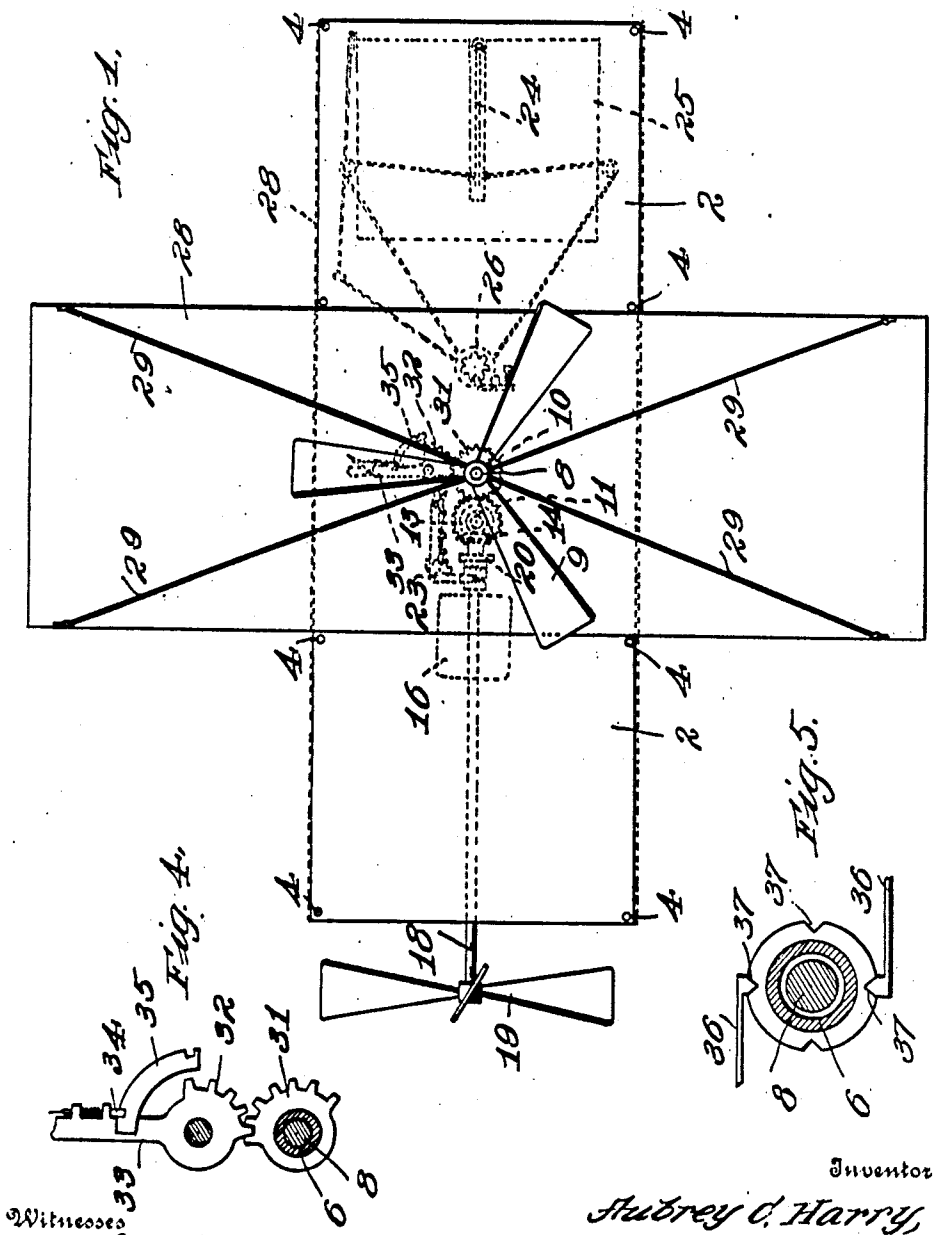
A. C. HARRY.

FLYING MACHINE.

APPLICATION FILED MAR. 5, 1912.

1,039,530. Patented Sept. 24, 1912.

3 SHEETS—SHEET 1.



Witnesses

G. A. Pauberschmidt

C. C. Hines.

Inventor

Aubrey C. Harry,

By Victor J. Evans

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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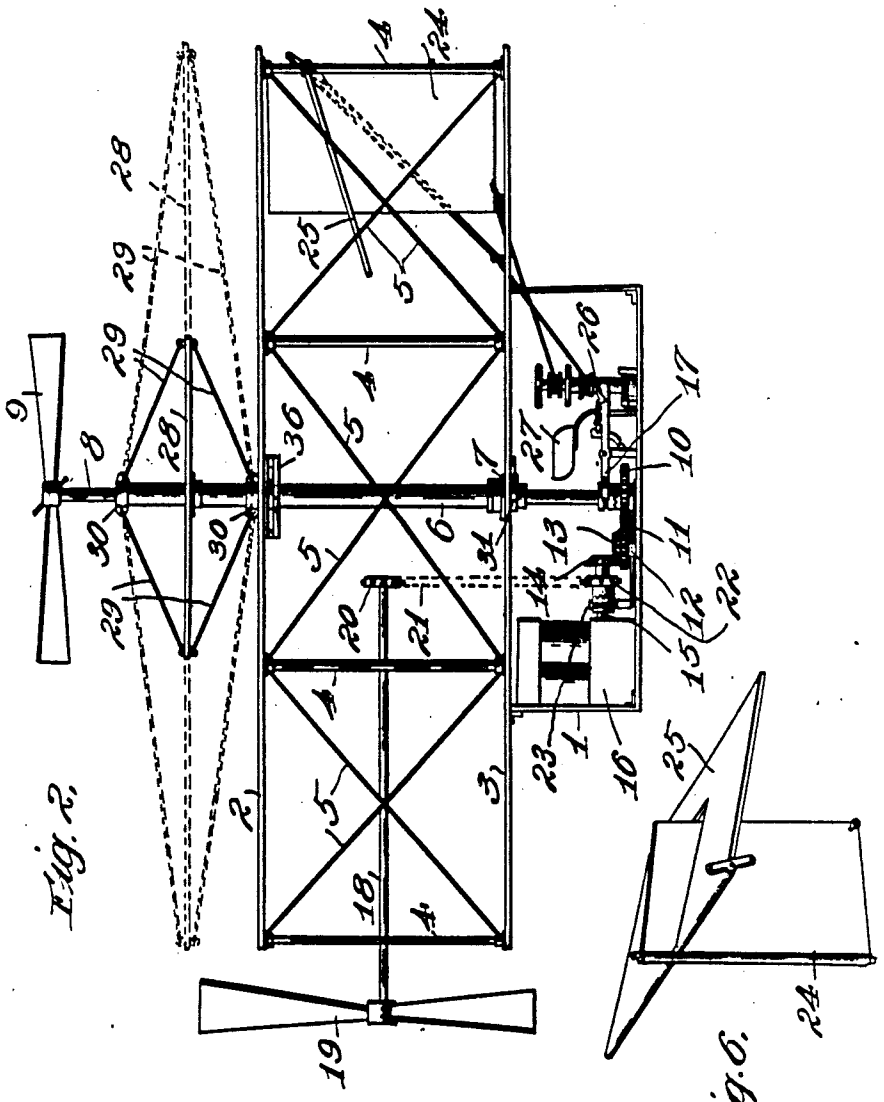

Fig. 2.

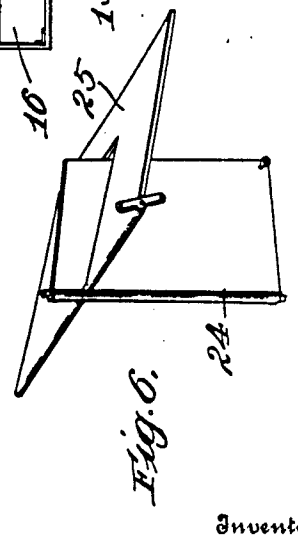

Fig. 6.

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G. A. Paulenschmidt

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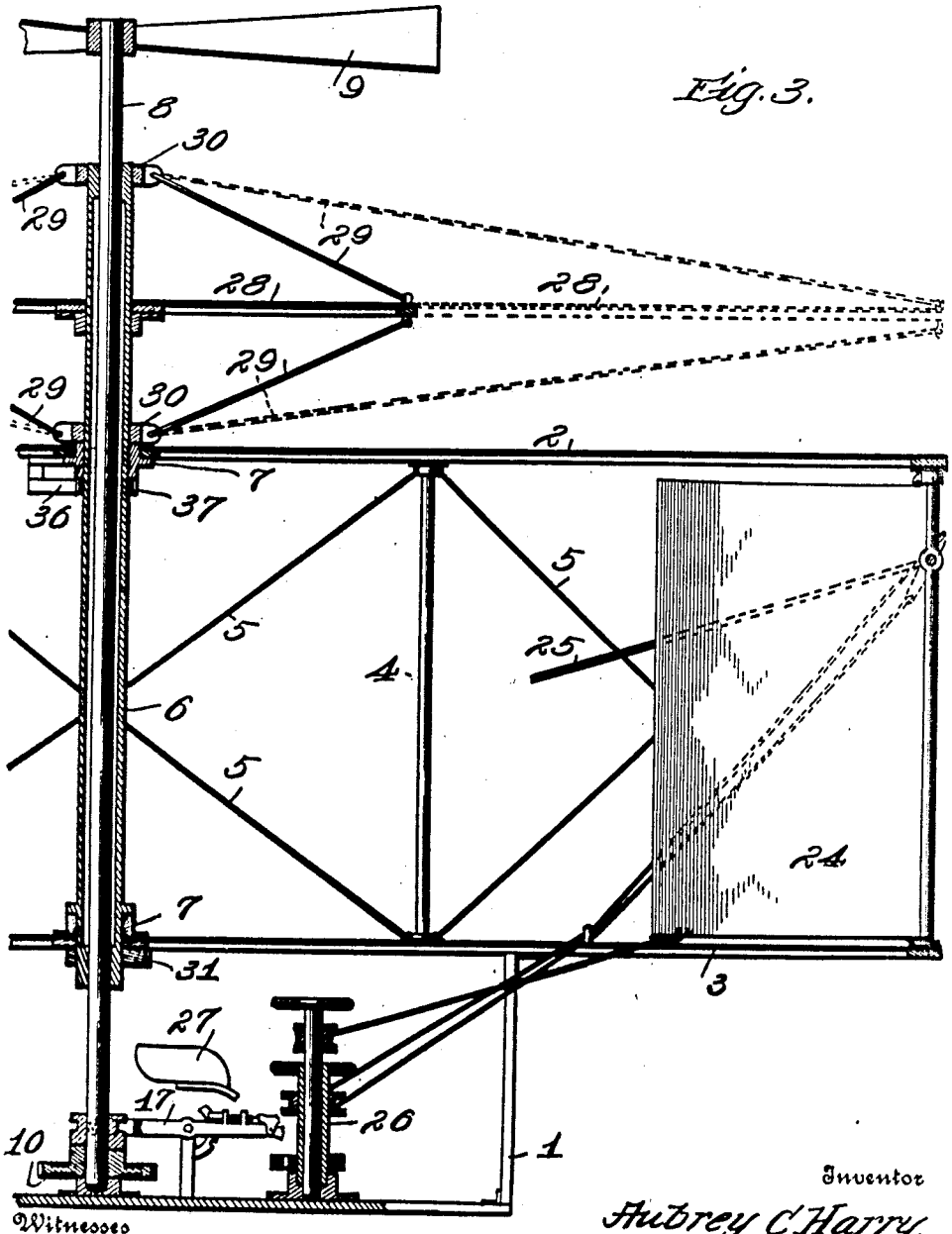
3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

AUBREY C. HARRY, OF PORTSMOUTH, OHIO.

FLYING-MACHINE.

1,039,530. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed March 5, 1912. Serial No. 681,695.

To all whom it may concern:

Be it known that I, AUBREY C. HARRY, a citizen of the United States, residing at Portsmouth, in the county of Scioto and State of Ohio, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to flying machines of the heavier-than-air class, one object of the invention being to provide a flying machine of this character having driving and lifting propellers which may be thrown into and out of operation at will, whereby the machine may be caused to rise directly from or descend in a straight path toward the ground, may be sustained in a stationary position at any altitude, and when the proper altitude is reached in its ascent for flight may be propelled forwardly in a horizontal path.

A further object of the invention is to provide a flying machine having a plurality of superposed supporting surfaces, one of which surfaces is adjustable from a working position lengthwise transversely to the line of flight to a position corresponding to that of the other surface or surfaces parallel with the line of flight, so as to diminish the resistance of the machine to ascent or descent whenever desired.

A further object of the invention is to provide a flying machine having a novel construction and organization of rudders, whereby the machine may be readily and conveniently steered.

A still further object of the invention is to provide a flying machine which may be controlled with facility, to maintain its longitudinal and lateral balance.

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

Figure 1 is a top plan view of a flying machine embodying my invention, showing the adjustable supporting plane in full lines in its working position and in dotted lines in its position of adjustment parallel with the line of flight. Fig. 2 is a side elevation of the machine. Fig. 3 is a vertical longitudinal section of the same. Fig. 4 is a horizontal transverse section through the mast and hollow shaft on a line immediately below the level of the lower plane, showing the means for turning the upper plane. Fig. 5 is a horizontal transverse section through the mast and hollow shaft showing the construction of the means for limiting the swinging movements of the upper plane. Fig. 6 is a perspective view of the rudders.

Referring to the drawings, 1 designates a carriage or frame, which may be of any suitable form and construction and provided with any preferred type of launching and landing gear. Mounted upon said frame or carriage are superposed fixed supporting surfaces 2 and 3 connected by stanchions or struts 4 and suitable stays or braces 5. These supporting surfaces or planes may be of any suitable length and width, and extend lengthwise parallel with the line of flight.

Extending upward from the carriage or frame is a mast 6, journaled in bearing sleeves 7, which mast is hollow for the passage of a shaft 8 carrying at its upper end a lifting propeller 9 and at its lower end a spur gear 10. This gear 10 meshes with a transmission spur gear 11 on a vertical shaft 12 which is also provided with a bevel gear 13 meshing with a similar gear 14 on the shaft 15 of a suitable motor 16, whereby the lifting propeller 9 is driven. The gear 10 is adapted to be thrown into and out of operation by a suitable clutch device 17 to enable the lifting propeller to be started or stopped at will. The frame also carries bearings for a horizontal shaft 18 extending longitudinally between the rear portions of the surfaces 2 and 3 and carrying at its rear end a driving propeller 19. Said shaft 18 is provided at its forward end with a sprocket wheel 20 connected by a chain 21 with a drive sprocket 22 on the motor shaft 15, whereby said driving propeller is driven. A clutch mechanism 23 of a suitable type is provided for throwing said sprocket wheel 22 into and out of action, so that the driving propeller may be rendered

operative or inoperative at will. It will thus be understood that the lifting propeller may be set into action to cause the machine to rise from the ground to the desired altitude in the air and then thrown out of action while the driving propeller is set into action to propel the machine forward. The driving propeller may be thrown out of action and the lifting propeller into action at any desired time when the machine is in flight, whereby the machine may be maintained in a stationary position in the air above any given point on the earth below. By the use of suitable speed regulating gearing the working thrust of the propeller 9 may be controlled to adapt it to simply assist the planes in supporting the machine while it is being driven ahead by the driving propeller, or to regulate the speed of descent of the machine to the ground in making a more or less vertical landing.

Arranged between the front portions of the planes 2 and 3 is a vertical rudder 24 pivotally mounted for lateral movement to different angular positions to the line of flight beyond the opposite sides of the central longitudinal line of the machine, whereby the latter may be steered laterally in either direction. Pivotally supported upon this vertical rudder is a bifurcated or bisected horizontal rudder 25 adjustable vertically to steer the machine up or down. This rudder is provided with a steering lever or other suitable steering element 26 adapted to be conveniently actuated from the aviator's or pilot's seat 27, and through the medium of which either rudder may be adjusted and a combination of steering movements secured, as will be readily understood.

Arranged above the supporting surface 2 is a third supporting surface 28, which is substantially coextensive in area with said supporting surfaces 2 and 3. This supporting surface or plane 28 is mounted to revolve through an angle of 90° upon the mast 6, and is connected and reinforced by stays 29 coupled to collars 30 revoluble on the mast. By this mode of mounting the plane or supporting surface 28 is adapted to be turned to a working position transversely to the line of flight, or to a non-working position parallel with the line of flight, as shown in full and dotted lines in the drawings. When the said plane 28 is disposed in parallel relation to the planes 2 and 3, the whole of the supporting surface is arranged within a compact area, so as to diminish its resistance to the ascent or descent of the machine. The plane 28 may, therefore, be disposed in the dotted line position to enable the machine to be elevated by the lifting propeller in starting a flight, and when the machine is being driven forward may be turned to its normal position shown in full lines to act as a supporting medium, increasing the sustentation power of the machine. For the purpose of adjusting said plane, a gear segment 31 is fixed thereto, which meshes with a gear segment 32 on a pivoted controlling lever 33 adapted to be conveniently operated by the aviator. This lever is provided with a spring actuated pawl or dog 34 to engage a rack 35, whereby the lever and plane may be locked in adjusted position. On the plane 2 are pawls or dogs 36 adapted to coöperate with pairs of opposed ratchet stop teeth or notches 37 on the mast, whereby the swing of said plane between its working and non-working positions is limited. By means of the adjusting mechanism the plane may be turned to a slight degree to slightly advance either of its end portions and retract the other beyond their normal working positions, whereby the machine may be balanced laterally and banked in making turns, as will be readily understood.

From the foregoing description, taken in connection with the drawings, the construction and mode of operation of my improved flying machine will be readily understood, and it will be seen that the invention provides a flying machine which is simple of construction and is adapted to be readily controlled by the aviator. While the construction disclosed is preferred, modifications within the scope of the appended claims may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what I claim as new is:—

1. A flying machine comprising a frame, a fixed supporting surface extending lengthwise parallel with the line of flight, a mast extending upwardly through said fixed supporting surface, an adjustable supporting surface revoluble upon the mast through an arc of 90° so as to extend parallel with or at right angles to the fixed supporting surface, means for adjusting said revoluble main supporting surface, and coacting means between said revoluble main supporting surface and the mast for arresting said supporting surface when it reaches the respective limits of motion thereof.

2. A flying machine comprising a frame, a fixed supporting surface, a hollow mast extending upwardly through said supporting surface, a shaft projecting through said mast and carrying a lifting propeller, a driving propeller, suitable means for operating the propellers, an adjustable supporting surface revolubly mounted upon the hollow mast above the fixed supporting surface for movement in an arc of 90° so as to extend parallel with or at right angles to said supporting surface, means for adjusting said

adjustable supporting surface, a collar upon the mast provided with pairs of notches arranged at right angles to each other, and spring dogs upon the adjustable supporting surface and adapted to engage said notches to limit the reverse rotary motions of the adjustable supporting surface.

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

AUBREY C. HARRY.

Witnesses:
JAMES H. HARRY,
CLYDE HARRY.