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TILTABLE WING

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3 Claims. (Cl. 244—44)

This case is a continuation in part of my original Patent Serial Number 461,412, filed April 14, 1921.

My invention primarily relates to that class of flying machines, which are heavier than air but certain details may be used on any flying machine, aircraft, or other uses.

One of the principal objects of the invention is to provide wings that may change the camber while in the air so that a camber that is satisfactory in the lower air may be materially increased if found necessary in navigating the stratosphere.

A still further object is to provide wings such that either of the planes may have its camber changed without changing the camber of the other plane to get varying conditions.

A still further object is to provide wings that change their camber to crack any ice that may form upon the planes by warping the planes or bearing surface until the ice cracks.

A still further object is to provide operating means to the above end or the ends herein disclosed.

Also certain other advantages which will hereinafter appear.

To these ends my inventions consist in certain novel features which I shall now proceed to describe and shall then point out in the accompanying claims.

In the accompanying drawing Figure 1 is a perspective view of self stabilizing aeroplane wings. This plane may be used as a glider or may have motivating power added without departing from the essential features involved.

Figure 2 is a cross sectional view of Figure 1 showing the operating mechanism for changing the camber of the wings by flexure.

Figure 3 is a modification of Figure 2, in which both front and rear edges are flexed to change camber.

Figure 4 is a modification of the bracing mechanism between the planes.

Figure 5 is a modification of the wing struts 3.

Figure 6 is a cross section of Figure 5.

In illustrating this device more specifically the top plane 1 and the bottom plane 2 are used to represent a multiplicity of planes which may be single or in any number without departing from the spirit of the idea disclosed. They are held together by struts 3 and 4. The modification struts shown in Figures 4, 5, and 6 are marked 3a and 3 and are to be considered equally applicable to strut 4. On strut 4 is a pivot 5 to which is attached lever arm 6. By the moving of lever

arm 6 the camber of the planes 1 and 2 may be varied by pulling on lines 7 and releasing line 8 or vice versa. As the struts 3 and 4 are hinged to plane framing and the struts 3 and 4 may be held in a rigid or varied position by guy lines 10. It is evident from this that the planes 1 and 2 may be flexible throughout their entire extent and are bowed by the action of lines 7 and 8 which pass over pulleys 9 to an operating means for independent and collective action if desired. Connections 11 are shown at the end of the lever 6 top and bottom to make them move in unison and connection 11 may be omitted if desired. They can move independently as it forms no part of the essential operation other than to keep them uniform as does rear strut 12 which connects the outer extremities of the wing and likewise may be omitted if desired, and is omitted from the drawing as non-essential when strut 11 is in.

This method of operation shown in section and Figure 2 and Figure 3 in the drawing may be placed at each strut connection or at any strut connection as the outer two struts or in any part of the aircraft. It likewise may be placed forward as well as aft of struts 3 and 4. Strut 3 shown in Figures 5 and 6 may be used in place of either or both struts 3 and 4, a single strut 3 or 4 as single strut 3a shown in Figure 4 may be used with levers 6 as in Figures 1, 2 and 3. The wires 7 and 8 may extend to an operating device that may have any form of variable control.

The guy wires 10, 17, and 18, may be set at any point desired. My device gives a more uniform curvature to give a more streamlined flow of air with greater lift with less drag. This is especially desirable where there is a vast variation in speed or in stratosphere flights.

I choose to illustrate the means of operating by the use of the device shown because of the simplicity in illustrating.

I have shown an apparatus embodying my invention in several general forms but do not wish to be understood as limiting myself strictly to the precise details of construction hereinbefore described. I do not wish to be held to exact shapes or dimensions or to any particular combination of parts but wish to be free to use any part herein or described or covered by the class with any other parts or part whether shown herein or elsewhere.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent is:—

1. In an airplane, a pair of superposed planes, a plurality of forward struts connecting said planes, preferably adjacent the forward edges, a plurality of intermediate struts, diagonal brace means between forward and intermediate struts, said intermediate struts connecting said planes intermediate their forward and rear edges, a plurality of levers respectively pivoted intermediate their ends to one of the said intermediate struts adjacent the upper and lower ends respectively of the latter, means for connecting the rear end only of the levers with said planes respectively adjacent the rear edges of the planes, a rod connecting the forward ends of the levers together, control lines secured to the forward ends of the levers.

2. In an airplane, a pair of superposed planes, a plurality of forward struts connecting said planes, a plurality of intermediate struts, diagonal brace means between the forward and intermediate struts, said struts connecting said planes intermediate their forward and rear edges, a pair

of levers respectively pivoted intermediate their ends to one of the said struts adjacent the upper and lower ends respectively of the latter, means for connecting the rear end only of the levers with said planes respectively adjacent the rear edges of the planes, a rod connecting the forward ends of the levers together, control lines secured to the forward ends of the levers.

3. In an airplane, a pair of superposed planes, a plurality of forward struts connecting said planes, a plurality of rearward struts, diagonal brace means between the forward and rearward struts, said struts connecting said planes intermediate their forward and rear edges, a pair of levers respectively pivoted intermediate their ends to one of the said struts adjacent the upper and lower ends respectively of the latter, means for connecting one end only of the levers with said planes respectively adjacent the edges of the planes, control means secured to the other ends of the levers.

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