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WING STRUCTURE FOR GLIDERS

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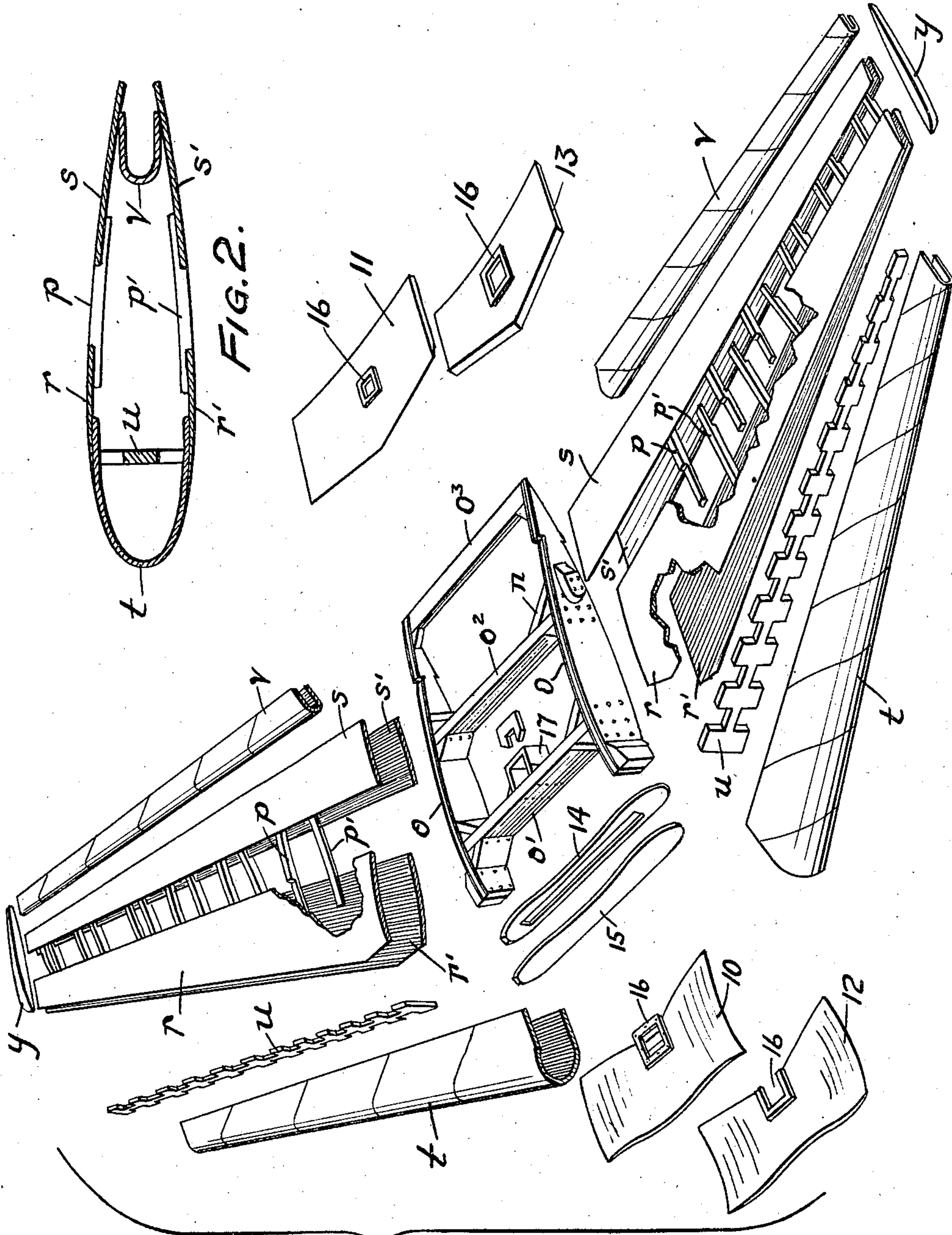


FIG. 1.

WITNESS:

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WING STRUCTURE FOR GLIDERS

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539,723. Divided and this application Septem-
ber 18, 1945, Serial No. 617,083

5 Claims. (Cl. 244—123)

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This invention relates to airplane wings and comprises a novel wing construction that is especially adapted to form an element of a bomb glider, although such wing construction is also adaptable as an element of certain types of airplanes.

The adaptation of my improved wing construction to a bomb glider and specifically to that type of bomb glider which is adapted to receive a bomb cradle and bomb, so as to form a combination of bomb, bomb cradle, fuselage and wing structure, all secured together in rigid relationship, is described and illustrated in an application filed June 10, 1944, Ser. No. 539,723, of which this application is a division. The subject-matter of the present invention is the wing structure per se.

In the drawing, which discloses one embodiment of my invention:

Fig. 1 is a perspective view of the elements comprising the wing structure in position for assembly.

Fig. 2 is a cross-section through the wing with the skin omitted.

The wing structure comprises a center frame and opposite wing sections the inner ends of which abut against each other on opposite sides of the center frame.

The center frame is composed of side bars or cross ribs *o*, front bar *o'*, center bar *o²* and rear trailing edge bar *o³*. The center frame is reinforced by corner blocks *n* applied at the junctions of the cross ribs with the front, center and rear bars.

Each wing section embodies elements arranged and connected as follows: Upper and lower front plates *r* and *r'* and upper and lower rear plates *s* and *s'* are connected together and spaced a definite distance by means of upper and lower sets of transverse ribs *p* and *p'*. The upper set of connecting ribs *p* connects the upper front and rear plates *r* and *s*. The lower set of connecting ribs *p'* connects the lower front and rear plates *r'* and *s'*. Opposite inner ends of the leading edge *t* extend within the front plates *r* and *r'*. A longitudinally extending wing former *u* extends within the leading edge *t* and engages the inner walls thereof. A rear U-shaped channel web *v* is positioned within, and engages the inner walls of, the rear plates *s* and *s'* and is adapted to receive and hold the aileron (not shown). A tip block *w* is applied to the outer ends of the upper and lower plates, leading edge and rear channel web. A longitudinally slotted plate *14* is secured to the

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front ends of the cross ribs *o* of the center frame and a cover plate *15* is applied to the plate *14*.

The main elements of the wing structure are shown assembled in cross-section in Fig. 2. The inner ends of formers *u* of the two wing sections abut against the cross-ribs *o* or side-bars of the center frame.

Applied to the top of the center frame are upper front cover or skin plate *10* and upper cover or skin plate *11*. Applied to the bottom of the center frame are lower front cover or skin plate *12* and lower cover or skin plate *13*. The covers or skin plates *10*, *11*, *12* and *13* are provided with reinforced orifices *16*. To the rear of the front bar *o'* of the center frame is secured a bracket *17* that encloses a channel which aligns with the orifices *16* in the front cover plates.

The described construction of the center section and particularly the skin plates *10*, *11*, *12* and *13* and their reinforced orifices are especially applicable as elements of a complete bomb glider having an open top fuselage (not shown) adapted to receive the bomb; the central section of the wing structure serving to close the opening in the fuselage and the reinforced aligning orifices *16* in the upper and lower skin plates and the channel *17* secured to the front bar *o'* allowing hangers (not shown) secured to the bomb or bomb cradle to extend through the wing structure, the hangers being adapted to be supported from an airplane. Means securing a fuselage, bomb cradle, bomb and the herein described wing structure in rigid relation are particularly described and illustrated in my said application Ser. No. 539,723, but such means are not herein described and shown, since they form no part of the present invention. Moreover, the wing structure embodying the present invention is not limited in its application to a fuselage and bomb carrier of the construction shown in my said application, but is applicable to bomb gliders having other arrangements of fuselage and bomb cradle. Moreover, with structural adaptations within the skill of those skilled in the art, the wing structure herein described is applicable to the construction of certain types of airplanes.

What I claim and desire to protect by Letters Patent is:

1. In a wing structure adapted to be applied to the open top of a fuselage, the combination with a central frame of right and left wing sections abutting against each other on opposite sides of the central frame, each wing section comprising upper and lower front flanges, upper and lower rear plates, cross ribs connecting the upper

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plates, cross ribs connecting the lower flanges, a U-shaped leading edge overlapped by the front plates, a rear U-shaped channel section extending between the rear plates, and a wing former extending longitudinally between the leading edge and front plates.

2. A wing structure adapted to be applied to the open top of a fuselage comprising a central frame; right and left wing sections abutting against the center frame; the center frame comprising cross-bars adjacent the respective wings and a front rib, a rear trailing rib and a mid-rib uniting the cross-bars; and upper and lower cover plates applied to the central frame, the upper and lower cross plates having aligning openings through which the bomb-hangers are adapted to extend.

3. A wing structure as defined in claim 1 in which the central frame comprises cross-bars adjacent the respective wings, a front rib, a rear trailing rib and a mid-rib uniting the cross-bars,

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and upper and lower cover plates applied to the central frame.

4. A wing structure as defined in claim 1 comprising also tip plates secured to the outer edges of the two wings.

5. A wing structure as defined in claim 1 comprising also a longitudinally slotted plate secured to the front ends of the cross-ribs of the center frame and a cover plate applied to the slotted plate.

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