

March 24, 1925

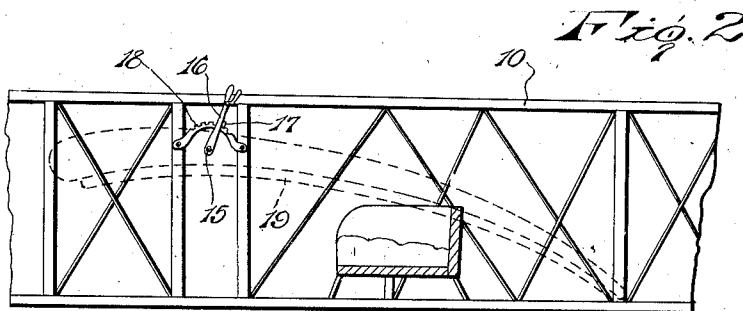
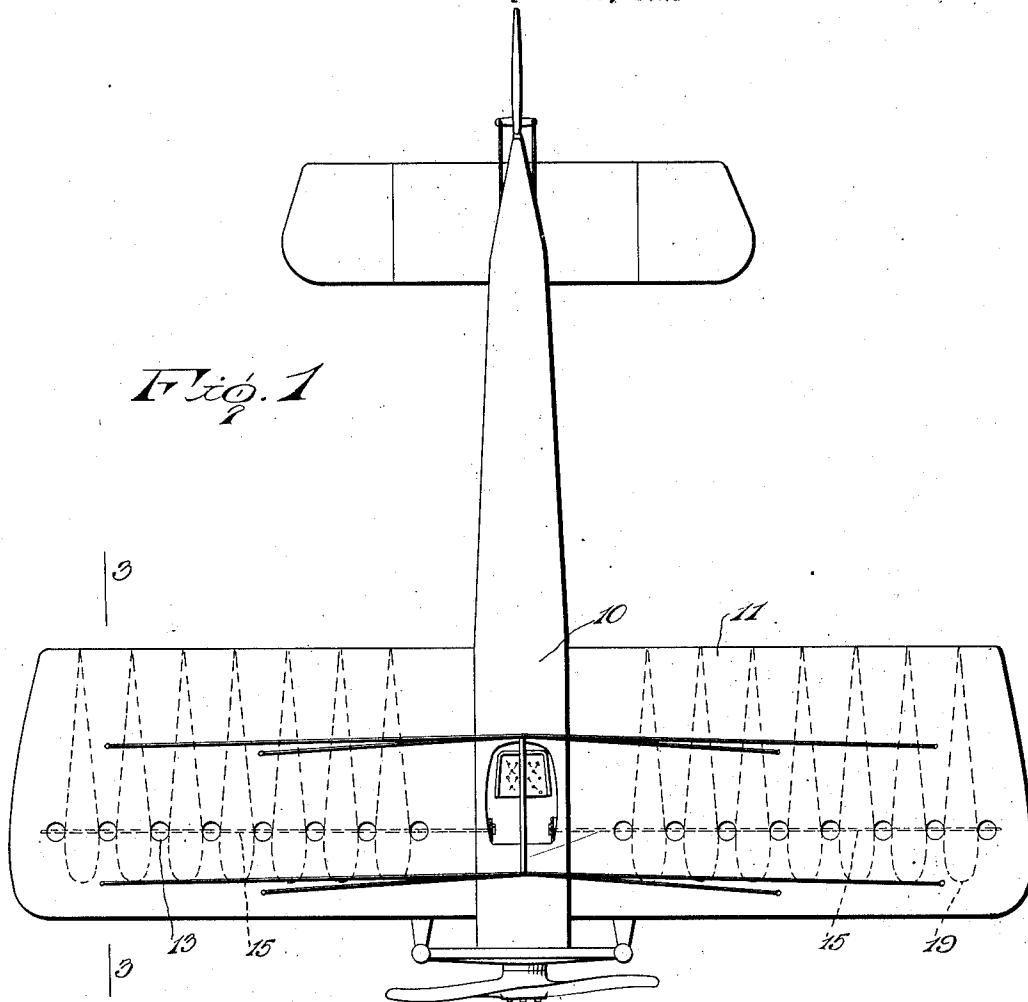
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C. F. ADAMS

AEROFOIL

Filed April 30, 1923

2 Sheets-Sheet 1



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Fig. 3.

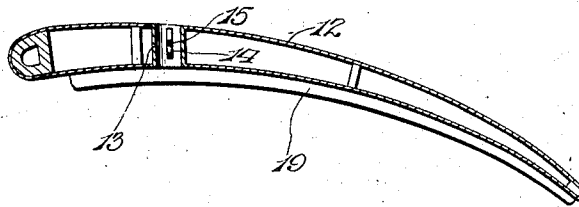


Fig. 4.

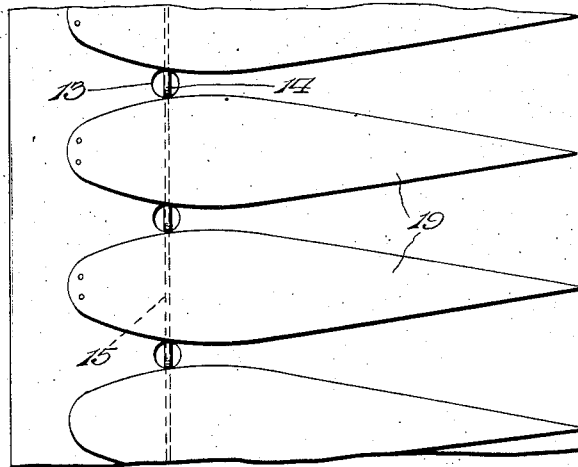


Fig. 5.

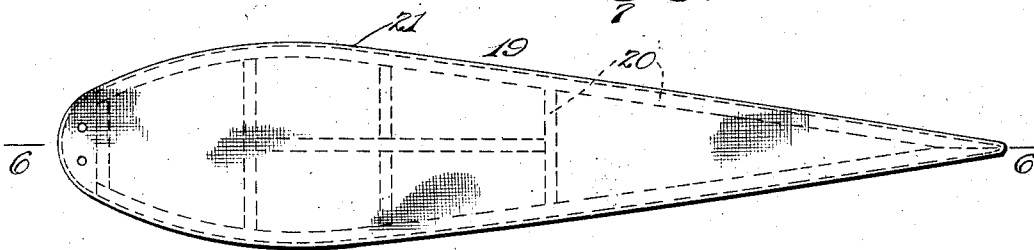
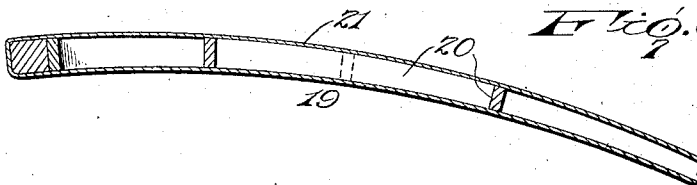


Fig. 6.



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UNITED STATES PATENT OFFICE.

CLARENCE F. ADAMS, OF DAYTON, OHIO.

AEROFOIL.

Application filed April 30, 1923. Serial No. 635,673.

To all whom it may concern:

Be it known that I, CLARENCE F. ADAMS, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Aerofoils, of which the following is a specification.

This invention relates to improvements in aerofoil construction.

The general object of this invention is the provision of an aerofoil which has in conjunction therewith means that may be controlled by the operator to increase the lifting power and which serve to give greater directional stability.

This object is accomplished by providing channels which extend through the aerofoils and providing in conjunction therewith means for controlling the flow of air there-through and mounting on the lower face of the aerofoils means for forming air tracks which converge at the mouth of the channels, said means also serving to convey air currents to the channels.

This and other objects of the invention will be more clearly understood from the following detailed description and accompanying drawings, of which—

Figure 1 is a top plan view of an aeroplane including an aerofoil of the improved construction;

Figure 2 is a section through the fuselage, showing the lever means for controlling the valves;

Figure 3 is a section along the line 3—3, Figure 1;

Figure 4 is a bottom plan view of a section of the aerofoil showing the relative positions of the adapters and tubes;

Figure 5 is a plan view of an adapter;

Figure 6 is a section along the line 6—6, Figure 5.

Referring to the above mentioned drawings, in Figure 1 an aeroplane is shown which consists of a fuselage 10, an aerofoil assemblage 11, and various other parts which are not important in the description of this aerofoil construction. The aerofoil assemblage 11 consists of the usual cambered aerofoil 12 consisting of a frame covered by a suitable fabric. Tubes 13 are mounted in the aerofoil at intervals and form channels extending through the aerofoil which serves to convey currents of air through the aerofoil. These channels are controlled by means of valves 14 of the butterfly type

which are mounted on rods 15 extending lengthwise through the aerofoil. A rack and lever assemblage mounted in the fuselage cooperates with the rod to rotate the same. This rack and lever assemblage consists of a lever 16 fixed to the rod and provided with a dog 17 which engages with the rack 18 mounted on the wall of the fuselage serving to retain the lever in any position to which it may be moved.

Adapters 19, which consist of a frame 20 covered with an impervious fabric 21, are mounted on the lower face of the aerofoil. These adapters are preferably given the same camber as the aerofoil. One adapter is located in each space between the tubes 13 and they extend from near the front edge of the aerofoil to the rear edge. The top elevation of an adapter shows the front portion to be elliptical in shape while the rear portion is triangular or the shape of a vertical section through a cone. The adjacent sides of the adapters converge towards the tubes 13 mounted in the aerofoil. The spaces between the adapters form air tracks which lead to the tubes 13.

The operation of this device is as follows:

Considering an aeroplane during flight, the lower surface of the lifting aerofoils, commonly known as wings, meets the air, compresses it and accelerates it downward. As a result of this definite action there is, of course, an equal and opposite reaction upwards due to the compressed air beneath. The top surface of the lifting aerofoil in moving forward tends to leave the air behind thus creating a semi-vacuum or rarefied area over the top of the lifting aerofoil. Consequently the pressure of air on the top surface is decreased thus assisting the reaction below to raise the lifting aerofoils. In a lifting aerofoil of the construction set forth in the above specifications, the air is compressed below the aerofoil as shown while above there is a space in which there is a semi-vacuum. In order to increase the area of the semi-vacuum or rarefied air the valve 14 may be operated to allow the air to pass through the aerofoil. This rush of air through the tubes 13 tends to carry the air further away from the top surface of the aerofoil and thus give a greater area of rarefied air above the lifting aerofoil. This increases the lifting power and, as apparent from the foregoing sentence, is under the control of the aviator. The adapters,

mounted on the under face of the lifting aerofoil, form air tracks which guide the air to the tubes. They also increase the amount of air acted upon by the under surface of the lifting aerofoil for a unit of time. The air passing between the adapters provides what might be called trackage. This assists greatly in giving directional stability.

I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention I do not limit myself strictly to the exact details herein illustrated since manifestly the same can be considerably varied without departing from the spirit of the invention as defined in the appended claims.

I claim:—

1. A lifting aerofoil of the class described having spaced upper and lower wing coverings, a plurality of openings extending substantially vertically therethrough, and means mounted on the lower face of the aerofoil for guiding the currents of air in the direction of said openings.

2. A lifting aerofoil of the class described having a plurality of openings extending therethrough, means located in said openings for controlling the amount of air that passes therethrough, and means mounted on the lower face of the aerofoil to guide the currents of air in the direction of said openings.

3. A lifting aerofoil of the class described having a plurality of openings extending therethrough, valves mounted in said openings for closing the same, means in conjunction with said valves for operating them, and means located on the lower face of the aerofoil for guiding the currents of air in the direction of the openings.

4. A lifting aerofoil of the class described having means mounted on its lower face to form air tracks, and tubes extending through the aerofoil to form channels leading from the air tracks through the aerofoil.

5. In an aeroplane, an improved lifting aerofoil of the class described, comprising a cambered aerofoil, elliptical-shaped adapters mounted on the lower face of the aerofoil to form air tracks, and tubes mounted in the aerofoil forming channels leading from the air tracks to above the surface of the aerofoil to allow the air to pass therethrough to increase the rarefaction above the aerofoil.

6. In an aeroplane, a lifting aerofoil of

the class described comprising a cambered aerofoil, tubes mounted in the aerofoil and forming channels which extend there- through, and adapters, the front ends of which are of elliptical shape and the rear ends triangular shape, mounted on the lower face of the aerofoil and serving to form tracks which converge near the lower end of the tube.

7. In an aeroplane, a lifting aerofoil of the class described, comprising a cambered aerofoil, adapters mounted on the lower face of the aerofoil, serving to form air tracks which converge comparatively near the front edge of the aerofoil, tubes mounted in the aerofoil forming channels which extend from the air tracks through the aerofoil to the upper surface of the same, and valves for closing the tubes.

8. As a new article of manufacture, a curved lifting aerofoil having openings extending therethrough, adapters, the front ends of which are elliptical in shape and the rear ends of triangular shape, covered with an impervious material and mounted on the lower face of the aerofoil forming air tracks which converge comparatively near the front edge of the aerofoil, tubes mounted in the aerofoil to form channels which extend from the air tracks through the upper wall of the aerofoil to convey air to the air tracks through the aerofoil, valves mounted in the tubes for controlling the flow of air, and lever means for operating the valves.

9. In an aeroplane, a lifting aerofoil of the class described, comprising a curved aerofoil having means mounted on the lower face for creating converging air tracks, tubes mounted in the aerofoil and extending therethrough to form channels which lead from the air tracks through the aerofoil to convey currents of air through the aerofoil to increase the rarefaction above the latter, and means for controlling the flow of air through said channels.

10. A lifting aerofoil of the class described having a plurality of openings extending therethrough, means mounted on the lower face of the aerofoil for guiding the currents of air in the direction of said openings, said means forming venturi shaped passages having said openings located at the restricted portion thereof.

In testimony whereof I affix my signature.

CLARENCE F. ADAMS.