Oct. 25, 1938. H. J. IRVIN 2,134,282

KITE

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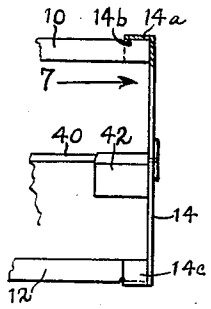


FIG. 3

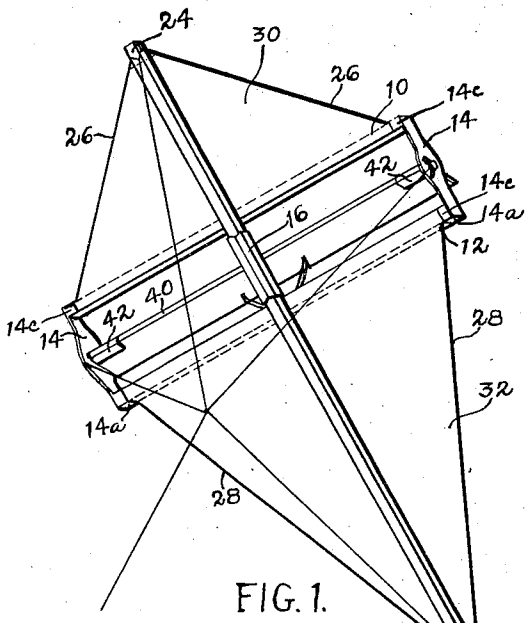


FIG. 1.

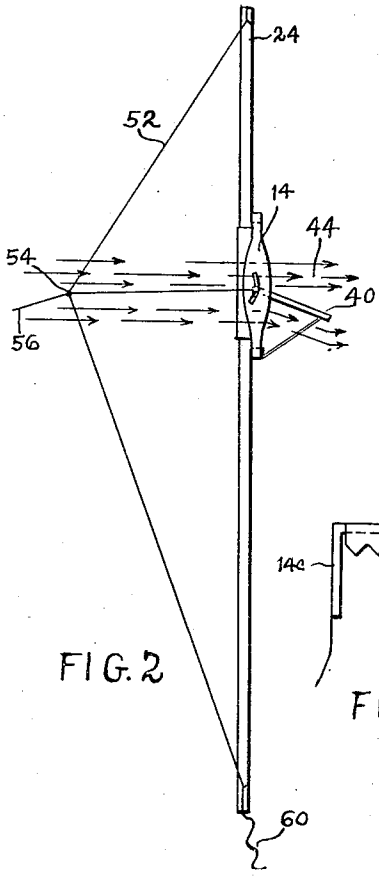


FIG. 2

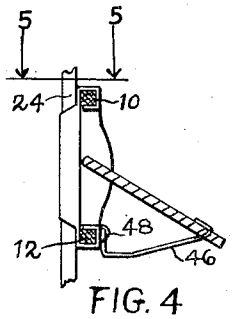


FIG. 4

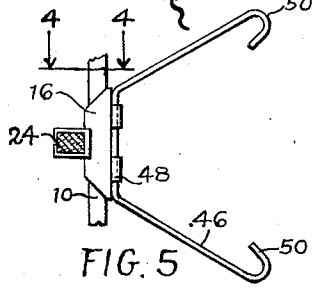


FIG. 5

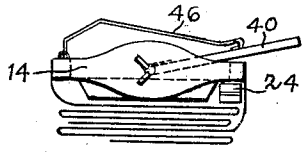


FIG. 6



FIG. 7

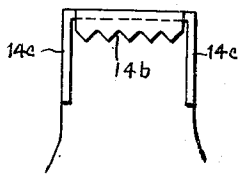


FIG. 8

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KITE

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5 Claims. (Cl. 244—153)

This invention relates to a kite and more particularly to a kite that will rise in a slight wind.

An object of this invention is to provide an elevator for a kite.

Another object of this invention is to provide a kite that rises readily, that is cheap, dependable and efficient.

Another object of this invention is to provide means for dividing an air current, deflecting some of the air current downwardly, the force caused by the deflected air current being utilized to lift the kite, the downwardly projected stream of air current cooperating with the remainder of the air current to form a vacuum, which vacuum is utilized to exert a lifting force upon the kite.

Another object of this invention is to provide a kite with sufficient lifting power to permit the use of cheaper materials, even though these materials are heavier than conventional materials now used.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparant from the following description.

In the drawing, Figure 1 is a perspective view of the kite shown in ascending position.

Figure 2 is a side elevational view of the kite in readiness for ascension.

Figure 3 is a fragmentary end view of the frame structure showing parts in section.

Figure 4 is a fragmentary sectional view taken substantially on the line 4—4 of Figure 5.

Figure 5 is another fragmentary sectional view taken substantially on the line 5—5 of Figure 4.

Figure 6 is an end view of the kite that has been folded for packing, for shipping or storage.

Figure 7 is a side elevation of the bracket removed, shown in the direction of the arrow 7 in Figure 3.

Figure 8 is an enlarged fragmentary view of an end of the bracket shown in Figure 7.

Various attempts have been made in the past to produce a kite that will ascend in a slight wind. For example, louvers have been cut into the face of the kite. However, none of these have, as far as known, provided an attachment for a kite wherein a vacuum is created, tending to lift the kite, other than whatever vacuum may be found on the lee side of the kite as a whole.

The kite shown herein is provided with an opening in the main body of the kite, permitting the passage of a current of air. This opening may be centrally located, or located in any other suitable place in the kite, depending entirely upon the design of the kite and its use. The current of air flowing through this opening is divided by a suitable elevator, angularly disposed, having the tail end directed downwardly. This elevator projects the lower half of the air current downwardly, permitting the upper half of the air current to flow unrestricted. It is a well known phenomenon in aerodynamics, that two air currents diverging will create a vacuum. By directing the elevator so as to have the rear portion extend downwardly, the vacuum created by the diverging air currents exerts a lifting force upon the kite which permits the kite to rise. This will be more fully seen when the preferred embodiment is described.

Referring to the drawing, the reference numerals 10 and 12 indicate a pair of parallel transversely disposed frame members of wood arranged in spaced relation from each other and held in position by a pair of brackets 14 and a spanning member 16. Each of the brackets 14 is provided with inwardly projecting ears 14*a*, provided with reentrant teeth 14*b* extending over and into engagement with suitable notches 20 in the transverse members 10 and 12. Instead of extending into the notches, the teeth 14*b* may embed themselves in the wood of the transverse members 10 and 12. Ears 14*c* integral with the bracket overlie the sides of the transverse members 10 and 12. The bracket 14 is provided with a suitable aperture 14*d*, the function of which will be described more fully later.

The spanning member 16 is provided with loops 16*a* enclosing the frame members 10 and 12 near their centers. This spanning member 16 is also provided with a longitudinal channel 22 enclosed by the reentrant flanges 16*b*. A vertically disposed rib member 24 extends through the channel 22. The rib member 24 may be removably mounted, so that it may slide freely through the channel 22.

The ends of the transverse member 10 are connected by a suitable cord, string or other supporting member 26, to the end of member 24. The end of member 24 is preferably provided with a slot or groove in which the cord 26 is seated. The cord 26 forms two legs of a triangle, the base of which is formed by the transverse member 10. This triangle is covered by paper 30, fabric or other suitable material.

A cord 28 cooperates with the transverse member 12 to form a downwardly projecting triangle covered by suitable paper 32, fabric or the like. The apex 28*c* formed by the cord 28 is arranged in spaced relation from the lower end of member

24. This apex is preferably attached to a slot in the end of member 24 by a suitable rubber band or other suitable string 34. The two triangles constitute the main wind engaging body of the kite. The space between members 10 and 12 forms an open slot or opening that is not covered with paper, the formation of which will now be described.

An elevator 40 supported upon the pair of brackets 42 pivotally mounted in the end brackets 14 extends across the opening found between members 10 and 12. As may be seen by referring to Figure 2, the elevator 40 has a leading edge disposed in the center of the opening and the rear edge directly downwardly, so as to deflect the lower half of the current passing through the opening between members 10 and 12. The upper half of the current continues in a straight path. As is well known to those skilled in aerodynamics, two diverging currents of air create a vacuum.

Referring to Figure 2, this vacuum is created in the area indicated by the reference character 44 directly above the elevator 40. This vacuum results in a differential in air pressure on the opposite sides of the elevator 40, the air pressure being greater on the under side than on the upper side. This differential in air pressure exerts a lifting force upon the kite, so that the elevator accelerates and aids the ascension of the kite, even though the wind velocity is quite low. The elevator is held in proper inclination by a pair of brackets 46 pivotally attached by suitable ears 48 to the spanning member 16. The bracket members 46 terminate in hooked portions 50 seated in a pair of notches in the rearwardly extending edge of the elevator, the hooked portions 50 holding the elevator in position.

The harness for the kite may consist of a plurality of cords 52 extending from the apices of the kite to a central point 54, connected to a suitable cord 56. In order to prevent the kite from orientation, a suitable tail 60 is preferably used, so as to provide a ballast.

For the purpose of shipping, storage or packing, this kite assembly may be folded up into compact formation, as shown in Figure 6. This is accomplished by releasing the retaining cord or band 34 so as to release the string 28 permitting the vertical rib 24 to be withdrawn or slid out of the channel in the spanning member 16, thereby releasing the tension upon cord 26 and disengaging the same. The triangular portions 30 and 32 may then be folded, as shown in Figure 6. The elevator 40 is preferably released from the brackets 46 and folded into the position shown in Figure 6. Rib 24 may be inserted in parallel relation to members 10 and 12, so that the folded assembly occupies a small compact space. Whenever it is desired to use the kite the triangular portions 30 and 32 may be extended, the rib 24 inserted and attached to the strings 26 and 28 and the harness, including members 52 and 56. By properly assembling, the kite is again in readiness for ascension.

The elevation of the elevator 40 may be selected to suit the demands of the particular kite. This may be influenced by the weight of the kite, the size of the elevator and the velocity of the wind, together with the angular position the harness bears to the kite, all of which will influence the rate of speed at which the kite ascends and the height to which it will rise.

In order to provide stability, it may in some cases be desirable to bow the longitudinal rib 24 and the transverse ribs 10 and 12, so as to present a convex surface as viewed from the harness side of the kite. Instead of the slot being rectangular, this slot could be tapered to both ends, so as to eliminate the brackets 14, the ends of the transverse members 10 and 12 being fastened together and suitably separated near the center of the kite.

Although the preferred modification of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts which generally stated consist in a device capable of carrying out the objects set forth, in the novel parts, combination of parts and mode of operation, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. In a kite having a body portion provided with an opening, a horizontally disposed elevator extending at an angle with respect to the main surface of the kite, the leading edge of the elevator being centrally disposed with respect to the opening, the rear edge of the elevator projecting downwardly so as to deflect the lower half of the air current downwardly thereby creating a vacuum above the elevator so as to provide a differential in air pressure on the two sides of the elevator thereby lifting the kite.

2. In a kite, the combination including a longitudinal rib, a pair of parallel members transversely disposed with respect to the rib, brackets for supporting the parallel members in fixed spaced relation from each other, means for interconnecting the ends of said parallel members to the ends of the rib, sheet material supported upon the parallel members and said interconnecting means, the space between said parallel members being open, and an elevator extending across the opening between said parallel members and intersecting the same, said elevator forming an acute angle with the plane of the sheet material and disposed to deflect the lower portion of the air current passing through the opening downwardly so as to create a vacuum above the elevator so that the differential of pressures on the opposite sides of the elevator aids the kite in ascending.

3. In a kite, the combination including a longitudinal rib, means transversely disposed with respect to the rib and removably attached thereto, said means including a pair of spanning members, covering means extending on each side of said transversely disposed means and supported by the ends of said longitudinal rib, said covering means leaving a space vacant between said transversely disposed spanning members to permit a current of air to flow therethrough, an elevator dividing said air current, said elevator directing the lower portion of the air current downwardly, said downwardly projected air current cooperating with the remainder of the air current to form a vacuum above said elevator, and means for holding said elevator in angular relation with respect to the plane of the kite.

4. In a kite, the combination including a longitudinal rib, a pair of spanning members transversely disposed with respect to the longitudinal rib, means for holding said transversely disposed members in fixed spaced relation from each other and slidably engaging said longitudinal rib, covering means extending upwardly from the upper spanning member to the upper end of the longitudinal rib, and covering means covering the space below the lower spanning member to the lower end of the longitudinal rib, the space be-

tween said spanning members being vacant permitting a current of air to flow therethrough, a current deflector intersecting the current of air flowing through the vacant space so as to deflect the lower portion of the air current downwardly, said deflector being supported by said means and held in angular relation thereto, the deflected portion of the current cooperating with the undeflected portion to form a vacuum above said deflector to thereby aid the ascension of the kite.

5. In a kite, the combination including a longitudinal rib, a pair of spanning members transversely disposed with respect to the longitudinal rib, means for holding said transversely disposed members in fixed spaced relation from each other and slidably engaging said longitudinal rib, covering means extending upwardly from the upper spanning member to the upper end of the longitudinal rib, and covering means covering the space below the lower spanning member to the lower end of the longitudinal rib, the space between said spanning members being vacant permitting a current of air to flow therethrough, a pivotally mounted deflector extending across the vacant space, means for releasably holding the deflector in angular relation with respect to the main surface of the kite so as to cause the deflector to deflect the lower portion of the air current downwardly but permitting the upper portion of the air current to pass freely through the vacant space, the deflected air current cooperating with the undeflected air current to form a vacuum above the deflector aiding the ascension of the kite.

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