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GLIDING DART

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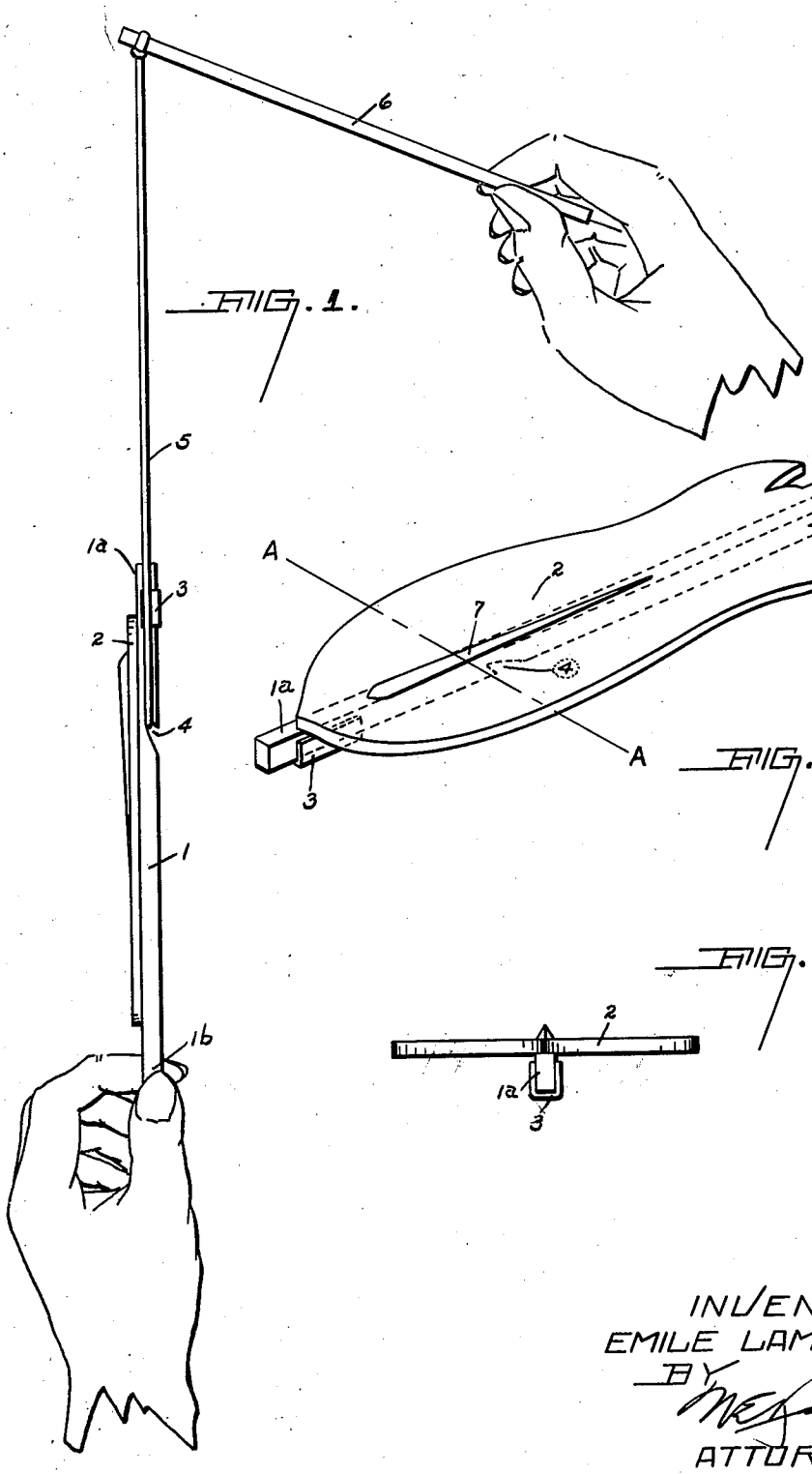


FIG. 1.

FIG. 2.

FIG. 3.

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GLIDING DART

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7 Claims. (Cl. 46—79)

The object of my invention is to provide a toy glider of the type adapted to be launched by a catapult a subtsantial distance in the air and after it has lost its momentum, to glide earthwardly. Although the parts are proportioned so that the center of mass approximately underlies the center of lifting of the wing of said glider, the latter normally descends in relatively wide spirals.

It has been deemed impossible to provide a device which would shoot along a straight line without swerving and when it reaches the top of its flight will level off and glide without providing devices for varying the center of gravity of said device, or without varying the center of lift of the wings or other supporting surfaces. I have determined that this can be attained in an elongated glider in which the parts are arranged so that the center of mass and the center of lift are in substantially vertical alinement if a relatively heavy head is provided for tending to hold the glider to a true course when it leaves the catapult. That is, I provide a head or weight on said glider of metal or some other material having substantially greater specific gravity than the remainder of the plane and this massive weight tends to hold the initial flight of said device to a straight course. I preferably make the remainder of the glider of balsa wood so that the difference in specific gravity of the materials used is accentuated. To secure these balances I preferably make the weight adjustable so that a balance can be attained. Sometimes it is desirable to have the massive weight slightly ahead so that the center of gravity lies slightly forward of the center of lift so that the descent will be more or less nose on and in this manner the downward flight of the device can be predetermined to a greater or lesser degree.

Further and more detailed features of my invention are hereinafter described with reference to the accompanying drawing, in which:

Fig. 1 is a more or less diagrammatic illustration of the manner in which said glider is launched with an elastic catapulting member;

Fig. 2 is a perspective view of said glider showing its position when descending; and

Fig. 3 is an elevation looking toward the nose portion.

A glider embodying my invention comprises an elongated shaft 1 preferably rectangular in section, having a relatively broad flat wing element secured to one edge 1*a* thereof. Said wing element preferably is glued to said edge substantially its entire length and said wing element lies intermediate the ends of said shaft. The wing element is almost as long as is the shaft, the shaft, however, projecting beyond the ends of the wing element slightly. The wing element is proportioned so that its front end, at a section thru the center of lift indicated by the line A—A, is broader than the trailing portions thereof. The trailing portions can be formed to some streamlined contour so that the glider does not impose too much resistance to forward flight when it leaves the catapult.

Secured to said shaft forward of the center of lift of the wing is a bifurcated or U-shaped weight 3. This weight has some elasticity and clamps to the sides of the shaft and underlies the under surface thereof. It can be slid longitudinally of said shaft so as to vary the location of the center of mass of said glider longitudinally. Said glider is symmetrical about a longitudinal axis and thus sliding said weight forwardly and rearwardly on a shaft does not produce a lateral shifting of the mass. Said weight preferably is made of some metal such as sheet iron or sheet lead which has a high specific gravity and the remainder of the plane is preferably made of balsa wood which is relatively light. Thus a slight shifting of the weight produces a substantial shifting of the center of mass of the entire glider.

On the under side of the shaft 1 is a notch 4 adapted for an engagement by an elastic band 5. Said elastic band preferably is secured to the end of a stick 6 held in one hand and the glider is gripped in the other hand by the portion 1*b* of the shaft lying rearwardly of the trailing end of the wing element 2 in the manner illustrated in Fig. 1. The glider is preferably launched directly upwardly so as to obtain the greatest altitude. In practice said glider will be shot in a straight line until it begins to lose its momentum. At this point, the surfaces of the wings tend to support it and it falls more or less level and descends either in a gradually inclined flight or in spirals. The trailing end 1*b* of the shaft provides a convenient gripping point on the glider for holding it against the tension of the elastic band 5 and thus the wing element is not injured in holding said glider against said tension.

It is to be noted that the wing element and the shaft are both flat and thus there are no curving surfaces which tend to disturb straight flight of said glider under the action of said elastic band. The center of gravity lies slightly below the wing, however, because of the presence of the weight 3 on the shaft and the mass of the shaft itself. This causes the glider to have lateral stability in flight and I have discovered that this lateral stability and, in fact, the trueness of the flight may be aided slightly by providing a very thin and shallow strip of cowling upon the upper surface of the wing element 2. Said cowling preferably is bluntnosed and tapers to a point at its trailing end to eliminate eddy currents which would tend to cause the flight of the glider to

deviate from a straight line. The weight 3 grips the sides of the shaft 1 sufficiently tightly so that the weight is not shifted under the acceleration given the dart when it is released by the elastic band. The gripping is not so severe, however, that it cannot be shifted manually to secure balance or to change the angle of descent.

A dart-like glider made in this manner is an inexpensive toy without moving parts and is capable of being projected to substantial altitudes and the descent is such that it will remain in flight for several minutes.

The wing element can be colored or otherwise decorated to simulate the fuselage and elevators of a plane and the strip of cowling 7 also suggests the cowling normally provided on the fuselage of said plane.

I claim:

1. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft, a longitudinally disposed wing element secured to one face of said shaft and extending substantially the entire length of said shaft, a weighted head secured to said shaft, said head being made of a material having greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

2. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft of rectangular section, a longitudinally disposed wing element secured to one edge portion of said shaft and extending substantially the entire length of said shaft, a weighted head secured to said shaft, said head being made of a material having a greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

3. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft, a longitudinally disposed wing element secured to one face of said shaft and extending substantially the entire length of said shaft, a weight head slidably secured to said shaft, said head being made of a material having greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

4. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft, a longitudinally disposed wing element secured to one face of said shaft and extending substantially the entire length of said shaft, a weighted head slidably secured to said shaft, said head being of U-shaped form and elastically gripping the sides of said shaft between the spaced leg portions thereof, said head being made of a material having greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

5. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft, a longitudinally disposed flat wing element secured to one face of said shaft and extending substantially the entire length of said shaft, the forward end thereof being substantially wider than the trailing portions thereof, a weighted head secured to said shaft, said head being made of a material having greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

6. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft, a longitudinally disposed wing element secured to one face of said shaft and extending substantially the entire length of said shaft, a weighted head secured to said shaft, a launching notch on said shaft intermediate the ends thereof adapted for engagement with a catapulting device, said head being made of a material having greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly, it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

7. A dart-like glider adapted to be catapulted by an elastic member comprising an elongated shaft, a longitudinally disposed wing element secured to one face of said shaft and extending substantially the entire length of said shaft, a weighted head secured to said shaft, a launching notch on said shaft intermediate the ends thereof adapted for engagement with a catapulting device, a strengthening rib simulating a cowling alined with said shaft and secured to the opposite side of said wing element and overlying said notch, said head being made of a material having greater specific gravity than that of which the remainder of said glider is made, the center of gravity of the entire glider being arranged adjacent the center of lift of said wing, said head being arranged substantially forwardly thereof, whereby when said glider is catapulted upwardly, it will be projected endwise until its momentum is spent and it will then descend flatwise with the wing element arranged substantially level.

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