

Oct. 7, 1924.

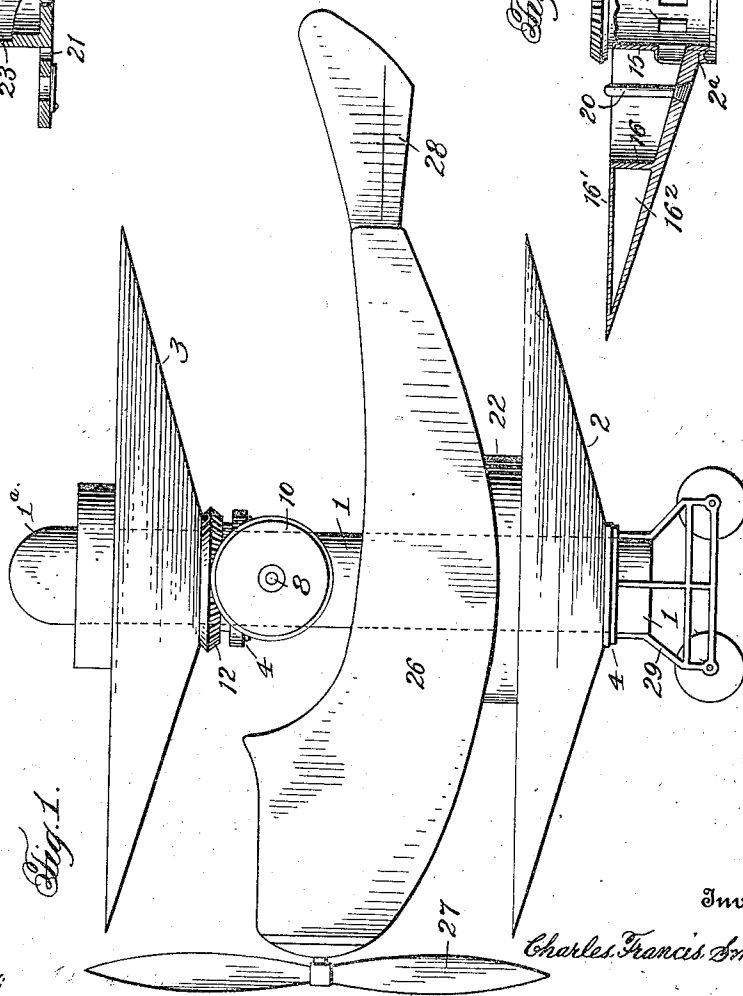
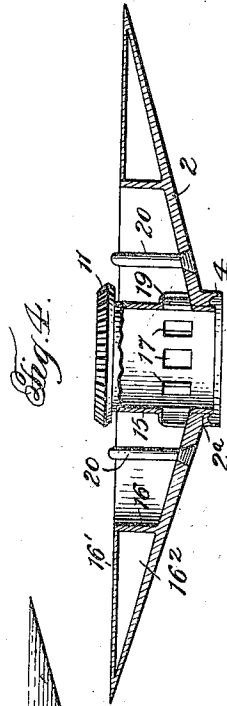
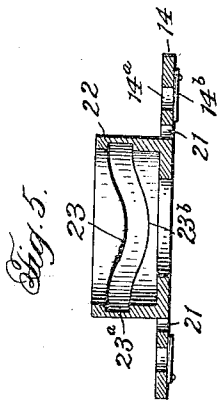
C. F. SMITH

1,511,008

AEROPLANE

Filed May 29, 1924

2 Sheets-Sheet 1



Witness:

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Oct. 7, 1924.

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AEROPLANE

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2 Sheets-Sheet 2

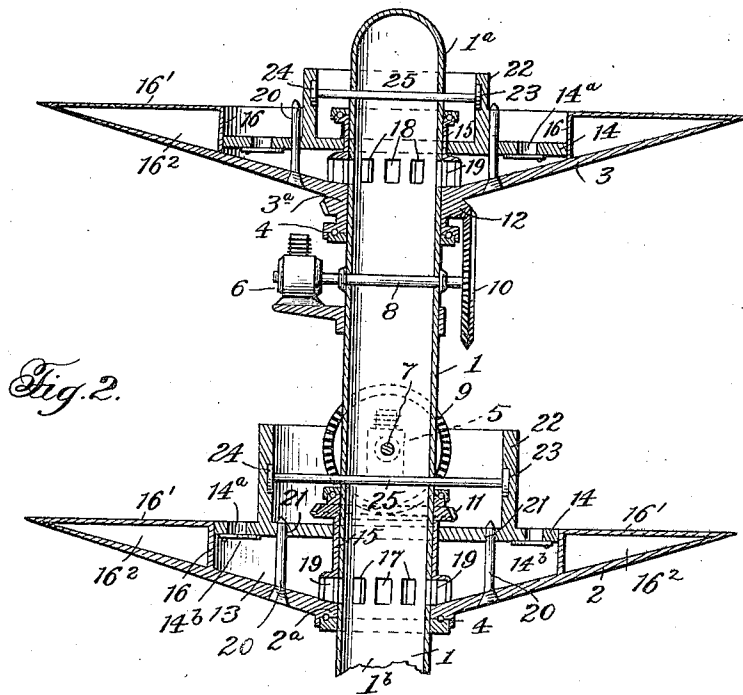


Fig. 2.

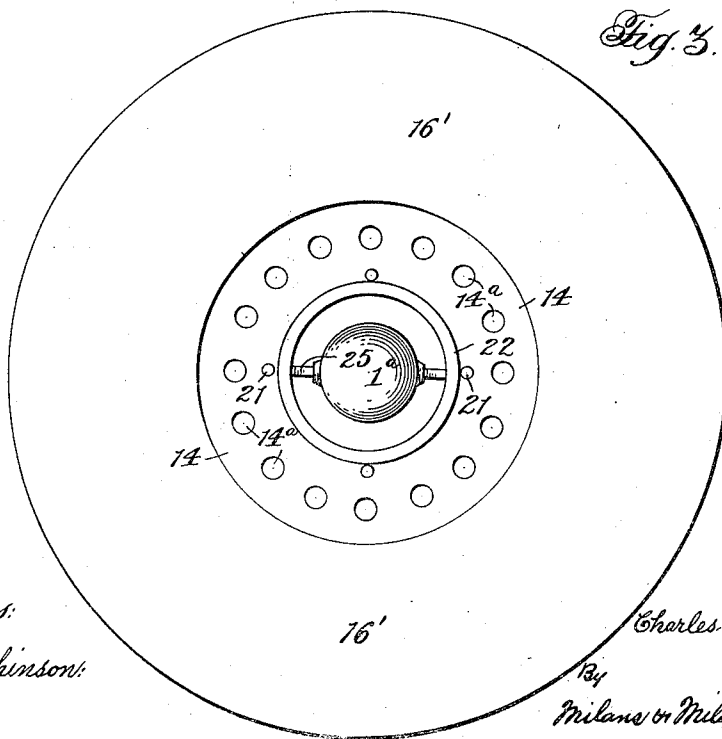


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES FRANCIS SMITH, OF WESTFIELD, NEW YORK.

AEROPLANE.

Application filed May 29, 1924. Serial No. 716,630.

To all whom it may concern:

Be it known that I, CHARLES FRANCIS SMITH, a citizen of the United States, residing at Westfield, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Aeroplanes, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in aeroplanes, and has for its object to provide an improved machine of this character that will be capable of direct vertical ascension.

The invention, with other objects and advantages thereof, and the particular construction, combinations and arrangements of parts comprising the same, will be understood from the following detail description when considered in connection with the accompanying drawings, forming part hereof, and illustrating one embodiment of the invention.

In the drawings:

Figure 1 is a side elevation of an aeroplane constructed in accordance with the present invention.

Fig. 2 is a vertical section of the main portion of the machine.

Fig. 3 is a detail plan view of one of the planes.

Fig. 4 is a detail transverse section of one of the planes.

Fig. 5 is a detail section of one of the piston members of the air forcing means.

The invention comprehends an aeroplane having a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, power means for driving the planes in opposite directions, and air forcing means associated with and operated by the revolving planes for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes, in combination with means for propelling the machine horizontally, the propulsion effort developed by the pressure of the air expelled downwardly from the underside of the machine coupled with the rarefaction of the air above the planes being sufficient to lift and sustain the

machine, enabling the same to rise vertically. More particularly the invention contemplates a machine of this character having planes of inverted conical shape or of dished formation with the dished side disposed upwardly, and air forcing and propulsion means associated with each plane and comprising an annular pump chamber on the plane located centrally at the upper side thereof, and a reciprocating piston in each pump chamber, the pistons being coupled to the planes to rotate therewith while permitting reciprocatory movement of the pistons relative to the planes, an engine for driving each plane, a cam way for each piston, and rollers journaled on the tubular body part and engaging the cam ways of the pistons to alternately reciprocate the pistons.

While a specific embodiment of the invention is illustrated in the drawings, it will of course be understood that changes and variations may be made in the particular construction shown, and the invention embodied in other forms, as will appeal to those skilled in the art and falling within the scope of the appended claims, without departing from the spirit of the invention.

Referring to a detail description of the particular embodiment of the invention in the drawings, 1 designates the tubular body part shown as of cylindrical form with an upper dome like end part 1^a and being open at its lower end 1^b. 2 and 3 designate the planes mounted on the tubular body part 1 in superposed spaced relation to extend around and revolve about the same as an axis. Each of the planes 2, 3, are of circular outline and dished with the dished side facing upwardly, the same being preferably, as shown, of inverted conical form, said planes having hub portions 2^a, 3^a, engaging suitable anti-friction bearings 4 on the tubular body part 1. 5 and 6, designate engines which may be of any of the conventional types of internal combustion engine, for driving the planes 2, 3. The engines 5 and 6, which are suitably mounted on the tubular body part 1, preferably, as shown, at opposite sides thereof, have driving shafts 7, 8, on which are bevel pinions 9, 10, which mesh with bevel pinions, 11, 12, on the hub portions 2^a, 3^a of the revolving planes 2, 3.

Associated with each of the revolving planes 2, 3, is air forcing means, said means

comprising an annular pump chamber 13 on each plane located at the upper side and adjoining the hub portion thereof, and an annular reciprocating piston 14 in each pump chamber 13, the inner and outer side walls of the pump chambers 13 being designated 15, 16 respectively. 16' designates an annular wall extending from the outer side wall 16 to the periphery of the plane and forming with said side wall and a portion of the plane an air chamber 16². The tubular body part 1 is provided with rings of ports 17, 18, and the inner walls 15 of the pump chambers 13 have lower portions surrounding the rings of ports 17, 18, of the tubular body part 1 and offset outwardly from the tubular body part, and each provided with a ring of ports 19. The pistons 14 are each provided with a series of ports 14^a with inwardly opening valves 14^b controlling the same so that upon the up stroke of the pistons, the valves 14^b will open and air will be drawn into the pump chambers 13, and on the downward stroke of the pistons the valves 14^b thereof will close and the air in the pump chambers 13 will be forced therefrom through the ports 19, 17, 18, into the interior of the tubular body part 1 and downwardly through the same out of the lower end 1^b thereof to the underside of the machine below the planes. The pistons 14 are coupled to the planes 2, 3, to rotate therewith and provide for reciprocatory movement of the pistons relative to the planes by pins 20 on the planes 2, 3, engaging openings 21 in the pistons 14, suitable packing, not shown, being provided for the openings 21. The pump pistons 14 are connected with the planes 2, 3, to be alternately operated thereby. Each pump piston is provided with an annular part 22 which has a cam groove or way 23, that is engaged by pairs of rollers 24 journaled on transverse rods 25 fixedly secured to the body part 1. The cam grooves or ways 23 have oppositely disposed elevated portions 23^a and intermediate depressions 23^b, said cam grooves or ways being relatively arranged so that the pump pistons 14 will be alternately operated by the revolving planes, 2, 3.

Fixedly secured to the body part 1 between the planes 2, 3, is a car 26, the length of the car being shown substantially equal the diameter of the planes, the car 26 being arranged with the tubular body part 1 extending centrally of the ends of the car. At the forward end of the car 26 is mounted a propeller 27 for propelling the machine horizontally, said propeller 27 being shown as the conventional form of aeroplane propeller. The propeller 27 is driven by a suitable internal combustion engine (not shown) in accordance with the common practice. 28 designates a laterally swinging steering vane mounted on the other end of the car

26 and having suitable control means not shown. The machine may be provided with a landing chassis 29 of any suitable construction.

The tubular body part 1, the revolving plane 23, and the other parts of the machine are constructed of any suitable material sufficiently light and possessing the requisite strength.

In the operation of the machine air will be drawn in by the air forcing means from the upper side of the planes 2, 3, and forced downwardly through the tubular body part 1 to the under side of the machine, the propelling power developed by the pressure of air expelled below the under side of the machine and planes, with the rarefaction produced at the upper side of the planes, being sufficient to lift the machine vertically.

What I claim is:

1. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, power means for revolving the planes in opposite directions, and air forcing means associated with each of the planes and operated thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes.
2. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, power means for revolving the planes in opposite directions, a reciprocating air pump associated with each of the planes and operated alternately thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes.

3. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, power means for revolving the planes in opposite directions, and air forcing means associated with each of the planes and operated thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes, said air forcing means comprising a pump chamber on each of the planes, passages leading from the pump chamber to the interior of said tubular body part, a

piston in each pump chamber coupled to one of the planes to rotate therewith and for reciprocatory movement relative thereto within the pump chamber, a cam way on each of said pistons, rods extending transversely of the tubular body part and fixed thereto, and rolls journaled on said rods and engaging the said cam ways of the pistons.

4. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, power means for revolving the planes in opposite directions, and air forcing means associated with each of the planes and operated thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes, said air forcing means comprising a pump chamber on each of the planes, passages leading from the pump chamber to the interior of said tubular body part, a piston in each pump chamber coupled to one of the planes to rotate therewith and for reciprocatory movement relative thereto within the pump chamber, a cam way on each of said pistons, journals fixed to the tubular body part, and rolls mounted on said journals engaging the said cam ways of the pistons.

5. An apparatus including a vertically extending body part, a pair of circular planes mounted on said tubular body part to extend around the same and revolve thereabout as an axis, said planes being arranged in superposed spaced relation and being of dished formation with the dished side facing upwardly, power means for revolving the planes, and air forcing means associated with each of the planes and operated thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes.

6. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend around the same and revolve thereabout as an axis, said planes being arranged in superposed spaced relation and being of inverted conical shape, power means for revolving the planes, and a reciprocating air pump for each of the planes located at the upper side and centrally thereof for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes, said air pumps being connected with the revolving planes to be operated thereby.

7. An aeroplane including a vertically extending tubular body part, a pair of circu-

lar planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, power means for revolving the planes in opposite directions, air forcing means associated with each of the planes and operated thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes, in combination with means for propelling the machine horizontally.

8. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, power means for revolving the planes in opposite directions, air forming means associated with each of the planes and operated thereby for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the underside of the machine below the planes, a frame secured to the body part between said planes, a vertically disposed propeller mounted on said frame for propelling the machine horizontally, and power means for said propeller.

9. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same, said planes being arranged in superposed relation, air forcing means associated with each of the planes, power means for operating said air forcing means, a car mounted on and extending transversely of the tubular body part between said planes, a vertically disposed propeller at one end of said car for propelling the machine horizontally, power means for said propeller, and a laterally swinging steering vane at the other end of said car.

10. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same, said planes being arranged in superposed spaced relation, air forcing means associated with each of the planes for drawing air from the upper side of the planes and forcing the same downwardly through the tubular body part to the under side of the machine below the planes, and power means for said air forcing means.

11. An aeroplane including a vertically extending tubular body part, a pair of circular planes mounted on said tubular body part to extend transversely thereof around the same and to revolve thereabout, said planes being arranged in superposed spaced relation, a separate engine for driving each

plane mounted on said tubular body part,
 and air forcing means associated with each
 of the planes and operated thereby for draw-
 ing air from the upper side of the planes
 5 and forcing the same downwardly through
 the tubular body part to the underside of
 the machine below the planes.

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

CHARLES FRANCIS SMITH.

Witnesses:

DOROTHY B. BOWEN,
 CORA E. OTTAWAY.