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2,528,268

TOY WHIP AIRPLANE

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FIG. 1

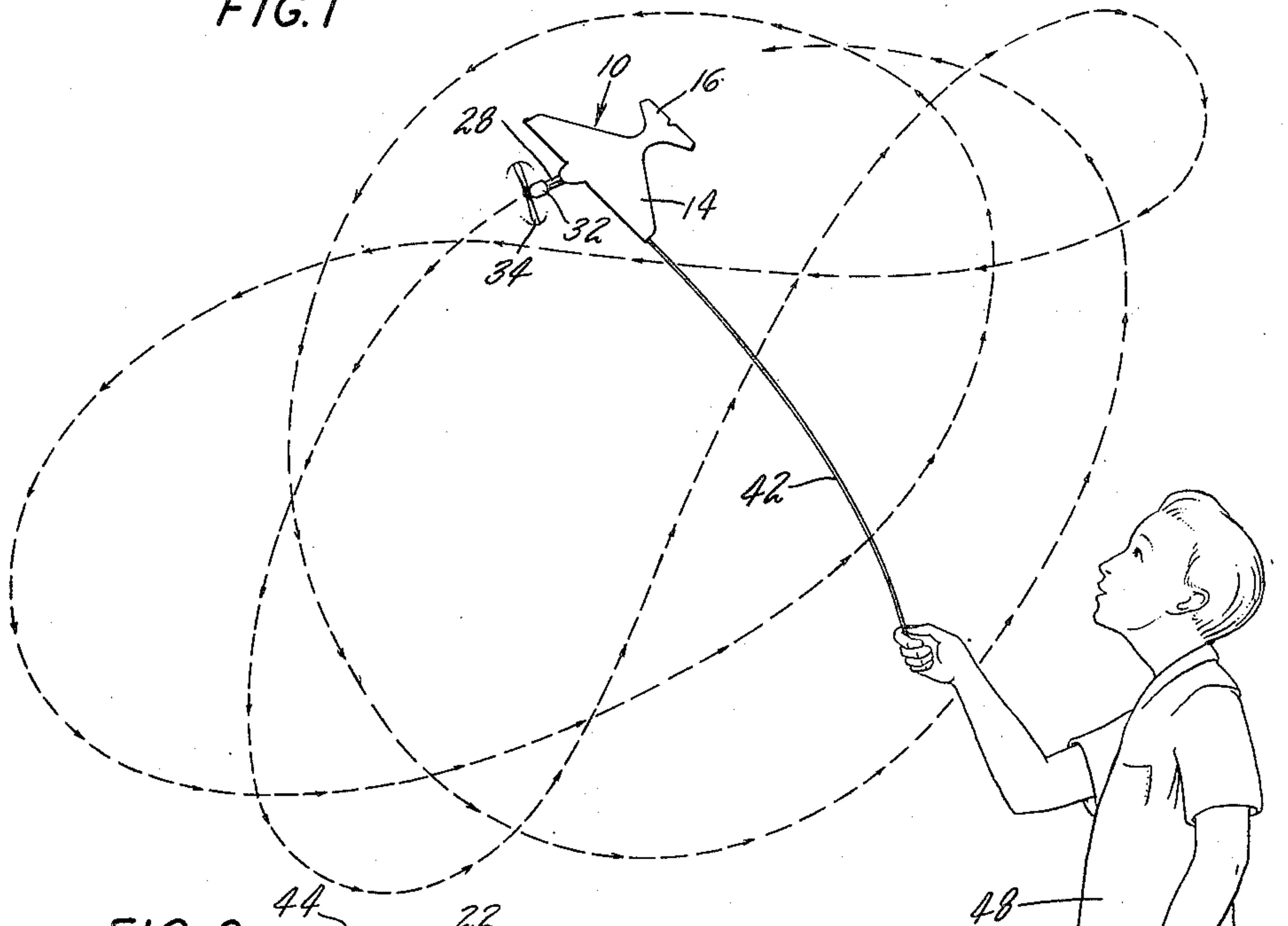


FIG. 2

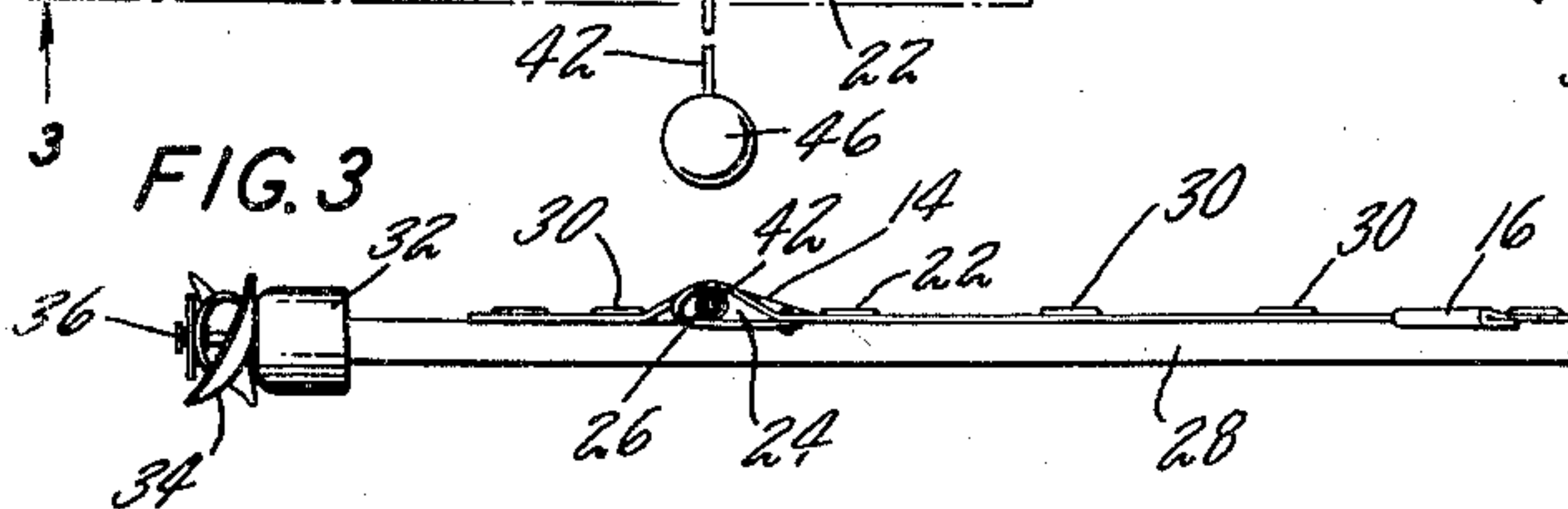
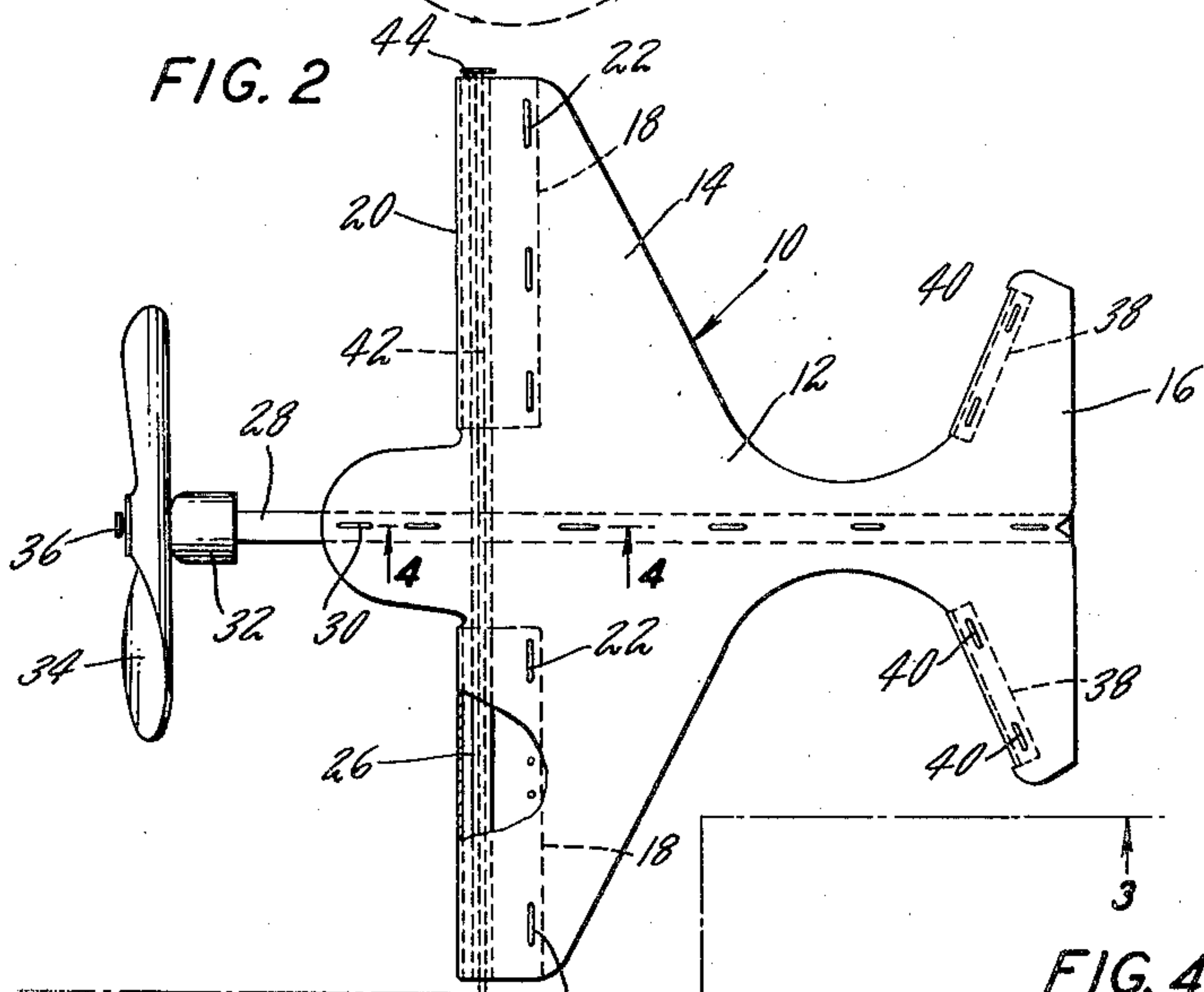
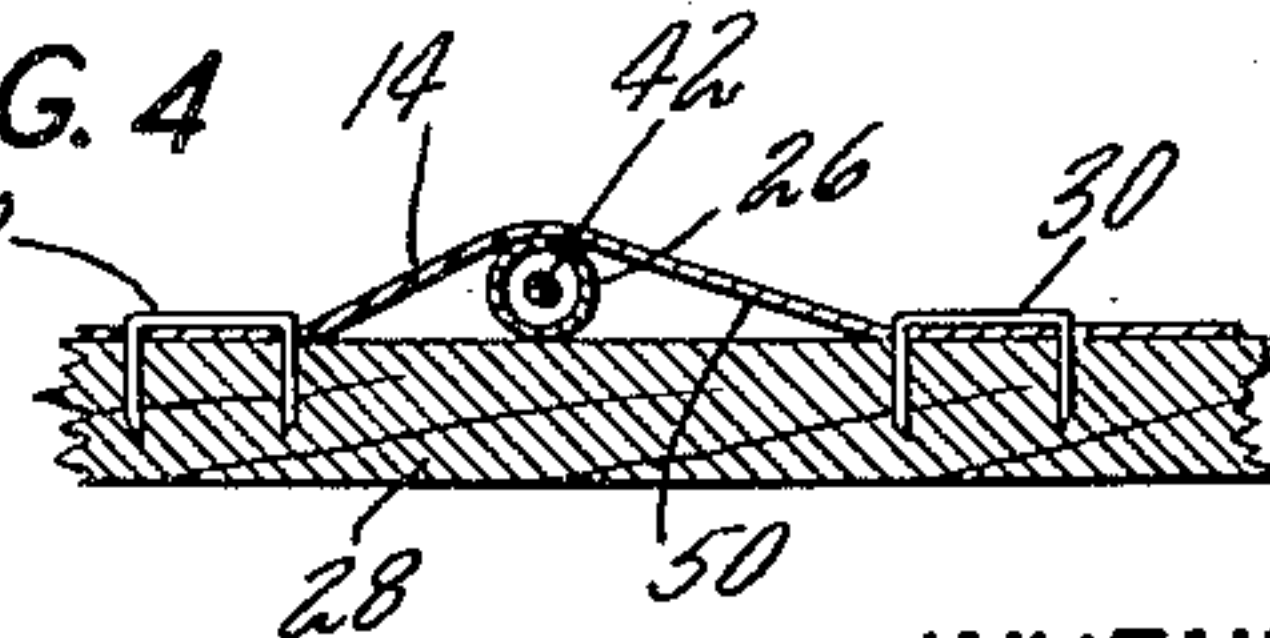


FIG. 4



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## TOY WHIP AIRPLANE

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6 Claims. (Cl. 46—77)

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This invention relates to improvements in a toy aeroplane of the whip type which may be manipulated manually.

Toy aeroplanes which may be controlled in flight from the end of a string or other support have been previously developed to provide a toy which may be whirled around from the end of the supporting means so as somewhat to resemble a full sized aeroplane in flight. Such toy planes as previously developed, however, have had only a limited scope of manipulation such, for example, as merely whirling the plane around in a circle about the head of the operator.

It is an object of the present invention to provide a toy including a miniature type aeroplane which is connected to a suitable manipulating support, said support being capable of whip-like movements whereby the toy aeroplane may be moved so as to simulate the movement of a full sized aeroplane by executing take-offs, landings, rolls, figure eights, turns, banks, and other maneuvers.

It is another object of the invention to support a toy aeroplane upon means which are flexible but somewhat stiff and pivotally connected to the toy aeroplane in such a way that the movement of the plane is graceful and capable of simulating a wide variety of movements with a minimum of manual movement and manipulation being required by the operator.

It is a further object of the invention to provide a toy aeroplane which is supported upon the end of a flexible support capable of being manipulated whip-like manually and the entire structure is extremely simple, capable of inexpensive manufacture, rugged and durable in use, and pleasing in appearance.

Details of these objects and of the invention, as well as other objects thereof are set forth in the following specification and illustrated in the accompanying drawing comprising a part thereof.

Referring to the drawings:

Figure 1 is a view of a person operating a whip-like toy plane embodying the principles of the present invention, said figure illustrating in dotted lines an exemplary path of movement of said toy plane.

Fig. 2 is a plan view of the whip-type toy plane illustrated in Fig. 1 but shown on a larger scale than in the latter figure.

Fig. 3 is a side elevation, partly in section, taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 2.

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The whip-type toy aeroplane embodying the principles of the present invention comprises a miniature aeroplane 10 formed from a flat sheet 12 of thin, relatively stiff material shaped to provide a wing 14 and a stabilizer or tail 16 extending rearwardly therefrom. For convenience and simplicity in manufacture, the wing and tail may be formed integrally as illustrated in the figures, but such formation is not to be considered restrictive. The material used to form the sheet 12 may be heavy paper of tagboard weight, parchment, synthetic resin of any suitable stiffness, or light weight metal. Flap portions 18 of the sheet 12 initially projecting forwardly from the leading edge 20 of wing 14 are folded backward preferably against the under surface of the wing 14 and secured to said wing by any suitable means such as a plurality of wire staples 22. Such folded flaps provide longitudinal bearing cavities 24 which are in axial alignment with each other. The bearing cavities 24 preferably enclose an elongated tubular bearing sleeve 26 which, in the preferred embodiment of the invention, is continuous from one tip end of the wing 14 to the other as clearly shown in Fig. 2. Such bearing sleeve 26 may comprise, for example, a soda straw of suitable length.

Secured to the sheet 12 and extending along the longitudinal axis thereof is a fuselage comprising a stick 28 of any suitable light weight material such as light weight wood. The sheet 12 may be secured to the stick 28 by any convenient means, such as a plurality of wire staples 30 which are forced through the sheet and into the wood. The stick 28 projects at its forward end beyond the leading edge 20 of the wing 14 and, in the preferred embodiment of the invention, the forward end of the stick terminates in an enlarged head 32 formed from material similar to the stick 28.

A simple propeller 34 formed from sheet synthetic resin, laquered paper, or otherwise is centrally apertured to receive a headed pin 36 which extends through the propeller and is driven into the head 32 in such manner that the propeller is freely rotatable relative to the head 32 as the plane 10 is moved forwardly through the air. The stick 28 affords rigidity to the aeroplane 10 longitudinally thereof and said stick preferably terminates at its rearward end adjacent the rear edge of the tail of sheet 12. The forward edges of the tail 16 may also be provided with flaps 38 which are folded against either the top or bottom surface of the tail 16 and are secured thereto by wire staples 40. Such folded flaps



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strengthen the leading edge of the laterally extending tail surfaces and also stiffen the tail.

The aeroplane 10 is supported by one end portion of a control member comprising a resilient rod or flexible wire 42 which is preferably piano wire. Piano wire is relatively high quality steel wire having a carbon content of from .75 to .85%. Such wire is flexible but is appreciably more rigid than many forms of soft iron wire, for example. The use of piano wire is desirable to permit the user of the plane to achieve the desired manipulations of the aeroplane 10 when pivotally supported at one end of the wire 42 as will be described hereinafter. Said one end portion of the wire 42 extends entirely through the bearing sleeve 26, said one end of the wire terminating slightly beyond one tip of the wing 14 and a washer 44 is secured to said end of wire 42 by peening or riveting, so as to prevent the washer from being removed from said end of the wire. Said washer preferably abuts either the adjacent tip end of the wing 14 or the end of the bearing sleeve 26 adjacent the same, or both. The other end of the wire 42 extends a substantial distance laterally from the other tip of the wing 14.

Secured to the extreme end portion of said other end of the wire 42 is a ball or a knob 46 which is manually held in the hand of the operator 48 during use as illustrated in Fig. 1. The wire 42 extends through the bearing sleeve 26 in a direction perpendicularly to the longitudinal axis of the aeroplane 10 and said bearing sleeve 26 is positioned relative to the aeroplane 10 at substantially the center of gravity thereof, or possibly very slightly forward of said center of gravity. It will also be noted from Fig. 4 that the preferably continuous bearing sleeve 26 is disposed between the stick 28 and the adjacent surface of the wing 14. In order to provide a space for the bearing sleeve 26 as described, the wing 14 is curved in a direction transversely to the length of the wing and such curved portion 50 provides a partial channel which serves to strengthen the wing longitudinally of the length thereof and transversely to the longitudinal axis of the entire aeroplane. The tubular configuration of the bearing sleeve 26 also further strengthens the wing against bending from the general plane thereof and the disposition of one end of the relatively stiff piano wire 42 within the bearing sleeve 26 also adds very materially to the strength of the wing to prevent bending thereof from its normal plane.

From the foregoing it will be seen that the disposition of the wire 42 within the bearing sleeve 26 at the leading edge of the wing pivotally connects the wire and aeroplane for free rotation of the aeroplane about the axis of the wire.

When the knob 46 on one end of the wire 42 is held within the hand of the operator 48, the wire may be manipulated in whip-like fashion while the wire is rotated around by the operator either in front of him or over his head or otherwise in such manner that the aeroplane may be made to loop, roll, bank, take off and land from the ground or any other surface, execute figure eights and numerous other types of manipulations so as gracefully to simulate many of the various possible maneuvers of an actual aeroplane in flight. Such manipulation of the aeroplane upon the end of the wire 42 also causes the propeller 34 to be rotated and produce a whirring noise, thus adding to the simulation of a full sized aeroplane.

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It has been found that the relation of the weight of the aeroplane 10 to the length and diameter of the piano wire 42 is of importance for purposes of producing the desired manipulations of the aeroplane 10 most advantageously. For example, it has been found that a toy aeroplane having a wing spread nearly  $\frac{1}{3}$  of the length of the wire 42 and weighing approximately  $\frac{3}{4}$  oz. may be most advantageously manipulated as desired upon a piano wire having  $\frac{1}{16}$ " diameter and a length of approximately three feet. Such length of said diameter of piano wire may be bent in a loop until the ends meet without permanently distorting or bending said wire. The general proportions discussed above are similar to those illustrated in the drawings and particularly Fig. 1. Notwithstanding the aforementioned proportions and ratios, however, it is to be understood that the other details of the present invention may be utilized advantageously in toy whip-type aeroplanes having proportions that vary somewhat from those stated above.

It will be seen from the foregoing that the present invention provides a whip-type toy aeroplane which may be inexpensively constructed so as to be light in weight, rugged and durable and capable of relatively long life. The toy aeroplane being supported from one end of a flexible but relatively stiff length of piano wire is capable of being manipulated and cause the aeroplane to simulate gracefully numerous maneuvers of an actual aeroplane and with a minimum of effort and movement by the hand of the operator by which the aeroplane and supporting wire are manually manipulated. The toy may also manually be manipulated for extensive periods of time without tiring.

While the invention has been illustrated and described in its preferred embodiment and has included certain details, it should be understood that the invention is not to be limited to the precise details herein illustrated and described since the same may be carried out in other ways, falling within the scope of the invention as claimed.

I claim as my invention:

1. A toy comprising in combination; a miniature aeroplane comprising a thin and flat, relatively stiff sheet to resemble an aeroplane wing and a tail extending rearwardly therefrom, a stick extending along the longitudinal axis of said sheet and connected thereto, said stick projecting forwardly from the leading edge of said wing, and a propeller rotatably mounted at the forward end of said stick; and a straight wire extending along said wing transversely to the longitudinal axis and substantially at the center of gravity of said aeroplane, said wire being pivotally connected to said aeroplane and extending laterally from one tip of said wing a substantial distance and the outer end of said wire being arranged to be manually held and manipulated for whip-like and whirling movement of the other end thereof to which said aeroplane is attached.

2. A toy comprising in combination; a miniature aeroplane comprising a thin and flat, relatively stiff sheet shaped to resemble an aeroplane wing and a tail extending rearwardly therefrom, the normally forward edge of said wing being folded upon itself to provide an elongated bearing, a stick extending along the longitudinal axis of said sheet and connected thereto, said stick projecting forwardly from the leading edge of said wing, and a propeller rotatably mounted at the forward end of said stick; and a straight wire



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rotatably disposed at one end within said bearing of said wing and extending a substantial distance from one end of said bearing, said bearing being transverse to the longitudinal axis of said aeroplane and substantially at the center of gravity thereof, the extending end of said wire being arranged to be manually held and manipulated for whip-like and whirling movement of the other end thereof to which said aeroplane is attached.

3. A toy comprising in combination; a miniature aeroplane comprising a thin and flat, relatively stiff sheet shaped to resemble an aeroplane wing and a tail extending rearwardly therefrom, the normally forward edge of said wing being folded upon itself to provide an elongated enclosure, a tubular bearing sleeve enclosed by said enclosure, a stick extending along the longitudinal axis of said sheet and connected thereto, said stick projecting forwardly from the leading edge of said wing, and a propeller rotatably mounted at the forward end of said stick; and a straight wire rotatably disposed at one end within said bearing sleeve, said wire extending a substantial distance from one end of said bearing sleeve and transversely to the longitudinal axis of said aeroplane substantially at the center of gravity thereof, the extending end of said wire being arranged to be manually held and manipulated for whip-like and whirling movement of the other end thereof to which said aeroplane is attached.

4. A toy comprising in combination; a miniature aeroplane comprising a thin and flat, relatively stiff sheet shaped to resemble an aeroplane wing and tail extending rearwardly therefrom, the normally forward edge of said wing being folded upon itself to provide an elongated enclosure, a tubular bearing sleeve enclosed by said enclosure, a stick extending along the longitudinal axis of said sheet and connected thereto, said stick projecting forwardly from the leading edge of said wing, and a propeller rotatably mounted at the forward end of said stick; and a straight wire rotatably disposed within said bearing sleeve and one end of said wire extending a substantial distance from one end of said bearing sleeve, a washer fixed against longitudinal movement from the other end of said wire and engageable with the adjacent end of said bearing sleeve, said bear-

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ing sleeve substantially intersecting the center of gravity of said aeroplane, and a knob fixed to said extending end of said wire and manually operable to manipulate said wire whip-like to whirl and otherwise move said aeroplane on said other end of said wire.

5. A toy comprising in combination; a miniature aeroplane comprising a thin and flat, relatively stiff sheet shaped to resemble an aeroplane wing and a tail extending rearwardly therefrom, a stick extending along the longitudinal axis of said sheet and connected thereto, said stick projecting forwardly from the leading edge of said wing, and a propeller rotatably mounted at the forward end of said stick; and a straight piece of piano wire extending along said wing transversely to the longitudinal axis and substantially at the center of gravity of said aeroplane, said wire being pivotally connected to said aeroplane and extending laterally from one tip of said wing a substantial distance and the outer end of said wire being arranged to be manually held and manipulated for whip-like and whirling movement of the other end thereof to which said aeroplane is attached; the length of said piano wire being sufficient to permit bending thereof to cause the ends to touch without permanently bending said wire and the ratio of the diameter of the wire to the weight of the aeroplane being of substantially the order of  $\frac{1}{16}$  inch to  $\frac{3}{4}$  oz.

6. A toy airplane of the character described including a fuselage portion having a wing and stabilizer thereon, a resilient elongated control member comprising a resilient rod for operating said plane and a flap along the leading edge of said wing folded over said rod for rotatably attaching the said plane thereto.

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