April 18, 1939. E. BONNELL 2,154,487

TOY AIRPLANE CONSTRUCTION

Filed April 12, 1937 2 Sheets-Sheet 1

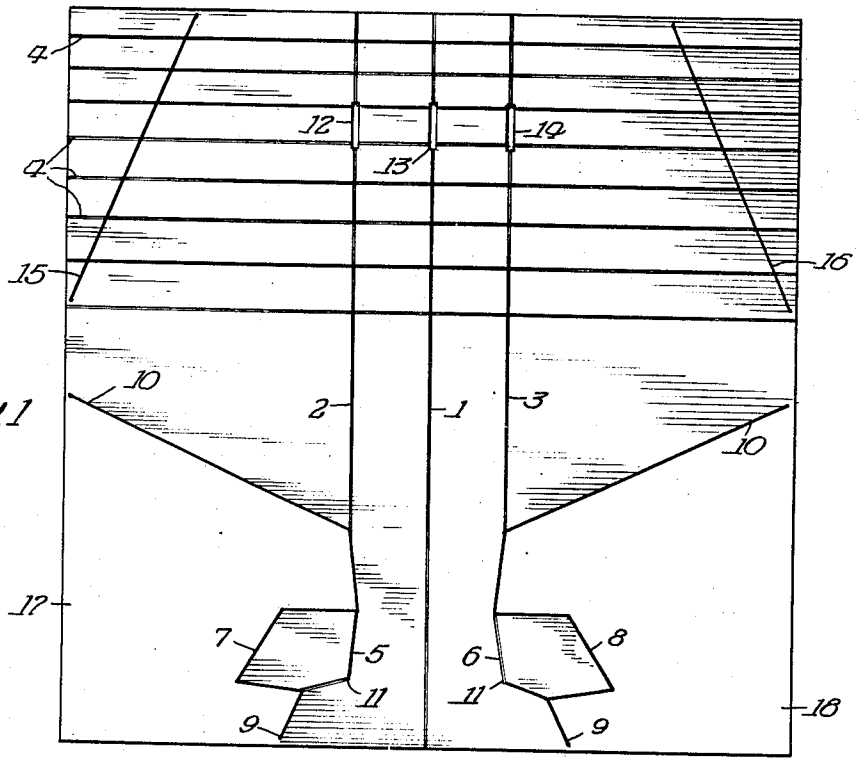


Fig. 1

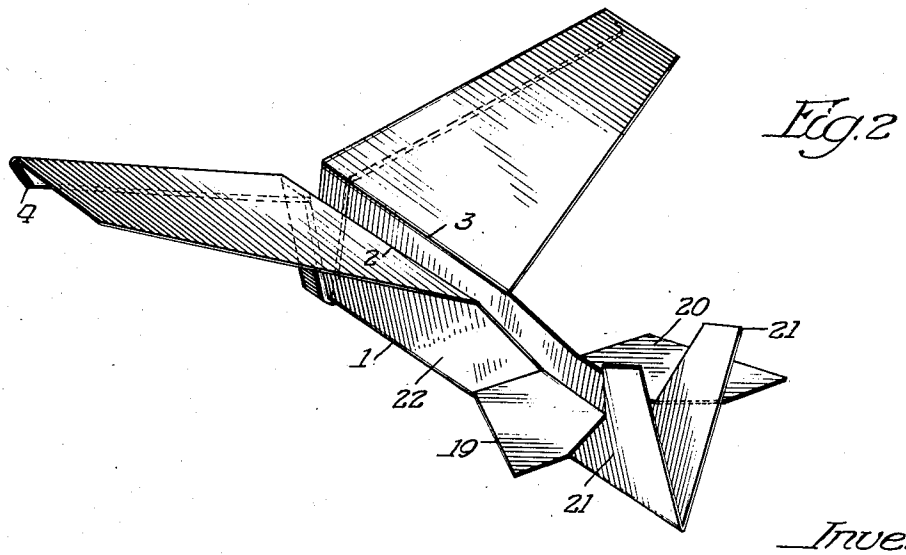


Fig. 2

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Fig. 3

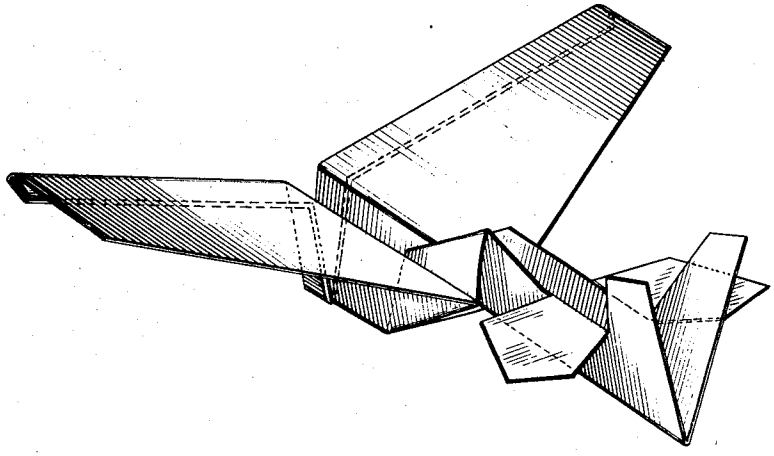
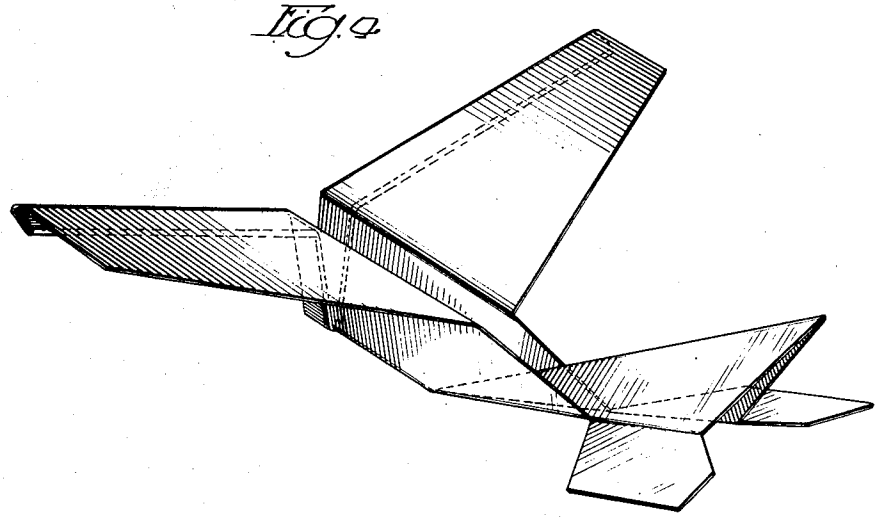


Fig. 4



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UNITED STATES PATENT OFFICE

2,154,487

TOY AIRPLANE CONSTRUCTION

Ellis Bonnell, Chicago, Ill.

Application April 12, 1937, Serial No. 136,393

4 Claims. (Cl. 46—79)

This invention is designed for the amusement and education of children with regard to various standard types of airplanes, and the relative areas, weights and forms of the body, sustaining and control surfaces.

An object of the invention is to provide a construction which may be made complete from a single piece of sheet material without the necessity of gluing or the use of separate parts for properly weighting, stiffening, and balancing the device.

The drawings illustrate the manner in which the foldable sheet material is scored and slit so as to be all ready for quick folding into the complete and usable toy.

The drawings also show, by way of example, how various types of planes may be imitated by the use of different blank forms, all following the same general system of scoring and slitting.

Fig. 1 is a plan view of a rectangular stock sheet of paper scored and slitted convenient for quick removal therefrom of scrap pieces of paper not required in the ultimate construction.

Fig. 2 shows in perspective the article resulting from folding the blank shown in Fig. 1 along the scored lines indicated thereon.

Fig. 3 shows a variation in type made by slight changes in the outline and folding of the tail portion of the plane. This form is intended to simulate a clipper ship.

Fig. 4 is a perspective view of another variation such as shown by Fig. 3, in imitation of the general form of a hydroplane.

Bond paper is a preferred sheet material for use in constructing the toy because of its cheapness and other desirable qualities for such a toy.

One of the principal characteristics of the toy as chiefly distinguishing it from other paper toys of the same class, is that the leading edges of the wing and fuselage portions are weighted and reinforced by a series of folds, or a flattened roll, along the front edge of the paper from which the toy is formed. This reinforcement stiffens the leading edges while allowing for the desired flexibility of the trailing portions of the wings, whereby the relative movement between the air and the plane may take place without the needless production of eddy currents.

This method for folding also provides for lessening the weight and rigidity of the wings toward their lateral tips.

Aside from the series of varying width folds for shaping and reinforcing the leading edges of the plane without the addition of separate parts, this glider differs from others of the same class by the use of slits or cutouts for weakening the flattened reinforcing roll at the corners of the bends therein.

The blank shown in Fig. 1 is a rectangular sheet of paper which is scored along the lines 1, 2, 3, 4, 5, and 6. The blank is also slit along the lines 7 and 8, each extending from a point 9 to a point 10 and into the corner 11 at the tail. The blank is also slit at 12, 13, and 14, so that small parts thereof may be torn out at these points. The blank also may at times be slit along the lines 15 and 16 when it is desired to allow for some flexibility at the lateral tip portions of the wings.

In folding the blank shown in Fig. 1 to the glider form, indicated by Fig. 2, small portions of the paper are removed at the points 12, 13 and 14 and the waste portions 17 and 18 at the lower corners of the blank are removed.

Next, the paper is folded downwardly along the uppermost score 4. Then it is again folded in the same direction along the next score 4. The scores 4 successively, from the upper end of the blank downwardly, are spaced wider apart; so that when all of these folds have been made, a flattened reinforcing roll is formed on the leading edge of the plane.

Next, the longitudinal center fold is made along the scored line 1, so that the two halves of the paper come together with the reinforcing roll at the front edge on the outside.

The wings are then brought to the proper angular relationship by folding them downwardly or creasing them along the lines 2 and 3. Then the tail fins 19 and 20 are folded outwardly along the lines 5 and 6 in the same manner in which the wings are folded. The rudder fin portions 21 are left alone to remain in line with the V-body portion 22, resulting from making the fold along line 1.

The variant forms shown in Figs. 3 and 4 are made in substantially the same way as the plane illustrated by Fig. 2, except that the tails and folds for forming the tail portions of the planes are made along a slightly different arrangement of lines consistent with the types there illustrated.

The leading edge formation is the same in all figures.

In using the toy it is tossed by hand in the different ways in which many children are familiar and often after having slightly changed the dihedral setting of the wings or warping them or changing the angular relationship therewith of the tail surfaces.

I claim:

1. A toy airplane formed from folded sheet material and having its leading edge adjustably stiffened and weighted by a series of folds along transverse lines forming a flattened roll edge with removable strips, said sheet material having longitudinal folds for shaping the body of the plane and slits across some of said longitudinal folds for weakening the material at the leading edge of the plane.

2. As an article of manufacture a unitary thin, flat blank adapted for folding and to stay set when folded to form a toy airplane, said blank having slits therein according to the outline of the plane to be produced, to facilitate removal of surplus parts of the blank, said blank also having medially disposed longitudinal lines for indicating where to fold the blank to the form of a plane, and said blank having a series of transverse scored lines parallel with the front and successively wider apart inwardly from the edge of the blank which forms the leading edge of the plane to be produced and extending across the full width of the blank.

3. A sheet blank for toy airplanes having slits therein according to the outline of the plane, and longitudinal lines for folding the sheet to plane form, and a series of transverse scored fold lines successively wider apart inwardly from the edge of the blank which forms the leading edge of the plane, to accommodate successive back folding of the front edge, and cuts along the lines of the longitudinal lines at the location of the transverse lines to accommodate folding along said longitudinal lines.

4. A sheet blank for forming toy airplanes having a series of transverse score lines parallel with the front edge of the blank and successively wider apart from said edge inwardly to facilitate successive folding, and diagonal slits in the sides of the blank traversing said score lines to accommodate yielding of the lateral front corner of the airplane.

ELLIS BONNELL.