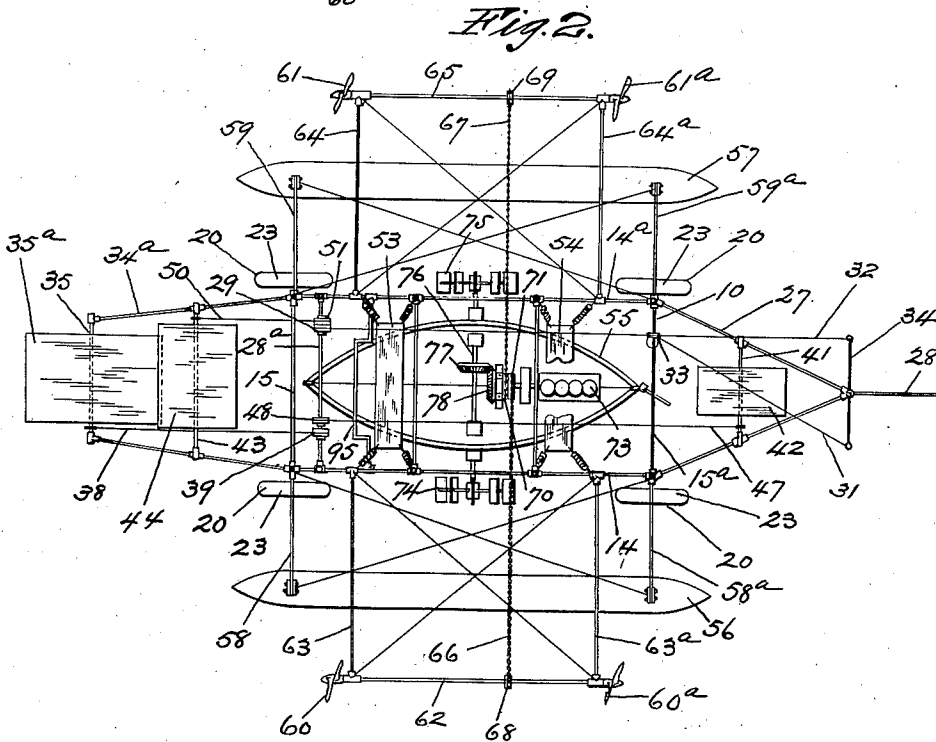
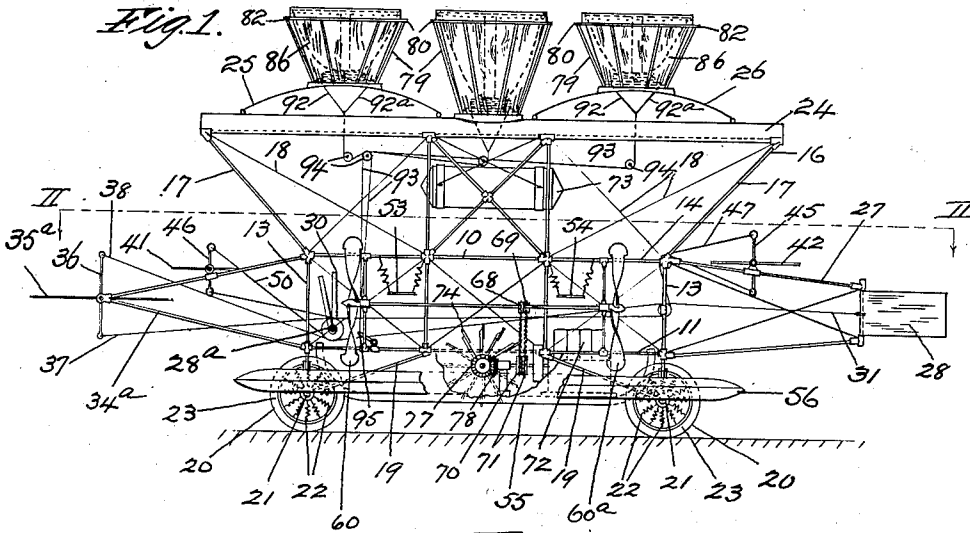


D. HACKER.
FLYING MACHINE.
APPLICATION FILED JULY 25, 1912.

1,041,781.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 1.



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By his Attorney
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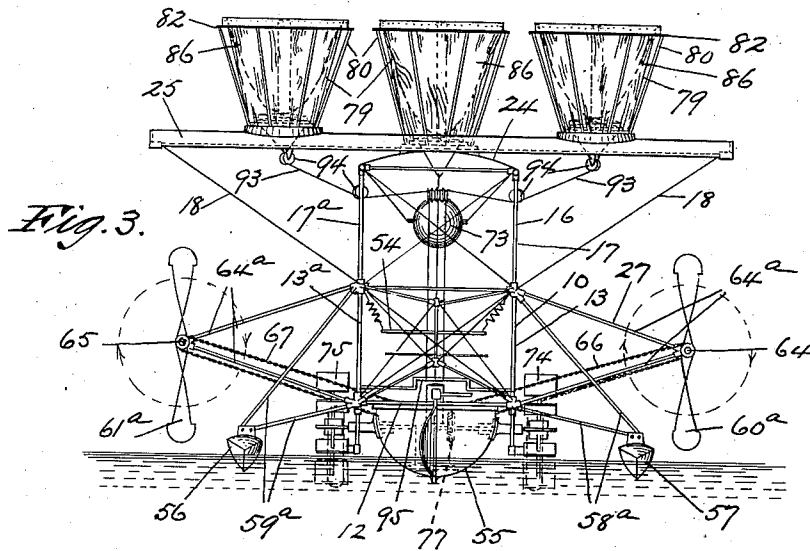
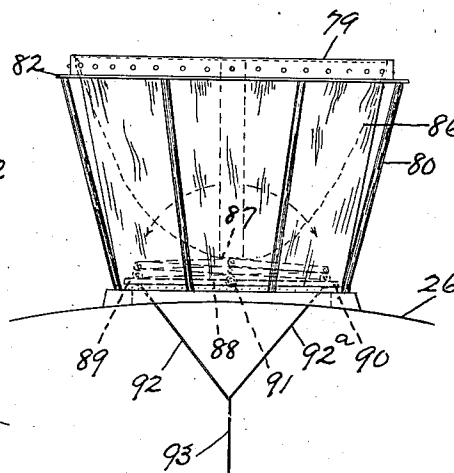
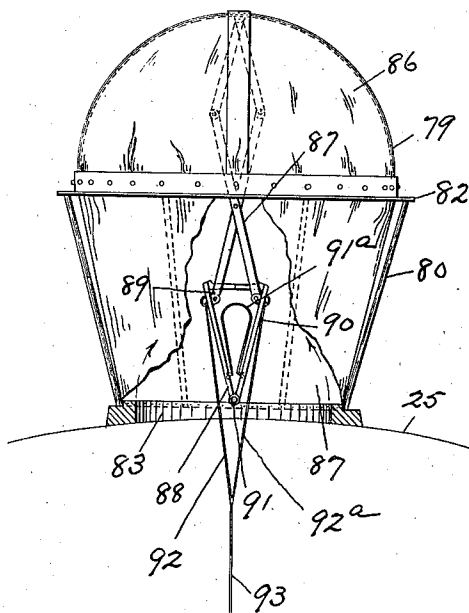


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID HACKER, OF NEW YORK, N. Y.

FLYING-MACHINE.

1,041,781.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed July 25, 1912. Serial No. 711,542.

To all whom it may concern:

Be it known that I, DAVID HACKER, a subject of the Emperor of Austria-Hungary, and a resident of New York, borough of Brooklyn, county of Kings, and State of New York, have invented a certain new and useful Improvement in Flying-Machines, of which the following is a full, clear, and exact specification.

This invention relates to a class of flying machines adapted to be used for transporting persons through the air, or upon the water.

My invention has for its object primarily to provide a flying machine designed to be employed either as an aeroplane, or hydroplane whereby one or more persons may be elevated to any desired height for travel through the air in various directions, and which is susceptible of being used to convey persons upon the water, if desired.

Another object of the invention is to provide a plurality of safety devices adapted to be controlled by the operator of the machine whereby in case of accident, or emergency it may be lowered to the ground, or place of safety at a slow descent, thus overcoming the danger of injuring the persons in the machine.

A still further object of the invention is to provide a light and strong flying machine which is adapted to have the propelling parts thereof operated by a suitable engine, motor, or the like.

With these and other objects in view, the invention will be hereinafter more particularly described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out in the claims at the end of the description.

In the drawing, Figure 1 is a side elevation of one form of flying machine embodying my invention. Fig. 2 is a top plan thereof with the upper planes and superposed frame removed therefrom, this view being taken on section line II—II of Fig. 1. Fig. 3 is a rear end view of the machine. Fig. 4 is an elevation of one of the safety devices employed in conjunction with the machine, and Fig. 5 is a fragmentary view showing the safety device when collapsed.

The body of my flying machine may be of any suitable shape, and made of any preferred material. As shown, the body 10 is substantially rectangular in form, and is composed preferably of two spaced longitudinally disposed lower rods, or bars 11, having the ends thereof connected by transverse rods, or bars 12. At spaced intervals upon each of the longitudinal rods 11 are connected the lower ends of a plurality of vertical rods, or uprights 13 and 13^a, and on the top of said vertical rods are connected longitudinal rods 14 and 14^a, and transverse rods 15 and 15^a. A superposed frame, as 16, consisting of a plurality of upwardly extending side rods, or bars 17 and 17^a, is provided upon the body 10, and said frame as well as the body of the flying machine may be strengthened by the employment of a plurality of cross-wires 18 arranged in any preferred manner.

Extending below each corner of the body 10 is a bracket 19, two of which carry an axle, and upon the ends of each axle are rotatably held wheels, as 20, which serve to permit the machine to be driven at a required speed upon the ground before its ascent in the air as is usual with flying machines of this class. The wheels 20 which I prefer to employ in conjunction with my machine are resilient in construction, and each is composed of a hub 21 to which is fastened one end of a number of radially disposed spiral springs 22 which are of sufficient tension to serve as the spokes of the wheel. Upon the opposite end of the spring spokes 22 is mounted a tire 23 which may be made of solid rubber, or inflated tubular rubber. The use of the rubber tires and spring spokes will tend to permit the wheels to resiliently receive the impact of the machine should it be lowered at times from the air to the ground with considerable force and thereby preventing damage to its structural parts.

Upon the top of the superposed frame 16 is a longitudinally disposed plane 24 which is preferably curved, as illustrated, and at the front and rear parts of the curved plane 24 is provided a transversely disposed plane, as 25 and 26, which are likewise curved. From the upper and lower parts of the rear

end of the body 10 of the machine are a number of projecting rods, or bars which converge so as to provide a bracket 27. Hinged to the free end of the bracket 27 is a rudder 28 adapted to be used for steering the machine in its forward flight, and to operate the rudder, at the forward part of the body 10 is a transverse shaft 28^a. Upon the shaft 28^a is a rotatable drum 29 upon which is mounted a lever 30 adapted to be moved backwardly, or forwardly, and to said drum is connected one of the ends of two lines, or cables 31 and 32. The lines 31 and 32 are directed through the body 28 and over a pulley 33 at the rear of said body, and the line 31 is connected to one end of a cross-rod 34 provided upon the rudder. The line 32 is guided over the pulley 33, and is fastened to the other end of the cross-rod 34. Thus when the lever 30 is moved backwardly, or forwardly by the operator of the machine the drum 29 will accordingly be rotated for moving the lines 31 and 32 so as to shift the rudder 28 to properly guide the machine.

Projecting from the upper and lower parts of the front of the body 10 of the machine are a number of rods, or bars which provide a bracket, as 34^a, and across the free end of this bracket is rotatably held a shaft 35 which carries a transversely disposed plane 25^a adapted to be operated for guiding the machine to different elevations when in the air. To direct the plane upon the desired incline, held to the shaft 35 is a vertical rod 36, and fastened to each end of said rod is a line, or cable 37 and 38. Each of the lines 37 and 38 are attached to a drum 39 which is revoluble upon the transverse shaft 28^a, and to this drum is mounted a lever which is also adapted to be manipulated by the operator of the machine for guiding the movement of the plane 32. Also serving to guide the machine to different elevations when in the air, in the brackets 27 is journaled a shaft 41 upon which is mounted a second transverse plane 42, and in the bracket 34 is journaled a shaft 43 which carries a third transverse plane 44. To each of the shafts 41 and 43 is held a vertically disposed rod 45 and 46. Fastened to the ends of the rod 45 are the ends of a line, or cable 47 having its other end connected to a drum 48 which is rotatable upon the shaft 28^a, and to this drum is held a lever adapted to be suitably adjusted by the operator of the machine. To the ends of the rod 46 is attached the ends of a line, or cable 50 the other end of which is connected to a drum 51 which is also rotatable upon the shaft 28^a, and to said drum is held a lever by which the plane 44 is adjusted by an aviator when seated upon the platform, as 53, which is preferably suspended from the top of the body 10, and to allow one or

more passengers to be carried in the machine a second platform 54 is also suspended from the top of said body.

In order to permit the machine to be used as an hydroplane upon the bottom of the body 10 is provided a boat, as 55, which is of any suitable size or shape, and serving to prevent the machine from sinking, or capsizing when in the water I provide two airtight and water-tight floats, as 56 and 57, which are disposed laterally from the sides of said body. The float 56 is supported to the body 10 by bars 58 and 58^a, and the float 57 is supported to the body by two bars 59 and 59^a.

The machine is propelled through the air by a number of propellers, as 60, 60^a and 61, 61^a. The propellers 60, 60^a, are held upon the ends of a shaft 62 journaled in bearings provided in rods, or bars 63 and 63^a projecting laterally from one side of the body 10 of the machine, and extending laterally from the opposite side of the machine are rods, or bars, 64 and 64^a having bearings in which is journaled a shaft 65 carrying the propellers 61, 61^a upon its ends. The shafts 62 and 65 are rotated through the medium of chains, or cables 66 and 67 which are guided over sprocket wheels, or pulleys 68 and 69 held upon each of said shafts, respectively, and these chains are also guided over sprocket wheels, or pulleys 70 and 71 held upon the drive shaft of a combustion engine 72, or the like which receives its supply of motive fuel from a tank, as 73, held in the frame 16.

To propel the machine when in the water as well as serving to assist in driving through the air, in conjunction with the propellers, 60, 60^a and 61, 61^a, centrally of each side of the body 10 of the machine are paddle wheels 74 and 75. The paddle wheels 74 and 75 may be of any well known type, and each of the paddle wheels is held upon the ends of a transverse shaft 76 which is journaled in bearings provided in the lower part of the body 10. Upon the shaft 76 is a bevel gear 77 which is in mesh with a bevel gear 78 held upon the drive shaft 72 of the engine 73, thus when the engine is operated the power therefrom will be transmitted to the paddle wheels in unison with the transmission of the power of the propellers.

For the purpose of permitting the machine to be lowered to the ground safely and without shock thereto particularly in event of emergency, I provide above the top of the planes 24, 25, 26, a plurality of collapsible safety devices, or parachutes, as 79, of which five are preferably employed. Each of the safety devices 79 has a circular frame, or basket 80 made of spaced bars and a ring, or band 82 connecting the upper ends of said bars. The lower ends of each of the

frames is fastened in any suitable manner to the top surface of the planes 24, 25, 26, and around the edge of an opening 83 in the longitudinal plane 24, also around the edges of two openings in the transverse plane 25, and around the edges of two openings in the transverse plane 26.

In each of the baskets or frames 80 is a bag, or parachute 86 adapted to be inflated with air, and approximately the central part of each of the bags is connected to one of said baskets. Each of the air bags 86 has an opening 87 which is in register with each of the openings of the planes, and the openings of the bags as well as its corresponding opening in the planes are adapted to be closed, or opened for admission of air into the bags by a shutter 88. Each of the shutters 88 is composed of two leaves 89 and 90 having the opposed edges thereof hinged together, as at 91, and to the leaves of each of the hinges is attached a spring, as 91^a, which serves to normally swing the leaves toward each other interiorly of each of the air bags. Interiorly of each of the air bags 86 is a collapsible element, or lazy tong 87, one end of which is connected to the inner surface of the bag, and the other end of the lazy tong is connected to the leaves of each of the shutters. Also to the free edge of each of the leaves of each of the shutters 88 is fastened one end of lines 92 and 92^a, and both of the opposite ends of these lines are connected to a line, or cable 93. The lines 93 are guided over pulleys 94 provided in the top of the superposed frame 16, and the opposite ends of these lines are attached to a transverse foot lever 95 rotatably held in the body 10 of the machine so as to be under the control of the aviator. When the machine is driven through the air the safety devices, or parachutes 79 are held in collapsed positions by the aviator holding, for instance by his feet, the lever 95 so that the lines 93 and lines 92, 92^a will be directed so that the shutters 88 will close the openings of the planes and openings of the air bags against the tension of the springs 91^a. To permit the machine to be lowered from the air at a slow speed the transverse lever 95, and the lines 92, 92^a and 93 will be released so that the tension of the springs 91^a will tend to swing the leaves 89 and 90 as well as the lazy tongs 87 in a direction to open the shutters. The bags 86 will then become inflated by the air rushing through the openings thereof, and the machine will make a gradual descent in a manner similar to the operation of an ordinary parachute.

In the foregoing description I have embodied the preferred form of my invention, but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without de-

parting from the principle, or sacrificing any of the advantages of this invention, therefore I reserve to myself the right to make such changes as fairly fall within the scope thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is revolved, a bracket extending from the front end of the body, a transverse plane movably held by the bracket, means supported within the body and serving to permit an operator to guide the plane for steering the machine to different elevations in the air, a superposed frame provided upon the body of the machine, and a plurality of planes supported upon the frame.

2. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is operated, a bracket extending from the front end of the body, two transverse planes, each movably held by the bracket, means supported within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, and

a plurality of planes supported upon the frame.

3. In a flying machine, the combination with a substantially rectangular body, of a
 5 boat held underneath the body, sets of
 brackets extending laterally from each side
 of the body, two air-tight and water-tight
 floats, each held to one of the brackets, a
 10 bracket extending from the rear end of the
 body, a rudder pivoted to the bracket,
 means provided within the body and serving
 to permit an operator to guide the rudder
 for steering the machine when in the air, an
 15 engine, sets of brackets extending laterally
 from each side of the machine, two longi-
 tudinally disposed shafts each journaled in
 one set of the brackets, four propellers, two
 being held upon the ends of each of the
 20 shafts, means adapted to impart rotation
 from the drive shaft of the engine to each
 shaft of the propellers, a transverse shaft
 journaled in the body, two paddle wheels,
 each held upon the transverse shaft, means
 25 adapted to revolve the shaft of the paddle
 wheels when the drive shaft of the engine is
 operated, a bracket extending from the
 front end of the body, a transverse plane
 movably held by the bracket, means sup-
 30 ported within the body and serving to per-
 mit an operator to guide the rudder for
 steering the machine to different elevations
 when in the air, a superposed frame pro-
 vided upon the body of the machine, and
 35 a plurality of planes supported upon the
 frame.

4. In a flying machine, the combination
 with a substantially rectangular body, of a
 40 boat held underneath the body, sets of
 brackets extending laterally from each side
 of the body, two air-tight and water-tight
 floats, each held to one of the brackets, a
 bracket extending from the rear end of
 the body, a rudder pivoted to the bracket,
 45 means provided within the body and
 serving to permit an operator to guide
 the rudder for steering the machine, an
 engine, sets of brackets extending later-
 ally from each side of the machine, two longi-
 50 tudinally disposed shafts each journaled
 in one set of the brackets, four propellers,
 two being held upon the ends of each of the
 shafts, means adapted to impart rotation
 from the drive shaft of the engine to each
 shaft of the propellers, a transverse shaft
 55 journaled in the body, two paddle wheels,
 each held upon the transverse shaft, means
 adapted to revolve the shaft of the paddle
 wheels when the drive shaft of the engine
 is operated, a bracket extending from the
 60 front end of the body, two transverse
 planes, each movably held by the bracket,
 means supported within the body and serv-
 ing to permit an operator to guide each of
 the planes for steering the machine to differ-
 65 ent elevations when in the air, a superposed

frame provided upon the body of the ma-
 chine, and a plurality of planes supported
 upon the frame.

5. In a flying machine, the combination
 with a substantially rectangular body, of a
 70 boat held underneath the body, sets of
 brackets extending laterally from each side
 of the body, two air-tight and water-tight
 floats, each held to one of the brackets, a
 75 bracket extending from the rear end of the
 body, a rudder pivoted to the bracket, means
 provided within the body and serving to
 permit an operator to guide the rudder for
 steering the machine when in the air, a
 80 transverse plane also movably held in said
 bracket, means provided within the body
 and serving to permit an operator to guide
 the machine to different elevations when in
 the air, an engine, sets of brackets extending
 85 laterally from each side of the machine, two
 longitudinally disposed shafts each jour-
 naled in one set of the brackets, four pro-
 pellers, two being held upon the ends of
 each of the shafts, means adapted to impart
 rotation from the drive shaft of the engine
 90 to each shaft of the propellers, a transverse
 shaft journaled in the body, two paddle
 wheels, each held upon the transverse shaft,
 means adapted to revolve the shaft of the
 95 paddle wheels when the drive shaft of the
 engine is operated, a bracket extending
 from the front end of the body, two trans-
 verse planes, each movably held by the
 bracket, means provided within the body
 100 and serving to permit an operator to guide
 each of the planes for steering the machine
 to different elevations when in the air, a
 superposed frame provided upon the body
 of the machine, and a plurality of planes
 105 supported upon the frame.

6. In a flying machine, the combination
 with a substantially rectangular body, of a
 110 boat held underneath the body, a bracket
 extending from the rear end of the body, a
 rudder pivoted to the bracket, means pro-
 vided within the body and serving to permit
 an operator to guide the rudder for steering
 the machine, an engine, sets of brackets ex-
 115 tending laterally from each side of the ma-
 chine, two longitudinally disposed shafts
 journaled in each set of the brackets, four
 propellers, two being held upon the ends of
 each of the shafts, means adapted to impart
 rotation from the drive shaft of the engine
 120 to each shaft of the propellers, a transverse
 shaft journaled in the body, two paddle
 wheels, each held upon the transverse shaft,
 means adapted to revolve the shaft of the
 paddle wheels when the drive shaft of the
 125 engine is revolved, a bracket extending from
 the front end of the body, a transverse plane
 movably held by the bracket, means pro-
 vided within the body and serving to per-
 130 mit an operator to guide the plane for steer-
 ing the machine to different elevations when

in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame, and a plurality of collapsible bags provided above the planes on top of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

7. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is driven, a bracket extending from the front end of the body, two transverse planes, each movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame, and a plurality of collapsible bags provided above the planes on top of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

8. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats, each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is driven, a bracket extending from the front end of the body, a transverse plane movably

held by the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame and a plurality of collapsible bags provided above the planes on top of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

9. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats, each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is driven, a bracket extending from the front end of the body, two transverse planes, each movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame, and plurality of collapsible bags provided above the planes on top of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

10. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats, each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, a transverse plane also movably held in said bracket means provided within the body and serving to permit an operator to guide the machine to different elevations when in the air, an engine, sets of brackets extending laterally from each side of the machine, two

longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is operated, a bracket extending from the front end of the body, two transverse planes, each movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame, and a plurality of collapsible bags provided above the planes of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

11. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats, each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two of which are held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, means adapted to be driven by the engine and serving to propel the machine when in the water, a bracket extending from the front end of the body, a transverse plane movably held by the bracket, means provided within the body and serving to permit an operator to guide the plane for steering the machine to different elevations when in the air, a plurality of planes supported above the body, and a plurality of collapsible bags provided on top of the planes above the body and adapted to be inflated with air when the machine is descending toward the ground.

12. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats, each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means pro-

vided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts journaled in each set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, means adapted to be driven by the engine and serving to propel the machine when in the water, a bracket extending from the front end of the body, two transverse planes, each movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a plurality of planes supported above the body, and a plurality of collapsible bags provided on top of the planes above the body and adapted to be inflated with air when the machine is descending toward the ground.

13. In a flying machine, the combination with a substantially rectangular body, of a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a bracket extending from the front end of the body, a transverse plane movably held by the bracket, means provided within the body and serving to permit an operator to guide the plane for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon said frame, and a plurality of collapsible bags provided on top of the planes of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

14. In a flying machine, the combination with a substantially rectangular body, of a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation

from the drive shaft of the engine to each shaft of the propellers, a bracket extending from the front end of the body, two transverse planes movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon said frame, and a plurality of collapsible bags provided on top of the planes of the superposed frame and adapted to be inflated with air when the machine is descending toward the ground.

15. In a flying machine, the combination with a substantially rectangular body, of a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a bracket extending from the front end of the body, a transverse plane movably held by the bracket, means provided within the body and serving to permit an operator to guide the plane for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame and each having an opening therethrough, a circular frame extending above each of the planes of the superposed frame, a bag held in each of the circular frames, and having an opening in register with the opening of each of the planes of the superposed frames, a collapsible shutter pivotally held in the opening of each bag, and means adapted to permit the shutters to be opened by the operator of the machine so that the bags will be inflated with air when the machine is descending toward the ground.

16. In a flying machine, the combination with a substantially rectangular body, of a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a

bracket extending from the front end of the body, two transverse planes movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported upon the frame and each having an opening therethrough, a circular frame extending above each of the planes of the superposed frame, a bag held in each of the circular frames and having an opening in register with the opening of each of the planes of the superposed frame, a collapsible shutter pivotally held in the opening of each bag, and means adapted to permit the shutters to be opened by the operator of the machine so that the bags will be inflated with air when the machine is descending toward the ground.

17. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is operated, a bracket extending from the front end of the body, a transverse plane movably held by the bracket, means provided within the body and serving to permit an operator to guide the plane for steering the machine to different elevations when in the air, a plurality of planes supported above the body and each having an opening therethrough, a circular frame extending above each of the planes of the body, a bag held in each of the circular frames and having an opening in register with the opening of each of the planes above the body, a collapsible shutter pivotally held in the opening of each bag, and means adapted to permit the shutters to be opened by the operator of the machine so that the bags will be inflated with air when the machine is descending toward the ground.

18. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to per-

mit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to remove the shaft of the paddle wheels when the drive shaft of the engine is operated, a bracket extending from the front end of the body, two transverse planes movably held by the bracket, means provided within the body and serving to permit an operator to guide each of the planes for steering the machine to different elevations when in the air, a plurality of planes supported above the body and each having an opening therethrough, a circular frame extending above each of the planes of the body, a bag held in each of the circular frames and having an opening in register with the opening of each bag, a collapsible shutter pivotally held in the opening of each bag, and means adapted to permit the shutters to be opened by the operator of the machine so that the bags will be inflated with air when the machine is descending toward the ground.

19. In a flying machine, the combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is operated, a bracket extending from the front end of the body, a transverse plane movably held by the bracket, means provided within the body and serving to permit an operator to guide the plane for steering the machine to different elevations when in the air, a superposed frame provided

upon the body of the machine, a plurality of planes supported above the frame and each having an opening therethrough, a circular frame extending above each of the planes of the body, a bag held in each of the circular frames and having an opening in register with the opening of each bag, a collapsible shutter pivotally held in the opening of each bag, and means adapted to permit the shutters to be opened by the operator of the machine so that the bags will be inflated with air when the machine is descending toward the ground.

20. In a flying machine, in combination with a substantially rectangular body, of a boat held underneath the body, sets of brackets extending laterally from each side of the body, two air-tight and water-tight floats each held to one of the brackets, a bracket extending from the rear end of the body, a rudder pivoted to the bracket, means provided within the body and serving to permit an operator to guide the rudder for steering the machine when in the air, an engine, sets of brackets extending laterally from each side of the machine, two longitudinally disposed shafts each journaled in one set of the brackets, four propellers, two being held upon the ends of each of the shafts, means adapted to impart rotation from the drive shaft of the engine to each shaft of the propellers, a transverse shaft journaled in the body, two paddle wheels, each held upon the transverse shaft, means adapted to revolve the shaft of the paddle wheels when the drive shaft of the engine is operated, a bracket extending from the front end of the body, two transverse planes movably held by the bracket, means provided within the body and serving to permit an operator to guide the planes for steering the machine to different elevations when in the air, a superposed frame provided upon the body of the machine, a plurality of planes supported above the frame, and each having an opening therethrough, a circular frame extending above each of the planes of the body, a bag held in each of the circular frames and having an opening in register with the opening of each bag, a collapsible shutter pivotally held in the opening of each bag, and means adapted to permit the shutters to be opened by the operator of the machine, so that the bag will be inflated with air when the machine is descending toward the ground.

This specification signed and witnessed 12 this twenty fourth day of July A. D. 1912.

DAVID HACKER.

Witnesses:

B. BHUBLINS,
M. DERMODY.