

July 1, 1930.

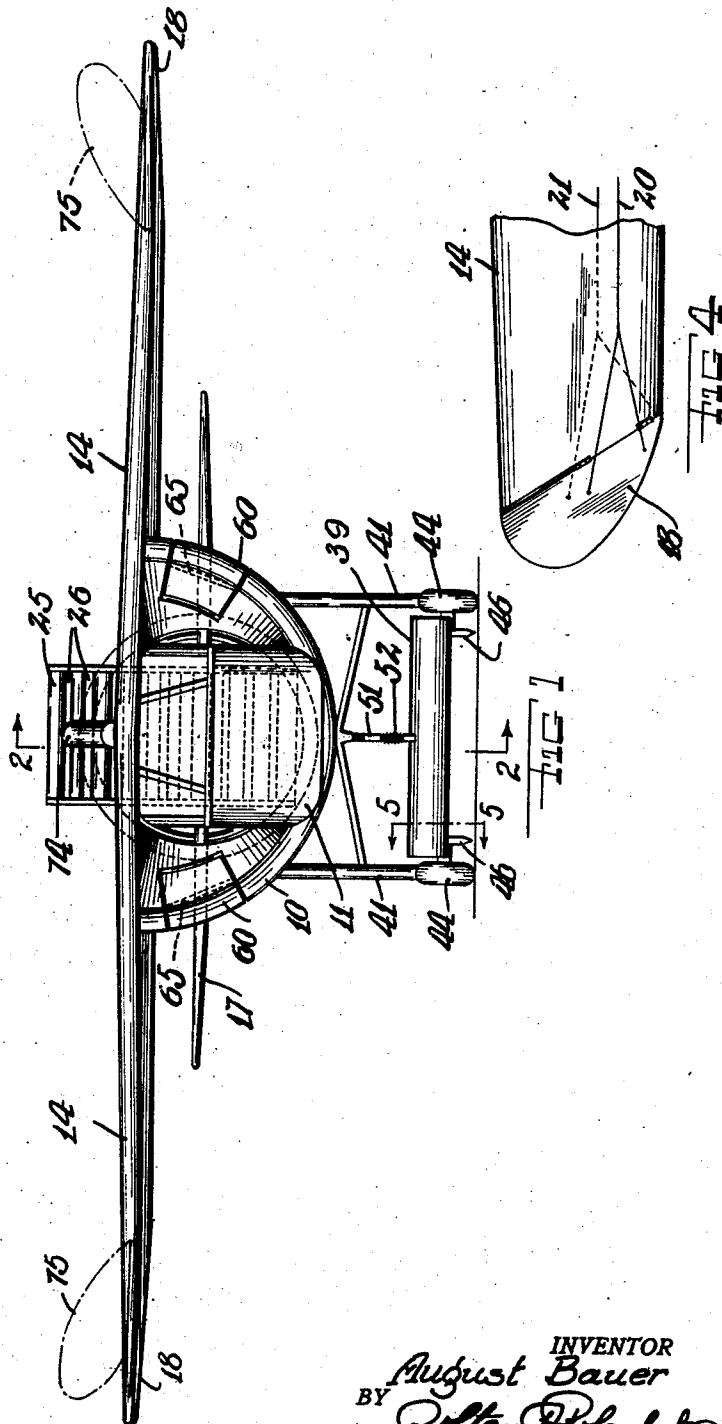
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1,768,878

AEROPLANE

Filed June 7, 1929

3 Sheets-Sheet 1



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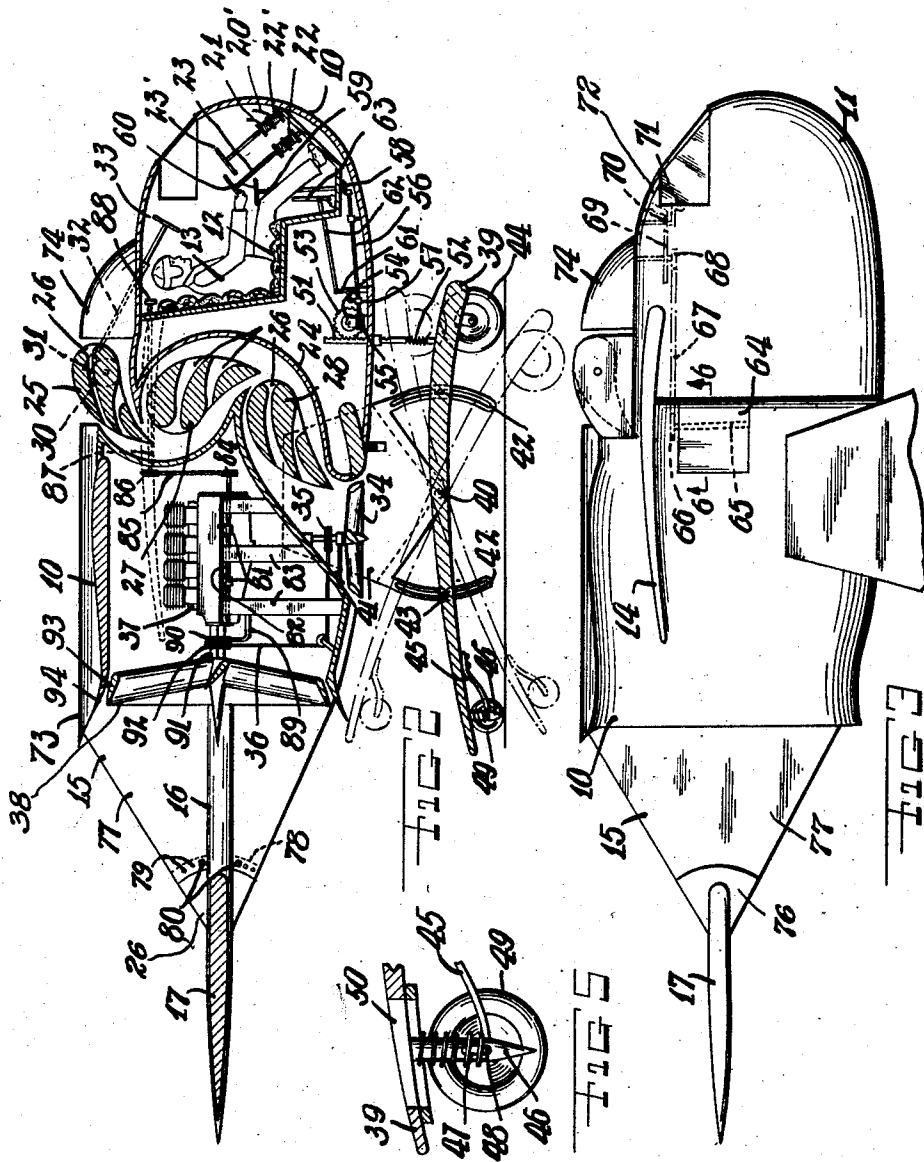
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AEROPLANE

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3 Sheets-Sheet 2



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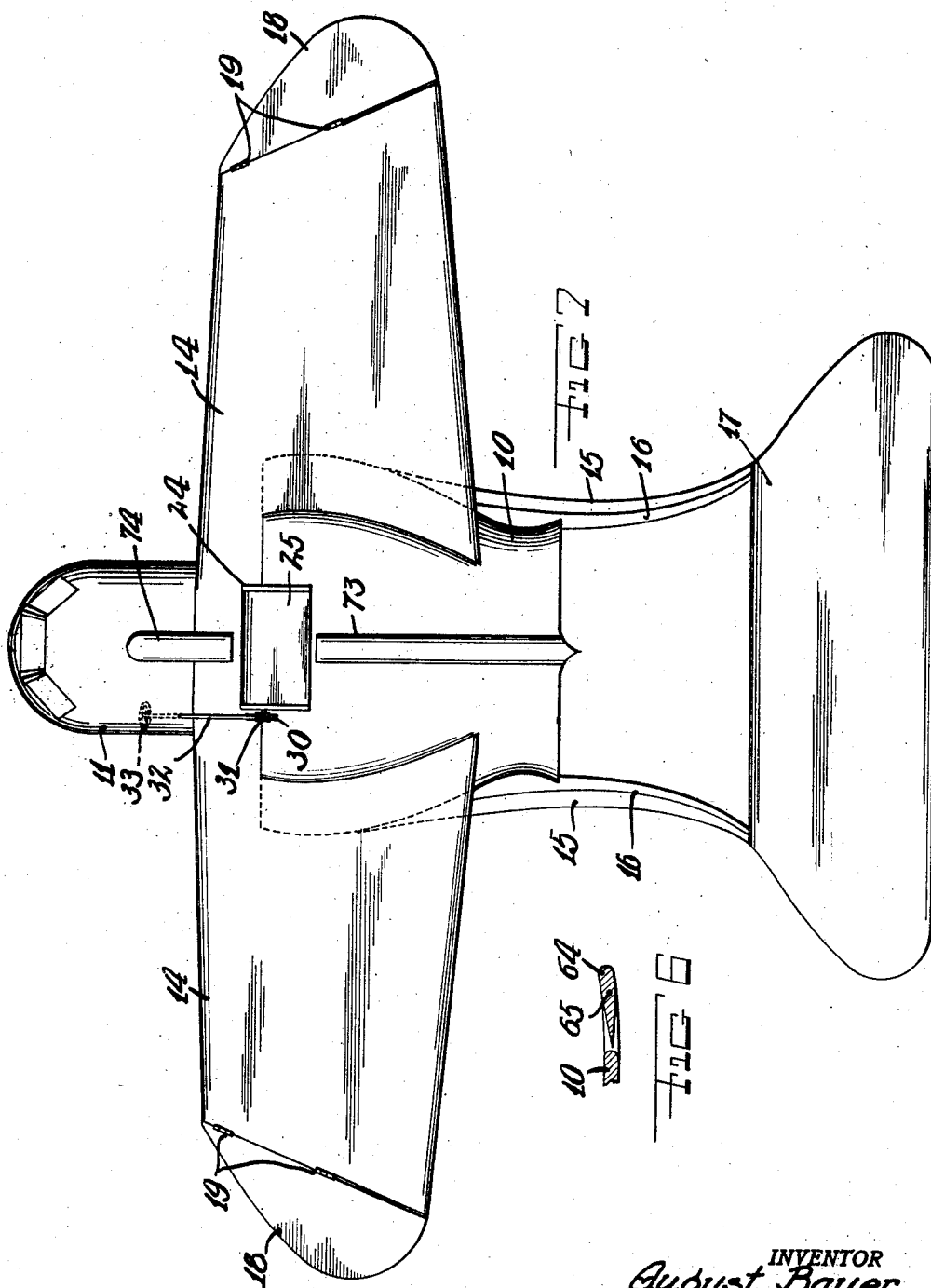
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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AEROPLANE

Application filed June 7, 1929. Serial No. 369,035.

This invention relates to new and useful improvements in flying machines.

The invention has for an object the provision of a device of the class mentioned, which is of simple durable construction, desirable in use and efficient in action and which may be manufactured and sold at a reasonable cost.

The invention proposes a tunnel member in an aeroplane body and of smaller rear diameter than front diameter and connected with main wings and with parallel vertical rearward extending walls supporting a horizontal tail wing, a motor-driven propeller to be mounted in the rear of the tunnel member and arranged for adjustment along the axis of the tunnel member, both propeller and tunnel member being slightly flared.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:—

Fig. 1 is a front elevational view of a device constructed according to this invention.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary side elevational view of Fig. 2.

Fig. 4 is a fragmentary detail plan view of a portion of one of the wings of the device.

Fig. 5 is a fragmentary vertical sectional view taken on the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary horizontal sectional view taken on the line 6—6 of Fig. 3.

Fig. 7 is a plan view of the device.

The reference numeral 10 indicates generally a tunnel member having a rear opening and a much larger front opening. A pilot's chamber 11 is attached upon the tunnel member and extends to the front thereof. This pilot's chamber is of smaller width than the tunnel member so as to provide air passages at the sides shown in Fig. 1. A seat 12 is arranged within the pilot's chamber and a pilot 13 is shown occupying the seat.

Main wings 14 are attached upon the sides of the tunnel member. Parallel spaced vertical walls 15 connect with the rear portion of a tunnel member and extend materially to the rear. These walls are reinforced by horizontal ribs 16. A horizontal tail wing 17 connects with the rear portion of the walls 15. The outer tips 18 of the main wings are separate from the other portions and are hingedly connected as at 19.

The vertical walls 15 are each formed of two separate sections 76 and 77, respectively. Sections 77 are stationary and sections 76 movably connected with the stationary sections. The movable sections have projecting tongues 78 engaging in corresponding grooves in the stationary sections. These sections connect with each other on the arcs of a circle so that the movable sections may be rotated relative to the stationary ones. Apertures 79 are extended thru the stationary sections and thru the tongues 78 and bolts 80 engage certain of these apertures for holding the sections in a relatively fixed position. The inclination of the tail wing 17 may be adjusted by removing the bolts 80 and rotating the sections 76 relative to the sections 77, then reengaging the bolts.

One of the hinged sections 18 connect with an upper wire 20 and with a lower wire 21, both wires leading to the pilot's chamber and one of these wires being wound in one direction upon a drum 22 on a steering rod 23 operable by the pilot, the other of the wires being wound upon the drum in the opposite direction to the first wire so that when the pilot turns the steering rod 23 in one direction the wing section 18 will be moved upwards and when the steering rod is turned in the opposite direction the section will be moved downwards.

The other hinged section 18 is similarly connected with wires 20' and 21' engaged upon a drum 22' mounted upon a steering rod 23' also operable by the pilot. This arrangement permits individual control of the sections 18 on the ends of the main wing. In plan view as seen in Fig. 7 the inner ends of the sections 18 are adjacent the outer ends of the main wing and the lines of contact are

inclined from the front of the machine diverging towards the rear.

A curved passage 24 passes thru the tunnel member 10 and an adjustable top vane 25 with air channels 26 engages in the top of the curved passage. Within the passage, central and bottom vanes 27 and 28, respectively are stationarily mounted. These vanes are provided with air channels 26. The air channels increase the operating surfaces of the vanes. The top vane 25 is fixed upon a shaft 29 provided with a worm wheel 30 meshing with a worm pinion 31 upon a shaft 32. The shaft 32 is rotatively mounted and extends within reach of the pilot. A hand wheel 33 is provided on the end of this shaft.

A horizontal bottom propeller 34 is disposed within the bottom of the passage 24 and is mounted upon a shaft provided with a pulley 35. This pulley connects with a belt 36 connected with another pulley upon the shaft of a motor 37. A vertical propeller 38 is mounted upon the shaft of the said motor. The motor is disposed within the tunnel 10 and the vertical propeller 38 rotatively engages in the rear end of the tunnel.

The motor 37 is provided with lugs 81 threadedly engaging screws 82. These screws are rotatively mounted in standards 83 attached within the tunnel member 10. A sprocket wheel 84 is fixed upon the screw 82 and connects with a sprocket chain 85 connecting with another sprocket wheel 86 upon a shaft 87. This shaft extends within reach of the pilot of the machine and is provided with a hand wheel 88.

A fork 89 is fixed upon one of the standards 83 and engages a collar 90 slidably mounted upon a square section 91 of the shaft of the motor 37. A pulley 92 is connected with the collar 90 and is engaged by the said belt 36. The tips of the propeller are flared as indicated by reference numeral 93. The rear end of the tubular member 10 is correspondingly flared as indicated by reference numeral 94.

The hand wheel 88 may be rotated for moving the motor 37 slightly forward or rearwards for increasing or decreasing the distance between the flared tips of the propeller and the flared end of the tubular member. The fork 89 serves to hold the pulley 92 stationarily during adjusting the motor, but the fork permitting rotation which rotation may be transmitted due to the square portion 91 of the motor shaft.

A landing gear wing 39 is pivotally mounted intermediate of its ends as at 40 upon a pair of brackets 41 depending from the tunnel member 10. The brackets are provided with arcuate slots 42 engaged by pins 43 projecting from the wing 39. Front wheels 44 engage upon the front of the wing 39 and rear springs 45 upon the rear of the wing. These springs are firmly connected with vertical

pegs 46. These pegs have slots 47 engaged by transverse shafts 48 supporting rear wheels 49. The wing 39 has an opening 50 permitting the peg 46 to move upwards if the springs 45 flex during landing.

A rack 51 is slidably mounted in the pilot's chamber and connects with a spring 52 connected with the wing 39. The rack 51 meshes with a gear 53 on a shaft provided with a worm wheel 54. The worm wheel meshes with a worm pinion 55 upon a shaft 56 rotatively mounted and provided with a collar 57 having a plurality of peripheral apertures. The shaft 56 is connected by bevel gears 58 to a steering rod 59 arranged in the vicinity of the pilot and provided with a steering wheel 60. A latch 61 is arranged to engage in the apertures of the collar 57 for latching the shaft 56 against rotation. The latch 61 is connected by a link 62 with a lever latch 63.

The tunnel member 10 is provided with side wings 64 fixed upon arbors 65 arranged for rotation. Sprocket wheels 66 are attached upon the arbors 65 and connect with sprocket chains 67 engaging upon sprocket wheels 68. The sprocket wheels 68 are fixed upon shafts rotatively mounted and provided with gears 69. These gears mesh with smaller gears 70 connected with a handle 71 for manual rotation. A spring pawl 72 is arranged for latching the gear 70 against rotation. A top fin is provided upon the main wings 14 and consists of a rear section 73 and a front section 74. Dot and dash lines 75 in Fig. 1 represent elevated positions of the end sections 18 of the wings.

In operation of the device, engine 37 drives propeller 38 for urging the machine forwards. The engine also drives propeller 34 and air current set up by this propeller act against the top of the landing gear wing 39. This wing may be angularly positioned as indicated by the dot and dash lines in Fig. 2 for directing the air current set up by the propeller towards the front or towards the rear. It is pointed out that component forces are produced by these air currents. One component urges the machine downwards and the other forwards or rearwards.

The pilot may move the lever catch 63 for disengaging the latch 61 and then manually turn hand wheels 60 for adjusting the inclination of the landing gear wing 39 to desirable inclinations. He may also operate the steering rods 23 or 23' for operating the main wing end sections 18.

The amount of air current set up by the propeller 34 may be controlled by manipulation of the hand wheel 33. This changes the inclination of the adjustable vane 25. A change in inclination of the vane causes different amount of air to pass thru the air channels of this vane and the stationary vanes. Handle 71 may be used for adjusting the posi-

tion of the side wings 64. Adjusting of these wings changes the amount of air entering the tunnel member 10. A change in the supply of this air changes the working effect of the propeller 38.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member.

2. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, said main wings having hinged end sections.

3. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, said main wings having hinged end sections, joined with the remaining portions of the wings by inclined lines diverging from the front to the rear.

4. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, said tunnel member being formed with side wings movably mounted.

5. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, said tunnel member being formed with side wings movably mounted, said side wings being fixed upon arbors connected for rotative adjustments.

6. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, adjustably mounted for axial adjustments.

7. In a flying machine, a tunnel member, lateral main wings connected therewith, rear-

ward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, said vertical walls being each of two sections arranged for adjustment to change the position of the tail wing.

8. In a flying machine, a tunnel member, lateral main wings connected therewith, rearward extending vertical walls connected with the tunnel member, a horizontal tail wing connected with the walls, and a motor driven propeller in the rear of the tunnel member, said propeller and tunnel being formed flared.

In testimony whereof I have affixed my signature.

AUGUST BAUER.