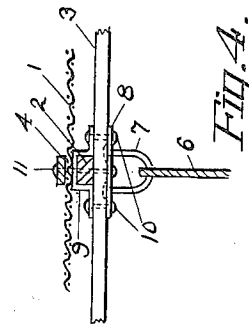
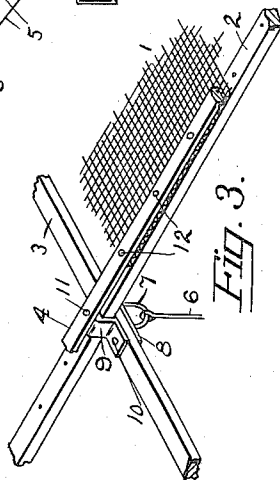
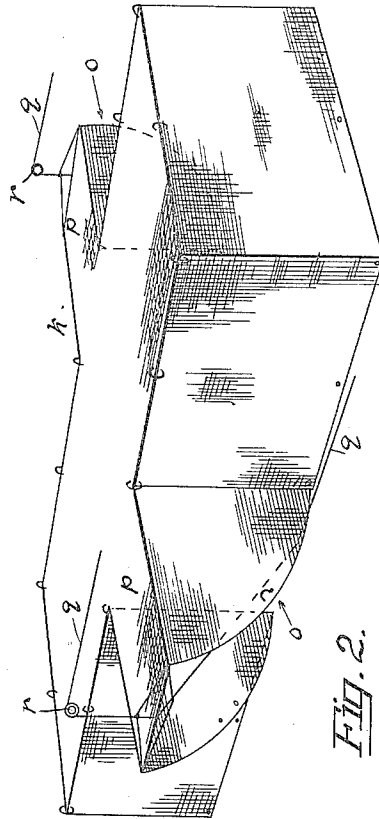
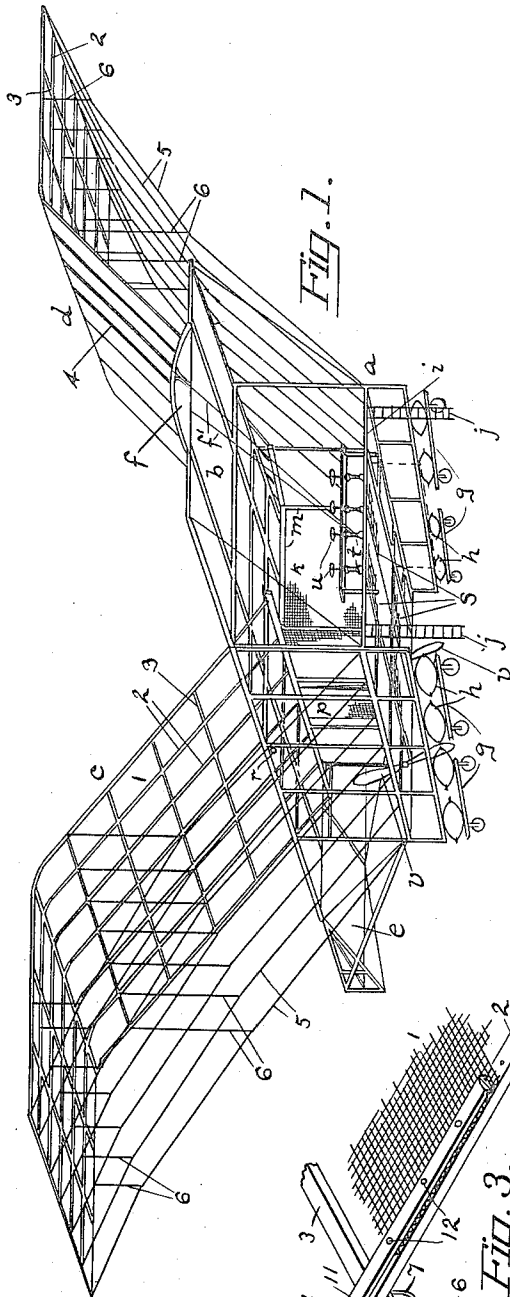


1,044,997.

L. DAN.
AEROPLANE.
APPLICATION FILED JULY 8, 1912.

Patented Nov. 19, 1912.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

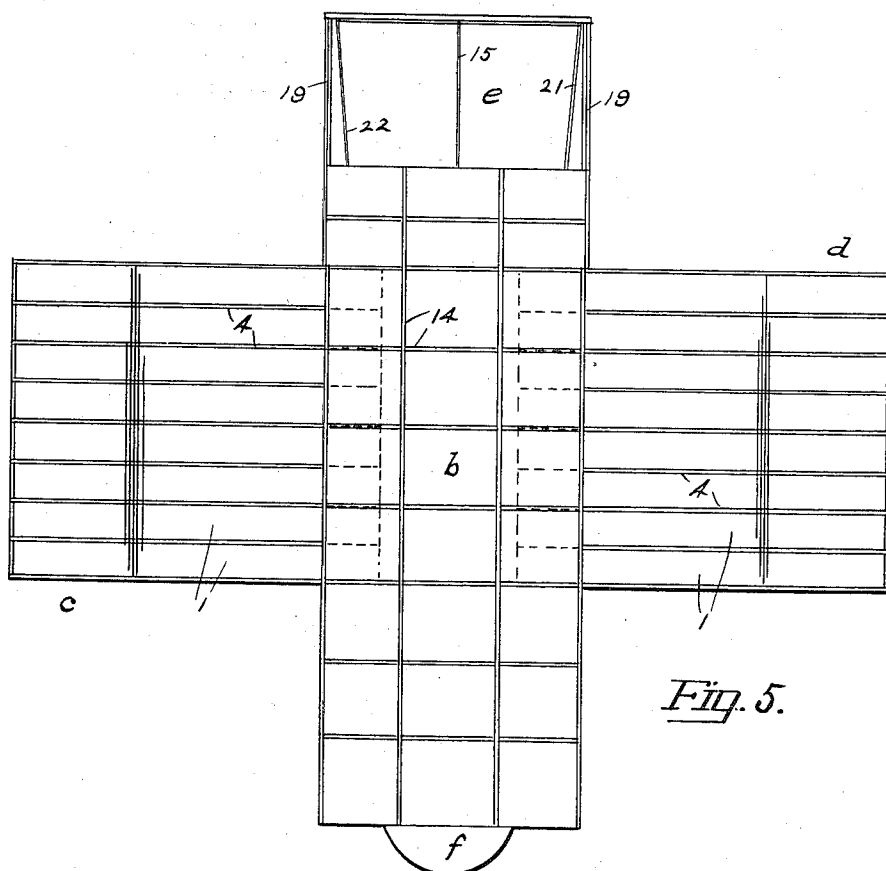


Fig. 5.

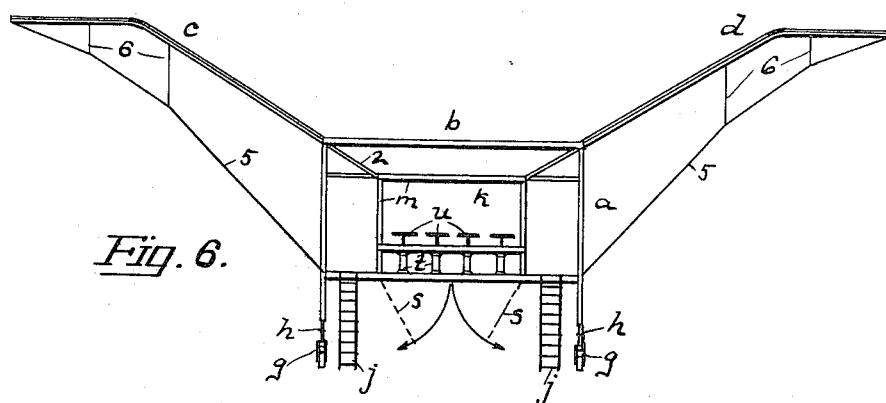


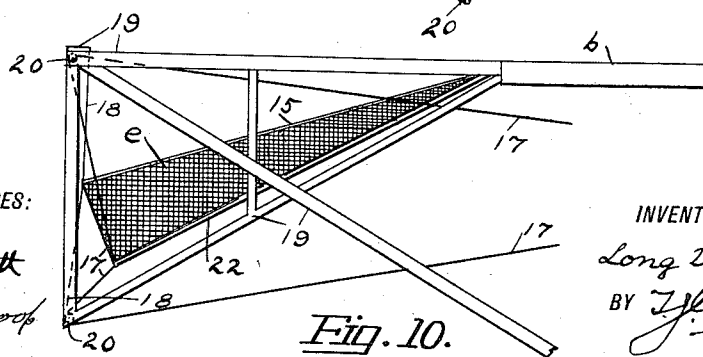
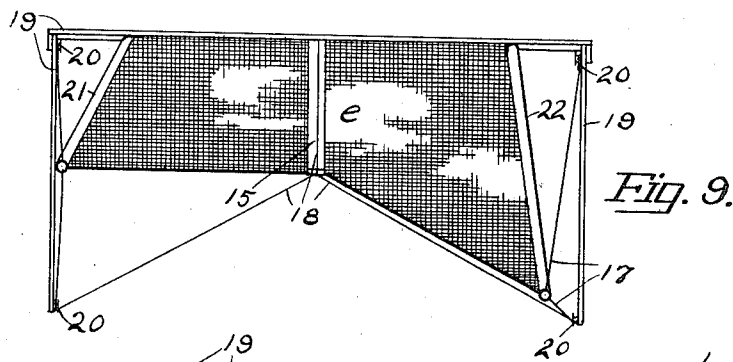
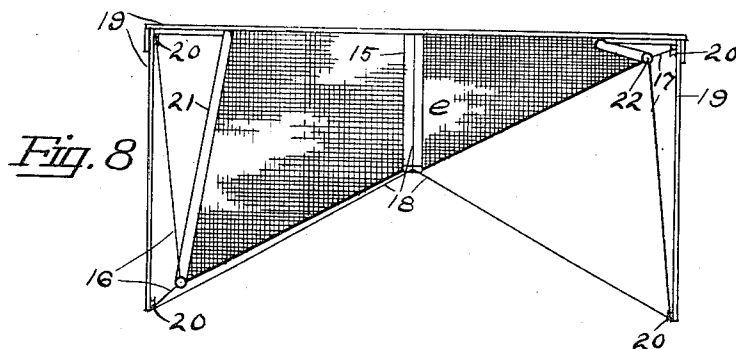
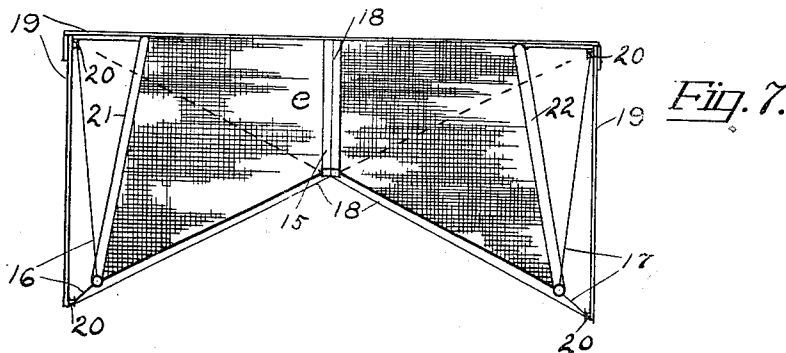
Fig. 6.

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UNITED STATES PATENT OFFICE.

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1,044,997.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed July 8, 1912. Serial No. 708,390.

To all whom it may concern:

Be it known that I, LONG DAN, a citizen of the Republic of China, and a resident of Portland, county of Multnomah, State of Oregon, have invented a new and useful Improvement in Aeroplanes, of which the following is a specification.

This invention relates to aeroplanes of the single or monoplane type, in which the main plane is shaped to form a modified dihedral angle and one of the main objects of this invention is to provide protection in case of the failure of the propelling power.

A further object of my invention is to simplify the balance control, and provide integral, longitudinal and lateral balancing means; and it is also the object of my invention to so construct the framework of the planes as to give maximum rigidity with minimum weight.

In the accompanying drawings: Figure 1 is a perspective view of my aeroplane as it appears in flight; Fig. 2 is a perspective view of the fabric cabin of my aeroplane, showing the doors opened; Fig. 3 is a perspective view of one of the joints between the ribs and crosspieces of the wing; Fig. 4 is a section of a rib showing the cross-piece and loop for the guy wire; Fig. 5 is a plan view of my aeroplane; Fig. 6 is a front elevation; Figs. 7, 8 and 9 are rear elevations, and Fig. 10 is a side elevation of the tail plane.

My aeroplane comprises a body, *a*, and main plane *b*, two wing planes *c* and *d*, a movable tail plane *e*, and an elevating plane *f*. When on the ground the body, *a*, is supported on wheel trucks, *g*, *g*, and springs, as *h*, *h*, are interposed between the trucks *g* and the body *a*. Access is had to the deck, *i*, by means of rope ladders *j*, *j*.

Centrally located on the deck, *i*, is a cabin *k*, constructed of fabric supported by a frame *m*. The cabin *k* is provided with closable entrances or doors *o*. The covers, *p*, of such entrances are actuated by cords *q*, running over suitable pulley wheels *r*. Beneath the deck of the cabin *k* are a plurality of hinged doors, *s*, *s*, made of fabric stretched on suitable frames, which may swing down, as shown in dotted lines in Fig. 6, in the direction indicated by the arrows. When the doors, *s*, *s*, are opened and the doors *p* are closed, the cabin *k* forms a parachute which will tend to retard the too rapid drop of the aeroplane should the engine stop; and when in motion the doors, *s*, form

a supplementary plane. A series of spools, *t*, having hand wheels, *u*, are provided to control the doors *s* and *p*, as well as the movable tail plane *e*, elevating plane *f*, and a suitable rudder (not shown); ropes being fastened to the spools *t* and to the part operated thereby, as at *f'* in Fig. 1, the other rope connections being omitted for clearness. The propellers *v* are mounted at the rear of the deck *i* and are driven by any suitable engine, not shown.

The side wings, *c* and *d*, are made of fabric and stretched on a frame comprising ribs 2, crosspieces 3 and the fabric being secured thereto by strips 4. The wings are attached to the body, *a*, by the ribs 2 which extend through the side members of the main plane *b* and are anchored in the upper members of the cabin frame *m*. The wings, *c* and *d*, are further braced by the guy wires 5, each wire having one or more lateral stays 6. Said wires are attached to the body as at the deck line and both wires and stays are made fast to the wings by means of the loop 7, shown in Figs. 3 and 4. Said loop 7 is pendent from a plate 8 beneath the crosspiece 3. The plate 8 forms a portion of the joint between the ribs 2 and crosspiece 3, the joint being completed by an inverted U-shaped strap 9 passing over the rib 2; the strap 9 and plate 8 being fastened through the crosspiece by the pins 10. A pin 11 passing through the strip 4, fabric 1, strap 9, rib 2, crosspiece 3 and plate 8 binds the whole together; and similar pins, 12, 12, passing through the strip 4, fabric 1, and rib 2, retain the fabric in place. A plurality of similar strips 14 retain the fabric of the main plane in place.

The tail plane, *e*, is hinged to the rear end of the main plane *b* and supported partly by a strut 15 and partly by the cords, 16, 17, see Figs. 7, 8, 9 and 10. The strut 15 is held rigidly in place by the guy wires 18 which extend from the projecting end of the strut to the frame 19. A series of pulley-wheels 20 mounted on said frame 19 support the control cords 16, 17, and the latter are made fast to the side members 21, 22 of the plane *e*, being actuated by the hand wheels, *u*, of the spools *t*, see Figs. 1 and 6.

When positioned as shown in Fig. 7, the outer ends of the side members 21 and 22 have been lowered by drawing in the lower cords and letting out the upper cords, and the tail plane tends to elevate the rear of

the aeroplane. When positioned as shown in dotted lines, the outer ends of the side members 21 and 22 have been elevated by drawing in on the upper cords, thus the tail plane tends to depress the rear of the aeroplane. The above described positions are assumed when maintaining the longitudinal equilibrium, and when changing altitude, as by depressing the tail plane the bow is raised and the aeroplane climbs to a higher level.

When positioned as shown in Fig. 8, the left side tends to elevate and the right side tends to depress, thus without affecting the longitudinal balance, tilting the aeroplane to one side. This position is assumed by raising the side member 22 and lowering the side member 21, and when reversed the tendency will be to tilt to the other side, thus controlling the lateral balance, and incidentally assisting the rudder.

When both lateral and longitudinal balance is to be effected at the same time, only one side of the tail plane *e* is actuated. Thus, as shown in Fig. 9, the side member 22 is lowered by paying out on the upper and drawing in on the lower cord, with the effect of raising the rear and right side of the aeroplane. By reversing the movement of the cord 17, the rear and right side will both be depressed, and a similar effect is brought about on the other side by actuating the cord 16.

I claim:

1. In an aeroplane, in combination with the main plane, an adjustable tail plane, hinged to the rear of the main plane, com-

prising a frame and two movable sections, divided longitudinally by a rigid frame member, the outer edges of each section being independently movable, and cords attached to each section, whereby when either section is moved independently both the lateral and longitudinal balance will be affected, when both sections are moved in the same direction the longitudinal balance only will be affected, and when both sections are moved in opposite directions the lateral balance only will be affected.

2. In an aeroplane, in combination with the deck, a safety device comprising a frame and fabric covering the frame, thereby enclosing a space on the deck, closable entrances in the sides of the fabric inclosure, and doors in the deck within said fabric inclosure, whereby when the doors are opened the aeroplane is transformed into a parachute.

3. In an aeroplane, wings extending diagonally, upwardly and outwardly, thence horizontally outward from the main plane and comprising a frame consisting of ribs and crosspieces, a fabric covering such frame and strips fastened through the fabric to the ribs, the whole clamped together at the joint formed by the intersecting ribs and crosspieces by two plates and a series of pins, one plate provided with a pendent loop adapted to hold the guy wire.

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