

APPLICATION FILED SEPT. 22, 1911.

Patented Mar. 26, 1912.

4 SHEETS--SHEET 1.



WITNESSES
J. P. Gephman,
Ralph C. Evert.

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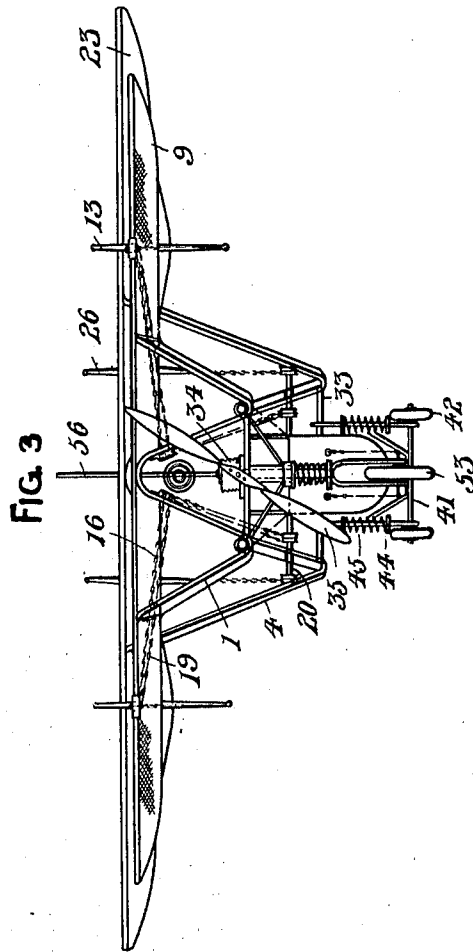
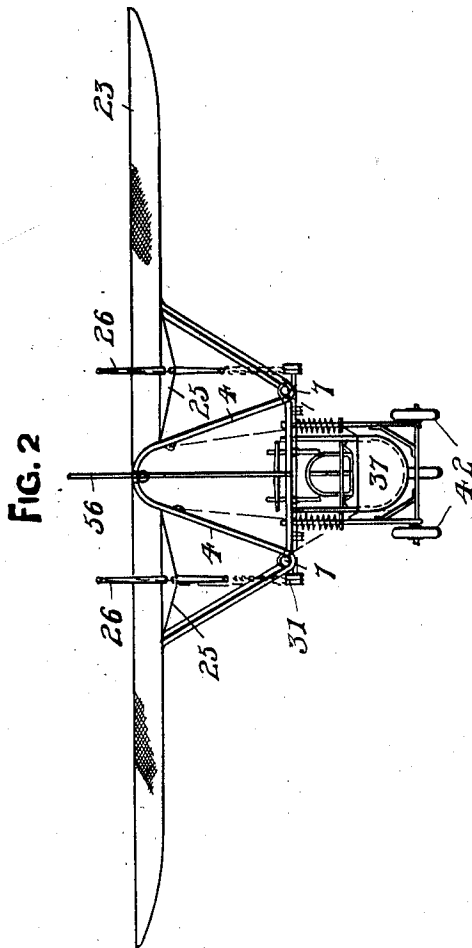
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AEROPLANE.
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1,021,129.

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4 SHEETS—SHEET 2.



WITNESSES

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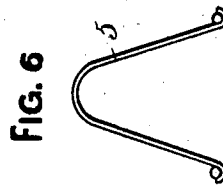
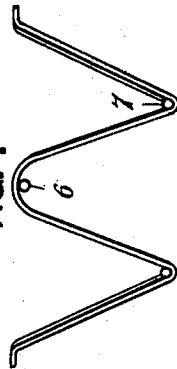
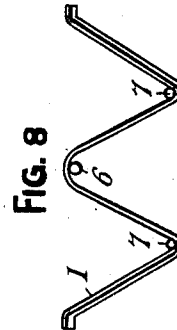
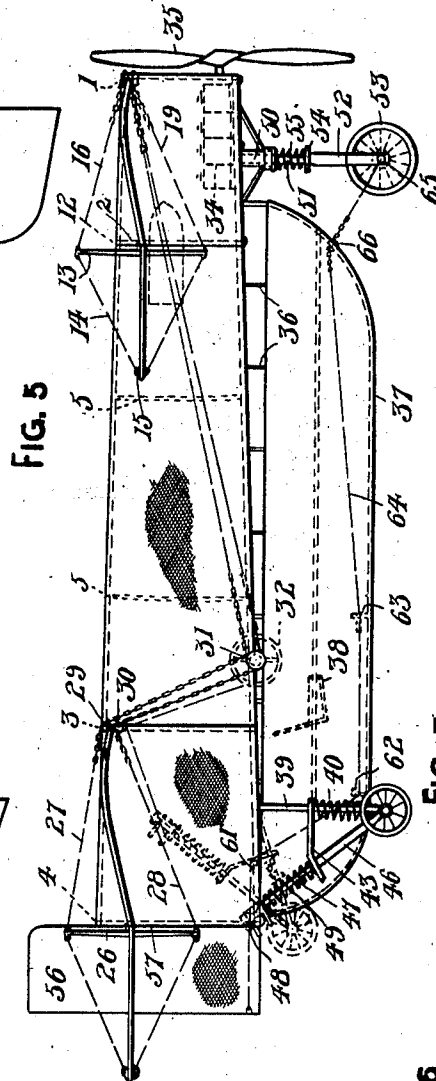
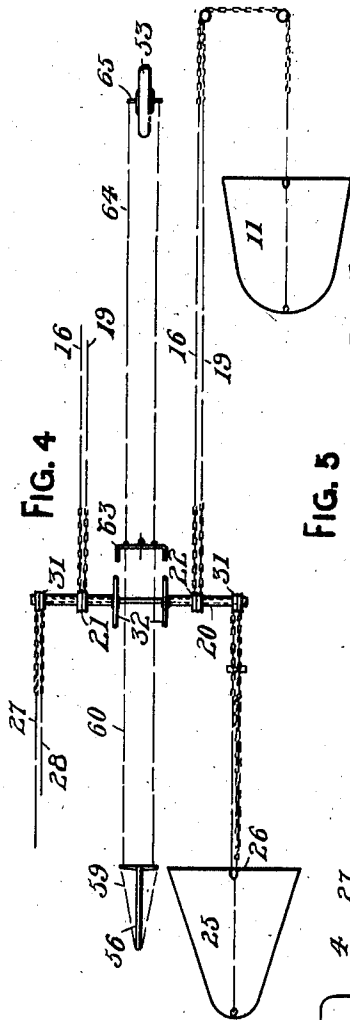
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4 SHEETS—SHEET 3.



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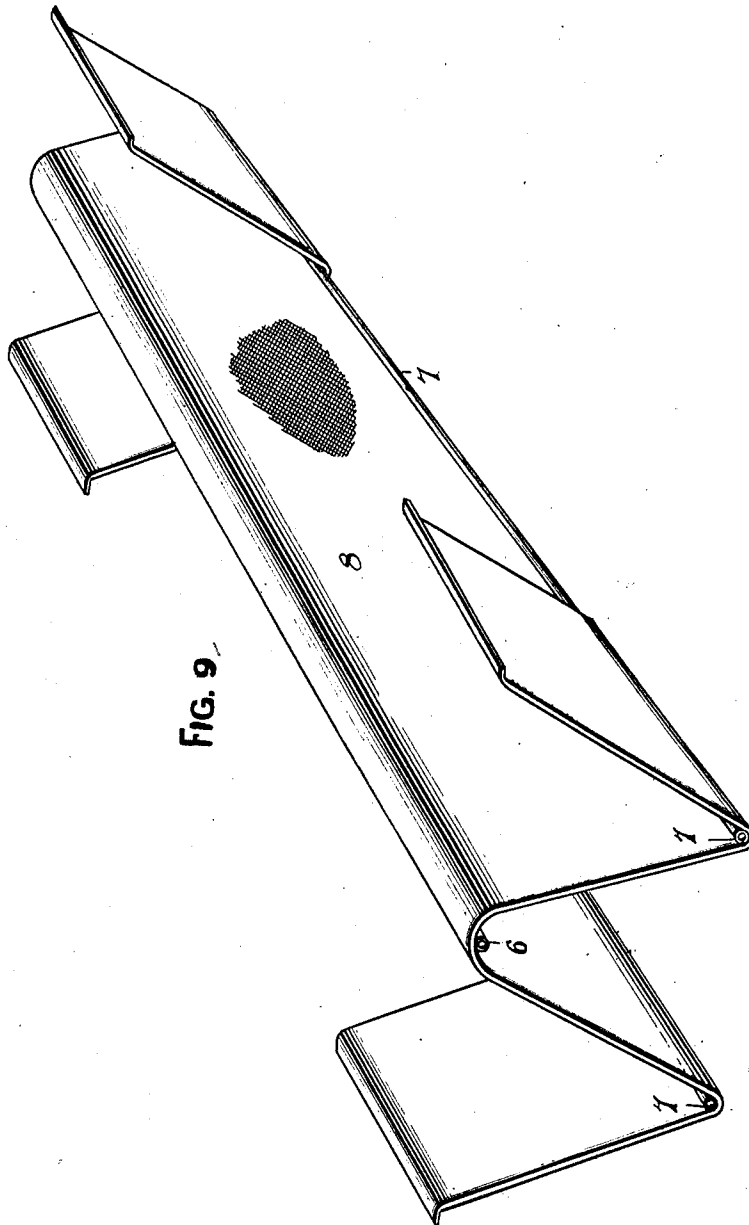
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4 SHEETS—SHEET 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

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AEROPLANE.

1,021,129.

Specification of Letters Patent.

Patented Mar. 26, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM A. BREWER, a citizen of the United States of America, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to aeroplanes, and my invention aims to provide:—First, an air craft having steering planes independent of the sustaining planes, whereby it will not be necessary to move or warp the main sustaining planes to steer or guide the air craft. Second, an air craft having a body that offers the least resistance possible to air when in flight. Third, a body or frame work that is rigid and durable, thereby insuring stability when in flight or when landing. Fourth, an air craft having a boat shaped sub-structure that facilitates the landing upon water, the safety of the aviator, and the ascent or flight of the air craft. Fifth, a steering mechanism for aeroplanes that is easy to operate and highly efficient for the purposes for which it is intended. Sixth, an adjustable starting gear for air crafts that can be swung to a position to facilitate the ascent of the craft from a body of water.

The invention further aims to accomplish the above results by a combination of mechanical elements that will be hereinafter specifically described and then claimed.

Reference will now be had to the drawings wherein like numerals denote corresponding parts throughout the several views in which:—

Figure 1 is a plan of the aeroplane. Fig. 2 is a rear view of the same. Fig. 3 is a front view of the machine. Fig. 4 is a diagrammatic plan of the steering mechanism. Fig. 5 is a side elevation of the aeroplane. Fig. 6 is an elevation of an intermediate frame. Fig. 7 a similar view of the rear frame. Fig. 8 a similar view of a front frame. Fig. 9 a perspective view of a cover or inclosure for the frames, shown in Figs. 6 to 8 inclusive.

The reference numerals 1 and 2 denote W shaped front frames, 3 and 4 similarly shaped rear frames, and 5 inverted V shaped intermediate frames. The front frames 1 and 2 are smaller than the intermediate as well as the rear frames, and said front, rear

and intermediate frames are connected by longitudinal rods 6 and 7, thereby forming a skeleton body portion or frame that tapers from the rear end thereof to the forward end. The skeleton frame is provided with a cover 8 that is inverted V shaped intermediate the ends thereof and W shaped at the ends. The cover can be made of canvas, light and durable sheet metal or other material, and suitably secured to the frames and the rods.

The front frames 1 and 2 are provided with a transverse plane frame 9 that is suitably connected to the upper edges of the frames 1 and 2, these plane frames supporting covers or sheets 10 made of silk or other light and durable material. The front planes are slightly curved, as best shown in Fig. 5, and the rear edge of the front plane, at each side of the body of the air craft, is provided with sub-planes 11. These sub-planes are constructed similar to ordinary planes and said sub-planes are pivotally connected, as at 12, to the rear edge of the main plane, whereby the rear or free ends of the sub-planes can be raised or lowered. To accomplish this movement of the sub-planes, each sub-plane has the hinged edge thereof provided with a vertical mast that extends above and below the sub-plane. The ends of the mast are connected by cables 14 to the rear end of the sub-plane, as at 15. The ends of the mast are also connected to cables 16 and 19 that extend over sheaves or pulleys 17 and 18, carried by the forward edge of the main plane frame 9. The sheaves 17 are in longitudinal alignment with the axes of a sub-plane and the sheaves 18 are located at the forward end of the skeleton frame of the craft, whereby the cables 16 and 19 can extend rearwardly between the intermediate frames 5 of the air craft. The rods 7, adjacent to the rear end of the air craft, supports a transverse revoluble steering shaft 20 and mounted upon this shaft are drums 21 and 22 to which the cables 16 and 19 are connected. The cables 16 are connected to the drums whereby they will wind upon said drums while the cables 19 unwind, or vice versa, the cables 16 and 19 being maintained taut, whereby a movement of the shaft 20 will elevate or lower the sub-planes.

The cables attached to the drum 21 operate the reverse of the cables which are attached to the drum 22 without interfering

with each other. The shaft 20 is a tube or sleeve formed of two sections having a shaft extending therethrough, the latter providing a spindle on which the sections of the shaft 20 turn, and by such an arrangement the sub-planes upon one side may be elevated and the sub-planes on the other side lowered, at the same time permitting of the craft being steered to right or left, or the sub-planes elevated or lowered at the same time. The sub-planes, however, can be maintained in a horizontal position whereby the craft will be approximately horizontal when moving in a straight line.

The tops of the rear frames 3 and 4 support a rear stationary plane 23 that is constructed similar to the plane 9, but of a larger size, whereby the rear end of the craft will be sustained and the craft properly balanced. The rear stationary plane 23 is slightly curved and hinged or pivotally connected to the rear edge thereof, as at 24, are rear sub-planes 25. These sub-planes are somewhat similar to the forward sub-planes 11, but they are arranged closer together in order to move through a strata of air that is out of alinement with the forward sub-plane. In arranging the sub-planes 25 closer together, the rear sub-planes and the forward sub-planes, upon one side of the craft can more readily cooperate in steering the machine to the right or left, as with the rear sub-plane closer to the longitudinal axis of the craft a sharper curve or elevation can be made by the air craft. The rear sub-planes 23 have mast 26 and cables 27 and 28 arranged similar to the mast 13 and the cables 16 and 19 of the forward sub-planes. The cables 27 and 28 pass over sheaves 29 and 30, carried by the forward edge of the rear main plane 23. The cables 27 and 28 are attached to drums 31 mounted upon the shaft 20, and said cables are adapted to wind and unwind upon the drum similar to the cables 16 and 19 upon the drums 21 and 22.

The shaft 20 is preferably made in two sections with the sections of the shaft independently supported by the rods 7, whereby one end of the shaft can be rotated and the opposite end of the shaft in the other direction. For instance, the sub-planes upon one side of the air craft can be lowered while the sub-planes upon the opposite side can be elevated. To facilitate the movements of the shaft 20, the inner ends of the sections are provided with large hand wheels 32 and these hand wheels are in proximity to the aviator's seat, as will hereinafter appear.

The longitudinal rods 7 throughout the length of the air craft are connected by transverse rods 33 and said rods at the forward end of the craft support an engine 34 or other source of power for driving a propeller 35 located in front of the air craft and in the longitudinal axis of said craft.

The engine 34 is of an ordinary and well known type, common to many aeroplanes or monoplanes and said engine can be controlled by a suitable mechanism extending in proximity to the aviator's seat.

Suspended from the rods 33 by hangers 36 is a boat-shaped body 37 having a suitable frame-work covered with waterproof material, as especially prepared silk, canvas or other light and durable material. The boat-shaped body 37 is of a sufficient size to accommodate passengers or matter to be transported, and adjacent to the rear end of the body there is an aviator's seat 38 in proximity to the shaft 20.

Pivotally connected to one of the rods 33, contiguous to the rear end of the air craft, there are depending guides 39 for posts 40, carried by an axle 41 provided with wheels 42. The posts 40 are movably mounted within the guides 39 and the lower ends of said guides are provided with rearwardly extending arms 43. The posts 40 are provided with collars 44 and encircling said posts between the arms 43 and the collars 44 are coiled compression springs 45. The axle 41 has rearwardly extending inclined guides 46 having the upper ends thereof connected to the arms 43. In the guides 45 are arranged rods 47 and the upper ends of said rods are provided with yokes 48 to engage over one of the rods 33. Encircling the rods 47, between the yokes 48 and the arms 43, are coiled compression springs 49. The yokes 43 are constructed and arranged whereby they can be easily shifted out of engagement with the rod 33, when it is desired to swing the axle 41 above the bottom of the boat-shaped body 37. The axle 41 and the elements just described constitute a rear truck for the air craft when upon land, and should the air craft land in a body of water, the rear truck can be swung upwardly to facilitate the ascent of the craft from the body of water.

The rods 33, at the forward end of the air craft, support a depending guide 50 for the stem 51 of a wheel bearing 52, said bearing revolubly supporting a wheel 53 adapted to cooperate with the wheels 42 when the air craft is upon land. The wheel bearing 52 has a collar 54 and encircling the stem 51, between the collar 54 and the lower end of the guide 50, is a coiled compression spring 55. This spring cooperates with the springs 45 and 49 in cushioning the air craft when landing.

The air craft is equipped with a rudder 56 and this rudder is located between the rear subplanes 25. The rudder 56 is of a greater depth than the rear end of the main frame and said rudder is hinged or otherwise connected to the frame, as at 57. The rudder has a cross head 58 connected by cables 59 to the rear edge of the rudder. The cross

head has the ends thereof connected to cables 60 that extend over sheaves 61 downwardly into the boat body 37. The cables pass under sheaves 62 to a pivoted foot rest 5 63. The foot rest is connected by cables 64 to the ends of the axle 65 of the wheel 53, said cables passing over sheaves 66 arranged in the forward end of the boat body 37. The aviator upon the seat 38 can easily shift 10 the rudder 56 or the wheel 53, said wheel serving functionally as a rudder when the air craft is upon a body of water.

From the foregoing it will be observed that the particular shape of the aeroplane 15 frame or body prevents the craft from skidding to the right or left, the shape of the body also insuring a proper balance of the machine when in flight. What weight there is in the boat body 37 is directly upon the 20 center line of the machine. I attach considerable importance to the forward and rear frames of the aeroplane, as these frames present a greater area at the upper ends thereof than at the lower ends and it is to 25 the upper ends that the main sustaining planes are attached. The shape of the body cooperates with these planes in preventing the air craft from turning turtle, and should control be lost of the aeroplane when 30 at a considerable height, the aeroplane will glide to earth in a graceful manner without injuring the occupant of the aeroplane or damaging the machine.

*The shape of the forward and rear frames 35 provides four openings beneath the main sustaining planes, and it is these openings that reduce head resistance to a minimum and prevents the craft from turning turtle when a gust of wind is encountered.

40 The boat body 35 of the air craft serves functionally as a hydro-plane when ascending from a body of water and the trucks are constructed to cushion the air craft when alighting or when traveling over irregular 45 ground.

What I claim is:—

1. An air craft comprising front and rear W-shaped frames, intermediate inverted V-shaped frames, longitudinal rods connecting 50 said frames, sustaining planes supported by said front and rear frames, and sub-planes carried by the rear edges of said sustaining planes.

2. An air craft comprising front and rear 55 W-shaped frames, intermediate inverted V-shaped frames, longitudinal rods connecting said frames, sustaining planes supported by said front and rear frames, sub-planes carried by the rear edges of said sustaining 60 planes, trucks arranged below said front and rear planes, and a boat-shaped body suspended beneath said front, rear and intermediate frames.

3. An aeroplane comprising front and rear 65 W-shaped frames, intermediate inverted V-

shaped frames, longitudinal rods connecting all of said frames, main sustaining planes carried by said front and rear frames, adjustable sub-planes carried by the rear edges of said main planes, means located 70 adjacent to said rear frames for adjusting said sub-planes, a boat-shaped body suspended below said intermediate frames, a rudder carried by said rear planes, and means arranged in said body for adjusting 75 said rudder.

4. An aeroplane comprising front and rear W-shaped frames, intermediate inverted V-shaped frames, longitudinal rods 80 connecting said frames, curved main sustaining planes mounted upon said front and rear frames, adjustable sub-planes carried by the rear edges of said main sustaining planes, a boat shaped body suspended beneath said intermediate frames, means at the 85 upper edge of said body for adjusting said sub-planes, a rudder carried by one of said rear frames, means extending into the bottom of said body for adjusting said rudder, trucks carried by said forward and rear 90 frames, means supported by said trucks for cushioning said forward and rear frames, and means carried by said forward frames for propelling said aeroplanes.

5. An aeroplane comprising a frame in- 95 cluding W-shaped end portions and a V-shaped intermediate portion.

6. An aeroplane comprising a frame including W-shaped end portions and an inverted V-shaped intermediate portion, said 100 frame gradually tapering from the front to the rear thereof.

7. An aeroplane comprising front and rear planes arranged in parallelism, said rear plane of greater length and width than 105 said front plane, a pair of rearwardly extending sub-planes pivotally connected to the rear edge of each of said front and rear planes, the sub-planes connected to the front plane being a greater distance apart than 110 the distance between the sub-planes carried by the rear planes.

8. An aeroplane comprising front and rear planes arranged in parallelism, said rear 115 plane of greater length and width than said front plane, a pair of rearwardly extending sub-planes pivotally connected to the rear edge of each of said front and rear planes, the sub-planes connected to the front plane being a greater distance apart than the distance 120 between the sub-planes carried by the rear planes, and means for operating the sub-planes simultaneously.

9. An aeroplane comprising a frame having a W-shaped front, a W-shaped rear and 125 an inverted V-shaped intermediate portion extending from the front to the rear, said W-shaped ends of said frames providing V-shaped openings at each side of the front and rear, said V-shaped openings extending 130

longitudinally for a portion of the length of said frame, planes mounted and secured upon the tops of the W-shaped end portions of said frame.

- 5 10. An aeroplane comprising a frame having a W-shaped front, a W-shaped rear and an inverted V-shaped intermediate portion extending from the front to the rear, said W-shaped ends of said frames provid-
10 ing V-shaped openings at each side of the front and rear, said V-shaped openings extending longitudinally for a portion of the length of said frame, planes mounted and secured upon the top of the W-shaped rear
15 end portions of said frame, and a pair of sub-planes secured to the rear edge of each of said planes.

11. An aeroplane comprising a frame including W-shaped end portions and an inverted V-shaped intermediate portion, said
20 frame gradually tapering from front to rear, sustaining planes mounted upon the tops of said W-shaped end portions and in

connection with the said end portions providing longitudinally extending air passages 25 to cause the machine to settle on an even keel when the machine is lowering.

12. An aeroplane comprising a frame including W-shaped end portions and an inverted V-shaped intermediate portion, said 30 frame gradually tapering from front to rear, sustaining planes mounted upon the tops of said W-shaped end portions and in connection with the said end portions providing longitudinally extending air passages 35 to cause the machine to settle on an even keel when the machine is lowering, and a pair of sub-planes pivotally connected to the rear edge of each of said sustaining planes.

In testimony whereof I affix my signature 40 in the presence of two witnesses.

WILLIAM A. BREWER.

Witnesses:

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CHRISTINA T. HOOD.