A. E. JOHNSON.

AIRPLANE.

APPLICATION FILED JUNE 19, 1918.

1,311,076.

Patented July 22, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

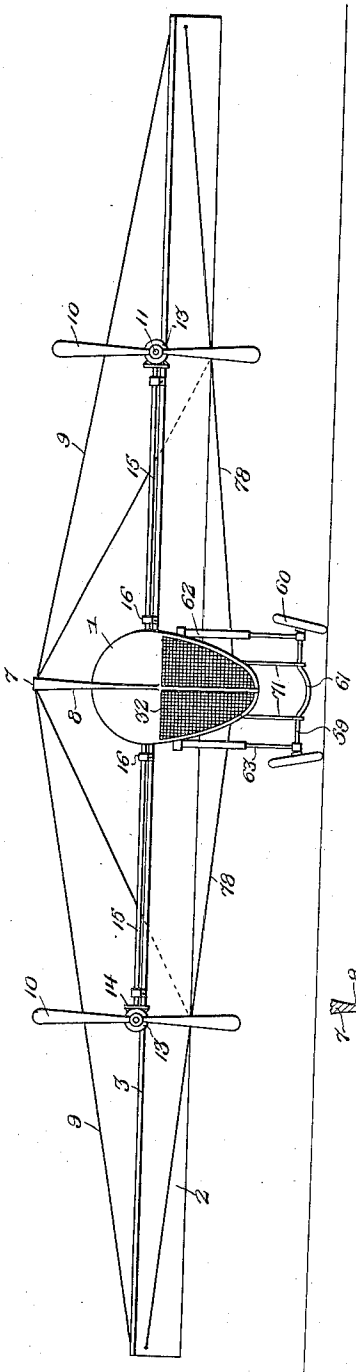
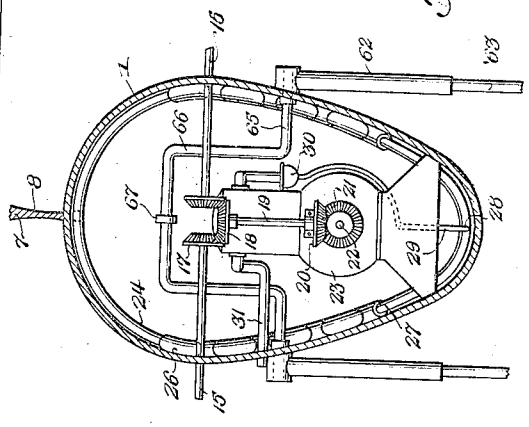


Fig. 4.



Witnesses

J. H. Crawford.

Pet. Smith.

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2 SHEETS—SHEET 2.

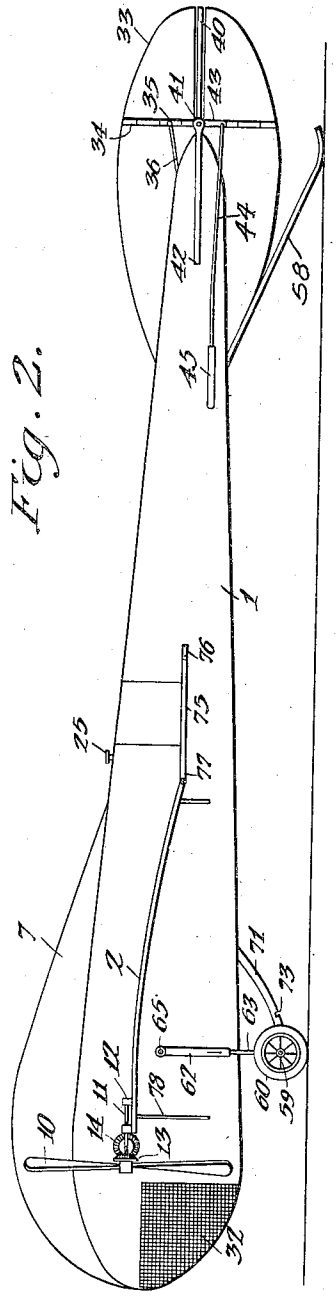


Fig. 2.

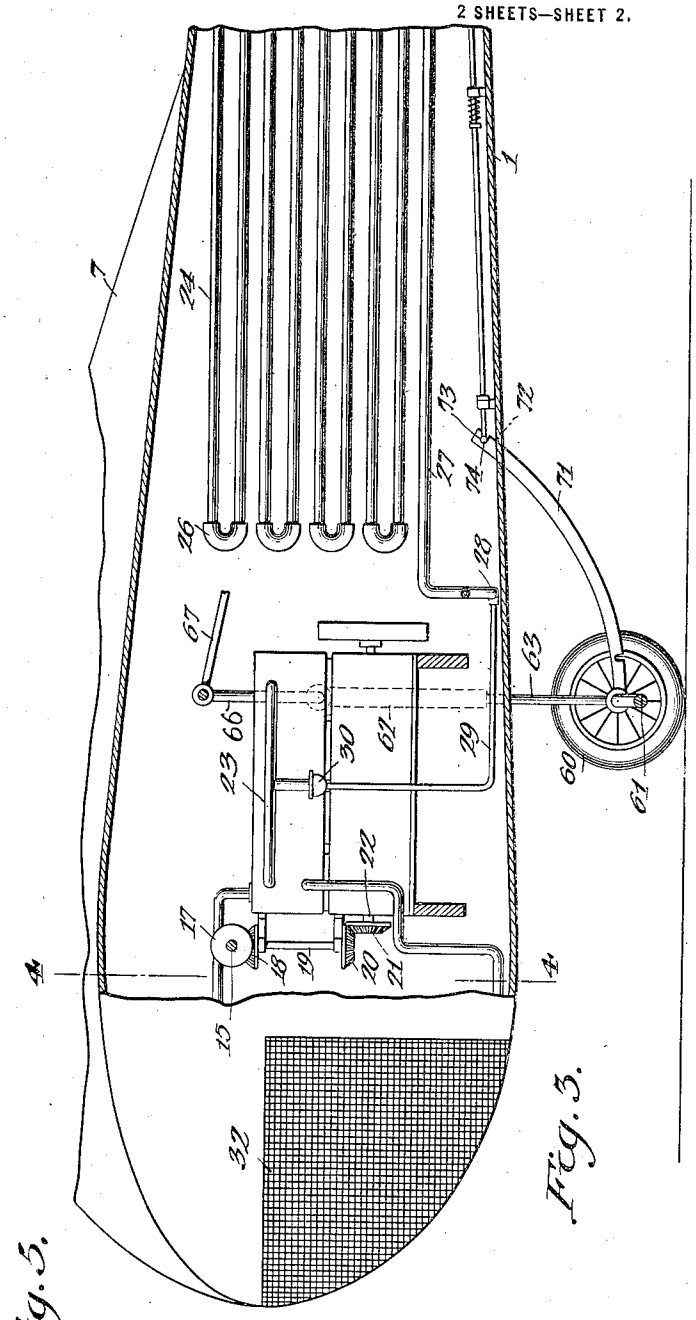


Fig. 3.

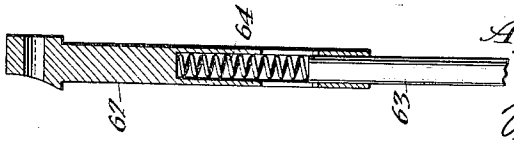


Fig. 5.

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UNITED STATES PATENT OFFICE.

ALFRED E. JOHNSON, OF RACINE, WISCONSIN.

AIRPLANE.

1,311,076. Specification of Letters Patent. Patented July 22, 1919.

Application filed June 19, 1918. Serial No. 240,858.

To all whom it may concern:

Be it known that I, ALFRED E. JOHNSON, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented new and useful Improvements in Airplanes, of which the following is a specification.

This invention relates to airplanes and the broad object thereof is to generally improve, simplify and strengthen an airplane structure and at the same time reduce the head resistance thereof while in actual flight.

Another object of the invention is to provide a new and particularly efficient form of fuel reservoir by means of which the center of gravity of the machine is not disturbed or shifted as the supply of fuel is increased or diminished.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement of parts herein fully described, illustrated and claimed.

In the accompanying drawings:—

Figure 1 is a front elevation of the improved airplane.

Fig. 2 is a side elevation of the same.

Fig. 3 is a side elevation of the body of the machine with the adjacent side wall or sheathing broken away, showing one side of the gasolene reservoir.

Fig. 4 is a vertical cross section through the same on the line 5—5 of Fig. 4.

Fig. 5 is a fragmentary vertical section through a portion of the landing gear.

The airplane herein described and shown is illustrated as of the monoplane type and as embodying twin propellers arranged equi-distantly from the longitudinal center of the machine. The body indicated at 1 is of stream line formation and substantially oval or egg-shaped in cross section. The wings 2 extend laterally from the opposite sides of the body and the front and rear spars 3 and 4 of each wing have their inner ends detachably secured to the body for transportation, storage or shipment.

Extending upwardly from the top surface of the stream line body 1 is a stream line lateral stabilization fin 7 having an arched upper edge and formed with upwardly converging and concaved side faces 8 to give a better hold on the air in case of side slipping of the airplane while in flight and in order to secure better lateral stability. The fin 8 also forms a strut for the truss or stay wires 9, the latter extending over and being secured to the fin 8 and secured at their outer extremities to the wings of the machine.

The propellers 10 are arranged immediately in advance of the leading edges of the wings 2 and are mounted upon propeller shafts 11 which extend parallel to the longitudinal axis of the body 1 and are mounted in bearings 12 on the respective wings. The propeller shafts 11 are connected by bevel gears 13 and 14 to countershafts 15 which extend parallel to the leading edges of the wings and are journaled in bearings 16 preferably secured to the front spars 3. At their inner ends the countershafts 16 are geared to and connected by gears 17 and 18 to a substantially vertical shaft 19 extending downwardly within the body and connected by gears 20 and 21 to the shaft 22 of the engine 23 which is located within the extreme forward end portion of the body 1.

The gasolene tank comprises two laterally disposed sections each made up and consisting of a plurality of pipes 24 having a series of runs arranged one above the other and in substantially parallel relation to each other as shown in Fig. 3. The initial end of the pipe is extended upwardly through the top of the body 1 where it is shaped to provide a filling neck or nozzle through which the fuel may be introduced into the reservoir. The runs 24 are connected in pairs by return couplings or elbows 26 so arranged that the fuel must travel the full length of each run before entering the next lower run, this being continued until the last or bottom run is reached, the bottom runs 27 terminating adjacent to the engine 23 where they merge into a common pipe or connection 28 from which a fuel feed pipe 29 leads to the carbureter 30 or its equivalent of the engine. By forming and arranging the fuel reservoir as described, the lowering of the level of fuel in the reservoir will have no disturbing effect upon the center of gravity of the machine. Furthermore it does away with the space now required for the ordinary fuel tank and enables the balance of the machine to be more easily obtained in the original design and manufacture thereof. The exhaust pipe 31 of the engine may lead through one of the side walls of the body as shown in Fig. 4.

The radiator comprises two sections 32 arranged at opposite sides of the center of the body as shown in Figs. 1 and 2, each of the

radiator sections being shown of quadrantal formation and curved to conform to the stream line formation of the extreme forward portion of the body or nacelle 1. The radiator as a whole thus adds very little if any to the head resistance of the machine.

33 designates the vertical rudder which is hinged to the body structure at 34 and provided with a cross bar or tiller arm 35 from which connections 36 lead forwardly into the body of the machine where they connect to suitable controlling means.

The horizontal rudder is formed in two sections 40 which are connected by hinges 41 to the trailing edges of fixed horizontal fins 42 extending laterally from the body 1. Extending downwardly from the horizontal rudder sections 40 and having a fixed relation thereto are tiller arms 43 having attached to the lower extremities thereof connecting rods 44 which extend forwardly through guideways 45 into the body 1 where they are connected to controlling means.

The landing gear or wheel base comprises an axle 59 on which are mounted two wheels 60 arranged equi-distantly from the longitudinal center of the machine. The axle 59 has the central portion thereof deflected downwardly or dropped as indicated at 61 so that when the axle is moved upwardly, it will conform more closely to the contour of the under side of the body 1. The axle 61 is carried at its opposite ends by a pair of pivoted hangers or supporting legs each of which is of telescopic formation, comprising an upper hollow or tubular section 62 and a lower section 63 which is slidable within said upper section. The lower section 63 is normally held distended or at the full limit of its downward movement by means of a compression spring 64 contained within the upper tubular section 62 and bearing against the adjacent end of the lower section 63. The hangers or supporting legs are fast at their upper ends on a transverse rock shaft 65 which is journaled in suitable bearings in the body of the machine and which has fast thereon between the ends thereof an upwardly extending arm 66 to which is attached the forward extremity of an operating rod 67. The rod 67 extends rearwardly and is attached at its rear extremity to the lower end of an operating lever 68 equipped with a thumb latch 69 to engage an arcuate rack 70 fastened to the interior of the body. By means of the lever 60 and the connections described, the aviator may raise and lower the landing gear. The landing gear also comprises an arcuate locking brace 71 which is slidable through an opening 72 in the bottom of the body 1. The brace 71 is formed at a suitable point in the length thereof with a notch 73 which is adapted to engage a locking rod or bar 74 extending transversely of the lower portion of the body and adapted to be moved laterally into and out of locking engagement with the notch 73 by the aviator. In this way the landing gear may be locked either in its useful position or in its folded position. When in its folded position, it offers less head resistance than in its useful position.

Obliquely disposed braces 75 are connected at their rear extremities by fastening means 76 to the body 1 and are connected at their forward and outer extremities by fastening means 77 to the rear spars 4 of the wings directly behind or in longitudinal alinement with the propeller shafts 11. The braces 75 thus withstand the pulling stress of the tractor propellers 10 on the wings directly in line with the longitudinal axes of said propeller shafts. The bottom stays shown at 78 extend from the bottom of the body 1 laterally in opposite directions and are connected at their outer extremities to the wings.

I claim:—

1. In an airplane, the combination of a body of stream line formation, substantially oval in cross section, an engine therein, and oppositely arranged fuel reservoir sections located within the forward portion of said body and arranged partly in advance and partly in rear of the center of gravity of the machine, the laterally disposed sections of the fuel reservoir having their discharge ends in communication with the engine.

2. In an airplane, the combination of a stream line body, an engine located within the forward portion of said body in advance of the center of gravity and the center of pressure, and a fuel reservoir comprising oppositely located sections situated in the sides of the body and each comprising a plurality of pipes extending longitudinally of the body from points in advance of the centers of gravity and pressure and the points in rear thereof, said pipes being joined by return connections at their extremities arranged to cause the fuel to flow throughout the entire lengths of all the pipes, the said fuel reservoir sections being connected to and in communication with the engine.

In testimony whereof I affix my signature.

ALFRED E. JOHNSON.