A. M. McINTOSH.

AEROPLANE.

APPLICATION FILED MAR. 16, 1911.

1,050,222.

Patented Jan. 14, 1913.

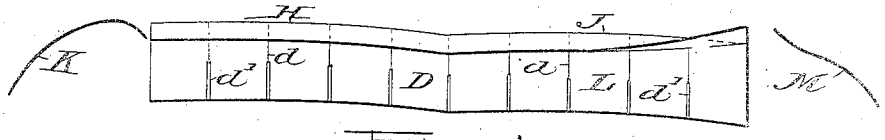


Fig 1

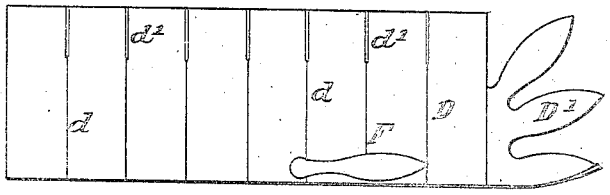


Fig 2

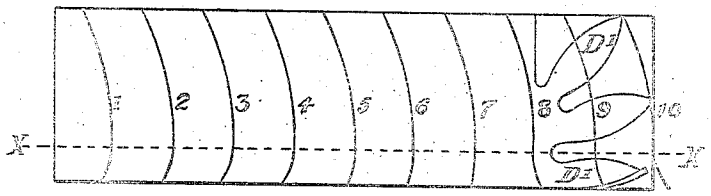


Fig 3

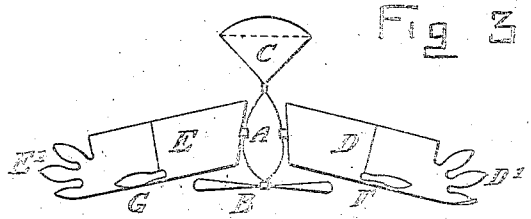
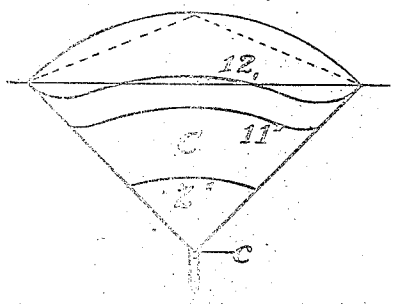


Fig 4

Fig 5



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AEROPLANE.

1,050,222. Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed March 16, 1911. Serial No. 614,914.

To all whom it may concern:

Be it known that I, ARTHUR MARSHALL McINTOSH, a subject of the King of Great Britain, residing at 157 Macquarie street, Sydney, in the State of New South Wales, Commonwealth of Australia, have invented new and useful Improvements in Aeroplanes, of which the following is a specification.

In this invention there are several improvements relating to the wings and rudder of an aeroplane.

The first improvement consists in making each wing of the aeroplane in two longitudinal convex arcs.

The second improvement consists in turning the front edge of each wing upward for a quarter or more of the length of the front edge of the wing, the turned up part being the most remote from the car.

The third improvement consists in scalloping the extreme end of each wing, thus forming a kind of terminal wing pinions with air spaces between the pinions.

The fourth improvement consists in providing a small auxiliary wing at or near the center of the front edge of each wing. This auxiliary wing may be manipulated from the car by a series of wires or rods. The auxiliary wing is adapted to be thrust out in front of the main wing.

The fifth improvement consists in splitting the back edge of the main wing whereby the back edge of the wing may be rendered more flexible, thereby conducing to the more perfect flight of the aeroplane.

The sixth improvement consists in dispensing with the perpendicular rudder and adopting a horizontal kite-shaped rudder of special design.

In order that the invention may be properly understood, reference is hereby made to the accompanying sheets of drawings, in which:

Figure 1 is a general front view of a plane left wing showing the longitudinal convex arcs and the front edge turned up at the outer end. Fig. 2 is a diagram showing a wing laid flat, the extreme end being scalloped, as above indicated, and the back edge split at intervals. Fig. 3 is a diagram showing the wing in plan view, the thick transverse lines showing the contour of the sections of the wing at the several points. Fig. 4 is a plan view on a small scale of the general arrangement of the several members of the aeroplane. Fig. 5 is a plan view of the horizontal rudder, the thick transverse lines showing the several sections of the kite-shaped rudder at those points.

Referring now to Fig. 4, A is the car, B the propeller which is in front and projects from the car at a relatively high point, C the rudder which should be placed at a lower level than the propeller, being, approximately, on a line with the bottom of the car; D is the left wing, E the right wing. Each wing is scalloped at the end, at D^1, E^1 respectively. At or near the front center of each wing is a small auxiliary wing or sail F, G, which may be thrust out or withdrawn at the pleasure of the driver in the car. It will be remarked that the main wings D, E, incline forward from the center toward the front, thus forming a very obtuse angle. These wings may be manipulated from the car to a limited extent, that is to say, the wings may be caused to assume any position between the forward position shown in Fig. 4, and a corresponding position on the opposite side of a horizontal line at right angles to the axis of the car.

Referring to Fig. 1, it will be seen that the front line of the wing D is formed as two longitudinal arcs, the arc H and the arc J. The wing inclines upward from the back edge and then dips toward the front edge, as shown in the section at K. At a point a short distance beyond the front center of the wing, the front edge will begin to incline upward at or near the point L, until the section of the wing at the extreme end will be of the contour shown at M. In order to facilitate illustration, the end of this wing has not been shown scalloped, but the positions of the scalloped points will follow the contour as shown in the diagram Fig. 3.

Fig. 2 shows the wing laid flat with the end scalloped at D^1. The lines *d*, *d*, represent light ribs which are split at the ends as shown by the double lines at d^1 d^1. These loose ends are very flexible and assist in balancing the car forward and backward during wind gusts. They operate automatically. F shows the auxiliary wing or sail which may be thrust out or withdrawn by means of wires or rods (not shown in the drawing) to be manipulated by the driver in the car.

Fig. 3 is a similar diagram to that shown at Fig. 2 but is for the purpose of illustrat-

ing the sections of the wing at different points. It will be remarked that the sections 1 to 4 are about the same; the part of the section below the line X—X in sections 5, 6, and 7, become progressively straighter; in sections 8, 9, and 10 the parts below the line X—X turn upward, or in the opposite direction to those at sections 1 to 4. These sections illustrate how the view shown at Fig. 1 is arrived at. The scallops D^1 will follow the line of the section. The scallops D^1 are flexible. When the plane is sailing the scallops will always be curved upward, and will greatly assist in maintaining the balance of the plane forward and sidewise during an unequal wind pressure.

Fig. 5 is a plan view of the horizontal kite-shaped rudder C. It presents a convex upper surface as shown by the section, but as the sections approach the horizontal line between the side corners, the edges will be progressively turned up as shown by the sections 11 and 12. The rear edge of the rudder is preferably circular, but it may be made angular, as shown by the dotted lines. The apex *c* of the rudder should be close to the car. The rudder is adapted to receive a lateral tilting motion for the purpose of steering the car to the right or to the left; it will also have a limited vertical tilting motion from the apex *c* in order to enable the car to soar or dive.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A monoplane wing provided with two convex curves extending in the direction of its length, said wing being convexly curved in the direction of its width, the front edge of said wing, adjacent its outer end, being curved upwardly forming a concavely curved portion.

2. In an aeroplane, in combination, a horizontal sector-shaped rudder, the upper surface of which is convexly curved in a direction of its width, the side edges adjacent the rear end of the rudder being turned upwardly, and means to tilt said rudder.

3. In an aeroplane, in combination, a horizontal sector-shaped rudder, the upper surface of which is convexly curved in a direction of its width, the side edges adjacent the rear end of the rudder being turned upwardly, and means to tilt said rudder in the direction of its length and in the direction of its width.

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

ARTHUR MARSHALL McINTOSH.

Witnesses:
ALBERT MASSEY,
CECIL NEWTON.