

March 15, 1938.

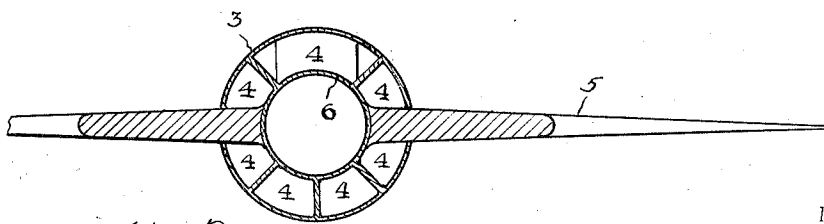
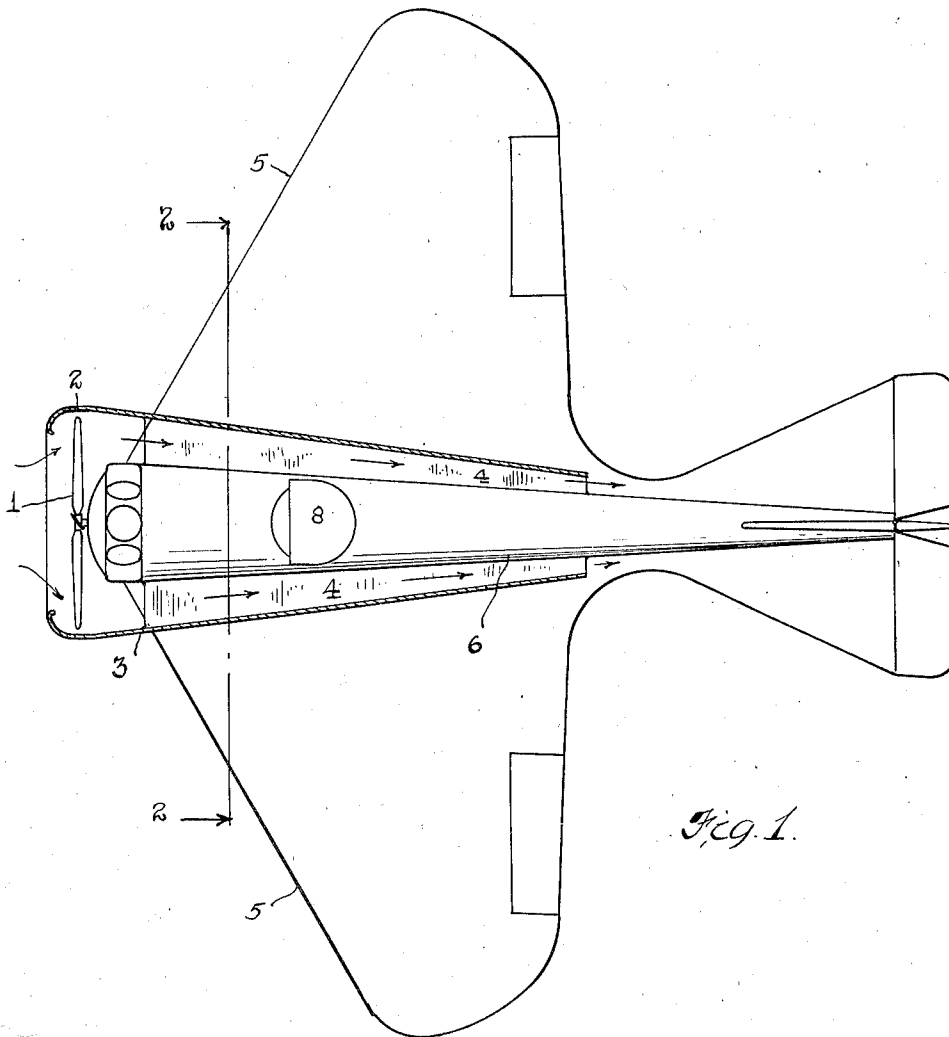
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2,111,318

AEROPLANE

Filed April 10, 1935

2 Sheets-Sheet 1



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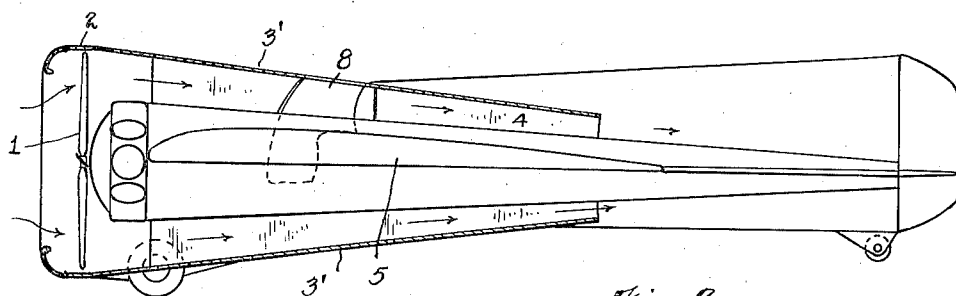


Fig. 3

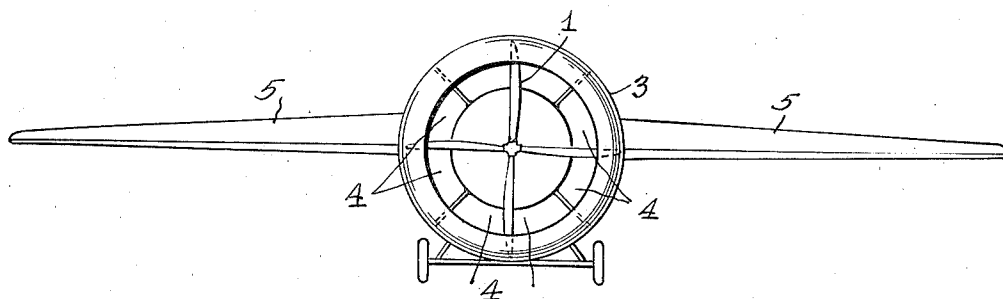


Fig. 4

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UNITED STATES PATENT OFFICE

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AEROPLANE

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Application April 10, 1935, Serial No. 15,651

2 Claims. (Cl. 244—15)

This invention relates to improvements in aeroplanes and has for its object the provision of structural modifications for handling the air moved by the propeller which materially increase the operating efficiency of the plane. Particularly, the improvements result in a marked increase in the speed attainable with a particular motor and propeller.

Essentially, in applying my improvement to a monoplane of the usual type, I gather the air moved by the propeller within a circumferential cowl of sheet metal or similar material and provide passages of similar material extending rearwardly therepast the wings of the plane and discharge same rearwardly thereof.

To the accomplishment of the foregoing and related ends, said invention, then consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawings and the following description setting forth in detail certain structure embodying the invention, such disclosed means constituting, however, but one of various structural forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a plan view of a plane equipped with an embodiment of my improvement; Fig. 2 is a cross-sectional view thereof taken on the line 2—2, in Fig. 1; Fig. 3 is a side elevational view of said plane partly in cross-section; and Fig. 4 is a front elevational view of said plane.

In the embodiment of my invention shown in Fig. 1, I place about the propeller 1 and concentric therewith a sheet-metal cowl 2. This cowl is attached to and supported by semicylindrical parts 3' of sheet metal, positioned one above and the other below the wing structures 5. These parts together form a cylindrical shell 3 which extends back beyond the wing structure and concentrically encloses the fuselage 6. The shell 3 and the fuselage 6 define therebetween a space through which the air moved by the propeller is driven back to a discharge opening adjacent the rear edge of the wings. This space is divided into passages 4 as hereinafter explained.

In the said embodiment I have so formed the parts 3' that the cylindrical shell 3 tapers rearwardly. This tapered construction not only conforms to the fuselage whereby increase of the total cross-sectional area of the passages 4 is avoided, but in the embodiment shown I have exaggerated the taper and have secured a distinct progressive decrease in the cross-sectional area of the passages 4 as the discharge end is approached. It may be deemed desirable to so

flatten the shell 3 as it approaches the discharge end, that the discharge orifice will be oblong either vertically or horizontally, or a combination of same.

In said embodiment the shell 3 is supported upon longitudinal fins 7 affixed to the fuselage 6. These fins 7 divide the air passages within the shells and serve a purpose in reducing the air eddies therewithin. It is important that the passages within the shells be kept unobstructed, and when an obstruction is necessary, as in the case of the cock-pit 8 in Figs. 1 and 3, the structure of such cock-pit within the passage should be streamlined that the air may pass freely thereby.

To secure greater stability of the plane at the speeds attached I prefer wings of great width relative to length. A preferred form of such wings is shown in Fig. 1.

It will be understood that in other respects the plane is constructed according to standard practice, using preferably a radial engine. Wings, rudders, ailerons, etc. are positioned as usual with the usual functions.

It will readily appear that a fuselage may be constructed of sufficient size to provide therein passages for conducting air from the cowl enclosing the propeller to a discharge opening near the rear edge of the wing. In such a construction, the structural supports for the motor, gas tank, cock-pit, rudders, etc., will be enclosed as it were by an inner fuselage which may form one side of the desired air passages. Likewise, structural members connecting with the outer shell or fuselage proper, particularly those for wing support, should be so arranged that they may be combined with the fins dividing the air passages. These air passages should be unobstructed and preferably so constructed that they never widen in cross-section as air is moved from the propeller to the discharge opening. As indicated, it is believed that it is advantageous to taper these passages rearwardly that the air may move at an increased speed therethrough.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In an aeroplane having a fuselage, wings, rearwardly positioned steering means and a driven propeller, a tubular shell surrounding the propeller receiving substantially all the air moved

thereby and extending to the rear edge of the wings thus carrying substantially all air moved by the propeller to the rear edge of the wing, said shell being substantially co-axial with the
5 fuselage and characterized by cross-sectional areas effective for the passage of air which do not increase rearwardly and by a discharge opening adjacent the rear edge of the wing structure which opening has a long dimension parallel to
10 one of the steering means and a shorter dimension normal thereto.

2. In an aeroplane having a fuselage, wings,

rearwardly positioned steering means and a driven propeller, a tubular shell surrounding the propeller and extending to the rear edge of the wings in substantial co-axial relation with the fuselage, which shell defines a passage adapted to carry
5 all the air moved by the propeller to the rear edge of the wings, said passage being characterized by having effective cross areas which decrease rearwardly, and by having a discharge opening rearwardly in which a longer dimension
10 is parallel to one of the steering means.

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