

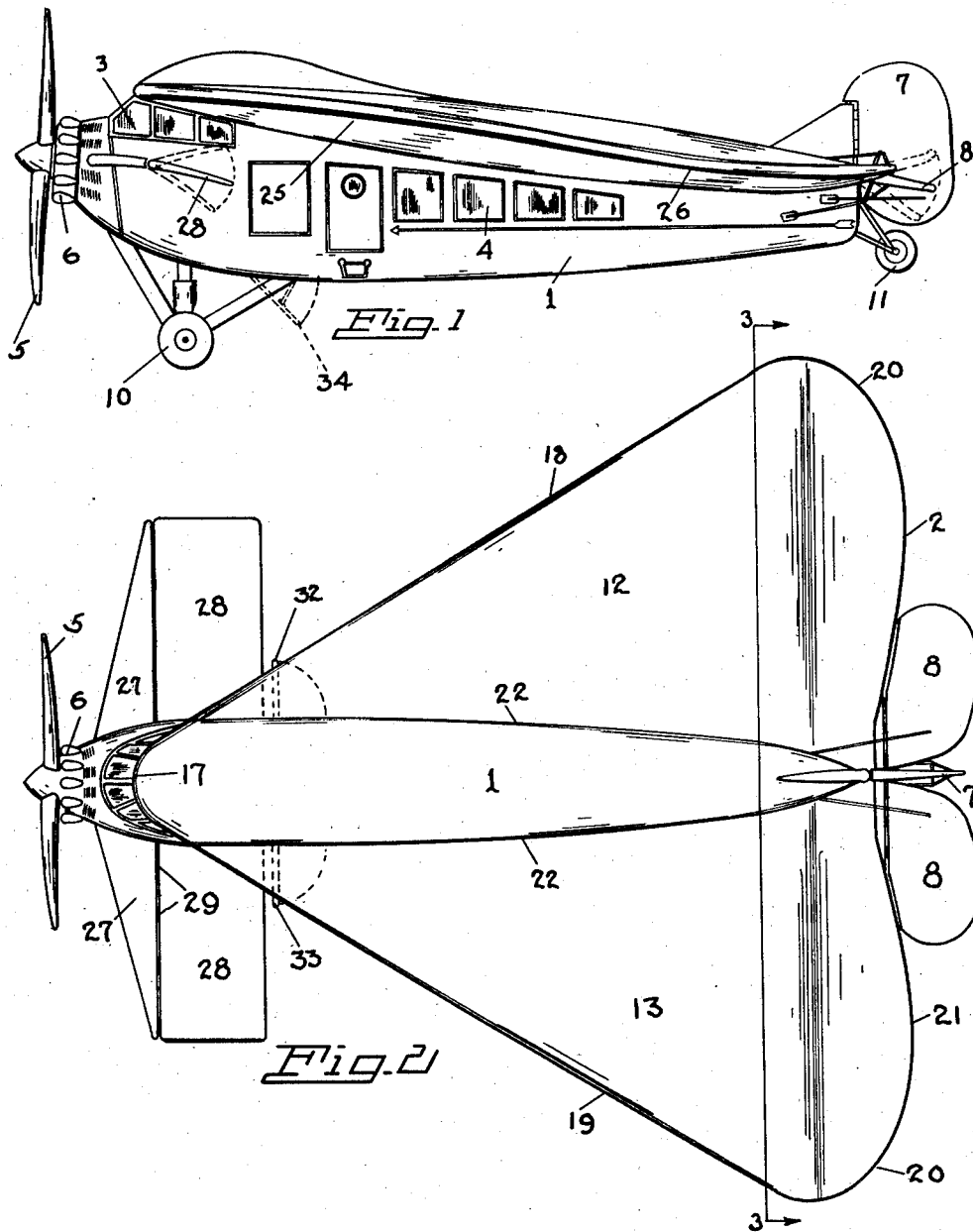
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H. PITTS

1,948,629

AIRPLANE

Original Filed May 23, 1931 2 Sheets-Sheet 1



HAROLD PITTS
INVENTOR

BY *Harold E. Smith*
ATTORNEY

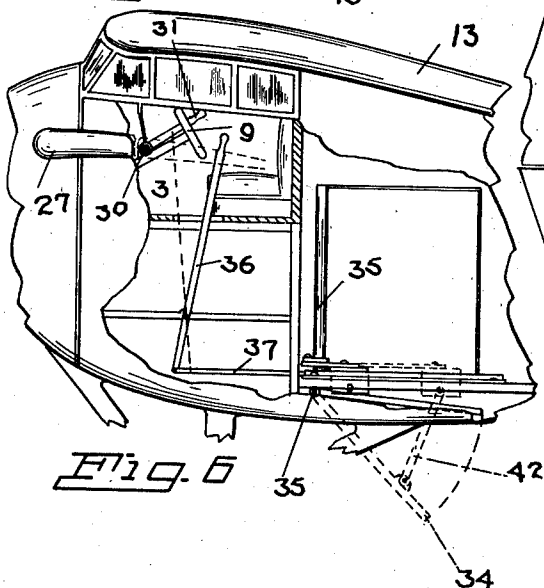
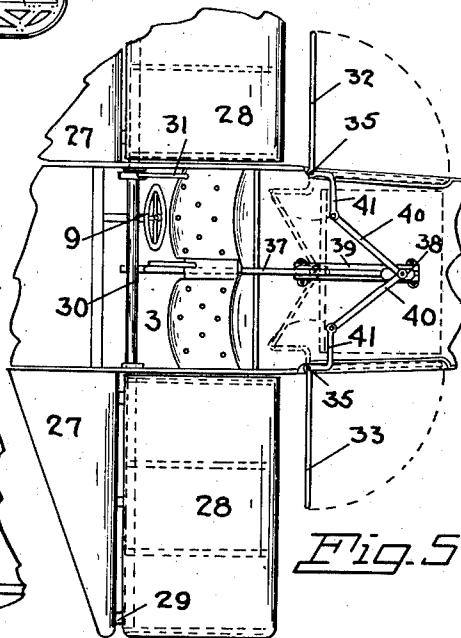
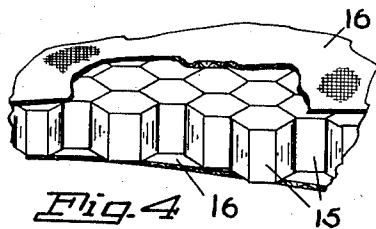
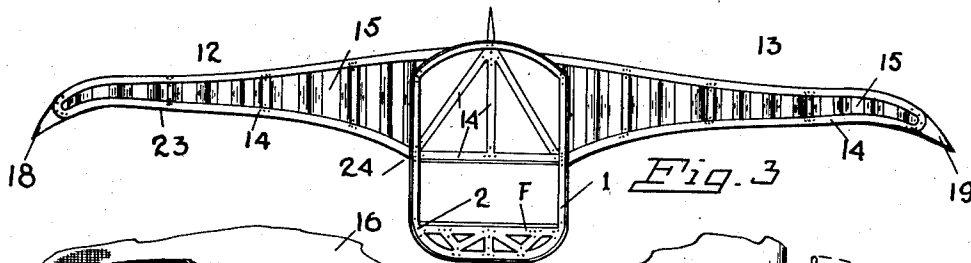
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AIRPLANE

Original Filed May 23, 1931 2 Sheets-Sheet 2



HAROLD PITTS
INVENTOR

BY *Herbert E. Smith*
ATTORNEY

UNITED STATES PATENT OFFICE

1,948,629

AIRPLANE

Harold Pitts, Spokane, Wash.

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Renewed July 28, 1933

2 Claims. (Cl. 244—29)

My present invention relates to improvements in airplanes or airships, of the heavier than air, monoplane type, and the improvements relate particularly to means for assuring a correctly balanced ship having an increased buoyancy as compared with the usual constructions of airships, and possessing planes having lines and curvatures in their shape that insure a minimum wind resistance, with a maximum speed for the ship. And means are provided for increasing the facility in navigation, as well as for enhancing the ease of maneuvering the ship when taking off as well as in landing.

The invention consists in certain novel features of construction and combinations and arrangements of parts involving a cellular wing structure, and the relation of the wings to the fuselage or hull of the ship, and in means for navigating, taking off and landing the ship, as will hereinafter be more fully set forth and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention.

Figure 1 is a view in side elevation of a ship embodying my invention, in the position of flight, and showing by dotted lines the movement of the forward ailerons and aft elevators for navigating the ship, and of one of the brake-wings employed in landing.

Figure 2 is a top plan view of the ship or airplane, showing by dotted lines the movement of the lateral brake-wings employed in landing or maneuvering the ship.

Figure 3 is a transverse sectional view of the ship, forward of the trailing edges of the planes, as at line 3—3 of Figure 2.

Figure 4 is an enlarged, detail, fragmentary view showing a portion of one of the cellular wings.

Figure 5 is a detail plan view showing the cockpit, the forward ailerons, and the brake-wings, and operating parts.

Figure 6 is a vertical sectional view at the cockpit, broken away to disclose the brake-wings and control mechanism therefor.

In carrying out my invention I have utilized a monoplane type of airship having the usual fuselage or body 1, which is preferably of approximate rectangular shape in cross section and built upon spaced, transverse frame-units as 2. The

usual cockpit is indicated at 3 and a passenger cabin 4 is shown aft of the cockpit.

At the nose or forward end of the ship a single propeller 5 is driven by the motor 6, and for navigation of the ship the usual vertical rudder 7 is employed in conjunction with the aft elevators, 8, 8, at opposite sides of the rudder. The control mechanism, part of which is indicated at 9, is placed as usual in position for ready access by the pilot in the cockpit, and the ship is operated in usual manner by the pilot.

The airship is provided with the usual wheeled forward landing gear 10 and aft landing gear or rigging 11, for use in taking off and in landing.

The two wings 12 and 13 of the airship are located at approximately the level of the top of the body or fuselage 1 of the ship, and of course they are symmetrically arranged at the sides of the ship. The wings are supported by and include a number of transversely arranged trusses as 14 (Figure 3) that are of course secured to the frames 2 of the fuselage, and longitudinally and transversely braced to afford a structure suitable for the purpose.

As indicated in Figure 3 the wings are of considerable thickness, especially at the sides of the fuselage where the vertical thickness of the wings are indicated, and adjacent to the trailing end or stern of the ship the wings have a thickness of approximately the depth of the fuselage.

In order to lighten the ship, and insure increased buoyancy in the air, as well as on the surface of the water, the interior of the wings is constructed with a multiplicity of cells 15, here shown as hexagonal in horizontal cross section, and the cells are enclosed within the top and bottom sheathing 16 and 16' respectively for the wings. The cells are of unequal capacities, depending upon their location in the two wings, and they are preferably filled with a lighter-than-air gas, as helium, to afford buoyancy in the interest of safety, while the ship is in the air, and also for floating the airship should a landing on the surface of water be required.

As best seen in Figure 2 the two wings at the sides of the ship provide an equilateral, triangular shape, with a curved apex 17 over the cockpit of the ship, and from this apex, the outspreading lateral edges 18 and 19 of the respective wings diverge at such an angle, toward the stern of the ship, as to afford a minimum resistance to passage of the ship through the air in flight. The obliquely disposed, leading edges 18 and 19 merge into rounded ends 20, 20, and they in turn merge into the trailing edges 21, 21 of the wings which trail

ing edges are disposed at the sides of the rudder and elevators at the stern of the ship. The wings thus extend from the nose of the ship, with their leading edges on diverging lines, to the tail of the ship, and the maximum width or span of the wings occurs at the tail of the ship as indicated in Figure 2. The inner edges of the wings merge at 22, 22, with the top surface of the fuselage or body of the ship.

As best seen in Figure 3, the under surface 23 of each wing is concave in cross section, with the meeting edge 24 of the under surface, at the side of the fuselage, extending from the nose to the tail of the ship, while the top surface of the wings also has a less pronounced, transverse concavity.

On the longitudinal lines, as best seen in Figure 1, the leading or diverging edges 18 and 19 form a compound curve with a lower concavity 25 from the nose to approximately amidship, and a lower convexity 26 from approximately amidship to the tail or trailing edge of the wing.

Due to this construction and configuration of the fuselage and the wings, the center of equilibrium of the ship is brought to a comparatively low point, approximately along the longitudinal axis of the ship at the floor boards F, to insure a correct balance of the ship in the air, and the shape of the wings similar to that of a bird's wings when soaring, assure a long glide for the ship available in flight, as well as for landing when a long glide is desirable.

For navigational use in ascending or descending, I provide near the nose of the ship and beneath the windows of the cockpit, and approximately on a longitudinal line with the under surface of the wings near their tails, lateral ailerons, comprising a pair of fixed ailerons 27, 27 of triangular shape, and a pair of substantially rectangular, movable ailerons 28, 28 which are hinged at opposite sides of the ship as at 29, on a transverse horizontal beam 30. The forward edges of the hinged ailerons are supported along the rear edges of the fixed ailerons 27, and the rear, free edges, or the trailing edges of the movable ailerons may be raised or lowered as indicated by dotted lines in Figure 1, through manipulation of the hand lever 31. The movable ailerons at the fore part of the ship co-operate with the elevators at the tail of the ship, and as is the case with the elevators, the ailerons are tilted upwardly to descend, and downwardly to ascend.

To aid in maneuvering the ship when a landing is desired, I equip the ship with three brake-wings, as 32, 33, and 34, the first two, arranged at opposite sides of the ship, just to the rear, or aft of the ailerons 28, and the brake-wing 34 is located at the underside of the fuselage. When retracted and not in use, these brake-wings are flush with the outer surface of the fuselage or body of the ship, and offer no resistance to wind pressure. The brake-wings 32 and 33, are hinged at 35 at their forward edges, while the brake-wing 34 is hinged at 35, the axis of the hinges for wings 32 and 33 being arranged in vertical planes while the axis of the bottom wing is arranged on a horizontal plane.

The free edges of trailing edges of the brake-wings are adapted to swing outwardly from the ship, and when the brake-wings are swung to position at right angles to, or perpendicular to the line of travel of the ship, as in Figure 5, the brake-wings present surfaces that offer a resistance to the atmospheric currents, and perform the functions of brakes for the ship, to retard its forward movement, and permit of a

quicker landing of the ship. The brake-wings are manipulated by the pilot, in synchronism with the rudder, elevators, and ailerons of the ship, and of course the judgment of the pilot determines the use, and the time of use of the brake-wings.

For simultaneously operating the three brake-wings I provide a control lever 36 (Figure 6) readily accessible to the pilot in the cockpit, and this pivoted lever is connected by the rearwardly extending connecting rod 37 to a slide block 38 that may be reciprocated on the longitudinally extending guides or guideways 39 fixed along the floor F of the ship. Pivoted links 40 connect the slide block with crank arms 41 of the vertically arranged, side, brake-wings 32 and 33, and similar links 42 pivotally connect the slide block with the bottom brake-wing 34, and it will be apparent that by manipulating the control lever 36 the brake-wings may be unfolded or folded on their hinges as indicated by dotted lines in the various figures of the drawings.

As best seen in Figure 1, the compound curve provides for an inverted camber, longitudinally on the upper surface of the wings 13 and 12, which has a tendency to increase the vacuum effect above the wings when the ship is traveling, and the pressure beneath the wings maintains the ship in uplifted position.

The lifting effect or buoyancy of the ship in the air is also enhanced by the shape of the wings, whereby the entire area of the wings is gradually presented to the atmospheric pressure as the ship advances, due to the divergence of out-spreading of the leading edges of the wings.

While I have illustrated the ship as a monoplane, it will be understood that the invention may be embodied in a biplane or other type of airship, and the single motor may be displaced by a multi-motor with additional propellers, preferably at the nose of the ship.

For increased speed, the angularity of the leading edges 18 and 19 of the wings may be changed and a more acute angle provided than the equilateral angle shown in the drawings, while for reduced speed with an increased load carrying capacity, the leading edges may be disposed at a more obtuse angle than that shown in the drawings.

These and other changes may be made in the exemplification of my invention disclosed in the drawings, without departing from the principles of my claims appended hereto.

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

1. The combination in an airship having a rounded nose, of a pair of wings forming an equilateral triangle including the nose, said wings having a longitudinal camber and reversely-curved leading edges diverging rearwardly from the nose, and transversely arranged outwardly curved trailing edges for the wings.

2. The combination in an airship having a rounded nose, of a pair of wings forming an equilateral triangle including the nose, said wings having a longitudinal camber and reversely-curved leading edges diverging rearwardly from the nose, transversely arranged outwardly curved trailing edges for the wings, a rudder and elevators at the rear of the wings, laterally extending ailerons adjacent the nose portion of the ship, hinge joints for a pair of said ailerons, and means for operating the rudders, elevators, and said ailerons.

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