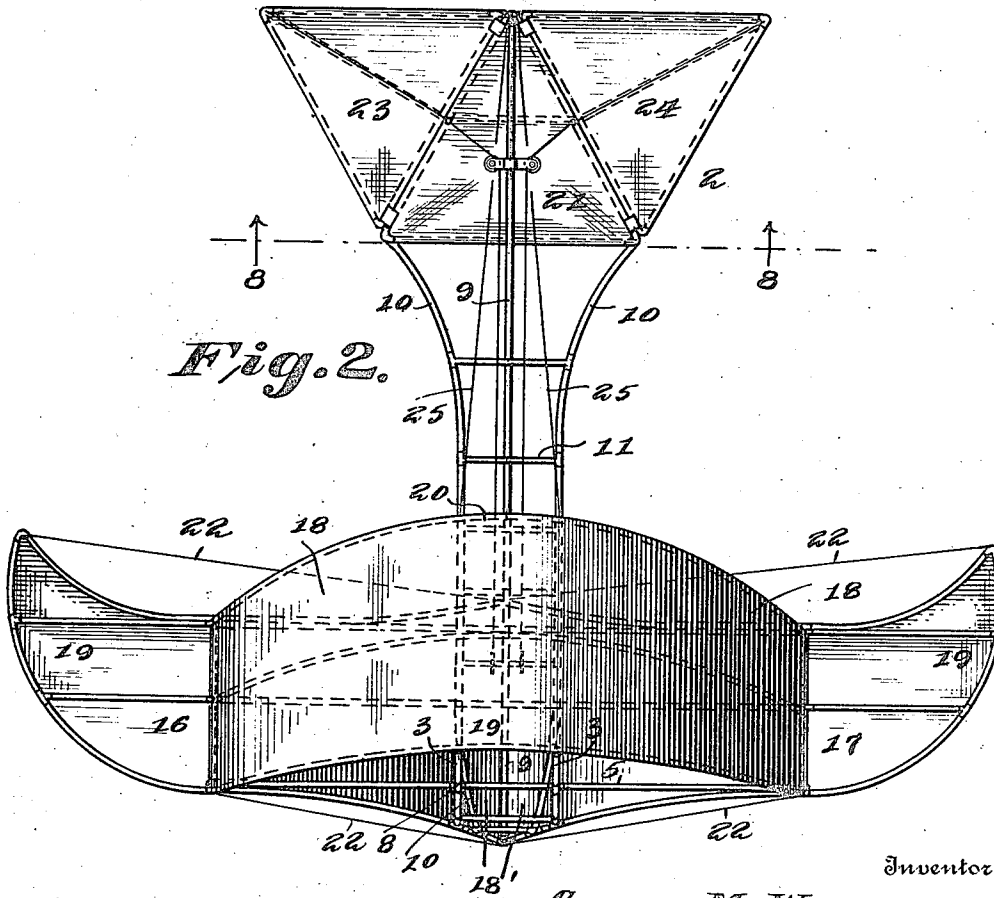
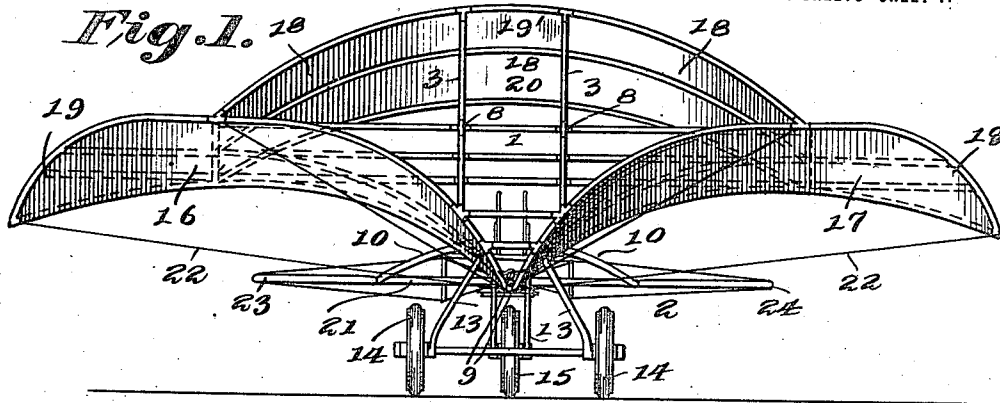


G. M. WANEE.
FLYING MACHINE.
APPLICATION FILED OCT. 8, 1915.

1,172,182.

Patented Feb. 15, 1916.

4 SHEETS—SHEET 1.



Inventor

George M. Wane

Witnesses

A. H. Lybrand

C. C. Hines

By

Victor J. Evans

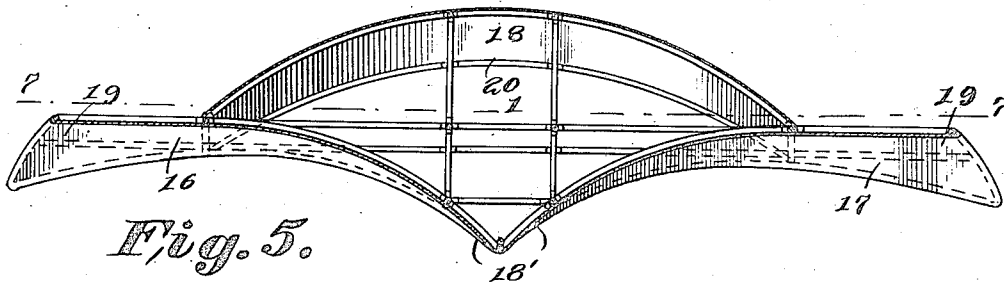
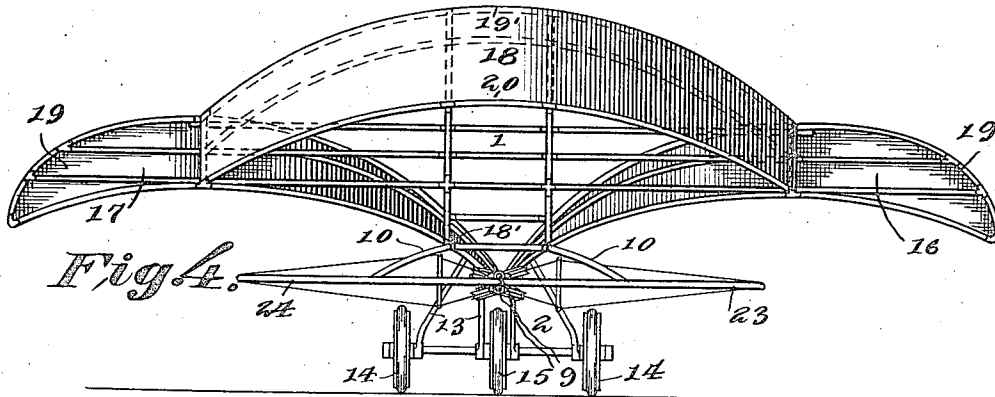
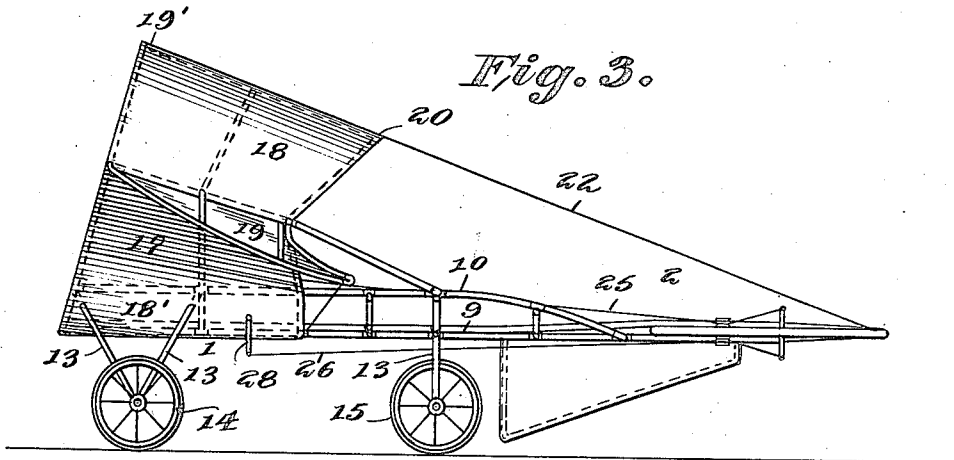
Attorney

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4 SHEETS—SHEET 2.



Inventor

George M. Wane

Witnesses

A. H. Lybrand
C. C. Hines

By

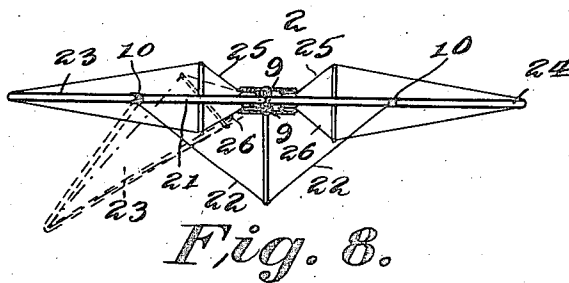
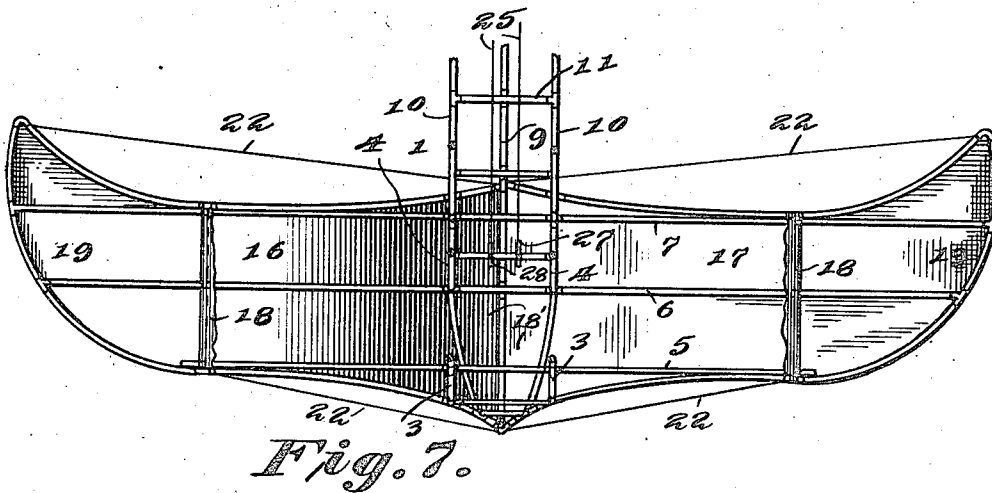
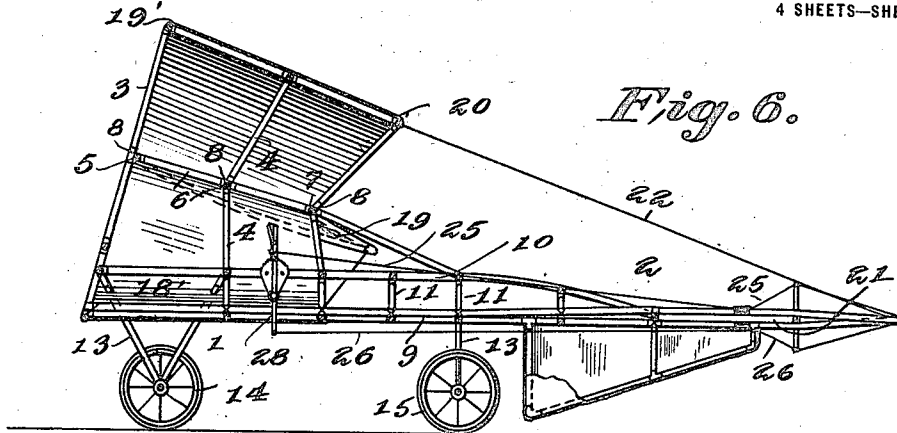
Victor J. Evans

Attorney

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4 SHEETS—SHEET 3.



Inventor

George M. Wane

Witnesses

A. H. Lybrand
C. C. Hines

Victor J. Evans

Attorney

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4 SHEETS—SHEET 4.

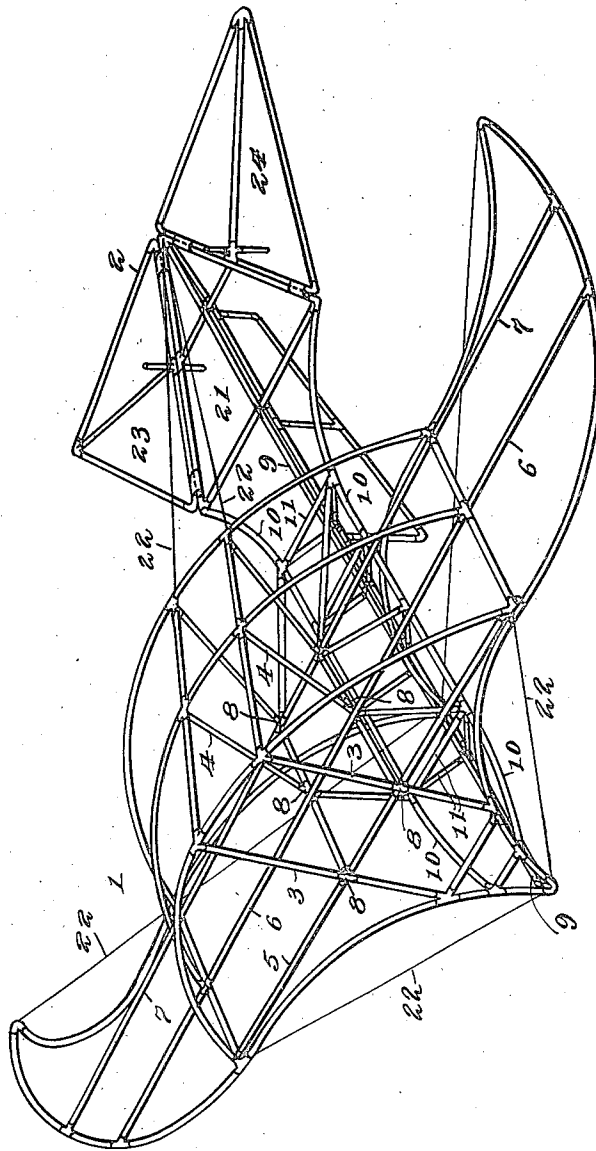


Fig. 9.

Witnesses

A. A. Lybrand
C. C. Hines

By

Inventor
George M. Wane
Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

GEORGE M. WANEE, OF OAKLAND, CALIFORNIA.

FLYING-MACHINE.

1,172,182.

Specification of Letters Patent.

Patented Feb. 15, 1916.

Application filed October 8, 1915. Serial No. 54,826.

To all whom it may concern:

Be it known that I, GEORGE M. WANEE, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to improvements in flying machine, contemplating particularly the provision of a flying machine of the aeroplane type, embodying means for securing greater lifting and sustaining power, inherent equilibrium, and safety against an abrupt fall in case of danger.

The invention further contemplates the provision of a flying machine having a novel construction and arrangement of supporting planes, and a novel construction and arrangement of steering and controlling devices and a novel construction of frame, whereby the desired ends are attained.

The invention consists of the features of construction, combination and arrangement of part, herein fully described and claimed, reference being had to the accompanying drawings in which:—

Figure 1 is a front elevation of my improved flying machine. Fig. 2 is a top plan view of the same. Fig. 3 is a side elevation of the machine. Fig. 4 is a rear elevation thereof. Fig. 5 is a vertical transverse section taken on a line about centrally through the wings of the planes. Fig. 6 is a central vertical longitudinal section through the machine. Fig. 7 is a sectional plan view on the line 7—7 of Fig. 5. Fig. 8 is a vertical transverse section on the line 8—8 of Fig. 1 through the tail frame. Fig. 9 is a perspective view of the main frame.

In carrying my invention into practice, I provide a flying machine including a vertically disposed main frame 1 and a longitudinally and horizontally extending tail frame 2.

The main frame 1 is of rectangular form and includes, among other parts, hereinafter fully described, front and rear pairs of uprights 3 and 4, front and rear transverse bars 5 and 6, and a pair of rear longitudinal frame bars 7, all united at their points of intersection by coupling members 8.

The tail frame 2 consists of a longitudinally extending keel or central portion 9 and longitudinal bars 10 disposed above and at equal distances on opposite sides of the main central bar or keel 10, which may con-

sist of one or more united frame bars, the said bars 9 and 10 being united at intervals by braces 11, and forming a substantially triangular or inverted V-shaped frame structure. Carried by this frame structure are front and rear buckets 13, suitably connected and braced and carrying axle supports for a pair of front wheels 14 and a single rear or trail wheel 15, the construction being such, if desired, that these wheels may be steered when the machine runs across the surface of the ground.

Supported by the main and tail frames are a pair of lower supporting planes 16 and 17 and an upper supporting plane 18. Each of these planes comprises a suitable frame structure having a covering of fabric or other suitable material. The planes 16 and 17 have inner ends 18' which extend inwardly and downwardly on curved lines and intersect each other in converging relationship, said portions of said planes forming a tapering fin or keel and curved surfaces to prevent the machine from skidding, and thereby maintain it on its course, and also to act as lifting and stabilizing surfaces, as hereinafter fully explained. The body portions 19 of the respective planes 16 and 17 are extended laterally beyond the sides of the machine to equal degrees and curved outwardly and downwardly, and said body portions of the planes are also curved or inclined downwardly and rearwardly at a desired angle of incidence to give a supporting action upon the air. It will thus be observed that the planes 16 and 17 are curved both longitudinally and transversely, and have certain peculiarities of formation, the purposes of which will be more fully hereinafter described.

The upper supporting plane 18 is longitudinally bowed or curved and has its central portion disposed above the inwardly and downwardly curved ends 18' of the planes 16 and 17, in the median vertical line of the machine, and the ends of said plane 18 thence extend outwardly and downwardly at a determined angle of inclination or degree of curvature and are connected at their extremities with the body portions of the planes 16 and 17 at points about midway of the distance between the tips of said body portions of the planes 16 and 17 and the adjacent sides of the main frame 1. The upper plane 18 is curved or inclined in a fore-and-aft direction at a desired general angle of

incidence, which is somewhat greater than the angle of the lower planes 16 and 17, and the front or leading portion 19' of the plane 18 is set at a somewhat greater angle of inclination than the rear or trail portion 20 of said plane. The concaved side of the plane 18 faces downwardly and is disposed above the convexed upper surfaces of the planes 16 and 17, with its middle portion above the downwardly extending inner ends 18' of the said planes 16 and 17, at which point the chord of the plane 18 is of greatest depth, the plane 18 thus providing a substantially hood-shaped structure over the main portions of the planes 16 and 17 and cooperating therewith to provide an air passage of greatest depth at the center and contracted between the juxtaposed surfaces of the superposed planes, as will be readily understood.

The frames of the respective supporting planes are respectively made up of longitudinal and transverse bars, and the longitudinal bars of the upper plane are suitably secured to the longitudinal bars of the lower planes, and the inner ends of the longitudinal bars of the lower planes converge and are secured to each other and to the bars of the keel portion of the main frame and the tail frame. The transverse bars of each plane are three in number, arranged along the front and rear edges and the central portions of said planes, respectively, and said bars are connected with the uprights of the main frame by the couplings or unions 8, the longitudinal bars 7 of the main frame extending rearwardly at a downward angle of inclination and being fastened to the upper bars 10 of the tail frame, which bars 10 of the tail frame, in addition to being connected with each other and with the bars 2, as hereinbefore described, are fastened to the forward cross bar of the frame of a triangular tail plane 21, whose vertex faces rearwardly. The frame structure of the machine is completed, except as to immaterial details, by the use of suitable bracing or stay wires 22 wherever necessary.

In practice, a suitable motor and propeller, either driver or tractor, may be employed, and suitably arranged upon the machine, and if desired any desired type of marine service or hydroplane base may be used. For the purpose of controlling the craft, I have shown the same provided with triangular horizontal steering planes or rudders 23 and 24 arranged on opposite sides of the fixed horizontal stability plane 21, said planes 23 and 24 being coupled by suitable connections 25 and 26 with control devices 27 and 28 whereby said steering planes may be adjusted independently or simultaneously for horizontal and vertical steering actions. It will be observed that

the planes 23 and 24 are hinged or pivoted to swing vertically on inclined axes, and are adjustable to different lateral angles to the line of flight, so that by independently adjusting one or the other of said planes the machine may be steered to the right or left while by adjusting both planes in unison the machine may be steered vertically, the planes being movable vertically to positions above and below the plane of the fixed plane 21, as will be readily understood. In addition, a fixed vertical stability plane 29 may be employed, said plane operating in conjunction with the keel to prevent the machine from skidding or making lateral leeway, as well as to resist any tendency of the machine to tilt laterally in either direction.

It will be observed that the curvature of the body portions of the lower planes, which are arranged at a dihedral angle, is such as to secure an effective degree of inherent stability, and this is augmented to a material extent by the curvature of the portions 18', since, as the planes are also curved in a fore-and-aft direction, a gust of wind striking the body portion of either lower plane and tending to tilt said plane upwardly will, on following the line of the plane inwardly and rearwardly, strike the portion 18' thereof and exert its pressure to right or restore the machine to a normal state of equilibrium. This is true of the balancing operation of both lower planes in maintaining lateral stability. Furthermore, the construction of the upper plane is such as to adapt said plane to cooperate with the lower planes in maintaining longitudinal stability, any tilting motion of the machine forward or backward tending to cause the air to strike the upper plane at an angle and compact in the space or passage below the same, thus resisting such tilting tendency. This action is promoted by the fact that the upper plane as a whole presents a greater angle of incidence than the lower planes, and as the forward portion of the upper plane is disposed at a greater angle of incidence than the rear portion thereof, the machine, even if completely overturned by a strong gust of air, or in losing its headway on account of the stoppage of the motor, will return to and maintain a balanced position and will travel downward by gravity at a descending angle, such as will bring it to a state of landing in an erect position, the upper plane, in the event of the fall of the machine, serving as a parachute by which the speed of descent will be diminished and a safe landing insured.

I claim:—

1. A flying machine including a frame structure, a pair of supporting wings carried by the main structure, the said wings having outer portions extending laterally

beyond the frame structure and longitudinally and transversely curved, and having the inner portions extending downwardly in converging relation, and united to form a forward keel beneath the main supporting surface, an upper plane forming an arched hood extending over the converging portions of the first-named planes and rigidly secured at its extremities to said plane about midway of the length of the outer portions of the planes, and a tail frame carrying an auxiliary supporting plane and rudders and a vertical plane forming a rear keel in line with said forward keel.

2. A flying machine including a main frame having a central portion formed of vertical uprights and bracing connections therebetween, and main supporting planes each composed of frame members connected with said uprights, and a fabric covering said frame members, said planes having downwardly and inwardly curved and converging portions united in V-shaped formation secured to the uprights and outer longitudinal and transversely curved portions, and a fixed upper plane arranged in arched formation over the inner halves of the main planes and the converging inner portions thereof and also comprising a frame and a fabric covering, the respective planes being

provided with curved main bars rigidly connected with each other and with the main frame uprights, and transversely extending horizontal braces rigidly uniting the respective sets of wing bars with the uprights.

3. A flying machine including a main frame, a trail frame extending from the main frame, a supporting surface carried by the main frame and comprising arched lower planes having their inner ends depending in convergent relation and united to form a keel, and a rigid, arched upper plane overhanging the inner portions of the lower planes and fixed thereto, a tail plane upon the tail frame comprising a substantially triangular body and having rudder wings mounted to swing vertically on inclined axes extending along opposite converging sides of said body, means for adjusting said rudder wings, and a vertical plane depending from the tail frame partially beneath the tail plane and partially in advance thereof and in line with the keel formed by the lower planes.

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

GEORGE M. WANEE.

Witnesses:

J. A. BILLINGS,
A. F. DERRICK.