Nov. 18, 1930. W. KRAMER 1,782,385

TOY AIRPLANE

Filed June 26, 1929 3 Sheets-Sheet 1

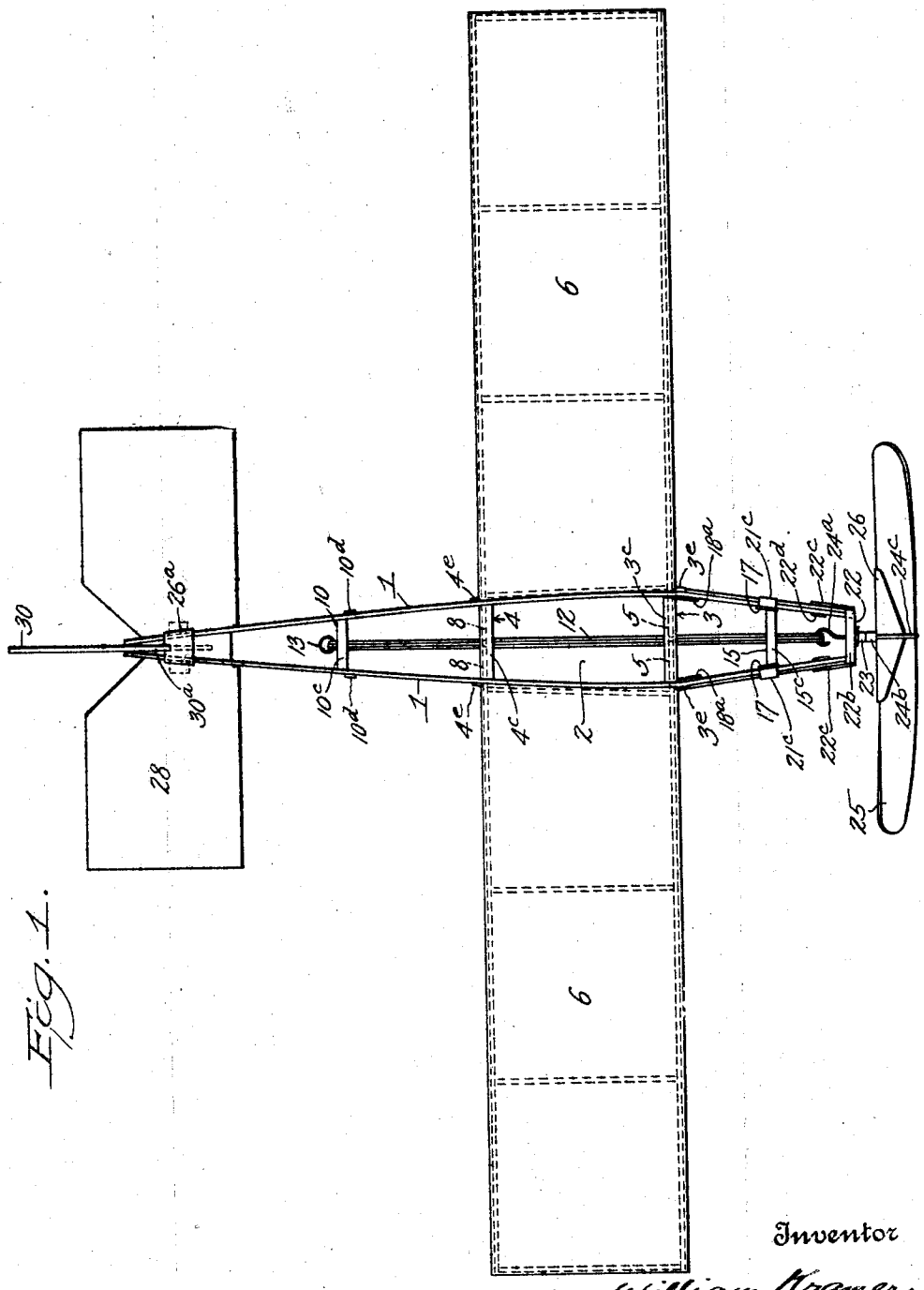


Fig. 1.

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TOY AIRPLANE

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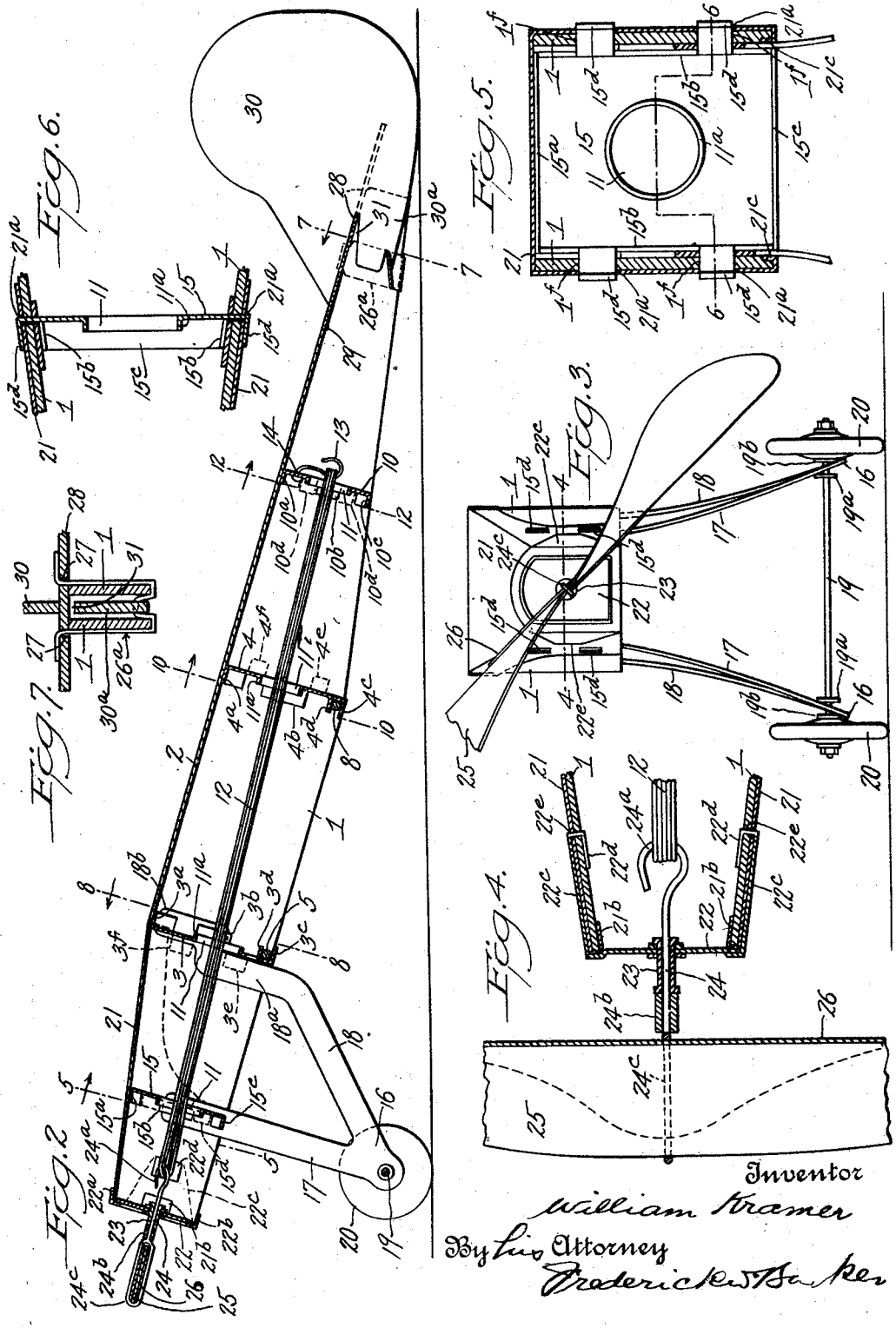


Fig. 6.

Fig. 5.

Fig. 3.

Fig. 7.

Fig. 2.

Fig. 4.

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Fig. 8.

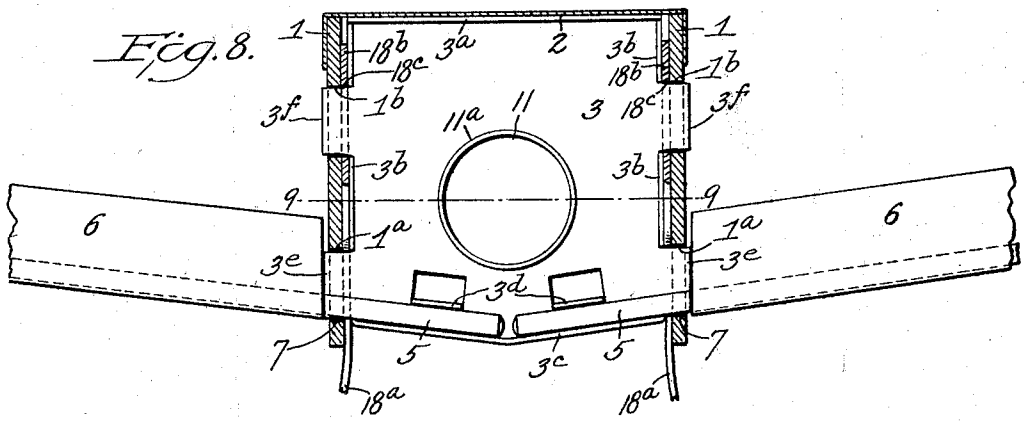


Fig. 9.

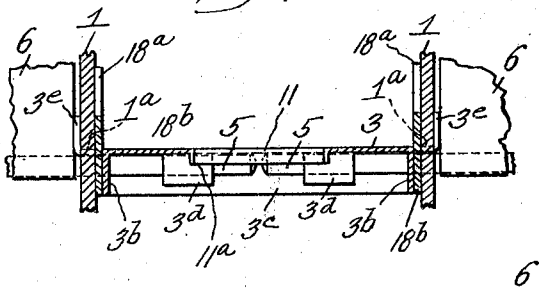


Fig. 10.

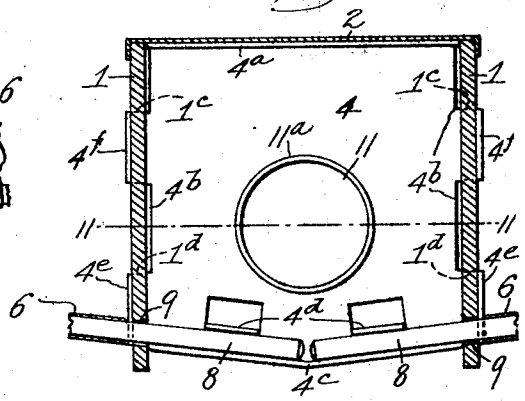


Fig. 14.

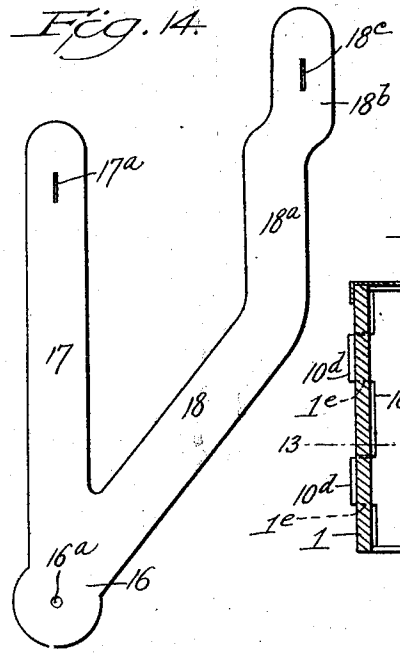


Fig. 11.

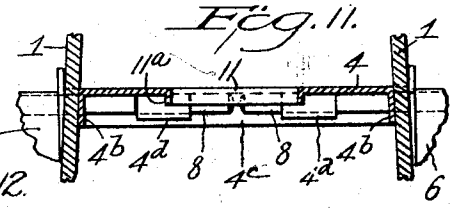


Fig. 12.

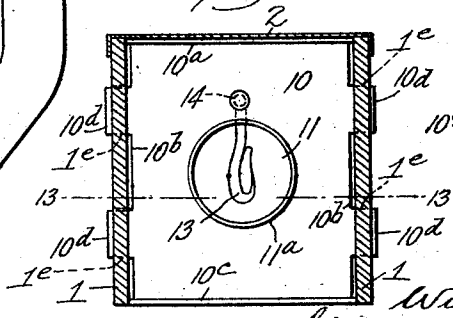
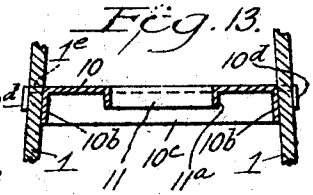


Fig. 13.



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UNITED STATES PATENT OFFICE

WILLIAM KRAMER, OF RICHMOND HILL, NEW YORK, ASSIGNOR TO IDEAL AEROPLANE & SUPPLY CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

TOY AIRPLANE

Application filed June 26, 1929. Serial No. 373,732.

This invention relates to toy airplanes of the kind composed of separable elements that are capable of convenient assembly in the production of the complete device, and my improvements are directed to the novel construction of the component parts and the means whereby they may be interfitted and connected to produce a model or toy airplane that is strong, durable, of light weight, and capable of efficient performance.

Other features and advantages of my invention will hereinafter appear.

In the drawings:—

Figure 1 is an inverted plan view of my improved toy airplane, as assembled.

Fig. 2 is a side sectional view thereof.

Fig. 3 is a front elevation.

Fig. 4 is an enlarged horizontal, sectional detail view, taken on the line 4—4 of Fig. 3.

Fig. 5 is an enlarged section taken on the line 5—5 of Fig. 2.

Fig. 6 is a section taken on the line 6—6 of Fig. 5.

Fig. 7 is a section taken on the line 7—7 of Fig. 2.

Fig. 8 is an enlarged section taken on the line 8—8 of Fig. 2.

Fig. 9 is a section taken on the line 9—9 of Fig. 8.

Fig. 10 is an enlarged section taken on the line 10—10 of Fig. 2.

Fig. 11 is a section taken on the line 11—11 of Fig. 10.

Fig. 12 is an enlarged section taken on the line 12—12 of Fig. 2.

Fig. 13 is a section taken on the line 13—13 of Fig. 12, and

Fig. 14 is a side view, enlarged, of a member of the landing gear.

In the construction of the fuselage I employ balsa wood or other relatively light weight material, said fuselage being hollow and composed of the side plates 1 and a top covering 2 of paper or other suitable material, forming a substantially inverted box-like structure.

This fuselage structure is braced internally by a series of bulkheads, formed of relatively thin sheet metallic material having flanges to afford stiffening means and to provide ample bearing surface for coaction with the side plates.

The bulkheads generally denoted, respectively, by the numerals 3, 4 are the bulkheads adapted to connect with the wing spars and will now be described.

Bulkhead 3, see Figures 8 and 9, has the horizontal, rearwardly turned flange 3^a at the top, side flanges 3^b and bottom flange 3^c. The bottom flange, it will be noted, is symmetrically angled in opposite directions from its centre, the angles provided representing the dihedral of the wings, tongues 3^d cut from the bulkhead and projected into spaced parallelism with the angled bottom flanges 3^c forming sockets or channels for the wing spars 5, which extend from the butt ends of wings 6, near their leading edges. Holes 7 formed through the fuselage sides 1, align with the aforesaid sockets or channels to admit the spars 5. Also the side flanges 3^b have tongues 3^e cut therefrom and turned outwardly leaving gaps for the entry of the spars 5 to said sockets or channels, said tongues being passed through the slots 1^a in the fuselage walls 1, and said tongues 3^e being turned forwardly against the outer surfaces of walls 1 to clamp the bulkhead to said walls. Also the side flanges 3^b have tongues 3^f cut therefrom and turned outwardly, said tongues 3^f being passed through slots 1^b in the fuselage walls 1 and turned rearwardly against the outer surfaces of said walls to clamp the bulkhead thereto.

Bulkhead 4, see Figs. 10 and 11, has the same general characteristics as bulkhead 3, being provided with top flange 4^a, side flanges 4^b and bottom flange 4^c. Also it has the tongue 4^d to coact with flange 4^c in providing angled channels for the reception of the ends of wing spars 8 which project from the trailing edge portions of the wings. Holes 9 formed through the fuselage sides 1 align with the aforesaid channels to admit the spars 8. Also the side flanges 4^b have tongues 4^e and 4^f cut therefrom, said tongues being passed respectively through slots 1^c, 1^d in the fuselage walls and folded rearwardly (the flanges of bulkhead 4 being directed forward-

ly) against the outer surfaces of said walls to clamp said bulkhead thereto.

The rearmost bulkhead, see Figs. 12, 13 is indicated by the numeral 10 and is provided with the top flange 10^a, side flanges 10^b and bottom flanges 10^c. The side flanges 10^b have tongues 10^d cut therefrom, outwardly turned and passed through slots 1^e in the fuselage walls, said tongues being folded against the side walls to clamp said bulkhead thereto.

All of the bulkheads have a circular opening 11 therethrough, these openings being aligned in the longitudinal centre of the fuselage for the operation of the elastic power band 12, rear anchorage means being provided for said band in the form of a hook 13 that is engaged in an orifice 14 located above opening 11 on bulkhead 10, said hook hanging behind opening 11 of said bulkhead. The openings 11 are provided with flanges 11^a to avoid the sharp edges which would tend to cut the power band.

The foremost bulkhead, see Figures 5 and 6, is designated by the numeral 15 and has the forwardly directed flanges 15^a, 15^b and 15^c, the side flanges 15^b having tongues 15^d cut therefrom, passed through slots 1^f in the fuselage walls, and folded forwardly against the outer surfaces of said walls.

Landing gear is provided in the form of two hangers composed of stiff sheet material of light weight, such for example as fibre board, said hangers having the lower portions 16, provided with holes 16^a to serve as bearings for axle 19, and said hangers being bifurcated to provide the upward extensions 17, 18 which connect with the fuselage respectively in the regions of bulkheads 15 and 3. Thus the extensions 17, which have slots 17^a therein are placed between the flanges 15^b of bulkhead 15 and the fuselage walls, the slots 17^a aligning with slots 1^f so that tongues 15^d also penetrate slots 17^a and thereby attach extensions 17 of the landing gear to the fuselage.

Extensions 18 are rearwardly divergent from extensions 17, and have continuing therefrom the portions 18^a that are parallel with extensions 17 and spaced therefrom to lie against the fuselage walls, with their rearward edges adjacent the forward surface of bulkhead 3. Also said extensions 18 have upper, rearwardly angled portions 18^b that lie between the bulkhead flanges 3^b above the tongues 3^c, said portions 18^b having slots 18^c to receive the tongues 3^f, thereby securing extensions 18 to the fuselage.

As the tread of the wheels is desirably wider than the fuselage width the hangers are spread and the axle 19 upon which wheels 20 are mounted, is provided with shoulders 19^a to serve as distancing means, washers 19^b lying between these shoulders and the hangers.

A cowling indicated at 21, which may be composed of thin sheet aluminum, is placed over the forward portion of the fuselage, and is provided with slots 21^a which register with the slots 1^f in the walls 1, so that the tongues 15^d extended from flanges 15^b of bulkhead 15, may also extend through slots 21^a and thus serve to secure the cowling in its adjusted position. Also the cowling has forwardly extending tongues 21^b that are bent rearwardly over the ends of the fuselage sides 1 and tongues 21^c that are bent upwardly over the lower edge of said sides to assist in securing the cowling to the fuselage.

Also a nose plate 22, composed of suitable sheet metallic material, is provided, said nose plate having the upper and lower rearwardly turned flanges 22^a, 22^b, and side wings 22^c that lie against the sides of the cowling, said side wings terminating in tongues 22^d that are passed through slots 22^e penetrating both the cowling and the fuselage walls, said tongues 22^d being bent forwardly against the inner surfaces of the fuselage walls to unite both the cowling and the nose plate to the fuselage.

Fitted and secured within the nose plate 22 is an elongated bearing member 23 and mounted therein is the propeller shaft 24, said shaft terminating, within the cowling, in a hook 24^a adapted to engage the forward end of power band 12. The shaft, forwardly of the nose plate, carries a ferrule 24^b adapted to have thrust bearing relation with member 23, and forwardly of the ferrule said shaft is formed into a loop 24^c that embraces the propeller 25 and constitutes the driving connection between the shaft and the propeller.

The propeller 25 may be formed of fibre or other suitable material, and is here shown as provided with a metallic brace 26 lying between loop 24^c and the propeller material.

It will be noted that the fuselage walls 1 converge rearwardly from the region of bulkhead 3 to the tail portion, and also that said walls converge forwardly from the same region, to the nose plate.

Also it will be noted that said side walls are tapered forwardly along their upper edges from a point slightly rearward of the region of bulkhead 3, and are tapered rearwardly along their lower edges from about the region of bulkhead 4. The contours thus described give the fuselage a symmetrical appearance, tend to aid its efficient performance, and besides effect economy in the quantity of material cut to produce the fuselage walls.

The rear ends of walls 1 are bound together, in spaced relation, by an approximately U-shaped clip 26^a, whose upper ends penetrate slots 27 formed through the horizontal stabilizer 28, and are bent down thereon to secure the latter in position upon the fuselage. The walls 1 of the fuselage are notched, as at 29, to form a seat for the horizontal stabilizer adapted to reduce its angle

of attack, as without such notches said stabilizer would set at too great an angle upon the fuselage for horizontal flight.

The vertical stabilizer, 30, has a forward recess 31 to receive the horizontal stabilizer, the portion 30ª of said vertical stabilizer, below recess 31, being interposed between the rear ends of walls 1, and frictionally held therebetween by the clamping action of clip 26ª.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

I claim:

1. A bulkhead to connect the side walls of a toy airplane fuselage, said bulkhead composed of sheet metallic material and having a central aperture for the passage of the power band, said bulkhead also provided with a hole above said central aperture, and a hook engaged in said bulkhead to hang rearwardly of said aperture and there engage the rear end of said power band.

2. The combination in a toy airplane fuselage having side walls, of a bulkhead therein composed of sheet metalic material, having a flange turned from its bottom edge, and tongues cut and bent from said bulkhead in spaced parallelism with said flange to co-act therewith in providing channels, the fuselage walls having holes therethrough to receive the ends of wing spars for lodgement in said channels.

3. The combination in a toy airplane fuselage having side walls with slots therein, and bulkheads having projecting tongues, of landing gear comprising a bifurcated member of stiff sheet material whose bifurcate portions lie between said bulkheads and said side walls and are provided with slots to register with the wall slots, said tongues penetrating said slots and being clamped to the outer surfaces of said walls, to unite said bulkheads, landing gear and walls.

4. The combination in a toy airplane fuselage having side walls with slots therein and a bulkhead having projecting tongues, of a cowling composed of sheet metallic material for the nose portion of said fuselage, said cowling having slots to register with the wall slots, and tongues to clamp over the wall ends, said bulkhead tongues penetrating said slots and being clamped to the outer surface of said cowling to unite said bulkhead, walls and cowling.

5. The combination in a toy airplane fuselage having side walls with slots in their forward portions and a cowling with slots that register with said wall slots, of a nose plate having side portions with tongues that penetrate said slots and are clamped to the inner surfaces of said walls, to unite said nose plate, cowling and walls.

6. The combination in a toy airplane of a fuselage composed of spaced walls whose rear ends converge, notches formed in the upper edges of said walls, a horizontal stabilizer mounted in said notches and having slots therethrough, and a U-shaped clip embracing said wall ends, said clip having tongues that penetrate said slots and are clamped upon the upper surface of said stabilizer.

7. The combination, in a toy airplane, of a fuselage composed of spaced side walls of stiff material, said walls having slots therein, and a series of sheet metallic bulkheads fitted between said walls, said bulkheads provided with flanges to lie against said walls, and tongues cut from said flanges to penetrate the slots through said walls, and to clamp against the outer surfaces of said walls.

8. The combination in a toy airplane having a fuselage, of landing gear therefor comprising resilient sheet material members engaging the fuselage in spaced relation, an axle carrying wheels, said axle penetrating bearing holes in said members, and shoulders on said axle to tensionally spread apart said members, thereby increasing the distance separating them at their lower portions.

9. The combination in a toy airplane of a fuselage composed of spaced walls whose rear ends converge, notches formed in the upper edges of said walls, a horizontal stabilizer mounted in said notches and having slots therethrough, a vertical rudder having a notch to receive said stabilizer, said rudder fitting between the converged walls, and a U-shaped clip embracing said wall ends, said clip having tongues that penetrate said slots and are clamped upon the upper surface of said stabilizer.

Executed this 10th day of June, 1929.

WILLIAM KRAMER.