Aug. 14, 1923. 1,465,040

H. B. HOLTVOIGT

KITE

Filed April 7, 1922

Fig 1

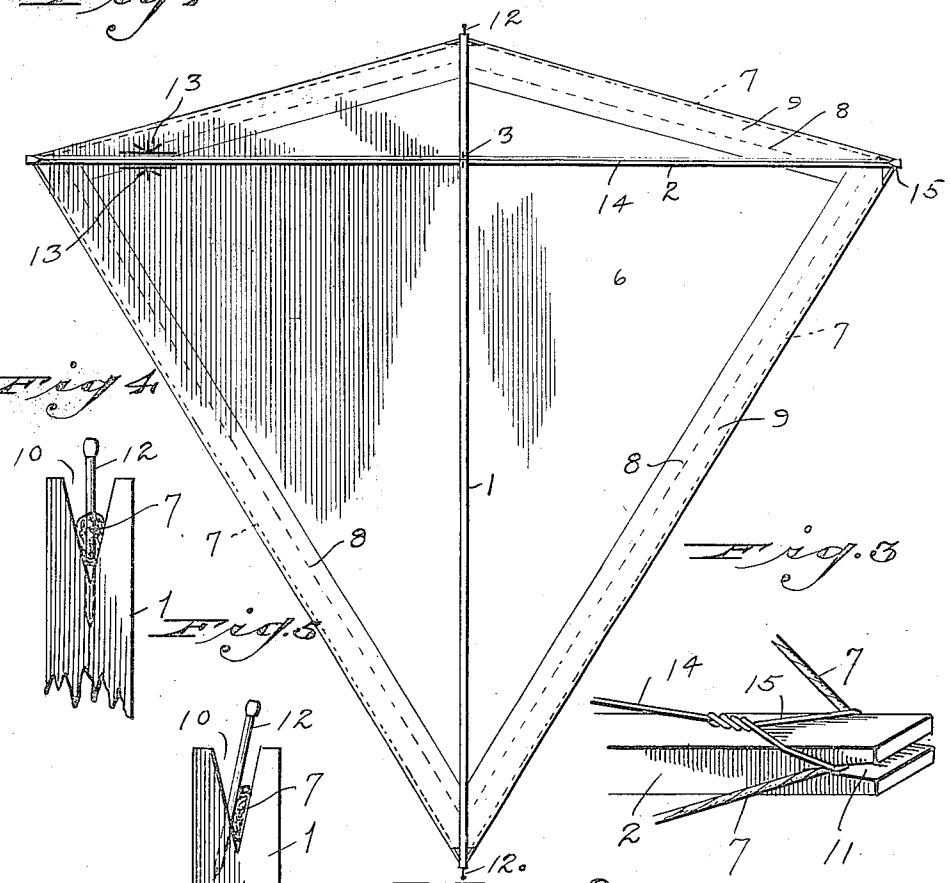


Fig 4.

Fig. 5

Fig. 3

Fig. 2

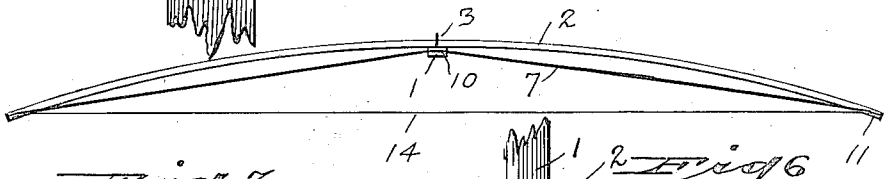


Fig 7

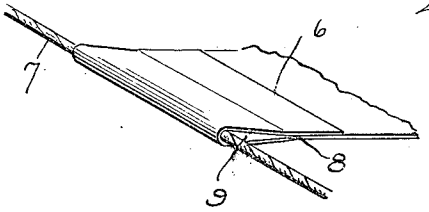
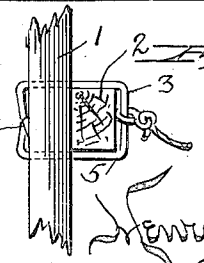


Fig 6



Inventor

Henry B. Holtvoigt

By H. E. Walker

Attorney

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UNITED STATES PATENT OFFICE.

HENRY B. HOLTVOIGT, OF DAYTON, OHIO.

KITE.

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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, of which the following is a specification.

My invention relates to kites, and more particularly to collapsible or folding kites, capable of being folded or rolled into compact form for storage, or packed for shipment.

While the invention has been herein shown applied to a kite of the Eddy type, it is to be understood that the invention is not limited to this particular form of kite, but may be applied to hexagonal or other type of kites.

The invention contemplates a kite sail, having a marginal cord loosely extending through a fold at the edge of a sail to permit the relative adjustment of the sail material and cord, the cord being permanently attached to one of the supporting ribs by engagement in converging or V-shaped notches into which brads or studs are subsequently driven, and detachably engaged with a second removable or detachable rib, by engagement in terminal notches, where it is held by the tension of the bow stay in the adjusted position indicated by guide marks upon the sail, the removable rib being interengaged by means of a wire staple, straddling such rib and clenched in the permanent or stationary rib, which staple also forms a connection for the flying bridle.

The object of the invention is to simplify the structure as well as the means and mode of operation of the assembling and disassembling of such kite, whereby they will not only be cheapened in construction, but will be more efficient in flying, capable of being easily and quickly assembled and disassembled and unlikely to get out of repair.

A further object of the invention is to provide a simple and economical mode of attaching the marginal cord of the sail in permanently fixed relation with one of the ribs.

A further object of the invention is to provide means for interconnecting the marginal cord of the sail with the other rib in various positions of adjustment, in such manner as to hold the cord and rib against slipping.

A further object of the invention is to provide improved guide means for relatively locating the ribs and sail to afford a symmetrical balanced structure.

A further object of the invention is to provide improved means for interconnecting the transversely arranged ribs, whereby one rib may be readily engaged in relation with the other.

A further object of the invention is to provide an improved mode of attaching the sail to the marginal cord to permit relative expansion and contraction.

With the above primary and other incidental objects in view as will more fully appear 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 accompanying drawings, wherein is shown the preferred but not necessarily the only form of embodiment of the invention, Fig. 1 is a rear view of the assembled kite, embodying the invention forming the subject matter hereof. Fig. 2 is a top view of the frame, devoid of the sail. Fig. 3 is a detail perspective view of one end of the transverse rib illustrating the mode of interconnecting the marginal cord of the sail therewith. Fig. 4 is an enlarged side elevation of one end of the permanent or vertical rib, illustrating the mode of attachment of the sail cord thereto. Fig. 5 is a similar view of a modification. Fig. 6 is a detail view illustrating the mode of detachably interconnecting the transversely arranged ribs at their point of intersection. Fig. 7 is a detail perspective view showing the mode of loosely engaging the sail with its marginal cord to compensate for expansion and contraction.

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

The Eddy kite illustrated in the drawings embodies two transversely arranged sticks or ribs 1 and 2, interconnected at their intersection. In the present instance the interconnection comprises a wire staple 3, the ends of which are cut off diagonally, as at 4 to afford sharpened points which enable the staple 3 to be driven through the upright or permanently attached rib 1. The staple 3 is secured by clenching the tines on the reverse side of the rib or stick

1, leaving a forwardly extending bight 5 through which the transverse rib 2 is thrust.

Supported upon the ribs or sticks 1 and 2 is a paper sail 6, preferably made from tissue paper, although it may be of fabric or other suitable material. The sail 6 is of suitable shape and proportions and enclosed in the marginal edges thereof is a continuous band or loop of string or cord 7. The margins of the sail 6 are inturned over the cord 7 and pasted on a line 8, removed inwardly from the fold of the inturned margin. There is thus formed at the margin of the kite an open hem or tubular enclosure 9 surrounding the marginal cord 7. While the sail is connected to and supported by the cord, the latter is free within the tubular edge for sliding adjustment and to permit relative adjustment of the sail 6 and cord 7 to compensate for expansion and contraction. It has been shown in practice, particularly in the use of tissue paper or light material, that when the marginal folds are tightly pasted, over the cord 7, the unequal strains upon the paper sail and the effect of the expansion and contraction under varying atmospheric and climatic conditions frequently cause the sail to be torn.

The tubular enclosure 9 is interrupted at the angle of the sail exposing at each angle a bight of the cord 7, which is connected with the ribs 1 and 2. The sail is permanently connected with vertical rib or stick 1, and detachably connected with the transverse stick or rib 2, although this relation may be reversed. In order to connect the marginal cord 7 with the respective ribs, the ends of the ribs are provided with converging or acutely V-shaped notches 10 and 11 in the sticks or ribs 1 and 2 respectively. The ends of the cords are preferably connected by wedging them tightly in the notch 10 at the lower end of the vertical stick or rib 1, while a medial portion of the cord exposed at the top angle of the sail is tightly wedged in the V-shaped notch 10 at the upper end of stick, 1. In order to secure the cord against disengagement and to prevent slipping within the notches, it is permanently attached by driving a small brad or stud 12 within the V-shaped notch 10, after the engagement of the cord therein. Ordinarily, this brad or stud 12 will penetrate the inserted cord 7 as shown in Fig. 3, thereby fixedly attaching the cord. However, if the brad or stud does not penetrate the cord, but passes to one side as is shown in Fig. 4, the cord will be sufficiently cramped or wedged within the converging slot to prevent ready disengagement.

The second rib 2 transversely arranged by being thrust through the staple 3, has its ends slidingly engageable with the marginal cord 7 to enable the sticks or ribs to be assembled into accurate right angle relation. The marginal cord engages in the convergent notches 11 in the ends of the rib 2, and while having a tendency to become wedged therein, the rib may be adjusted to and fro upon the bight of the cord, by slipping the latter through the notch. The proper adjustment of the ribs is indicated by guide marks or indications 13 printed, impressed or otherwise displayed upon the rear face of the sail. By registering the transverse rib 2 to such mark, it will be properly positioned in relation with the vertical rib 1, and with the sail. In kites of this character, it is the practice to bow the transverse rib by bending it backwardly and connecting its ends by a transverse bow stay 14. This bow stay may be a string, but preferably a fine wire. The bow stay 14 is provided with loops 15 in each end and these loops are engaged in the convergent notches 11 in the ends of the rib, subsequently to the engagement therein of the marginal cord 7 of the sail. The bights of the loop 15 of the bow stay thus overlie the cord 7 within the notches, and due to the tension of the bowed rib, these loops 15 are drawn forcibly inwardly, thereby pressing the cord 7 more deeply within converging notches and clamping it therein under the pressure of the tensioned bow stay. This engagement will prevent any further relative adjustment of the rib and cord until the bow stay is disengaged.

In constructing the kite, the sheet of paper forming the sail is placed upon a suitable table or form, and the strip 1, to which the staple 3 has previously been secured is laid thereon, and held by suitable holding means. The marginal cord 7 is engaged in the notch 10 in the lower end of the stick and thence passed around a round pin, or locating member in the table or form, positioned in accordance with outer angles of the sail and the ends of the rib 2, the string being carried thence through the notch 10 in the upper end of the stick or rib 1, thence around the opposite form pin or locating member and the free end of the string is then brought again through the notch 10 in the lower end of the stick 1. The string is cut off leaving, however, an extended end, sufficient to form the flying bridle. The brads 12 are then inserted in the ends of the stick 1 to permanently secure the cord thereto. The sail then having been cut to proper shape leaving marginal flaps to be inserted, is pasted along the line 8 spaced inward from the marginal cord 7, and the marginal flaps are turned inward over the cord 7 onto such pasted portion.

Before removing the partially completed kite from the building form or table, the in-

dicating marks 13 are impressed thereon by suitable printing means, which will make such impression in predetermined relation with the permanently attached stick or rib 1 and with the angles of the sail. The kite may then be removed from the building form or table. It will be understood that during the construction the transverse rib is ordinarily not employed, but is to be inserted only when the kite is set up or assembled for use. After being removed from the form, the second rib 2 and the bow stay 14 are laid parallel with the attached rib or strut 1, and the sail rolled thereabout, forming an elongated cylindrical packing. As a precautionary measure, the flying bridle may be further secured at the lower end of the rib 1 by taking one or more half hitches around the brad or stud 12.

While for commercial purposes, the kite is preferably built upon a table or form as before mentioned, it is to be understood that it may be built directly upon the transversely arranged ribs 1 and 2, by interconnecting the ribs and stretching the string 7 thereabout and pasting the sail over the string in the usual manner. While the loose enclosure of the marginal cord within the inturned edge of the sail is to be preferred, since it will compensate for variations of pressure or unequal strains upon different parts of the sail, and for expansion and contraction, the cord may be tightly pasted within the inturned portion as has been the practice heretofore. The flying bridle is attached through a suitable hole in the sail to the bight of the staple 3, as shown in Fig. 6.

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, proportion, 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 comprises the preferred form of several modes of putting the invention into effect and the invention is therefore claimed in any of its forms of modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. In a kite, the combination with a sail and supporting ribs therefor, of a cord connecting the ends of the ribs and supporting the sail, the ends of the ribs having converging notches therein, in which the string is initially longitudinally adjustable, and brads driven within the notches and engaging with the cord therein to prevent relative movement of the cord and rib.

2. In a kite, the combination with a sail and supporting ribs therefor, of a cord connecting the ends of the ribs and supporting the sail, the ends of the ribs having notches therein in which the string engages, one of the ribs being bowed, and a stay for the bowed rib engaged in the same notches of said rib and extending parallel with and over the engaged portion of the string, whereby the tension of the stay under influence of the bowed rib tends to clamp the cord within the notch.

3. In a kite, the combination with a sail and supporting ribs therefor, of a cord connecting the ends of the ribs and supporting the sail, the ends of the ribs having notches therein in which the string engages and tensioned means overlying the cord within the same notches to prevent its accidental disengagement therefrom.

4. A kite wherein a sail is supported upon a cord connected to the ends of supporting ribs, characterized by converging notches in the ends of the rib in which the sail cord is wedged to afford gripping effect therein, a member insertable within the converging notch for increasing the gripping effect of the converging notch upon the cord therein.

5. In a kite a paper sail, supporting ribs and a marginal cord connecting the ribs and supporting the sail, the sail and cord being relatively adjustable longitudinally of the cord.

6. A kite including a sail, transverse supporting ribs therefor, a cord connecting the ends of the ribs and supporting the sail, characterized by a wire staple driven through one of the ribs and having its tines clenched on one side of the rib through which the other rib is to be inserted.

7. A kite including a sail, transverse supporting ribs therefor, a cord connecting the ends of the ribs and supporting the sail, characterized by a wire staple straddling one of the ribs and extending through the other rib with its ends clenched therebeyond, said staple forming an attachment for one end of a flying bridle.

8. In a kite, the combination with a sail supporting ribs therefor and a cord connecting the ends of the ribs and carrying the sail, of a bow stay connecting the ends of one of the ribs and maintaining the rib under tensioned arcuate form, and loops in the ends of said bow stay overlapping the cord to maintain the cord in adjusted relation with the rib.

9. The herein described method of attaching the marginal cord of a kite sail to a

supporting rib, including engaging the cord in a converging notch in the rib, and driving a brad within the converging notch in engagement with the cord.

10. A kite including a sail, supporting struts therefor, and a sail supporting cord connecting the ends of the struts, characterized by guide marks located in predetermined positions upon the kite sail determining the relative positions of the ribs.

11. In a kite, a sail, supporting ribs and a marginal cord supporting the sail and connectible with a rib in different relative position of the rim, of guide means upon the sail indicating the relative position of the rib for proper engagement with the cord.

12. In a kite the combination with a sail, supporting ribs therefor, and a cord engaged with the ribs and supporting the sail, of a flying bridle integral with the sail cord and comprising a surplus length of the sail cord extending beyond the point of attachment of the sail supporting portion of the cord to one of the supporting ribs, with its free end secured to the supporting rib at a point intermediate its ends.

In testimony whereof, I have hereunto set my hand this 28 day of March, 1922.

HENRY B. HOLTVOIGT.

Witnesses:

HARRY F. NOLAN,

GEORGE C. HELWIG.