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(19) **United States**(12) **Patent Application Publication**  
**Im**(10) **Pub. No.: US 2010/0314498 A1**(43) **Pub. Date: Dec. 16, 2010**(54) **PERSONAL SPACECRAFT**(76) Inventor: **Sunstar Im**, Lancaster, CA (US)Correspondence Address:  
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**LANCASTER, CA 93536 (US)**(21) Appl. No.: **12/456,008**(22) Filed: **Jun. 10, 2009****Publication Classification**(51) **Int. Cl.**  
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**B64C 3/56** (2006.01)(52) **U.S. Cl. .... 244/159.3**(57) **ABSTRACT**

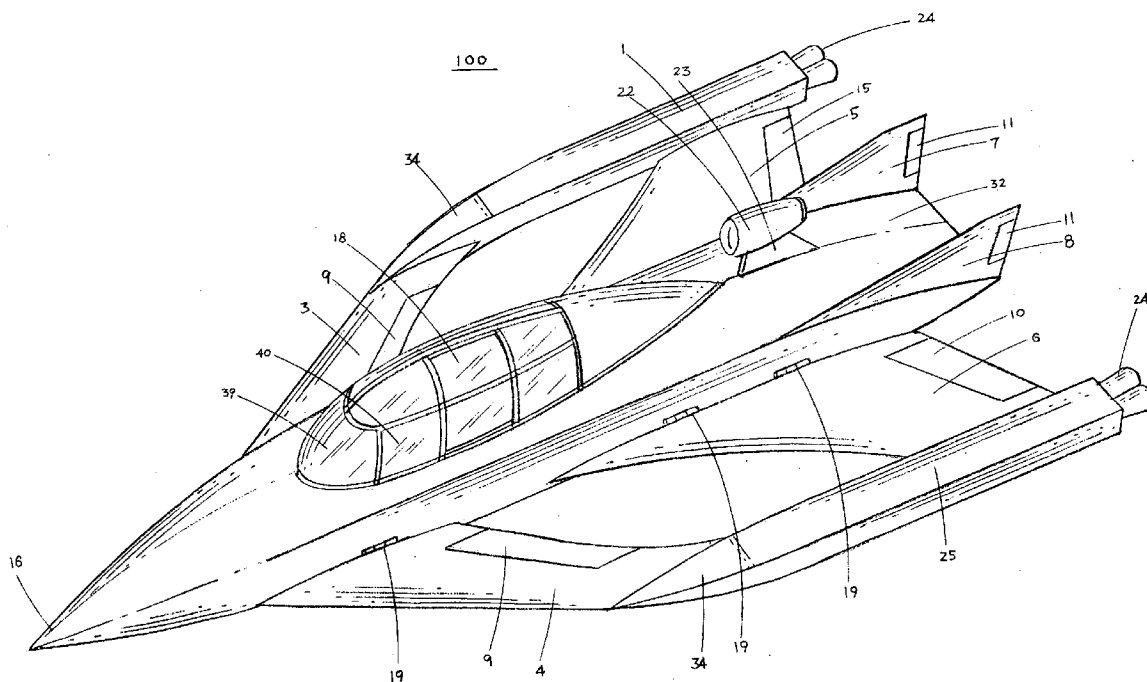
The spacecraft structure is provide, the spacecraft structure for the spacecraft includes, a center fuselage, right wing side fuselage, left wing side fuselage, front wings, and rear wings of Arch-Wings, vertical winglets, and the first levels, the fuselage has a cross-section of substantially flat floor fuselage shape, being is wide enough to provide lifting force.

The front wings of the Arch-Wings are disposed horizontally in rear portions of the fuselage the vertical winglets are disposed the top of the rear fuselage the first level disposed fuel tank storage, plurality of landing gear bays, cockpit with control panel, various avionic instruments, cabin doors.

The top of the rear fuselage disposed jet-power plants and further more at compartment of the Arch-Wings disposed rocket power plants.

The fuselage provide lifting force and the wings provides lifting force and steering force, he whole structure of spacecraft comprises carbon fiber honey comb composite molded structure which is makes the spacecraft lighter weight and shear strong.

At the front portion of wing body compartment of the Arch-Wings comprises retro rocket power plant with covered door, and under belly of the Arch-Wings disposed pontoon systems which could provide float at sea port.



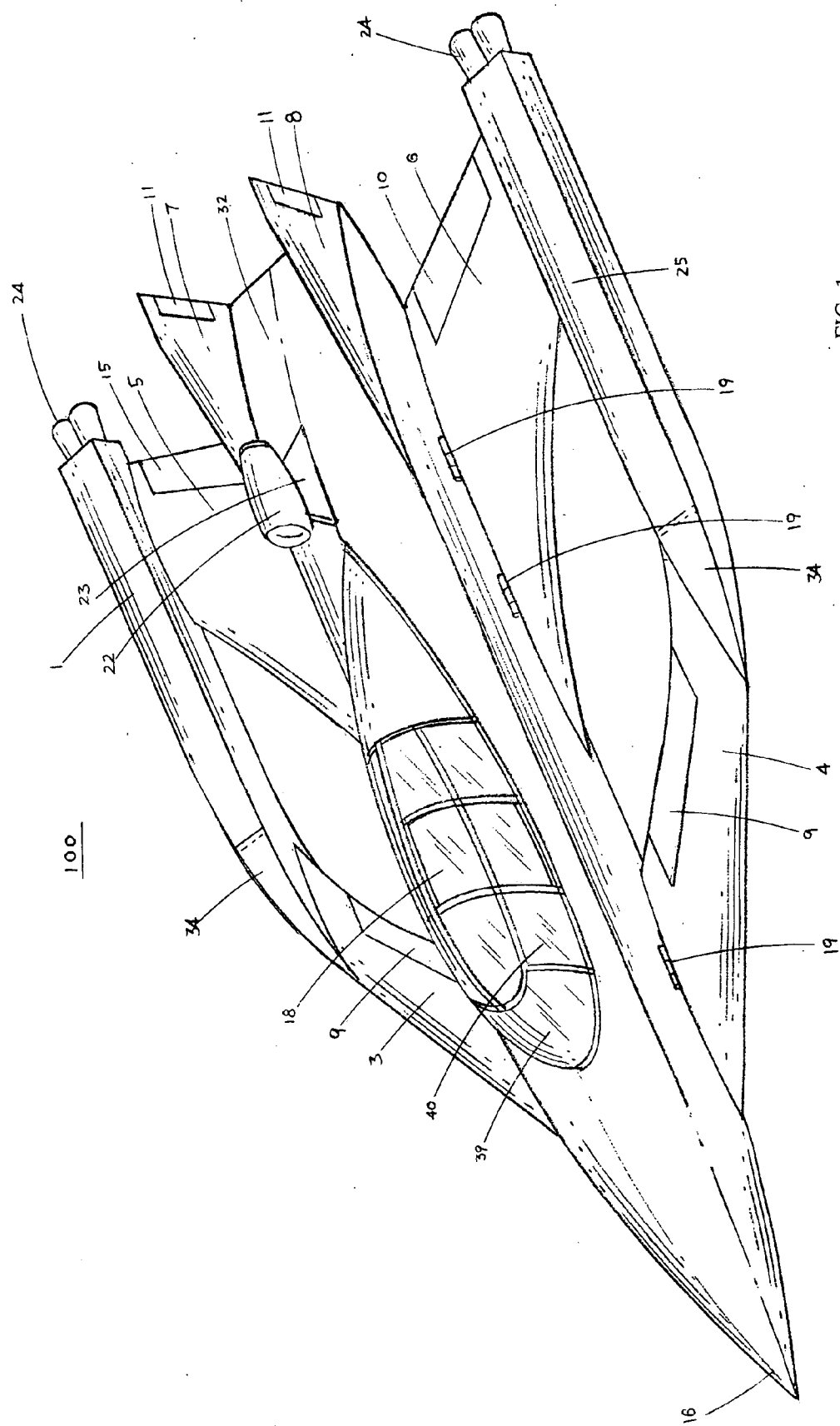


FIG 1

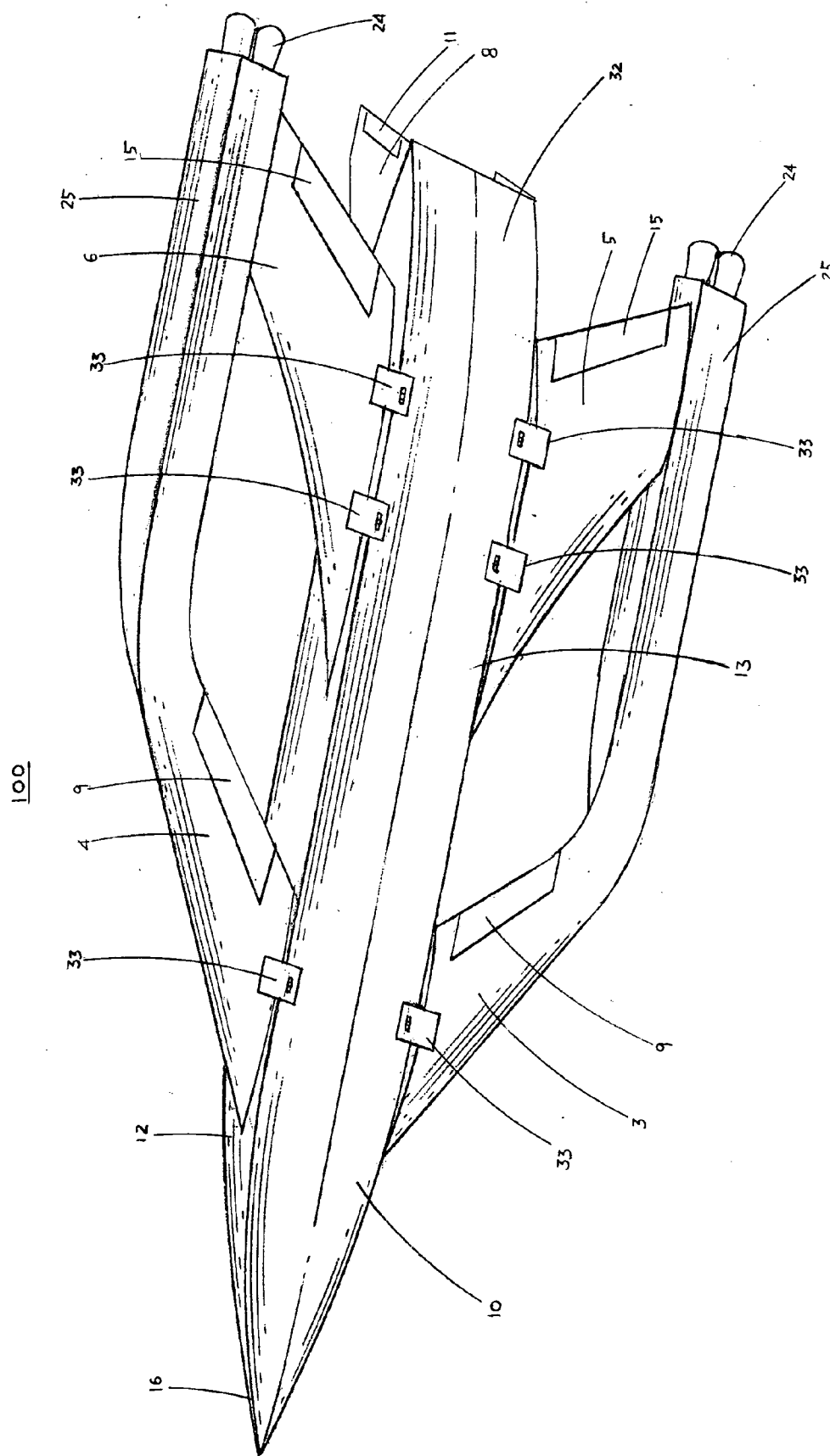


FIG 2

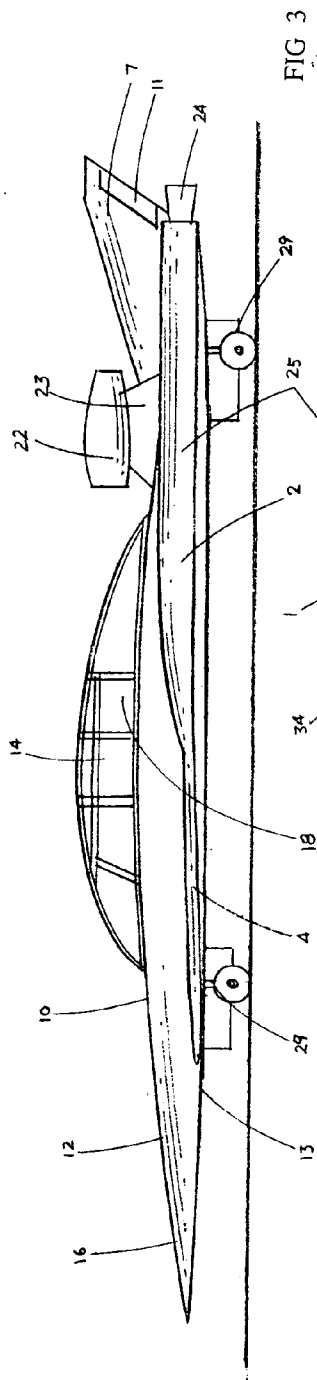


FIG 3

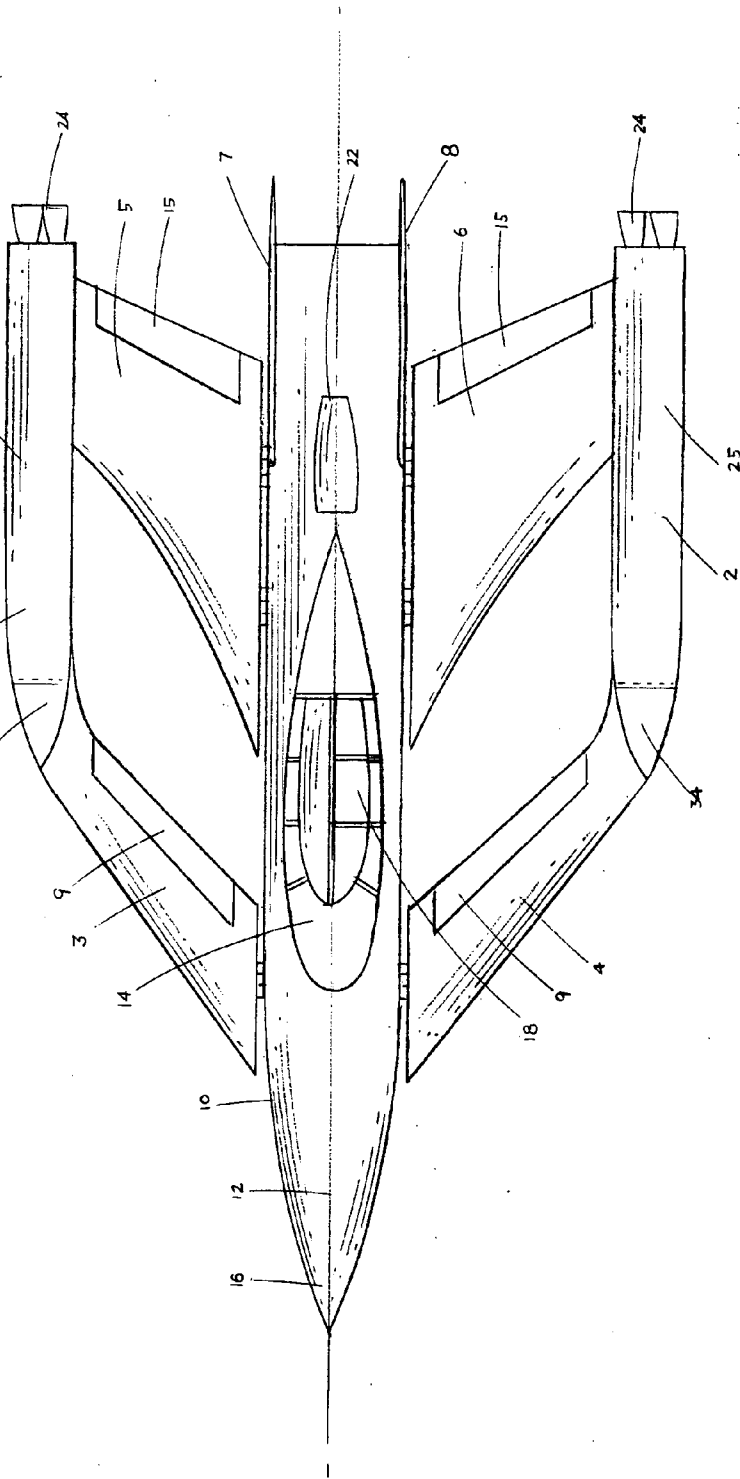


FIG 4

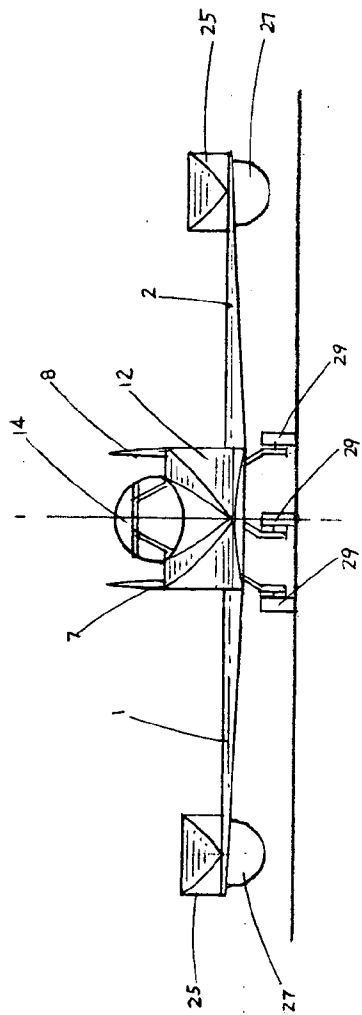


FIG 5

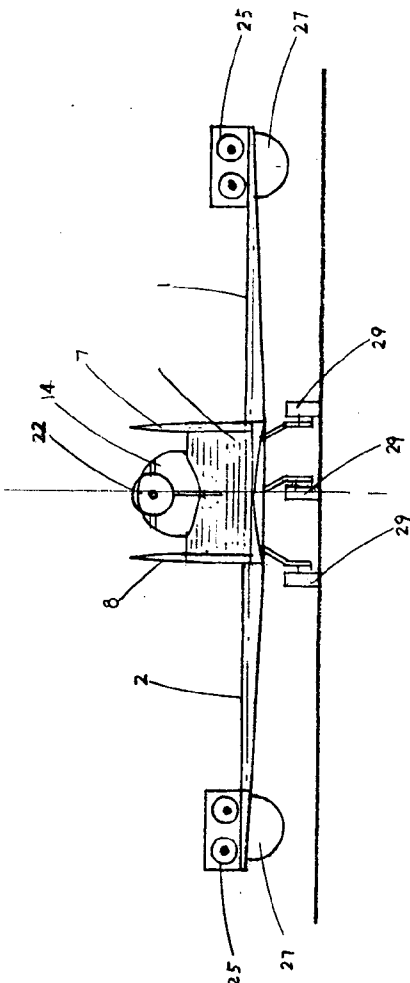
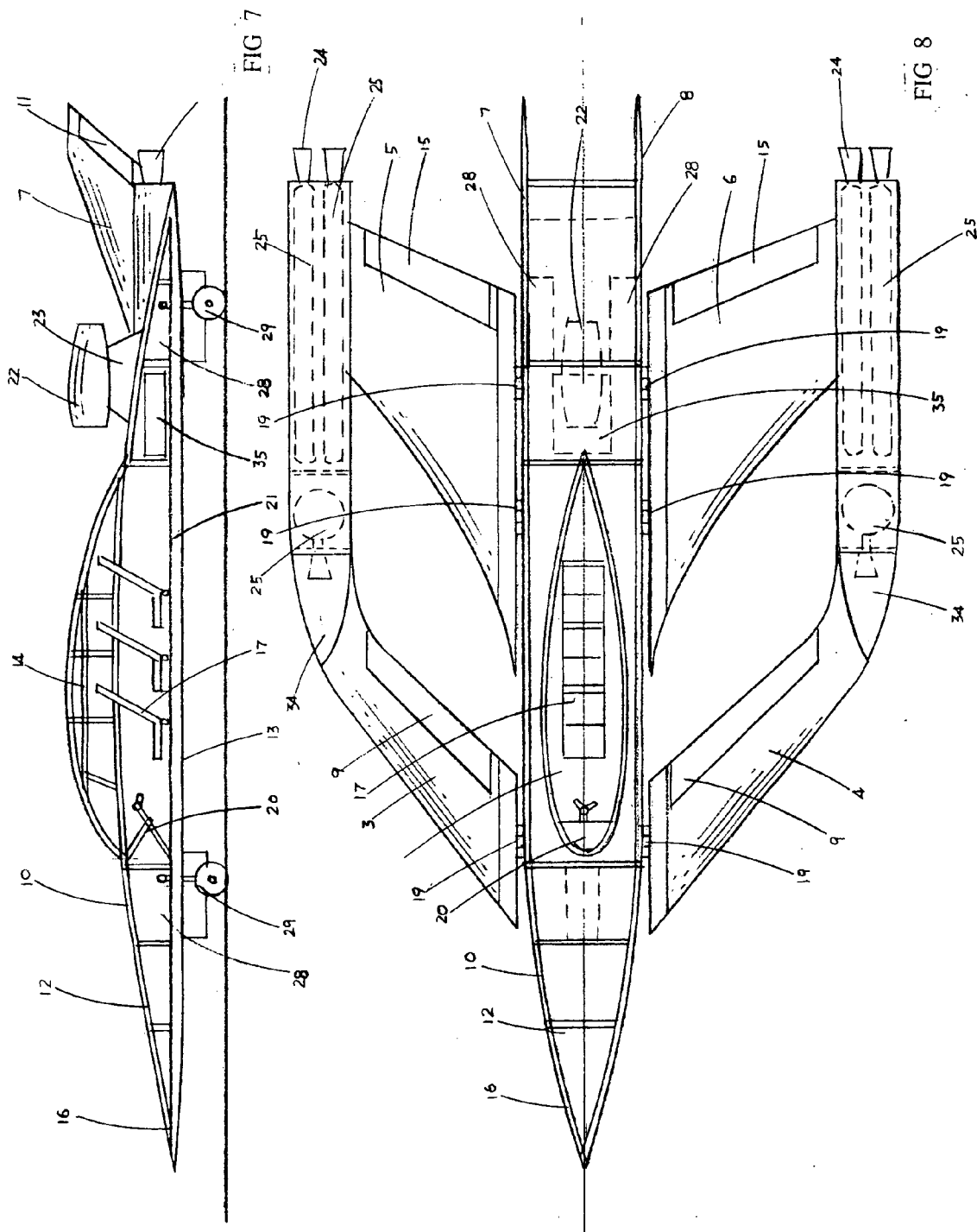
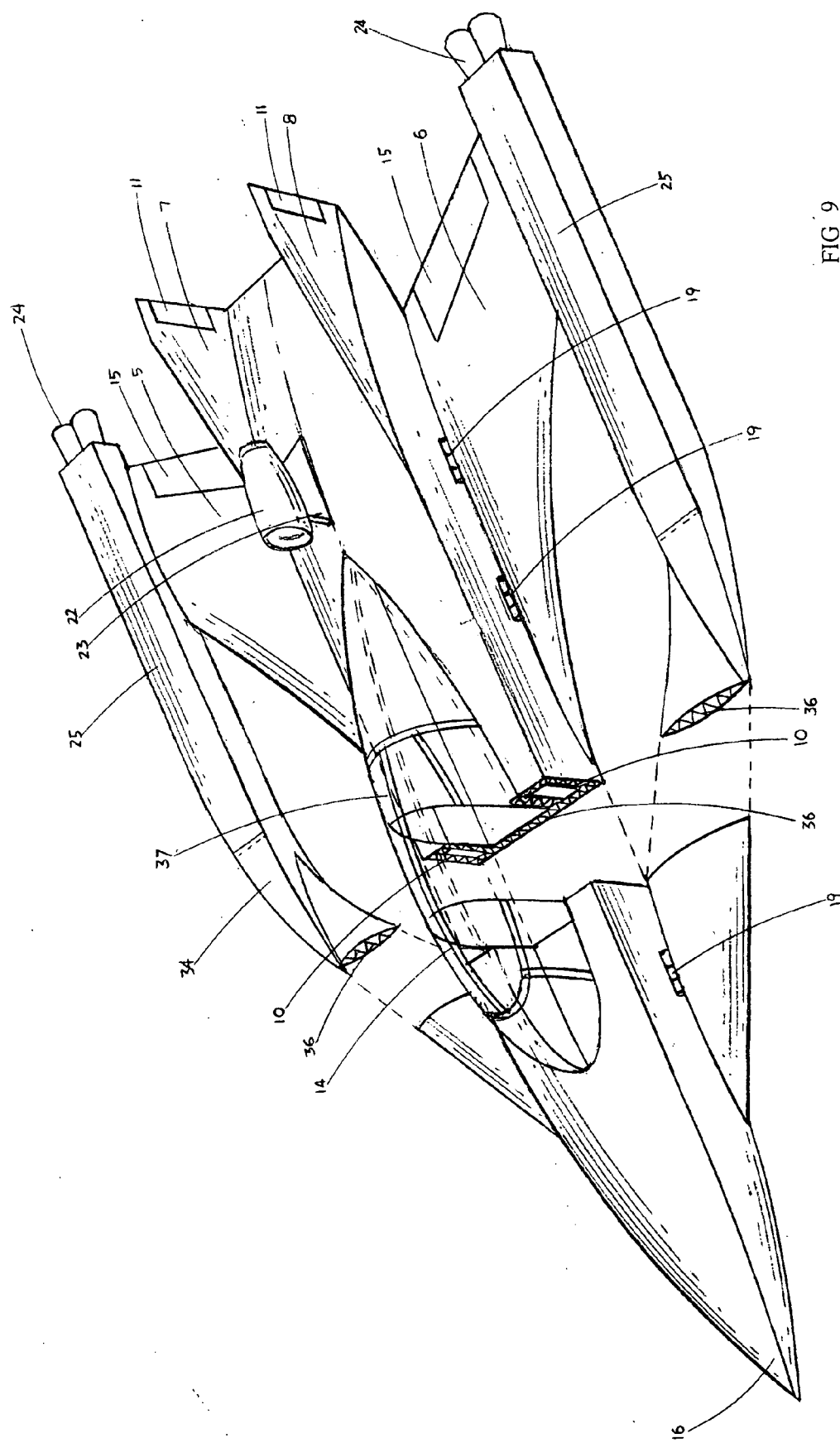
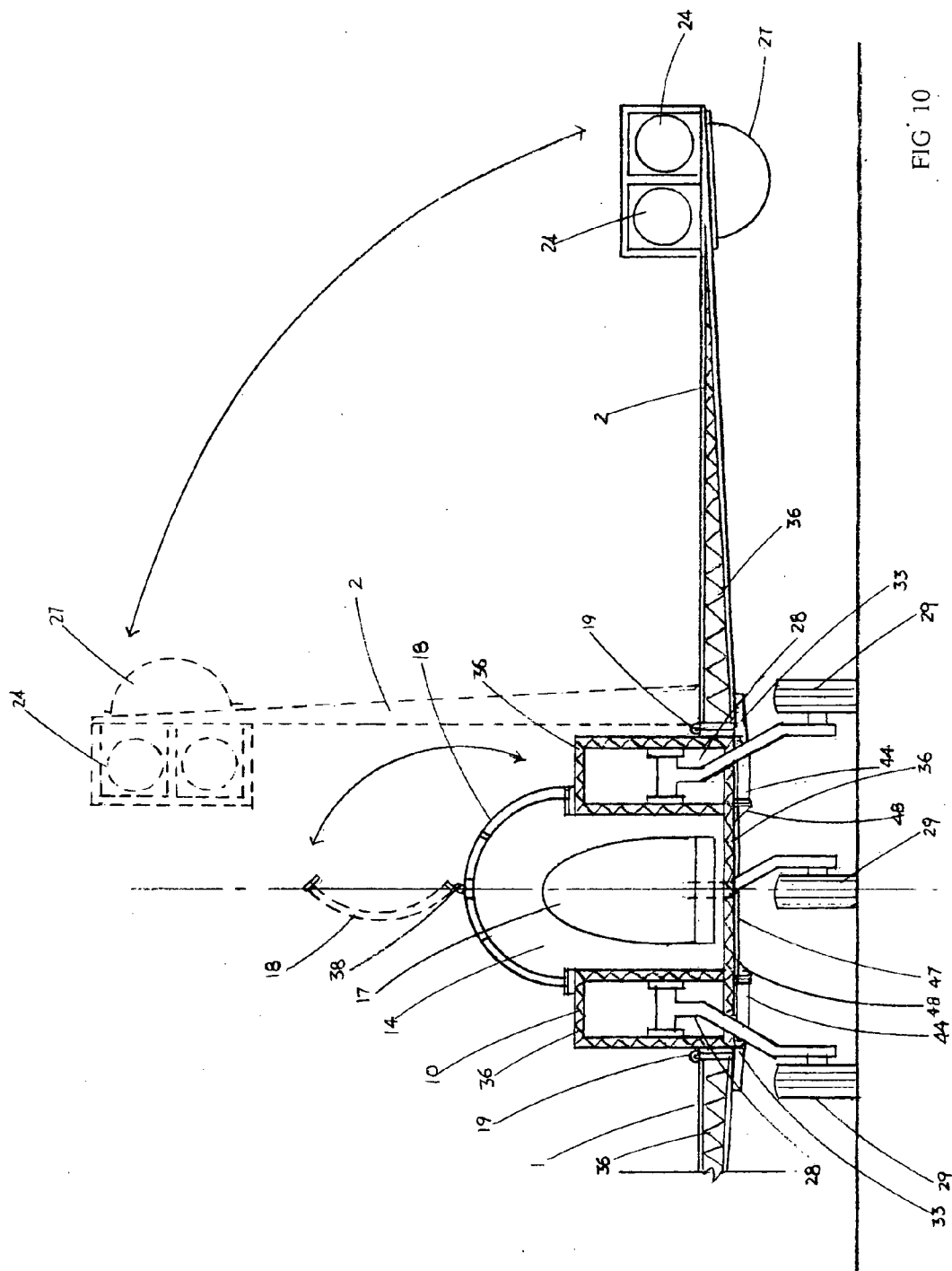


FIG 6









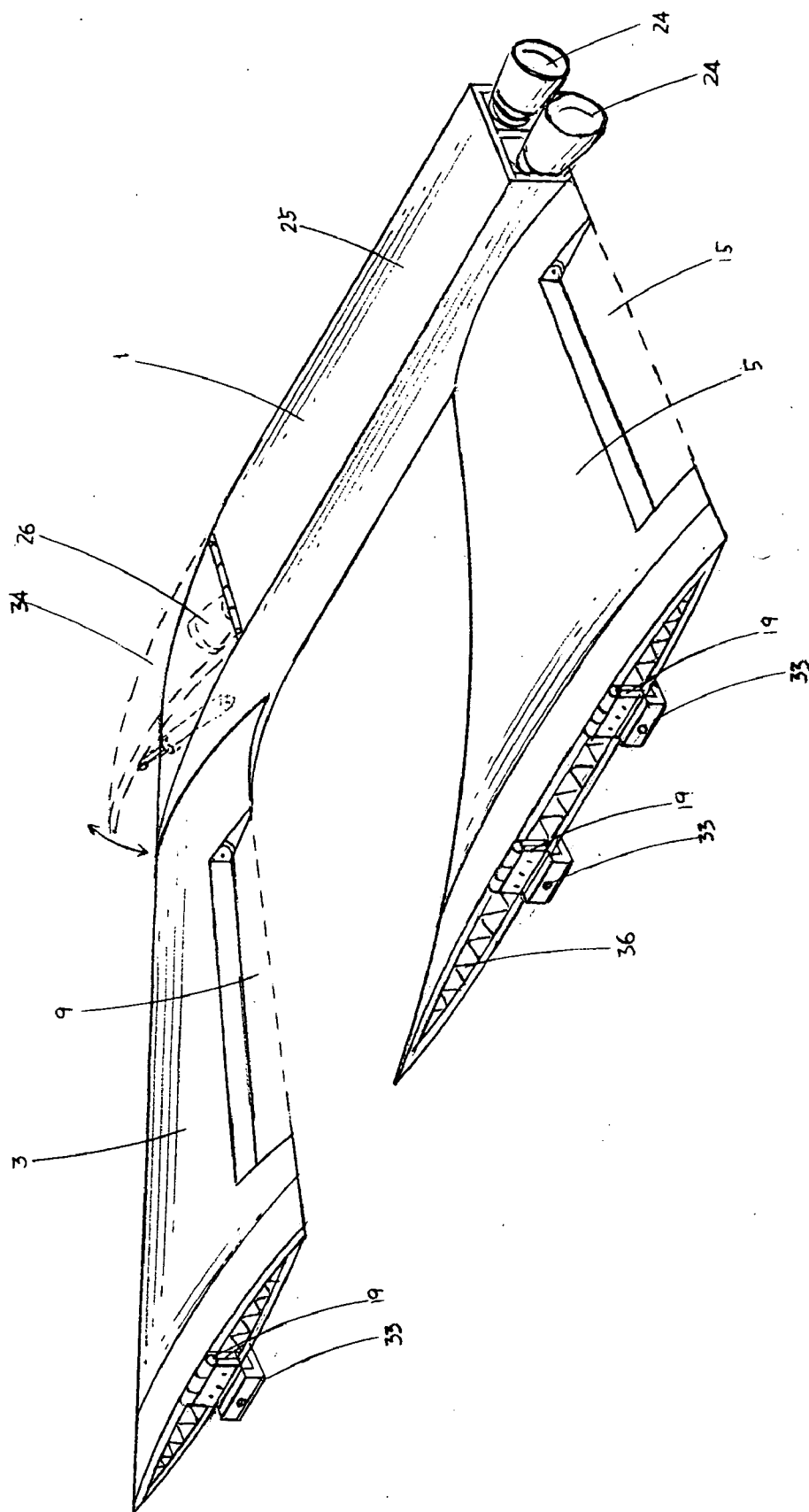
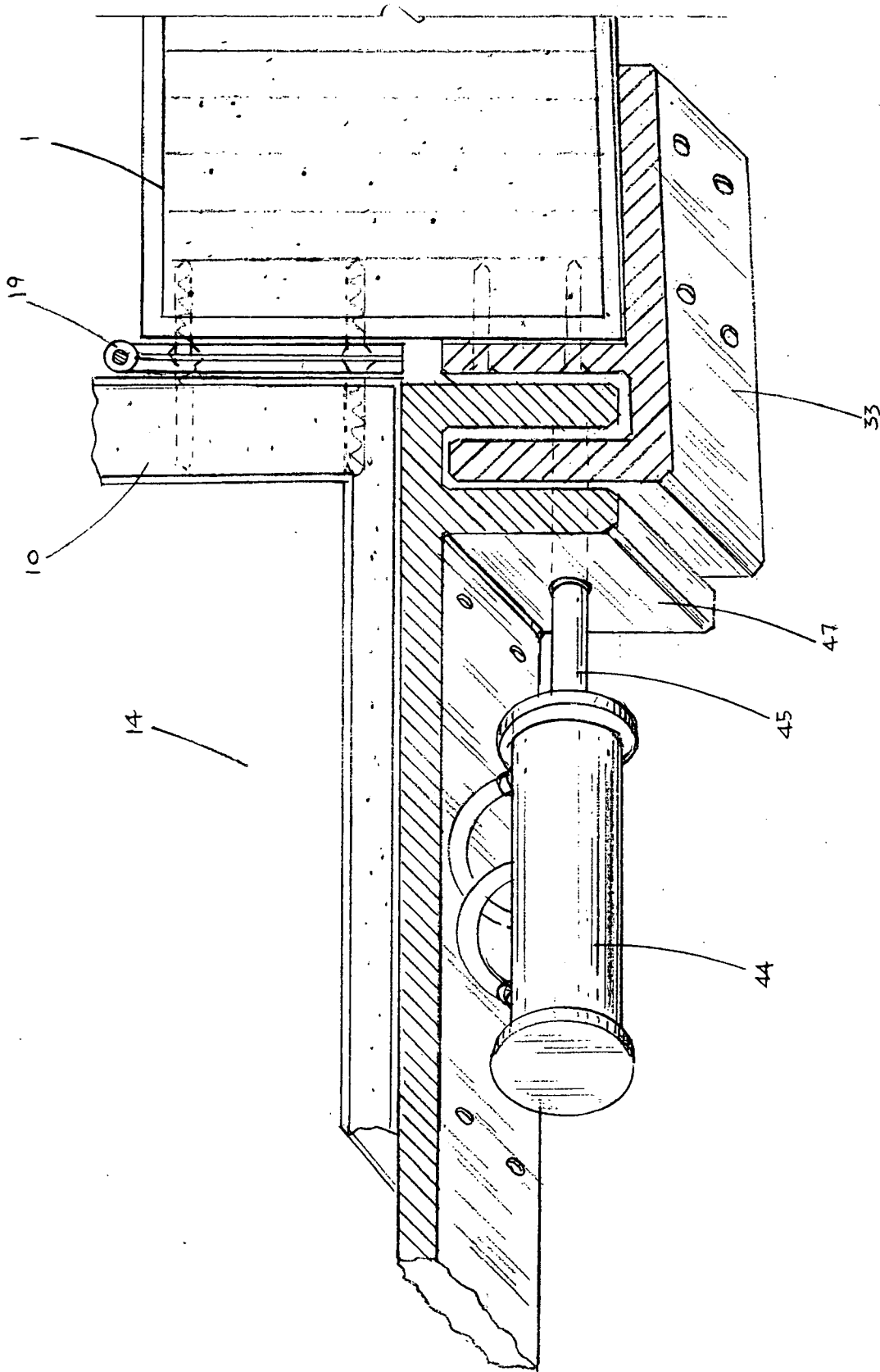


FIG. 11



## PERSONAL SPACECRAFT

### BACKGROUND OF THE INVENTION

[0001] The present invention relates to a foldable Arch-Wings spacecraft structure with multi fuselage body structure, more particularly, this invention relates to the spacecrafts structure which includes flat wide body center fuselage, right wings edge side of fuselage and left wings edge side of fuselage compartment structure. The spacecraft structure comprises three fuselage body structure integrated with right and left side Arch-wings in which lifting wings and highly controllable pitch and roll axes of the spacecraft.

[0002] The center fuselage is for carry the passengers and the flight. The right and left wings edge side of the fuselage comprises hybrid rocket engine propulsion housing compartment in which may provide solid or expandable rocket engine propulsion systems with the nozzle. The Arch-Wings are where the spacecrafts gets the lifting and control the spacecrafts pitch and roll axes. Specially at home base personal spacecrafts are hard to operate in twenty first century. In the next modern society there needs to be an advanced transportation spacecraft system that is quick, easily and economic for traveling from home to space travel.

[0003] The present invention of foldable Arch-Wings spacecraft is the best solution for future space travel from home base.

[0004] The foldable Arch-Wings spacecraft could park at home in a garage and carry by trailer to the airport. The spacecraft could travel into space and fly back to the airport then bring it home the same way and park it at own home garage with fold or unfold wings position. Specially the foldable Arch-Wings extended and connected toward the end of the rear wing structure of Arch-Wings, it is designed like arch shape of wings as solid one wing structure body could fold and unfold both wings in which could parking at home garage as sports spacecraft.

[0005] The foldable Arch-Wings to anchor at the center fuselage body structure with such kinds of spacecraft. It is the evolution of the new Arch-Wings technology in twenty first century which would contribute to the future aircraft industries bright and versatility wings development. The Arch-wings are created new breed of spacecrafts wings technology widely open for the next century air transportation field.

[0006] Prior arts included US patents;

3,065,937	3,160,366	3,204,892	3,534,924	D396685
4,047,680	4,165,058	4,735,381	4,836,479	5,125,206
5,415,365	6,666,406B2	7,195,207B2	7,287,722	

[0007] To accomplish many objectives which were not possible, it is necessary to break the fuselage and the Arch shape wing, accordingly, which need for the spacecraft structure has been present for a long time.

[0008] This invention is directed to solve these problems and satisfy the long felt need. and are configured to provide lifting force and to control flight of the spacecraft. The rocket booster of the right side Arch-Wings and left side Arch-Wings of the compartment comprises rocket power plant for the space travel capable.

[0009] The first level comprises cockpit and a plurality of passenger cabins.

[0010] The top portion of the rear fuselage comprises jet power plant to provide air power to take off from the airport to the high altitude atmosphere.

[0011] The passenger cabin may further comprises a plurality of seating system, passenger cabin may further comprises a plurality of passenger door, front window, side windows.

[0012] The two front wings disposed horizontally in front portion of the Arch-Wings and are configured to lifting power and control flight of the spacecraft.

[0013] The two rear wings disposed horizontally in rear portion of the Arch-Wings and are configured to lifting force and to control flight of the spacecraft.

[0014] The spacecraft structure may further comprises each of the two front wings and the two rear wings may comprises an elevator, each of the two front wings and two rear wings have a cross-sectional shape of lamina flow, each of two front wings and the two rear wings may comprises a plurality of carbon fiber honey comb composite molded wings. Some of the plurality of landing gear bays maybe aligned in two parallel lines in the bottom of the fuselage structure and front of landing gear bays at front portion of the bottom of the fuselage.

[0015] Each of some of the two front wings and the two rear wings may comprises one or more elevators. Each of the two vertical winglets may comprises a stabilizer.

[0016] Another aspect of the invention provide the spacecraft structure for the spacecraft

### SUMMARY OF THE INVENTION

[0017] The present invention contrives to solve the disadvantages of the prior arts, another objective of the invention is to provide the spacecraft structure.

[0018] Another objective of the invention is to provide the spacecraft structure, which includes substantially flat wide body fuselage structure.

[0019] Still another object of the invention is to provide the spacecraft structure which includes a fuselage having first level, top surface and bottom surface.

[0020] Still another object of the invention is to provide the spacecraft structure, which includes fuel tank storage and a plurality of the compartment with wall insulation for prevent thermal high heat condition.

[0021] Still another object of the invention provide the spacecraft structure which includes a foldable Arch-Wings structure which comprises carbon fiber honey comb composite structure and anchor to the lower fuselage structure body by the hinge and latch-lock unlock mechanism which foldable wings upward and downward to set the system.

[0022] An aspect of the invention provides the spacecraft structure for the spacecraft comprises a fuselage with right side Arch-Wings and left side Arch-Wings of the fuselage.

[0023] The two winglets disposed at top of the rear fuselage body.

[0024] The right side foldable Arch-Wings are disposed horizontally in right side portion of the fuselage and are configured to provide lifting force and are configured to control flight of the spacecraft.

[0025] The left side foldable Arch-wings are disposed horizontally in left portion of the fuselage comprising the fuselage having a cross-section of the substantially a flat fuselage shape in a direction of width, the fuselage being wide enough to provide lifting force wherein the fuselage comprises, first level, an upper top surface, and a lower surface, Specially

foldable Arch-Wings comprises the end of the front wings extended and connected toward the end of the rear wings structure of Arch-Wings. It is designed like arch shape of wings as solid one wing structure body could fold or unfold both wings which could parking at home garage as sports spacecraft. Also jet power and hybrid rocket engine power plants system comprises combination dual power plants. Lift off by jet power to fly the air space and hybrid rocket engine power to travel into space. The foldable Arch-Wings to anchor both side at the center fuselage body structure by the hinge and latch-lock, unlock mechanism is to provide two or more of right and left side pneumatic actuator with cylinder having piston pin to lock or unlock position into locking hole position. And need to operate actuator pins pressurized or released pressure by the pilots choose when it necessary.

The advantages of the present invention are;

[0026] 1, The spacecraft structure can provide more lifting force with the flat fuselage.

2, The foldable Arch-shape of wings structure can provide maximum lifting force.

3, The foldable Arch-Wings are highly maneuverable versatility maximum flight control of the spacecraft.

4, The foldable Arch-Wings may comprises carbon fiber honey comb composite structure lighter weight and shear strong wing structure.

5, The foldable Arch-Wings are much advantages to transportable one place to another place by trailer at road travel, just like potable spacecraft in twenty century.

6, Jet power plants and rocket power plants provide easy to lift off from the airport to the high speed travel into space.

[0027] Although the present invention is briefly summarized, the fuller understanding of the invention can be obtained by the following drawings, detailed description and appended claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0028] These other features, aspects and advantages of the present invention will become better understood with reference to the accompanying drawings wherein;

[0029] FIG. 1, is a perspective view showing the spacecraft having a structure according to an embodiment of the present invention.

[0030] FIG. 2, is a perspective bottom view of the spacecraft of FIG. 1.

[0031] FIG. 3, is a side plan view of the spacecraft of FIG. 1.

[0032] FIG. 4, is a top plan view of the spacecraft of FIG. 1.

[0033] FIG. 5 is a front plan view of the spacecraft of FIG. 1.

[0034] FIG. 6 is a rear plan view of the spacecraft of FIG. 1.

[0035] FIG. 7 is a cross section side view of the spacecraft of FIG. 1.

[0036] FIG. 8 is a cross section top view of the spacecraft of FIG. 1.

[0037] FIG. 9 is a perspective top and partial cross-section view of the spacecraft embodiment of the invention.

[0038] FIG. 10 is a cross section front view of the spacecraft of FIG. 9.

[0039] FIG. 11 is a perspective top view of Arch-Wings of the spacecraft of FIG. 1.

[0040] FIG. 12 is a perspective under side actuator mechanism of the spacecraft of FIG. 10.

#### DETAILED DESCRIPTION EMBODIMENTS OF THE INVENTION

[0041] FIG. 1-6, shows the spacecraft 100, according to embodiments of the present invention.

[0042] FIG. 7-11, shows inner structure of the spacecraft 100.

[0043] An aspect of the invention provides the illustrated structure of the spacecraft 100, the spacecraft structure for the spacecraft 100, comprises a fuselage 10, the spacecraft 100, may further comprises right side Arch-Wings of the fuselage 1, and left side Arch-Wings of the fuselage 2, may further comprises two front wings 3,4, two rear wings 5,6, and the vertical winglets 7,8, the spacecraft structure for the spacecraft 100, may comprises, first level 21, top surface 37, bottom surface 13, as shown in FIGS. 7, 9.

[0044] The fuselage 10, has a cross section of substantially flat fuselage shape in a direction of width, and the fuselage 10, is wide enough to provide lifting force, the two front wings 3,4, of the Arch-Wings 1,2, are disposed horizontally in front portion of the fuselage 10, and are configured to control flight and lifting force of the spacecraft 100, the two rear wings 5,6, of the arch-Wings 1,2, are disposed horizontally in rear portions of the fuselage 10, and are configured to control flight of the spacecraft 100, the vertical winglets are disposed at the top of the rear fuselage 32, the first level 21, is configured to anchor the Arch-Wings 1,2, by the hinged-latch mechanism 19, provide locking, unlocking 33, 44, 45, 47, systems is provide two or more of right and left side pneumatic actuator 45, mounted on bracket 48, and pneumatic actuator with cylinder 44, having piston pin 45, lock or unlock position into lock-hole plate 47, and need to operate actuator pins 45, pressurized or released pressure by the pilots choose when it necessary, as shown in FIGS. 10, 11, 12.

[0045] The fuselage 10, may float in water due to the whole structure comprises carbon fiber honey comb composite 36, molded structure 10, as shown in FIGS. 9,10. since such a structure is water tight as well as airtight, the spacecraft may be landing sea port and also comprises pontoon 27, system at the belly of the rocket power compartment structure as shown in FIGS. 5,6,10,

[0046] First level cabin 14, further comprises a plurality of seating systems 17, front window 39, side windows 40, as shown in FIGS. 1, 7, 8, 9, 10.

[0047] The cockpit 14, at the first level further comprises a plurality of doors 18, at cabin 14, and control panel board 20, with various necessary navigation and control systems, as shown in FIGS. 1, 7, 8, 9.

[0048] Each of the two front wings 3, 4, comprises an elevator 9, each of two rear wings 5, 6, comprises an elevator 15, as shown in FIGS. 1, 2, 8, Each of the two front wings 3, 4, and each of two rear wings may have a cross-sectional shape of lamina flow as shown in FIG. 3.

[0049] The air foil shape is provide with the wings 3, 4, 5, 6, the ratio of the lifting force of the Arch-Wings maybe predetermined optimize the flight.

[0050] Each of the two Arch-Wings may comprises plurality of the carbon fiber honey comb composite 36, molded structure which sear strong and highly flexible maneuverable in the air space as shown in FIGS. 9, 10, 11.

[0051] Each of the fuselage wall, floor, roof and cabins may comprise plurality of carbon fiber honey comb composite 36, molded structure. As shown in FIGS. 9, 10.

[0052] The first level 21, further comprises fuel tank storage compartment 35, at rear cabin as shown in FIGS. 7, 8.

[0053] Each of some of the two front wings 5, 6, and each of two rear wings may comprises one or more elevators 9, 15.

[0054] Each of the two vertical winglets 7, 8, may comprises stabilizer 11 as shown in FIGS. 1, 2, 4, 8, 9.

[0055] Another aspect of the invention further comprising wherein the landing gear bays under the belly of the fuselage and front landing gear bays at front portion bottom of the fuselage and rear landing gear bays comprises rear parallel portion of the rear fuselage.

[0056] Another aspect of the invention provides the spacecraft structure for the spacecraft 100, comprises jet-power plants 22, at the top portion of the rear fuselage 32, as shown in FIGS. 1, 7, 9, for providing high altitude and high speed in air space.

[0057] Another aspect of the invention provide the spacecraft structure for the spacecraft 100, comprises rocket power plants 24, at Arch-Wings rocket propulsion fuselage compartment body structure 25, as shown in FIGS. 1, 2, 8, 9, 10, providing high speed travel at space.

[0058] Another aspect of the invention provide the spacecraft 100, comprises retro-rocket power plant 26, at front of the Arch-Wings rocket propulsion compartment body structure 25, as shown in FIGS. 1, 4, 8, 9, for providing braking the speed when return back to home from space which necessary to operate hinged doors open and close system by pneumatic actuator with cylinder piston activated under pressurized or released pressure.

[0059] While the invention has been shown and described with reference different embodiments thereof, it will be appreciated by the skilled in the art that variations in form, detail, compositions and operations may be made without departing from the spirit and scope of the invention as defined by the accompanying claims.

What is claimed is:

1. The spacecraft structure claim 1;

The spacecraft structure comprising three fuselage configuration system which comprises center fuselage body and both the edge wings fuselage body structure with Arch-Wings body structure integrated.

2. The spacecraft structure claim 2;

Further comprising end of the front portion wings of the Arch-Wings extended connected toward end of the rear portion wings of the Arch-Wings structure becomes one unit Arch-Wings structure shear strong Arch-Wings structure design, which comprises carbon fiber honey comb composite molded wing structure as shear strong highly maneuverable versatility spacecraft wings. It is evolution of the new Arch-Wings technology in twenty century.

3. The spacecraft structure claim 3;

further comprising the two front portion wings of the Arch-Wings disposed horizontally in front portions of the fuselage, the two front portion wings of the Arch-Wings being configured to control flight of the spacecraft and provide lifting force and the two rear portion wings of the Arch-Wings disposed horizontally in rear portion of the fuselage structure.

The two rear portion wings of the Arch-wings configured to control flight of the spacecraft and lifting force and the

two vertical winglets, each of which being disposed at the top of rear fuselage structure.

4. The spacecraft structure claim 4;

further comprising wherein the first level is configured to anchor the Arch-Wings at the both side of the lower fuselage structure by the hinge-latch mechanism for the foldable wing structure body which operate locking or unlocking system.

5. The spacecraft structure of claim 5;

further comprising wherein the first level comprises a plurality of cockpit and passenger cabin with seating system, control panel, and various avionic system.

6. The spacecraft structure of claim 6;

further comprising wherein the Arch-Wings foldable hinged-latch locking system and folded wing upwardly and tie together to carry to road travel by trailer car.

7. The spacecraft structure of claim 7;

further comprising wherein the jet power-plants comprises at the top of the rear portions of the fuselage structure to provide air power for the air space travel as take off from airport to the high altitude airspace.

8. The spacecraft structure of claim 8;

further comprising wherein the rocket power plants at the Arch-Wings compartment structure which to provide rocket power may comprises solid or expandable rocket power system for the travel into space.

9. The spacecraft structure of claim 9;

further comprising retro rocket power plants at front portions of the both side Arch-Wings compartment structure for providing braking the high speed when return back to home from space travel into the atmosphere air space which need glide ratio in which means avoid high thermal heat problems, as rolling-hill driving attitude is essential for the safe flying at reentry atmosphere.

10. The spacecraft structure of claim 10;

further comprising carbon-carbon composite reinforced to the edge of the front fuselage and edge of the front Arch-Wing for the high heat shield.

11. The spacecraft structure of claim 11;

further comprising wherein the landing gear bays under the belly of fuselage and front landing gear bays at front portion of the fuselage and rear landing gear bays comprises rear parallel portion of the rear fuselage.

12. The spacecraft structure of claim 12;

further comprising wherein the first level comprises a plurality of the fuel tank storages and a plurality of the compartments.

13. The spacecraft structure of claim 13;

further comprising wherein the pontoon bays comprises under the belly of the rocket power plants fuselage body compartments of the both side Arch-Wings.

14. The spacecraft structure of claim 14;

further future vision, may modifying to useful unmanned craft as UAV, by military and civilian version.

15. The spacecraft structure of claim 15;

further advise and need to operating spacecraft at high atmosphere through space travel time for able to safe travel space required slow driving down when come back home. As like 'rolling hill driving down' attitude driving methods are essential. These Arch-Wings are highly control and maneuverable wing structure system at high altitude air space and high speed space travel which avoid high heat condition, which best solution for the airspace and space travel.

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