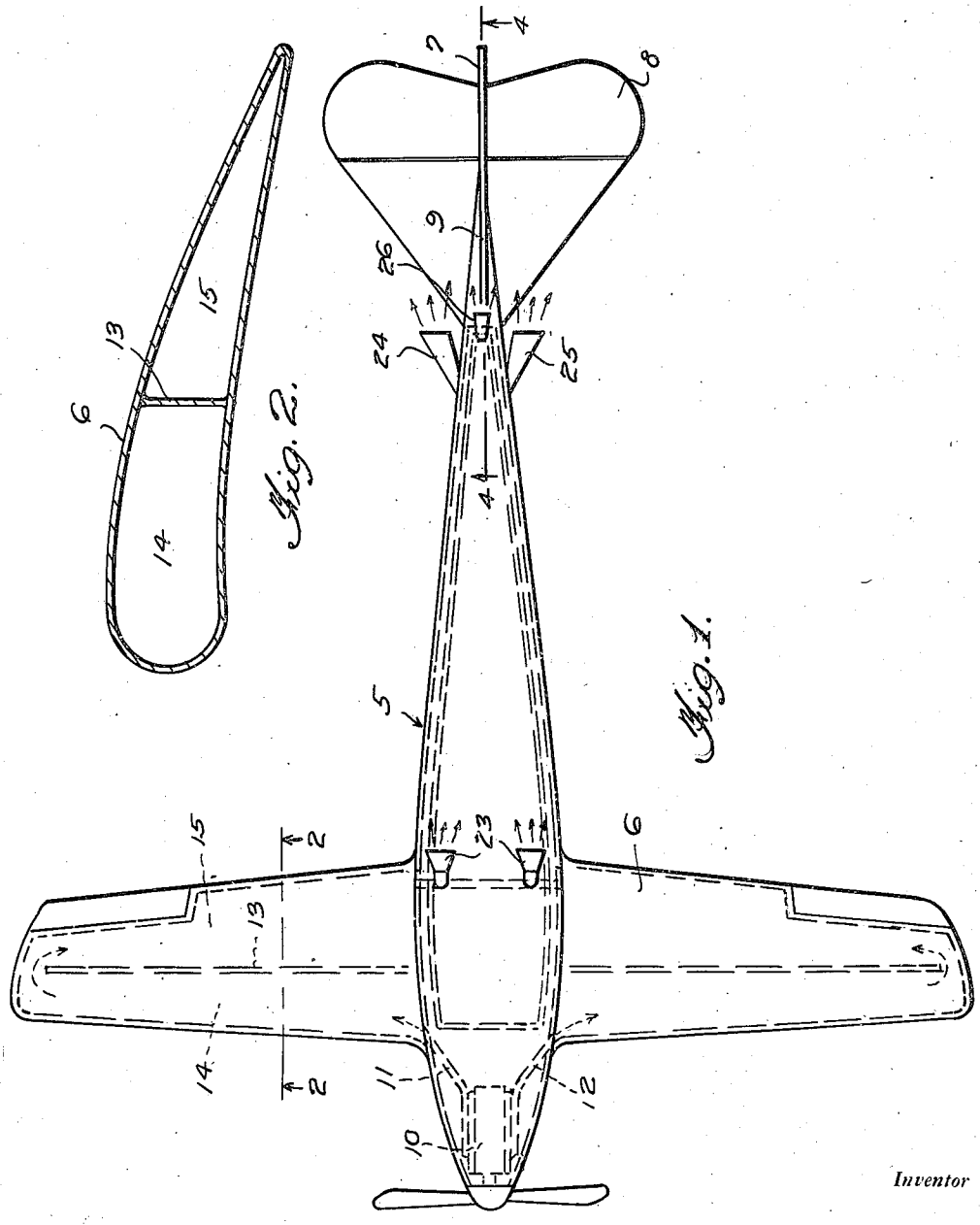
March 19, 1946. F. P. CHADSEY 2,396,684

AIRPLANE DEICING AND ENGINE SILENCING CONSTRUCTION

Filed Oct. 2, 1942 5 Sheets-Sheet 1



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AIRPLANE DEICING AND ENGINE SILENCING CONSTRUCTION

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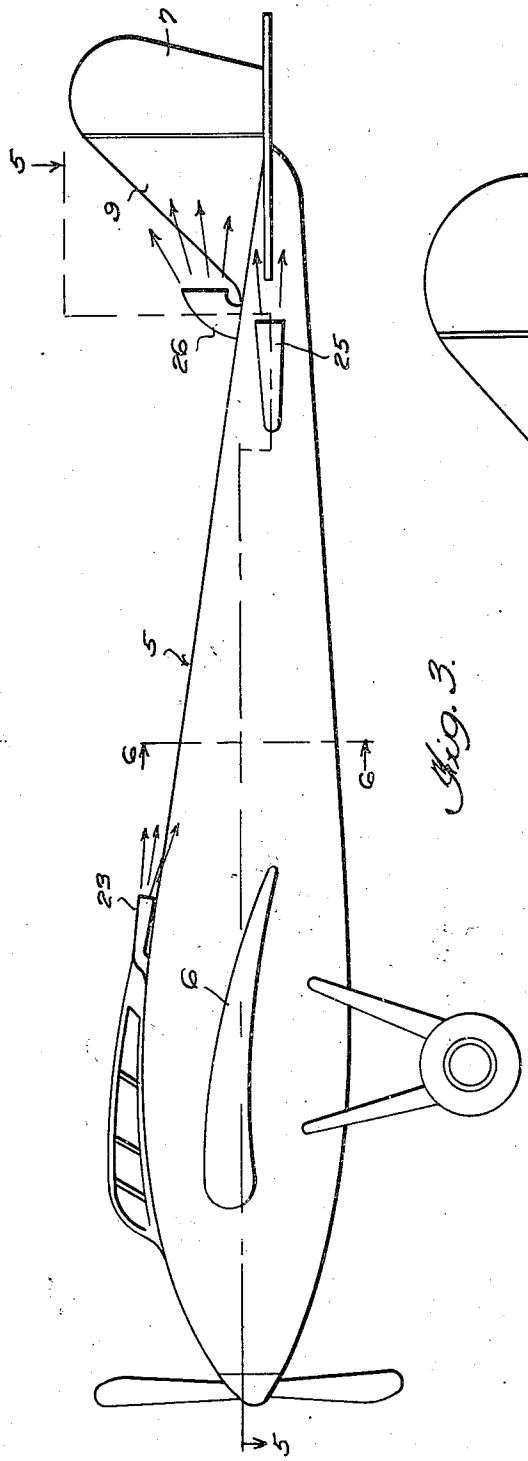


Fig. 3.

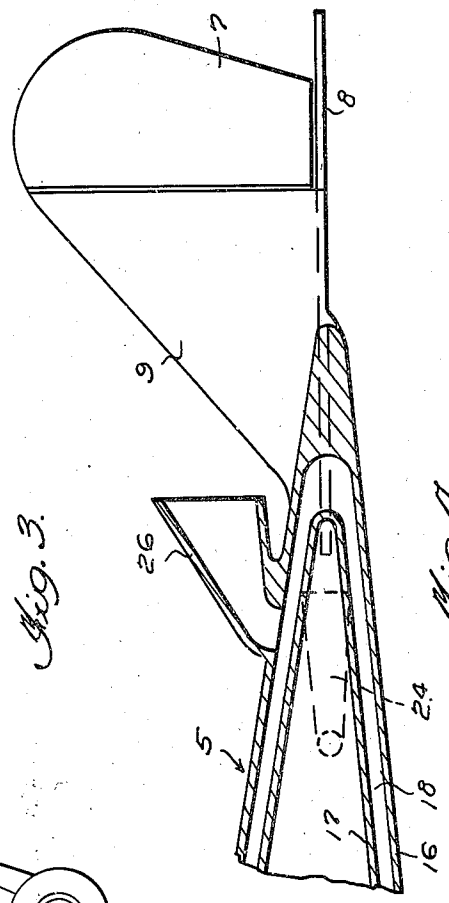


Fig. 4.

Inventor

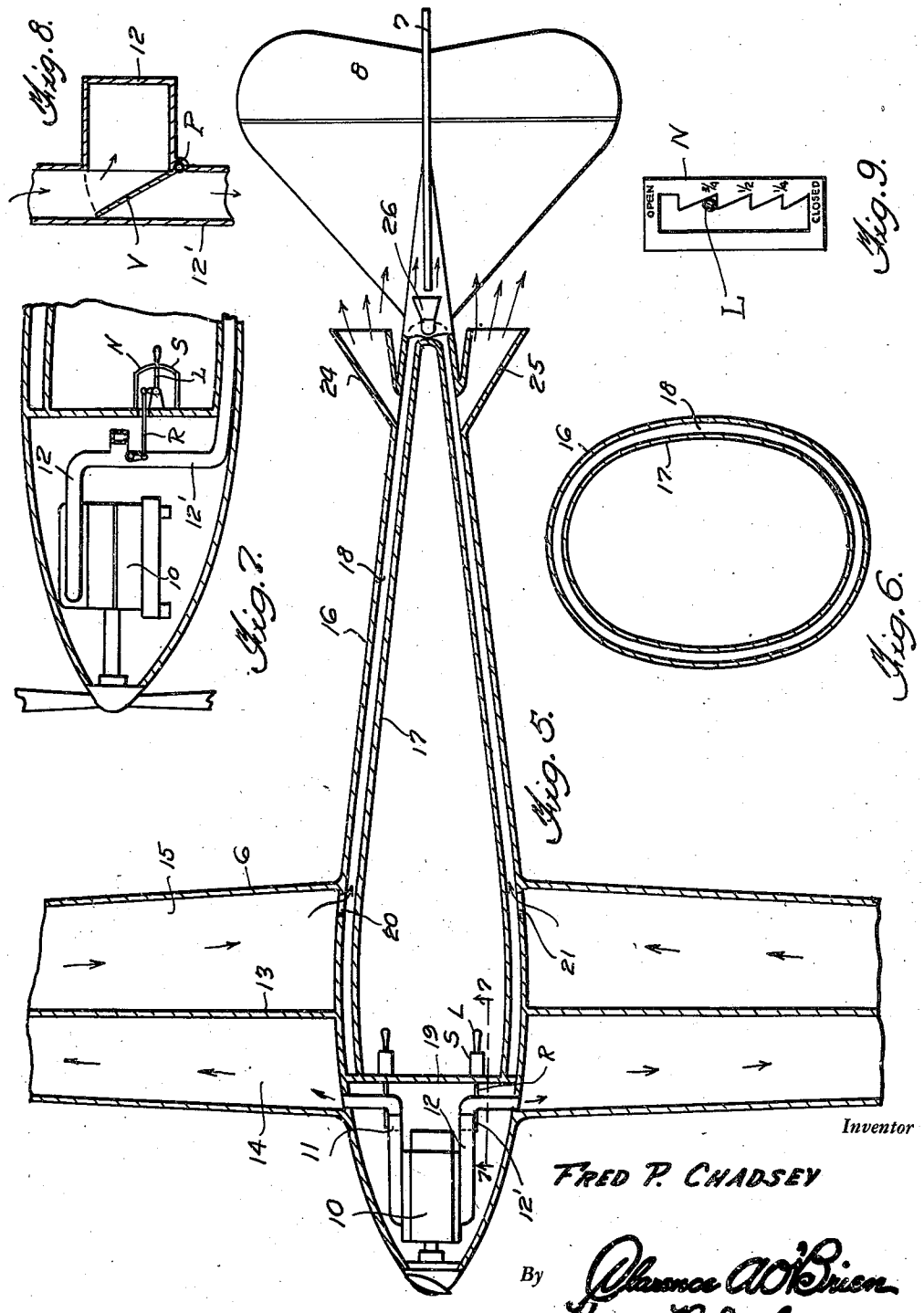
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AIRPLANE DEICING AND ENGINE SILENCING CONSTRUCTION

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AIRPLANE DEICING AND ENGINE SILENCING CONSTRUCTION

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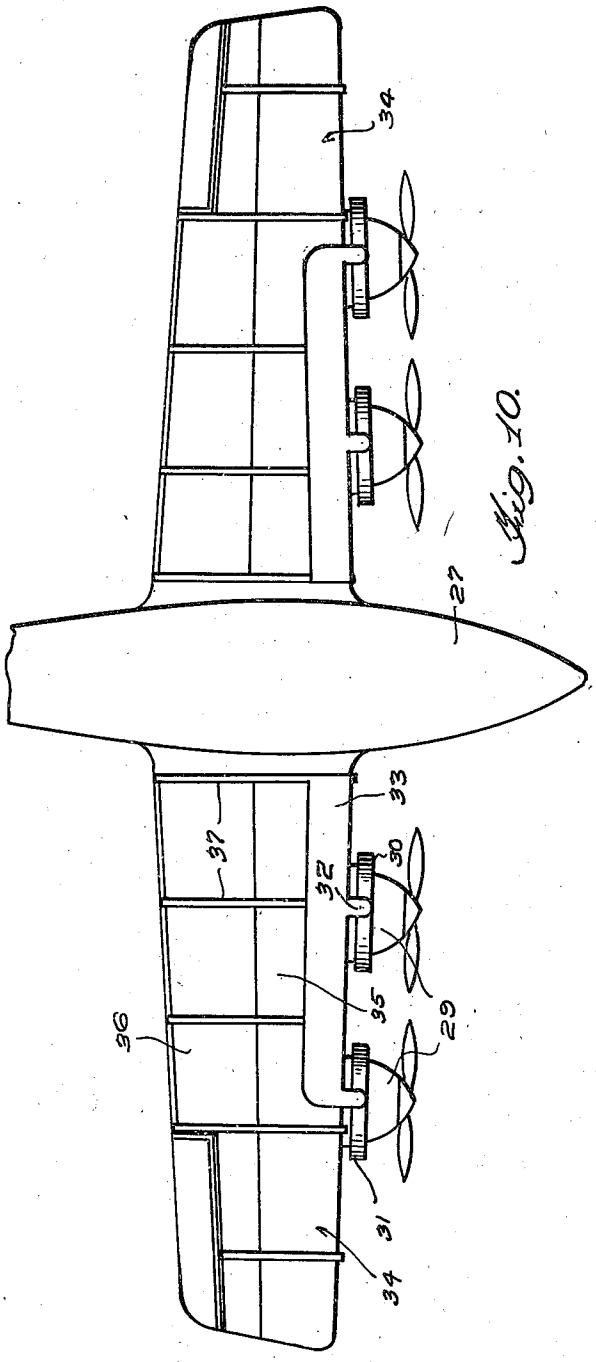


Fig. 10.

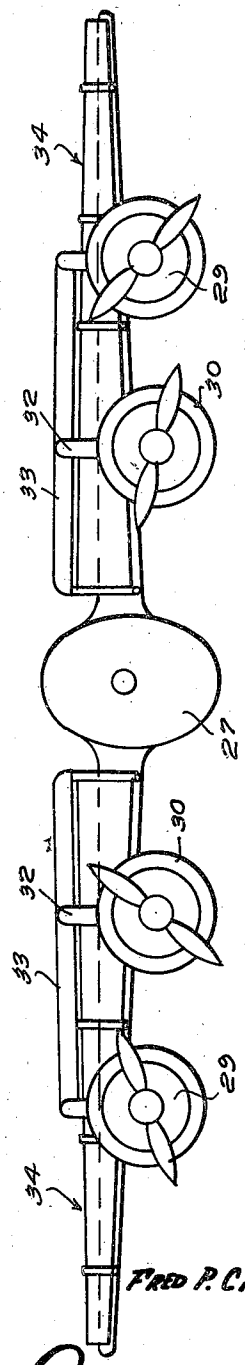


Fig. 11.

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AIRPLANE DEICING AND ENGINE SILENCING CONSTRUCTION

Filed Oct. 2, 1942 5 Sheets-Sheet 5

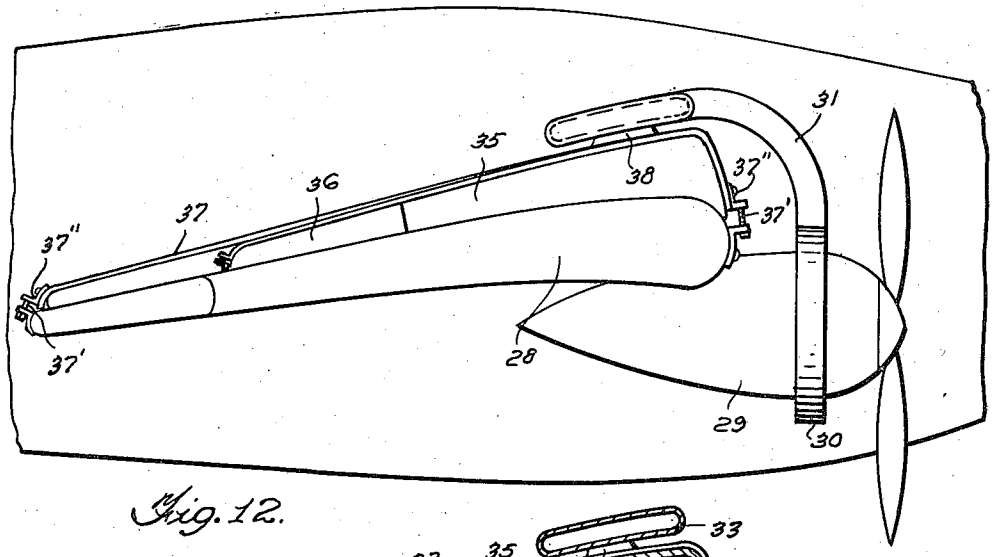


Fig. 12.

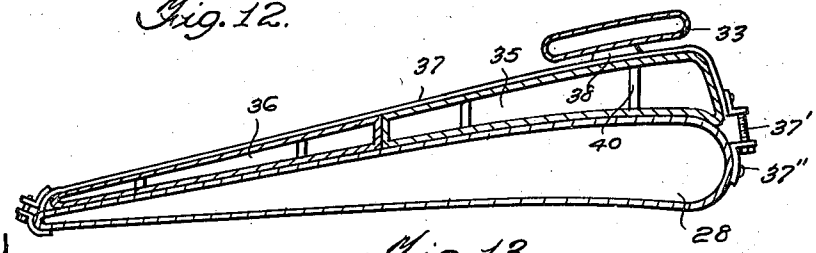


Fig. 13.

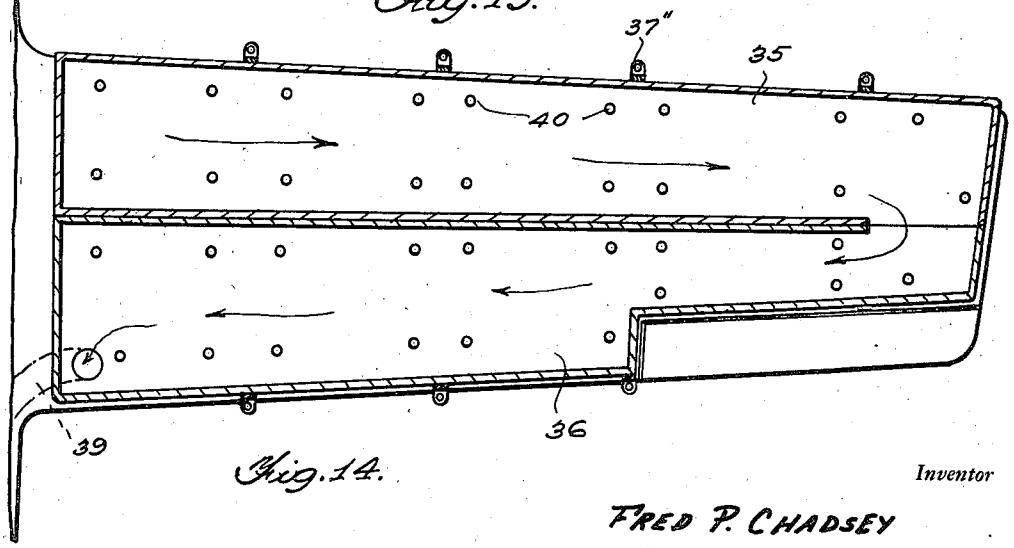


Fig. 14.

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UNITED STATES PATENT OFFICE

2,396,684

AIRPLANE DEICING AND ENGINE SILENCING CONSTRUCTION

Fred P. Chadsey, Fillmore, Calif.

Application October 2, 1942, Serial No. 460,547

4 Claims. (Cl. 244—134)

The present invention relates to new and useful improvements in airplanes and more particularly to means for de-icing the wings, body, rear elevators and rudder.

An important object of the invention is to provide connections for the exhaust manifold of the engine of the airplane to distribute the exhaust gases over the desired parts and thus supply sufficient heat to prevent formation of ice thereon.

Another object is to provide an improved airplane construction which adds to the efficiency and control of the machine, and thus improve the safety thereof, and which is also inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like reference numerals refer to like parts throughout and in which:

Figure 1 is a plan view of one type of an airplane embodying my invention.

Figure 2 is a sectional view through the wing taken on a line 2—2 of Figure 1.

Figure 3 is a side elevational view.

Figure 4 is a sectional view taken substantially on a line 4—4 of Figure 1.

Figure 5 is a fragmentary sectional view taken substantially on a line 5—5 of Figure 3.

Figure 6 is a sectional view through the body taken on a line 6—6 of Figure 3.

Figure 7 is a fragmentary sectional view taken substantially on a line 7—7 of Figure 5.

Figure 8 is a sectional view through the exhaust control valve.

Figure 9 is a detail of the bracket for the exhaust control valve.

Figure 10 is a fragmentary plan view of a modified form of the invention.

Figure 11 is a front elevational view thereof.

Figure 12 is a fragmentary side elevational view.

Figure 13 is a transverse sectional view of a wing embodying the modified construction, and

Figure 14 is a horizontal longitudinal sectional view thereof.

Referring now to the drawings in detail, and with particular reference to Figures 1 to 6, inclusive, the numeral 5 designates the body or fuselage of the airplane having wings 6, rudder 7 and rear elevators 8. In advance of the rudder is the upstanding fin 9.

To the engine, shown at dotted lines at 10, is connected exhaust pipes 11 and 12 leading to the opposite sides of the body and entering the respective wings 6 adjacent their front edges. The wings are of hollow construction and are provided with vertical laterally extending partitions 13, the partitions at their inner ends connect with the body and at their outer ends terminate short of the outer ends of the wings to provide front and rear chambers or passages 14 and 15 communicating at the outer ends of the wings.

The body is formed of inner and outer spaced shells 16 and 17 to form an insulated air space 18 therebetween, the front end of the air space being closed by a transverse partition 19. Openings 20 and 21 provide communication between each of the rear compartments 15 with the air space 18.

Each of the exhaust pipes 11 and 12 are provided with a branch pipe 12' (shown in detail in Figure 7) leading through the partition 19 into the air space 18, and at the junction of the branch pipe a gate valve V is provided on a pivot pin P to control passage of the exhaust gases either to the wings or to the air space. The pin P is provided with a rod R which is attached to a lever L engaged in notches N of a support S to secure the valve in open or closed position, or in a partly open position.

Projecting above the body adjacent the wings are a plurality of air discharge nozzles 23 connected to the air space 18, the nozzles being of flat flaring form disposed horizontally and directing the heated air from the nozzles fanwise over the upper surface of the body.

Nozzles 24 and 25 project outwardly from opposite sides of the body adjacent its rear end and also communicate with the air space 18, the nozzles 24 and 25 likewise being of flat flaring form and are disposed horizontally immediately in advance of the elevators 8.

Projecting upwardly from the top of the body at its rear end immediately in advance of the fin 9 is a nozzle 26 communicating with the air space 18 and also of flat flaring form and vertically disposed to spread the heated air over the fin.

In the form of the invention illustrated in Figures 9 to 13, inclusive, the body or fuselage is shown at 27 and the wings at 28. The wings have motor nacelles 29 mounted in the leading edges thereof, it being understood any desired number of motors may be provided.

Annular exhaust manifolds 30 surround the motors from which exhaust pipes 31 and 32 extend, the exhaust pipes 31 extending inwardly to a flat elongated manifold 33.

A sectional defroster conduit designated generally at **34** is conformably fitted on top of the wing **28** substantially coextensive therewith and is composed of a front section **35** and rear section **36** secured to the wing by straps **37** and bolts **37'** threaded in angle brackets **37''** at the front and rear edges of the wings. One edge of each section is in abutting relation and the abutting edges at the outer ends of the sections are open to provide communication with each other.

The manifold **33** is secured on top of the front section and communicates therewith by means of a passage **38** at the inner end of the front section, while the rear section at its inner end communicates with the air passage **18** of the fuselage by a pipe **39**.

Stay bolts **40** brace the top and bottom surfaces of the sections of the defroster.

From the foregoing it will be apparent exhaust gases from the engine will pass through the manifold **30** into the front section **35** of the defroster and will then travel toward the outer end thereof, as indicated by the arrows in Figure 14, into the rear section **36** and thence into the air passage **18** of the fuselage for subsequent discharge at the tail thereof as heretofore explained.

The distribution and dissipation of the exhaust gases as indicated further reduces the noise of the motors to produce a quieter running airplane.

It is believed the details of construction and manner of use of the device will be readily understood from the foregoing without further detailed explanation.

Having thus described the invention what I claim is:

1. An airplane de-icing construction comprising a fuselage having inner and outer spaced shells to provide a gas chamber surrounding the fuselage, hollow wings at each side of the fuselage, a partition longitudinally in the wings defining front and rear compartments communicating adjacent the outer ends of the wings, said rear compartment being connected to the gas chamber in the fuselage, and means for feeding engine exhaust gases to the front compartment for circulation through said compartments into the gas chamber of the fuselage.

2. An airplane de-icing construction comprising a fuselage having inner and outer spaced shells to provide a gas chamber surrounding the fuselage, hollow wings at each side of the fuselage, a partition longitudinally in the wings defining front and rear compartments communicating adjacent the outer ends of the wings, said rear compartment being connected to the air chamber in the fuselage, means for feeding engine exhaust gases to the front compartment for circulation through said compartments into the gas chamber of the fuselage and exhaust funnels connected to the gas chamber of the fuselage and arranged to spread the exhaust gases over adjacent surfaces of the fuselage.

3. An airplane de-icing construction comprising a fuselage having inner and outer spaced shells to provide a gas chamber surrounding the fuselage, hollow wings at each side of the fuselage, a partition longitudinally in the wings defining front and rear compartments communicating adjacent the outer ends of the wings, said rear compartment being connected to the gas chamber in the fuselage and means for feeding engine exhaust gases to the front compartment for circulation through said compartments into the gas chamber of the fuselage, said fuselage having vertical and horizontal control elements at its rear end, and exhaust funnels connected to the gas chamber of the fuselage for directing exhaust gases against said control elements.

4. An airplane de-icing construction comprising a fuselage having inner and outer spaced shells to provide a gas chamber surrounding the fuselage, hollow wings at each side of the fuselage, a partition longitudinally in the wings defining front and rear compartments communicating adjacent the outer ends of the wings, said rear compartment being connected to the gas chamber in the fuselage, means for selectively feeding engine exhaust gases to the front compartments of the wings or directly to the gas chamber of the fuselage, and exhaust funnels connected to the gas chamber of the fuselage and arranged to spread exhaust gases over adjacent surfaces of the fuselage.

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