J. H. S. BARTHOLOMEW & E. F. HEATH.

AEROPLANE.

APPLICATION FILED AUG. 8, 1911.

1,037,411.

Patented Sept. 3, 1912.

4 SHEETS—SHEET 1.

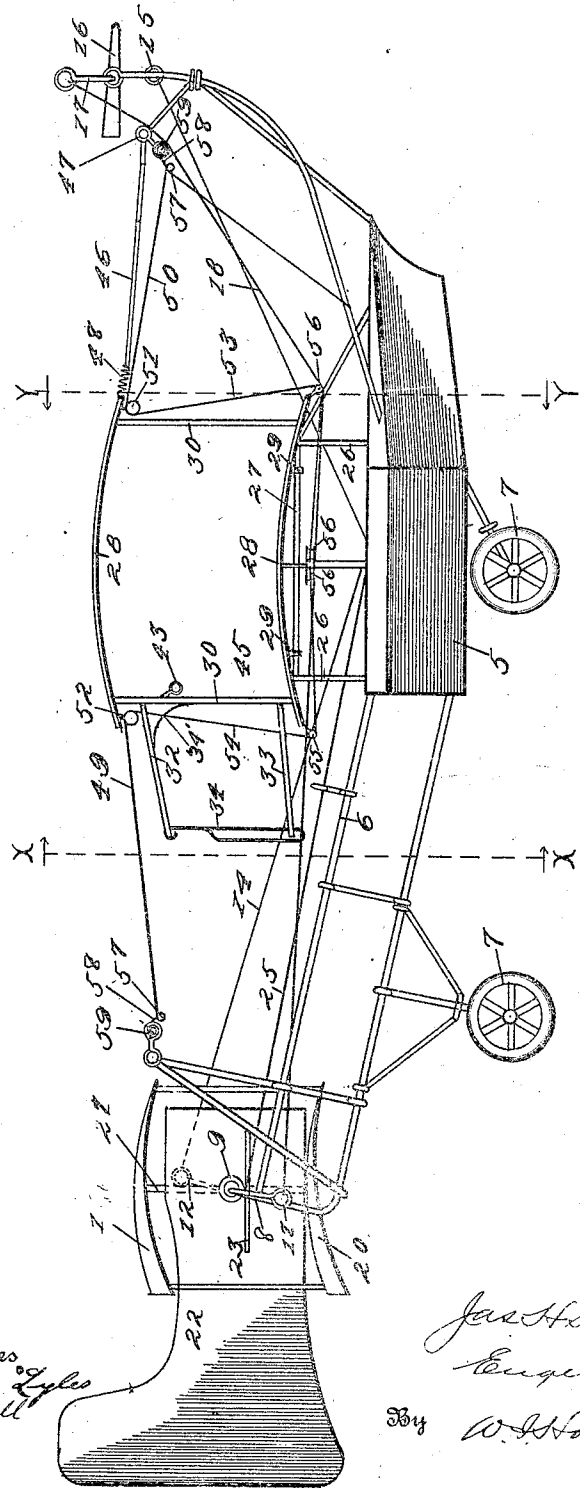


FIG. 1

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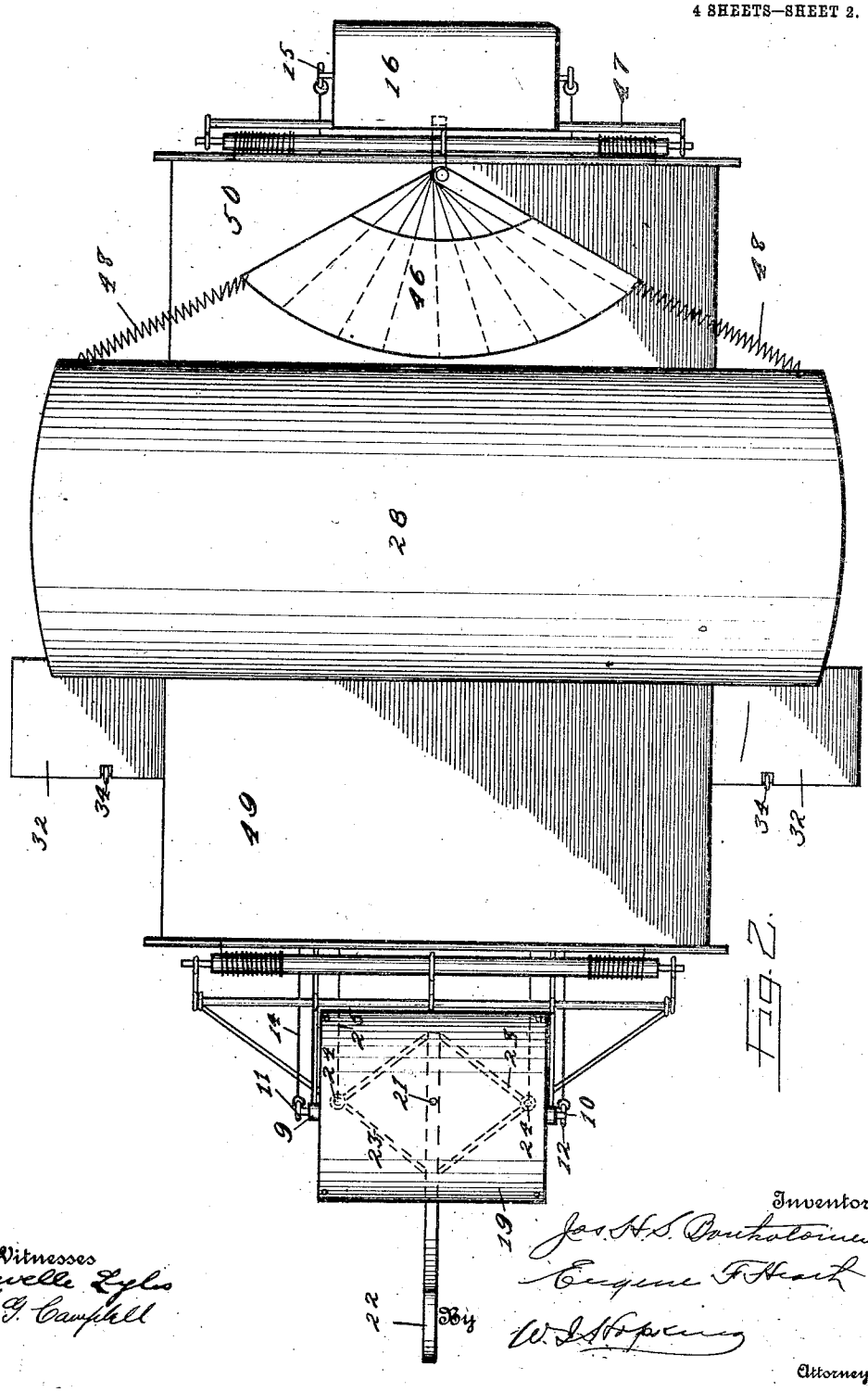



Fig. 2.

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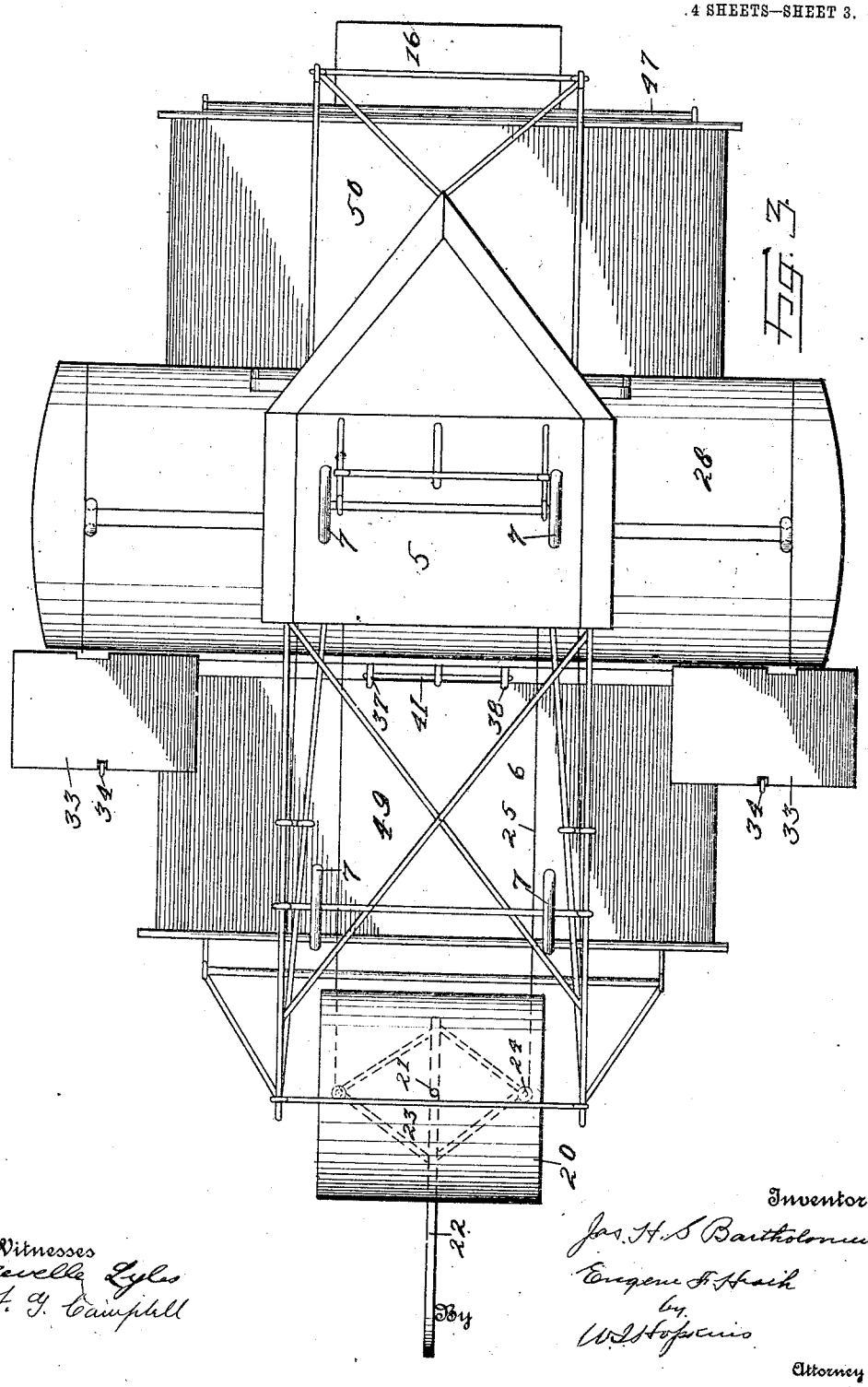



Fig. 3.

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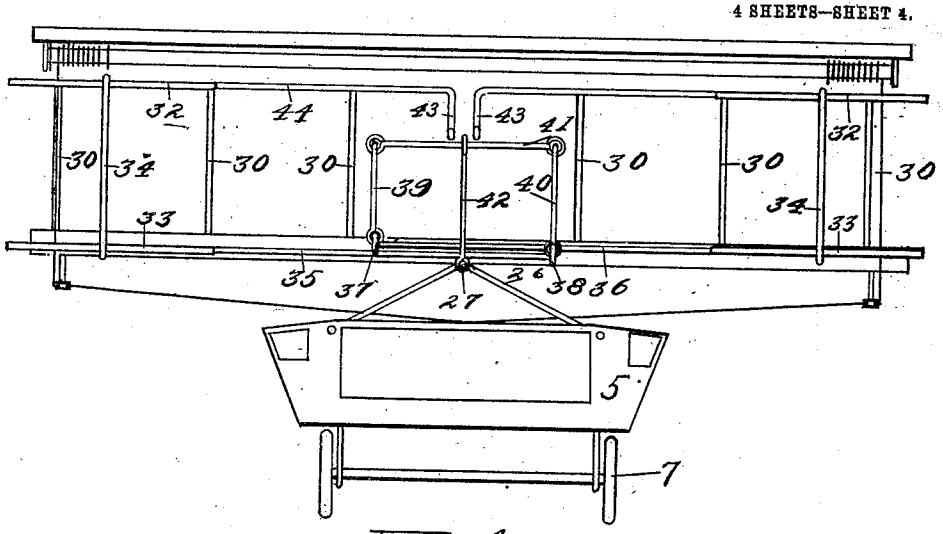



Fig. 4.

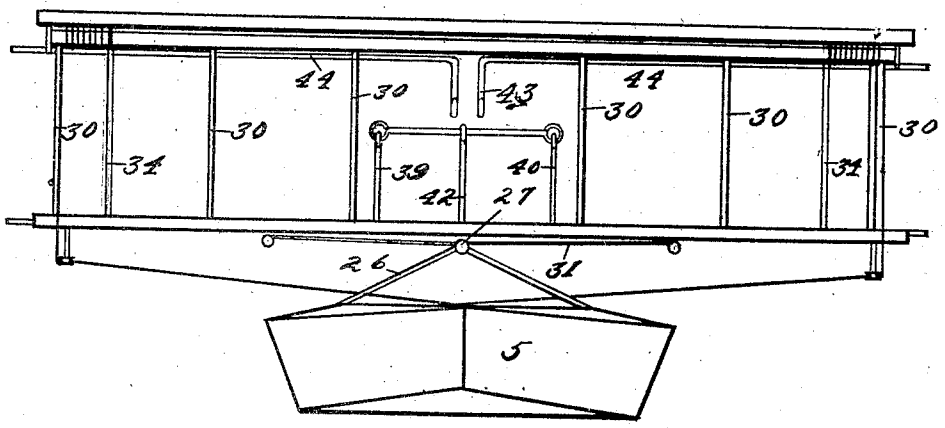



Fig. 5.

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# UNITED STATES PATENT OFFICE.

JAMES H. S. BARTHOLOMEW, OF OCCIDENTAL, AND EUGENE F. HEATH, OF SANTA ROSA, CALIFORNIA.

## AEROPLANE.

1,037,411. Specification of Letters Patent. Patented Sept. 3, 1912.

Application filed August 8, 1911. Serial No. 643,061.

*To all whom it may concern:*

Be it known that we, JAMES H. S. BARTHOLOMEW and EUGENE F. HEATH, citizens of the United States of America, the said JAMES H. S. BARTHOLOMEW residing at Occidental, in the county of Sonoma and State of California, and the said EUGENE F. HEATH residing at Santa Rosa, in the county of Sonoma and State of California, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

This invention relates to airships and more particularly to aeroplanes, the object of the invention being to provide an improved device of this character embodying among other things, parachute elements controllable by the operator, which elements serve to aid in rendering the descent of the machine a gradual one when desired.

A further object of the invention is the provision of an improved automatic balancing mechanism for the aeroplane.

A further object of the invention is the provision of improved means for steering and controlling the aeroplane.

Further objects and advantages of the invention will be set forth in the detailed description which now follows:

In the accompanying drawing, Figure 1 is a side elevation of the aeroplane constructed in accordance with the invention, Fig. 2 is a plan view thereof, Fig. 3 is an underside view of the aeroplane, Fig. 4 is a transverse vertical section upon line $x$—$x$ of Fig. 1, looking in the direction of the arrow, with certain of the parts omitted, and Fig. 5 is a sectional view upon line $y$—$y$ of Fig. 1, looking in the direction of the arrow.

Like numerals designate corresponding parts in all of the figures of the drawing.

Referring to the drawing, the numeral 5 designates a body or passenger carrying portion, which together with the skeleton frame 6 is supported upon ground wheels 7. The skeleton frame is extended upwardly at 8 to form a bearing 9 for a transverse shaft 10. Upon this shaft is secured crank arms 11 and 12, the crank arm 11 extending downwardly and the crank arm 12 extending upwardly.

A cord or cable 14 extends from the crank arm 12 to a corresponding crank arm 15, which when moved, serves to actuate a front horizontal plane 16, the intermediate portion of this cable passing within reach of the aviator who occupies a position in the body 5.

A crank arm 17 connected to plane 16 has connected thereto a cord or cable 18, which after passing adjacent the aviator's seat, extends rearwardly and is connected to the crank arm 11. The shaft 10, by which the crank arms 11 and 12 are carried, carries curved horizontal planes 19 and 20 through the medium of a vertical shaft 21. It will therefore be seen that the planes 19 and 20 and the plane 16 are connected to move in unison. A vertical rudder 22 is pivotally mounted upon the shaft 21 and while partaking of the bodily swinging movement of these planes, is capable of a horizontal swinging movement with relation to them. This horizontal swinging movement is accomplished by means of arms 23, these arms being bent to form eyelets 24 to which cords or cables 25 are attached, these cords or cables being carried forwardly to the body 5.

The body 5 carries a frame-work 26, this frame-work including a horizontal shaft 27 upon which a pair of main planes 28 is pivotally mounted, these main planes having hinge connection with said shaft 27 at 29. Strut rods 30 space the main planes from each other and impart the necessary rigidity to the structure.

As is best illustrated in Fig. 5, a flat spring member 31 is carried by the shaft 27 and is rigidly secured to said shaft. This spring member 31 is of such length as to bear beneath the underside of the plane at some distance upon each side of the shaft 27, to limit the degree of tilting of which said planes will be capable with relation to the body or car 5, despite the fact that said car is pendulously supported upon the shaft 27.

A pair of tilting wings 32 and 33 is pivotally connected to the rear side of the main plane structure at each end thereof. The uppermost of these wings 32 are capable of independent movement with relation to the lowermost wings 33, but these wings are connected by means of links 34, said links being positively connected to the uppermost wings 32 and slidably connected to the lowermost wings 33. Springs 34′ carried by the strut rods 30 bear against the under-

side of the uppermost wings 32 and normally tend to hold them in elevated position. The lowermost wings 33 are carried by shafts 35 and 36 respectively. These shafts overlap each other and are provided with outwardly extending crank arms 37 and 38 by which links 39 and 40 are connected to a cross bar 41, this cross bar being in turn carried by a rigid upstanding bar 42 that is supported from the shaft 27. It will therefore be seen that when the main planes tend to tilt with relation to the body 5, the links 39 and 40 form positive supporting elements to thrust against the crank arms 37 and 38 to thereby tilt the wings 33 to counteract such tendency to tilting of the main planes, and the downward movement of the lower planes to counteract this tendency to tilt is imparted through link 34 to the corresponding upper plane and yet normally said upper plane is left free to be moved manually through the medium of operating members 43 upon shafts 44 of the wings 32, these operating members 43 being adapted to have cords (not shown) thereto which will extend downwardly to the car 5.

A fan-like parachute member 46 is supported from a cross bar 47 upon the main frame and its corners are connected by yielding or spring members 48 with the corners of the main plane. Additional parachute members comprise curtains 49 and 50. These curtains ordinarily roll upon rollers 51 and 52 and these rollers are actuated by cords or cables 53 and 54 that pass downwardly over guide pulleys 55 and 56 to the car 5. At their outer ends the curtains are provided with cross bars 57, said cross bars in turn having attached thereto cords 58 which are connected with spring rollers 59 substantially of the shade roller type, these rollers serving to normally wind the curtains 58 thereon to draw the curtains 49 and 50 from the rollers 51 and 52 at which time said curtains and the fan member 46 serve as parachutes when it is desired to descend or if the motor (not shown) should stop in mid-air. The cords 53 and 54 when drawn upon, rotate the rollers 52 to wind the curtains thereon, this movement drawing the curtains 58 from the rollers 59 and putting said rollers under tension.

From the foregoing description, it will be seen that simple and efficient means are herein provided for accomplishing the objects of the invention, but while the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that the invention is not limited to the precise construction set forth but includes within its purview such changes as may be made within the scope of the appended claims.

Having described our invention, what we claim is:

1. The combination with a main plane of a car pendulously hung from said main plane and a yielding, supporting and stop member carried by the car structure extending longitudinally of the main plane and bearing against the under side thereof upon opposite sides of the point of attachment of the car to the main plane.

2. In a device of the character described, the combination with a body portion, of a pair of main planes supported above said body portion and mounted to tilt with relation thereto, a pair of pivotally mounted wings located at each side of the main planes and extending rearwardly therefrom, connections between said wings and the body portion for automatically tilting said wings to counteract tipping of the main planes, one of the wings of each pair being capable of independent movement with relation to the other wings of the pair.

3. In a device of the character described, the combination with a pair of main planes, a body portion, a fixed member carried by the body portion and upon which said main planes are tiltingly mounted, a pair of wings located at the rear of the main planes upon each side thereof, a link connection between the wings of each pair, said link connection positively connecting said wings for movement in one direction but permitting movement of said wings with relation to each other in the opposite direction.

4. The combination with a main plane of a car pendulously hung from said main plane and a yielding, supporting and stop member carried by the car structure extending longitudinally of the main plane and bearing against the under side thereof upon opposite sides of the point of attachment of the car to the main plane, supplemental tilting planes carried by the main plane and means for tilting said supplemental planes in opposite direction when the main plane tilts with relation to the car.

In testimony whereof, we each affix our signatures in the presence of two witnesses.

JAMES H. S. BARTHOLOMEW.
EUGENE F. HEATH.

Witnesses to signature of James H. S. Bartholomew:

SHERMAN B. BARTHOLOMEW,
J. F. DUGAN.

Witnesses to signature of Eugene F. Heath:

J. F. DUGAN,
C. A. POMEROY.