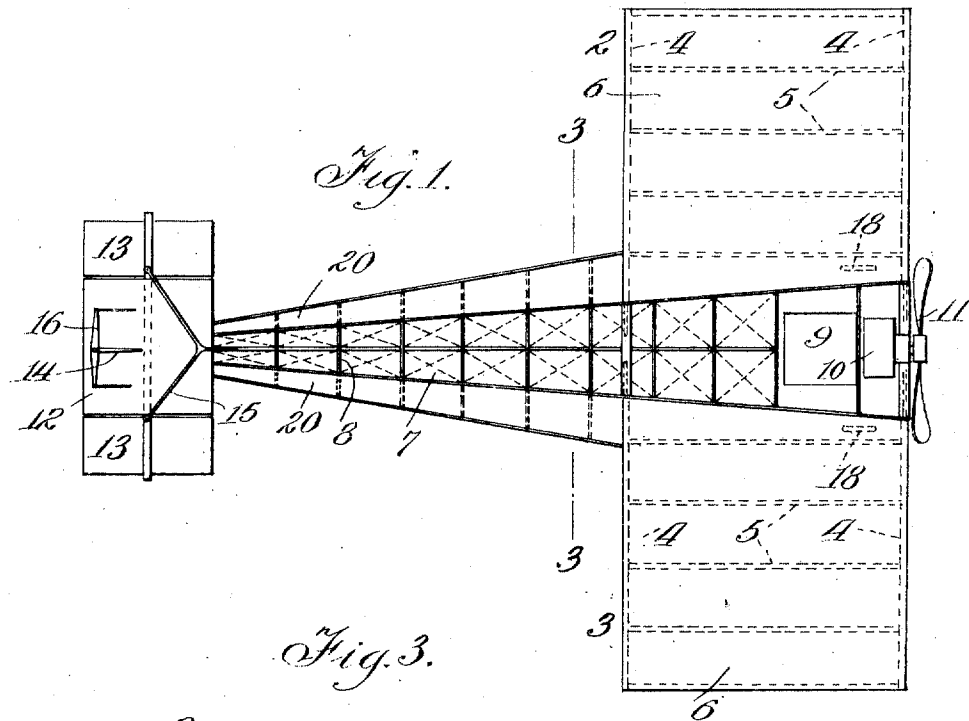
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AEROPLANE.

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994,106.

Patented June 6, 1911.



UNITED STATES PATENT OFFICE.

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AEROPLANE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM BOYD ALEXANDER, of the city of Montreal, in the Province of Quebec and the Dominion of Canada, have invented certain new and useful Improvements in Aeroplanes; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates more particularly to the arrangement of the planes or surfaces which by their contact with the air control the action of the aeroplane while in motion, the object of the invention being to provide an aeroplane which will be in stable equilibrium under ordinary conditions that is to say which will automatically maintain its balance under ordinary conditions without necessitating the employment of moving parts, such as ailerons, warping or flexing wings, or the like.

Other objects and the advantage of the invention will be apparent to those skilled in the art from a consideration of the following description and accompanying drawings in which my invention is described and illustrated, in which drawings—

Figure 1 is a plan view of an aeroplane constructed according to my invention, Fig. 2 is a side elevation thereof, and Fig. 3 is a detail enlarged transverse section taken on line 3—3 Fig. 1.

My improved aeroplane comprises a main sustaining or lifting plane made up of two laterally disposed and oppositely projecting sections or wings 2 and 3 respectively curved from front to rear as shown in Fig. 2 such curvature being preferably parabolic. These plane sections may be constructed in any approved fashion, the frames thereof being here indicated as made up of the front and rear cross bars 4, and ribs 5 over which is stretched a suitable fabric or covering 6. These wings 2 and 3 are secured at their inner edges to the top side edges of a longitudinal body member of angular cross section with downwardly converging closed sides which may be formed by stretching a suitable covering or fabric 7 over the lower sides of an inverted triangular frame or

fuselage indicated by the reference numeral 8, this frame tapering longitudinally to the front as shown in Figs. 1 and 2 and having the converging lower sides thereof forming for reasons to be pointed out later an angle of substantially 100° with each other as shown in Fig. 3, this frame forming the main frame of the aeroplane upon which and between the converging sides thereof may be supported the pilot's seat 9 and motor 10 for driving the propeller 11, it being understood that I do not confine myself to the use of any particular means for propelling the aeroplane. This body member also acts as a fin or heel to prevent "drift" or sidewise movement and extends longitudinally beyond the plane 2 and projects at its forward end underneath and is connected to an auxiliary plane 12. This plane 12 is placed at a distance in front of the main plane and may be provided with adjustable side sections or ailerons 13 by means of which vertical steering is accomplished, while a rudder 14 for lateral steering is provided, such ailerons and rudder being controlled by any suitable means a portion of which is indicated respectively by the numerals 15 and 16 but which is not necessary to be illustrated or described here in detail as such means forms no part of my invention and would be readily supplied by any skilled mechanic. The aeroplane may be supported when on the ground by any suitable means as the skid 17 under the front plane and wheels 18 under the main plane.

Projecting laterally from the top side edges of the longitudinally intermediate portion of the fin (or that between the front and rear planes) are flanges 20 which I term baffle flanges, these flanges being comparatively narrow and preferably tapering slightly from front to rear at which points they connect respectively to the rear of the front plane and the front of the rear plane. These flanges may taper in width from front to rear in correspondence with the taper of the fin, the flanges being preferably throughout their length of a width equal

to one half the depth of the corresponding or adjacent portions of the inclined sides of the fin.

By constructing the fin with the sides thereof forming an angle of slightly greater than 90° with each other and providing the baffle flanges I have found that a maximum stabilizing effect is obtained by the use of such fin as a relatively large variation occurs in the upward pressure or "lift" on the opposite sides thereof upon any slight loss of lateral balance, such variation in pressure acting to restore balance as will be readily understood. These baffle flanges prevent the air from spilling over the upper edges of the fin or body and direct it under the rear plane, the expanding of the fin or body toward the rear end causing as will be readily understood a compression of the air, which compressed air is caused by the flanges to be directed as just stated under the main plane. These flanges however do not extend laterally a sufficient distance to affect the proper contact of the curved wings with the air (whereby the lift is obtained) but act in conjunction with the fin to cause the air to be somewhat compressed in meeting such plane and thereby increase its lifting capacity, the transverse width of the main plane being as shown in the drawings substantially greater than the combined width of the fin and baffle flanges at the point of juncture of the latter with the plane.

By means of my improved arrangement the frame or fuselage which extends longitudinally to support the fore and aft balancing plane 12 is employed to present a surface acting both to maintain lateral balance, to prevent "drift" and to increase the total lifting capacity of the aeroplane with a comparatively small increase in the total weight.

It will be understood of course that for use in very gusty or stormy weather or in making sharp turns the aeroplane may if desired be fitted with ailerons or other movable balancing parts although as such parts form no part of my invention they have not been here shown.

What I claim is as follows:—

1. An aeroplane consisting of front and rear planes, an angle shaped fin extending between and connecting such planes, and baffle flanges extending laterally from the top side edges of such fin, the said rear plane being of substantially greater transverse width than the combined width of the fin and baffle flanges at the point of juncture of the said baffle plates and plane.

2. An aeroplane consisting of a main sustaining plane made up of two laterally disposed and longitudinally curved sections, an open-topped hollow angle shaped fin located between such sections and to the upper top

sides of which the said sections are connected, such angle-shaped fin extending longitudinally of the aeroplane beyond the said plane, baffle flanges projecting laterally from the top side edges of such extended portion, the said plane sections being of substantially greater width than the said flanges.

3. An aeroplane consisting of a main sustaining plane made up of two laterally disposed and longitudinally curved sections, an open-topped hollow angle shaped fin disposed longitudinally of the aeroplane and located between such sections and to the upper top sides of which the said sections are connected, such angle shaped fin extending at one end forwardly of the said main sustaining plane, and lower sides of such fin forming an angle with each of slightly greater than 90°, baffle flanges projecting laterally from the top side edges of such extended portion, the said plane sections being of substantially greater width than the said flanges and an auxiliary lifting plane placed at a distance in front of the main plane and to which the front end of such fin is connected.

4. An aeroplane consisting of front and rear planes, and an angle-shaped fin extending between and connecting such planes such fin tapering toward the front of the aeroplane, and baffle flanges projecting laterally from the top side edges of the said fin such baffle flanges being throughout their length of a width substantially one-half the depth of the adjacent portions of the sides of the fin.

5. An aeroplane comprising a main sustaining plane made up of two oppositely disposed sections, an auxiliary plane arranged in front of and spaced apart from such plane, a longitudinally disposed frame of inverted triangular cross-section forming the main frame of the aeroplane and having the said main plane sections connected to the rear portions of the top side edges thereof and being connected at its front end to the auxiliary plane, such frame tapering toward the front and having the lower converging sides thereof fabric covered, for the purpose set forth.

6. An aeroplane comprising a main sustaining plane made up of two oppositely disposed sections, an auxiliary plane arranged in front of and spaced apart from such plane, a longitudinally disposed frame of inverted triangular cross-section forming the main frame of the aeroplane having the said main plane sections connected to the rear portions of the top side edges thereof and being connected at its front end to the auxiliary plane, such frame tapering toward the front and having the lower converging sides thereof fabric covered, and baffle flanges projecting outwardly from the

top side edges of the said frame and connected at opposite ends to the main and auxiliary planes, such flanges being throughout their length of a width substantially
5 one half the depth of the adjacent portions of the said fabric covered sides of the frames, for the purpose set forth.

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

WILLIAM BOYD ALEXANDER.

Witnesses:

ALEX. CURRIE,
FRED J. SEARS.