PUBLISHED
MAY 25, 1943.
BY A. P. C.

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STABILIZERS FOR AIRCRAFTS
Filed March 24, 1939

Serial No.
264,004
2 Sheets-Sheet 1

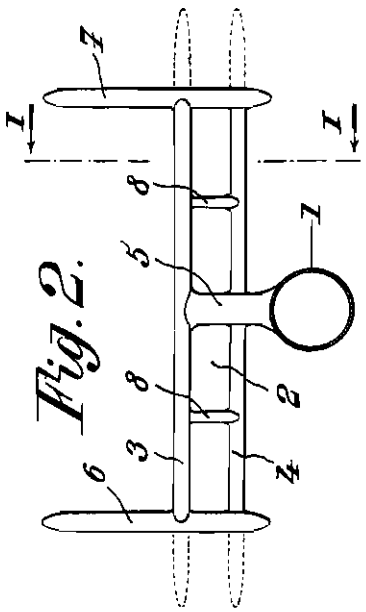

Fig. 2.

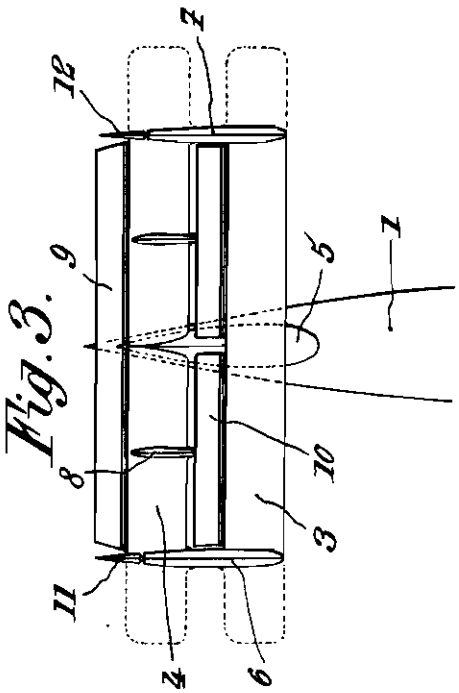

Fig. 3.

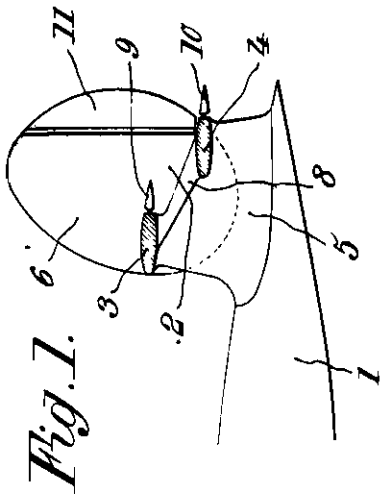

Fig. 1.

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Fig. 7.

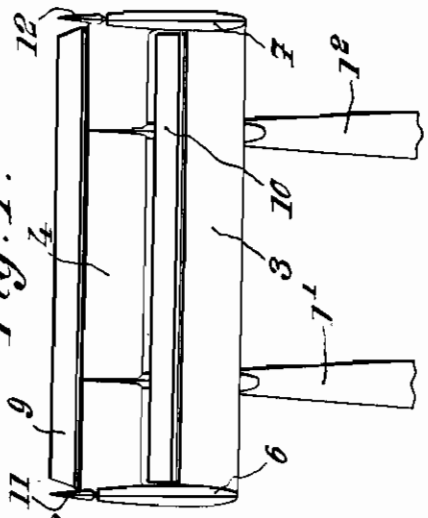


Fig. 6.

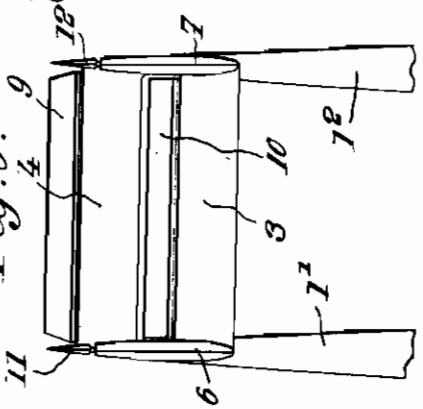


Fig. 4.

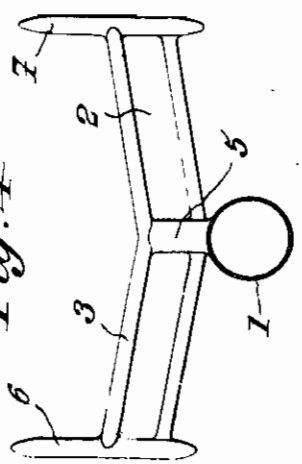


Fig. 8.

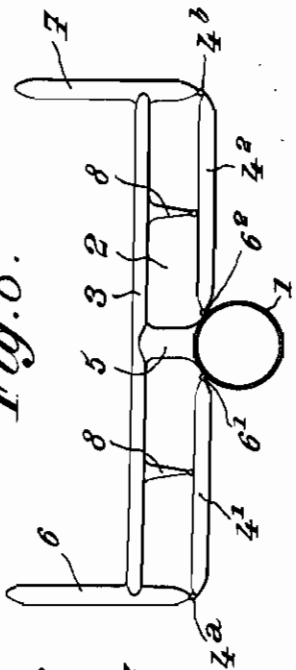
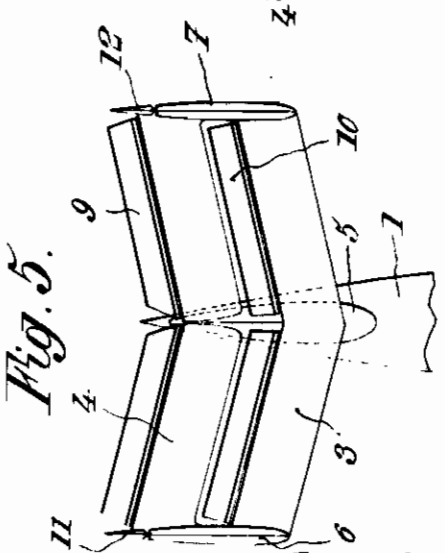


Fig. 5.



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Published May 25, 1943 Serial No. 264,004

ALIEN PROPERTY CUSTODIAN

STABILIZERS FOR AIRCRAFTS

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Application filed March 24, 1939

The present invention relates to the stabilizing or balancing devices of aerial locomotion machines and it is more especially, although not exclusively, concerned, among these devices, with those carrying the control surfaces of these machines.

The chief object of the present invention is to provide devices of this kind which are better adapted to meet the requirements of practice than those made up to the present time, especially concerning their rigidity, their resistance to stresses more especially produced by the controlling surfaces and their capacity of reducing the tail vibrations which are very important with the devices of this kind as they are made at the present time.

According to an essential feature of the present invention, the stabilizers of machines of the type above mentioned are constituted by at least two streamlined planes, substantially horizontal and transversely supported by the fuselage, these horizontal planes being interconnected by at least two substantially vertical streamlined planes, respectively located in the vicinity of the free ends of said horizontal planes and forming, together with them, at least one element or section of a so-called "ladder" beam.

Other features of the present invention will result from the following detailed description of some specific embodiments thereof.

Preferred embodiments of the present invention will be hereinafter described, with reference to the accompanying drawings, given merely by way of example and in which:

Fig. 1 is a vertical sectional view, on the line 1—1 of Fig. 2, of a stabilizer made according to a first embodiment of the invention;

Fig. 2 is an elevational view corresponding to Fig. 1;

Fig. 3 is a plan view corresponding to said Fig. 1;

Fig. 4 is a diagrammatic elevational view of a modification of this first embodiment of the invention;

Fig. 5 is a diagrammatical plan view of another modification of this first embodiment of the invention;

Fig. 6 shows, in diagrammatical plan view, a stabilizer made according to a second embodiment of the invention;

Fig. 7 shows, in a similar manner, a stabilizer device made according to a modification of this second embodiment;

Fig. 8 shows, in diagrammatical elevation, a device made according to a third embodiment of the invention.

In the following description with reference to the drawings, it will be supposed, by way of example, that it is desired to provide an improved stabilizer or tail for an airplane.

In this case, on the fuselage of the airplane, for instance at the rear end thereof, I provide two streamlined planes 3 and 4, constituting a kind of biplane structure, and which are arranged in staggered relationship with respect to each other. Between these planes 3 and 4, I provide an interval 2 which is more or less important as the case may be.

I arrange these streamlined planes 3 and 4 in such manner that they are substantially horizontal and perpendicular (Figs. 1 to 3 and 6 to 8) or oblique (Fig. 5) with respect to the axis of the fuselage, or again these planes are inclined with respect to the horizontal plane passing through said axis, in such manner as to form a kind of V the branches of which make a large angle with respect to each other and are perpendicular (Fig. 4) or oblique with respect to said axis of the fuselage.

In order to fit or mount said planes on the fuselage and especially at the rear part thereof, I may make use, as shown by Figs. 1 to 5 inclusive, and by Fig. 8, of a streamlined central support provided at the upper part of said fuselage and extending vertically in a fore and aft direction. The planes in question may be engaged in said support as shown by Figs. 1 to 5. According to another embodiment of the invention, only the upper plane 3 is mounted in said support, while the lower plane is made of two elements 4^1 and 4^2 respectively hinged at 6^1 and 6^2 to this support 5 or to fuselage 1.

When the apparatus includes several fuselages or tail supporting beams, such as 1^1 and 1^2, as shown by Figs. 6 and 7, this central support 5 may be dispensed with, and the horizontal planes are mounted directly on said fuselages or beams. The free ends of said planes may be located close to the vertical planes passing through the axes of said fuselages, as shown by Fig. 6, or they may extend, in a more or less overhanging manner, beyond said vertical planes, as shown by Fig. 7.

The horizontal planes are connected together by means of vertical planes 6 and 7, which are located, respectively, at the free ends of said horizontal planes or in positions intermediate between these free ends, as shown in dotted lines by Fig. 2.

These vertical planes may either be rigidly en-

gaged in horizontal planes 3 and 4, as shown by Figs. 1 to 7, or they may be hinged, at 4a and 4b, to the corresponding portions of the lower plane 4.

These vertical planes 6 and 7 are made of sizes such that they can act not only as connections between the horizontal planes but as tail fins, such as they are made at the tips of some supporting surfaces. However, the vertical planes 6 and 7 according to the present invention should not be confounded with these fins, since the latter are supported by each supporting surface or plane, individually, and do not serve to provide a connection, either rigid or articulated, between two horizontal planes, and, more especially, two planes of this kind belonging to a stabilizer device.

If necessary, for reasons of resistanee or rigidity, the horizontal planes 3 and 4 may be connected together by means of bracing members 8 suitably distributed over the span of these planes and fixed thereto either rigidly (Figs. 1 to 3) or rigidly to the top plane and pivotally to the lower plane, as illustrated by Fig. 8.

Whatever be the specific embodiment that is chosen, I obtain a stabilizer structure in which the horizontal and vertical streamlined planes, connected together as above explained and including eventually, a central support such as 5, and/or several bracing members such as 8, constitute one or several sections of a ladder beam with rigid angles or including rigid angles and articulated angles.

At the rear of one or the other, or both, of the horizontal planes 3 and 4, I may hinge blades 9 and 10, controlled either simultaneously or individually, and acting as adjustable stabilizing elements.

Likewise, I may hinge to the rear edge of vertical planes 6 and 7, and eventually of bracing members, respectively, vertical panels or blades 11 and 12, which act as rudder elements.

Of course, the whole of the stabilizing system, instead of being provided at the rear of the flying machine, as above explained, can be mounted as well at the front thereof.

Furthermore, I might provide more than two horizontal or vertical planes, while maintaining the arrangement, connection, and mounting characteristics above mentioned.

In any case, I obtain a structure which constitutes a beam capable of absorbing, with the maximum of rigidity, the bending stresses which result chiefly from the efforts transmitted from the control surfaces of the aircraft.

Furthermore, with the arrangement according to the present invention, I greatly reduce the tail or other vibrations which are very considerable with the arrangements now in use.

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