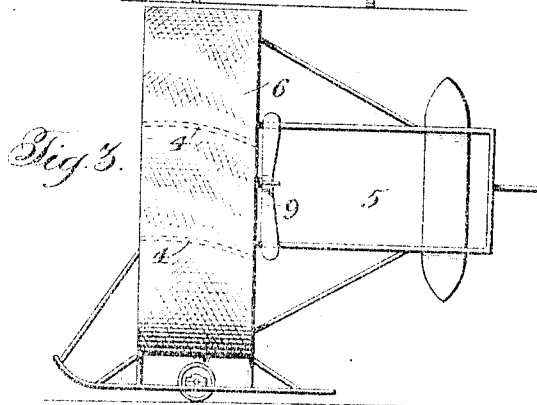
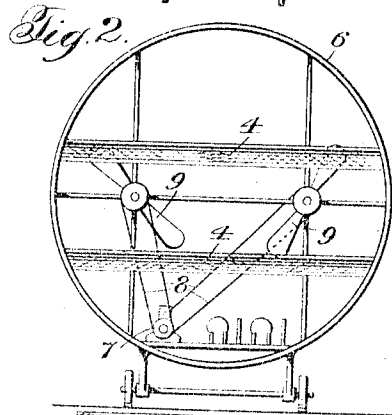
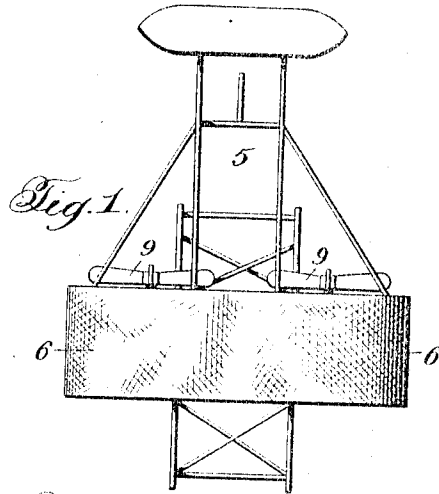


L. J. BERGDOLL.
AEROPLANE.

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1,080,531.

Patented Dec. 9, 1913.



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AEROPLANE.

1,080,531.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS J. BERGDOLL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification, reference being had therein to the accompanying drawing.

10 The aeroplane provided by this invention is so constructed that it has inherent stability laterally; has inherent stability vertically, that is, fore and aft; it automatically banks in negotiating a turn or curve, this being effected by centrifugal force on center of weight or gravity; it is steady in gusty winds, as it constitutes a self-contained and single unit that can be actuated only as a whole and not in sections by uneven air-currents; it is rigid, having no warping or twisting parts; it has no outriggering or other projections; and it can fall only head-on when stalled, whereby the rudders are kept acting and a glide made certain.

25 The foregoing characteristics are imparted to an aeroplane by the embodiment therein of a circular or curved "plane" that surrounds, among other parts, the substantially horizontal sustentation-planes common in machines of this type, in order that there may be presented to the air an equal resistance in all transverse directions and all lateral air or wind kept away from the sustentation-planes. By the use of the circular or curved "plane", it is practicable to place the propelling-engine and other weights carried by the sustentation-planes, and thereby the center of gravity of the machine, below the sustentation-planes, instead of at a point coincident with at least one of them as now is advisable in order to prevent rocking or pendulum action, as the circular or curved "plane" will prevent such air action on the sustentation-planes as would accentuate pendulum action and as the sustentation-planes are left free of themselves to retard such motion. The center of gravity being below that of sustentation, it is relied upon to stabilize the machine.

50 Any standard tail and guiding devices and any standard means of propulsion may be employed with this machine.

55 When read in connection with the description herein, the details of construction and arrangement of parts, as exemplifying

the principles involved in the invention, will be apparent from the accompanying drawing, forming part hereof, wherein an embodiment of the invention, as applied to a biplane, is disclosed, for purposes of illustration.

While the embodiment of the invention shown in the drawing now is preferred, it is to be understood that it is not the intention to be limited necessarily to the precise delineation herein in interpretation of claims hereinafter, as it is obvious that certain changes in the structure shown can be made within the limits prescribed by the claims without departing from the nature and spirit of the invention, and that the invention is applicable as well to monoplanes and to aeroplanes having other numbers of sustentation-planes than shown by the drawing.

Like reference-characters refer to corresponding parts in the views of the drawing, of which—

Figure 1 is a plan view; Fig. 2 is an end view; and Fig. 3 is a side view.

Referring more particularly to the drawings, 4 designates sustentation-planes of any desired standard formation, with which are associated a tail 5 including guiding devices of usual form. For the purposes enumerated in the foregoing, I surround the sustentation planes of an aeroplane with a hollow cylindrical or tubular member 6, which is open at its front and rear ends, and which has its axial line midway between the side ends of the sustentation-planes and parallel, or substantially parallel, to the line of flight. The sustentation-planes intersect the cylinder substantially horizontally, and their sides or lateral ends terminate at and are connected to the cylinder at its interior periphery. The cylinder 6 preferably is circular in cross-section, although it may be made with an ellipse or some other closed curve than a circle as the directrix, provided there is formed a regular curved "plane" so called that will be devoid of such uneven surfaces as will offer uneven resistance to air-currents. The cylinder is at least as wide as the width or fore and aft dimension of the sustentation-planes, so that it will laterally entirely comprehend those planes, which extend from one side to the other of the interior periphery of and terminate in the cylinder. In case of a machine having multiple sustentation-planes, these planes preferably

are disposed in secant lines with respect to the cylinder and above and below the diameter thereof, as shown in the drawing, but one of them may be disposed in a diametrical or focal line; and, in case of a monoplane, the sustention-plane may be disposed either in a secant or in a diametrical or focal line. It thus will be seen that the circular or curved "plane" constitutes a hollow cylinder that incloses the sustention-planes laterally and above and below and protects them from the disadvantageous influences of air-currents or winds acting in any direction transverse to the line of flight, and that the curve thereof is continuous and such as will not offer uneven resistance to the atmosphere.

The cylindrical or tubular member is made of comparatively thin material, such as that commonly employed in the manufacture of the planes of air craft, and it is structurally associated with other parts of the machine in any suitable manner. It is rigidly connected with the sustention-planes in such manner that the cylindrical member and the sustention-planes have no relative movement, but form an integral combination consisting of sustention and protection elements.

The member 6 being cylindrical, when the machine is in flight, it offers no other resistance to the atmosphere in a fore and aft direction than front edge resistance and resistance that may be incident to the tilting of the machine under the influence of the tail to cause the machine to ascend or descend, the sustention-planes being placed at a sufficient fore and aft angle to the axial line of the cylinder to maintain the machine at uniform elevation at normal speed without tilting.

The machine is propelled by any suitable motor 7 transmitting motion by belts, chains, or other transmission elements 8 to one or more propellers 9, the propellers being placed behind the sustention-planes in such manner that they will be in a line coincident with the center line of the resistance im-

posed upon the machine in forward movement during flight.

The motor, operator's and passengers' seats 10, and the like are placed below the sustention-planes, so that the center of gravity is below those planes and the stability of the machine thereby enhanced, and these parts also are positioned within the cylindrical protecting member, so that they, as well as the sustention-planes, are protected from the adverse laterally-acting influences mentioned in the foregoing.

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

1. An aeroplane comprising a sustention-plane, a continuously-curved open-ended member surrounding said plane, and a propelling-motor below said plane and within said member.

2. In an aeroplane, the combination of a propeller, guiding means, a sustention-plane, a hollow continuously-curved open-ended protective member surrounding said plane laterally, and a propelling-motor connected with said propeller and positioned within said member and below said plane.

3. In an aeroplane, the combination of a propeller, guiding means, a hollow cylindrical open-ended member, therein a sustention-plane having angular disposition with respect to the axial line of said member, and a propelling-motor connected with said propeller and positioned within said member and below said plane.

4. An aeroplane comprising the combination of a sustention-plane, a continuously-curved open ended member surrounding said plane, a propelling-motor within said member, and below said plane and within said member a seat for a person carried by the aeroplane.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS J. BERGDOLL.

Witnesses:

JOHN MEHN THISSELL,
HARRY C. KOHLHAS, Jr.