No. 883,565. PATENTED MAR. 31, 1908.

W. PARS.

AERO TUBE.

APPLICATION FILED OCT. 29, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

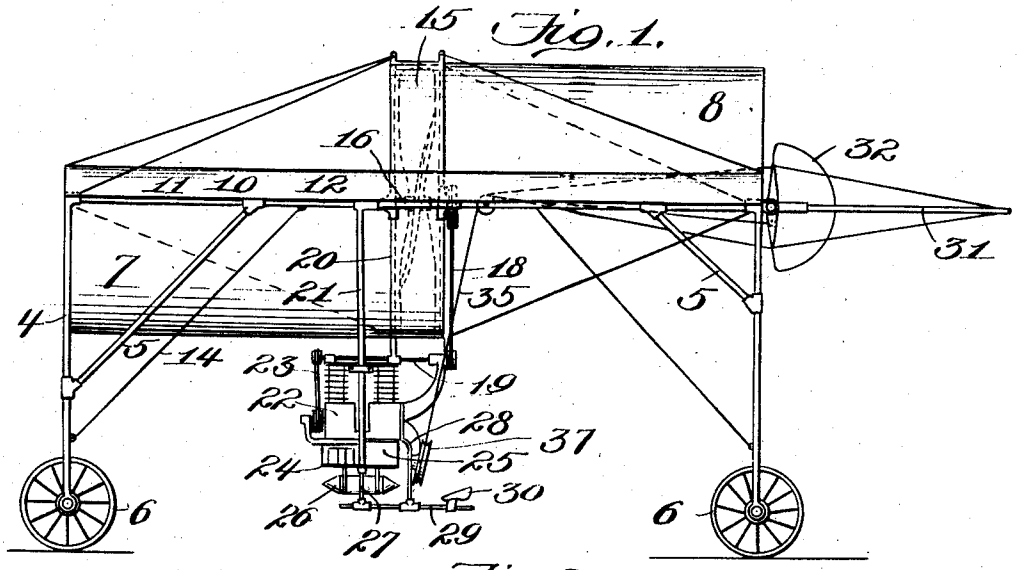
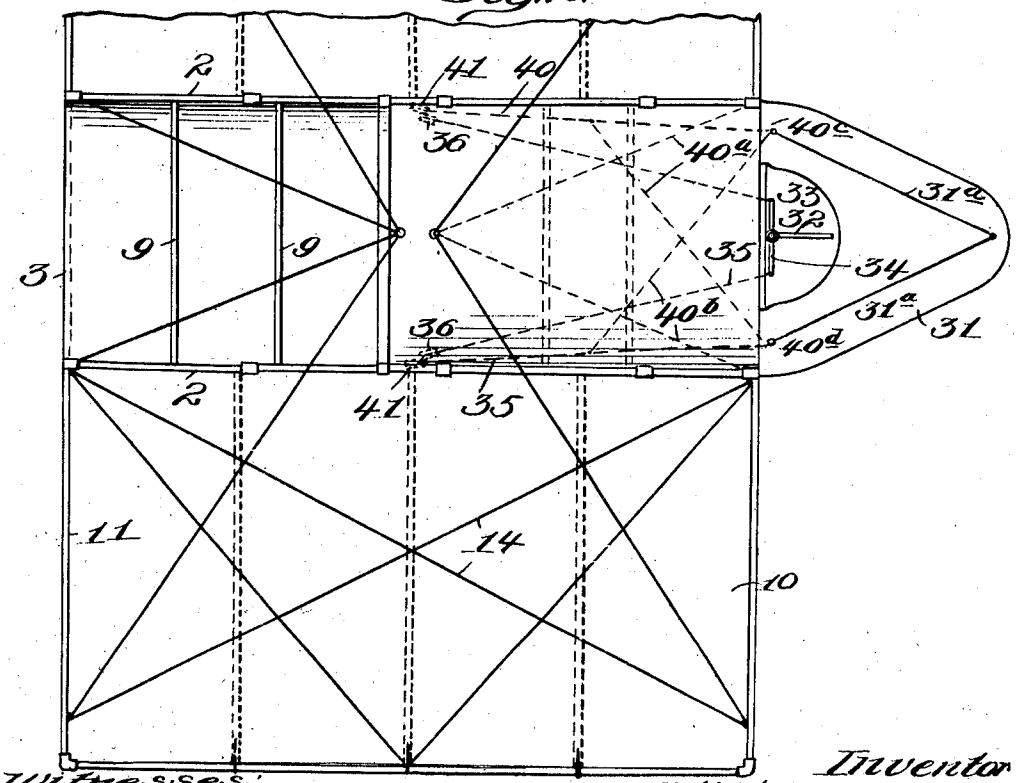


Fig. 2.



Witnesses:

Inventor

Wiltje Pars

By James L. Norris

Attys.

No. 883,565. PATENTED MAR. 31, 1908.

W. PARS.

AERO TUBE.

APPLICATION FILED OCT. 29, 1907.

2 SHEETS—SHEET 2.

Fig. 3.

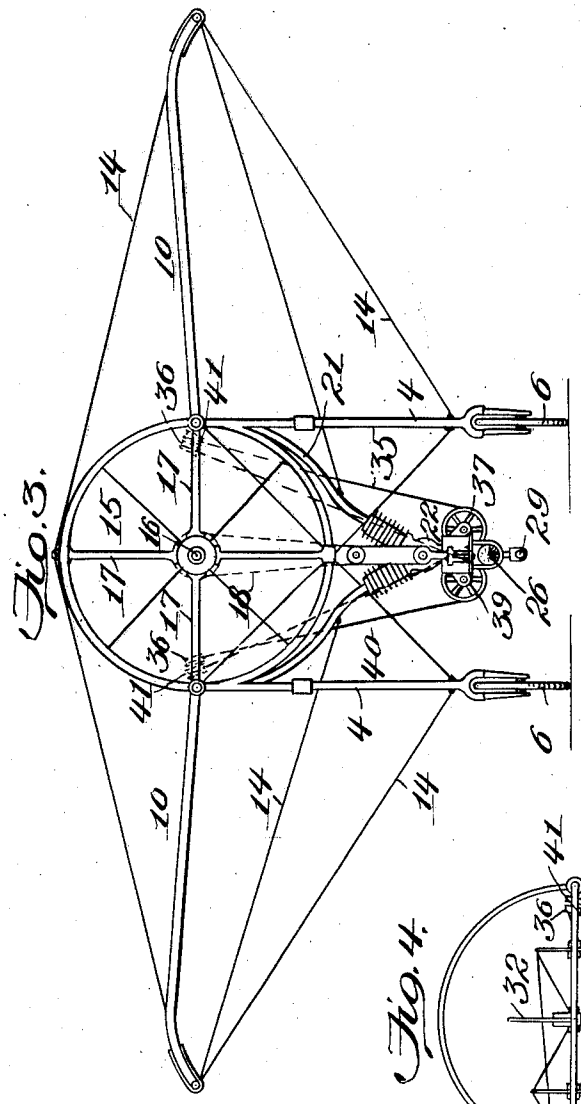
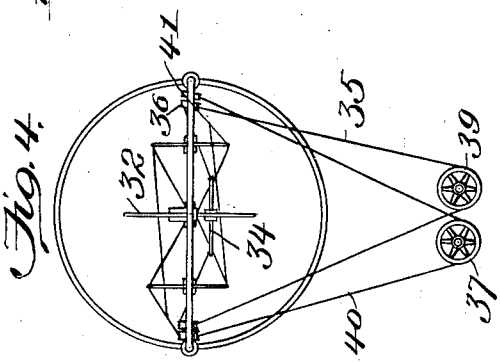


Fig. 4.



Witnesses:
C. D. Kesler
J. B. Kesler

Inventor
Wiltje Pars
By James L. Norris
Atty.

UNITED STATES PATENT OFFICE.

WILTJE PARS, OF SEATTLE, WASHINGTON.

AERO-TUBE.

No. 883,565. Specification of Letters Patent. Patented March 31, 1908.

Application filed October 29, 1907. Serial No. 399,698.

To all whom it may concern:

Be it known that I, WILTJE PARS, a subject of the Queen of the Netherlands, residing at Seattle, in the county of King and State of Washington, have invented new and useful Improvements in Aero-Tubes, of which the following is a specification.

This invention relates to aero-tubes, the object of the invention being to provide an apparatus of this character which is simple in construction, light yet thoroughly strong, which can be readily and quickly governed, and by which the maximum efficiency of the motor can be utilized in the navigation of the apparatus.

The device possesses other advantageous features which with the foregoing will be set forth at length in the following description wherein is outlined that form of embodiment of the invention which I have selected for illustration in the drawings accompanying and forming a part of this specification, the novelty of the invention being included in the claims succeeding said description.

Referring to said drawings: Figure 1 is a side elevation of an aero-tube involving my invention. Fig. 2 is a top plan view of said aero-tube with one of the side planes removed. Fig. 3 is a front elevation. Fig. 4 is a similar view on a smaller scale of the rudder mechanism and certain coöperative parts.

Like characters refer to like parts throughout the several figures of the drawings.

The main frame of the apparatus comprises the parallel side bars 2, cross bars 3 connecting said side bars, and the depending bars 4, said depending and vertically disposed bars 4 being connected respectively with the side bars 2 by diagonally disposed braces as 5. There may be any desirable number of cross bars 3, and from the four corners of the substantially rectangular skeleton frame composed by the bars 2 and 3 the bars 4 depend and are provided at their lower ends with ground wheels as 6. These several bars may be made of any desirable material; for example, light metal tubing.

One of the important features of the device is two semi-cylinders or half-tubes as 7 and 8 respectively. The half-tube or semi-cylinder 7 in the present case is arranged forward or in advance of the companion semi-tube 8. The side edges of these semi-tubes are preferably connected with the side bars 2; said semi-tubes or cylinders may be made of canvas held in the desired shape by semi-circular strips of bamboo, light metal, or other suitable material, all the strips being designated for simplicity by the character 9. The front semi tube or cylinder 7 is shown as opening upward, while the rear semi-tube is represented as opening downward.

The semi tubes or cylinders are superposed, the forward portion of the semi-tube 8 overlying the rear portion of the semi-tube 7, and at their junction they are united rigidly in some desirable way so as to present at such place a complete tube or cylinder in which a propelling means of some suitable kind is mounted.

I desire to make it clear that I may provide any desirable propelling means in the cylinder or complete tube formed by the junction of the two semi tubes, although I will hereinafter describe a screw propelling means that is quite satisfactory for my purpose. While I have described these semi-tubes as being formed of canvas maintained in the desired shape by semi-circular strips, it is obvious that light sheet metal or other fabric could be utilized in their formation so long as lightness and strength are present. It will be apparent, of course, that I do not restrict myself to the use of any particular material in the construction of the different parts of the apparatus.

Along the sides of the apparatus I dispose two planes or lateral wings as 10 of duplicate character. As seen from above these side or lateral planes or wings are of substantially rectangular formation. As seen from the end, however, they are first disposed at an outward upward angle, and beyond such angular portions are made of bowed form, as clearly shown in Fig. 3, this being a desirable shape, although they may be made of any other cross sectional form. The shape described, however, provides pockets on the under sides of the planes in which air can be received to aid in the elevation of the apparatus. Each plane is shown as being co-extensive with the two semi-cylinders 7 and 8 and as consisting of a skeleton framework as 11 and a covering of canvas or other suitable fabric as 12 for the framework. I may for strength extend between the different parts hereinbefore described braces of piano-wire or other suitable material, and all these braces are designated by 14.

The propeller is denoted in a general way by 15 and the ends of the same are exactly co-

incident with the ends of the cylinder made by the union of the overlapping portions of the two semi tubes or cylinders 7 and 8. The shaft 16 of the propeller is supported by spiders as 17 fastened in said cylinder in any desirable way, and said shaft is connected by chain-gearing denoted in a general way by 18 with the shaft 19 supported by hangers as 20 depending from said spiders. Other hangers as 21 are connected to the side bars 2 and said hangers 21 sustain the motor 22, the power shaft of which is operatively connected by gearing denoted in a general way by 23 with the counter-shaft 19, whereby, when the motor 22 is in operation, the propeller 15, through the intermediate parts, will be driven. The hangers 21 sustain below the motor a platform as 24 which supports the batteries for the motor and a tool box as 25. The platform 24 carries below the same a tank as 26 to receive the fuel for the motor.

While the motor may be of any desirable type, I prefer that it be operated by gasolene and that the tank 26 be utilized for carrying the necessary gasolene for the motor. A bracket as 27 depends from the platform, while a bracket as 28 depends from the motor 22, said brackets 27 and 28 supporting a shaft as 29 upon which the seat 30 for the operator of the apparatus is mounted. Said seat 30 is illustrated as mounted to permit the occupant to be located at the rear of the motor 22; the seat, however, may be so positioned that the operator might occupy a position in front of said motor if desired, in which case such motor will be placed further rearward. The propeller 15 is generally driven at a very high speed and it consists preferably of four similar blades so disposed that the edge of each will be approximately in the same radial plane as the adjacent edge of the next blade so that, if the cylinder in which said blade revolves be viewed from either end, daylight cannot be seen at the other end. It is not essential, however, that I employ several blades, for I might use only one. The propeller is fastened to the shaft, is freely rotative in its tube or cylinder, and its periphery, as far as practicable, is contiguous to the inner surface of the cylinder or tube in which it turns. I do not intend that the blades of the propeller should overlap whatever may be their number.

It will be assumed that the propeller 15 is being rotated at a high velocity. In such an event the air is violently sucked away from the semi-tube 7 and is pushed equally violently into the semi-tube 8, the air being prevented from easily entering the semi-tube 7 and from easily escaping from the semi-tube 8 owing to the presence of the side planes 10. In consequence of this there will be a considerable static air pressure from below on the two semi-tubes owing to the difference between the partial vacuum in the semi-tube 7 and the common air pressure below said tube 7, and the difference between the super-pressure in the semi-tube 8 and the common air pressure above said semi-tube 8, these pressures resulting in a vertical up-push to the apparatus. The side planes 10 will materially assist in this operation; they will not only make the partial vacuum in the front semi-tube and the super-pressure in the back semi-tube greater than it would be without the planes and in this way make the up-pressure on the semi-tubes higher, but they will also receive themselves such an up-pressure because there will be a tendency for the air to be sucked from under the front semi-tube and pushed above the back one which creates a rush of air around the edges of the side planes, resulting in a vertical up-push on said planes by the action of the propeller 15. It is therefore clear that the apparatus when moving through the air can retain an elevated position with the side planes parallel to the horizon so that less friction is present than would be the case were said side planes at an angle or tipped relatively to the horizon. It is easy to rise and to alight with the apparatus and I can carry comparatively heavy loads with the same. I have shown in the drawings rudder mechanism whereby the apparatus may be steered laterally or up and down. There are preferably two rudders, one denoted by 31 and the other by 32. The rudder 31 oscillates about a horizontal axis, while the rudder 32 oscillates about a vertical axis.

The two rudders are supported by bearings on the upper framework of the apparatus. The rudder 32 operates in an opening as 33 in the forward end of the rudder 31 and has a cross bar 34 connected therewith, to the outer ends of which the branches of a wire or other suitable connection as 35 are connected. These branches extend divergingly forward and are passed around guide pulleys as 36 supported on the inner sides of the side bars 2 substantially centrally thereof. The wire 35 below said guide pulleys 36 depends in the form of a loop as shown in Fig. 3, the loop passing around a steering wheel as 37 rotatively supported by the bracket 28 and within easy reach of the operator occupying the seat 30. It will be evident that, when the wheel 37 is turned, the rudder 32 may be also turned by reason of the intermediate wire or equivalent connection 35. The bracket 28 further supports a second steering wheel as 39 located beside the wheel 37, and around the wheel 39 the wire 40 is extended, said wire being projected upward from the wheel 39 in two diverging branches which pass over the guide pulleys or wheels 41. The branches of the wire 40 are provided in turn respectively with branches 40^a and 40^b, the branches 40^a being connected with posts as 40^c on one side of the rudder 31,

while the branches 40[b] are connected with like posts as 40[d] on the opposite side of said rudder 31. From said several posts to the outer ends of the rudder 31 braces as 31[a] of piano-wire or other suitable material can extend. It will be apparent therefore that on the rotation of the wheel 39 the rudder 31 can be swung up or down in accordance with the direction said wheel 39 is turned. The two pairs of wheels 36 and 41 may be respectively carried by common shafts.

From the foregoing description it will be evident that I provide a tube in which, in the present case, is located suitable propelling means, and from this tube extend oppositely air deflecting portions, the working or deflecting areas of which face in opposite directions.

What I claim is:

1. An aero-tube compising two semi-tubes, one of which opens upward and the other of which opens downward, the two tubes overlapping for a portion of their lengths to form a cylinder, and propelling means in said cylinder.

2. An aero-tube comprising two semi-tubes, one of which opens upward and the other of which opens downward, the two tubes overlapping for a portion of their lengths to form a cylinder, screw-propelling means in the cylinder, and side planes connected with the semi-tubes and substantially co-extensive therewith.

3. An aero-tube comprising two semi-tubes, one of which opens upward and the other of which opens downward, the two semi-tubes overlapping for a portion of their lengths to form a cylinder, screw-propelling means in the cylinder, and two side planes connected with and substantially coincident with the semi-tubes, the side planes being upwardly inclined from the semi-tubes and being downwardly bowed at their outer sides.

4. An aero-tube comprising two semi-tubes, one of which opens upward and the other of which opens downward, the two tubes overlapping for a portion of their lengths to provide a horizontally disposed cylinder, a horizontally rotative screw-propeller in said cylinder, two side planes extending from one end of one of the semi-tubes to the other end of the other semi-tube, and steering means for the aero-tube.

5. An aero-tube comprising two semi-tubes, one of which opens upward and the other of which opens downward, the two tubes overlapping for a portion of their lengths to provide a horizontally disposed cylinder, a horizontally rotative screw-propeller in said cylinder, two side planes extending from one end of one of the semi-tubes to the other end of the other semi-tube, and steering means for the aero-tube, involving a plurality of rudders movable about transversely disposed axes.

6. An aero-tube comprising two semi-tubes, one of which opens upward and the other of which opens downward, the two tubes overlapping for a portion of their lengths to form a cylinder, propelling means in said cylinder, means below the cylinder for supporting an operator, steering means for the aero-tube, and operative connections extending from said steering means to a place within access of the operator.

7. An aero-tube comprising two semi-tubes, one of which opens upward and the other of which opens downward, the tubes overlapping for a portion of their lengths to provide a cylinder, a screw-propeller in said cylinder, a pair of rudders one of which is movable about a horizontal axis and the other of which is movable about a vertical axis, means for supporting an operator below the said cylinder, a pair of steering wheels within reach of the operator, and operative connections between the steering wheels and the rudders.

8. An aero-tube comprising a tube and air deflecting portions extending oppositely from said tube, the effective areas of said air deflecting portions facing in opposite directions, combined with propelling means in said tube.

9. An aero-tube comprising a tube and air deflecting portions extending oppositely from said tube, the effective areas of said air deflecting portions facing in opposite directions, combined with propelling means in said tube, and side planes located at opposite sides of said tube.

10. An aero-tube comprising a tube and air deflecting portions extending oppositely from said tube, the effective areas of said air deflecting portions facing in opposite directions, combined with propelling means in said tube, and rudders movable about transversely disposed axes for steering said aero-tube.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILTJE PARS.

Witnesses:
C. J. SMITH,
A. H. LITCHFIELD.