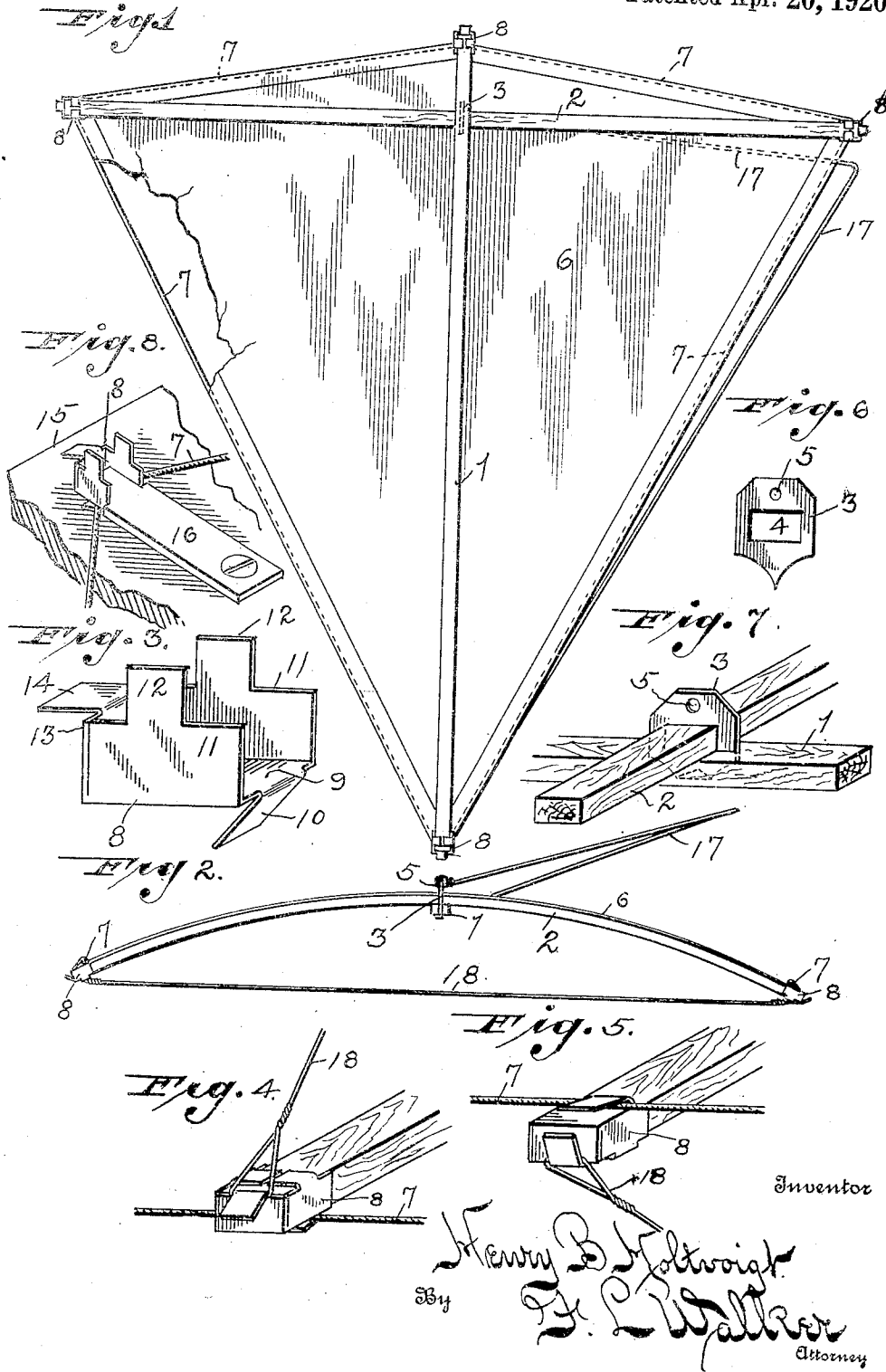


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KITE AND PROCESS OF MAKING SAME.
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To all whom it may concern:

Be it known that I, HENRY B. HOLTVOIGT, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Kites and Processes of Making Same, of which the following is a specification.

This invention relates to kites and more particularly to a folding or collapsible type having fixed engaging elements secured in fixed relation one with the other whereby the sticks may be subsequently attached to the cover or body portion of the kite without the necessity of special adjustment or fitting.

While the invention has been shown as applied to a kite of the Eddy type which is the preferred construction, it is to be understood that the invention is not limited to this character of kite but may be applied to the hexagonal or other shape of kite.

The object of the invention is to simplify the structure as well as the means and operation of assembling folding or collapsible kites whereby they will not only be cheapened in construction, but will be more efficient in use, easily and quickly assembled, strong and durable, and unlikely to get out of repair.

A further object of the invention is to provide stick engaging sockets or attachment elements fixedly attached in predetermined spaced relation upon an endless or continuous band or loop of string or cable forming the margin of the kite cover or body whereby the ultimate positions and relation of the kite sticks will be accurately and positively determined at the time of manufacture. Such construction is designed to enable the flier of the kite to assemble the same without the necessity of measurements or fitting operation, and whereby the proper relation of the parts in the assembled kite is absolutely assured.

A further object of the invention is to provide an improved form of strut or stick connection with means for permanently attaching it to the endless or continuous marginal strings or band and to provide an improved form of inter-connection at the intersection of the struts or sticks.

With the above primary and other incidental objects in view as will more fully ap-

pear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation or their equivalents as hereinafter described and set forth in the claims.

Referring to the drawings, Figure 1 is a rear elevation of the assembled kite embodying the invention forming the subject matter hereof. Fig. 2 is a transverse sectional view thereof. Fig. 3 is a detail perspective view of one of the strut sockets or stick engaging elements detached from the kite structure. Figs. 4 and 5 are detail perspective views of the ends of the strut or stick showing the socket member thereon in reverse position, with a portion of the endless marginal band and the transverse tie wire connected therewith. Fig. 6 is a detail view of inter-connecting members for the intersection of the strut or stick. Fig. 7 is a detail perspective view of the struts or sticks connected by the member shown in Fig. 6. Fig. 8 is a detail view of the socket locking means.

Like parts are indicated by similar characters of reference throughout the several views.

As illustrated in the drawing the kite there shown of the Eddy type comprises two sticks or struts 1 and 2 arranged at right angles one to the other and interconnected at their intersection by a coupling member as shown in Fig. 6. This coupling member 3 comprises a flat sheet metal element having therein rectangular opening 4 through which the transverse strut 2 is to be projected. At one end the element 3 is provided with a sharpened extremity or point to be driven through the longitudinal strut 1 from the front or face side thereof and clenched upon the rear side. The opposite end of the coupling member 3 is provided with a small hole 5 for the attachment of the bellyband as hereafter described after the kite has been assembled and the edge of the coupling member containing the hole 5 has been pressed through the paper cover of the kite. Supported upon the struts 1 and 2 is a paper cover 6 of suitable shape and proportion having inclosed in the marginal edges thereof a continuous or endless band or loop of string or cord, 7. Located at proper

spaced intervals corresponding with the angles of the kite cover, and permanently secured to the marginal cord 7 at the time of manufacture are a plurality of sockets or strut engaging elements 8. These sockets or strut engaging elements are shown in detail in Fig. 3. They comprise a rectangular receptacle-like body having a bottom section 9 the inner edge of which is bent downwardly and backwardly upon itself to form a clamping finger 10, for engagement with the marginal band or cord 7 of the kite cover. Projecting perpendicularly to the bottom section 9 are side walls 11 from which extend upwardly projecting fingers or tines 12. These fingers or tines 12 are to be later clenched or bent downward over the ends of the struts or sticks. There is also provided an end or terminal wall 13 from which projects an outwardly and downwardly extending finger or tine 14 for engagement with the cross or bow stay hereafter mentioned.

In constructing the kite the cover section or sail is laid upon a form or table and the strut sockets or engaging elements such as shown in Fig. 3 are positioned in predetermined relation one with the other upon the table or form. This is effected by means of suitable guides such as studs or pins or location fingers or even guide marks upon the table or form. Preferably, however, the table or form is provided with some form of holding device by which these socket members may be held in their adjusted positions. Such a device is shown in Fig. 8 in which 15 is the table or form and 16 a finger or stop secured to the table under the free end of which the strut socket member is to be engaged as indicated in the figure.

The strut engaging members having been located in their predetermined spaced relation by whatever means may be employed, the cord or marginal band 7 is passed around such located strut socket by being introduced beneath the bottom 9 of the socket intermediate such bottom and the back turned flap or extension 10. Having been engaged intermediate the bottom 9 and back turned flap 10 of each of the strut sockets the marginal band 7 is drawn tight and the ends are secured together by tying or by being passed in opposite directions under one of the socket members and subsequently clamped by the compression of the extension or flap 10. Each of the socket members is in turn positively and permanently secured to the endless band 7 thus formed by the contraction of the back turned flap or extension 10 to grip or clasp the string or band. This is effectively done by any sort of a setting implement placed within the socket and given a sharp blow with a hammer. The string or band 7 is thus compressed and firmly held by the socket member. The margins of the paper

cover or sail 8 are then inturned over the endless marginal band 7, pasted or cemented so as to inclose such marginal band.

Upon disengagement from the table or form the sail or cover will be complete with the marginal band inclosed therein and the strut sockets positioned at the angles of the cover or sail and securely fixed there-to against slippage or variation of their relation one to another. After securing the ends of the marginal string or band 7 to form the endless loop a free end of the string is purposely left of sufficient length to subsequently form the bellyband or bridle. The sharpened point of the coupling member 3 having been driven through the longitudinal strut 1 at the proper point, and the extremity of the coupling member being clenched the manufacture of the kite is complete and it is ready for transportation. In driving the coupling member through the strut 1 it is inserted until the edge of the eye 4 is flush with the face or front side of the strut 1 whereby the transverse strut 2 inserted through such eye will contact with the face of the strut 1.

Upon the purchase or receipt of the kite by the ultimate flier the transverse strut 2 is passed through the eye 4 of the coupling member and the ends of the struts 1 and 2 are positioned in the corresponding strut sockets. These sockets being opened to the rear the strut may be laid therein loosely without subjecting the cover or sail to strain or tension. The fingers 12 of the several strut sockets are then clenched over the ends of the struts or sticks 1 and 2. The perforated projecting portion of the coupling member 3 is then caused to penetrate the cover or sail 8 and the bellyband or bridle shown by dotted lines in Fig. 1 is secured at one end through the perforation 5 in the coupling member 3 and at its opposite end to the member 8 at the lower end of the upright strut 1. Preferably this bridle or bellyband 17 is a continuation of the marginal string or band 7 which has been joined beneath the socket member at the lower end of the strut 1.

With the addition of a transverse tie or bow stay 18 which is preferably provided with loops at each end to be engaged over the outturned fingers or tines 14 of the lateral strut socket, the kite is complete. For economy and simplicity of manufacture the same form of strut socket having the outward turned fingers 14 is employed in all positions although at the top and bottom or opposite ends of the vertical strut 1 the outturned fingers 14 perform no function. These may therefore be omitted from the socket members used in such positions.

In packing the kite for storage or shipment the cover or sail may be wrapped around the struts 1 and 2 and the bow stay

18 and held in compact form by twining the bridle or bellyband 17 about the package.

As thus constructed the kite may be readily and quickly assembled by boys having little or no mechanical skill or training. The permanent location and engagement of the socket members upon the marginal band 7 insures the accurate positioning of the struts 1 and 2. The use of these sockets or strut engaging elements and the form of coupling element 3 enables the kite to be quickly assembled without the use of special tools. Socket members are formed from sufficiently light sheet metal that the fingers 12 may be clenched or bent downward by the fingers or with the aid of a knife or small stone. The assembly of the kite is thus within the skill of the small boy.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim—

1. A kite comprising an endless string loop, a plurality of strut sockets each having a lateral open side, fixedly attached to the loop in predetermined spaced relation, a sail attached to said loop and struts laterally insertible within said sockets through the open sides thereof in a direction substantially perpendicular to the lineal extent of the strut.

2. A kite comprising a sail, a plurality of laterally open sockets attached in spaced relation to said sail and struts laterally insertible within said sockets in a direction angular to the lineal extent of the strut.

3. In a kite the combination with a sail and supporting struts of means for attaching the struts to the sail comprising flexible fingers attached to the sail in predetermined spaced relation and adapted to be clenched over the ends of the struts.

4. In a kite the combination with a sail and supporting struts therefor of flexible fingers arranged in pairs and supported in

spaced relation by the kite sail between which the ends of the struts are to be inserted, said fingers being capable of being clenched over the struts to retain same in adjusted positions.

5. A kite strut socket comprising a receptacle having a bottom, opposite side and one end walls, flexible fingers projecting from the side walls adapted to be bent over the strut to retain the same within the socket, and means for fixedly attaching the same to the kite sail.

6. In a kite, the combination with a sail and supporting struts, of a plurality of pairs of flexible fingers between which the struts are to be engaged and adapted to be clenched over the positioned struts, a cord to which the pairs of flexible fingers are attached in predetermined spaced relation, and a sail attached to said cord.

7. A kite strut socket comprising a receptacle having a bottom, opposite side and one end walls, extensions on the side walls to be folded over the inserted strut, and a downwardly and outwardly extending flexible finger projecting from the bottom section at the open end of the receptacle, and adapted to be clenched over a cord to retain the socket members in predetermined spaced relation thereon.

8. In a kite the combination with a sail and supporting struts of sockets to receive the ends of the struts, flexible tongues carried by said sockets, and a marginal cord supporting the sail over which the flexible tongues are clenched to fix said sockets in spaced relation thereon.

9. In a kite the combination with a sail and transversely arranged supporting struts therefor of a coupling member comprising a flat pointed sheet metal bit driven into one strut and having therein an opening through which the other strut is extended.

10. In a kite the combination with a sail and transversely arranged supporting struts therefor of a coupling member comprising a perforated sheet metal member carried by one of the struts through the perforation of which the other strut extends, said coupling member being projected through the sail to form an attachment for the kite bridle.

11. In a kite the combination with a sail and transversely arranged supporting struts therefor of a coupling member comprising a bridle attachment member extending through the kite sail and on opposite sides of one of the struts and fixedly engaged with another strut beyond the first mentioned strut.

12. In a kite the combination with a sail and transversely arranged supporting struts therefor of a coupling member comprising a flat bit of sheet metal having therein an orifice agreeing substantially in shape and pro-

portions with the cross sectional dimensions of one of the struts to be coupled, said bit being pointed at one side of the orifice for engagement in one of the struts and being
5 perforated at the opposite side of the orifice for the engagement of the bridle.

13. The herein described method of making a kite comprising locating a plurality of separate strut engaging elements in pre-
10 terminated spaced relation, positively connecting the strut engaging elements one with another by means of a flexible cord extended

from one element to another in regular succession, attaching a sail to said cord, and finally engaging the struts with said ele- 15 ments.

In testimony whereof, I have hereunto set my hand this 1st day of November A. D. 1919.

HENRY B. HOLTVOIGT.

Witnesses:

WILLIAM A. SWANEY,
GEORGE C. HELMIG.