March 1, 1949. R. F. BACH 2,463,135

"FLYING WING" KITE

Filed May 29, 1947

FIG.1

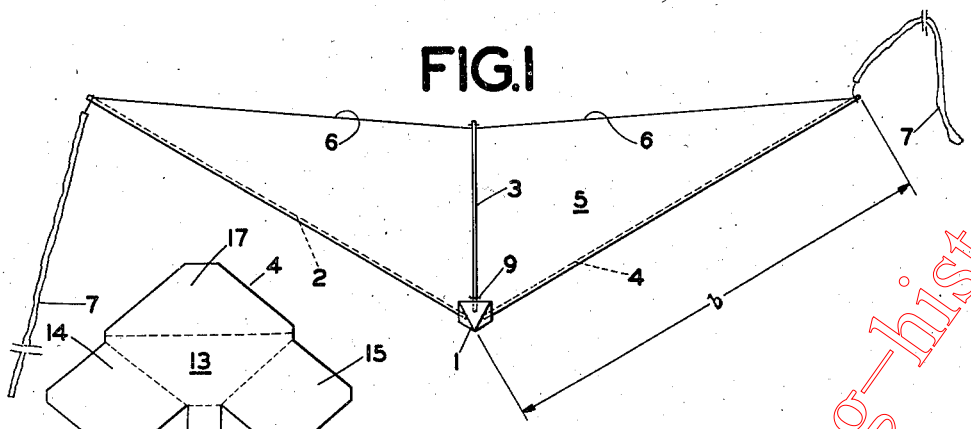


FIG.6

FIG.7

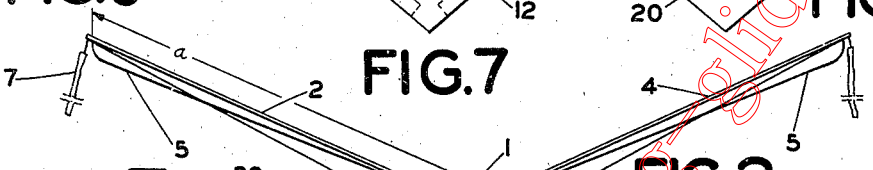


FIG.8

FIG.2

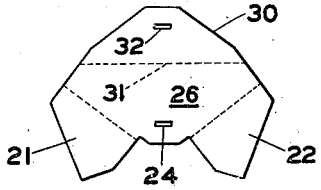


FIG.10

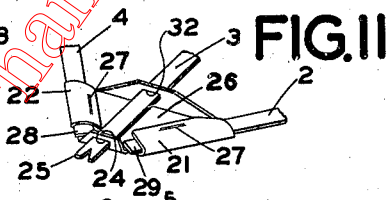


FIG.11

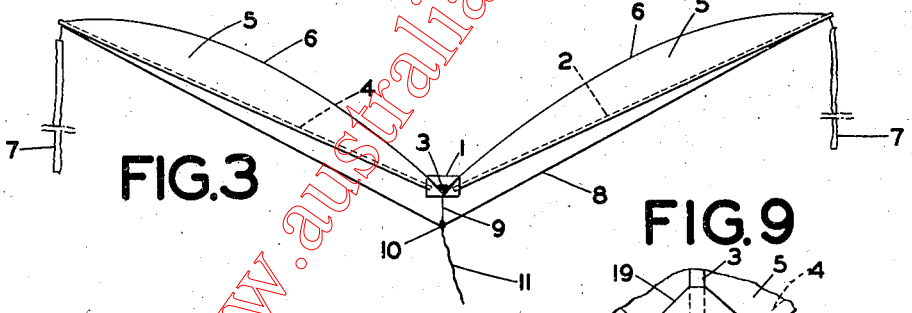


FIG.3

FIG.9

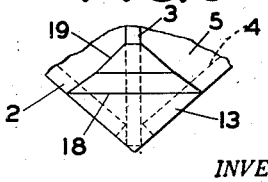
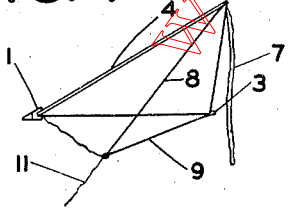


FIG.4



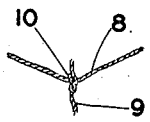


FIG.5

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"FLYING WING" KITE

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7 Claims. (Cl. 244—153)

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This invention relates to new and useful improvements in flying devices and more particularly to a toy wing capable of captive or free flight.

An object of the invention is to provide an airborne sailing toy which is flexible in performance.

Another object is to provide such a toy which can be manipulated in the air to effect gliding and sailing.

Another object is to provide a device of simple construction which can be readily "knocked down" and assembled with ease.

The invention consists in the improved construction and cooperative relation of parts to be more fully described hereinafter, and the novelty of which will be particularly pointed out and distinctly claimed.

In the accompanying drawings, to be taken as a part of this specification, there is fully and clearly illustrated a preferred embodiment of the invention in which drawings:

Figure 1 is a top plan view of a flying device at rest and showing the invention,

Figure 2 is a view in front elevation of the same, also at rest,

Figure 3 is a rear elevational view of the device in flight,

Figure 4 is a side view of the device, at rest,

Figure 5 is a detail view of certain bridle members,

Figure 6 is a detail view of a sheet material nosepiece blank,

Figures 7 and 8 are nosepiece details,

Figure 9 is a view of the nosepiece of Fig. 6 after folding and securing it together and in locking position on the spars of the device, with the fuselage shown in horizontal or paper-plane position,

Figure 10 is a plan view of another form of nose-piece blank, and

Figure 11 is a view in bottom perspective of the nose-piece of Figure 10, showing it folded with the three spars in position.

Referring to the drawings by characters of reference, 1 designates a nosepiece or head member preferably of generally pyramid or tapering form having a flat underside and pointed front end. In the member 1 are three sockets to receive removably three spars 2, 3 and 4. The intermediate spar 3 forms the fuselage extending rearward parallel to the flat underface of the member 1 and bisecting the angle at the nosepiece formed by the outside or wing spars 2 and 4. The spars are preferably of light weight wood, say 1/16" x 1/4" soft pine or they may be, for larger

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devices, of aluminum or other light metal. The wooden spars would be satisfactory for devices having a span, of say up to 24". The central spar 3 is preferably substantially one-half the length *b* of the spar 4 which is equal in length to the spar 2. The space between the spars is filled and closed by limp light weight sheet material 5 such as tissue paper for the smaller sizes of the device whereas for those large enough to employ tubing, the material might, for example, be a synthetic film. The rear edge 6 of the material, which passes beneath the fuselage, is of greater length than twice the inclined distance *a* between the free end portion of one outside spar and the free end portion of the fuselage and for smaller sizes may be say one-sixth greater in length. Secured to the free end portions of each of the spars 2 and 4 is a tail member 7 for each which are of equal length and preferably substantially equal in length to the distance between the free end portions of the spars 2 and 4. The members 7 are preferably of about one-half inch wide light weight cotton material. Bridle cords 8 and 9 of string or other flexible limp material are connected respectively at their ends to the free ends of the spars 2 and 4 and to the end portion of the fuselage 3. The cord 9 is knotted or otherwise slidably adjustably secured to the cord 8 so that the cord 9 can be laterally adjusted along the cord 8. The knot or cord intersection 10 is preferably about two-thirds of the distance from the free portion of the fuselage toward the nosepiece 1. The length of cord 9 is preferably such that when the cord 8 and the rear portion of cord 9 are taut, that the front portion of cord 9 will be loose. The knot 10 forms the point at which the kite string 11 is secured, it being preferably tied about both the string 8 and 9.

Referring to Figs. 6 to 9, there is shown a sheet material nosepiece formed from blanks of relatively stiff paper, such as the gummed carton sealing variety. In using this type of nosepiece, the triangular element 12, Fig. 7, is first glued or secured across the top flats of the outside spars 2 and 4, indicated by dotted lines, to hold them in sweep-back form. The fuselage 3 is then inserted between their adjacent ends, see Fig. 9, and the main nosepiece element 13 is laid and secured on the element 12 with the spars 2 and 4 at their desired dihedral angle to the fuselage 3. The side flaps 14 and 15 are then bent down and rearward against the underside of the fuselage 3, one being secured thereto and the second to the first flap, as by gluing. Next the tongue 16 is folded down and rearward against

the flaps and secured, to hold the flaps in place and eliminate raw edges facing the wind. Finally, the rear portion 17 is bent downward along the dotted line, Fig. 6, and reversely bent along line 18, Fig. 9, to lie flat along the fuselage to which the terminal portion 19 is secured, which due to the stiffness of the material holds and locks the spars in relative position to each other. A finish piece or element 20, Fig. 8, is then glued against the upward diverging underfaces of the nosepiece element 13. This sheet material nosepiece of Fig. 9 is advantageous in knock-down kit structures and is cheaper to manufacture than the socketed nosepiece 1 which, however, would be desirable in the large size devices.

Referring to Figs. 10 and 11, this form of nosepiece is made from sheet material, such for example as cardboard, the blank being of generally diamond form having sleeve or pocket-forming flaps 21, 22 along its leading edges. Between the flaps, at their adjacent forward ends, there is a fuselage tab 23 to be warped downward just enough to receive through its slot 24, the fuselage end portions 25, see Fig. 11. The flaps 21, 22 are each bent downward and back along their dotted bend lines to lie at their long edges against the nosepiece body 26 to which they are stapled by a wire fastener, for example, as at 27 to provide flat tubes or sleeves. The leading end portions 28, 29 of the outer wing spars 2 and 4 substantially fit the flap tubes 21, 22 respectively and are slid thereinto and frictionally held therein by the resilience of the cardboard. The rear body portion 30, is bent downward along the line 31 at an obtuse angle to the body, such that the above desired dihedral angle is formed when the fuselage member 3 is positioned through the rear flap or body portion slot 32, as in Fig. 11.

In flying the device, it, of course, would not have the bridle strings when used as a glider in free flight. When captive by means of the usual kite string, it is easily launched into the wind and will hold steady when the knot 10 is centered. If it is desired to fly the device on a tack or at an angle to the wind, it may be done by a lateral adjustment of the knot 10. The looseness of the material 5 along its rear edge, forms pockets, concave downward or dished on their undersides which stabilize the flight.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent of the United States is:

1. An airborne device comprising a nosepiece, three straight spars extending from said nosepiece, the outside spars being of equal length and the intermediate spar forming a bisecting fuselage, said outside spars having an upward inclination to provide a dihedral angle, flexible sheet material spanning and substantially filling the space between and secured to said outside spars, said material contacting and being held intermediate its length by said fuselage, and said intermediate spar and said material terminating rearwardly substantially at a plane normal to said intermediate spar and passing through the rear ends of said outside spars.

2. An airborne device comprising a nosepiece, three spars extending rearward from said nosepiece, the outside spars being of equal length and the intermediate spar forming a bisecting fuselage, said outside spars having an upward inclination to provide a dihedral angle, tail strips of limp material extending one from the free end of each outside spar, flexible sheet material spanning and substantially filling the space between and secured to said outside spars, said material contacting and being held intermediate its length by said fuselage, and a four-way bridle secured to the free end portions of said spars and to said nosepiece.

3. An airborne device comprising a nosepiece, three spars extending rearward from said nosepiece, the outside spars being of equal length and the intermediate spar forming a bisecting fuselage, said outside spars having an upward inclination to provide a dihedral angle, tail strips of limp material extending one from the free end of each outside spar, flexible sheet material spanning and substantially filling the space between and secured to said outside spars, said material contacting and being held intermediate its length by said fuselage, a bridle cord extending between the free end portions of said outside spars, a second bridle cord secured to the end portions of said fuselage and means adjustably securing said second cord for lateral displacement to said first cord at about two-thirds of the distance from the free end of said fuselage.

4. An airborne device comprising a nosepiece, three spars extending rearward from said nosepiece, the outside spars being of equal length and the intermediate spar forming a bisecting fuselage, said outside spars having an upward inclination to provide a dihedral angle, tail strips of limp material extending one from the free end of each outside spar, flexible sheet material spanning and substantially filling the space between and secured to said outside spars, said material contacting and being held intermediate its length by said fuselage, said sheet material being of greater length along its base edge than twice the distance between the fuselage and one of said outside space at the points where said material contacts said spars, and a four-way bridle secured to the free end portion of said spars and to said nosepiece.

5. A "flying wing" kite comprising a nosepiece having three rearwardly directed sockets, spars removably supported in said sockets, the intermediate spar forming a fuselage, the outside spars each having a length substantially equal to twice the length of said fuselage and being inclined upward relative to the fuselage when horizontal to provide dihedral angles, tissue-like material secured to and along substantially the entire length of said outside spars and passing beneath said fuselage, said material having a base edge length substantially one-sixth longer than twice the distance between the points at which it contacts the end portions of said fuselage and one of said outside spars, tail members of limp material extending one from each of the free end portions of said outside spars and each having a length substantially equal to the distance between the free end portions of said outside spars, a bridle cord extending loosely between said outside spar end portions, and a second bridle cord knotted about said first-named cord for adjustable lateral displacement at substantially two-thirds of the distance from the free end of said fuselage to said nosepiece and having its ends connected one to each end portion of said fuselage.

6. In an airborne device, a nosepiece of a plurality of bendable sheet material elements, a pair of outside spars and an intermediate spar forming a fuselage, all extending from said nosepiece, one of said elements lying on and secured to said outside spars, another of said elements overlying said one element and having flaps ex-

tending around and secured to said outside spars respectively and across and secured to said fuselage and having a nose tab bent rearward and secured to said flaps, and a third element secured over said flaps and tab, said one element having a downturned rear portion locking said outside spars and said fuselage in their relative positions to each other.

7. In an airborne device, a spar-supporting nosepiece of bendable sheet material, leading edge back-swept sleeves along the leading nosepiece edges, an intermediate forward portion having a fuselage-receiving slot therethrough, and a rear down-turned portion positioned between

said sleeves and having a fuselage-receiving slot therethrough, said slots being so related to said sleeves as to provide a dihedral angle.

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