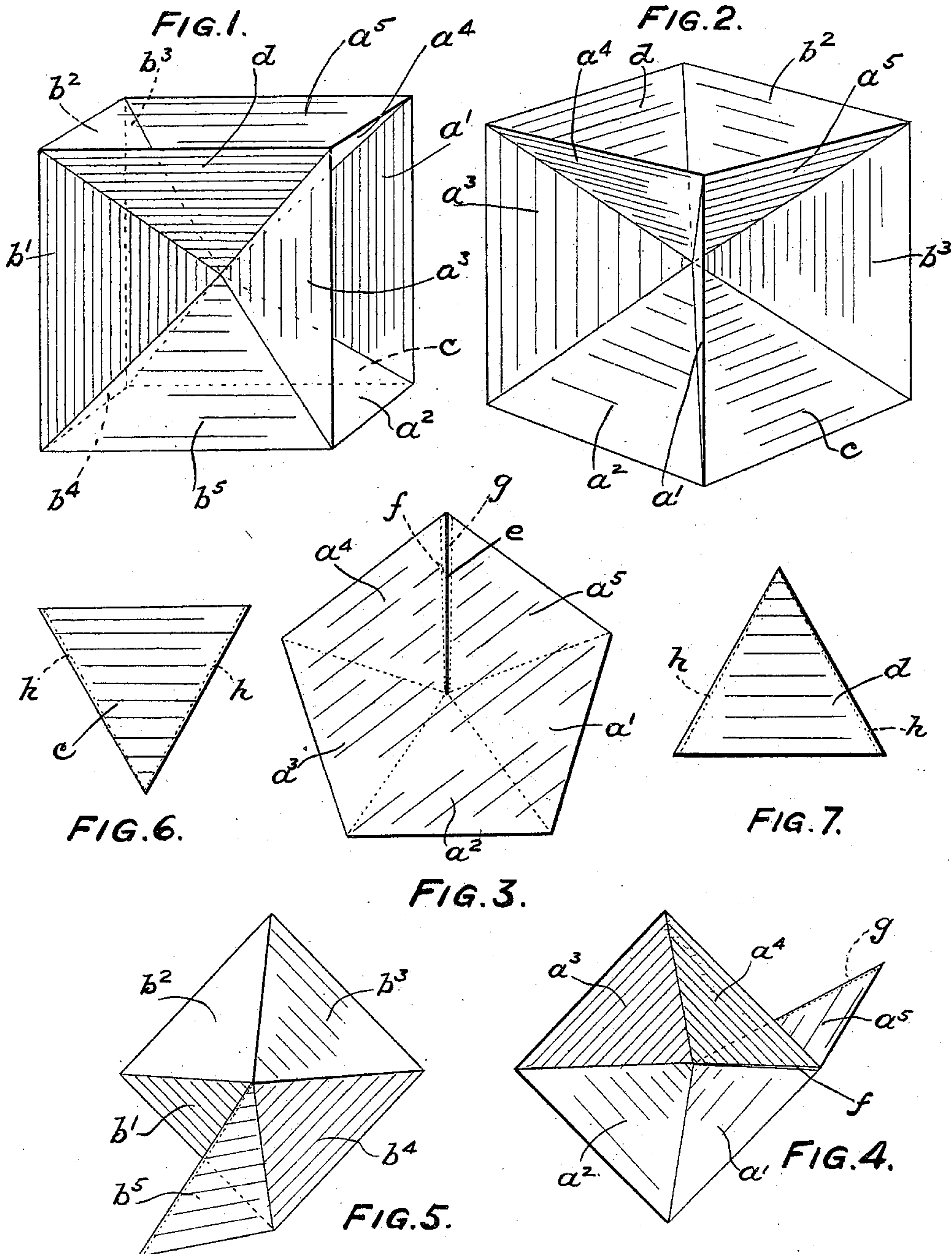


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AERIAL TOY.  
APPLICATION FILED JULY 29, 1909.

975,182.

Patented Nov. 8, 1910.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## AERIAL TOY.

975,182.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed July 29, 1909. Serial No. 510,257.

*To all whom it may concern:*

Be it known that I, ZOE D. UNDERHILL, a citizen of the United States, residing at Bedford Station, county of Westchester, and State of New York, have invented a new and useful Improvement in Aerial Toys, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The object of my invention is to produce a device adapted to be made of material heavier than air or even heavier than water and which will possess, by reason of its shape, or structure, sufficient inherent buoyancy to sink slowly in the air or to float in the water.

One of the purposes of the invention is to produce a toy capable, by the use of fans, of being maintained afloat in the air and of having its general direction of movement therein regulated or determined.

In the drawings, which illustrate a preferred embodiment of my invention: Figures 1 and 2 are perspective views of the completed device; Fig. 3 is a plan view of one of the two larger of the blanks from which the device is formed; Figs. 4 and 5 are perspective views of the two larger blanks after folding; Figs. 6 and 7 are plan views of the two smaller of the blanks from which the device is formed.

In manufacturing the embodiment of my invention illustrated in the drawings, I cut out of paper or other material, two blanks of the pentagonal shape shown in Fig. 3. One of these blanks is then slitted, as at *e* from the center of the pentagon to one of its angles and is folded along the dotted lines to form five triangular-shaped plane sections or wings *a'*, *a*<sup>2</sup>, *a*<sup>3</sup>, *a*<sup>4</sup> and *a*<sup>5</sup>. The blank is then shaped as shown in Fig. 4 by bringing the edge of section *a*<sup>4</sup> adjoining section *a*<sup>5</sup> over against the edge of section *a'* adjoining section *a*<sup>5</sup> and then securing sections *a'* and *a*<sup>4</sup> together along such edges. One way of enabling these edges to be secured together is to fold the edge of section *a*<sup>4</sup> formed by slit *e*, so as to form a narrow flap *f*, which flap is pasted or otherwise secured to section *a'* along the latter's edge. It will be understood, however, that other means of securing together the sections *a'* and *a*<sup>4</sup> may be employed. It will be observed that the blank shown in Fig. 5 is of the

shape of a four-sided pyramid with a triangular wing or section projecting outwardly from one of the corners thereof. Another blank of pentagonal shape is then cut, folded and pasted similarly to the blank of Fig. 3, forming another pyramid shaped figure composed of the four wings or sections *b'*, *b*<sup>2</sup>, *b*<sup>3</sup> and *b*<sup>4</sup> with a triangular shaped wing section *b*<sup>5</sup> projecting outwardly from one of the corners thereof. The two blanks of Figs. 4 and 5 are then placed with their points directly toward each other and brought together until their points abut. This brings one of the edges of section *a*<sup>5</sup> against the line of fold between sections *b*<sup>2</sup> and *b*<sup>3</sup> and brings one of the edges of section *b*<sup>5</sup> against the line of fold between sections *a*<sup>2</sup> and *a*<sup>3</sup>. The sections *a*<sup>5</sup> and *b*<sup>5</sup> are then respectively secured to the opposing blanks along such lines of contact and for this purpose each section *a*<sup>5</sup> and *b*<sup>5</sup> may be folded near the edge thereof formed by slit *e*, to form a narrow flap *g*, as shown in Fig. 3. The two triangular-shaped blanks or wings *c* and *d*, shown respectively in Figs. 6 and 7, are then applied and secured to the two larger blanks in the following manner. Each blank *c* and *d* is folded near two of its edges to form two narrow flaps *h*, *h*. Blank *c* is so applied to the larger blanks that its two folded edges coincide with the lines of fold respectively between sections *a'* and *a*<sup>2</sup> and sections *b*<sup>3</sup> and *b*<sup>4</sup>, and it is secured to the larger blanks along such lines of contact. Blank *d* is so applied to the larger blanks that its two folded edges coincide with the line of fold respectively between sections *a*<sup>3</sup> and *a*<sup>4</sup> and sections *b'* and *b*<sup>2</sup>, and it is secured to the larger blanks along such lines of contact. Thus the completed device shown in Figs. 1 and 2 is formed. In these figures, however, for purposes of clearness, I have not indicated any flaps *f*, *g*, *h*, or any lines of fold by which the flaps are produced.

It is to be understood that the employment of pentagonal shaped blanks is not at all essential, the same being used merely for purposes of convenience. Twelve triangular blanks like that shown in Fig. 6 or Fig. 7 may be used instead, as blanks comprising two or more integrally connected triangular blanks may be employed.

The completed device comprises a regularly shaped twenty-four-faced figure composed of six groups of four faces each, the



faces of each group forming the sides of a four-sided pyramid.

It will be noticed that each triangular wing or section of the twelve sections composing the original blanks forms a part of two adjacent pyramids and that all of the faces of all the sections are outside faces—that is, faces that will be in contact with any medium in which the device is immersed.

It will also be noticed that the twelve wings or sections are arranged in six different intersecting planes— $a'$  and  $b'$  in one plane,  $a^2$  and  $b^2$  in a second plane,  $a^3$  and  $b^3$  in a third plane,  $a^4$  and  $b^4$  in a fourth plane,  $a^5$  and  $b^5$  in a fifth plane, and  $c$  and  $d$  in a sixth plane—and that each of the two edges of each section is joined to two edges of two adjacent sections and that the four sections thus connected to the two edges of a different section are all in different planes, as, for example, section  $d$  is connected to sections  $b'$ ,  $b^2$ ,  $a^4$  and  $a^3$ , all five sections being in different planes.

By reason of the fact that the device is perfectly symmetrical, that it presents a series of open-ended pockets to the medium in which it is immersed, and that both faces of all the planes of which the device is composed are in contact with such medium, the device possesses a great degree of buoyancy when set afloat in the air and falls very slowly.

Inasmuch as the center of gravity is substantially at the common apex of all the pyramidal-shaped pockets, there is no tendency for the device to assume any particular position in the air; but on the contrary, by virtue of its nice balance, it is affected by the weakest air currents and is thereby caused to turn about its center in every direction more or less constantly, which tends to still further impede its fall, besides causing it to float along with the air currents.

In view of the sensitiveness and resiliency of the device, it is especially adapted for use as a toy, the object being, when so used, to cause the same to be agitated by a fan, applied under and at the side of the same, in such manner as to direct and propel the device through the air toward a distant receptacle. It is not intended, however, to limit the application of the invention to any particular use, nor is the invention limited to the precise form and shape shown, nor to the method described and shown of constructing the device from blanks. Nor is it intended to imply that the device is capable of use only in the air, as it is adapted to float in water even where it is made of material heavier than water by reason of the fact that in any position the device may assume, a certain amount of air will be imprisoned in that one of the pyramidal shaped pockets whose outer edges, at any given time, are immersed in the water.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. A device of the character described, composed of a series of pockets, closed at their inner ends and open at their outer ends, and radiating outwardly from substantially a common point.

2. A device of the character described, composed of a series of open-ended pockets radiating outwardly from substantially a common point, said pockets enlarging toward their outer open ends.

3. A device of the character described, composed of a series of radiating pockets closed at their sides and open at their outer ends.

4. A device of the character described, composed of a series of wings radiating outwardly from substantially a common point and associated to form pockets, each wing forming walls of two adjacent pockets.

5. A device of the character described, composed of a series of wings radiating outwardly from substantially a common point and joined along their radiating edges to form a series of open ended pockets of similar size and shape.

6. A device of the character described, composed of twelve triangular-shaped plane sections, radiating from a substantially common point, whose twenty-four sides or faces are open to any medium in which the device is immersed.

7. A device of the character described, composed of twelve triangular-shaped plane sections, in which each section, along each of two of its edges, contacts with one edge of each of two other sections, thereby forming six pockets of pyramidal shape.

8. A device of the character described, composed of six pyramidal shaped pockets each formed of four sections which also form respectively the adjacent walls of four adjacent pockets.

9. A device of the character described, composed of six similarly shaped pockets opening outwardly from a substantially common apex, in which the walls of each pocket are composed of one side of each of four triangular sections, whose opposite sides form walls of four adjacent pockets.

10. A device of the character described, composed of twelve triangular-shaped plane sections radiating from a substantially common point, said sections being arranged substantially in six different planes, there being two oppositely disposed sections in each plane, each of two of the edges of each section being joined to two edges of two adjacent sections, the four sections thus connected to the two edges of a given section all being in different planes as well as in a plane different from that of the given section.

11. A device of the character described,



composed of two pentagonal shaped blanks  
each cut substantially along a line connect-  
ing its center with one outer angle and each  
folded substantially along lines connecting  
5 its center with the remaining outer angles,  
each blank being folded to form a four-sided  
pyramidal-shaped figure and a single trian-  
gular shaped section projecting beyond the  
apex of said pyramid and secured to the other  
10 pyramid substantially along the line of fold  
between two adjacent sections of the last  
named pyramid, and two triangular shaped

blanks connecting the said pyramids along  
oppositely disposed lines of fold between  
other pairs of sections composing said pyra- 15  
mids.

In testimony of which invention, I have  
hereunto set my hand, at Philadelphia, on  
this 26th day of July, 1909.

ZOE D. UNDERHILL.

Witnesses:

ELLA E. MEURER,  
CHARLOTTE MARSHALL.