No. 648,544. Patented May 1, 1900.

G. T. WOGLOM.

KITE LIKE AEROPLANE.

(Application filed Nov. 20, 1895.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

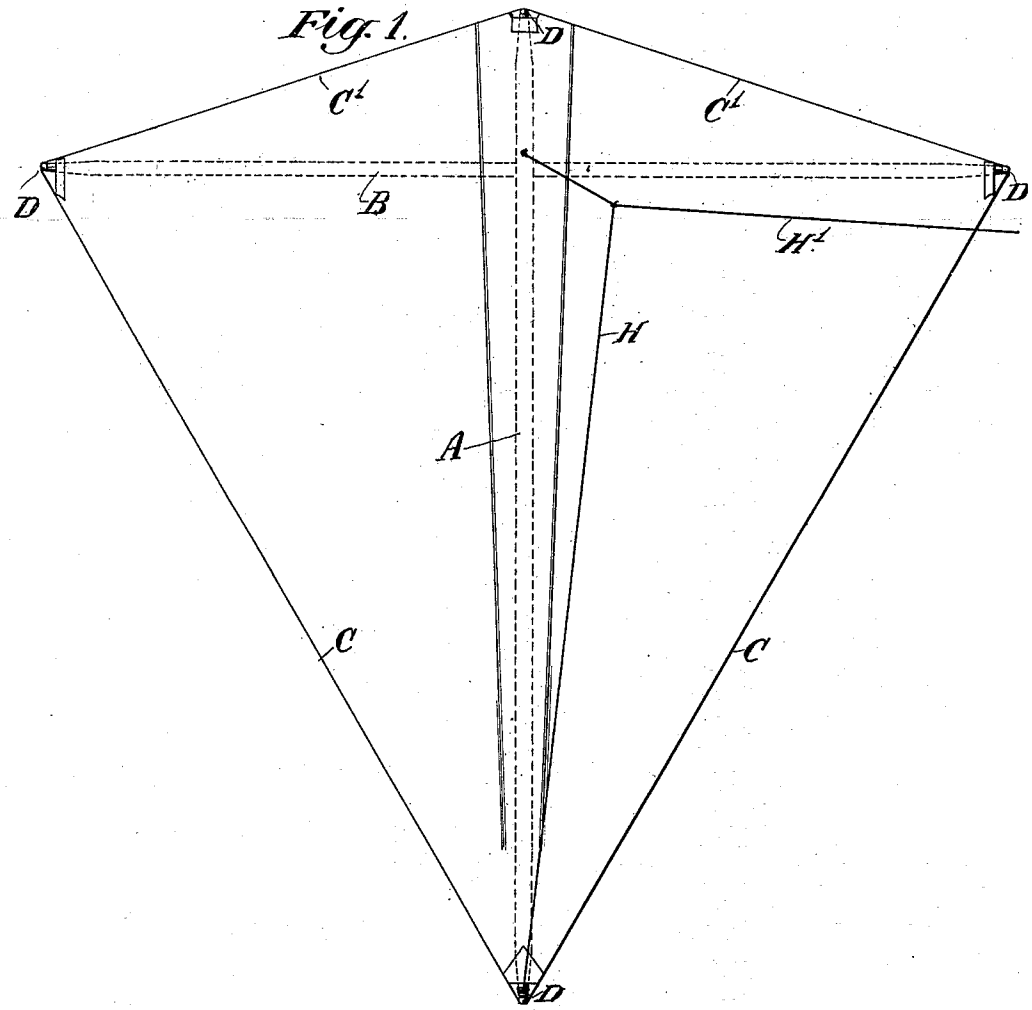
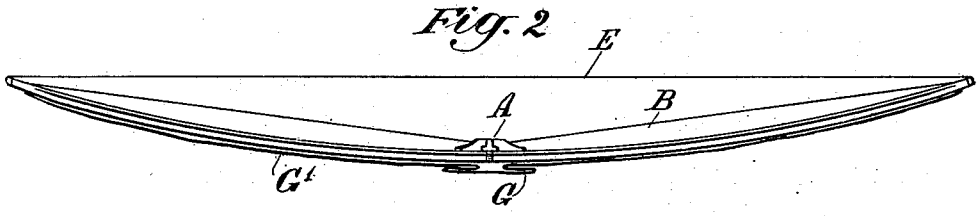


Fig. 2



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Gilbert T Woglom

By Edwin H. Brown

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Fig. 3.

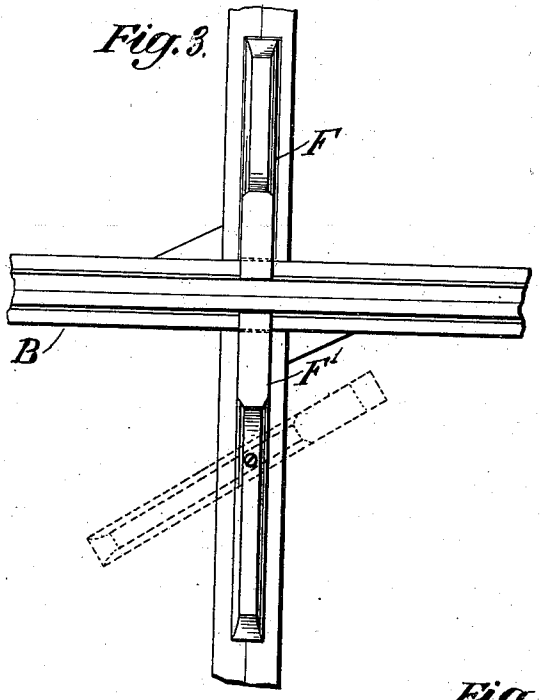


Fig. 4.

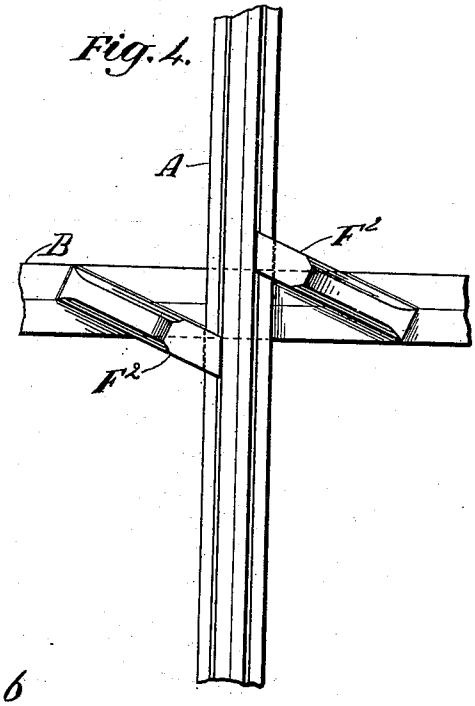


Fig. 6

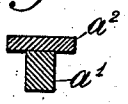


Fig. 5.

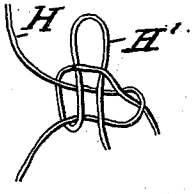


Fig. 7.



Fig. 8

Fig. 9.



Witnesses:-

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UNITED STATES PATENT OFFICE.

GILBERT T. WOGLOM, OF NEW YORK, N. Y.

KITE-LIKE AEROPLANE.

SPECIFICATION forming part of Letters Patent No. 648,544, dated May 1, 1900.

Application filed November 20, 1895. Serial No. 569,545. (No model.)

To all whom it may concern:

Be it known that I, GILBERT T. WOGLOM, of the city, county, and State of New York, have invented a new and useful Improvement in Kite-Like Aeroplanes, of which the following is a specification.

In the scientific investigation of the effects producible by upper-air currents, of their direction or their existance, or to acquire with facility a knowledge of their characteristics, it is desirable that an aeroplane shall be employed of such a nature as to be capable of lifting itself in the wind and eventually assuming a position inclined to the horizontal to the extent of from forty-five to seventy-five degrees. Furthermore, for purposes of aerial photography and the recording of the conditions of the upper regions of the atmosphere it is necessary to employ a kite possessing a high degree of lifting power in its ascent. These are qualities sought to be obtained by the present invention.

Kites with and without tails have been employed for years in which a suitable frame consisting oftentimes of a vertical and a transverse member arranged and secured in the form of a Roman cross has been overlaid on its face with a convenient covering, as paper or fabric. Such kites, however, do not and cannot attain the high angle of elevation which it is desirable to reach and which is within the attainment of the present invention.

This invention involves, therefore, the construction of a kite-like aeroplane of the character described, or "parakite," as I term it, as well as the manner of attaching it to the restraining cord or line.

I will describe a kite-like aeroplane wherein are embodied the features of my invention and then point out the novelty thereof in claims.

In the accompanying drawings, Figure 1 is a front elevation of an embodiment of the invention. Fig. 2 is a top view of Fig. 1. Figs. 3 and 4 are front and rear elevations, respectively, of a construction for detachably connecting the extender members of the frame at their point of crossing. Figs. 5, 6, and 7 each represent cross-sections of different forms of frame-extender members. Fig. 8 is a perspective view of a preferred means for attaching the ends of guys comprised in the frame. Fig. 9 is an illustration, in a loosened condition, of a preferred knot for securing the restraining-cord to the parakite.

Similar letters of reference designate corresponding parts in all the figures.

In general the supporting-frame comprises guys and extenders, the latter consisting of an upright and a transverse or cross piece arranged and secured together in the form of a cross, A representing the upright extender and B the transverse extender.

It is highly essential to the successful performance of the parakite that the frame of the same should be rigid and free as far as possible from all liability to distortion under wind-pressure. In other words, it is important that the parakite should maintain the form and dimensions given to it in its fabrication.

To this end my invention includes and I will now describe a conformation for the extenders comprised in the frame and a manner of bracing calculated to prevent distortion.

Lightness and strength are prime requisites in the frame. These may be secured in a high degree by employing extenders presenting a cruciform appearance in cross-sectional outline, or, in other words, the material of the extender is arranged mainly along lines which intersect each other, as shown in Figs. 5, 6, and 7. In Fig. 5 the member is formed from a single piece a, having rabbeted corners, as shown. In Fig. 6 two rectangular pieces a' a^2 are placed in contact with their longer dimensions arranged at right angles, while in Fig. 7 the construction represented is one in which two similar L-shaped pieces a^3 a^3 are placed back to back. As a material of construction I may employ wood, steel, aluminium, or other bodies.

C C represent the lower guys of the frame and C′ C′ the upper guys. They will be conveniently formed of wire and secured at their ends to eyes extending from caps or ferrules D or other removable devices fitted to the several ends of the extenders A and B.

The extender members A B of the frame and the guys C C C′ C′ are so proportioned and combined with each other as to render the frame symmetrical or equally disposed

upon opposite sides of the center line of the member A, as the equilibrium and steadiness in flight of the parakite depends to a large degree upon the attainment of this condition.

Experiment has proved that the most advantageous position for the point of crossing of the extender members A and B is located fifteen one-hundredths of the length of the member A below its top.

The best form of parakite is one in which the surface exposed to wind-pressure is of slightly-convex form. For this purpose instead of making the member B straight from end to end I give to the same a curved form corresponding to a circular arc, as shown in Fig. 2. This may be done by sawing the members in a curved form directly from a block of wood and securing the ends by a tie E, or the tie itself may be utilized to produce a curved form initially in the member and to maintain it in this form, or the tie may be used to maintain the member in a curved form after being bent. A stiffening-piece may be secured to the member after the same has been initially curved, being applied to the curved face of the bent member.

In placing the extender members in the frame they will, when made of a form having a cross-section of unequal dimensions, be preferably arranged with the longer cross-sectional dimension of both members extending perpendicularly to the plane of the frame. This will be conducive to rigidity.

The two members A and B at their point of crossing are detachably secured together, preferably, as contrasted to a fixed connection. Any suitable construction for the purpose may be adopted. I have illustrated in Figs. 3 and 4 a convenient construction for this purpose.

Upon the upright member A there are mounted two brackets F F′, one of which is rigidly fixed to the member, while the bracket F′ is pivoted thereto. The adjacent ends of the brackets F F′ are formed to correspond to the cross-sectional outline of the transverse member B, which is adapted to fit in the channel formed between the brackets.

On the reverse side of the transverse member there are rigidly secured angularly-extending brackets F^2 F^2, whose edges conform to the cross-sectional outline of the upright member A. The movable bracket F′ facilitates the connecting and disconnecting of the members. This collapsibility of the frame permits the ready insertion or withdrawal of a member or the removal of the covering presently to be described. It further permits the parakite to be packed in small compass for transportation purposes.

As a covering for the frame I have found China silk an acceptable material. Other textile fabrics will also answer. Paper or like material may also be used if of sufficient pliability. The pliability of strong paper may be much increased by rubbing it upon itself or crinkling or rumpling the same. In this condition it will prove much more elastic and flexible and answer the purpose better as a covering for the parakite.

In securing the covering to the frame of the parakite I do not stretch the same tightly in place, or even approximately so, but so secure the covering thereto that it shall extend loosely between the edges of the frame and form concavities when under the pressure of the wind. Experiment has evolved the best manner in which this looseness of the covering should be arranged—namely, in the form of a double fold or box-plait tapering from the top of the aeroplane to the bottom. A desirable amount, as given by experiment, for this plait is such an amount as will correspond to approximately ten per cent. of the length of the transverse extender member B, as measured on the covering opposite said member. In other words, the total linear dimension of the plait G extending from the covering material G′, as measured in Fig. 2, is approximately ten per cent. of the distance from end to end of the curved member B. The lower converging edges of the covering material G′ will be lapped over and secured on the opposite sides of the guys C C after allowing for the fullness constituting the plait G. The parts may conveniently be secured together by an adhesive. I have stated a particular fullness to be allowed in the covering material, but of course do not wish to limit myself thereto, merely instancing this as an allowance producing good results. The edges of the plait G are now creased and the upper edge of the covering turned over the guys C′ C′ and secured on the opposite side of the parakite. Preferably at the corners the covering is cut away to expose the ends of the tension members or guys to facilitate adjustment should occasion therefor arise.

The fullness in the covering of the aeroplane when arranged as shown gives to the aeroplane when under wind-pressure in the atmosphere a surface conformation best fitted, as experiment shows, to cause the plane to assume a position approximating the horizontal. In this position the plane can exert its greatest lifting energy, the lower surface presenting an appearance of two concavities diminishing in depth and superficial area from the transverse compression member B to the base of the aeroplane.

The proper point of attachment of the restraining-cord is an important element in these kite-like aeroplanes.

H is a hanger consisting of a cord or its equivalent secured at one end to the frame adjacent the point of crossing of the members A and B and at the opposite end to the lower extremity of the upright member A.

H′ is the restraining-cord, leading to earth and secured in the bight of the hanger. All possibility of slipping must be precluded in this connection when once made. I may therefore employ such a knot as represented in Fig. 9 for securing the attached cords. The

method of tying this knot is clearly represented in said figure and needs no further explanation. Suffice it to say that all possibility of slipping is precluded by its use.

Having described my invention, what I consider as new, and desire to secure by Letters Patent, is—

1. In an object of the character described, the combination of extender members and guys coöperating to form a symmetrical frame and a covering secured to said guys, said covering being provided with a longitudinally-extending double fold or box-plait at its middle portion, so that when the covering is under the action of the wind it will have formed in it two concavities extending longitudinally of the upright extender member, substantially as described.

2. In an object of the character described, the combination of extender members and guys coöperating to form a symmetrical frame and a covering secured to said frame, said covering being provided with a longitudinally-extending double fold or box-plait which tapers from the top of the frame to the bottom, so that when the covering is under the action of the wind it will have formed in it two concavities extending longitudinally of the upright extender member, substantially as described.

3. In an object of the character described, the combination of extender members and guys coöperating to form a symmetrical frame, a covering secured to said guys, said covering being approximately ten per cent. wider than the length of the transverse member along the line of the transverse member to produce a looseness in the cover, and a longitudinally-extending double fold or box-plait provided in the said covering at its middle portion, so that when the covering is under the action of the wind it will have formed in it two concavities extending longitudinally of the upright extender member, substantially as described.

4. In a device of the character described, the combination of an upright extender member, a transverse extender member crossing said upright member and detachably secured thereto, removable ferrules on the ends of the extender members, guys extending between the ends of the extender members and detachably secured to the ferrules, and a covering for said extender members fastened to the guys, substantially as described.

5. In a frame for an object of the character described comprising an upright extender member and a transverse extender member and means for securing said parts together, said means consisting of two brackets carried by the upright member, one of which is pivoted, and having their adjacent ends engaging the transverse member, and angularly-extending brackets rigidly carried by the reverse side of the transverse member and having their free ends engaging the upright member, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GILBERT T. WOGLOM.

Witnesses:
W. LAIRD GOLDSBOROUGH,
PIERSON L. WELLS.