

March 18, 1958

E. F. POHL

2,827,252

TOY AIRPLANE KITE

Filed Jan. 11, 1955

2 Sheets-Sheet 1

FIG. 1.

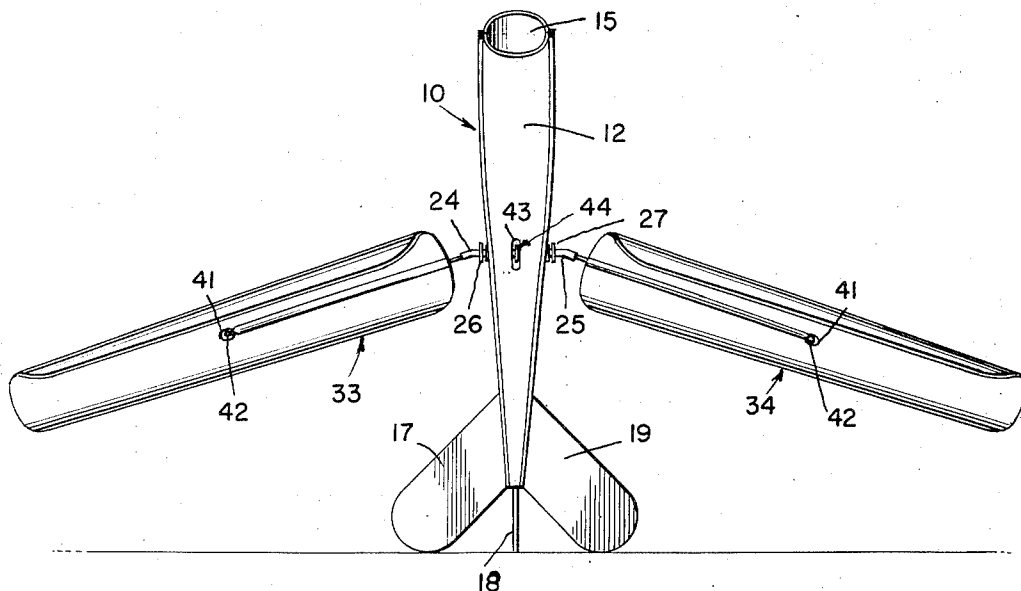


FIG. 2.

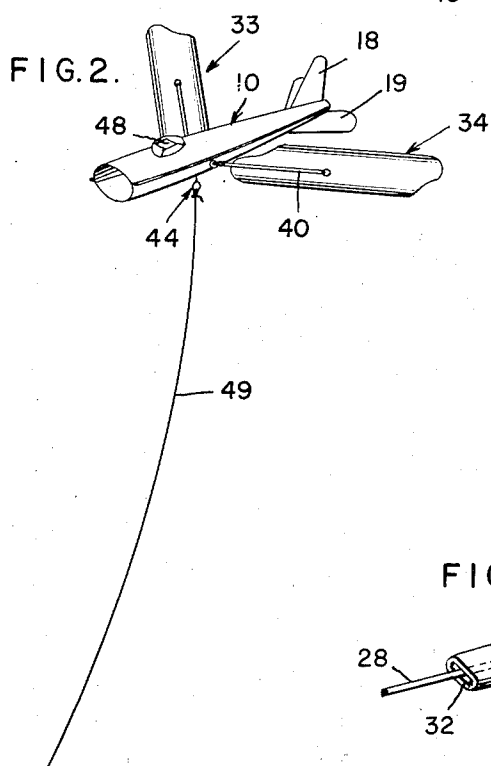


FIG. 7.

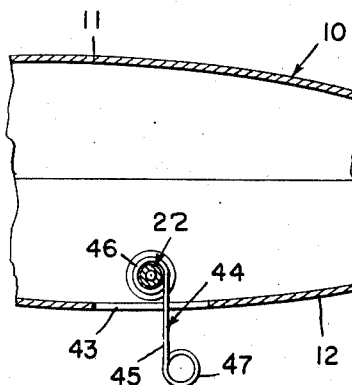
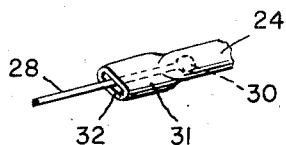


FIG. 8.



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FIG. 3.

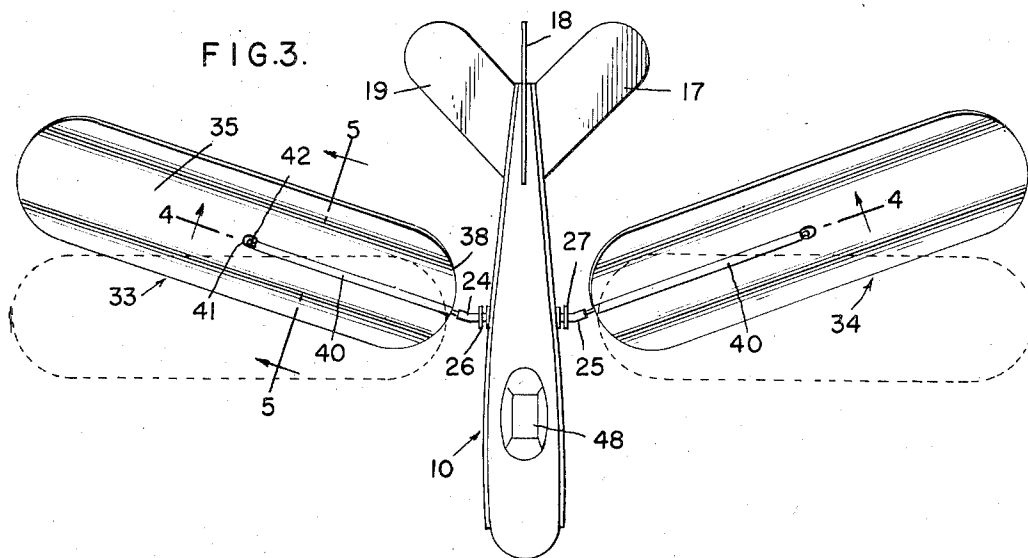


FIG. 4.

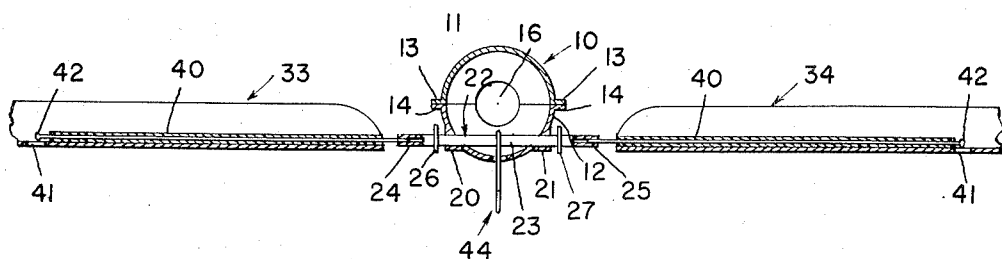


FIG. 5.

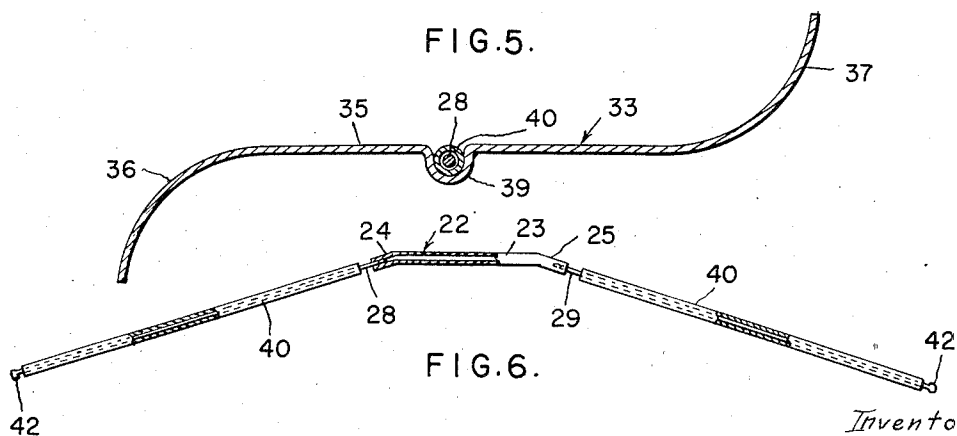


FIG. 6.

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TOY AIRPLANE KITE

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Application January 11, 1955, Serial No. 481,074

10 Claims. (Cl. 244—154)

This invention relates to toy airplanes of the type to be tethered at the end of a flexible element such as a wire or string and flown in the presence of wind currents.

The invention embraces the use of revoluble wing elements which enhance the soaring characteristics of the toy and also embraces the provision of means enabling the wing elements to shift their position longitudinally of the main body portion of the toy so as to compensate for varying wind velocities and allow the toy to quickly recover from dips, dives and the like occasioned by variations in wind velocity and direction and sustain level flight.

It is, therefore, an object of this invention to provide improvements in toy airplanes wherein the revoluble wings thereof will automatically shift in a direction longitudinally of the body in an effort to sustain level flight.

Another object of this invention is to provide improved wing-mounted means which includes a rod for rotatably carrying each wing which is rotatable both with respect to the fuselage or body and with the wing to in effect provide a full floating or rotating structure such that little chance for binding will be present.

An illustrative embodiment of the invention is shown in the accompanying drawings but it is to be understood that this showing is illustrative only and is not intended to be limiting to the exact construction shown since obviously changes can be made both in detailed construction and arrangement of parts without departing from the spirit and scope of this invention as set forth and defined in the appended claims.

In the drawings:

Fig. 1 is an elevational view showing the toy constructed in accordance with this invention in position and poised for flight;

Fig. 2 is a perspective view showing the toy in flight;

Fig. 3 is a plan view of the toy;

Fig. 4 is a transverse section taken substantially along the plane of section line 4—4 in Fig. 3;

Fig. 5 is an enlarged section taken transversely through one wing as indicated by section line 5—5 in Fig. 3;

Fig. 6 is a view, partly in section, illustrating the wings and their mounting assembly;

Fig. 7 is an enlarged section taken through a longitudinal portion of the fuselage or body and illustrating the manner in which the tether securing member is mounted upon the wing mounting member; and

Fig. 8 is an enlarged perspective view showing the manner of interconnection between one of the wing-carrying rods and the mounting member.

Reference is had now more particularly to Figs. 1, 3 and 4 wherein it will be noted that the toy comprises a body indicated by the reference character 10 which is formed from upper and lower similarly formed sections or halves 11 and 12 each having opposite side marginal flange portions 13 and 14 whereby when the flanges are disposed in abutting relationship and secured together by suitable means, such as adhesive or the like, a generally

cigar-shaped fuselage or body is provided. The body may be formed from plastic material, metallic foil or any other suitable substance or material. As illustrated, it is preferred that the larger forward end of the body be open as at 15 and the smaller or tapered rearward end is also open as at 16, whereas it is permissible to have both of these ends closed such that an enclosed chamber is presented by the body. The open ended construction is preferred since this seems to produce a jet-like effect when the toy is in flight.

Located in circumferentially spaced relation around the rearward end of the fuselage or body are a plurality of rudder blades 17, 18 and 19 which are swept back from their point of attachment to the fuselage to project rearwardly therefrom such that the trailing edges thereof will provide feet whereby the toy may be disposed in the vertical position illustrated in Fig. 1. This is the position for launching, the particular manner of which will be hereinafter described.

Formed on opposite sides of the body substantially midway between the ends thereof are a pair of bosses 20 and 21 which are apertured to rotatably receive there-through a transverse wing mounting member 22. This wing mounting member includes a central bight portion 23, which projects completely through the fuselage or body, and the similarly angulated opposite end portions 24 and 25 disposed exteriorly of the body. The end portions 24 and 25, as stated above, are angulated in similar fashion from the bight and are also disposed in a common plane.

To limit transverse movement between the mounting member and the fuselage or body, the bight portion 23 is provided adjacent its opposite end portions with the stop collars 26 and 27 which are adapted to bear or abut against the bosses 20 and 21 in an obvious manner.

As seen most clearly in Figs. 6 and 8, the end portions 24 and 25 of the mounting member rotatably receive inner end portions of a pair of wing-carrying rods 28 and 29. The mounting member, being tubular, receives the rods therein and for the purpose of limiting longitudinal movement between these members the inner end of each rod which is disposed within an associated end portion 24, 25 is provided with an enlargement 30, whereas the outer end of each end portion is flattened as indicated by the reference character 31 in Fig. 8 such that the opening 32 provided by such flattening is of less cross sectional extent than the enlarged rod portion 30. This will prevent the rods from being pulled from the associated end portions of the mounting member while at the same time permitting the rod to rotate within the end portions.

The toy is provided with two wing assemblies 33 and 34 and each, as will be seen most clearly in Fig. 5, embodies a longitudinally extending flap portion 35 and on opposite sides thereof with oppositely directed arcuate portions 36 and 37. Thus, each wing is of generally S-shaped configuration in cross section.

Extending from the inner edge 38 of each wing to a point substantially midway between its ends is a longitudinal trough 39 within which is received a tubular bushing member 40. At the outer terminus of each bushing each wing is provided with an opening 41 there-through. The bushings 40 may be secured in any suitable manner within the troughs 39, adhesive being particularly suitable for this purpose. Each rod 28 and 29 extends completely through its associated bushing 40 and is rotatable therein and it will be noted that the outer end portion of each rod which projects beyond the bushings is enlarged as at 42 so that the rods cannot be pulled from the bushings. The openings 41 in the wings readily permit the deforming operation to be

performed on the outer ends of the rods such as to produce the enlarged portions 42.

As will be seen most clearly in Figs. 4 and 7, the lower section 12 of the fuselage is provided with a longitudinally extending slot 43 immediately below the central portion of the bight 23 of the mounting member, thus permitting the tether attaching assembly 44 to be associated therewith. The tether attaching member includes a straight shank portion 45 having at one end a loop portion 46 encircling the bight portion of the mounting member 22. The shank 45 projects outwardly through the fuselage opening 42 and terminates at its opposite end in an eye or loop 47 for convenient fastening to a tether such as a string, wire or the like. The loop 46 loosely engages about the mounting member so that the rotation of the latter, hereinafter described, is not impeded in any way by the tether securing member.

If desired, the upper section 11 of the fuselage may be provided with a canopy 48 simulating a cockpit and so positioned on the fuselage to produce this effect.

In operation, the tether 49 is secured to the member 44 and the toy positioned in the manner illustrated in Fig. 4 wherein the fuselage thereof is disposed in a vertical manner. The flight of the toy is, of course, dependent upon sufficient wind current and although a sufficiently strong wind may produce in itself a lifting action on the toy sufficient to elevate the same, it will usually be necessary to manipulate the tether in a manner similar to that which is necessary when flying a kite. It will be noted that due to the offset relation of the end portions 24 and 25 of the mounting member 22, the wing assemblies 33 and 34 will, by force of gravity, normally assume the position shown in Fig. 1. However, when the wind is sufficiently strong, the wing assembly will be rotated by virtue of the offset in the end portions of the mounting member such that the plane passing through the bight 23 and containing the end portions 24 and 25 will lie in the direction of the wind current. Thus, Fig. 1 illustrates the position of the wing assembly only when insufficient wind is present to overcome the weight of the wings. That is, Fig. 1 shows the most rearwardly disposed position of the wing assembly. The wing assembly may be rotated in either direction 90° from the position shown in Fig. 1 such that each wing 33 and 34 is disposed perpendicular to the center line of the fuselage and is shifted longitudinally of the fuselage in a forward direction. Also, each wing can be rotated 180° from the position shown in Fig. 1, this position being the forward position of the wings, in which the wings will be angulated forwardly with respect to the center line of the fuselage. Of course, the wings, by virtue of the integral construction of the mounting member 22, move angularly and longitudinally with respect to the fuselage center line as a unit.

The longitudinal shifting and angular variation of the wings with respect to the fuselage imparts varying flying characteristics to the toy which, by virtue of the construction of the mounting member, as it will be rotated by variations in wind velocity and direction, will effect superior flight characteristics to the toy over those toys which are constructed only with revoluble wing elements. In this respect, it will be noted that during higher wind velocities the wings will be disposed in their rearmost position or that position which under the conditions prevailing would effect proper level flight. Then assuming that either or both a change in wind velocity and direction occurs, the mounting assembly 22 will permit the wings to rotate as a unit more or less toward the forward position thereof so as to maintain or sustain level flight conditions without undue dipping or diving which would tend to substantially decrease the level of flight of the toy. This is in accordance with well known aerodynamic principles, wherein greater relative velocity between the airplane and the wind requires a more rearward position of the wings to sustain level

flight, whereas decreases in the relative wind and airplane velocity will require the wing to be shifted forwardly to sustain the level flight.

Fig. 3 illustrates in full and dotted lines, respectively, the rearmost and forward positions of the wings.

I claim:

1. In a toy airplane, an elongate body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite end portions with said end portions being disposed in a common plane, a wing-carrying rod connected to and projecting from each of said end portions in the direction of each of said end portions, and a pair of revoluble wings, said wings being rotatably mounted on and disposed longitudinally of said rods.

2. In a toy airplane, an elongate hollow body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite end portions with said end portions being disposed in a common plane, a wing-carrying rod rotatably carried by and projecting from each of said end portions in the direction of each of said end portions, and a pair of revoluble wings connected to and disposed longitudinally of said rods.

3. In a toy airplane, an elongate body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite end portions with said end portions being disposed in a common plane, a wing-carrying rod rotatably carried by and projecting from each of said end portions in the direction of each of said end portions, and a pair of revoluble wings, said wings being rotatably mounted on and disposed longitudinally of said rods.

4. In a toy airplane, an elongate hollow body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite tubular end portions, said end portions being disposed in a common plane, a pair of wing-carrying rods each having one end rotatably received in one of said tubular end portions, said one end of each rod having an enlarged extremity, and said tubular end portions being flattened at their extremities to prevent removal of the rods therefrom and to provide a slot in which said corresponding rod will have limited oscillation about said enlarged end, and a pair of revoluble wings connected to and disposed longitudinally of said rods.

5. In a toy airplane, an elongate hollow body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite tubular end portions, said end portions being disposed in a common plane, a pair of wing-carrying rods each having one end rotatably received in one of said tubular end portions, said one end of each rod having an enlarged extremity, and said tubular end portions being flattened at their extremities to prevent removal of the rods therefrom and to provide a slot in which said corresponding rod will have limited oscillation about said enlarged end, and a pair of revoluble wings, said wings being rotatably mounted on and disposed longitudinally of said rods.

6. In a toy airplane, an elongate hollow body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite tubular end portions, said end portions being disposed in a common plane, a pair of wing-carrying rods each having one end rotatably received in one of said tubular end portions, said one end of each rod having an enlarged extremity, and said tubular end portions being flattened at their extremities to prevent removal of the rods therefrom and to provide a slot in which said corresponding rod will have limited oscillation about said enlarged end, and a pair

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of revoluble wings, each of said wings having a longitudinally extending trough therein, an elongate bushing secured within each trough, said wing-carrying rods being rotatably received in said bushings and projecting from the outer ends thereof, the outer extremities of said rods being enlarged to present a cross sectional area greater than the bore of said bushings.

7. In a toy airplane, an elongate body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite end portions with said end portions being disposed in a common plane, a wing-carrying rod connected to and projecting from each of said end portions in the direction of each of said end portions, and a pair of revoluble wings, each of said wings having a longitudinally extending trough therein, an elongate bushing secured within each trough, said wing-carrying rods being rotatably received in said bushings and projecting from the outer ends thereof, the outer extremities of said rods being enlarged to present a cross sectional area greater than the bore of said bushings.

8. In a toy airplane, an elongate body, a mounting member projecting transversely through said body and rotatably mounted therein, said mounting member having angularly extended opposite end portions with said end portions being disposed in a common plane, a wing-carrying rod rotatably carried by and projecting from each of said end portions in the direction of each of said end portions, and a pair of revoluble wings, each of said wings having a longitudinally extending trough therein, an elongate bushing secured within each trough, said wing-carrying rods being rotatably received in said bushings and projecting from the outer ends thereof, the outer extremities of said rods being enlarged to present a cross sectional area greater than the bore of said bushings.

9. A toy airplane comprising, an elongate hollow body having its opposite ends open, said body being tapered from front to rear to present a large open forward end and a smaller open rearward end, a tubular mounting

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member having a bight portion projecting transversely through said body and rotatably received therethrough and angularly extended opposite end portions lying in a common plane, a pair of wing-carrying rods each having one end rotatably received in one of said end portions, said one end of each rod having an enlarged extremity, said end portions being flattened at their extremities to prevent removal of said rods therefrom and to provide a slot in which said corresponding rod will have limited oscillation about said enlarged end, a pair of revoluble wings, each of said wings being S-shaped in cross section and each having a medially disposed, longitudinally extending trough therein, an elongate bushing fixed within each trough, said wing-carrying rods being rotatably received in said bushings and projecting from the outer ends thereof, the outer ends of said rods being enlarged to present a cross sectional area greater than the bore of said bushings, each wing having an opening therein adjacent the outer ends of said bushings to accommodate said enlarged outer end of the corresponding rod, and a plurality of circumferentially spaced, longitudinally extending rudders secured to said body adjacent the rearward end thereof.

10. In a toy aircraft having rotatable wings on axial rods extending from a central fuselage, means for attaching said rods to said fuselage comprising a rotatable shaft mounted transversely in said fuselage and having an angularly extending outer end for each rod, and a hinge connection between said outer end and the inner end of the corresponding rod for limited oscillation substantially in the plane of said angular shaft to vary the sweep of said wings in response to the air speed.

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