June 26, 1928. 1,674,637

R. E. CONWAY

TOY KNOCKDOWN AEROPLANE

Filed Nov. 25, 1927 2 Sheets-Sheet 1

Fig. 1.

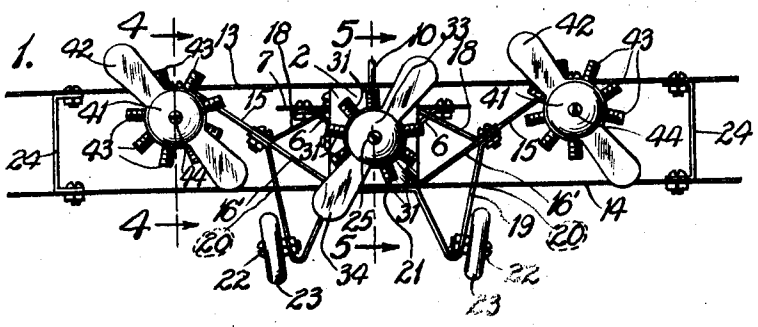


Fig. 2.

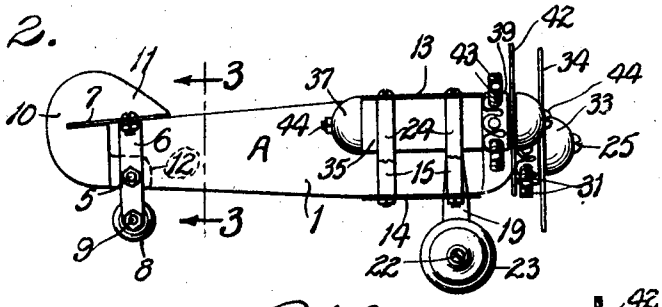


Fig. 3.

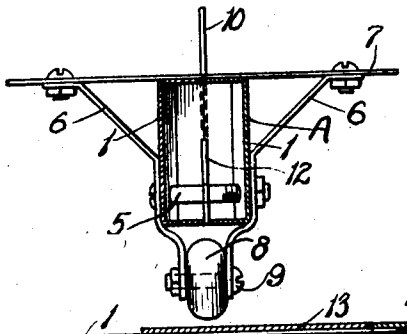


Fig. 4.

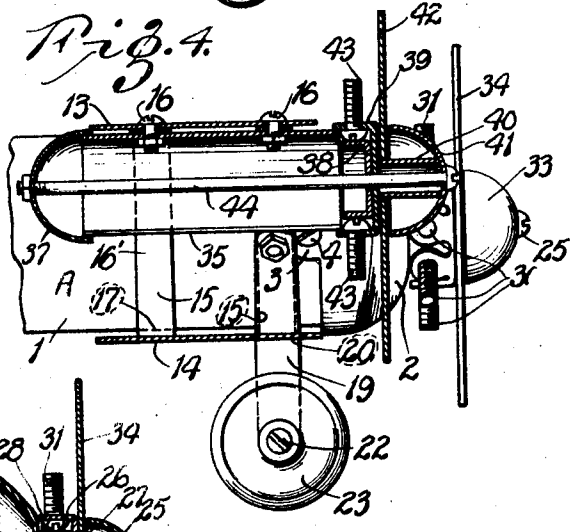
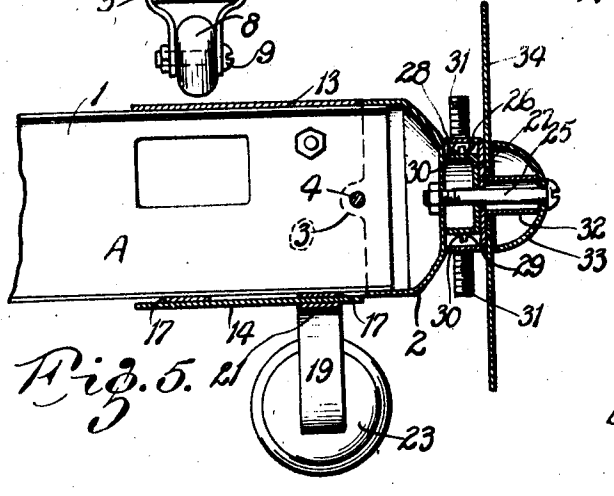


Fig. 5.



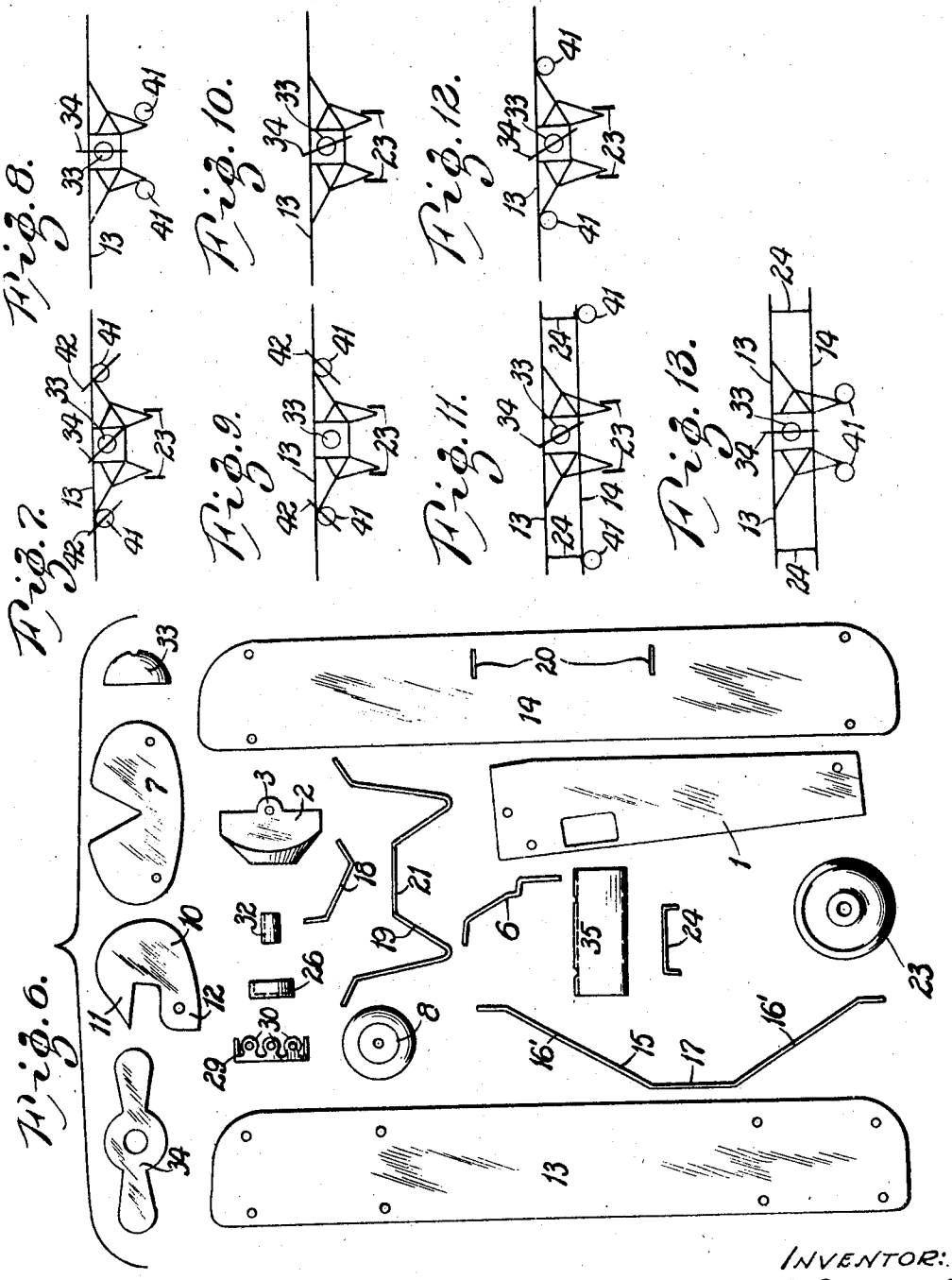
INVENTOR:
ROBERT E. CONWAY.
BY Elliott & Harrington
ATTORNEYS

June 26, 1928. 1,674,637

R. E. CONWAY

TOY KNOCKDOWN AEROPLANE

Filed Nov. 25, 1927 2 Sheets-Sheet 2



INVENTOR:
ROBERT E. CONWAY.
BY Elliott Harrington
ATTORNEYS.

Patented June 26, 1928. 1,674,637

UNITED STATES PATENT OFFICE.

ROBERT E. CONWAY, OF HAMMOND, INDIANA, ASSIGNOR TO METALCRAFT CORPORATION, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

TOY KNOCKDOWN AEROPLANE.

Application filed November 25, 1927. Serial No. 235,693.

This invention relates generally to toys, and more specifically to a toy comprising a plurality of separable parts which may be assembled to produce toy aeroplanes of various types, the predominant object of the invention being to produce a toy which will excite the interest and test the mechanical ingenuity of a child and in this manner serve to entertain him while increasing his knowledge of aeroplanes and directing his thoughts and activities along mechanical lines.

Briefly stated, the toy in its knock-down condition includes the various parts from which the toy aeroplanes are produced and all of the necessary bolts and nuts which are used to secure the parts together.

By following the instruction sheet which will accompany the toy, a child may construct, for instance, a bi-plane with three engines, this type of aeroplane necessitating the use of all of the parts of which the toy is comprised; then by removing one of the planes from the bi-plane, a three-engined monoplane may be produced; and by removing some of the parts representing the engines and propellers, a one or two-engined bi-plane or monoplane may be produced. Also, the invention contemplates the transposition of certain of the parts of the toy so as to produce sea-planes with pontoons attached thereto and bombers, certain of the parts which are used to represent parts of the engines in producing land planes being transposed and utilized to represent the pontoons of the sea-plane and the bombs of the bombers.

By eliminating from use certain of the parts of the toy and transposing, in the organization of the parts producing the toy aeroplanes, certain parts, a large number of different types of aeroplanes may be constructed whereby a toy is provided which serves as a source of entertainment and instruction to the youthful user thereof.

Figure 1 is a front view of a three-engined bi-plane, the construction of which involves the use of all of the parts of my improved toy;

Figure 2 is a view in side elevation of the toy aeroplane shown in Fig. 1;

Figure 3 is a section on line 3—3 of Fig. 2;

Figure 4 is a sectional view on an enlarged scale taken on the line 4—4 of Fig. 1;

Figure 5 is a similar view taken on the line 5—5 of Fig. 1;

Figure 6 is a view of the various parts of my improved toy, duplicate parts being omitted;

Figures 7, 8, 9, 10, 11, 12 and 13 are diagrammatical views illustrating various types of aeroplanes which may be constructed with the parts of my improved toy.

Referring now to Figs. 1 to 5 inclusive, wherein is illustrated a type of toy aeroplane in the construction of which all of the parts of the top are employed, A designates the fuselage of the aeroplane which is produced by a pair of members 1. The members 1 are approximately U-shaped in cross-section, as shown clearly in Fig. 3, said members each comprising a side wall, top and bottom walls, and an end wall which is located at the tail of the aeroplane. When the pair of members 1 are assembled to produce a fuselage, said members are arranged so that the edges of the top and bottom walls and the edges of the end walls of the associated members 1 are in contact with each other, whereby a hollow body is produced which is closed on all sides with the exception of the forward end, as shown in Fig. 5. The members 1 are so shaped that a fuselage is provided which is tapered toward the smaller rear end thereof. The members 1 of the fuselage A are held together at the forward end of said fuselage by a cap 2 which is of such dimensions that it fits over the forward end portions of the associated members 1, as shown in Fig. 5, said cap being provided with ears 3, and said cap and members 1 being secured together by a bolt 4 having a head and nut associated therewith which passes transversely through the fuselage and extends through the side walls of the members 1 and through the ears 3 of the cap 2. The members 1 of the fuselage are held together at the rear end of the toy aeroplane by a bolt 5 which also serves to secure a pair of braces 6 to the fuselage, said bolt having a head and being provided with a nut and being extended through the side walls of the members 1 and through said braces, as shown in Fig. 3. The braces 6 are flared outwardly from the fuselage at their upper ends and are attached at their upper ends by means of bolts to a member 7 which represents the elevators of the toy aeroplane,

said member 7 resting on the top surface of the fuselage and being held in place by said braces 6. Beneath the rear end of the fuselage A, the braces 6 are bent toward each other and interposed between said inwardly bent portions of said braces is the rear ground wheel 8 of the aeroplane, there being a bolt 9 passed through said braces on which said ground wheel is rotatably mounted.

Located at the rear portion of the fuselage is a member 10 which represents the rudder of the toy aeroplane, said member 10 having a portion 11 which overlaps the member 7 and a portion 12 which passes into the interior of the fuselage and is provided with an aperture through which the bolt 5 passes, whereby said member 10 is held in place, the rear walls of the members 1 being cut away sufficiently to permit said portion 12 to pass between said rear walls into the interior of the fuselage.

Referring now to the front portion of the aeroplane, 13 designates the upper plane and 14 designates the lower plane thereof, the planes 13 and 14 preferably comprise flat strips of material, the top plane being in contact with the top surface of the fuselage and the lower plane being in contact with the bottom surface of said fuselage. The planes 13 and 14 are held in place by a plurality of struts or braces, a pair thereof, which is designated by the reference character 15, being secured at their opposite ends by means of bolts 16 to the top plane 13. The struts 15, as shown in Figs. 2 and 4, are spaced apart transversely of the planes 13 and 14, each of said struts having angularly arranged portions 16′ which pass inwardly and downwardly from the top plane 13 toward the lower surface of the fuselage A, and the lower ends of the angularly arranged portions of each of said struts 15 being joined by a straight portion 17, which is in contact with the lower surface of the fuselage. 18 designates a pair of braces which extend from the angular portions 16′ of one of the struts 15 to the side walls of the fuselage, each of said braces 18 being secured at its opposite ends by means of bolts to one of the angularly arranged portions 16′ of a strut 15 and to a side wall of the fuselage, respectively, whereby the strut 15 with which said braces 18 are associated is connected rigidly to the fuselage.

19 designates a member which serves as the undercarriage of the toy aeroplane, said member having the general shape of a letter W, as shown clearly in Fig. 1. The two outer legs of the member 19 are secured at their upper ends to the forward strut 15, this attachment being effected by the same bolts which secure the braces 18 to said strut 15. The outer legs of the member 19 pass downwardly from the forward strut 15 and through apertures 20 in the lower plane 14, said member being bent upwardly at the lower ends of the outer legs thereof toward the fuselage and being provided with a straight portion 21 which is arranged in contact with the lower surface of said fuselage. Rotatably mounted on bolts 22 attached to the member 19 is a pair of circular elements 23 representing the ground wheels of the aeroplane. Located adjacent to the outer ends of the planes 13 and 14 are pairs of braces 24 each of which is attached at its opposite ends to said upper and lower plane, respectively.

Extended through an aperture in the cap 2 located at the forward end of the fuselage A and projected forwardly from said cap is a bolt 25 (Fig. 5), said bolt having a head at its forward end and being provided with a nut at its rearmost end. 26 designates a cup-shaped member having an end wall 27 and an annular wall 28, said end wall being provided with an aperture through which the bolt 25 passes, whereby said cup-shaped member is supported on said bolt. 29 designates a member having approximately the same shape as the member 26, said member 29 having an end wall provided with an aperture through which the bolt 25 passes, but instead of having a solid annular wall, as has the member 26, the member 29 is provided with a plurality of ears 30 which are arranged at an approximate right angle to the end wall of said member. The member 29 is of greater diameter than the member 26 and when the parts referred to are in their assembled positions, the member 26 is located within the member 29, as shown in Fig. 5. The angularly arranged ears 30 of the member 29 are provided each with an aperture, as shown clearly in Fig. 6, and extended through each of said apertures is a bolt 31, said bolts being so arranged with respect to the members 26 and 29 that the head portions thereof are confined between the outer face of the annular wall 28 of the member 26 and the inner faces of the angularly arranged ears 30 on the member 29, and the threaded portions of said bolts extend outwardly radially from said ears 30. The members 26 and 29 and the bolts 30 are intended to represent an internal combustion engine of the radial type ordinarily used on aeroplanes, the radially arranged bolts representing the radial cylinders of the engine, and the screw-threads on the bolts representing the cooling fins on the engine cylinders. 32 designates a sleeve which surrounds the outer portion of the bolt 25, and 33 designates a semi-spherical cap or nose portion which is mounted on the bolt 5 at the outer end thereof, the wall of said cap or nose portion having an aperture formed therethrough through which said bolt passes. The inner edge of the cap or nose portion 33 is spaced apart slightly

from the end wall of the member 29, and rotatably mounted on the sleeve 32 so that it will rotate in said space is a member 34 which is provided with outwardly extended wing portions whereby same resembles a propeller. It will be noted by referring to Fig. 5 that when the nut at the inner end portion of the bolt 25 is moved inwardly with respect to said bolt, the members 26 and 29, sleeve 32 and cap 33 are all drawn into close contact with each other, whereby said parts will be rigidly held in fixed positions, the member 34 being capable of rotating freely about the sleeve 32.

Secured to the upper plane 13 at the lower surface thereof and at opposite sides of the fuselage A, is a pair of cylindrical elements 35, said cylindrical elements being secured to said upper plane by means of bolts 36 which pass through the walls of said cylindrical elements and through said upper plane. The cylindrical elements 35 are each closed at its rear end by a semi-spherical cap 37 and at its forward end each cylindrical element is provided with the organization of parts already described, which produce a structure resembling and representing an internal combustion engine having radial cylinders and having a propeller associated therewith; that is to say, each of said cylindrical elements 35 is provided at its forward end with members 38 and 39 of the same construction and arrangement as the members 26 and 29 already described, a sleeve 40, a cap 41, a member 42 rotatably mounted on the sleeve 40 and resembling in shape a propeller, and bolts 43. The caps 37 and 41 associated with each of the cylindrical elements 35 are drawn together by a bolt 44 which extends longitudinally through each of said cylindrical elements, whereby said caps and the associated elements other than the member 42 are rigidly held in fixed positions. In connection with the parts associated with the cylindrical elements 35, inward movement of the members 39 is prevented by the heads of the bolts 43 contacting with the forward edges of the cylindrical elements 35.

Thus far, I have described only one type of aeroplane toy, namely the three-engined bi-plane, and as has been already stated it is possible by omitting certain of the parts or transposing certain parts in the organization of parts, to construct a number of different types of aeroplanes. For instance, if it were desired to construct a three-engined monoplane such as that shown diagrammatically in Fig. 7, it would be merely necessary to dispense with the use of the lower plane 14 and the braces 24 at the outer ends of the planes, while if a two-engined monoplane such as that shown in Fig. 9 were desired, the members 26 and 29, the screws 31, the propeller 34, and the sleeve 32 would be omitted and the cap 33 would be drawn rearwardly by screwing the nut inwardly on the bolt 25 until the edge of said cap contacts with the cap 2. Also, a one-engined monoplane such as that shown in Fig. 10 may be constructed by omitting the cylindrical elements 35 and the parts associated therewith.

In like manner, it is possible to construct different types of aeroplanes by transposing certain of the parts. For instance, a one-engined sea-plane, either monoplane or bi-plane, may be constructed by omitting the ground wheels 23 and attaching the cylindrical elements, which are closed at their opposite ends by the caps 37 and 41 and are without the engine parts and propellers, to the member 19, as shown in Figs. 8 and 13. In accordance with this arrangement the cylindrical elements 35 represent the pontoons of the sea-plane.

Also, if it is desired to construct a bomber, the cylindrical elements 35 without the engine parts and propellers are attached as shown in Fig. 12, while if a bi-plane bomber were to be constructed, the cylindrical elements 35 would be attached as shown in Fig. 11. Also the cylindrical elements 35 may represent auxiliary fuel tanks when attached to the planes.

In like manner, a great number of types of aeroplanes may be constructed by merely omitting some of the parts or transposing certain of the parts, it having been found that an excess of fifteen types may be made, and, therefore, a great amount of amusement and instruction is afforded in the use of my improved toy.

I claim:—

1. A toy aeroplane having an assembly of parts representing a motor, said parts including an annular member, and bolts extended radially therefrom simulating motor cylinders, said bolts being provided with exposed screwthreads simulating cooling fins on the motor cylinders.

2. A toy aeroplane having an assembly of parts representing a motor, said parts including a member provided with an annular wall, a second member having portions arranged parallel with the annular wall of the first mentioned member, and a plurality of members representing the radial motor cylinders extending outwardly through apertures in the alined portions of the second mentioned member, said members representing the motor cylinders having head portions which are confined between the annular wall of the first mentioned member and the parallel portions of the second mentioned member.

3. A toy aeroplane having an assembly of parts representing a motor, said parts including a member provided with an annular wall, a second member having portions arranged parallel with the annular wall of the first mentioned member, a plurality of

screwthreaded bolts representing radial motor cylinders extended outwardly through apertures in the alined portions of the second mentioned member, the head portions of said bolts being confined between the annular wall of the first mentioned member and the parallel portions of the second mentioned member, a member representing a propeller, and a support for the last mentioned member on which same is rotatably mounted.

4. A toy aeroplane having an assembly of parts representing a motor, said parts including a member provided with an annular wall, a second member having portions arranged parallel with the annular wall of the first mentioned member, a plurality of screwthreaded bolts representing radial motor cylinders extended outwardly through apertures in the alined portions of the second mentioned member, the head portions of said bolts being confined between the annular wall of the first mentioned member and the parallel portions of the second mentioned member, a member representing a propeller, a sleeve located adjacent to the first and second mentioned members on which said propeller is rotatably mounted, and a bolt extended through said sleeve and through apertures in the walls of said first and second mentioned members to maintain said parts in their proper positions.

5. A toy aeroplane provided with a plane, a cylindrical member attached to said plane, an assembly of parts at one end of said cylindrical member representing a motor, said parts including a plurality of radially arranged screwthreaded bolts simulating radial motor cylinders having cooling fins thereon, a rotatably mounted member representing a propeller, a cap adjacent to said propeller, a second cap at the end of the cylindrical member opposite to the end thereof at which the assembly of motor parts is located, and a bolt extended longitudinally through said cylindrical member to maintain in their proper positions the parts associated with said cylindrical member.

6. A toy aeroplane provided with a fuselage, a member at the tail end of said fuselage simulating the elevators of an aeroplane, braces attached to said member and in contact with a portion of said fuselage, said braces having portions arranged in spaced relation beneath said fuselage, a ground contacting member located between said spaced portions of said braces, a fastening device extended through said fuselage and through said braces for securing the braces to the fuselage, and a fastening member for securing said ground contacting member to the spaced portions of said braces.

7. A toy aeroplane comprising a fuselage, a plane arranged to rest upon said fuselage at the top surface thereof, and a member simulating struts, for said plane, said member comprising a rigid element secured at its opposite ends to said plane and being arranged in contact intermediate of its ends with the lower surface of said fuselage.

8. A toy aeroplane comprising a fuselage, a plane arranged to rest upon said fuselage at the top surface thereof, and a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said member is secured to said plane, and said member being provided with a portion arranged in contact with the lower surface of said fuselage.

9. A toy aeroplane comprising a fuselage, a plane arranged to rest upon said fuselage at the top surface thereof, a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said member is secured to said plane and said member being provided with a portion arranged in contact with the lower surface of said fuselage, and braces secured to said strut and to said fuselage at the side faces of the fuselage.

10. A toy aeroplane having a fuselage comprising a plurality of separable, longitudinal elements assembled to produce said fuselage, a cap at one end of said fuselage arranged to embrace the adjacent end portions of said separable elements in a manner to maintain said separable elements in their assembled condition, and means at the opposite end of said fuselage for aiding said cap in maintaining the separable elements comprising the fuselage in their assembled condition.

11. A toy aeroplane comprising a fuselage, a plane arranged to rest upon said fuselage at the top surface thereof, a member simulating struts for said plane, said member being secured at its opposite ends to said plane and being arranged in contact intermediate its ends with the lower surface of said fuselage, and an assemblage of parts representing a motor supported by said plane.

12. A toy aeroplane comprising a fuselage, a plane arranged to rest upon said fuselage at the top surface thereof, a member simulating struts for said plane, said member being secured at its opposite ends to said plane and being arranged in contact intermediate its ends with the lower surface of said fuselage, and an assemblage of parts representing a motor supported by said plane, said assemblage of parts representing motors being secured to the plane by the

same fastening devices which secure said member thereto.

13. A toy aeroplane comprising a fuselage, an upper plane arranged to rest upon said fuselage at the top surface thereof, a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said strut is secured to said plane, and said member being provided with a portion arranged in contact with the lower surface of said fuselage, a lower plane arranged in contact with the lower surface of the fuselage, and means for maintaining said lower plane in its proper position.

14. A toy aeroplane comprising a fuselage, an upper plane arranged to rest upon said fuselage at the top surface thereof, a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said strut is secured to said plane, and said member being provided with a portion arranged in contact with the lower surface of said fuselage, a lower plane arranged in contact with the lower surface of said fuselage, and braces for securing said lower plane to said upper plane.

15. A toy aeroplane comprising a fuselage, an upper plane arranged to rest upon said fuselage at the top surface thereof, a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said member is secured to said plane, and said member being provided with a portion arranged in contact with the lower surface of said fuselage, a lower plane arranged in contact with the lower surface of said fuselage, braces for securing said lower plane to said upper plane, and elements representing parts of an aeroplane structure secured to said lower plane.

16. A toy aeroplane comprising a fuselage, an upper plane arranged to rest upon said fuselage at the top surface thereof, a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said member is secured to said plane and said member being provided with a portion arranged in contact with the lower surface of said fuselage, a lower plane arranged in contact with the lower surface of said fuselage, means for maintaining said lower plane in its proper position, an element simulating the undercarriage of an aeroplane secured to said member and extended through apertures in said lower plane, and supporting devices fixed to said element.

17. A toy aeroplane comprising a fuselage, a plane arranged immediately above said fuselage, and a strut for maintaining said plane in position with respect to said fuselage, said strut being secured at its opposite ends to said plane and having inclined portions extended downwardly from the points at which said strut is secured to said plane, and said strut being provided with a portion in contact with the lower surface of said fuselage.

18. A toy aeroplane comprising a fuselage, a plane arranged immediately above said fuselage, diagonal struts for said plane, members comprising the undercarriage of the toy aeroplane fixed to said struts intermediate the upper and lower ends thereof and extending downwardly from said struts, and supporting devices for the toy aeroplane secured to the lower ends of said members.

19. A toy aeroplane provided with a fuselage, a member at the tail-end of said fuselage simulating the elevators of an aeroplane, elements extended downwardly from said member, said elements being spaced apart from each other transversely of the fuselage at their lower ends, a ground wheel interposed between said spaced-apart lower portions of said elements, and means extended through said elements and through said ground wheel at the center thereof, whereby said ground wheel is rotatably supported.

20. A toy aeroplane comprising a fuselage, an upper plane arranged immediately above said fuselage members simulating struts for said plane, an element simulating an undercarriage of an aeroplane, a lower plane arranged beneath said fuselage, and a member simulating a portion of a motor, a bomb, a pontoon, and an auxiliary fuel tank, said member being provided with an aperture to receive attaching means and said upper plane, said lower plane, and said undercarriage likewise being provided with apertures to receive attaching means whereby said member may be attached to said upper or lower plane to simulate a part of a motor, a bomb or an auxiliary fuel tank, and to said undercarriage to simulate a pontoon.

21. A toy aeroplane comprising a fuselage, a plane arranged immediately above said fuselage, a member for simulating diagonal struts common to many full size aeroplanes, said member being secured at its opposite ends to said plane and having inclined portions representing the diagonal struts extended downwardly from the points at which said member is secured to the said plane, and said member being provided with a por-

tion arranged in contact with the lower surface of said fuselage, elements comprising the undercarriage of the toy aeroplane affixed to said member and extended downwardly therefrom, and supporting devices for the toy aeroplane secured to the lower ends of said elements.

22. A toy aeroplane comprising a fuselage, a plane arranged immediately above said fuselage, members simulating struts for said plane, an element simulating an undercarriage of an aeroplane, and a member simulating a portion of a motor, a bomb, a pontoon and an auxiliary fuel tank, said member being provided with an aperture to receive fastening means and said plane and said element simulating the undercarriage likewise being provided with apertures to receive fastening means, whereby said member may be attached to said plane to simulate a part of a motor, a bomb, a pontoon or an auxiliary fuel tank and to said element simulating the undercarriage to simulate a pontoon.

In testimony whereof, I have hereunto set my hand.

ROBERT E. CONWAY.