C. A. SIMMONS.

AEROPLANE.

APPLICATION FILED MAY 1, 1918.

1,308,997.

Patented July 8, 1919.

3 SHEETS—SHEET 1.

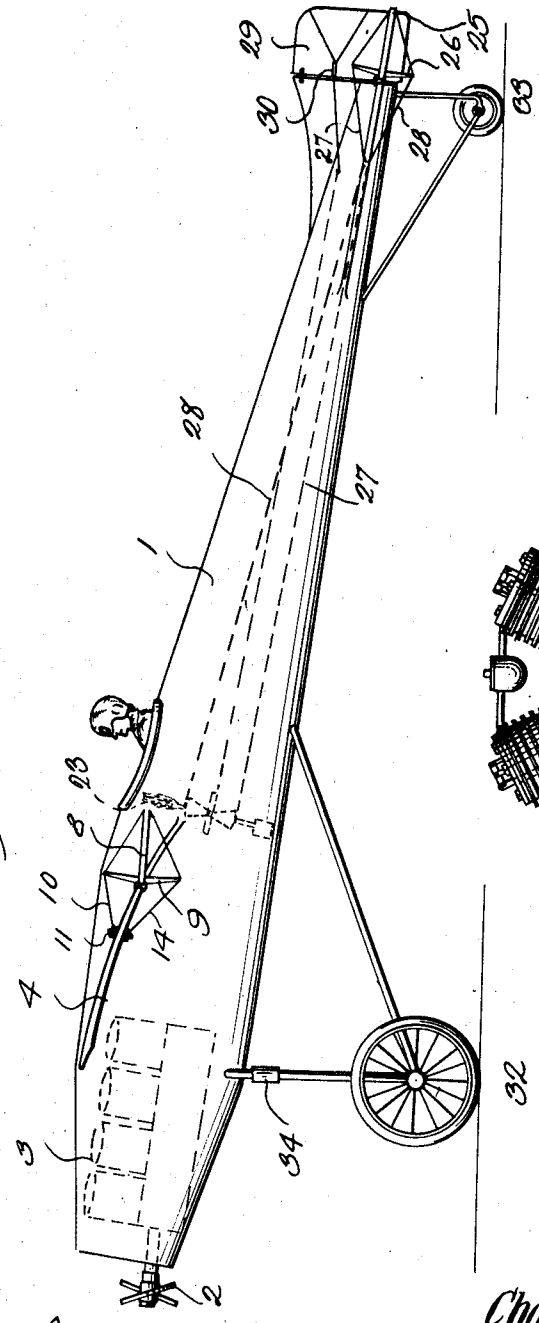

Fig. 1.

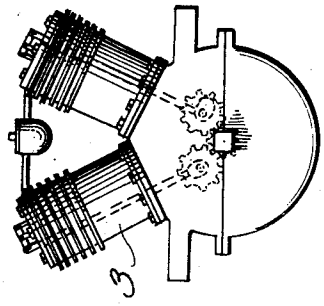

Fig. 6.

WITNESSES

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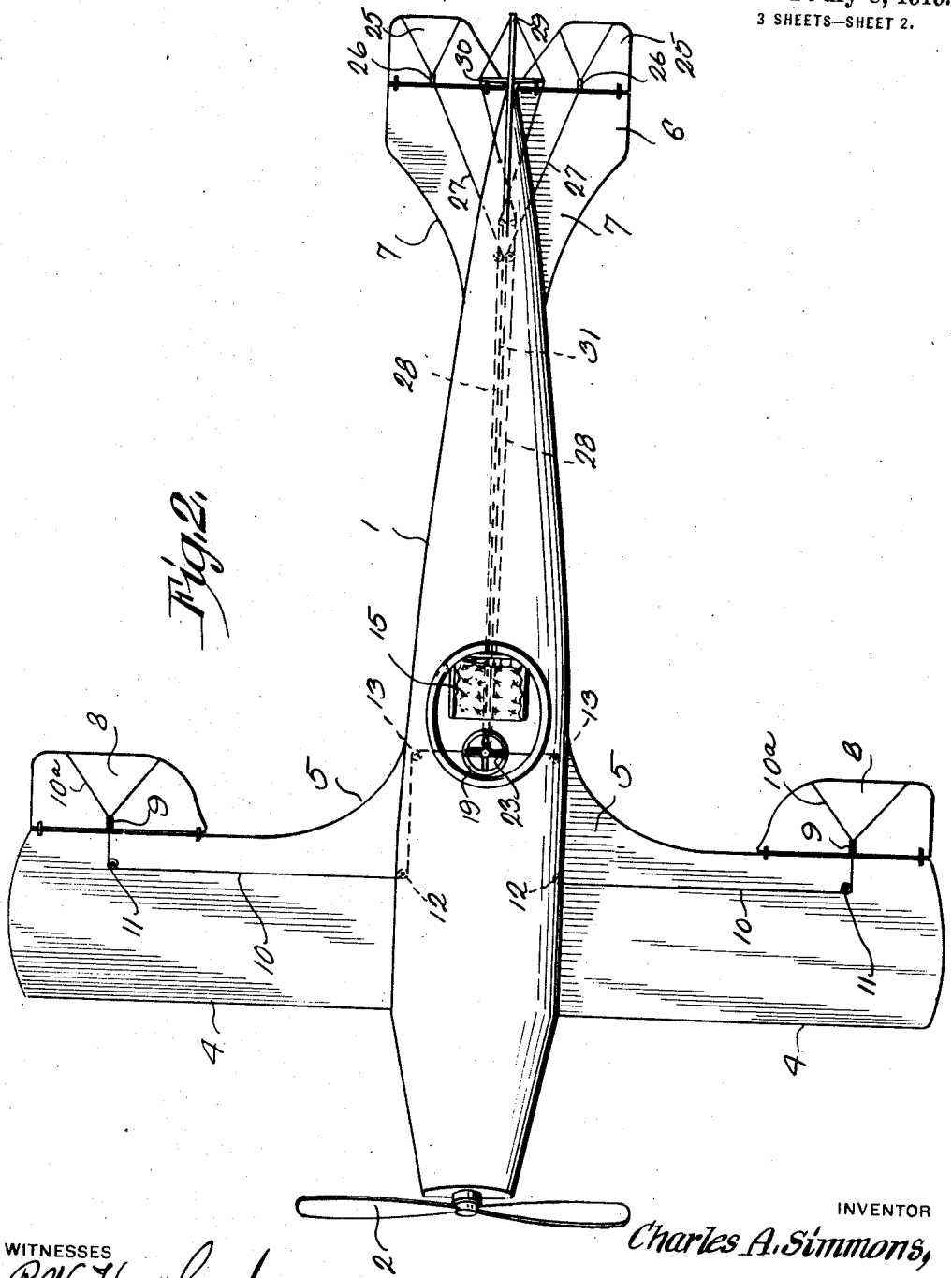
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

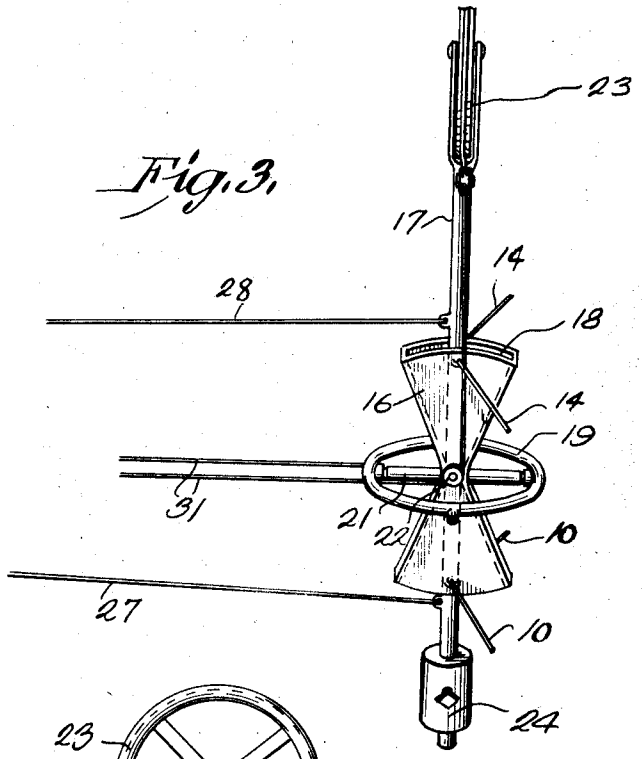


Fig. 4.

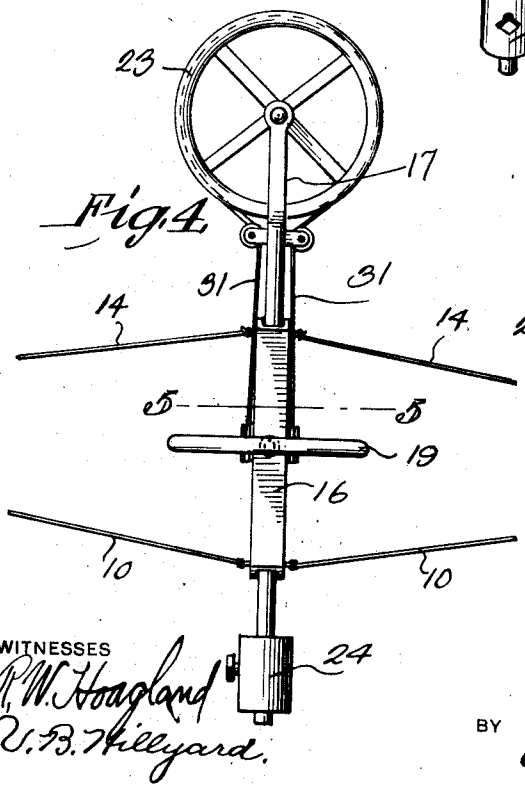
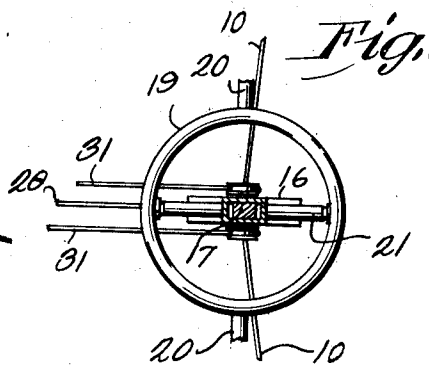


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

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AEROPLANE.

1,308,997. Specification of Letters Patent. Patented July 8, 1919.

Application filed May 1, 1918. Serial No. 231,886.

To all whom it may concern:

Be it known that I, CHARLES A. SIMMONS, a citizen of the United States, residing at Fairfield, in the county of Wayne and State of Illinois, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

This invention relates to flying machines of the type designed chiefly for warfare, and relates more particularly to craft of the monoplane type which has been found to be the speedier of the many forms.

One of the leading features of the invention is the provision of an automatic control which enables the machine to be operated by a single person who, at times, may neglect the control without fear of disastrous results in order to make observations or engage an enemy craft or drop missiles upon an object.

The invention furthermore provides a machine equipped with lifting planes of novel formation and presenting more than the usual amount of extent of surface to insure sustaining the machine in the air during flight without requiring an excessive expenditure of power for said purpose.

A further purpose of the invention is the provision of a machine having a hull of novel outline in order to attain speed and provided with alighting gear which is also utilized for automatically cutting off the power which is of advantage in the event of the machine landing while not under control of the operator.

The drawings illustrate a preferred embodiment of the invention; however, it is to be understood that in adapting the same to meet different conditions, various changes in the form, proportion, and minor details of construction may be resorted to without departing from the nature of the invention as claimed hereinafter.

In the drawings:

Figure 1 is a side view of a flying machine of the monoplane type embodying the invention.

Fig. 2 is a top plan view of the machine.

Fig. 3 is a detail view in perspective of the automatic control.

Fig. 4 is a view of the control as seen taken at a right angle to Fig. 3.

Fig. 5 is a horizontal section on the line 5—5 of Fig. 4.

Fig. 6 is an end view of the power plant showing the parts on a larger scale.

Corresponding and like parts are referred to in the description and indicated in all the views of the drawings by like reference characters.

The numeral 1 designates the hull or body of the machine, the same having its major portion tapering rearwardly and its front portion tapering forwardly, the intermediate portion being approximately of cylindrical form. The shell or body is truncated at its forward end and the propeller 2 is located in advance of the truncated end. The power plant comprises an engine 3 preferably of the internal combustion type and comprising a plurality of cylinders which are oppositely inclined, as indicated most clearly in Fig. 6. The power plant is preferably located in the head of the hull or body and well forward of the operator. A plane 4 is disposed at each side of the hull or body and curves slightly from the front to the rear edge, as indicated most clearly in Fig. 1. The side planes 4 are arranged opposite the cylindrical portion of the body. Other planes 5 are located in the angular spaces formed between the rear edges of the planes 4 and the hull 1, and these planes 5 practically form extensions of the planes 4 and serve to provide a greater extent of supporting surface. A plane 6 is located at the rear end of the hull or body 1 and projects a like distance from opposite sides of the hull. Other planes 7 similar to the planes 5 occupy the angular spaces formed between end portions of the plane 6 and the sides of the hull or body 1. These planes 7 perform the same office as the planes 5, and furthermore strengthen the plane 6.

Controlling planes or ailerons 8 are disposed at the outer ends of the planes 4 in the rear thereof and are hinged at their forward edges to the rear edges of the planes 4. The planes 8 normally occupy a horizontal position and each is provided with a vertically disposed bar 9 which projects a like distance below and above the plane 8. An upper cable 10 or like part is attached to the upper end of the vertical bar 9 and comprises rearwardly diverging elements 10^a which are attached to the rear edge of the plane 8. The cable 10 passes around a guide-pulley 11 mounted upon the outer portion of the plane 4, and thence extends inward and passes around guide pulleys 12 and 13 and is attached at its inner end to the control. It is to be understood that a cable or like flexible connection 10 is provided for

each of the planes 8, and the same is similarly mounted and connected to the control. Other cables or connections 14 are connected to the planes 8 and are disposed below such planes and the planes 4 and are connected to the control at a point above the axis thereof equal to the distance of the connections 10 below said axis. This is indicated most clearly in Figs. 3 and 4. It will thus be understood that the planes 8 are positively actuated in both directions, the arrangement being such that when one of the planes 8 is moved upward at its rear edge, the opposite plane is moved downward a corresponding distance.

The control is located adjacent the operator's seat 15 and comprises a member 16 and a post 17. The member 16 flares in opposite directions from a central point and is hollow, the space 18 likewise flaring from the center toward the upper and lower ends of the member, and such space 18 being narrower and disposed with its width in line with the length of the hull. The cables or flexible connections 10 and 14 are attached to opposite sides of the member 16 as indicated most clearly in Figs. 3 and 4. The member 16 is mounted to tilt laterally but is held against longitudinal tilting, hence movement of the member 16 toward the right will effect a movement of the planes 8 in one direction and a movement of the member 16 laterally in the opposite direction will result in moving the planes 8 in a reverse direction. It will thus be understood that the position of the planes 8 is controlled by the relative position of the member 16.

A ring 19 is provided at diametrically opposite points with journals 20 which are suitably mounted in a part of the framework. This admits of the ring 19 tilting to the horizontal and prevents any relative lateral tilting. A shaft 21 is secured centrally to the member 16 and is disposed in the plane thereof, and projects an equal distance to the front and in the rear thereof. This shaft is mounted at its ends in the ring 19 and is disposed at a right angle to the journals 20. It will thus be understood that while the ring 19 is adapted to tilt about its journals 20, the member 16 is adapted to tilt laterally about the shaft 21.

The post 17 passes through the space 18 of the member 16 and is journaled to the member 16 at 22 which is in the plane of the ring 19. The axis of the post 17 also coincides with the central constricted portion of the member 16 and the longitudinally flared space 18 provides for a fore-and-aft swinging movement of the post 17 as will be readily understood. The post 17 has a two-fold movement, the one fore-and-aft, and the other from side to side. A hand wheel 23 is provided at the upper end of the post 17 for convenience of operation. The cables or flexible connections for controlling the rudders are connected to the post 17. A weight 24 is secured to the lower end of the post 17 which projects some distance below the member 16, and this weight 24 is of sufficient mass to hold the post 17 and member 16 in vertical position so that the planes 8 and rudders may be maintained in a predetermined position when the control is free from the attention of the operator. The weight 24 may be adjusted on the post 17 and secured in the required adjusted position. In this manner, the effectiveness of the weight 24 is regulated by varying its distance from the pivotal support 22 of the post 17.

Horizontal rudders 25 are hinged at their forward edges to the rear edges of the plane 6 and are adapted to be moved up or down at their rear edges. Vertical bars 26 are secured to the rudders 25 at their forward edges and project above and below the rudders a like distance. Cables or flexible connections 28 connect the lower ends of the bars 26 with the upper portion of the post 17 and pass around suitable guide-pulleys. Other cables or flexible connections 27 connect the upper ends of the bars 26 with the lower portion of the post 17. The rear ends of the cables or flexible connections 27 and 28 are branched and the branches are connected to the rear ends of the planes 25. It will thus be understood that when the post 17 is moved forward or rearward at its upper end, the wings or planes 25 are swung downward and upward thereby controlling the flight of the machine as to altitude.

A vertical rudder 29 is hinged at its front edge to the rear end of the hull or body 1 in line with the longitudinal center thereof. A horizontal bar 30 is secured to the vertical rudder 29 and projects laterally therefrom to a like distance.

Cables or like flexible connections 31 are attached to the outer ends of the bar 30 and their rear ends are branched and made fast to the rear end of the rudder 29. The cables or like flexible connections 31 pass around suitable guide-pulleys and extend forwardly and are attached to the hand wheel 23 or other suitable part so that upon manipulating the hand wheel 23, the vertical rudder, wing or plane 29 may be moved laterally to the right or to the left to cause the machine to swerve from a direct course as when turning to the right or to the left.

It is to be understood that the hull or body 1 may be of any suitable material, and the same is strengthened internally by means of a frame-work comprising ribs, braces, struts, and stringers. A suitable opening is provided in the top of the hull and may coincide with a cock-pit in which is disposed the seat 15 and the various controlling devices. It is noted that the machine is essen-

tially a monoplane and a one-man flier and may be advantageously utilized in warfare for the various purposes for which air-craft is desirable, either in making observations, attacking enemy air-craft, or in dropping explosive or other missiles upon objects. By reason of the automatic control, the operator may be free to attend to any duty instant to the machine upon which he may be bent. It is also observed that in the event of the operator becoming disabled, the machine may be depended upon to effect a safe landing because the control is so adjusted that when unrestrained, the planes 8 and 25 are set so as to cause the machine to gradually descend.

The landing device comprises a forward truck 32 and a rear truck 33, such trucks comprising a suitable frame-work and supporting wheels. One of the trucks as 32 has its frame-work yieldable and provided with a switch 34 whereby when the machine lands, the switch 34 is automatically operated to break the circuit of the ignition system with the result that the motor becomes dead. In this connection, it is to be understood that a second switch will be provided and is under control of the operator so that the circuit of the ignition system may be controlled independently of the automatically operated switch 34 so that the engine may be started and after the machine is in flight, the manually operated switch is actuated to admit of the automatic switch 34 controlling the circuit so that, in the event of a forced landing, the motor may be automatically cut off.

The foregoing description and the drawings have reference to what may be considered the preferred or approved form of my invention. It is to be understood that I may make such changes in construction, arrangement, and combination of parts, materials, dimensions, et cetera, as may prove expedient and fall within the scope of the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. Controlling mechanism for flying machines, comprising a laterally tilting member having its upper and lower ends flared, a second member pivoted to the constricted portion of the laterally tilting member and adapted to have a fore-and-aft swinging movement imparted thereto and having its end portions projecting beyond the ends of the laterally tilting member, and a weight on the lower end of the fore-and-aft tilting member.

2. A controlling mechanism for flying machines, embodying a laterally tilting member, vertically disposed and having its upper and lower end flared and made hollow, a member mounted in the laterally tilting member and projecting above and below the same and adapted to receive a fore-and-aft swinging movement, and a weight on the lower end of the last mentioned member.

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

CHARLES A. SIMMONS.

Witnesses:
A. O. Boyd,
Arthur Craig.