July 27, 1948. J. CHIZMADIA 2,445,906

FLYING TOY HELIPLANE

Filed Nov. 29, 1946

FIG. 1

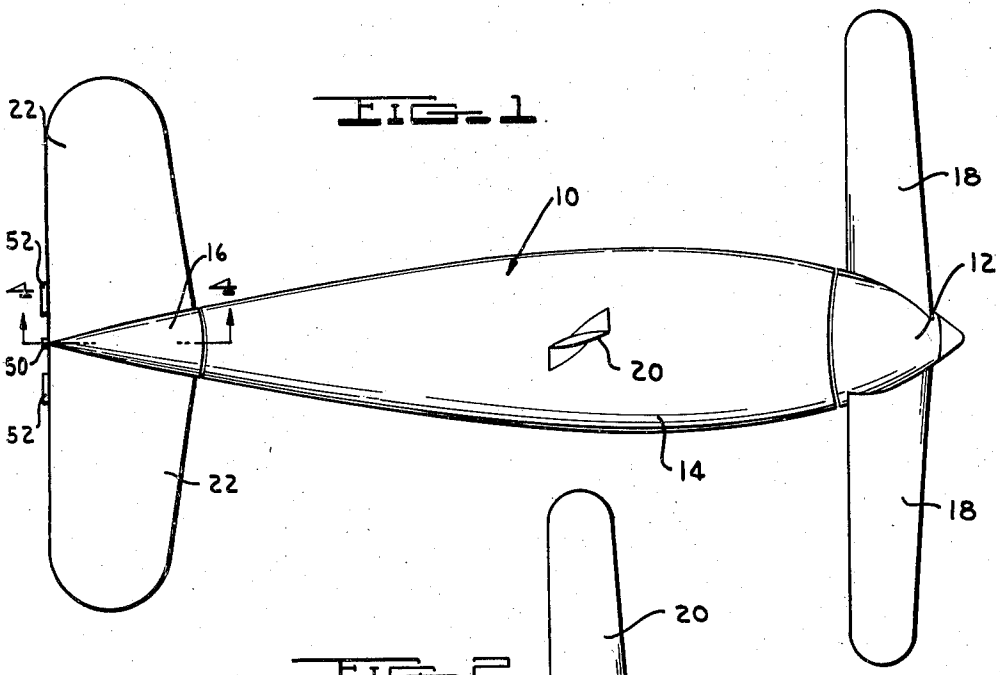


FIG. 2

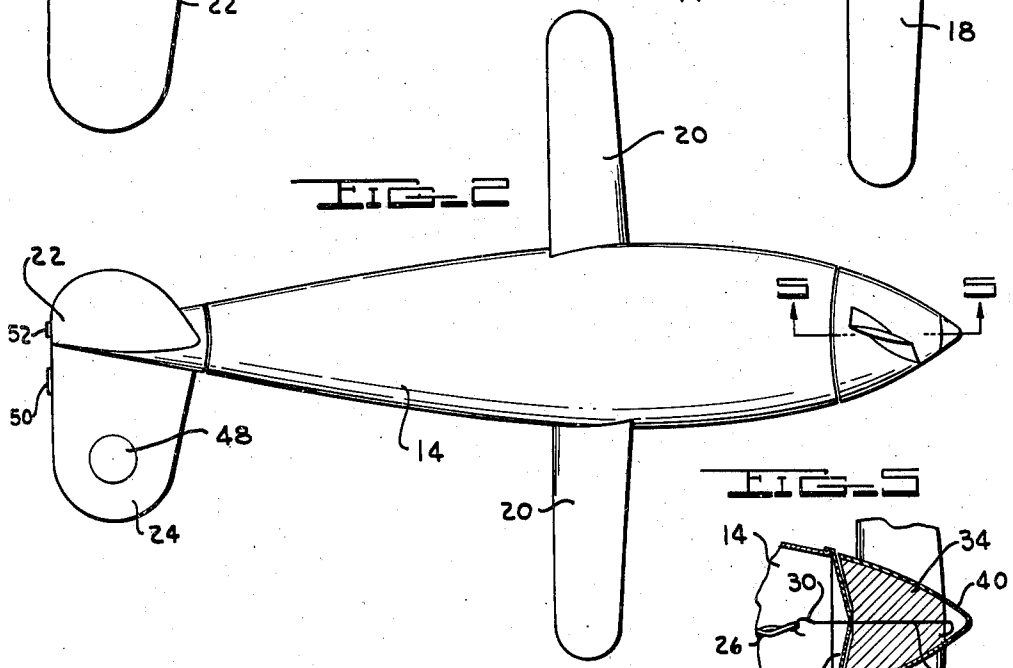


FIG. 5

FIG. 3

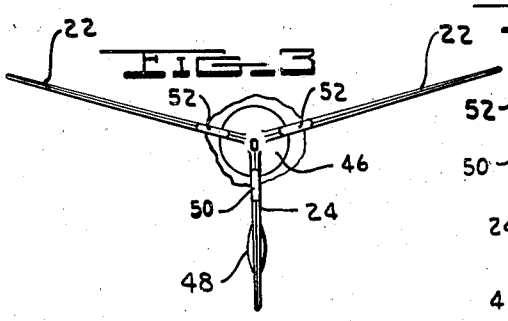
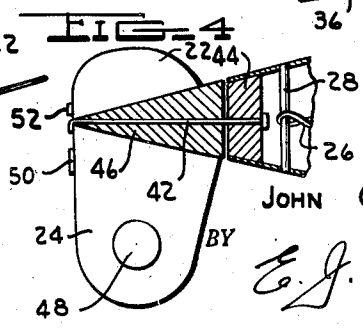


FIG. 4



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Patented July 27, 1948 2,445,906

UNITED STATES PATENT OFFICE

2,445,906

FLYING TOY HELIPLANE

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Application November 29, 1946, Serial No. 712,988

4 Claims. (Cl. 46—78)

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This invention relates to flying toy heliplanes and has particular reference to certain new and useful improvements therein whereby the flight of the craft may be more effectively controlled and whereby better flying results may be obtained than were heretofore possible with the devices of the prior art.

The principal object of the invention, therefore, is to provide a new and improved self-propelled flying toy heliplane.

Other and further objects of the invention will be apparent from the following description and claims and will be understood by reference to the accompanying drawings, of which there is one sheet, which, by way of illustration, show a preferred embodiment and the principles thereof and what I now consider to be the best mode in which I have contemplated applying those principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims. I also contemplate that of the several different features of my invention, certain ones thereof may be advantageously employed in some applications separate and apart from the remainder of the features.

In the drawings

Fig. 1 is a plan view of a device embodying the invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a rear elevational view thereof;

Fig. 4 is a fragmentary sectional view taken along the line 4—4 of Fig. 1; and

Fig. 5 is a fragmentary sectional view taken along the line 5—5 of Fig. 2.

As illustrated in the embodiment of the invention selected for purposes of illustration, a flying toy heliplane embodying the invention comprises an elongated fuselage indicated generally at 10 having a nose section 12, a main body section 14, and a tail section 16 arranged on a common axis, the nose and tail sections being arranged to swivel or rotate freely on said axis relative to said main body section 14.

A wing system comprising a plurality of propeller blades 18 is mounted on the nose section and projects laterally therefrom, and another wing system comprising a plurality of propeller blades 20 is mounted on the body section 14 and projects laterally therefrom. The tail section 16 is provided with oppositely extending, laterally projecting tail surfaces 22 and a rudder 24.

The fuselage 10 is hollow and means are arranged inside thereof and connected to the nose section 12 and the body section 14 for rotating the same relative to each other so as to rotate the blades in opposite directions in order to propel the craft in flight, such means comprising an elastic band or loop 26, one end of which is fastened to a cross piece 28 in the rear end of the body section 14, and the other end of which is fastened to the hook 30 on the end of the shaft 32 which is fastened to the nose section 12 so as to rotate therewith.

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The shaft 32 may be embedded or otherwise secured in the hub 34 of the nose section on the axis of the fuselage. The shaft 32 extends through a central hole in the cap 36 which defines the front end of the main body section 14. The cap 36 is in the form of a relatively flat cone so that the apex thereof around the hole through which the shaft 32 extends will bear against a flat surface formed on the hub 34 around the shaft 32 so as to provide a thrust bearing between the nose section 12 and the main body section 14. The edge of the hole in the cap 36 through which the shaft extends defines a bearing for the shaft 32.

The tension of the band 26 will maintain the nose section 12 operatively arranged relative to the main body section 14 as illustrated in the several figures of the drawings. The nose section may include a rubber bumper 40 which encloses the hub 34.

A spindle 42 is fixed in the end wall 44 of the main body section 14 and projects rearwardly therefrom so as to form a shaft on which the hub 46 of the tail section 16 is free to swivel or rotate relative to the body section 14. The tail surfaces 22 and the rudder 24 project radially from the hub 46. The tail 24 is weighted as indicated at 48 so as to maintain the laterally extending tail surfaces horizontal during flight of the craft.

The rear edge of the ruuder may have a tab 50 thereon which may be arranged so as to project toward one side or the other of the rudder in order to make the craft fly in a circular path, if desired. This tab may consist of a flexible piece of sheet metal, such as aluminum, which may be readily deflected. The rear edges of the tail surfaces 22 may also be provided with tabs 52 similar to the tabs 50 which preferably are adjusted or set so as to neutralize any tendency of the tail section 16 to rotate about its own axis.

In order to fly the craft the elastic band or loop 26 must be wound, which may be effected by

turning the body section 14 relative to the nose section 12 in a direction opposite to that in which the sections must rotate in order to forwardly propel the craft. After this has been done the craft may be launched by casting it forwardly and upwardly with the craft headed forwardly and releasing the sections 12 and 14 so that the band 26 will be free to turn the same in opposite directions relative to each other.

As the nose and body sections 12 and 14 are free to turn relative to each other, and as the wing systems 18 and 20 are of the same size and arranged at substantially the same pitch, the wings 18 and 20 will turn opposite relative to each other at substantially the same speed about their own axis and will propel the craft in flight. The tail section 12 being free to swivel on the spindle 42 will remain substantially as shown in Fig. 3 in horizontal flight and will enable the craft to fly in a substantially predetermined path until the energy stored in the elastic band 26 is substantially expended.

The parts of the craft are made from extremely light weight material so as to keep the over-all weight of the craft as low as possible.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. A flying toy heliplane comprising an elongated fuselage having a nose section, a main body section and a tail section arranged on a common axis, said nose and tail sections being arranged to swivel on said axis relative to said body section, a pair of oppositely rotatable wing systems, one of said wing systems comprising a plurality of blades mounted on said nose section and projecting laterally therefrom and the other of said wing systems comprising a plurality of blades mounted on said body section and projecting laterally therefrom, means arranged within said fuselage and connected to said nose and body sections and operable for rotating the same relative to each other so as to rotate said blades in opposite directions in order to propel said heliplane in flight, said tail section having laterally and oppositely extending tail surfaces and a depending rudder which is weighted so as to maintain said laterally extending tail surfaces horizontal during flight, said laterally extending tail surfaces having tabs projecting from the rear edges and away from the surface thereof.

2. A craft of the class described comprising an elongated fuselage having a nose section, a main body section and a tail section arranged on a common axis, said nose and tail sections being arranged to swivel on said axis relative to said body section, a pair of oppositely rotatable wing systems, one of said wing systems comprising a plurality of blades mounted on said nose section and projecting laterally therefrom and the other of said wing systems comprising a plurality of blades mounted on said body section and projecting laterally therefrom, means arranged for rotating said nose and body sections relative to each other so as to rotate said blades in opposite directions in order to propel said craft in flight, said tail section having laterally extending tail surfaces and a depending rudder which is constructed and arranged so as to maintain said laterally extending tail surfaces horizontal during flight.

3. A device according to claim 2 wherein said means for rotating said nose and body sections relative to each other comprises an elastic band disposed in said fuselage and connected to said body and nose sections.

4. An aircraft comprising an elongated fuselage having a nose section, a main body section and a tail section arranged on a common axis, said nose and tail sections being constructed and arranged so as to be freely rotatable on said axis relative to said body section and to each other, a pair of oppositely rotatable wing systems, one of said wing systems comprising a plurality of blades mounted on said nose section and projecting laterally therefrom and the other of said wing systems comprising a plurality of blades mounted on said body section and projecting laterally therefrom, means arranged for rotating said nose and body sections relative to each other so as to rotate said blades in opposite directions in order to propel said craft in flight, said tail section having laterally extending tail surfaces and a rudder which is constructed and arranged so as to maintain said laterally extending tail surfaces horizontal during flight.

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