Oct. 7, 1924. 1,510,607

T. J. POLK

AIRSHIP AND GLIDER

Filed July 28. 1923 3 Sheets-Sheet 1

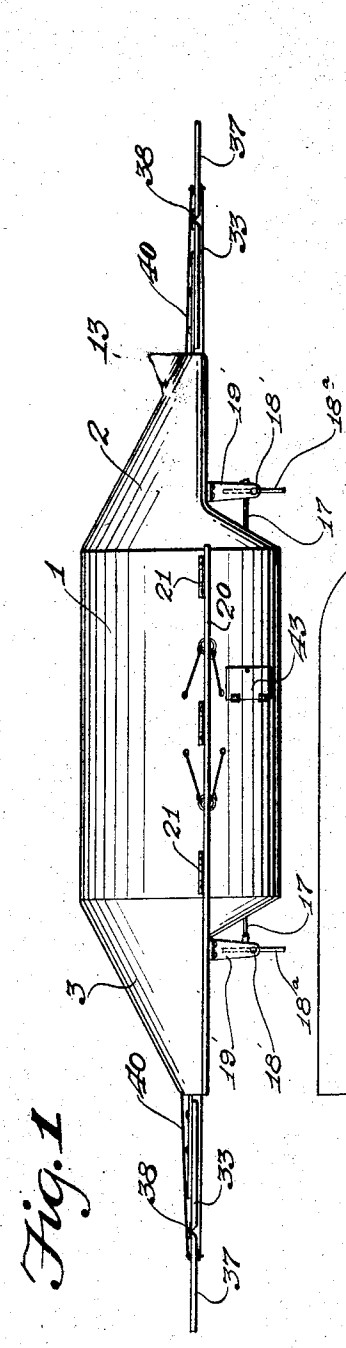


Fig. 1

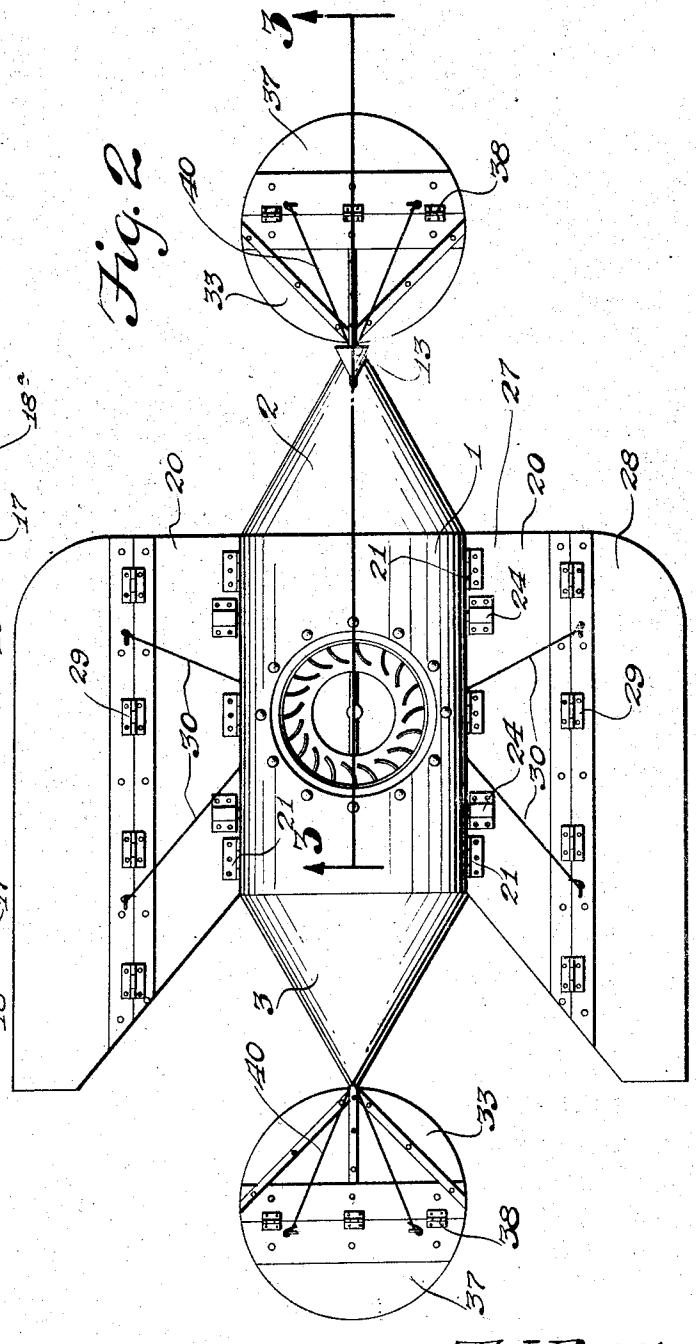


Fig. 2

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Fig. 3

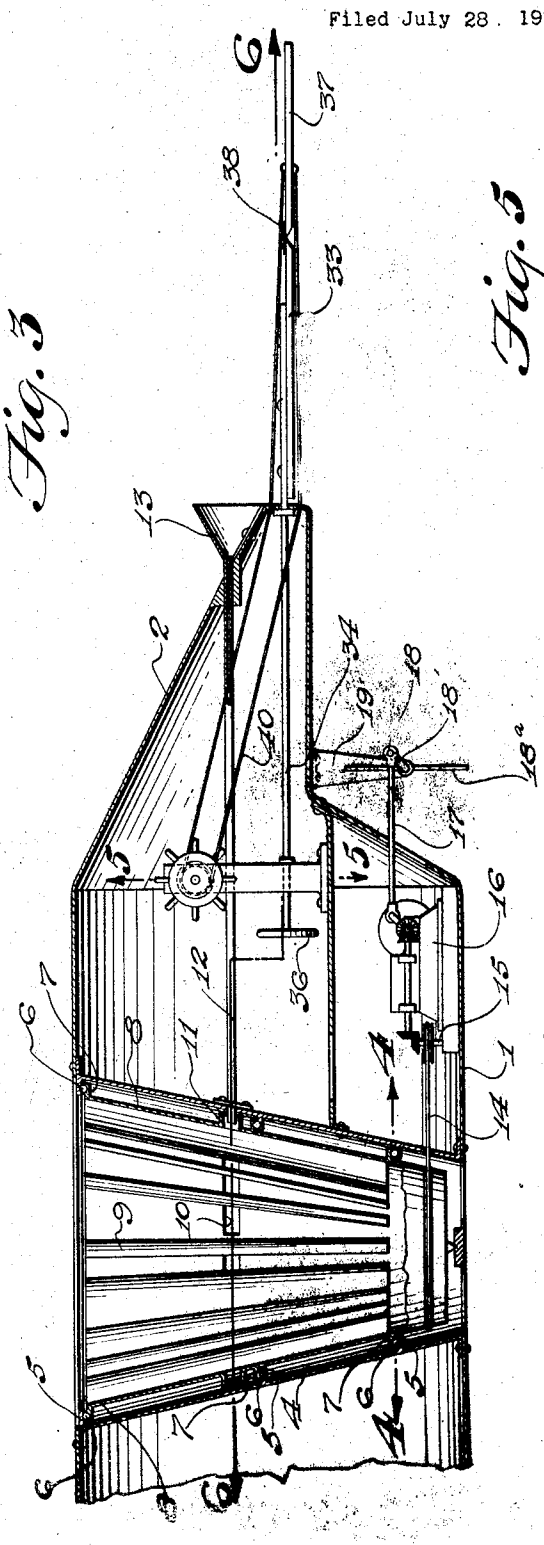


Fig. 5

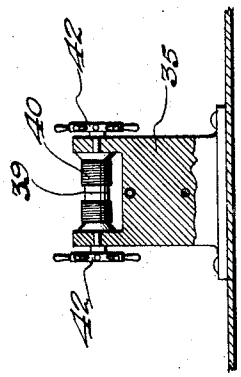
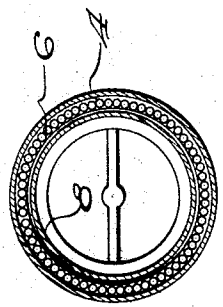


Fig. 4



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Fig. 6

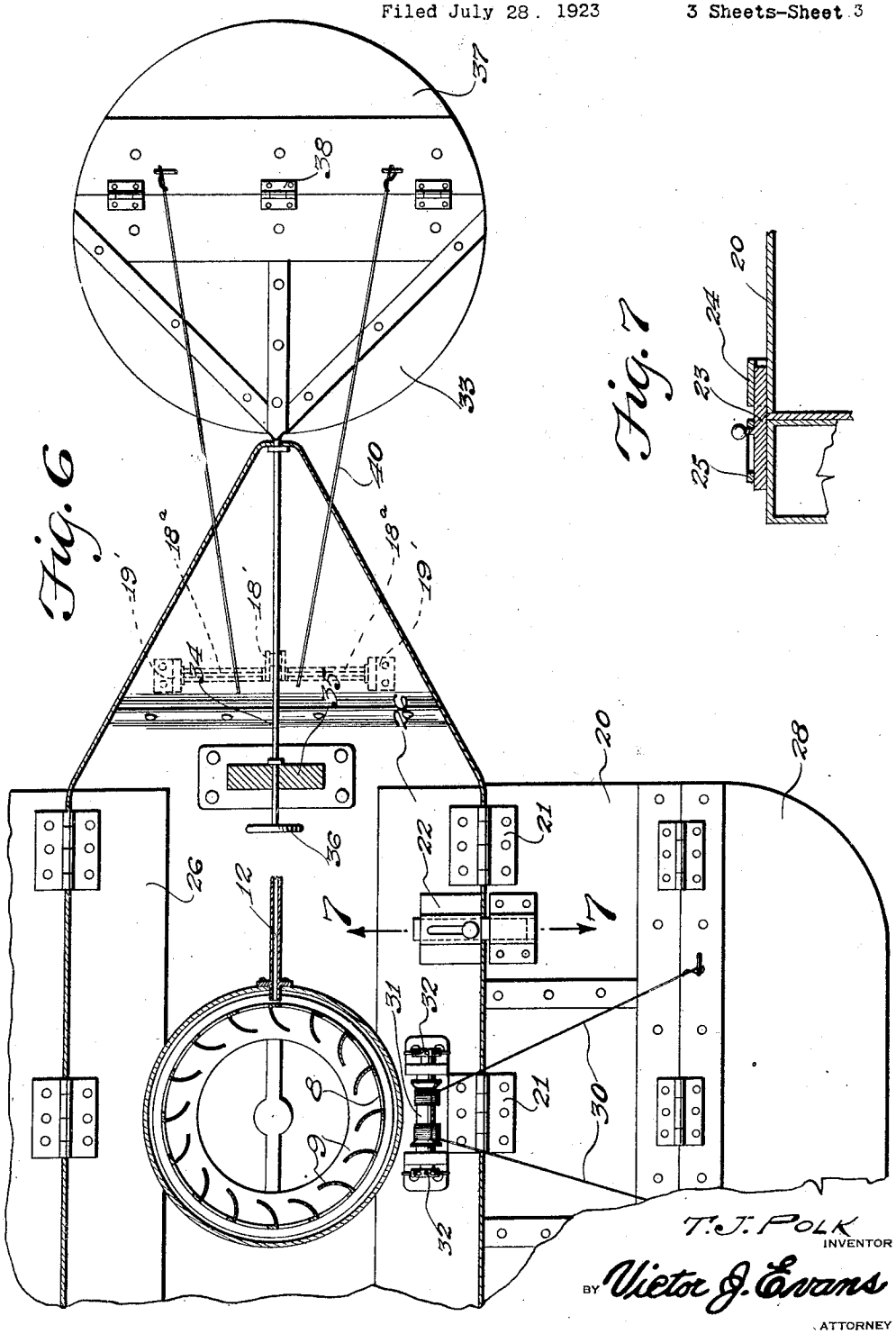


Fig. 7

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Patented Oct. 7, 1924. 1,510,607

UNITED STATES PATENT OFFICE.

THOMAS J. POLK, OF CHICAGO, ILLINOIS.

AIRSHIP AND GLIDER.

Application filed July 28, 1923. Serial No. 654,419.

To all whom it may concern:

Be it known that I, THOMAS J. POLK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Airships and Gliders, of which the following is a specification.

This invention relates to airships or flying machines, and an object of the invention is to provide a flying machine designed so that it may rise in a substantially vertical path, eliminating the necessity of large landing fields as well as eliminating the high speed necessary for the take off.

Another object of this invention is to provide a flying machine as specified which comprises a frusto conical rotary fan rotatable about a vertical axis, intermediate the ends of the body of the flying machine or airship, which fan is rotatable to create air currents for imparting a vertical lifting action to the air ship.

A further object of the invention is to provide an airship as specified in which a novel form of aerofoils and rudders are provided which are designed to facilitate the gliding action of the flying machine so as to permit it to be used as a glider when desired, and which aerofoils and rudders are composed of hingedly connected sections movable through manually operated adjusting means, into various angles relative to the horizontal, for permitting accurate control of the flight of the machine or ship.

Other objects of the invention will appear in the following detailed description taken in connection with the accompanying drawings wherein:

Fig. 1 is a side elevation of the improved airship or glider.

Fig. 2 is a top plan of the improved airship or glider.

Fig. 3 is a fragmentary longitudinal section through the airship.

Fig. 4 is a detail horizontal section on the line 4—4 of Fig. 3.

Fig. 5 is a detail vertical section on the line 5—5 of Fig. 3.

Fig. 6 is a fragmentary horizontal section through the airship taken on the line 6—6 of Fig. 3.

Fig. 7 is a detail section on the line 7—7 of Fig. 6.

Referring more particularly to the drawings, the improved airship or glider comprises a body 1, the forward and rear ends 2 and 3 of which are substantially conical in shape, while the body is cylindrical in shape. The body 1 is provided with a transversely extending substantially frusto conical well extending therethrough which is formed by the shell 4. The shell 4 has annular bearing flanges 5 formed therein at spaced points which cooperate with the bearing balls 6 and the bearing flanges 7 for supporting the fan shell 8 rotatable within the well formed by the shell 4. The flanges 7 are formed upon the shell 8. The rotary shell 8 has a plurality of arcuate inwardly curving blades 9 formed thereon which extend through the major portion of the length of the shell and which are curved to engage the air in the shell, to create a forced draught or air currents for imparting a lifting action to the airship. The shell 8 is provided with auxiliary side openings 10 formed therein at circumferentially spaced points.

Cups 11 are attached to the outer perimeter of the shell 8 at longitudinally spaced points and air is guided into and against these cups through the air guiding pipe 12 for cooperating with the prime mover in driving or rotating the shell 8. The pipe 12 extends forwardly through the body 1 and opens out in a flared funnel like mouth 13 exteriorly of the front end 2 of the body 1.

The shell 8 is connected, by any suitable power transmitting mechanism such as a belt 14 with a shaft 15, which shaft is in turn connected to a prime mover 16 which may be in the form of an internal combustion engine, electric motor or the like.

The prime mover 16 is connected by means of a connecting rod 17 with a propeller shaft 18. The propeller shaft 18 has a crank portion 18′ to which the connecting rod 17 is connected, and it has propeller blades 18ª positioned one upon each side of the crank portion 18′ as indicated in dotted lines in Fig. 6 of the drawings. The shaft 18 is supported by suitable bearings 19′, which are carried by the body and project beneath the cut away portions at the ends of the body. A propeller structure is provided at both the front and rear end of the aeroplane.

The body 1 has wings or aerofoils 20 hingedly connected thereto as shown at 21, and any suitable type of fasteners 22 may be provided for maintaining the wings in horizontal position. In Figs. 6 and 7 of the drawings the fastener structure shown

comprises slidable bolts 23 which engage in keepers 24 carried by the wings 20 and are slidable through suitable housings 25 carried by horizontal supporting platforms 26 which are located within the body 1 and to which the hinges 21 are connected.

Each of the wings 20 is composed of hingedly connected sections 27 and 28 which are hingedly connected along a line parallel with the longitudinal axis of the body 1 as shown at 29 in Fig. 2 of the drawings. Cables or ropes 30 are connected to the outer wing sections 28 and are in turn connected to drums 31 positioned within the body, which drums are rotatable through the medium of hand wheels 22 to permit varying of the angle at which the outer hinge sections 28 extend relative to the hinge section 27, and relative to the horizontal to permit regulation of the camber of the wings and consequently permit regulation of the flight of the airship and adapt it to different air conditions.

Rudders 33 are positioned at the front and rear ends of the body 1 and in the drawings these rudders are shown as substantially circular in shape, however, it is to be understood that they may be any desired shape as found practical in the construction of the airship or glider. The rudders 33 are carried by shafts or rods 34 which are in turn rotatably carried by the body 1, and by suitable supports 35. Hand wheels 36 are mounted on the inner ends of the shafts 34 and are provided to facilitate rotation of the shafts to vary the angle of the rudders relative to the horizontal, so as to permit the rudders to be moved into vertical position during the rising of the flying machine, so as to offer as little resistance as possible to the upward travel of the airship. The outer wing sections 28 may be moved vertically during the rising of the airship, to decrease the air resistance.

The rudders 33 have their outer sections 37 hingedly connected to the main body portion of the rudders as shown at 38 and the outer hinged sections 37 act as ailerons and they are adjusted through the medium of the rotation of the drum 39 for winding the cables 40 upon the drums or unwinding them therefrom. The drum 39 is supported by the supporting structure 35 and has hand wheels 42 thereon to facilitate its manual rotation.

The body 1 is entirely enclosed, and access to the interior thereof may be had through a door 43.

It is, of course, to be understood that the invention may be constructed in other manners and the parts associated in different relations and, therefore, I do not desire to be limited in any manner except as set forth in the claims hereunto appended.

Having thus described my invention what I claim is:—

1. An airship comprising a body having a substantially centrally disposed transversely extending well therein, a substantially frusto conical shell rotatable in said well, and a plurality of fan blades carried by and extending inwardly into said shell.

2. An airship including a body, a well disposed transversely in the body, a shell rotatable in said well, fan blades carried by and extending into the shell, and means for guiding air into the shell and against the blades.

3. An airship including a body, a substantially frusto conical shell disposed transversely within said body and mounted for rotation therein, fan blades carried by and extending into the shell, and means for guiding air into the shell and against the blades.

4. An airship comprising a body, said body provided with a transversely extending well, a rotary shell within said well, a plurality of blades extending longitudinally of said shell and curving inwardly into the shell, means for rotating said shell, said shell provided with openings adjacent said blades, and means for guiding air through said openings and against said blades.

5. An airship comprising a body, said body provided with a transversely extending well, a rotary shell within said well, a plurality of blades extending longitudinally of said shell and curving inwardly into the shell, means for rotating said shell, said shell provided with openings adjacent said blades, means for guiding air through said openings and against said blades, a prime mover for rotating said shell, and a propeller rotated by said prime mover.

6. An airship comprising a body, said body provided with a transversely extending well, a rotary shell within said well, a plurality of blades extending longitudinally of said shell and curving inwardly into the shell, means for rotating said shell, said shell provided with openings adjacent said blades, means for guiding air through said openings and against said blades, wings hingedly connected to the sides of the body, and rudders positioned at the front and rear ends of the body.

7. An airship comprising a body, said body provided with a transversely extending well, a rotary shell within said well, a plurality of blades extending longitudinally of said shell and curving inwardly into the shell, means for rotating said shell, said shell provided with openings adjacent said blades, means for guiding air through said openings and against said blades, wings hingedly connected to the sides of the body, and rudders positioned at the front and

rear ends of the body, said rudders mounted for rotary movement about the longitudinal axis of the body.

8. An airship comprising a body, said body provided with a transversely extending well, a rotary shell within said well, a plurality of blades extending longitudinally of said shell and curving inwardly into the shell, means for rotating said shell, said shell provided with openings adjacent said blades, means for guiding air through said openings and against said blades, wings hingedly connected to the sides of the body, rudders positioned at the front and rear ends of the body, said rudders mounted for rotary movement about the longitudinal axis of the body, said wings composed of hingedly connected sections, and means for adjusting the position of the outer sections of said wings.

In testimony whereof I affix my signature.

THOMAS J. POLK.