April 4, 1933. F. STEINMANN, SR 1,903,345

FLYING MACHINE

Filed Feb. 18, 1932 4 Sheets-Sheet 1

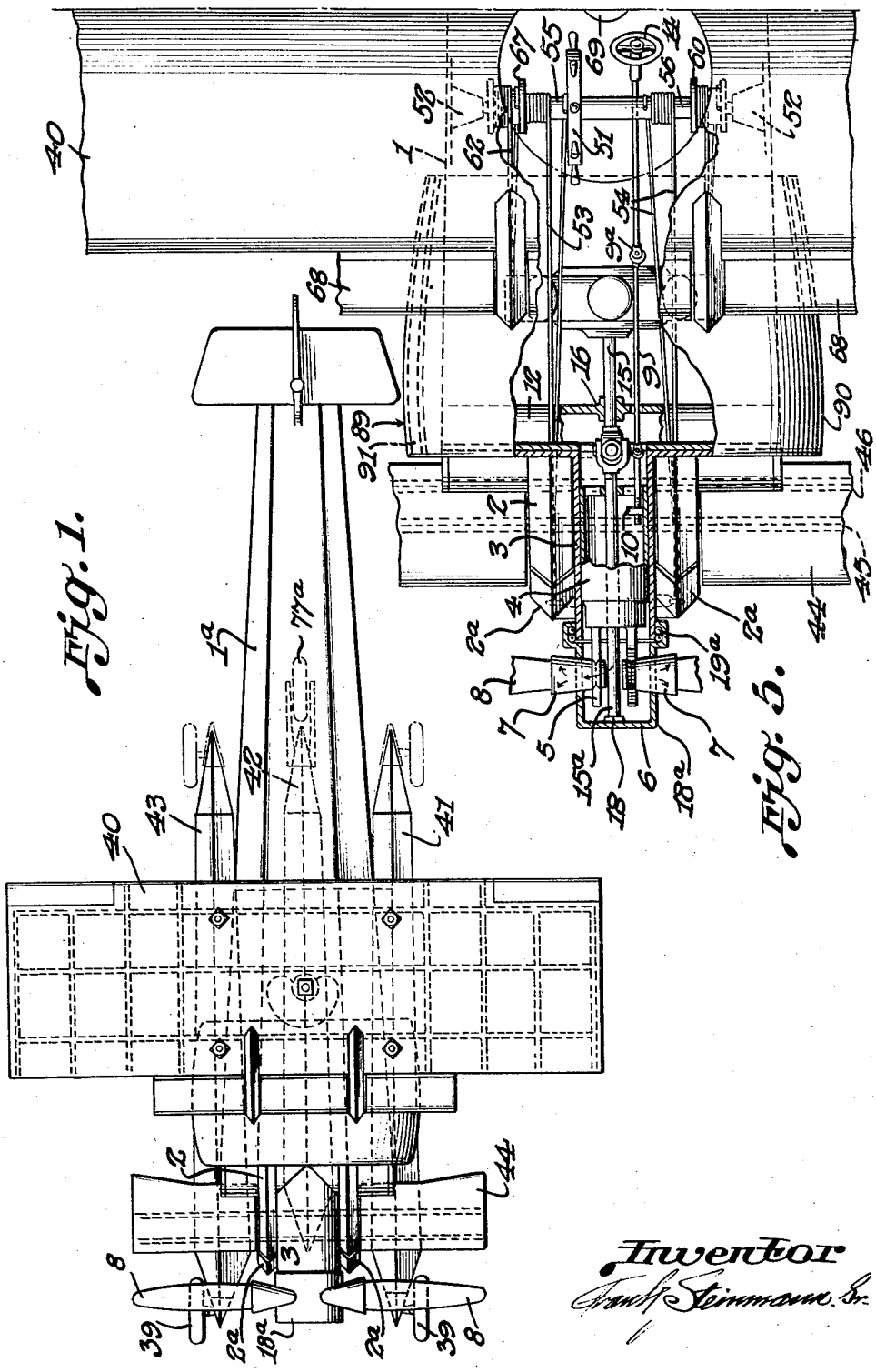


Fig. 1.

Fig. 5.

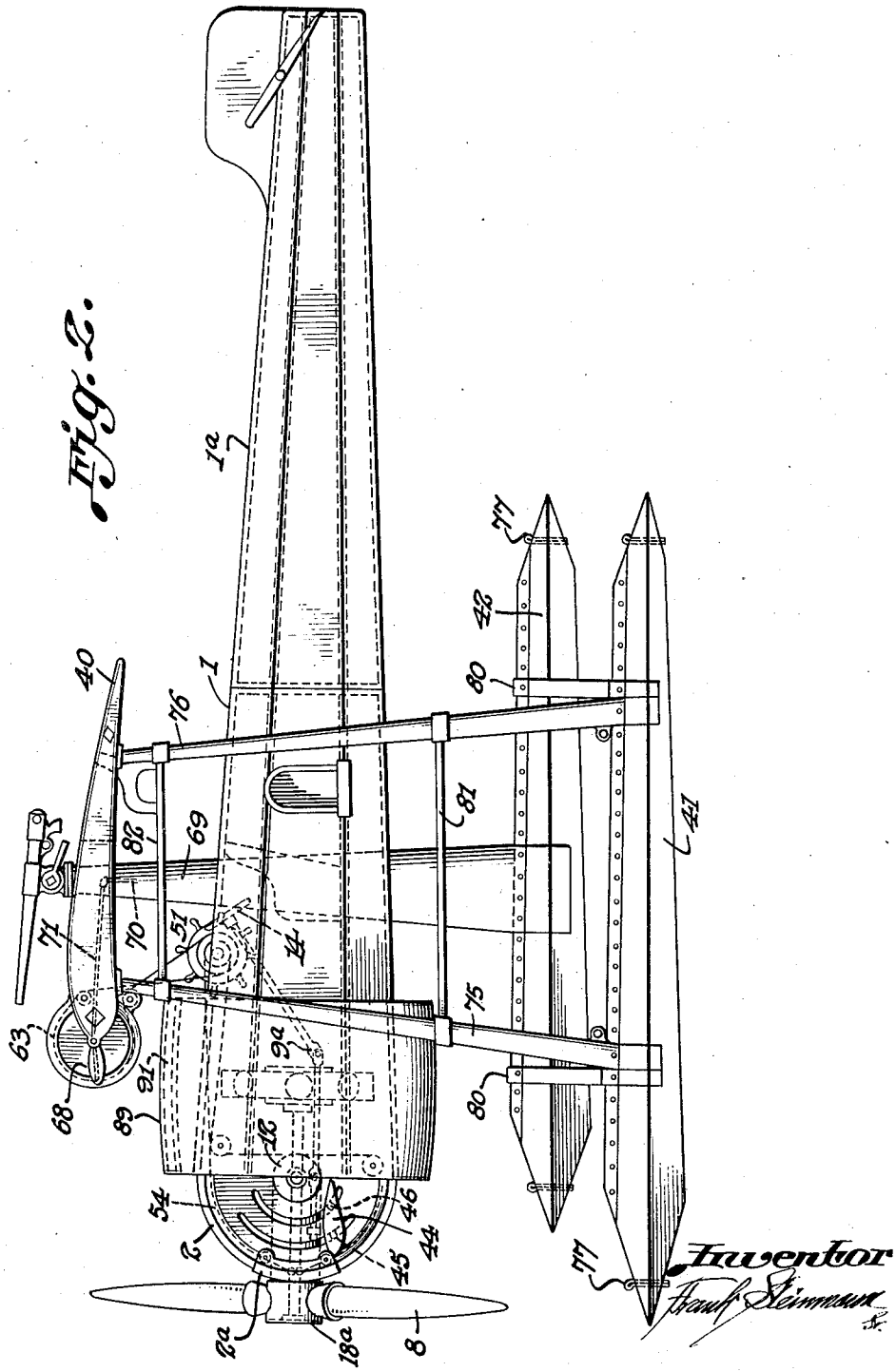
Inventor
Frank Steinmann Sr.

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Fig. 2.



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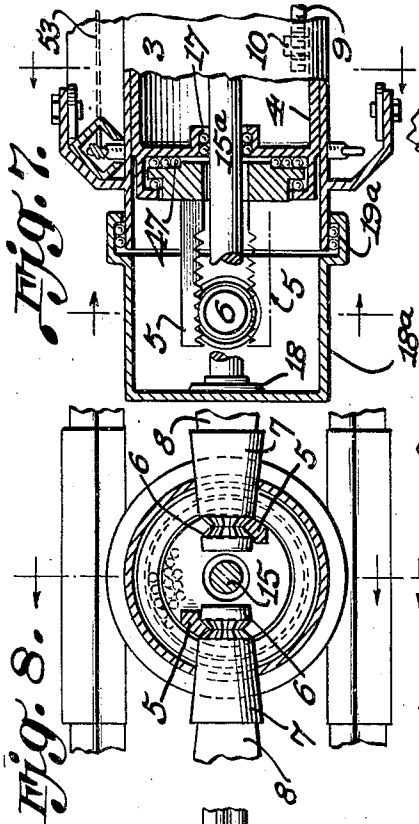


Fig. 7.

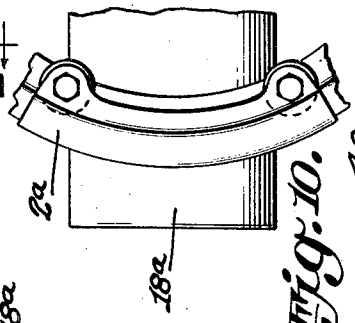


Fig. 10.

Fig. 8.

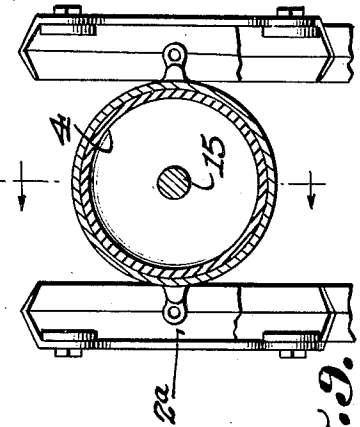


Fig. 9.

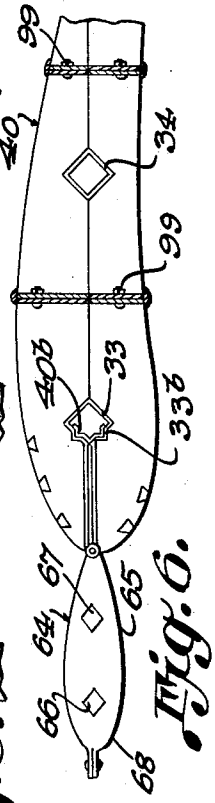


Fig. 6.

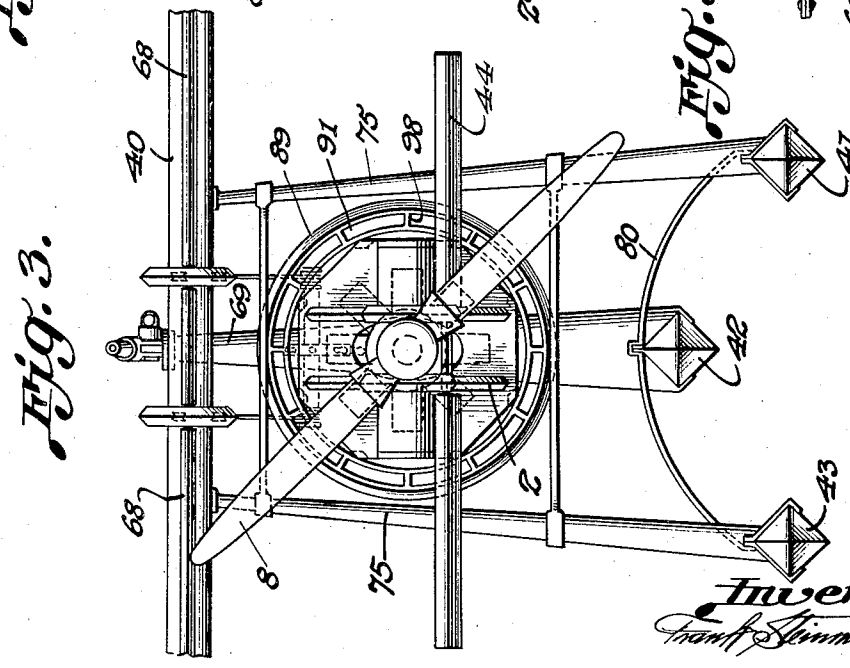


Fig. 3.

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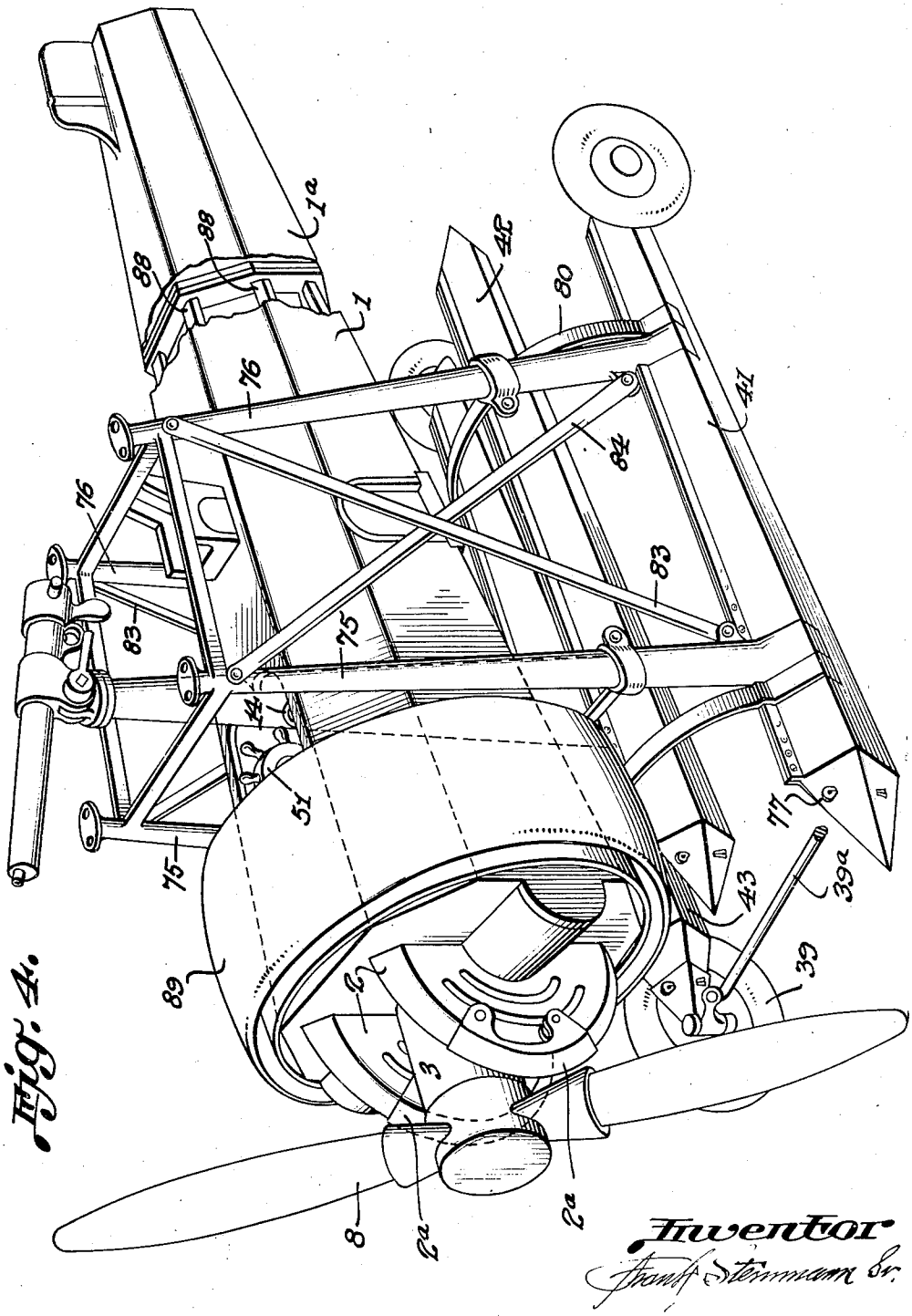


Fig. 4.

Inventor
Frank Steinmann Sr.

Patented Apr. 4, 1933 1,903,345

UNITED STATES PATENT OFFICE

FRANK STEINMANN, SR., OF DE SOTO, MISSOURI

FLYING MACHINE

Application filed February 18, 1932. Serial No. 593,808.

This invention relates to flying machines and is directed to numerous features of novelty adapted to facilitate the manipulation of a plane when in the air, and obtain the highest efficiency when alighting on water. The principal object of the present invention is to provide an improved frame structure of slotted box tubing and riveted or welded seam, box tubing, longitudinal transverse and diagonal members, used in the general framework, a plurality of pontoons connected by vertical tubes to the maintaining wings, constitute the base for the machine, cone shaped ends of pontoons adapted to engage landing wheels, additional rear wheels, may be adjusted to rear cone shaped ends of pontoons by means of sockets to fit over said cones and stay, bolt or cotter key attached, wheels provided with bearings, creating a wheeled truck for ground service. One other important improvement is the variable pitch propeller, extension propeller shaft pivoted by universal joint, its mechanism inclosed in lubricating oil container, this variable pitch propeller is operated from convenient point in reach of operator's hand wheel, the revolving variable pitch propeller sockets are entirely inclosed in lubricating oil housing. By changing the blade angles the propeller efficiency can be maintained maximum at various forward speeds of the flying machine. By decreasing the pitch the engine speeds up and greater pulling powers exerted when it is taking off, when up to flying speed the angle of the blades is increased so that the pitch speed bears the most favorable relation to flying speed.

Figure 1 is the top view of the general arrangement of the machine.

Figure 2 is the side elevation of the plane with landing wheels removed, showing in particular the contrivance for manipulating the pivoted propeller in conjunction with stabilizing auxiliary wing around a circular guide, sheet metal fins, protruding from the mouth of the main wing, shaped to a suitable stream lined contrivance with its adjustments for stabilizing the craft when in the air. Above the plane on the central vertical wing support or turret, machine gun is shown, radio equipment might be located thereon.

Figure 3 is a front elevation of the airplane showing the main wing in flying position with the extreme ends broken away. The landing wheels attached to the pontoons comprising the main base of the machine, also the arrangement of frame structures made up of slotted box tubing especially adapted for use on the ground.

Figure 4 is a side elevation of the machine with the main wing detached preliminary to taxiing over the highways.

Figure 5 is a fragmental assembly or top view of the forward position of the operator's adjusting and stabilizing contrivance, variable pitch propeller blades and reversing system.

Figure 6 is also a diagrammatic assembly on enlarged form of the crosshead incasing the adjusting parts of propeller blades pivoted to motor shaft by means of universal joint.

Figure 7 is a sectional view of plunger controlling the adjustment to vary the incidence or pitch of propeller blades by means of toothed circular blade roots.

Figure 8 is a sectional end view of a plunger regulating the opposite root blades by means of toothed shifting levers.

Figure 9 is a fragmental end view of pivoted crosshead.

Figure 10 is a view of the interior adjusting mechanism to vary the incidence of propeller blades connected with universal joint of motor shaft, all inclosed in lubricating oil container crosshead case.

Referring to the drawings 1 designates the fuselages or nacelle. Located at the forward end is a detachable circular crosshead guide 3, and inclosed in this lubricating case is plunger 4. A projecting circular lug 10 engages plunger 4, connecting revolving toothed extension rack 5, which meshes the toothed propeller root 6, which is held in position by socket 7, actuating adjustable propeller blades 8 mounted therein to vary the pitch or helix of propeller 8 by shifting plunger 4 inclosed in tubular casing 3. Plunger 4 is moved by rod 9, its threaded end engaging

lug 10. Rotating rod 9 is connected by means of universal joints 9ª passing through the wall of crosshead casing 12, which extends transversely of said crosshead 4. Movement is transmitted to plunger 3 by extension rod 9 attached to hand wheel 14 located in convenient reach of operator thru suitably spaced universal joints on rod 9. Hand wheel 14 is adapted to manipulate the movement of plunger 4 which partly incloses pivoted motor shaft 15 mounted in ball bearings 16 and 17 securely attached to the revolving base of propeller socket 7 which forms the lubricating housing for the variable pitch propeller with its variation device mounted on the extension motor shaft 15ª, as well as ball bearing 16, located in crosshead housing 12 which properly attached prevents the loss of lubricating oil. Toothed lever 5 shifts in opposite direction, simultaneously varying the pitch of independent propeller blades 8—8. If it is assumed that the machine is taxiing on the ground its main wing 40 detached, varying the propeller blades 8 from neutral to any desired angle creates the desired power capacity, without the altering of motor speed, the rotating of hand wheel 14 manipulating the machine to the forward or rearward direction of flight, steering the machine to right or left on the ground. The steering mechanism of any suitable auto car may be applied to the detachable cone, wheel base, part of a plurality of pontoons 41—42—43, its novel design is the wheeled structure which serves to support the box tubing frame structures, front end steering wheels 39—39, and shifting rod 39ª especially adapted for a farm to market vehicle. The rear end of fuselage 1ª may be disconnected and a trailer may be attached to carry pay loads over highways.

Auxiliary stabilizing wing 44 is attached to guide 2. Slide 2ª mounted on circular arc 2 serves to hold propeller crosshead 3ª and stabilizing wing 44 rigidly in shifting around the circular guide 2. A slotted box tubing frame makes up the stabilizing wing, its square shaped tubings 45 and 46 passing through circular arc disk, its slotted openings permitting tubes 45—46 to shift in the same direction of propeller 8 which is manipulated to any desired incidence of the flying machine. Extension motor shaft 15ª, at its extreme forward end engages revolving propeller socket base 18ª by means of interior lug 18. The balanced base is provided with ball bearings 47 revolving in lubricating housing 3, the flow of lubrication being indicated by arrows. Intersecting joint head, revolving with ball bearing 19ª inside bearing 3, casing 3, and revolving head 18ª serves to move the plunger and consequently shifting levers 5—5 and each toothed lever controls the movement of propeller blades 8—8 in the opposite direction.

If an ascending flight is to be made hand wheel 51, in the hands of an operator is rotated and adjusting cables 53—54 are wound about drums 55 and 56. By rotating the wheel the propeller is adjusted around the circular bearing 2 which consists of two cast hollow box tubes which are fastened to the front end of cabin and are spaced apart so as to admit the extending motor shaft housing to move freely at the will of operator. This results in setting propeller 8, in conjunction with stabilizing wing 44, to a suitable angle of incidence to make the ascension more rapid. Propeller blades 8—8 are adjusted accordingly, by means of hand wheel 14 transmitting rotating movement to rod 9 which is connected to universal joint 9ª rotating threaded end in lug 10, which is attached to plunger 4. The interior of circular bearings form a runway for adjusting flexible cables 53—54 wound about drums 55—56, held in position by bearings 52—52. Larger diameter drums 60—61, at the extreme ends of winding drum device, are in evidence and serve to operate the pivoted sheet metal fins 64—65. Spaced box tubings 66—67 are for forming the stabilizing wing 68. The interior of these tubings are heated when at a high altitude preventing the exterior covering from icy coatings; for this purpose the central main wing support 69, located in the cabin constitutes a box tubing in vertical position, and adapted to furnish additional rigidity to the structure, and is a means to pivotally connect the main wing 40 thereon to be turned longitudinally with the fuselage when traveling on the ground. The interior of said box tubing support 69 may be utilized for a heating contrivance and the heated air is admitted to pass through pipes 70—71 into stabilizing wing 68 and the box tubing inserted in metal fins 64—65 are shaped to a stream lined stabilizing wing 68 to be adjusted by means of cables 62 and 63, which are inclosed in a circular guide forming a runway for said cables to be attached to stabilizing contrivances to be shifted for simultaneously varying the incidence of the craft when in the air, stabilizing wing 44, manipulating in conjunction with wing 68 by rotating hand wheel 51. This adjustment is used to overcome the disturbing influence of dangerous air currents, nose dives or tail spins. The advantages of this construction are evident, whereas other craft become helpless. In my invention it is merely necessary for the operator to adjust hand wheels 51 and 14 while the applying of rear elevators may be brought into service in normal flying, rudder of any convenient style preferable, steering the ship to right or left.

A number of elongated air or fuel tanks 41—42—43 serve to support the box tubing frame structure constituting the pilots' and passengers' cabin and the various controlling

elements for the machine. Pontoons 72—73—74 are constructed from suitable light metal shaped in box style, its flanged seams riveted to the cone fore and aft ends, welded seams preferred for landing wheel to be slipped on or removed by means of cotter key 77 or any suitable fastening device, rear central wheel 77[a] may be attached in conjunction with front end landing wheels 39. Yokes or separators 80—80 two or more complete the wheeled truck or floating base of the machine. Additional braces 81—82 separate the vertical tubes 75—75—76—76, and the lower ends are securely fastened to flanged pontoons. Wing supports 83—84 are used for a cross brace on both sides of the cabin when taxiing on the ground. Slotted box tubing 88 is used for the cabin and fuselage frame construction. A housing 89, a detachable power plant air cooling system with air passage 91 and a slotted box tubing 90 and a covering 89, make up the device, including separators or spacing blocks 98. In disclosing the construction of the slotted box tubing frame work end, view of tubing showing more particularly in Figure 6, end section of wing spar tubing 33 note V shaped impression 33[b] disclosing the advantage of having a secure hold of the inserted metal sheet covering 40. The filler 40[b] with its extending ends of sheet metal 64—65 has a corresponding V shaped impression meshing with 33[b] forming a self locking device, and the wing spar is made in two parts bolted together by means of bolts 99.

Box tubing style is very efficient and suitable for all styles of frame work, a flanged tubing being hand shaped open seam or welded, into a solid tubing of great strength. I have hereinbefore specifically directed attention to my present invention disclosing the full and complete construction of a flying machine of the monoplane type covering novel methods in stabilizing air craft and creating a useful vehicle for road service by means of propulsion obtained from variable pitch propeller, reversing the machine in the direction of the desired flight eliminating the reversing mechanism used on auto cars.

I do not limit myself to the exact details described and shown, but consider as the equivalent of my invention all such forms as fall within the scope of the appended claims.

What I claim is:

1. In a flying machine in combination with the main sustaining plane and cabin, a pivoted crosshead having a lubricating housing, a pivoted motor shaft mounted on said crosshead, a main propeller of variable pitch type mounted on said motor shaft, a stabilizing wing affixed to the underside of the crosshead, an extension motor shaft located in the interior of lubricating housing, means to move the pivoted crosshead by means of cables fixed to winding drums adapted to shift the pivoted motor shaft in conjunction with main propeller in the desired direction of ascending or descending when in the air, detachable circular propeller guides adapted for inspecting power plant and the interior of lubricating and propeller shaft housing fastened to the forward end of cabin, means for shifting the guides relative to the forward end of cabin, means in the interior of lubricating housing for shifting variable propeller blades including encased therein a plunger pivoted to toothed levers for varying the pitch of propeller blades, ball bearings affixed for extension motor shaft in the interior of lubricating crosshead housing, adjusting rod having a threaded end connected to the plunger and extending to a pilot's operating hand wheel for manipulating the speed of machine and reversing the angle of propeller blades.

2. In a flying machine, a truss frame for main sustaining planes constructed of slotted V-shaped box tubing extending laterally of the machine adapted to retain covering in its interior V-shaped box tubing crevice, meshing sheet metal covering having its lateral portions extending through said slots into the interior of said box tubing, V-shaped impressions about the mouth receiving the seam of V-shaped portions which are held in its depression by a retaining sheet metal portion injected into the interior of tube, the extending ends thereof forming a fin utilized for stabilizing purposes and operable by the pilot in ascending for normal flying, for tilting the auxiliary device in emergency or in conjunction with main propeller controlling elements which consist of a main hand wheel and auxiliary speed controlling hand wheel for regulating the angle of propeller blades, its device being located in the interior of oil container crosshead housing.

3. In a flying machine, a truss frame of slotted box tubing extending laterally of the machine spaced and held in position by wing spars and clamping system including trapezoid framework, adjusting space contour spars adapted for affixing a device for controlling lateral and longitudinal stability thereon, suitable rear end controlling elements, elevators and rudder, reversible propeller means to propel the machine on the ground eliminating reversing mechanism such as used in modern automobile vehicles for reversing the direction of flight and means for lubricating said reversing propeller.

4. In a flying machine having a main wing and a truss frame, of light metal slotted box tubing comprising a plurality of longitudinally extending air tanks forming the base of the machine, thus providing a floating contrivance when alighting on water, connecting means extending between said tanks, vertical supports of tubing attached to the tanks, adapted to engage with the main sustaining

wing by means of fastening device of bolts passing through said wing truss frame for convenient disconnection of wing from said vertical supports so that the wing may be turned longitudinal with the cabin, a central main support contrivance located in the interior of cabin and serving as the pivot for main wing truss frame, means for shifting the lateral position of wing longitudinal of the machine and parallel to the direction of flight when motoring on the ground, the vertical main wing support consisting of a cone box tube shell adapted for heating the cabin and wings by means of tubing connections to main wing stabilizing attachment frame provided to be manipulated from the pilot's hand wheel device for preventing tail spins and nose dives.

5. In a flying vehicle, a truss frame of slotted box tubing adapted to house a power plant, in conjunction with operators' and passengers' cabin, rear end controlling elements of any suitable design, rudder and elevators, a front end circular propeller guide and housing adapted for disconnection for inspecting, propeller driving and blade shifting mechanism mounted in said housing, means for lubricating the housing interior and propeller blades shifting contrivance, comprising of a hand wheel in reach of operator, longitudinal slotted box tubing frame for fuselage formed with larger circular front end embracing the power plant and operators' cabin, means to strengthen the framework at suitable intervals in the interior of the fuselage tapering to rear end, suitably arranged to locate elevators and rudder thereon, a plurality of air tanks running longitudinally of the machine and forming in conjunction with the cabin a base for the machine cone-shaped front and rear ends on said air tanks and adapted to attach or disconnect suitable running gears to meet requirements for doing useful work when taxiing on the ground and specially designed cone ends for flying over water.

6. In a flying machine, in combination with a detachable main plane consisting of a plurality of parallel slotted box tubes, a centrally located closed tube running transversely and parallel with said slotted tubes flexible metal covering having its side portions passing through the slots in the tubes into the interior of box tubes, means in the tubes to retain the side portions of the planes with the tubes, means extending through the pair of slotted tubes into space creating stabilizing fins, a hand controlled stabilizing wing, running parallel with main plane, means for adjusting said tilting stabilizing wings, floats especially adapted to engage or disengage the wheeled convertible turret to the centrally located tank, engaged to the vertically affixed turret or pivot adapted to mount thereon any suitable head light machine gun or instrument for night flying.

In testimony whereof I affix my signature this 18th day of October, 1932.

FRANK STEINMANN, Sr.