A. L. GRAHAM.

KITE.

APPLICATION FILED DEC. 14, 1916.

1,223,163. Patented Apr. 17, 1917.

Fig. 1.

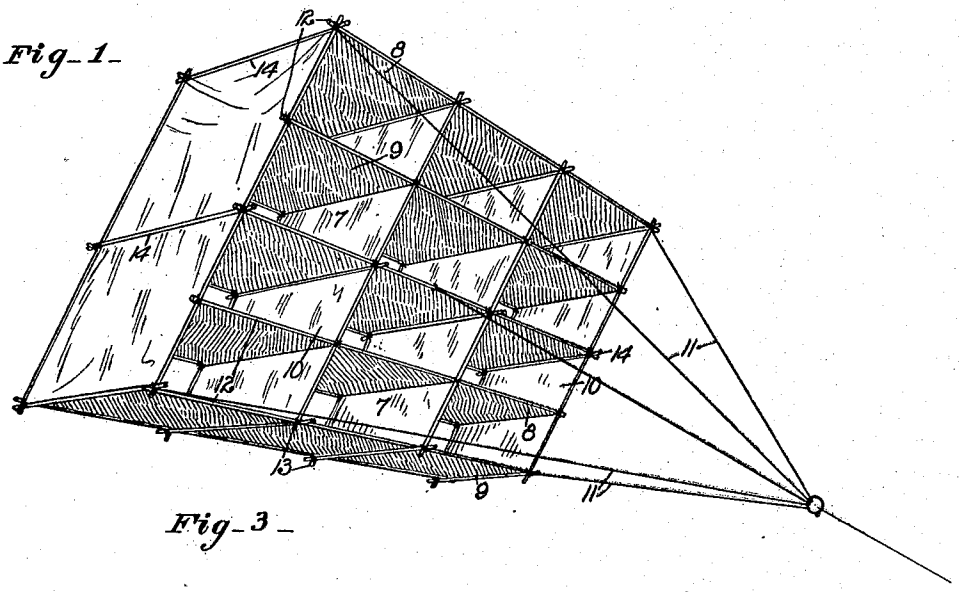
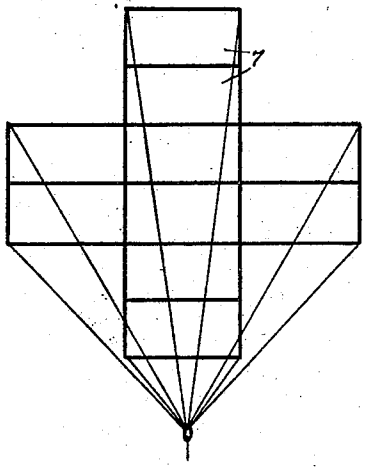


Fig. 3.

Fig. 4.



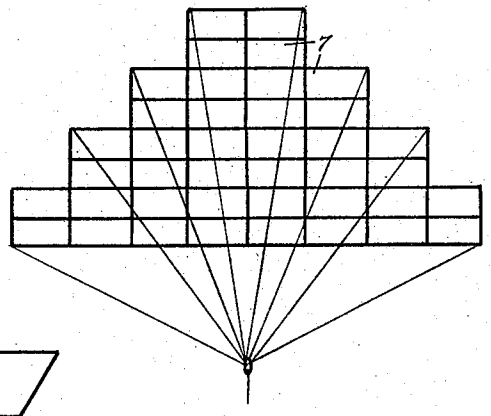


Fig. 5.

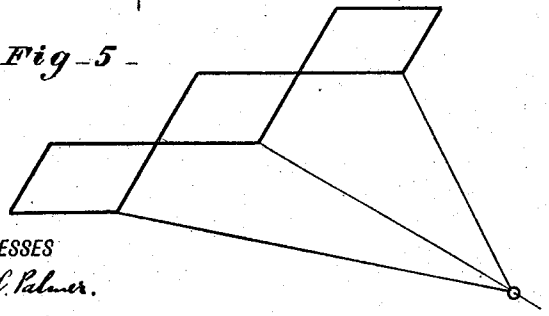
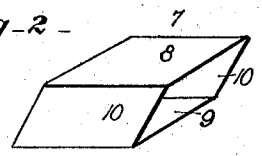


Fig. 2.



WITNESSES

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KITE.

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To all whom it may concern:

Be it known that I, ANDREW L. GRAHAM, a citizen of Great Britain and Ireland, and a resident of Santa Rosa, in the county of Sonoma and State of California, have invented a new and Improved Kite, of which the following is a full, clear, and exact description.

My invention relates to kites of cellular structure characterized by the ability to fly without any auxiliary stabilizer.

An object of the invention is to provide a simple and efficient cellular kite, each cell having inherent stability and serving as a stabilizer for the coöperating cells.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed.

In the accompanying drawings, forming part of the application, similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of a kite embodying my invention;

Fig. 2 is a diagrammatic perspective view of a single cell;

Figs. 3 and 4 are elevations of kites having a different arrangement of cells from that shown in Fig. 1; and

Fig. 5 is a side elevation of a further modification of the arrangement of the cells of the kite.

Before proceeding to a more detailed description of my invention it must be clearly understood that although the kite disclosed and referred to herein is of multicellular structure the real advantage resides in the particular cell structure, which is in itself stable in a moderate breeze, particularly when the bridle strings are fastened in the proper way. The efficiency or stability of such a cell is considerably increased when similar cells are united therewith, consequently the combination of cells increases the efficiency in a greater ratio than it increases the weight of the resulting kite. It would, therefore, follow that the cellular structure may be increased indefinitely with a gain of efficiency, a condition which is impossible with the ordinary boxlike kite.

Referring to the drawings, the kite comprises a plurality of coplanar cells 7, each cell being bordered on the top and bottom by rectangular planes 8 and 9 respectively, and on the sides by parallelogram-shaped planes 10. The front and rear of the cell which are open appear, therefore, as rectangular in shape. The parallelogram-shaped planes are so releated to the rectangular planes that the free edges thereof slope rearwardly. In view of this, the top plane of each cell when projected on to the bottom plane overhangs the bottom cell in front, while in the rear the bottom plane extends beyond the top plane.

The top and bottom planes of the cell may be made square and the side planes may be made in the shape of a rhomb. Generally the side planes have the smaller angles of 60°, as from experience I have found that this arrangement gives the better result; but the side planes are by no means limited or restricted to that construction. I have also found by experience that the best ratio between the sides of the parallelogram is 4 and 3, 3 representing the free edges of the parallogram-shaped side planes. It will be noted that with the top planes horizontal the common plane of the center cells will be at the same angle to the vertical as the front or rear edges of the side planes are with the vertical.

The bridle strings 11 may be connected in any desired way, but preferably the leading strings are connected to the four corners in front. Of course, other strings may be connected to the corners of the centrally-located cells to prevent a yielding of the center part during the flying of the kite.

The framework of the kite consists of a series of transverse bars 12 provided on the front and rear of the kite, that is, front and rear transverse bars form the free edges of the top and bottom planes of the cells. Similar bars 13 disposed across the transverse bars, or vertically of the kite, are provided in the front and rear of the kite, the said bars forming the free edges of the side planes of the cells. The front and rear frames formed by the bars 12 and 13 are united by braces 14 provided at the corners of the kite. Preferably additional braces are provided in the top, bottom and sides of the kite to reinforce the frame work; and, if desired, such braces may be provided at the junction of the central cells to further reinforce the frame structure. There is no necessity, however, of providing such braces at the intersection of each cell, as this would

only increase the weight of the kite without adding any material strength thereto.

In Fig. 3, the coplanar cells 7 are arranged to form a cross. The coplanar cells 7 in Fig. 4 are arranged so as to form a pyramid. The arrangement of the cells can be varied to obtain any desired configuration of the kite, the principle involved remaining the same.

In the arrangement shown in Fig. 5 the superimposing cells are not coplanar but are arranged in steps, and, therefore, in different planes. Such an arrangement will also produce a good flying kite, but the efficiency of same, by increasing the number of cells, is not in the same proportion to the increase of weight as in a coplanar arrangement of cells. Furthermore, the framework for such a kite will necessarily be heavier than a kite having the coplanar arrangement of cells.

While I have described the principle of operation, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made as are within the scope of the appended claims.

The cells do not need to have rectangular openings. They may have triangular or diamond-shaped openings, but such-shaped cells are less efficient than cells having a rectangular-shaped opening.

I claim:

1. A kite comprising a cell having a rectangular-shaped opening in the front and rear thereof and presenting rectangular-shaped top and bottom planes and parallelogram-shaped side planes, said side planes being so related to the top planes that the free front edge of said top plane overhangs the free front edge of the bottom plane in the projection of said top plane on the bottom plane.

2. In a multicellular kite, a plurality of coplanar cells each presenting a substantially rectangular-shaped front and rear opening, each of said cells having substantially rectangular-shaped top and bottom planes and substantially parallelogram-shaped side planes.

3. In a kite, a plurality of cells, each cell presenting a front and rear opening, the top and bottom planes of each cell being in the shape of a rectangle, the side planes of the cell being in the shape of a parallelogram, the front and rear of said cells lying in respectively common planes.

4. In a kite, a plurality of coplanar cells open in the front and rear thereof, each cell presenting rectangularly-shaped top and bottom planes, and parallelogram-shaped side planes, said side planes being so related to the top and bottom planes that the front edge of the top plane overhangs the front edge of the bottom plane and the rear edge of the bottom plane extends beyond the rear edge of the top plane.

5. In a kite, a plurality of coplanar cells open in the front and rear thereof, each cell presenting a rectangularly-shaped top and bottom plane and parallelogram-shaped side planes, transverse and vertical bars reinforcing said cells at the front and rear, brace members connecting said bars, and bridle strings connected to said brace members at predetermined points of the kite, substantially as and for the purpose set forth.

ANDREW LANG GRAHAM.