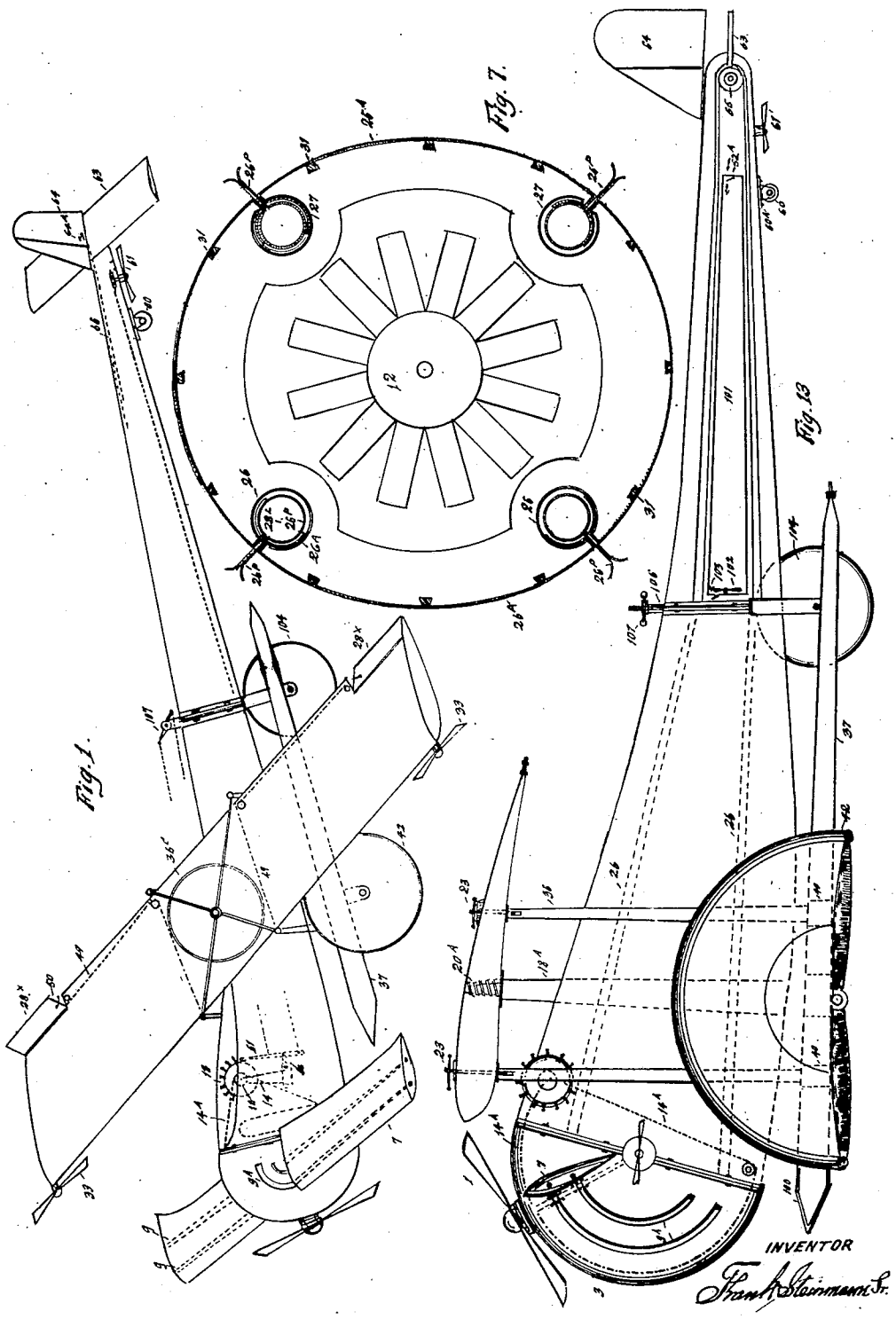
June 9, 1931. F. STEINMANN, SR 1,808,908

FLYING MACHINE

Filed May 8, 1930 4 Sheets-Sheet 1



June 9, 1931. F. STEINMANN, SR 1,808,908

FLYING MACHINE

Filed May 8, 1930 4 Sheets-Sheet 2

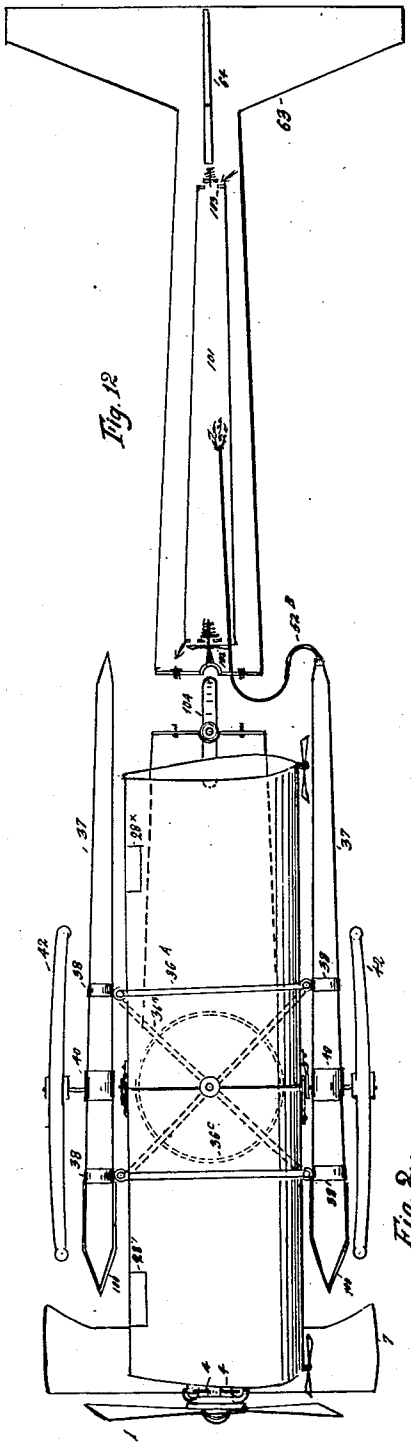


Fig. 2.

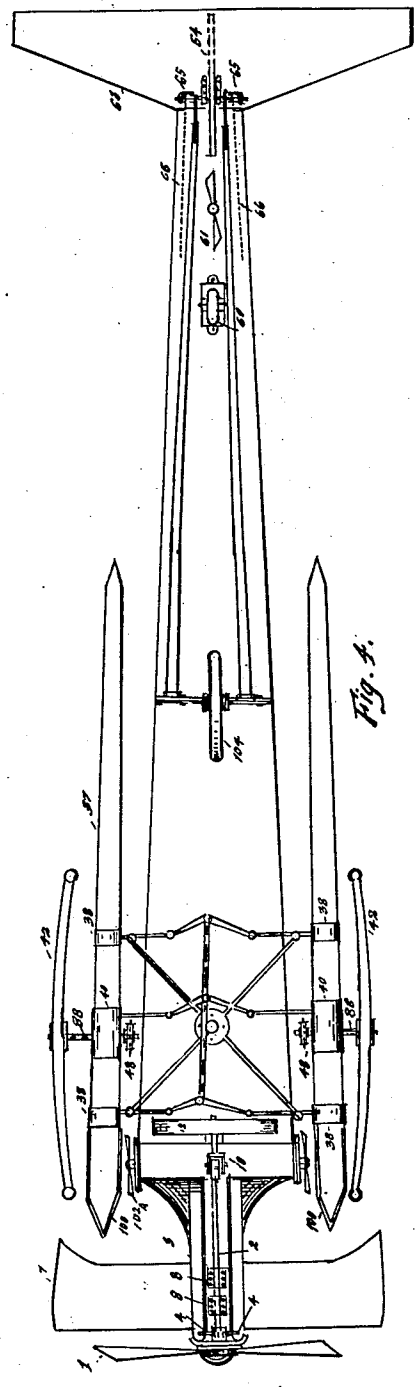


Fig. 4.

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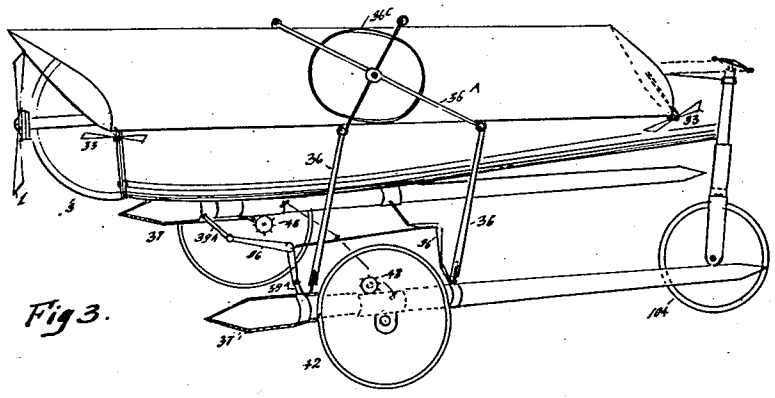


Fig 3.

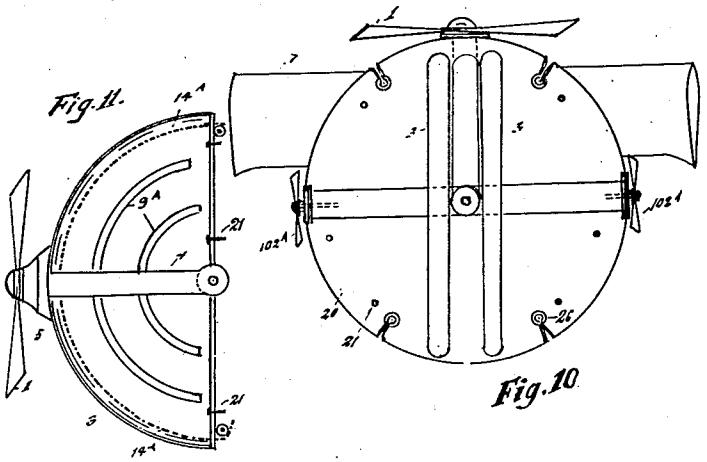


Fig. 11.

Fig. 10

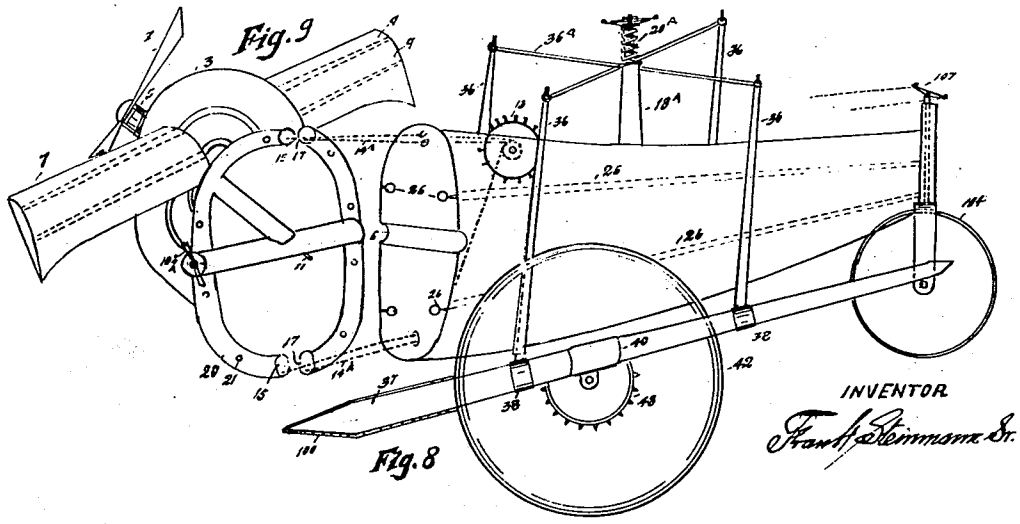


Fig. 9

Fig. 8

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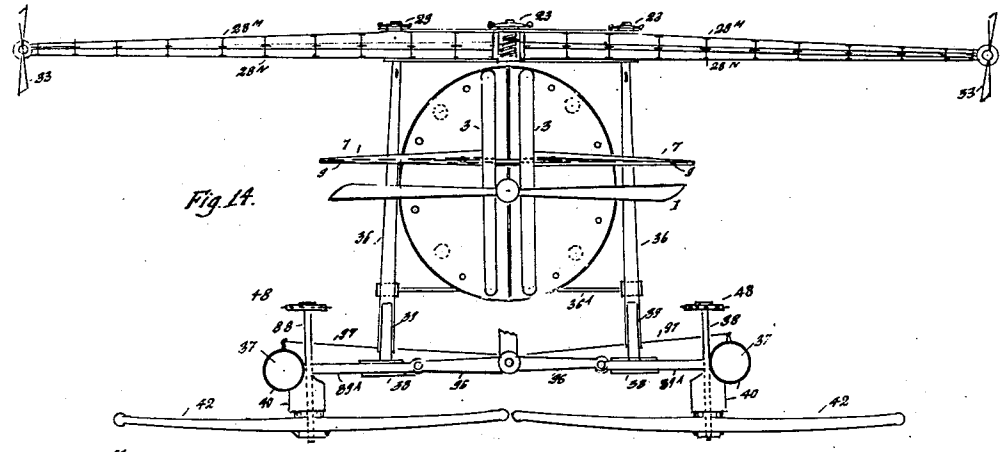


Fig. 4.

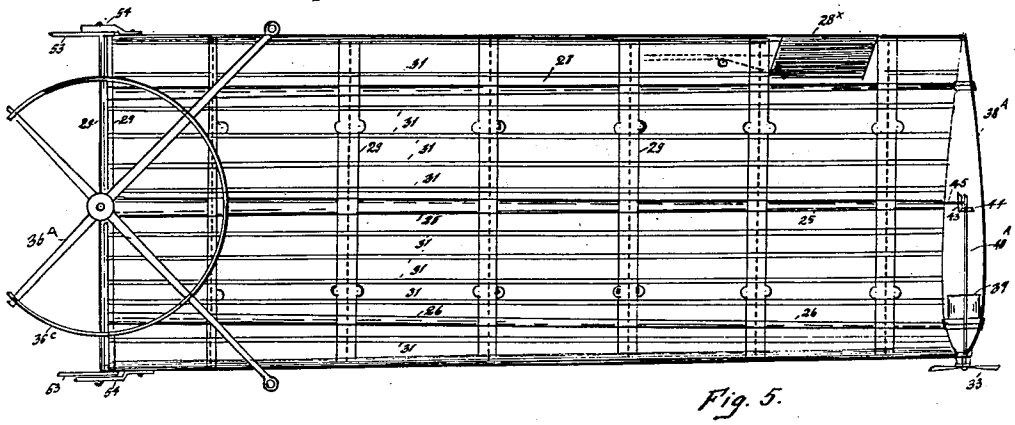


Fig. 5.

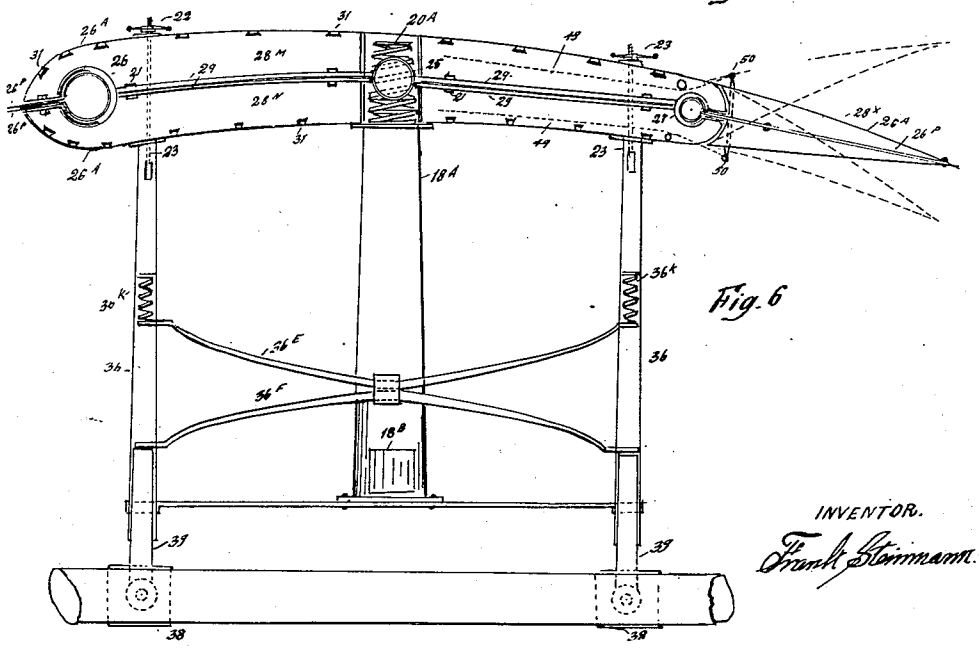


Fig. 6

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Frank Steinmann Sr.

Patented June 9, 1931 1,808,908

UNITED STATES PATENT OFFICE

FRANK STEINMANN, SR., OF DE SOTO, MISSOURI

FLYING MACHINE

Application filed May 8, 1930. Serial No. 451,309.

This invention relates to airplane construction 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 for the power expended by the motor in doing useful work when on the ground, thereby rendering a wholly novel and efficient means for commercial land transportation. The pilot is adapted to control the mechanism for steering the vehicle by means of a rear landing wheel located on the rear portion of the cabin.

The principal object of the present invention is to provide an improved frame structure of tubular closed or open seam, longitudinal, transverse and diagonal members, a covering of metal or any other material fastened to the inside of the slotted opening of the frame members, eliminating all wood construction, increasing the stability by means of a hand controlled tiltable main propeller and auxiliary stabilizing wing connected to a hand control adjusting contrivance so as to create the most efficient pitch for the new angle of incidence. In this manner the efficiency of stabilizing the plane is maintained when in the air. Large landing wheels provided with suitable chain drive serve to taxi the craft with its pivoted main wing turned longitudinal with the fuselage, its propeller tilted to a suitable elevation out of action, a feature of importance in taxiing the passengers to and from flying fields thereby creating a profitable investment to the private owner of planes or combination vehicles. Heretofore, a plane on the ground was a liability. The invention embodies as supplemental features, a disconnectible wing and rear end of fuselage to be stored. To ride on the vehicle when on the ground will inspire confidence which means passengers for flying and greater earnings for investments. My invention when properly prepared for commercial means is also a weapon of defense on the wing and on the ground in the silence of night, ready always to call to arms.

The invention embodies numerous features supplemental, and advantages will be apparent from the hereinafter detailed description and from the appended claims. It may be stated that the propeller is tilted to an elevation when running on the highways or about the flying fields preventing accidents, avoiding the whirling of a propeller. Camping features on the ground in stormy weather include a heating furnace enclosed in cabin serving to support the pivoted main wing.

Figure 1 is a side elevation of an airplane embodying the present invention. The wings are illustrated in this figure in flying position preliminary to a take-off, the motor shown may be of any suitable type connected to propeller shaft extending through the forward large circular housing constituting the guide for main propeller and serving to tilt the stabilizing wing to any desired angle of incidence to suit particular conditions when in the air.

Figure 2 is a top view showing the main wing in position longitudinal of the fuselage, travelling on the ground, cross bar top wing connections affixed to vertical tube supports and separators engaged to the base of the machine, large radius landing wheels serve to speed the vehicle along the ground by means of chain drive or any suitable contrivance combined with air propeller steered by rear wheel or wheels.

Figure 3 is a perspective view of the combination vehicle with the planes turned longitudinal to the enclosed cabin, its rear portion detached preliminary to taxiing over highways, rear centrally located steering wheels shown in position to be guided over the intended route, to passengers' destination.

Figure 4 is a ground plan view from beneath the machine, showing the power plant and in particular the tiltable propeller shaft and its connection with tiltable auxiliary stabilizing wings, also the wheel truck constituting large radius landing gears with tiltable axes and chain drive affixed thereon, elongated air floats serve to make up the wheel structure.

Figure 5 is a detailed view and plan showing sectional frame structure of main sustaining wing. The frame for this purpose is made up of slotted steel tubing, spars and

separators to clamp the tube and fasten the wing surface thereon affixed to the extreme outer ends in a compressed air compartment. Mounted thereon is a small stabilizing propeller to be operated and counterbalance any side-slips or be used for propulsion purposes.

Figure 6 is a sectional end view of wing spar, its vertical standards and pivoted turn support serve to shift the pivoted wing, from a transverse to a longitudinal position or vice versa.

The central support affixed to floor of cabin serves as a hot air furnace for heating cabin and hot air compartments of the wing.

Figure 7 is a view of the forward end of contour spar and fastening means for the metal covering in slotted tubing showing in particular the interior clinched ends of metal sheet. Its novel design to create air-tight joints and partitions at the points of intersections at which the outer covering is fastened to streamlined members of the wing or fuselage and tubular frame members.

Figure 8 is a diagrammatic assembly of the central portion of the airplane in perspective.

Figure 9 is a fragmental assembly of the forward portion of the machine in detached form with propeller and stabilizing auxiliary wing.

Figure 10 is an end view of connecting means of Figure 8 showing part of a runway guide and crosshead contrivance.

Figure 11 is a view of circular propeller guide and runway for flexible adjusting cable hereinafter described.

Figure 12 is the rear portion detachable fuselage shown with frame members of slotted tubing fastened to metal head on line EE indicating position of steering wheel.

Figure 13 is a diagrammatic assembly of the under-carriage serving to support the airplane when taxiing on the ground.

Figure 14 is a view of modified arrangement showing vertical supports affixed to wheel base, pivoted to floats, the landing gears two or more in number to be affixed thereon for folding under when flying.

Referring to the drawings, 1 designates main propeller mounted on shaft 2 tilted on circular guide 3 attached to cross head 4, crosshead slide 5, seat 6, for fastening pivot 4*a* which is made of cast steel and consists of two hollow parts for easy access to inspect the universal joint 10 affixed to propeller shaft 2 and attached to motor shaft 11, and motor 12 which may be of any suitable radial type. Tiltable auxiliary stabilizing wing 7 constructed similar to framework of main wing parts 28*n*, 28*m* is of small proportion, frame tubing 9, 9, passing through slots 10—10 and guide-head 3*a*. Space 10 is shifting space for tilting stabilizing wing 7 which is affixed to bearing 8 and connected to propeller shaft 2 and crosshead 4*a*. Rotating handwheel 13 mounted on stand 14 is a hand-controlled device creating fore and aft stabilization of the craft and should also prevent side-slips of the wings.

Flexible cables 14—14 located in runways 15 securely affixed to crosshead gibs 4—4 extend through slots 17. Said cables 14—14 are wound about drums 18—18 affixed to hand wheels 13. The rear end control elements might be attached to hand wheel 13 and operated in conjunction with stabilizing wing 7 and propeller 1. Referring to Fig. 11 guide 3 is shown detached from cabin frame structure Fig. 8 by means of bolts 21 in flange 20. Main sustaining wing frame structure is made up of two sections. The pivoted centrally located shell or wing support 18^a is provided with threaded upper end 20^a affixed between spars 28—28 also connected to cross-braces 36^a shown in Fig. 5 strengthening the frame structure and forming means to connect vertical struts in the shape of slotted tubing 36—36—36—36 to increase the additional rigidity of the plane and strengthening other portions of the machine, connecting bolt and lock nut 23—22 comprising an adjusting hand-wheel device. Vertical tube standards 36 located two on each side of the fuselage or cabin walls, are affixed to floats 37—37 by means of sleeves 38—38. Tiltable axes are journalled to large radius landing wheels 42, shock absorbing steel spring members 36^e and 36^f are inserted into slotted standards intended for wheeled undercarriage shock absorbing contrivance. Wheels 42 are affixed to sleeves 40—40 adjusting rod on each bearing 39^a provided with rod projecting into lower end of tubing 36—36, coming in contact with inserted spring members 36^f and 36^e said members being adjoined in the central portion of curved bow, upper member 36^e coming in contact with spiral spring 36^k. It is not of importance to confine the construction of shock absorbing device to the exact form described but changes may be made to simplify the device illustrated in the drawings. Landing wheels 42 are provided with sprocket wheels 48 and are suitably connected with a power drive obtained by locating a motor in convenient position in cabin, this power plant is not shown in the drawings. Truck wheels mounted on tiltable axes are folded under the wheel base as shown in Fig. 14 when in the air. A streamlined special designed wheel is used to answer the purpose. A hollow vertically tapered metal wing support 17^a serves to engage wing spars 28 centrally located in sectional wing frame skeleton and affixed thereon by threaded contrivance 18^x. Slotted tubings 26—27 extending tapering towards extreme ends of the wing structure engaging air pockets 38^a. Located in the interior thereof is motor 39 and propeller shaft 40. Mounted thereon is small propeller 33 which may be

driven by compressed fluid or by means of beveled wheels 43—44 driven by rod 45 enclosed in tubing 25 and rotated by suitable means attached direct to a motor and operated for emergency landings or side slips of machine when in the air. Steel cross brace 36^a reinforced by circular bearing 36 serve to strengthen the wing structure and couple up the sectional plane. Lock bolts 23 are connecting means for standard vertical slotted tubing and wing support 36—36—36—36. Spars 28 are frame members used in suitable numbers to space and clamp slotted tubes 26—27 and centrally located tube 25 which is also tapered towards its extreme end. Spars are cast of light metal and shaped to any streamlined contour desired, as shown in Figs. 6 and 7, parts 28^n, 28^m and trapezoids 31. The two parts are bolted together by bolts 30. The joint ends of metal sheets 26^a are inserted in tubing 26—27 by way of the slot running the full length of said tubes and held to internal tube walls by sheet metal 26^p, and filling out space 28 with suitable material (cork preferable). End of flexible sheets 26^p extending outwardly into space, creating a stabilizing fin which may be utilized in connection with front end stabilizing control propeller 1 and stabilizing wing 7 subject to experimenting purposes in aeronautical research. Banking flaps 28^x hinged to tube 27 on line 1—1 by flexible ends 26^p, 26^p inserted in slotted tube 27 are manipulated by wire controls 49 affixed to rocker arm 50 attached to control stick 51 located on stand 52 shown in Figs. 5 and 6. Connecting lugs 53—54 serve to set the plane to a slight angle towards the extreme ends. 10^a designates a furnace door on wing support 18^a. The detachable rear end of fuselage is composed of a framework of tubes longitudinally tapered, reinforced by spars and separators and a circular rear end suitably fixed for rudder and elevator is to be located thereon. Control adjusting cable 66^a is attached to drum 65 and elevator 63 is connected to the drum and a pull on wire cable to a reversed position as may be desired alters the position of the machine. A suitable compressed air motor located in the circular space of drum 65, attached to propeller 61 will prevent tailspins, if properly manipulated in conjunction with stabilizing wing 7, in conjunction with elevator 63. By setting in motion compressed air actuated motors 39 and rotating emergency propellers 33, a safe landing can be made anywhere on rough ground by means of large radius landing wheels 42—42 in conjunction with the tilting of propeller 1 and stabilizing wing 7 set to a suitable angle of incidence, thereby breaking the speed of the craft when alighting on the ground. I am aware that commercially procurably tubular steel of closed hollow sections, as principal longitudinals transverse and diagonal members has been applied in aeroplane construction after date of Letters Patent granted to me on June 1st 1915. Evidence of conception in July 1910. See patent copy No. 1,141,431 June 1st, 1915. It will be apparent the adjustable landing wheels 42 have a tiltable bearing affixed to elongated tanks 37—37 and serve to support the flying machine when alighting on water when tilted horizontally underneath the machine base or wheeled truck. Sleeves 40—40 embracing pontoons 37—37 serve as bearings for spindle 88—88. A sprocket wheel 87 is provided which may be connected to a suitable power transmission located at the pilot's cabin. To adjust wheel centers in or outwardly, lever 90 is shifted and connecting rod 91 moved to rear or front, levers 92 are tilted and expanded, adjusting the wheel base to a required width or distance, to tilt the wheels in the most advantageous or convenient way for the pilot. Changes may be made in the construction of the described device. It is obvious that the machine might be used for a flying boat. Landing wheels might not be necessary but should the vehicle be wanted for special commercial ground transportation, extra rear wheels may be attached to rear ends of elongated floats 37—37 and rear central steering wheel removed. This invention embodies the novel methods of commercial transportation simultaneously varying usefulness of craft under any weather conditions being a convertible structure throughout. A roller 60 is affixed to rear end of fuselage and mounted on bracket 60^a. Cork covering 100 is applied to exterior of floats 37. A valve 52 is provided to shut off the supply of fuel through flexible hose 52^b connected with removable container 101 in the extreme end interior space of the fuselage, A blower 102 is affixed to the large front end of container 101 forcing hot air through passage 103 indicated by arrows into space of fuselage. I have hereinbefore specifically directed attention to my invention disclosing the full and complete construction of a flying machine of the monoplane type covering novel methods in stabilizing the craft when in the air and to my knowledge made important improvements. 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 a main sustaining plane, an auxiliary stabilizing wing in conjunction with main tiltable propeller, mounted on the forward end of fuselage capable of adjustment to vary the incidence thereof and interconnected means for simultaneously varying the incidence of the flying machine including a circular section of slotted tubing secured to fr-

ward end of fuselage or nacelle, means for pivoted movement around the slotted circular guide comprising the housing for propeller shaft, a crosshead and bearing for universal joint connection affixed to motor shaft within.

2. In a flying machine in combination with main sustaining plane, an auxiliary stabilizing wing in conjunction with main tiltable propeller mounted on the forward end of fuselage or nacelle, a detachable circular section of slotted cast tubing secured thereon by means of crosshead and bearing for pivoted movement around the slotted circular guide means of universal joint connection with motor shaft, detachable housing of stabilizing wing and tiltable propeller shaft adapted to setting the stabilizing plane to any angle at the will of the operator, a hand controlled stabilizing device by means of flexible cables inclosed in circular guide forming a runway, attached to crosshead and means to operate same from within the machine, hand-wheel with cable winding drum, runways forming a twin tube circular large radius arch, extension shaft pivoted by means of universal joint affixed to motor shaft, incidence cables extending into pilot's cabin and interconnected means for simultaneously varying the incidence, instantly responding the movement of twin adjusting cables attached to hand controlled steering contrivance.

3. In a flying machine embodying a detachable front end constituting a hollow tube slotted arch or housing for crosshead comprising bearings for main propeller shaft and the lateral stabilizing wing, universal joint in closure lubricating space or pocket constitute a hollow shell or crosshead pivoted to intersection of cabin and slotted archhead, reinforcing side walls of nacelle or power plant.

4. In a flying machine in combination with main sustaining planes, a supplemental wing pivoted to propeller shaft extending lateral of circular front end of fuselage, operating means to set the propeller in combination with stabilizing wing to any angle of incidence at the will of operator in conjunction with rear end controls whereby almost any dangerous air currents in navigating the air are conquered or overcome, side slips impossible, flexible cables attached to crosshead of pivoted front end propulsion and stabilizing contrivance mounted on detachable circular guide and operated by the touch of one hand.

5. A flying machine embodying a detachable housing for pivoted rotating propeller shaft in combination with a tiltable auxiliary wing mounted on circular guide, its frame structure extending lateral of the housing passing through the slotted side walls or openings, its spars embracing slotted tapered tubes form the skeleton framework of auxiliary wing, metal covering affixed thereon, serve to stabilize the machine when in the air, means for pivotally moving main propeller and stabilizing auxiliary wing from horizontal or normal position to any desired angle of incidence to effect a corresponding change in incidence of the craft, main plane support comprising a truss frame of slotted tubing extending laterally of the machine, a fuselage or nacelle comprising a truss frame formed with a large circular front end and tapering to a small circular rear end, means for covering said truss frame with suitable material and adapted to be inserted into the slotted pipes, means in the pipes to retain the portions of covering within the pipes.

6. In a flying machine in combination with a main sustaining plane, operatively connected to a plurality of air tanks extending longitudinally of the machine and forming in conjunction with vertical standards a base for the machine and also a means for keeping it afloat when alighting on water, a frame with bearings attached to the floats, means for tilting large radius landing gears capable to fold under the machine when flying, means for rotating landing wheels when taxiing on the ground and capable of being disengaged when ascending flight is to be made therefrom.

7. In a flying machine a truss frame of slotted and closed hollow tubes extending laterally of the machine, metal spars embracing the tapered slotted frame members and commercially obtainable closed hollow types, means for clamping said tubes by suitable metal contour spars provided with trapezoidal notches and streamlined adapted with unique design metal coverings joint inserted into hollow tubes producing airtight compartments in wing to keep the wings in a heated condition when inflated by hot air, derived from hot air system located in pivoted main wing support attached to central portion of cabin or power plant pivoted to plane by threaded upper end.

8. In a flying machine embodying a main plane truss frame of slotted hollow tubes longitudinally extending spars or metal ribs embracing the tubes at intervals forming sectional truss frames patterned to suitable streamlines contour reinforced by metal strips trapezoidal in cross section and fastened or clamped, embracing said tube truss frame metal covering in sectional sheets inserted into the interior of tubes, means in the tubes to retain the side portions of the planes within the tubes, means for adjusting and clamping the joint ends comprising flexible sheet metal extending through the mouth of main wing into space in suitable length to create a stabilizing fin, when properly manipulated in connection with controlling means for auxiliary wing means to perfect lateral and longi-

tudinal stability, a common operating means for both, probably the most unique feature in stabilizing aircraft by means of hand control using rear end rudder and aileron control.

9. In a flying machine elongated air tanks torpedo-shaped extending longitudinally of the machine serving to support a frame structure of vertical slotted standards attached by its upper ends to main plane and its lower end affixed, to cross truss frame supporting fuselage, adjustable bearings, means to retain tiltable bearings in contact with shock absorbing contrivance interconnected by steel spring separator and vertical standards provided with a top bolt or locking device fastened to top cross brace pivoted to centrally located main wing support serving to guide the main plane in a turning movement from lateral to longitudinal position of the machine or vice versa, compressed air driven small propellers mounted on the exterior end of main sustaining wing for stabilizing or effecting side slips of craft, oil burning heater located in the interior of main wing pivot shell support and separator, sleeves affixed to floats embracing adjusting axle bearings, levers manipulated by operator adjusting wheel base and tilting wheels underneath the base of machine when in the air, an auxiliary wing mounted on detachable circular guide consisting of parallel slotted cast steel tubings serving to guide the main propeller by means of cross head covering bearings for propeller shaft to be shifted around circular runway if desired to change the angle of incidence by means of hand wheel control normally flying the propeller remains in neutral in conjunction with stabilizing wing the rear elevators or aileron control may be used instead, a rear steering wheel centrally located serves to steer the vehicle when taxiing on the ground, light disk design streamlined with cork may be preferable when navigating in water, large radius landing wheels with cork streamlined disk, and floats or air tanks also cork lined reinforced by light metal trapezoid, truss frame work of parallel slotted tubes for lateral extending stabilizing wing, spars with suitable contour and trapezoid, a surface of flexible material its lateral portions extending through the slots into the interior of said tubes and adapted to retain its clamped hold, means to journal tubes and spars by means of crosshead bearings extending to through openings in propeller housing to be shifted in conjunction with main propeller.

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