Aug. 13, 1929. T. SORENSEN 1,724,226

FLYING MACHINE

Filed May 24, 1928

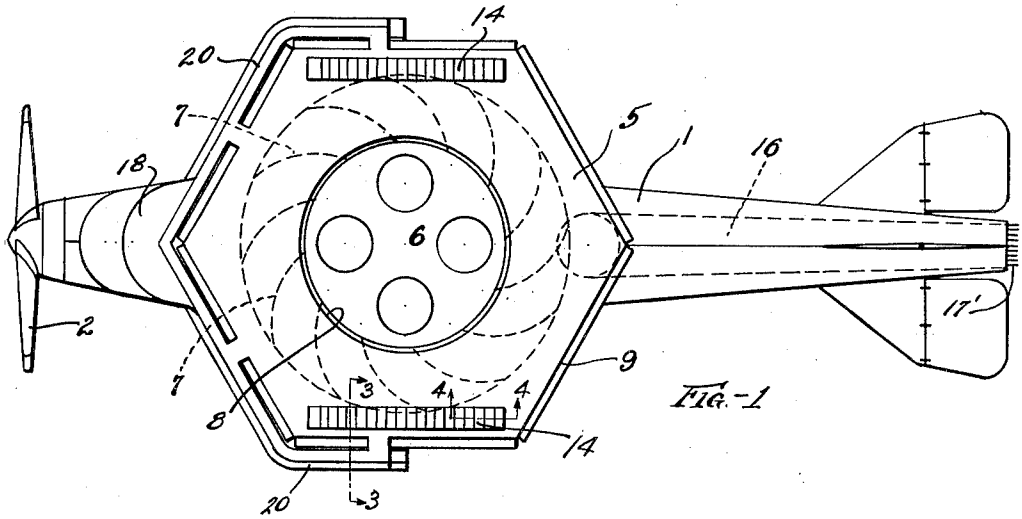



FIG. -1

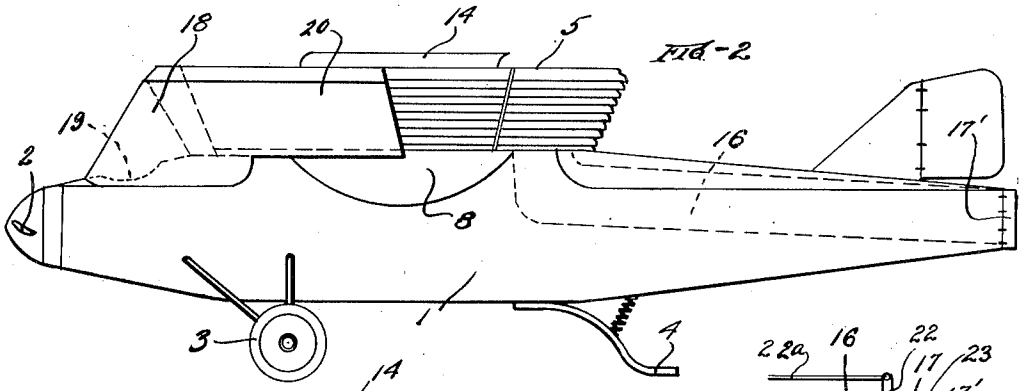



FIG. -2

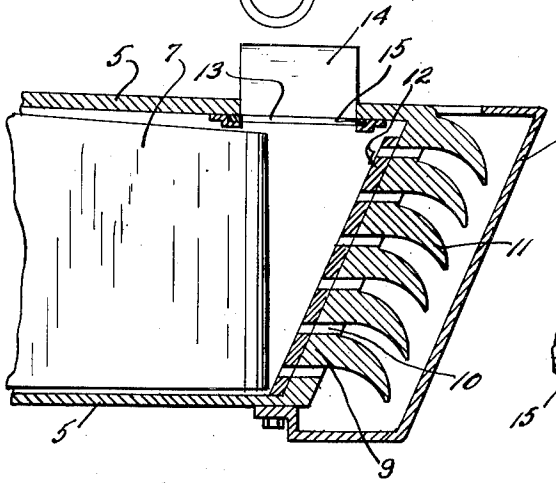



FIG. -3

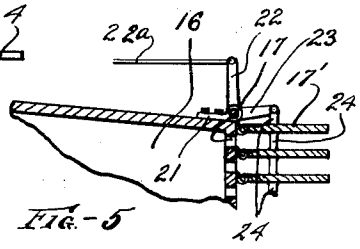



FIG. -5

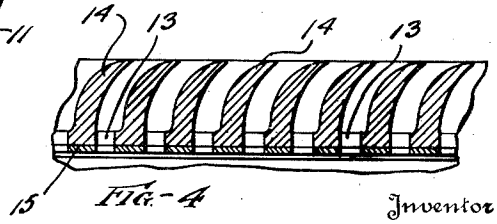



FIG. -4

Inventor

Theodore Sorensen

By Brockett & Hyde

Attorneys

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# UNITED STATES PATENT OFFICE.

THEODORE SORENSEN, OF CLEVELAND, OHIO, ASSIGNOR TO JAMES S. REID, OF CLEVELAND, OHIO.

## FLYING MACHINE.

Application filed May 24, 1928. Serial No. 280,237.

This invention relates to aeroplanes and particularly to elevating and driving means therefor.

The object of the present invention is to produce an aeroplane provided with a suitable motor for driving the various elements and particularly a fan arranged in a fan casing preferably disposed horizontally at the center of the fuselage and provided with outwardly and downwardly curved surfaces receiving blasts of air from the fan casings at great velocity as the result of being projected through orifices which retard the discharge from the fan casing and result in building up the air pressure therein, the lifting effect thus produced being the result of the impinging of streams of air against the curved surfaces at great velocity and also the impact of the air discharge against the atmosphere.

A further object is to also provide the plane, preferably the fan casing, with rearwardly curved surfaces similar to those for lifting but arranged to discharge to the rear either upon the top or bottom and thereby produce a forward impelling force for driving the plane forward after it has been elevated to the proper elevation.

A still further object is to provide a suitable discharge of the same type between vertically arranged blades at the tail for the purpose of taking care of the torque of the motor in driving the fan.

The invention also contemplates the provision of a suitable guard arranged about the discharge through the fins of the fan casing at the front for preventing a back pressure therein due to the movement of the plane through the air.

Other details of the invention will be brought out in the following description, drawings and claims.

Referring to the drawings, Fig. 1 is a top plan view of a plane constructed according to my invention; Fig. 2 is a side elevation; Fig. 3 is a section upon the line 3—3 of Fig. 1; Fig. 4 is a section upon the line 4—4 of Fig. 1; and Fig. 5 is a detailed view of the rear end of the fuselage.

In the arrangement shown, the fuselage 1 is of the usual type with or without a motor driven propeller 2 at the front. It is also provided with the usual landing gear in the form of wheels 3 and the runner 4. Arranged preferably upon the fuselage is the fan casing 5 adapted to receive a fan comprising the hub portion 6 driven by any suitable motor arranged in the fuselage and blades 7. The fan casing is provided with a central opening 8 preferably upon the top and bottom for a supply of air. The periphery of the casing is preferably made hexagonal and comprises a plurality of flat sides 9 each of which has suitable slots or passages 10 extending throughout the length of the side and adapted to project air under downwardly curved baffles or plates 11. The openings 10 are of a size such that they retard the discharge from the fan and build up a pressure within the casing to an extent such that the discharge through the openings 10 is at great velocity so that it impinges under the curved sides of the baffles or fins 11 and creates a lifting effect as the result thereof. These high speed volumes of air also impact upon the atmosphere and tend to produce a lifting effect. Any suitable means, such as a slide 12, may be utilized to regulate the size of the openings 10. This slide would be connected to a suitable control, not shown, but of any preferred type.

The casing 9 is still further provided near its two side edges with upwardly extending openings 13 similar to the openings 10 and arranged to project streams of air at great velocity against the rearwardly curved fins 14. A suitable slide 15 controls the discharge through these openings 13. There is preferably one of these groups of openings and blades 13 and 14 on each side of the casing to increase the driving capacity.

The fan casing 9 is further provided with a conduit 16 extending through the fuselage to the tail thereof where it discharges through openings 17 similar to the openings 10 and 13 arranged between vertically disposed planes or fins 17'. This discharge at this point is for the purpose of resisting the torque created by the motor in driving the fan.

If desirable, the fan casing may be guarded at its front by a suitable guard 18 extending up in front of the driver's seat 19 and extending around in side portions 20. This guard prevents the rush of air at the front of the plane when moving forward from interfering with the air discharged at the front of the elevating casing.

In operation, the operator speeds up the fan and opens the discharge through the

openings 10 when the plane will rise to the desired height, the torque of the plane, due to driving the fan being prevented by a discharge permitted through the fins 17′. When the plane reaches the desired height, the operator checks the discharge of air through the openings 10 and permits a discharge past the blades 14 thereby causing the plane to move forward. Adjustment of the air supply to the openings 10 and 13 will cause the plane to travel at the proper heighth and at the proper forward speed.

The fins 17′, which are for the purpose of being set to resist the torque of the fan, may be made adjustable in any way so that they may be set to overcome the torque, but on the other hand, they may be under the control of the operator, in which case the fuselage is provided at its tail end with a bracket 21 supporting pivotally a bell crank lever comprising an operating arm 22 connected by a rod $22^a$ to any suitable control, not shown, but handy to the operator and an operated arm 23 pivotally connected to a link 24 similar in all respects to other links connecting the several fins 17′ in a gang. In this way the operator may set these fins 17′ for resisting the torque of the motor or for use in turning the plane around in the air, or, indeed, on the ground.

What I claim is:

1. An aeroplane comprising a fuselage, an air casing carried by said fuselage and having a plurality of air discharge openings symmetrically about its entire periphery, said openings being of a size and number to restrict the air discharge from said casing to create a back pressure in the casing and increase the velocity effect of the air discharged through said openings, and a plurality of curved fins symmetrically arranged around the entire casing adjacent said openings, and means for supplying air to said casing.

2. As in claim 1 wherein the air casing is arranged horizontally and is provided with a plurality of downwardly curved fins about its entire periphery adjacent said openings.

3. As in claim 1 wherein the casing is provided with a plurality of fins curved rearwardly and arranged in a horizontal group adjacent some of said openings for producing forward movement of the plane.

4. As in claim 1 wherein the casing is arranged horizontally and is provided with a plurality of downwardly curved peripheral fins and with a gang of rearwardly curved fins arranged in a horizontal group, all of said fins being adjacent the air discharge openings in said casing.

5. As in claim 1 wherein the casing is provided with means for regulating the passage of air through said openings.

6. As in claim 1 wherein the air casing is arranged horizontally and is provided with a plurality of downwardly curved fins about its periphery adjacent said openings, and a guard carried by said fuselage and extending about said fins at the front to protect the same against the rush of air as the plane moves forward.

7. An aeroplane comprising a fuselage, an air casing carried by said fuselage and having a plurality of air discharge openings, said openings being of a size and number to restrict the air discharge from said casing to create a back pressure in the casing and increase the velocity effect of the air discharged through said openings, a plurality of curved fins carried by said casing adjacent said openings, a horizontally rotating fan element in said casing, a conduit extending from said casing to the tail of said fuselage and there provided with a plurality of vertically spaced discharge openings of restricted area, a plurality of vertically disposed fins adjacent said openings, and means for changing the angular position of said fins as a gang to counteract the torque of said horizontally rotating fan element in said casing.

8. An aeroplane comprising a fuselage, an air casing carried by said fuselage and having a plurality of air discharge openings, said openings being of a size and number to restrict the air discharge from said casing to create a back pressure in the casing and increase the velocity effect of the air discharged through said openings, a plurality of curved fins carried by said casing adjacent said openings, a rotating fan element in said casing, a conduit extending from said casing to the tail of said fuselage and there provided with a group of elongated restricted orifices, a plurality of parallel fins arranged adjacent said orifices, and means for changing the angular position of said fins as a gang to counteract the torque of said fan.

9. An areoplane comprising a fuselage, an air casing carried by said fuselage, a conduit extending from said casing to the tail of said fuselage and provided with vertically disposed spaced air discharge openings, a plurality of vertical fins adjacent said openings, and means for adjusting the angular position of said fins as a gang.

In testimony whereof I hereby affix my signature.

THEODORE SORENSEN.