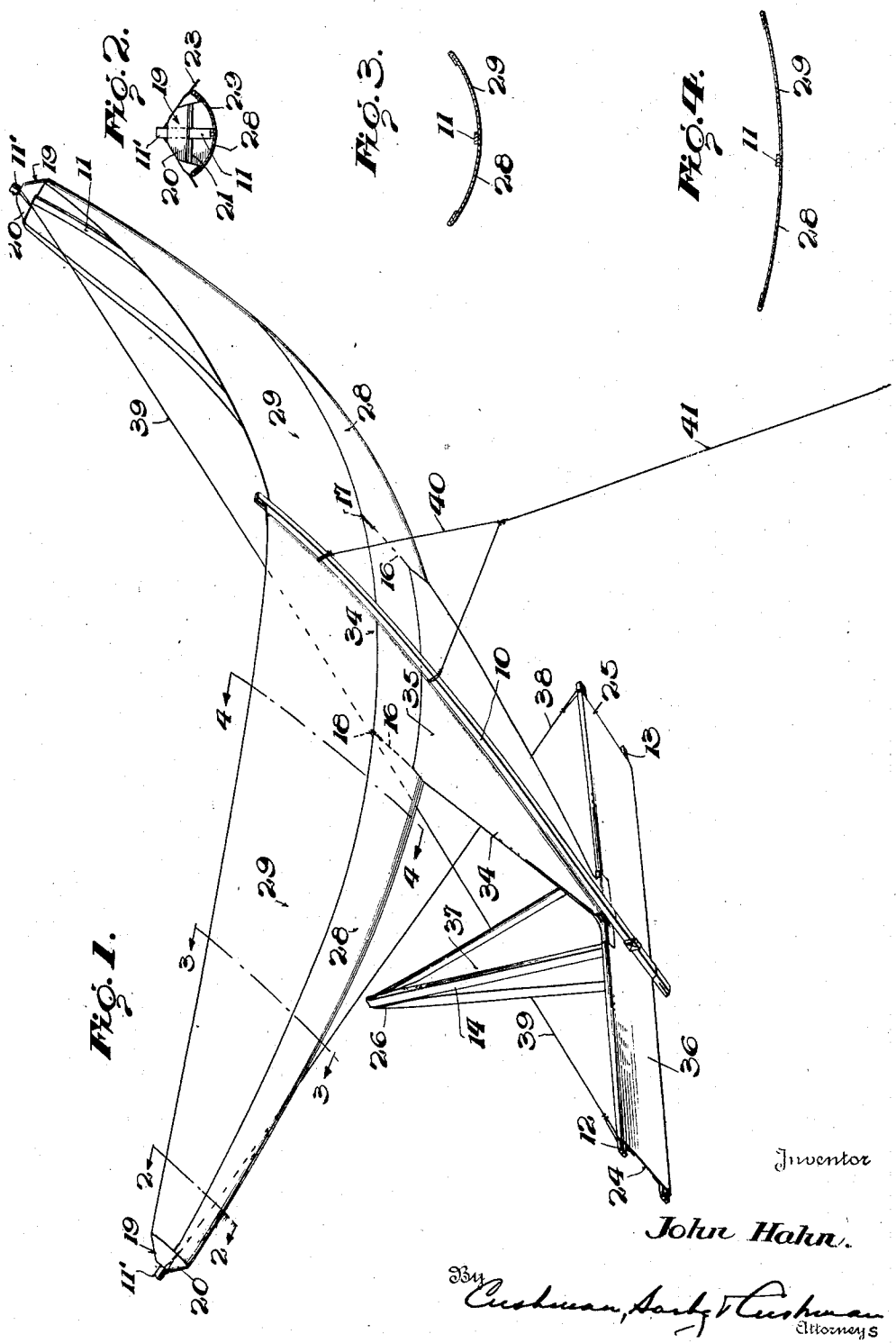
Sept. 30, 1941. J. HAHN 2,257,298

KITE AND METHOD OF FORMING THE SAME

Filed Feb. 8, 1940 2 Sheets-Sheet 1



Inventor

John Hahn.

By Cushman, Darby & Cushman

Attorneys

Sept. 30, 1941. J. HAHN 2,257,298

KITE AND METHOD OF FORMING THE SAME

Filed Feb. 8, 1940 2 Sheets-Sheet 2

Fig. 5.

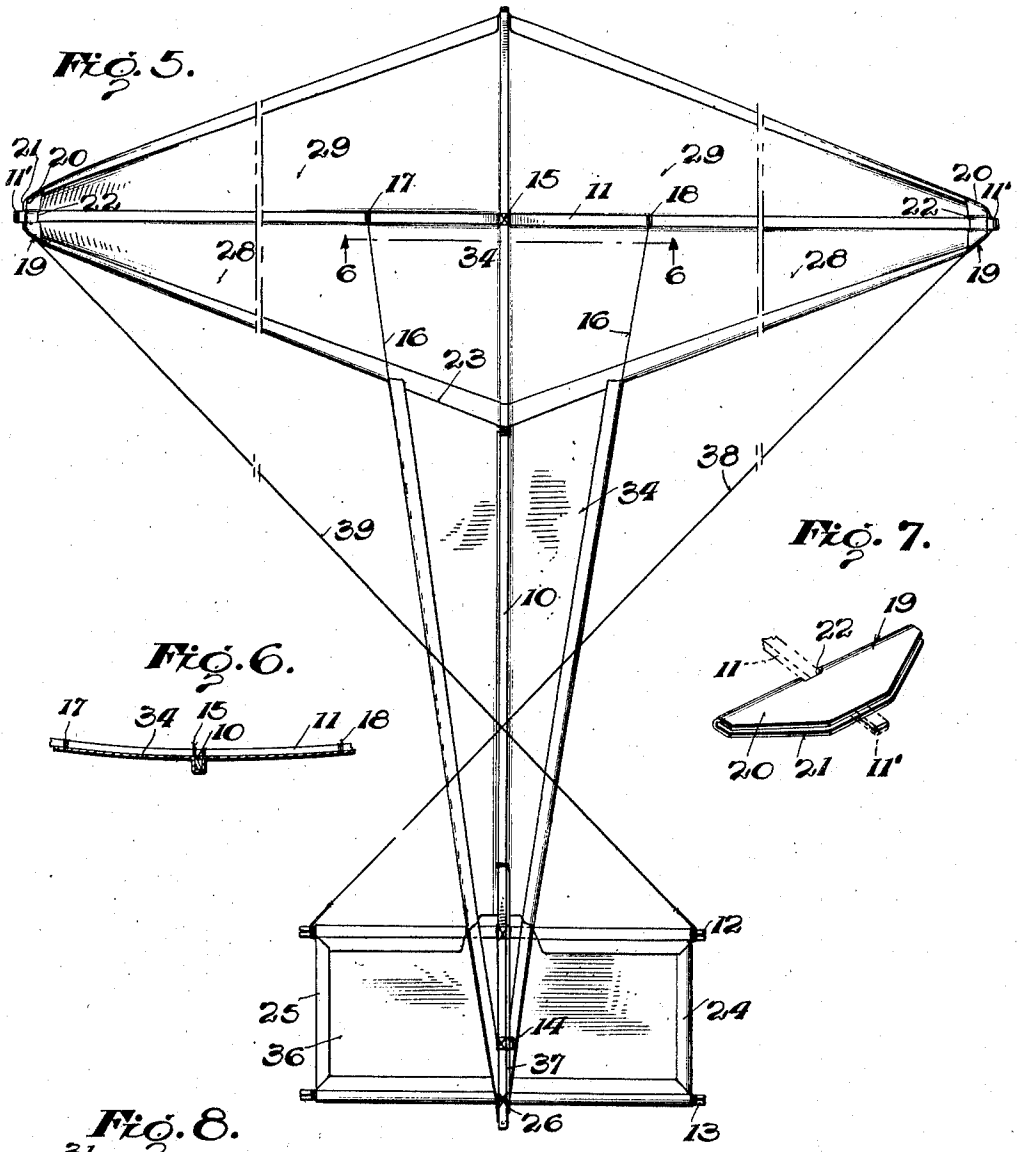
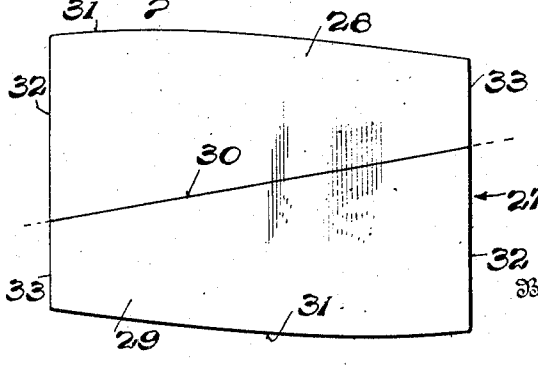


Fig. 7.

Fig. 6.

Fig. 8.



Inventor

John Hahn.

By Cushman, Darby & Cushman

Attorneys

Patented Sept. 30, 1941

2,257,298

UNITED STATES PATENT OFFICE

2,257,298

KITE AND METHOD OF FORMING THE SAME

John Hahn, Decatur, Ill., assignor to H & W Kite Co., Decatur, Ill., a partnership consisting of John Hahn and Thomas G. Wilson

Application February 8, 1940, Serial No. 317,997

11 Claims. (Cl. 244—154)

The present invention relates to kites and the method of forming the same and has for one of its objects the provision of a kite which has the appearance of an airplane.

Another object is to provide an airplane kite which may be easily assembled and which will not only simulate an airplane in flying but will fly steadily without the application of the usual tail.

A further object is the provision of an airplane kite having a wing structure in which each wing section is formed with a rearwardly opening pocket which greatly assists in improving the flying qualities of the kite.

Another object is the employment of a method of forming the wing structure whereby the wing surface can be built up without bulges or wrinkles and in which the wing covering can be cut from a blank utilizing a minimum amount of material.

A still further object is to provide a wing structure employing a bowed wing stick and wing string in which the string not only constitutes an outline of the wings but is capable of being placed under sufficient tension to maintain the wing stick in bowed condition.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawings in which:

Figure 1 is a perspective view of the kite.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 1.

Figure 4 is a section on line 4—4 of Figure 1.

Figure 5 is a plan view of the kite looking at the same from the rear.

Figure 6 is a section taken on line 6—6 of Figure 5.

Figure 7 is a detail view showing a wing string spacer, and

Figure 8 is a view of a blank from which two of the wing covering sections are formed.

Referring now to the drawings and particularly Figures 1 and 5, the kite includes a framework comprising a body stick 10, a wing stick 11 stabilizer sticks 12 and 13 respectively, and a rudder stick 14. The frame is completed by connecting certain of the sticks with strings or cords and by applying covering material over certain of the areas of the frame.

As will be observed, each stick preferably has a greater width than its thickness and as shown in Figure 5, the body stick 10 is positioned so that each of its narrow sides extends forwardly and rearwardly of the kite. Both ends of this stick are notched so that the slot extends through the wide sides of the stick. The ends of the wing stick 11 are also notched but these notches, as distinguished from those of the body stick, extend through the narrow sides of the stick. Both sticks are of substantially the same length and this length may vary according to the size of kite to be formed. As one example of the several proportions to be used in making a kite, the body and wing sticks may be formed forty inches in length.

The method of forming the kite frame is as follows:

The first step consists in placing the body stick 10 with its narrow edges or sides extending forwardly and rearwardly of the kite and then placing the wing stick 11 at right angles to the body stick, with one of its wide faces or sides in engagement with the front narrow face of the body stick. The wing stick is centered relative to the body stick and is preferably positioned about six inches from the upper end thereof. With the sticks in this position, glue, cement or any other suitable adhesive is applied adjacent the point of intersection, and a heavy thread 15 is wrapped about the sticks to secure them together.

Assuming that the body and wing sticks are forty inches in length, the stabilizer sticks 12 and 13 should be about twenty inches in length and these are centered with respect to the body stick and, similarly to the wing stick, each has one of its wide faces contacting the narrow front face of the body stick. The lower stick 13 is placed about a half inch from the lower end of the body stick while the upper stick 12 is positioned about eight and one-half inches from the lower end of the body stick. Glue is preferably applied to these sticks and a heavy thread or string is then wrapped around the sticks in a manner similar to that described in connecting the wing stick to the body stick. The rudder stick 14 is then mounted in position and, as shown in Figure 1, extends rearwardly from the body stick 10, with one of its wide faces contacting a wide face of the body stick. This rudder stick is preferably ten and one-half inches long and is positioned about three inches above the lower end of the body stick. The stick is also glued and wrapped to the body stick.

The next step in forming the kite consists in applying the body string 16 to the frame. One end of this string is fastened to the wing stick about four inches outwardly from its connection to the body stick as shown at 17, Figure 5. The string is then passed downwardly over the sta-

bilizer sticks, through the notch in the lower end of the body stick and then upwardly, where it is again secured to the wing stick about four inches outwardly from the opposite side of the body stick, as at 18, Figure 5. This body string is preferably placed under some tension but not enough to bend or bow the body stick.

The present invention utilizes what will be termed a pair of wing string spacers 19. One of these is shown in detail in Figure 7 and comprises a piece of cardboard or other suitable stiff material which is bent upon itself to form a pair of similar flaps 20 and 21 respectively. Each spacer is about four inches in length and, as shown in Figure 7, each flap is widest at its center and converges inwardly toward each end. A hole or opening 22 is formed centrally of the spacer between the flaps so that it may be slipped upon one end of the wing stick 11. As shown in the drawings in applying the spacers 19, each one is positioned about one-half an inch from its respective end of the wing stick and is then glued to the stick. Preferably the widest central portions of the flaps are located at the base of the notch 11', as shown in Figure 7.

The next step consists in bowing the wing stick to the position shown in Figure 1 and while the present method is such that the completed kite will remain in this bowed position without the use of a bow string, it is preferable that a bow string be utilized to maintain the wing string in its bowed condition during assembly of the frame. After the kite is completed, the string is adapted to be removed and therefore is not shown in Figures 1 and 5 which illustrate the finished kite.

In bowing the wing stick, it is preferable to run a double string through the notched ends of the stick until there is a distance of substantially seven and one half inches from the center of the stick where the body and wing stick cross, to the center line of the string. I have found that this is the desired bend for a stick of this length, that is forty inches, and that it permits the correct formation of pockets when the covering is applied as will be hereinafter described.

After the wing stick is bowed, a wing string or cord 23 is applied to the bow and wing sticks and spacers 19 to form the outline of the wing structure of the kite. One end of the string 23 is fastened to the body stick at a point about six inches below its connection to the wing stick. This distance is substantially the same as the distance from the wing stick to the upper end of the body stick. The wing string after being connected to the body stick is then drawn outwardly until it engages one of the spacers 19. It will be observed that each spacer is so positioned on the end of the wing stick that its flaps form a groove which receives and spaces the string relative to the end of the wing stick. As clearly shown in Figures 2 and 5, the string also passes through the slot or notch in the end of the wing stick. The string is then drawn through the notch in the upper end of the body stick and then down into engagement with the spacer 19 mounted on the other end of the wing stick. This string also engages the notch in this end of the wing stick and is finally brought back to the body stick 10 where it contacts with its other end and is fastened to the body stick at this point.

As above described, the wing string is drawn taut and placed under tension. This will have a tendency to bend or curve the spacers 19 somewhat. In this connection, it is preferable that the spacers directly before application of the wing string be bent or curved slightly to assist in the tensioning of the string and to assure that in the final form of the kite, a pair of pockets will be formed in each wing. The tension under which the wing string is placed is such that after the covering has been applied to the wing structure as will be hereinafter described, the wing stick will be maintained in its bowed condition without the use of a bow string.

If desired, the stabilizer and rudder strings may next be applied or these may be secured in position after the wing structure has been entirely completed. In this connection, the stabilizer sticks are preferably secured together by means of strings 24 and 25 respectively, each of which connects opposite adjacent ends of the stabilizer sticks.

A rudder string 26 is also provided and one end of this string is secured to the lower end of the body stick. The string is passed upwardly and through a notch formed in the outer end of the rudder stick and is then extended downwardly and fastened to the body stick at a point slightly above the upper stabilizer stick 12.

The next step consists in applying the wing covering over the wing structure formed by the wing string 23, spacers 19 and wing and body sticks. This covering may be of any suitable material or fabric but I prefer to use a paper which is relatively light but strong. This paper is preferably colored and, if desired, the color of the wing paper may be different from that of the body and stabilizer covering.

It will be observed that the wing structure comprises two identical wings, one on each side of the body stick 10. Further, each wing is divided into two equal sections by the wing stick 11.

In view of the fact that the wing stick is bowed, each wing in its final form will be somewhat dished so as to form a pocket or concave area on the rear side of the wing which will provide a low pressure area at the back of the wing structure when the kite is flown. The depth of the pockets are determined by the amount of bow or bend of the wing stick and as stated aforesaid, for a wing stick of 40 inches, this distance from the center of the stick back to the bow string should be approximately 7½ inches. I have found that an improved and economical wing structure can be built by forming each wing covering out of two substantially identical pieces or sections of material.

Referring to Fig. 8, there is disclosed a blank 27 out of which are formed sections 28 and 29 which go to make up one wing covering. A plurality of these blanks may be made up and cut as a unit along the straight line 30 to form the wing covering sections. It will be observed that the longitudinal edge of each blank 31 is slightly curved. This is to compensate for the curvature of the bowed wing stick 11. After the blank 27 has been severed along the diagonal line 30, it will be observed that each covering section 28, 29 comprises the curved longitudinal edge 31 and the straight inclined longitudinal edge 30, thereby forming a relatively wide end portion 32 and a relatively narrow end portion 33.

In applying one of the covering sections to the frame structure, the curved edge 31 is laid over one-half of the wing stick and it is to be understood that the curvature of the longitudinal edge 31 has been computed so that it will align perfectly with the wing stick. Thus when applying the covering sections to the frame, this curved

portion 31 will cooperate with the wing stick to provide a smooth unwrinkled surface. It is to be further understood that the relatively narrow end 33 is positioned at the outer end of the wing and engages a portion of one of the spacers 19. After the edge 31 has been aligned with the wing stick, this is then glued or otherwise fastened to the stick, after which the material is drawn taut over its adjacent portion of wing string 23. The cover section is of sufficient length to permit the edge 30 to be folded about the string so that the overlapping portion may be pasted or glued to the rest of the section. Each covering section, when initially placed on the wing frame is of such a size as to permit the end 32 to embrace and partially cover a portion of the body stick. This end portion is also adapted to be pasted or glued to the stick. The covering section is also of a length to permit the end 33 to be wrapped about and glued to a portion of its respective spacer 19.

It will be observed that when the blank 27 is severed, the wing sections are sufficient to cover one wing. After the first section has been applied as above described, the curved edge 31 of the second section is coated with paste or glue and is superposed over the corresponding edge of the first section. In like manner, the edge 32 embraces a portion of the body stick and the straight longitudinal edge 30 is folded around a section of the wing string 23. The end 33 is also folded and glued about the free section of the spacer 19.

If a paper or covering is to be used in which both surfaces are of identical finish, then blanks similar to that shown in Figure 8 will be sufficient for the purpose of forming the wing coverings. However, if the paper is such that one side is smooth or glossy and the other side is unfinished, then the blank forming the other two wing sections must be made slightly different. That is, the blank for the other sections must be formed so that the straight diagonal line 30 extends in the opposite direction to that shown in Figure 8. In other words, this line will extend downwardly from left to right instead of from right to left as in Figure 8. As stated above, these two types of blanks are only necessary if the two surfaces of the covering material are of different texture or finish. Regardless of whether the same blank or different blanks must be utilized, the other two sections are applied to the wing frame in the same manner as the first two sections. Of course, the inner ends 32 of these last two sections will not only embrace the body stick 10 but will overlie the inner ends of the first two sections.

By forming the wing structure in this manner, the covering can be applied smoothly without any bulges, wrinkles or creases. Furthermore, considerably less material is used than if the wing covering was made in one piece.

The next step is to apply the body covering 34 to the body string 16. In this connection, the body piece 3 is made to converge downwardly, following the outline of the string 16, and is of sufficient width to permit the longitudinal edges to be folded over the string. Paste or glue is applied to the folded over portion so that it may be secured to the string and the rear surface of the body piece, as shown in Figure 5. It will be observed, however (see Figure 1), that the upper portion 35 of the body piece overlaps the lower sections of the wing covering and is adhesively secured thereto.

After the body covering has been applied, the stabilizer paper 36 is secured to the stabilizer sticks 12 and 13 and to the cords 24 and 25. This piece is substantially rectangular in formation and is of sufficient area to permit the top and bottom edges to be folded over on the sticks 12 and 13 respectively, and the sides to be folded over upon the strings 24 and 25. As in the other covering sections, these marginal overlapping portions are fastened by glue or paste to the body of the material.

In like manner, a triangular shaped rudder piece 37 is placed on the rudder stick with two of its sides being folded over the rudder string 26 and glued thereto. If desired, a pair of cross strings 38 and 39 may connect the wing stick with the top stabilizer strip 12, that is, the upper end of the string 38 is fastened to one end of the wing stick and extends diagonally over the body stick to the opposite end of the stick 12. One end of the string 39 is likewise attached to the opposite end of the wing stick and is attached to the other end of the stick 12. It will be observed that the points of intersection of the strings 38 and 39 meet in the plane of the body stick 10. It is to be understood, however, that the strings 38 and 39 are not absolutely necessary and that they may be eliminated if desired.

With the kite formed in this manner, the bow string or other means for initially bowing the stick 11 is removed and the tension placed on the wing string will be sufficient to maintain the wing stick in its bowed condition. Each wing will be substantially flat at its inner extremity due to the fact that the body stick 10 is perfectly straight. However, because of the bowed formation of the wing stick 11 and the curvature of the spacers 19, each wing will have a pocket formed in its rear surface. This pocket will have its greatest depth between the portion designated by the section lines 2 and 3 in Figure 1 and will gradually diminish in the direction of the body stick 10. It has been found that it is essential to provide these pocket areas in the wings in order that the kite may fly satisfactorily without the application of a tail or other stabilizing means such as is necessary in the usual type of kite. The present kite provides a construction which not only closely simulates an airplane in appearance but at the same time has all of the requisites necessary to permit it to be flown as a kite.

It is to be understood that while the drawings illustrate the preferred form of the device, the invention is not limited to this specific disclosure. For instance, the wing stick need not necessarily be secured to the body stick adjacent the upper end thereof but may cross the body stick at other points and still cooperate with the covering elements to form a wing structure having pockets which function to provide a kite which will fly satisfactorily without the application of a tail.

It is, of course, necessary to apply a bridle string before the kite can be flown. As shown in Figure 1, a bridle string 40 is fastened to the body stick 10 with its upper end about three inches below the top of the stick and its other end about twelve inches from the top of the kite. The kite flying string 41 is secured to the bridle string as shown in Figure 1, and the kite is then ready for immediate use.

I claim:

1. In an airplane kite, a frame including a straight body stick, a bowed wing stick of sub-

stantially the same length as the body stick and positioned transversely of and adjacent the upper end of said body stick, a pair of bowed string spacers, each secured to one end of the wing stick, a string passing through the spacers and connecting the body stick at its top and also slightly below the wing stick and forming with said sticks a pair of wing frames, said string being placed under sufficient tension to maintain the wing stick and string spacers in their bowed condition, and a covering secured to and drawn taut over said sticks and string to form pockets in each of the wings.

2. A string spacer for use in an airplane kite comprising an elongated piece of stiff, bendable material doubled upon itself to form a pair of flaps, and a stick receiving opening formed in the folded area centrally of the flaps, said opening adapted to receive the end of a wing stick and the flaps adapted to embrace and be secured to the stick adjacent its end.

3. In an airplane kite, a frame including a straight body stick, a bowed wing stick positioned transversely of said body stick, a string passing through the top of the body stick, the ends of the wing stick and connected to the body stick below the wing stick, and forming with said sticks a pair of wing frames, and a covering secured to and drawn taut over said sticks and string to form pockets in each of said wings, said covering comprising four sections of material, two for each wing, each section having an outer straight longitudinal edge folded and secured about an adjacent portion of said string, the inner longitudinal edge of each section being slightly curved to compensate for the curvature of the wing stick and being secured to said stick and to its complementary section.

4. In an airplane kite, a frame including a straight body stick, a bowed wing stick of substantially the same length as the body stick and positioned transversely of and adjacent the upper end of said body stick, a pair of string spacers, each secured to one end of the wing stick, a string passing through the spacers and connecting the body stick at its top and also slightly below the wing stick and forming with said sticks a pair of wing frames, and a covering secured to and drawn taut over said sticks and string to form pockets in each of the wings, said covering comprising four identical sections of material, two for each wing, each section having an outer straight longitudinal edge folded and secured about an adjacent portion of said string, the inner longitudinal edge of each section being slightly curved to compensate for the curvature of the wing stick and being secured to said stick and to its complementary section.

5. The method of forming the wing structure of an airplane kite comprising securing a wing stick to and transversely of a body stick adjacent the upper end thereof, bowing the wing stick and maintaining the same in bowed condition by means of a string connecting the ends of the wing stick, passing a string through the top of the body stick and the ends of said wing stick, drawing said string taut and securing the ends thereof to the body stick below the wing stick so as to solely maintain the wing stick in bowed condition, applying covering material over said sticks and string to complete the wing structure, and finally removing the first-mentioned string from the ends of the wing stick.

6. The method of forming the wing structure of an airplane kite comprising securing a wing stick to and transversely of a body stick adjacent the upper end thereof, bowing the wing stick and maintaining the same in bowed condition, passing a string through the top of the body stick and the ends of said wing stick, drawing said string taut and securing the ends thereof to the body stick below the wing stick so as to solely maintain the wing stick in bowed condition, forming four identical sections of covering material, with each section having one longitudinal edge curved so as to engage and conform to the curved surface of the wing stick, and then securing said covering sections to said sticks and string to complete the wing structure.

7. The method of forming the wing structure of an airplane kite comprising securing a wing stick to and transversely of a body stick adjacent the upper end thereof, securing a pair of string spacers, one to each end of the wing stick, bowing the wing stick and temporarily maintaining the same in a bowed condition, passing a string through the top of the body stick, the ends of the wing stick and the string spacers, drawing said string taut and securing the ends thereof to the body stick slightly below the wing stick so as to solely maintain the wing stick in bowed condition, and then applying covering material over said sticks, spacers and string to complete the wing stick.

8. The method of forming the wing structure of an airplane kite comprising securing a wing stick to and transversely of a body stick adjacent the upper end thereof, securing a pair of string spacers, one to each end of the wing stick, bowing the wing stick and temporarily maintaining the same in a bowed condition, passing a string through the top of the body stick, the ends of the wing stick and the string spacers, drawing said string taut and securing the ends thereof to the body stick below the wing stick so as to solely maintain the wing stick in bowed condition, forming four identical sections of covering material, with each section having one longitudinal edge curved so as to engage and conform to the curved surface of the wing stick, and then securing said covering sections to said sticks, spacers and strings with the curved edges of each pair of upper and lower sections being fastened to the wing stick in overlapping relation.

9. In an airplane kite, a frame including a straight body stick, a bowed wing stick positioned transversely of said body stick, a string passing through the top of the body stick, the ends of the wing stick and connected to the body stick slightly below the wing stick and forming with said stick a pair of wing frames, and a covering secured to said sticks and string to form pockets in each of said wings, the wing stick being bowed to such a degree that the pockets will be deepest adjacent the outer ends of the wing stick and will gradually diminish in depth toward the center of the wing stick.

10. In an airplane kite, a frame including a straight body stick, a bowed wing stick positioned transversely of said body stick, a string passing through the top of the body stick, the ends of the wing stick and connected to the body stick slightly below the wing stick a distance substantially equal to the distance between the intersection of the wing and body sticks and the top of the body stick, so as to form a pair of wing frames, each divided into two equal sections, and a covering secured to said sticks and string to form identical pockets in each of said wings.

11. In an airplane kite, a frame including a

straight body stick, a bowed wing stick positioned transversely of the body stick, a pair of string spacers, each comprising an elongated piece of stiffened bendable material folded upon itself to form a pair of flaps, each spacer provided with a central opening in the folded area through which an end of the wing stick projects, a string passing through the spacers, and connecting the body stick at its top and below the wing stick and forming with the stick a pair of wing frames, and a covering secured to and drawn taut over said sticks, strings, and spacers.

JOHN HAHN.