March 26, 1946. F. D. MYERS 2,397,364

TOY AIRPLANE

Filed May 20, 1944 3 Sheets-Sheet 1

Fig. 1

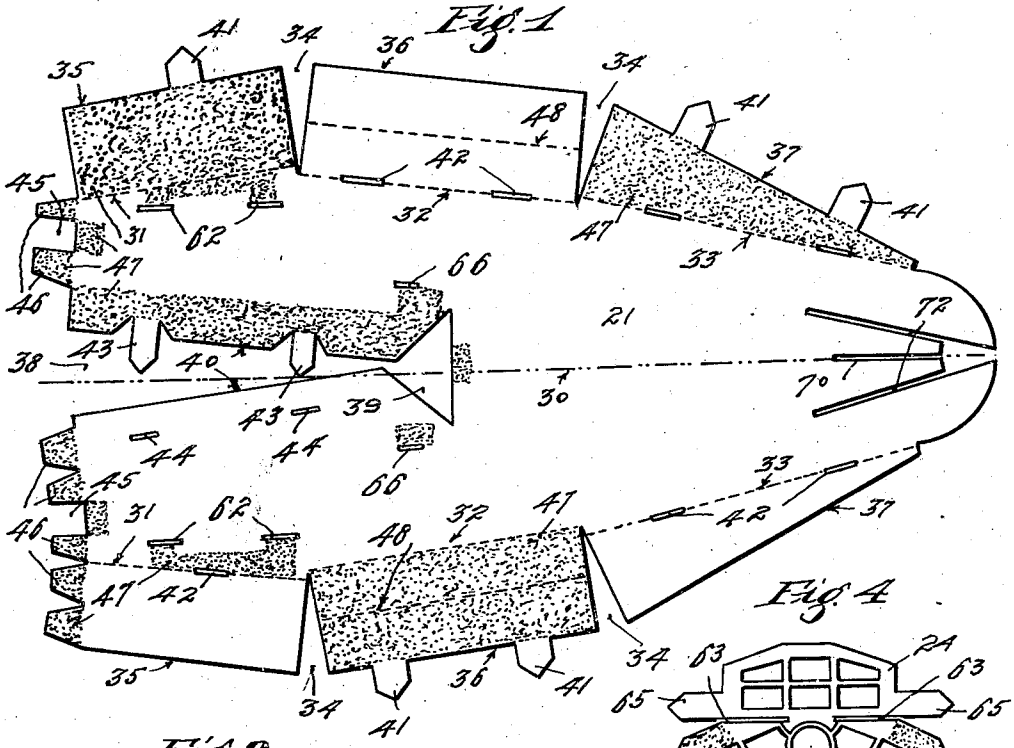


Fig. 4

Fig. 2

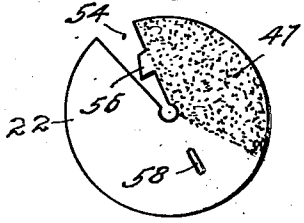


Fig. 7

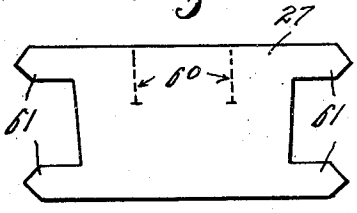


Fig. 5

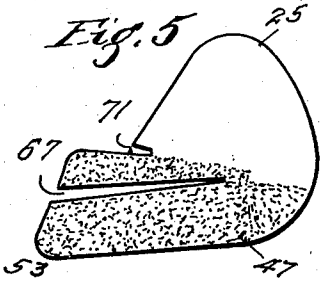


Fig. 3

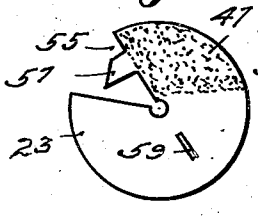


Fig. 8

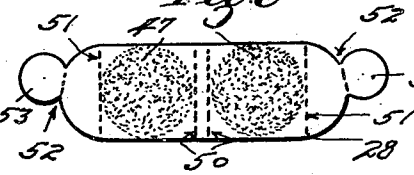
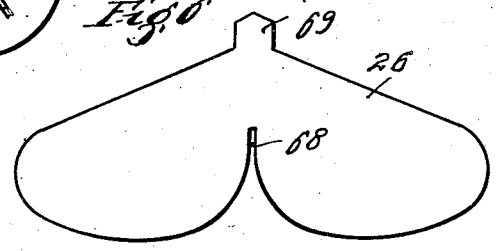


Fig. 6



INVENTOR
FRED D. MYERS
Anthony A. Juettner
BY ATTY.

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Fig. 10

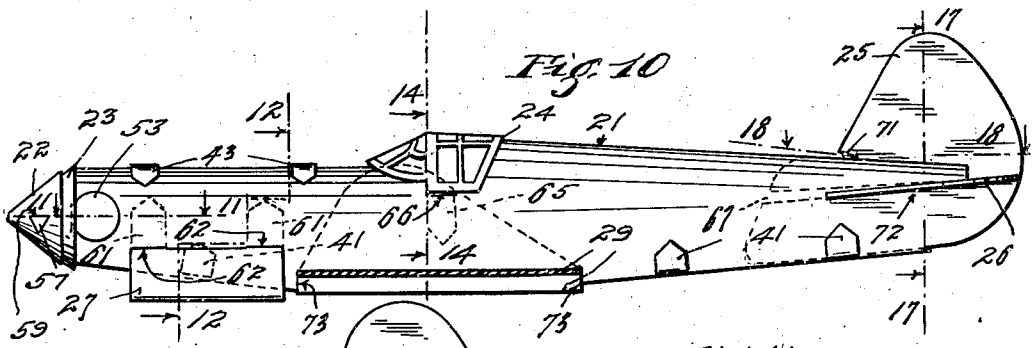


Fig. 11

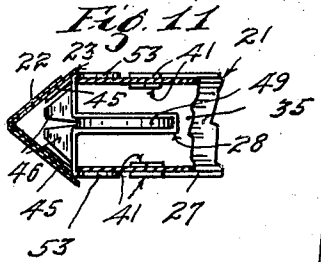


Fig. 12

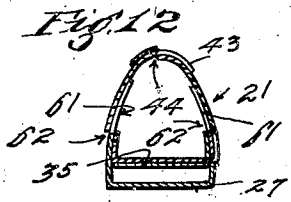


Fig. 9

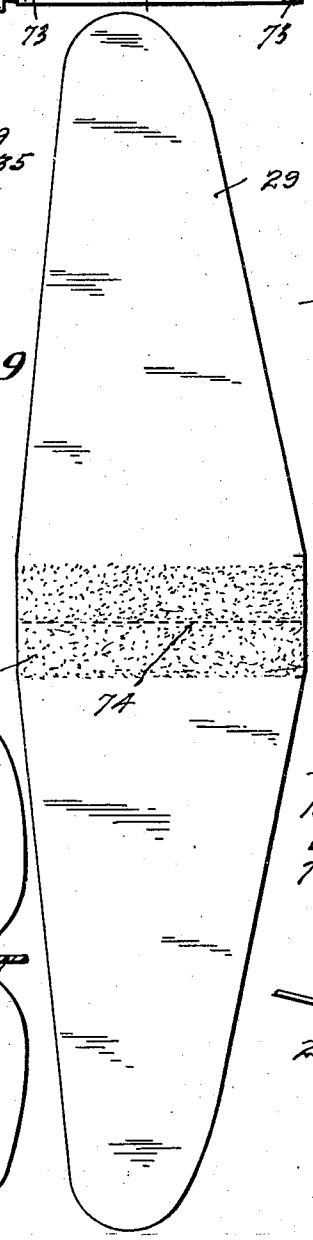


Fig. 13

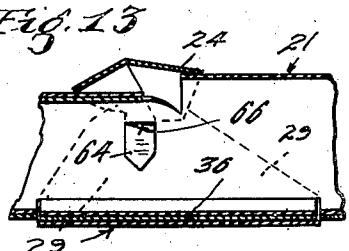


Fig. 17

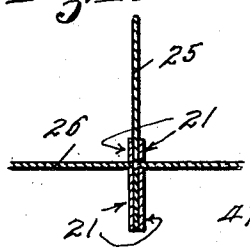


Fig. 14

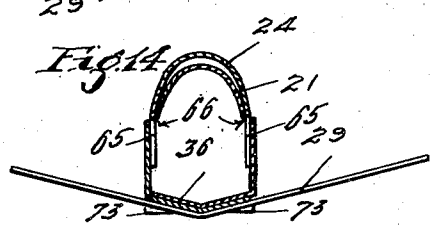


Fig. 18

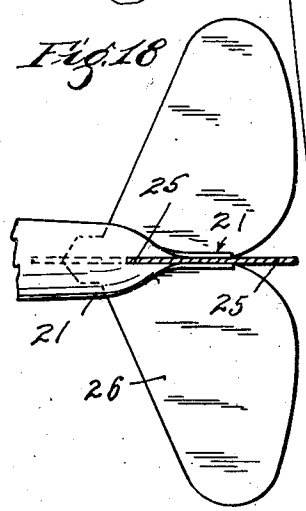


Fig. 15

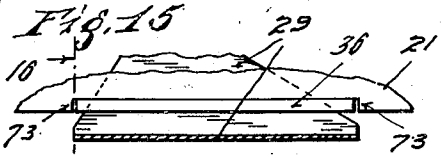
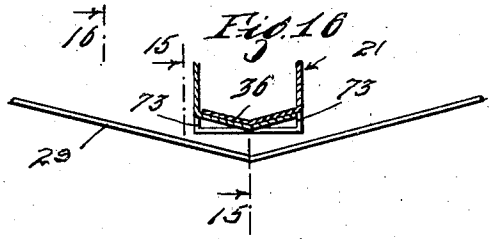


Fig. 16



INVENTOR
FRED D. MYERS
BY Anthony A. Juettner
ATTY.

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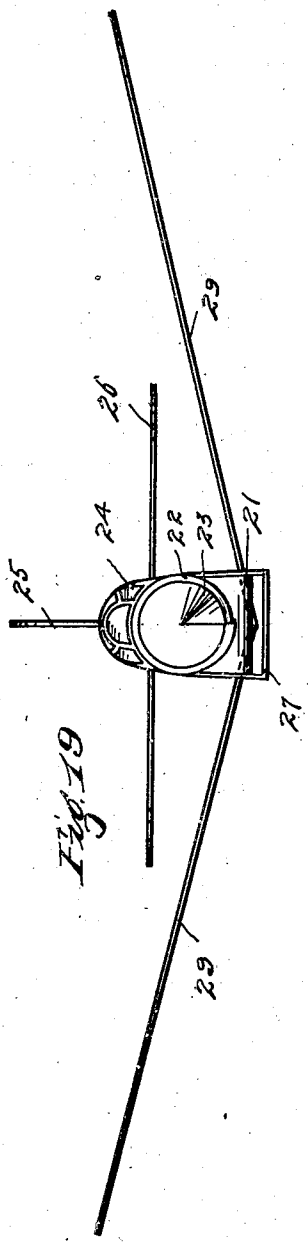


Fig. 19

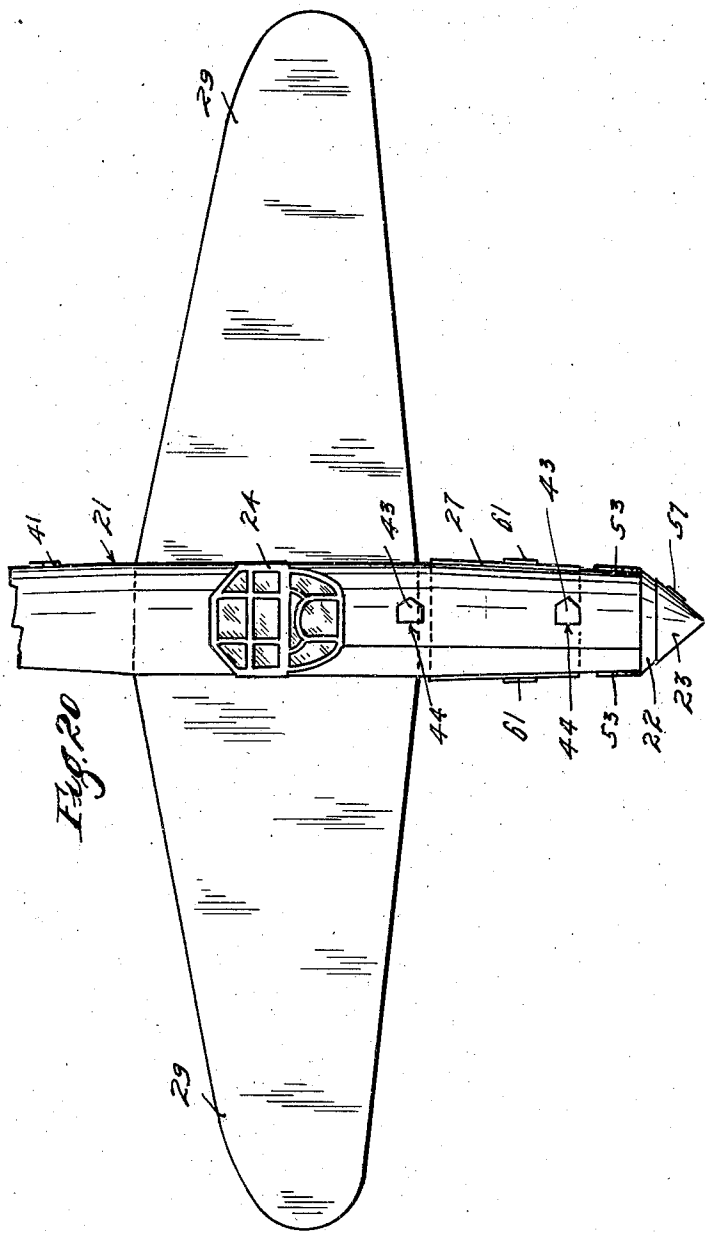


Fig. 20

INVENTOR
FRED O. MYERS
BY Anthony A. J. Wettner
ATTY.

Patented Mar. 26, 1946 2,397,364

UNITED STATES PATENT OFFICE

2,397,364

TOY AIRPLANE

Fred D. Myers, Minneapolis, Minn., assignor to General Mills, Inc., a corporation of Delaware

Application May 20, 1944, Serial No. 536,594

16 Claims. (Cl. 46—76)

This invention relates to improvements in cut-outs for constructing a model airplane from sheet material such as paper.

Numerous attempts have been made to produce toy airplanes capable of sustained flight over appreciable distances. These attempts have met with varying degrees of success. Largely, the toys thus produced have, however, been a disappointment in that they are incapable of any prolonged flight and/or have been unduly cumbersome to construct.

It has now been discovered that toy airplanes, which may, if desired, be quite accurate replicas of full-sized planes, may be constructed with great ease and facility even by young children. Moreover, such toy airplanes are capable of sustained flight over appreciable distances, especially under outdoor flight conditions. These results have been achieved by means of the present inventor's designs of the respective parts and the method of assembly. The parts may be supplied in the form of a sheet having the parts illustrated thereon or in the form of the parts already cut out from the sheet material.

It is, therefore, a primary object of the invention to provide illustrations of the respective parts of a toy airplane, capable of being assembled with ease to form a toy airplane capable of sustained flight over appreciable distances.

Another object of the present invention is to provide a novel design of airplane cut-outs.

Another object of this invention is to form a part of the fuselage of a model airplane in such a manner that the application of a wing cut-out thereon will automatically position the end portions thereof on a predetermined dihedral angle.

A further object of this invention is to form a part of the fuselage of a model airplane in such a manner that the application of a wing cut-out thereon will automatically position the wing at right angles transversely of the fuselage.

Other objects of this invention will be apparent from the following description, reference being had to the drawings, in which:

Figs. 1 to 9, inclusive, illustrate cut-outs from a sheet of paper. These cut-outs when folded, glued and assembled according to instructions, will form a model airplane that is a replica of an airplane.

Figure 1 illustrates the fuselage cut-out;

Figs. 2 and 3 illustrate the inner and outer nose cone cut-outs, respectively;

Fig. 4 illustrates the cockpit cover cut-out;

Fig. 5 illustrates the rudder cut-out;

Fig. 6 illustrates the stabilizer cut-out;

Fig. 7 illustrates the ventilator cut-out;

Fig. 8 illustrates the weight holder cut-out;

Fig. 9 illustrates the wing cut-out;

Fig. 10 is a view principally in side elevation of a model airplane constructed from the cut-outs shown in Figs. 1 to 9, inclusive;

Fig. 11 is a fragmentary detail view in horizontal section taken on the line 11—11 of Fig. 10;

Fig. 12 is a view in transverse vertical section taken on the line 12—12 of Fig. 10;

Fig. 13 is a view in longitudinal vertical section taken centrally through the fuselage, the cockpit cover and the wing of the model airplane shown in Fig. 10;

Fig. 14 is a view partly in edge elevation and partly in transverse vertical section taken on the line 14—14 of Fig. 10;

Fig. 15 is a fragmentary detail view partly in side elevation and partly in section taken on the irregular line 15—15 of Fig. 16;

Fig. 16 is a view partly in edge elevation and partly in transverse vertical section taken on the line 16—16 of Fig. 15;

Fig. 17 is a detail view in section taken on the line 17—17 of Fig. 10;

Fig. 18 is a detail view partly in plan and partly in section taken on the line 18—18 of Fig. 10;

Fig. 19 is a front elevation of the model airplane shown in Fig. 10; and

Fig. 20 is a fragmentary plan view of the same.

The model airplane includes the following cut-outs, to wit: the fuselage 21, the inner cone 22, the outer cone 23, the cockpit cover 24, the rudder 25, the stabilizer 26, the ventilator 27, the weight holder 28 and the wing 29. These cut-outs shown in Figs. 1 to 9, inclusive, are just as they appear after having been cut from one or more sheets of paper on which they are printed.

Fuselage

The fuselage 21 is formed from a single piece of paper and when folded and certain of the parts thereof connected by glue, is a replica of the fuselage of an airplane of which it is a model. The broken line 30 is at the transverse center of the fuselage 21. On each side of the line 30 are front, intermediate and rear broken lines 31, 32 and 33, respectively. Primarily the lines 31 are in forwardly converging relation and the lines 32 and 33 of each pair are in forwardly diverging relation. For the sake of brevity, the prefix "cut-out" will not be used when referring to the illustrations in Figs. 1 to 9, inclusive.

The section of the fuselage 21 within the broken lines 31, 32 and 33 forms the top and sides of said fuselage when folded. These broken lines 31, 32 and 33, when the fuselage is folded, are at the bottom thereof. The relative arrangement of the pairs of broken lines 31, 32 and 33 give the bottom portion of the fuselage its proper shape. It is important to note that the broken lines 32 are inset from the adjacent ends of the broken lines 31 and 33, for a purpose which will presently appear.

Front and rear pairs of V-shaped notches 34 extend inwardly from the longitudinal edges of the fuselage 21. The apexes of the notches 34 are at the adjacent ends of the broken lines 31 and 32 and 32 and 33. These notches 34 divide the bottom of the fuselage 21, outwardly of the broken lines 31, 32 and 33, into front, central and rear two-part sections 35, 36 and 37. When the fuselage 21 is folded, the bottom sections 35, 36 and 37 are in overlapping relation and form a two-ply bottom for the fuselage 21 and thereby reinforce the same. The purpose of the notches 34 is to permit the bottom of the fuselage 21 to be bent to position the several sections thereof relative to each other, as shown in Fig. 10. The perimeter of each member of the bottom sections 35 and 36 is rectangular and the perimeter of each member of each bottom section 37 is wedge-shaped and the taper thereof is toward the rear of the fuselage 21.

A deep V-shaped notch 38 extends longitudinally into the fuselage 21 from the front end thereof and its apex is substantially on the line 30. At the inner end of the notch 38 is a second notch 39. This notch 39 is in the form of an equilateral triangle, with its apex at the apex of the notch 38 and forms a continuation of the notch 38 on the line 30. The purpose of the notch 39 is to permit the edge portions 40 of the fuselage 21 at the notch 38 to be brought into overlapping relation and without overlapping the main body of said fuselage. The edge portions 40 of the fuselage 21, when brought into overlapping arrangement, lowers the height of said fuselage at its front end portion.

Outwardly projecting tabs 41 are formed on the longitudinal edges of one of the members of the bottom sections 35, 36 and 37, and slits 42 therefor are formed on the broken lines 31, 32 and 33 on the other members of said bottom sections. The insertion of the tabs 41 into the slits 42 brings the members of each pair of bottom sections 35, 36 and 37 into coincident relation, at the time said bottom members are being folded into overlapping positions. A pair of tabs 43 is formed in notches in one of the edge portions 40 and slits 44 therefor are formed in the other of said edge portions. Formed in the front end portion of the fuselage 21, on each side of the notch 38, is a notch 45 having parallel sides. The notches 45 are provided for receiving the end portions of the weight holder 28 and assist in holding the same within the fuselage 21, as will presently appear. Also formed on the front end of the fuselage 21 is a plurality of forwardly projecting prongs 46.

In shaping the cut-out shown in Fig. 1, to form the fuselage 21, glue is directly applied to one of the edge portions 40 and thereafter said edge portions are brought into overlapping relation and the tabs 43 inserted through the slits 44, which brings said edge portions into coincident relation. Said edge portions 40 are then pressed together with the glue therebetween and thus held until the glue is set. Glue, wherever shown in the drawings, is indicated by the numeral 47. A further step in shaping the fuselage is to fold slightly the members of the bottom section 36 downwardly on broken lines 48. These broken lines 48 extend the full length of the members of the bottom section 36, and at the transverse centers thereof. Next, the members of the bottom sections 35, 36 and 37 are folded downwardly on the lines 31, 32 and 33 and thereafter glue is applied to one of the members of each of said bottom sections. Finally, the members of the bottom sections 35, 36 and 37 are brought into overlapping relation, the tabs 41 inserted through the slits 42 and said members pressed together with the glue therebetween. This completes the formation of the fuselage 21.

Weight holder

A further step in forming the model airplane is to apply two spots of glue to the weight holder 28, as shown in Fig. 8. A weight 49, see Fig. 11, is placed on one of the spots of glue and the weight holder 28 is folded upon itself, on the broken lines 50, with the weight 49 therebetween and held by the two spots of glue. The end portions of the weight holder 28 are next folded outwardly on the broken lines 51. The weight holder 28 at its end portions is contracted on the broken lines 52 and then expanded to form disk-like members 53. To apply the weight holder 28 to the fuselage 21, the same is inserted into said fuselage at the open front end thereof and the contracted end portions of said holder inserted into the two notches 45 and the disk-like members 53 folded on the broken lines 52 and glued to the sides of the fuselage 21, see Fig. 11. This weight holder 28 supports the weight 49 in a vertical position at the exact transverse center of the fuselage 21.

Cones

Formed in the cones 22 and 23 are V-shaped notches 54 and 55, respectively. These notches 54 and 55 extend from the perimeters of the cones 22 and 23 to holes in the centers thereof. A tab 56 on the cone 22 primarily extends into the notch 54 and a tab 57 on the cone 23 primarily extends into the notch 55. Slits 58 and 59 for the tabs 56 and 57 are formed in the respective cones 22 and 23. The cones 22 and 23 are formed by bringing the portions thereof, at the notches 54 and 55, into overlapping relation and inserting the tabs 56 and 57 into the respective slits 58 and 59. The insertion of the tabs 56 and 57 into the slits 58 and 59 brings the cut-outs 22 and 23 into the forms of cones. Prior to the shaping of the cones 22 and 23, glue is applied to the cut-outs, as shown. At the completion of the formation of the cones 22 and 23, glue is applied to the prongs 46 and the cone 22 inserted over said prongs. This application of the inner cone 22 over the prongs 46 bends said prongs inwardly so that the surfaces thereof to which glue has been applied, are pressed onto the inner surface of the cone 22 and thereby connect said cone to the fuselage 21. Next, glue is applied to the interior of the cone 23 and said cone placed on the cone 22 for reinforcing the same.

Ventilator

The ventilator 27 is held suspended from the fuselage 21 at the under side of its bottom section 35. In applying the ventilator 27 to the fuselage 21, the same is folded upon itself on a trans-

verse curve at its forward portion and then folded, at its rear portion, on the broken lines 60. Next, the tabs 61, on the upturned ends of the ventilator 27, are inserted in slits 62 in the side of the fuselage 21 above its bottom section 35 and the end portions of the ventilator 27 secured to the fuselage 21 by glue.

Cockpit cover

The cockpit cover 24 has formed therein a pair of aligned slits 63 which extend transversely into said cover from the side edges thereof. These slits 63 divide the cockpit cover 24 into front and rear sections. The front and rear sections of the cockpit cover 24 are each provided at the notches 63 with a pair of outwardly projecting tabs 64 and 65, respectively. In forming the cockpit cover 24 from the cut-out shown in Fig. 4, said cut-out is bent to permit the tabs 64 to be placed under the tabs 65 and glued thereto. This overlapping of the tabs 64 and 65 transversely curves the cockpit cover and also draws the front section thereof downwardly, see Figs. 10 and 19. The cockpit cover 24 is placed on the top of the fuselage 21 and its tabs 64 and 65 inserted through slits 66 in the side of the fuselage 21. It will be noted by reference to Fig. 10 that the front end portion of the fuselage 21, at the top thereof, is horizontal and at an elevation below the adjacent end of the rear end portion of said fuselage. The top of the rear end portion of the fuselage 21 is rearwardly and downwardly inclined. It is at the junction of the front and rear sections of the top of the fuselage 21 that the cockpit cover 24 is applied. The cockpit cover 24 is outlined to represent transparent panes.

Rudder and stabilizer

The rudder 25 and the stabilizer 26 are interlocked by inserting the stabilizer into a deep and narrow V-shaped notch 67 in said rudder. A notch 68 in the stabilizer 26 limits the movement of said stabilizer into the rudder 25. On the front end of the stabilizer 26 is a tab 69, provided to direct stabilizer into the fuselage 21 at the rear end portion thereof. A long slit 70 on the line 30 is provided for receiving the rudder 25 and positioning the same at the transverse center of the fuselage 21. Formed in the rudder 25 above the slit 70 is a small notch 71 which limits the movement of the rudder 25 into the fuselage 21. The stabilizer 25 extends into a pair of slits 72 in the side of the fuselage. The several prongs on the rear end portion of the fuselage 21 formed by the slits 70 and 72 are glued to the rudder 25 and the stabilizer 26 and thereby securely hold the rudder 25 and stabilizer 26 at right angles to each other and also secure said rudder and stabilizer in their proper position on the fuselage 21.

Wing

The final operation in assembling the several cut-outs of the model airplane is the attachment of the wing 29 to the fuselage 21. The folding of the bottom section 36 of the fuselage 21 on the inset broken lines 43 forms, on each side of the fuselage 21, a pair of stop shoulders 73, see Figs. 15 and 16. In folding the members of the bottom section 36 on the broken lines 43, said section is shaped so that it upwardly and outwardly diverges from the transverse center of the fuselage 21 and affords a seat for the wing 29.

To mount the wing 29 on the fuselage 21, its end portions are first upwardly folded on the broken line 74 and thereafter glue is applied thereto, as shown. The wing 29 is then placed in its seat between the shoulders 73 and which shoulders automatically position the wing 29 at right angles to the center line 30 of the fuselage and securely hold the same against angular movement relative to the fuselage. Next, the wing 29 is pressed against the bottom section 36 and its contact with the upwardly diverging surfaces thereof automatically positions the end portion of the wing 29 at a predetermined dihedral angle which is absolutely necessary for the correct flying of the model airplane.

It will be understood that the invention described is capable of various modifications within the scope of the invention herein disclosed and claimed.

I claim as my invention:

1. A fuselage for a model airplane formed from sheet material and having a wing-positioning seat, said seat having two surfaces that diverge upwardly and outwardly from the transverse center of the fuselage, and a cut-out wing folded at its longitudinal center, mounted in said seat and positioned thereby with its end portions at a predetermined dihedral angle.

2. The structure defined in claim 1 in which the seat is provided with stop shoulders that position the axis of the wing at right angles to the longitudinal center of the fuselage.

3. The structure defined in claim 1 in which the seat is provided with stop shoulders that position the axis of the wing at right angles to the longitudinal center of the fuselage and hold the same against angular movement in the planes of the end portions of the wing.

4. A fuselage cut out for a model airplane formed of sheet material and foldable upon itself to form the top, the sides and the bottom of the fuselage, said cut-out having a deep notch extending inwardly from its front end and also being transversely cut at the inner end of the notch, whereby the portions of the cut-out, at the notch, may be drawn together, overlapped and connected to lower the height of the fuselage at its front end portion relative to its rear end portion.

5. A fuselage cut-out for a model airplane formed of sheet material and foldable upon itself to form the top, the sides and the bottom of the fuselage, said cut-out having a deep V-shaped notch, extending inwardly from its front end, and a substantially equilateral notch forming a continuation of the first noted notch, the two notches being joined at their apexes, whereby the portions of the cut-out at the notches may be drawn together, overlapped and connected to lower the height of the fuselage at its front end portion, relative to its rear end portion.

6. The structure defined in claim 5, further including tabs on one of the edges of the cut-out formed by the V-shaped notch and slits therefor in the cut-out on the opposite side of said notch.

7. A fuselage cut-out for a model airplane formed from sheet material and foldable to form the top, the sides and the bottom of the fuselage, said cut-out having front, center and rear longitudinal folding lines spaced inwardly from the longitudinal edges of the cut-out, the area of the cut-out within the folding lines, when said cut-out is folded, forming the top and the sides of the fuselage, notches extending transversely into the cut-out from its longitudinal edges and having their inner ends at the adjacent ends of the front and the center folding lines and at the adjacent

ends of the rear and the center folding lines, these notches dividing the cut-out outwardly of the folding lines into front, center and rear sections which, when folded on said lines, overlapped and connected form a two-ply bottom for the fuselage.

8. The structure defined in claim 7 in which the folding lines for the members of the center section of the bottom of the fuselage are inset from the adjacent ends of the front and rear folding lines, each member of the center bottom section having a longitudinal central folding line, the members of the center bottom section, when folded on the respective folding lines, diverging upwardly and outwardly from the transverse center of the fuselage and affording a wing seat and exposing the adjacent ends of the front and the rear bottom sections, and which ends afford stop shoulders for a wing cut-out, said seat when the wing cut-out is placed therein and pressed thereagainst, automatically positioning the end portions of the wing at a predetermined dihedral angle and said stop shoulders automatically positioning the axis of the wing at right angles to the longitudinal center of the fuselage.

9. The structure defined in claim 7 further including outwardly projecting tabs on the outer longitudinal edges of one of the members of each bottom section and slits in the cut-out for the tabs.

10. The structure defined in claim 7 in which the members of the front bottom section are in forwardly converging relation and the members of the center and rear bottom section are in forwardly diverging relation.

11. A fuselage cut-out for a model airplane formed from sheet material and foldable upon itself to form the top, the sides and the bottom of the fuselage, said cut-out having a plurality of forwardly projecting prongs, and a paper cone cut-out that is severed from its outer edge to its center whereby the severed portions of the cone cut-out may be drawn together, into overlapped relation and connected to shape the cone, said cone being applicable over the prongs on the fuselage and thereby contacting and pressing the same into outwardly converging relation and secured to the cone by glue previously applied to the prongs.

12. The structure defined in claim 11 further including a second cone, similar to the first noted cone, applicable over the first noted cone and glued thereto to reinforce the same.

13. A fuselage for a model airplane formed from sheet material, a sheet material cockpit cover cut-out having a pair of slits extending transversely from opposite edges thereof and dividing the cut-out into front and rear sections, a tab on the cut-out on each side of said slit, said cockpit cover cut-out being formable into a cockpit cover by moving the tabs on said front section under the tabs on the rear section, whereby the cut-out is transversely curved and the front section thereof drawn downwardly, the formed cockpit cover being mounted on the fuselage by placing the same transversely thereover and inserting the tabs into slits in the fuselage.

14. A fuselage for a model airplane formed from sheet material and having in the top of its rear end portion a long slit at the transverse center of the fuselage, said fuselage also having in its sides under said slit a pair of slits, a rudder cut-out, and a stabilizer cut-out, said rudder cut-out having a notch into which the stabilizer extends, said rudder extending into said top slit and the stabilizer extending into the side slits, the end portions of the fuselage formed by the slits therein being glued to the rudder and the stabilizer.

15. A fuselage for a model airplane formed from sheet material and having in its sides at the front end thereof a pair of notches, a weight, a holder cut-out for the weight within the fuselage, said holder cut-out being folded upon itself with the weight held therein, tabs on the outer ends of the weight holder, opposing notches in the cut-out between the weight holder and its tabs, said tabs being turned outwardly and backwardly with the notched portions of the weight holder in said first noted notches, said tabs being glued to the sides of the fuselage on the outside thereof.

16. A fuselage for a model airplane formed from sheet material, and a ventilator cut-out having tabs on its ends, said cut-out being folded upon itself and extending transversely under the fuselage with its tabs extending into slits in the sides of the fuselage, said ventilator being glued to the fuselage.

FRED D. MYERS.