

AFRICAN AMERICAN PATENTED AIRCRAFT

John F. Pickering, of Gonaives, Haiti was granted Patent Number 643,975, on February 20, 1900 for "Air Ship"

<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=643,975>.

The United States Patent Office assigned Pickering's airship to class 244/29, "Airship and Fluid Sustained."

No. 643,975.

Patented Feb. 20, 1900.

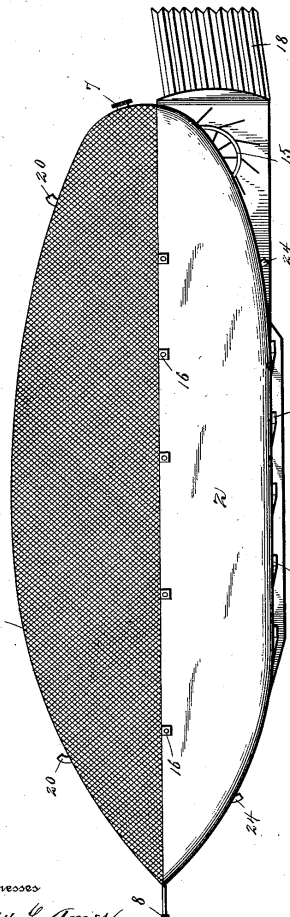
J. F. PICKERING.
AIR SHIP.

(Application filed July 19, 1899.)

(No Model.)

2 Sheets—Sheet 1.

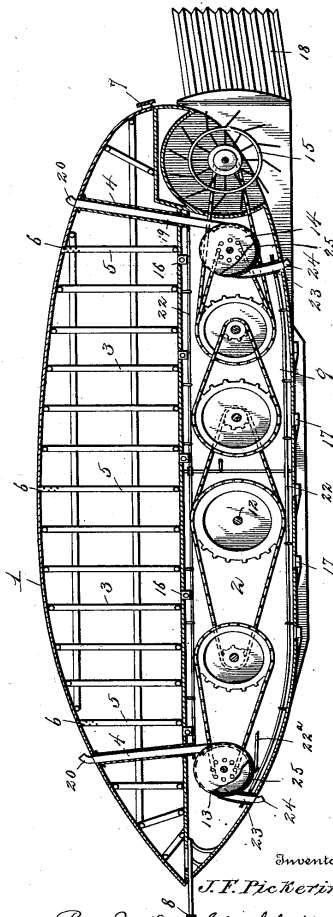
FIG. 1-



Witnesses

Harry G. Ames.
H. A. Nau.

FIG. 2-



Inventor

J. F. Pickering.

By V. D. Stockbridge.
Attorney

No. 643,975.

J. F. PICKERING.
AIR SHIP.

Patented Feb. 20, 1900.

(No Model.)

(Application filed July 19, 1899.)

2 Sheets—Sheet 2.

FIG. 3-

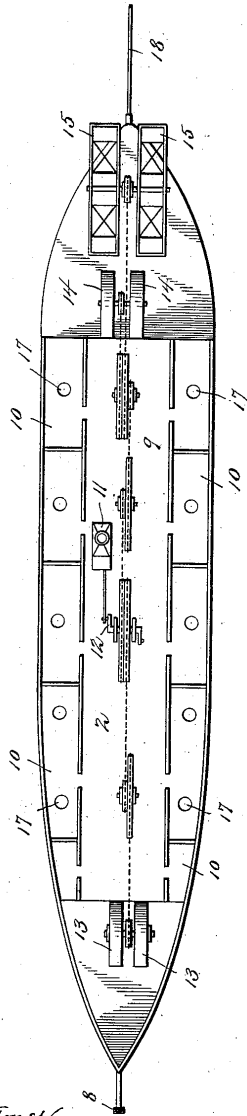


FIG. 5.

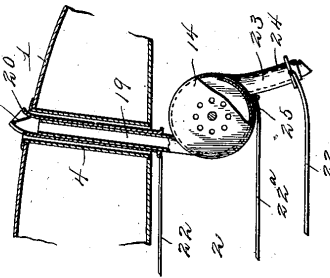
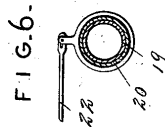
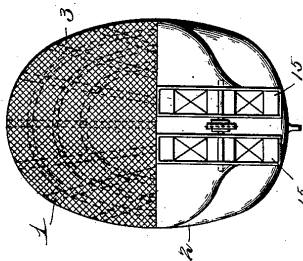


FIG. 4.



Witnesses
Harry L. Ames,
H. A. Haw.

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UNITED STATES PATENT OFFICE.

JOHN F. PICKERING, OF GONAIVES, HAITI.

AIR-SHIP.

SPECIFICATION forming part of Letters Patent No. 643,975, dated February 20, 1900.

Application filed July 19, 1899. Serial No. 724,406. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. PICKERING, a subject of the Queen of Great Britain, residing at Gonaives, Haiti, West Indies, have invented a certain new and useful Air Ship or Launch, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to air ships or launches.

The object of the invention is to provide a ship or launch of great strength and durability and to combine with the float mechanism and appliances whereby the movements of the launch may be completely under the control of an operator—that is to say, that the propulsion horizontally or at any desired angle with relation to the horizon or the gradual raising or lowering of the float or the turning of the same to any desired point of the compass may be entirely and completely within the control of the operator.

The invention consists in certain constructions and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of my improved air ship or launch. Fig. 2 is a central vertical section through the same. Fig. 3 is a plan of that part of my ship below the gas dome or float, illustrating a suitable arrangement of the machinery and compartments. Fig. 4 is a rear elevation, the rudder being removed. Fig. 5 is a detail section through the gas dome or float, showing a fan and air-trunks leading upwardly and downwardly from the fan-casing. Fig. 6 is a detail section taken above one of the fan-casings.

1 is a gas dome, balloon, or float for sustaining or floating a structure 2, the latter being provided with a series of compartments and carrying a suitable motor or motors and mechanism for driving and controlling the motions of the ship. The gas dome or balloon part of my ship is preferably made in substantially the form shown in Figs. 1 and 2, and consists of a frame made of strong light tubing 3, of aluminium or like substance. The parts of the frame are securely braced or tied together. Extending through the dome and its cover are tubes 4 4 4 4, two at the forward or bow end and two near the stern. The

braces or framework 5, leading from different parts of the dome, are perforated, as shown, and lead through the outer skin or cover of the balloon and are provided with safety-valves 6 6 to give relief to the dome or float in case the pressure from within becomes too great for any reason whatever. The space within the dome is entirely inclosed by silk or other suitable gas-holding fabric.

In order to charge or introduce gas to the dome, I provide an opening at one end, adapted to be closed by a cap 7 and a suitable gasket, and in order that the air within the dome may escape I provide at the other end a passage provided with a cap 8, similar to cap 7. As gas is introduced at one end of the dome air is forced out through the passage at the other end, and when it has been entirely expelled and the dome completely filled with gas the caps 7 and 8 are both closed and the balloon or float is ready for service. Suitably fastened to or connected with the dome or balloon is the structure 2, provided with compartment 9 for machinery and side compartments 10 10 for any desired purpose. The structure or hold 2 carries in compartment 9 a suitable motor 11, coupled with driving-shaft 12, the driving-shaft being operatively coupled through suitable multiplying-gearing with fans 13 near the bow of the ship and with fans 14 and driving-paddles 15 near the stern of the ship. The gearing between the driving-shaft and the driven parts consists, by preference, of sprocket wheels, pinions, and chains, as clearly indicated in the drawings.

The car or structure 2 is provided with a series of sight and ventilating ports 16 in the upper part thereof and with observation-ports 17 through the bottom of the car. An ordinary rudder 18 is connected with the ship for its general guidance and control. Leading upwardly from the fans 13 and 14 into the tubes 4 are air ducts or passages 19 19, and telescopically or loosely mounted on the ducts and within the tubes are other bent tubes or cowls 20. The crooked tubes 20 are each provided with a hole at the bend corresponding in size with that of the air-duct 19 and with a butterfly or flap valve 21, so that the air driven through the duct 19 may pass vertically through the opening or may be caused

to follow the bend of the pipe. These bent tubes are conveniently operated by means of a rod or connection 22.

Leading downwardly from the cases of the fans 13 14 are air-ducts 23 23, and mounted in or on these air-ducts are other crooked or bent tubes 24, having openings at the bend or angle and adjusted to operate in a manner similar to the bent or crooked tubes 20. To control the blast from the fans, so as to cause the same to pass upwardly or downwardly, I provide gates or valves 25 for alternately opening and closing one or the other of said air-trunks. These valves are conveniently operated through connections 22^a.

In operation the balloon or gas-dome being charged and having a buoyancy sufficient to lift the car and its load the engine is started by the engineer or operator, and motion is imparted to the fans and propelling-wheels. In case it is desired to run both the fans and the propelling-wheels the crooked or bent tubes 20 and 24 are turned so that they project rearwardly, and the blast through them contributes to the propulsion or forward movement of the ship. In case the operator wishes to elevate the ship or carry it to a higher plane the cut-offs or gates to the upwardly-projecting air-trunks are closed and the valves in the downwardly-projecting crooked tubes are changed so as to direct the current downward, in which case the entire ship is driven upward. In case it is desired to lower the ship the downwardly-projecting air-ducts are closed by their valves or gates and the valve in the crooked tube 20 is turned so that the current is directed upward, in which case the ship is forced downward toward

the earth. In case it becomes desirable to turn the ship around from end to end or through a considerable arc of a circle the crooked tubes projecting upwardly and downwardly are turned to the proper angle, in which case the ship may be turned promptly and readily to any desired direction much more rapidly and efficiently than could be accomplished through the medium of the rudder.

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

1. The combination of a balloon, an attached car carrying a motor, and a propeller, fans driven by the motor, air-pipes provided with bent movable outlets leading both upward and downward from the fans and extending through the balloon and the bottom of the car, and means for shifting the blast of air from the fan to either the upward or downward air-pipes.

2. The combination of a balloon having passages leading entirely through it, a car connected with the balloon, fans or blowers mounted within the car, air-trunks leading from the fans, movable bent or crooked tubes coupled with the air-trunks, and means for directing the current directly upward or downward or through the bent tubes, substantially as described.

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

JOHN F. PICKERING.

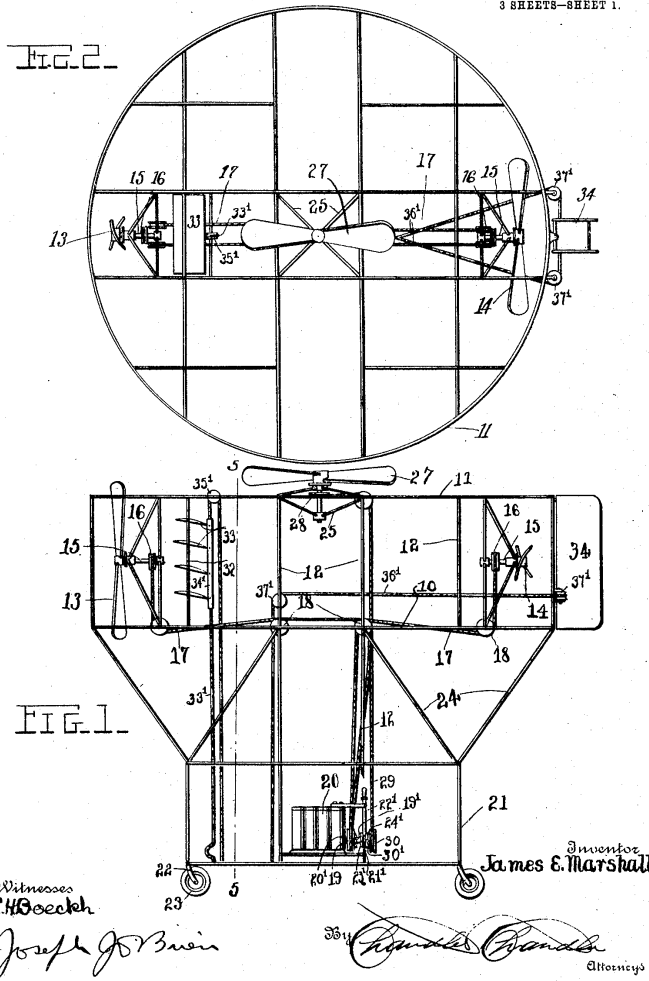
Witnesses:

WM. L. FORD,

HARRY L. AMER.

On September 10, 1912, James E. Marshall, of New York, NY,
was granted Patent Number 1,038,168, for "Flying Machine,"
<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,038,168>.

J. E. MARSHALL.
FLYING MACHINE.
APPLICATION FILED AUG. 15, 1910.
1,038,168. Patented Sept. 10, 1912.
3 SHEETS—SHEET 1.



J. E. MARSHALL.
 FLYING MACHINE.
 APPLICATION FILED AUG. 15, 1910.

1,038,168.

Patented Sept. 10, 1912.

3 SHEETS—SHEET 2.

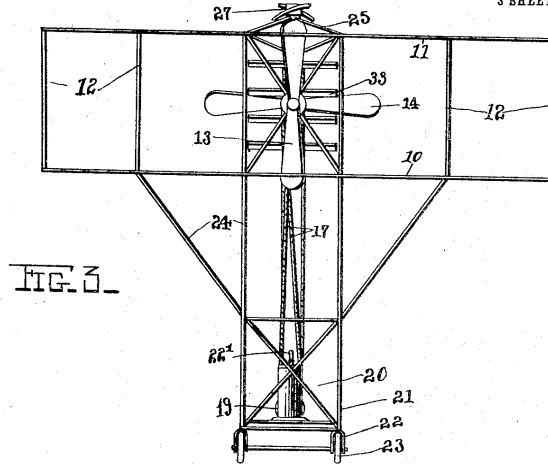


FIG. 3.

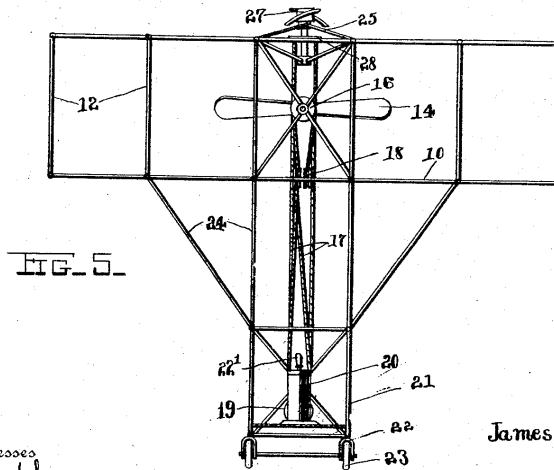


FIG. 5.

Witnesses
 J. E. Marshall

Joseph J. Brown

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 James E. Marshall

By *James E. Marshall*
 Attorney

J. E. MARSHALL.
 FLYING MACHINE.
 APPLICATION FILED AUG. 15, 1910.

1,038,168.

Patented Sept. 10, 1912.
 3 SHEETS-SHEET 3.

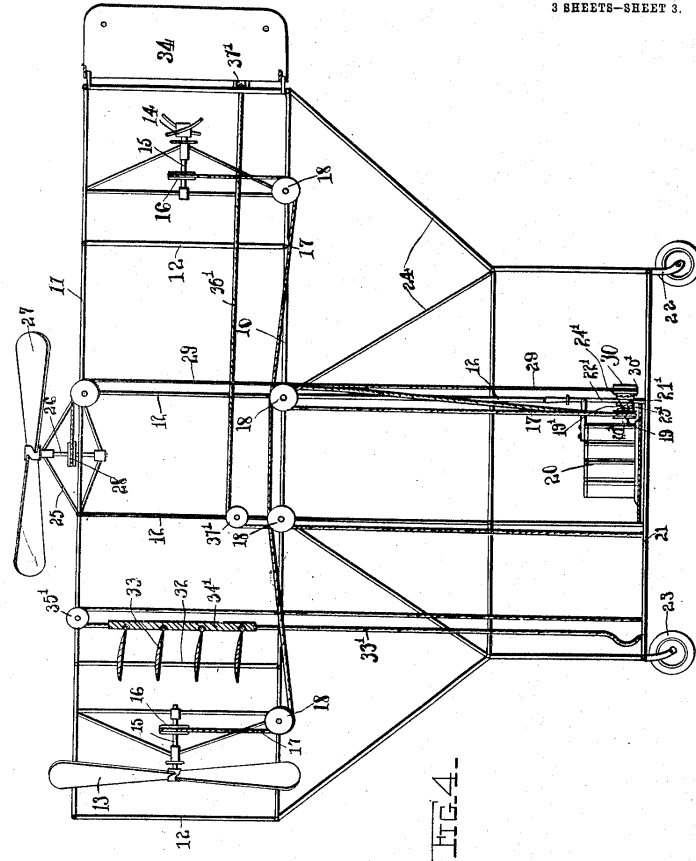


FIG. 4-

Witnesses
 E. H. Boehck

Joseph G.'Brien

Inventor
 James E. Marshall

By *[Signature]*
 Attorneys

UNITED STATES PATENT OFFICE.

JAMES E. MARSHALL, OF NEW YORK, N. Y.

FLYING-MACHINE.

1,038,168.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed August 15, 1910. Serial No. 577,161.

To all whom it may concern:

Be it known that I, JAMES E. MARSHALL, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Flying-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a flying machine and more particularly to the class of aeroplanes of the circular planescope type.

The primary object of the invention is the provision of a machine of this character in which there are arranged superposed circularly shaped main planes which latter support a depending carrier so that the said carrier may be lifted into the air for the sailing thereof during its flight.

Another object of the invention is the provision of a machine of this character in which the carrier of the machine will be prevented from capsizing during the flight thereof thus avoiding possibility of injury to the passengers or an operator of the machine while sailing or navigating through the air above land and water.

A further object of the invention is the provision of a machine of this character which is simple in construction, although possessing the requisite amount of strength, and that is thoroughly reliable and efficient in operation and inexpensive in manufacture.

With these and other objects in view the invention consists in the construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, disclosing the preferred form of embodiment of the invention, and pointed out in the claims hereunto appended.

In the drawings:—Figure 1 is a side elevation of a machine constructed in accordance with the invention. Fig. 2 is a top plan view thereof. Fig. 3 is a front elevation. Fig. 4 is a vertical longitudinal sectional view through the machine. Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 1.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings by numerals 10

and 11 designate spaced circularly shaped planes the same being of identical size and are connected by suitable vertical stay rods 12 and disposed between these planes at diametrically opposite points thereof near their peripheries are front and rear propeller wheels 13 and 14, the wheels being fixed to stud shafts 15 journaled in suitable bearings connected to the said planes.

On the stud shafts 15 of the propeller wheels are grooved pulleys 16 over which is trained an endless cable 17 the latter being also trained over suitable ball bearing guide rollers 18 journaled in suitable bearings upon the plane 10 and this cable 17 is also trained over a driving wheel 19 of a suitable motor 20 the latter being mounted within a carrier 21 which latter is connected to the plane 10 in suspended relation relative thereto as will be hereinafter more fully described. This carrier 21 is provided with suitable brackets 22 in which are journaled ground or guide wheels 23 the latter being of any desirable construction as may be required so as to permit the traveling of the carrier upon the ground during the initial starting of the machine in its flight. The carrier 21 is connected to the plane 10 through the medium of diagonally arranged rigid brace bars or rods 24 which are connected to the said plane 10 and to the carrier at suitable intervals thereof.

Located medially of the top plane 11 is fixed a spider bracket 25 in which is disposed a vertical rotatable shaft 26 to the upper end of which is fixed a horizontally rotatable propeller wheel 27, the shaft 26 being provided with a grooved pulley 28 over which is trained an endless cable 29 the latter being also trained over a driving wheel 30 of the motor 20.

It will be noted that the front and rear propeller wheels 13 and 14 are disposed so as to effect the advancement of the machine when lifted in the air while the horizontally rotatable propeller wheel 27 serves to lift the machine to the desired height in the air for the proper navigating of the said machine in the air.

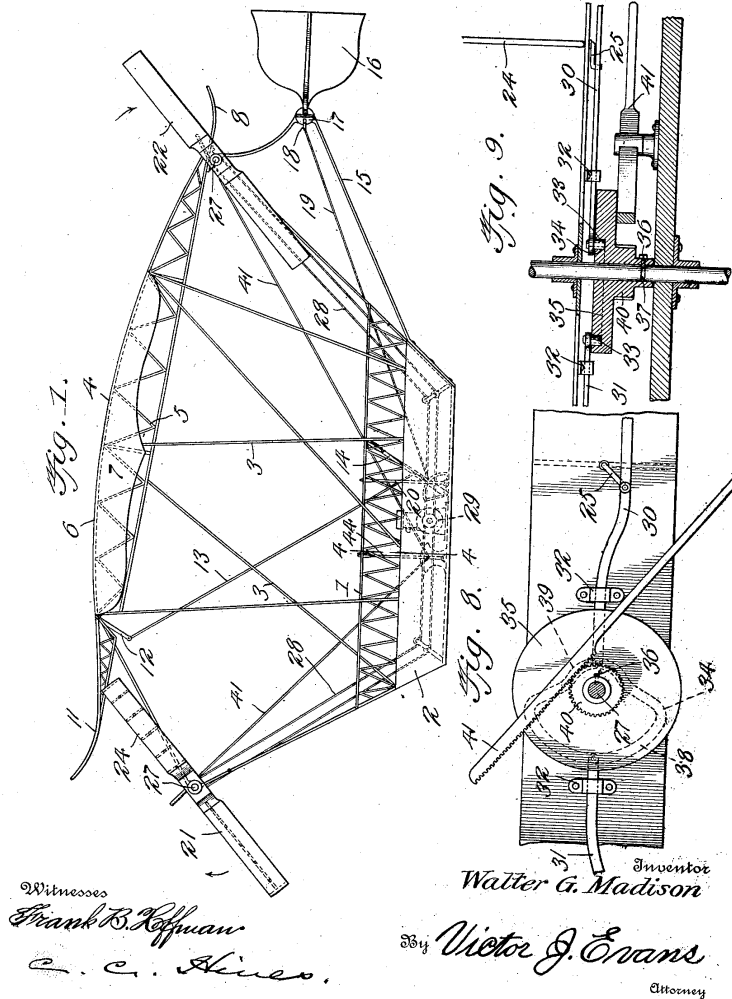
In order to independently operate the horizontally and vertically rotatable propeller wheels, the shaft 20' of the motor 20 carries a slidable clutch element 21' which is splined on the shaft and adapted to be shifted by a pivotal lever 22' and said slidable clutch element 21' is provided with

On December 10, 1912, Walter G. Madison, of Ames, IA, was granted Patent Number 1, 047,098 for "Flying Machine,"
<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,047,098>.

1,047,098.

W. G. MADISON.
FLYING MACHINE.
APPLICATION FILED JUNE 8, 1910.

Patented Dec. 10, 1912.
4 SHEETS—SHEET 1.



1,047,098.

W. G. MADISON.
FLYING MACHINE.
APPLICATION FILED JUNE 8, 1910.

Patented Dec. 10, 1912.

4 SHEETS—SHEET 2.

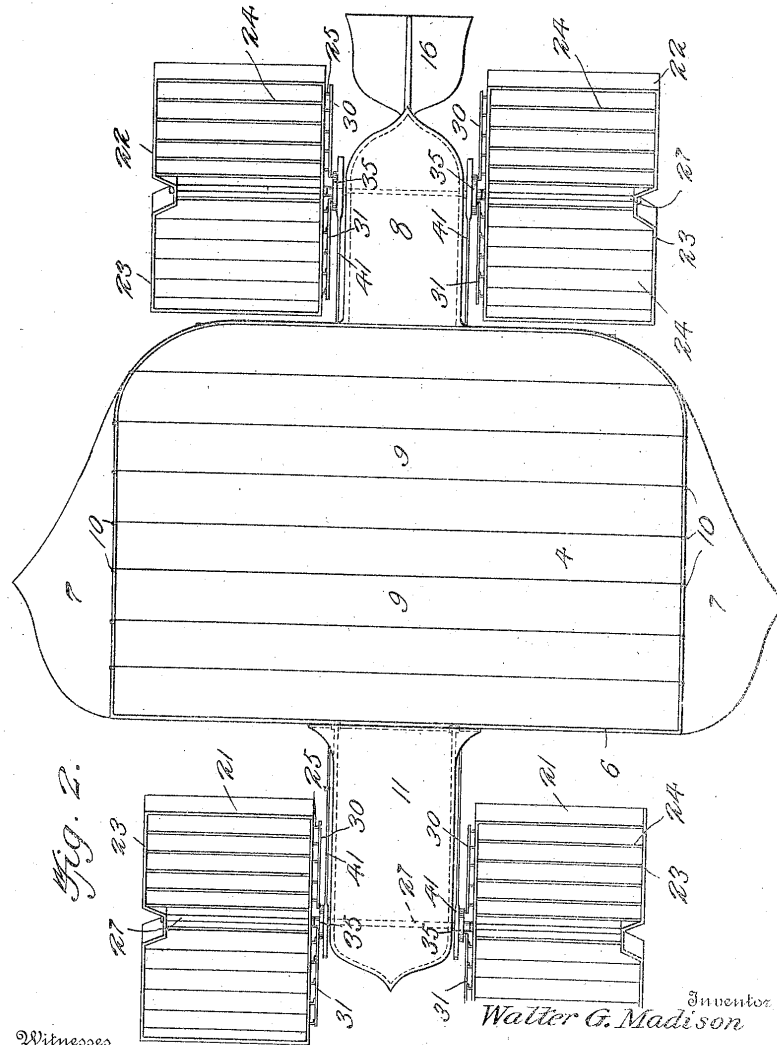


Fig. 2.

Witnesses

Frank B. Hoffman

C. C. Hines

Inventor
Walter G. Madison

Victor J. Evans

Att. in ch.

UNITED STATES PATENT OFFICE.

WALTER G. MADISON, OF AMES, IOWA.

FLYING-MACHINE.

1,047,098.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed June 8, 1910. Serial No. 565,687.

To all whom it may concern:

Be it known that I, WALTER G. MADISON, a citizen of the United States, residing at Ames, in the county of Story and State of Iowa, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to aeroplane flying machines of the monoplane type, and its objects are, first, to provide an improved construction of supporting plane for increasing the longitudinal and lateral stability; and reducing resistance to the ascent of the machine; second, to provide simple and effective means for horizontal and vertical steering; and, third, to provide a construction and arrangement of propellers which will operate both as lifting and driving propellers.

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

Figure 1 is a side elevation of a flying machine embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a front elevation. Fig. 4 is a vertical transverse section through the car on the line 4—4 of Fig. 1. Fig. 5 is a top plan view of the supporting plane with its slats or pivoted portions arranged for the ascent of the machine. Fig. 6 is a longitudinal section thereof on the line 6—6 of Fig. 5. Fig. 7 is a side view, showing the horizontal rudder. Fig. 8 is a side view of the feathering and reversing devices of one of the propellers on an enlarged scale. Fig. 9 is a horizontal transverse section of the same.

The main frame 1 of the machine includes a car 2 of suitable construction and has extending therefrom uprights 3 of any desired character which carry the supporting or flotation plane 4, said plane including in its construction a frame structure 5. The body of the plane proper is secured to the frame structure 5 in any preferred manner and consists of an open rectangular frame portion 6 provided with rigid laterally extending fixed tips or ailerons 7 and a rear tip or aileron 8, said tips or ailerons serving to increase the lateral and longitudinal stability of the machine. The central portion of the plane body is composed of a series of transversely extending vanes or slats 9 mounted on eccentric journals 10 to normally drop

downward to the substantially vertical position shown in Fig. 6 when not supported by wind pressure. The plane is curved transversely or in a fore and aft direction to secure a desired lift with a minimum drift and may also be concavo-convexly curved transversely to the line of flight. As shown, the vanes are curved to conform to and complete the general curvature of the plane and are adapted when the machine is in straight-away flight or descending to swing upwardly to a substantially horizontal position in the plane of the supporting plane and thus close the open rectangular frame portion 6 to prevent the passage of air there-through. By this construction, a full supporting surface will be provided when the machine is traveling horizontally or descending, while the area of the supporting surface will be reduced when the machine is ascending in a substantially straight vertical line to reduce the air resistance to its ascent. At the front of the plane is arranged a pivoted, vertically swinging horizontal rudder 11 in the form of a central flexible rear wing tip, which rudder is connected by a crank arm 12 and a link 13 with a controlling lever 14 on the car, whereby said rudder may be adjusted to steer the machine in a vertical plane and held in the desired adjusted position, suitable means being employed for securing the lever at any point in its range of movement. A bracket 15 extends from the rear portion of the main frame and plane frame and supports a vertical rudder 16 mounted to swing laterally on a hinge joint 17 and connected by a crank arm 18 and link 19 with an adjusting lever 20 on the car, by which the rudder may be moved to the right or left to steer the machine laterally.

Rotary propellers 21 and 22 are respectively arranged in pairs at the front and rear of the machine and at what may be called the four corners of the flotation plane, the propellers of each pair being disposed on opposite sides of the longitudinal center of the machine and mounted on horizontal axes for rotation in a vertical plane. Each propeller consists of a substantially open, flat rectangular frame 23 provided with blades on each side of its transverse center, each blade consisting of a transverse series of vanes or slats 24 the ends of which are provided with journals mounted in bearings in the opposite side walls of the frame,

John E. McWorter of New Philadelphia, IL, was granted three patents for flying machines. At the same time that the Wright Brothers were inventing their flying machines McWorter was working on his flying machines in St. Louis Missouri. McWorter inventions resembled modern day airplanes McWorter was assigned patent number 1,115,710, on November 3, 1914, for "Aeroplane,"

<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,115,710>.

The United States Patent Office assigned McWorter's patent to Class 244/20, "Feathering."

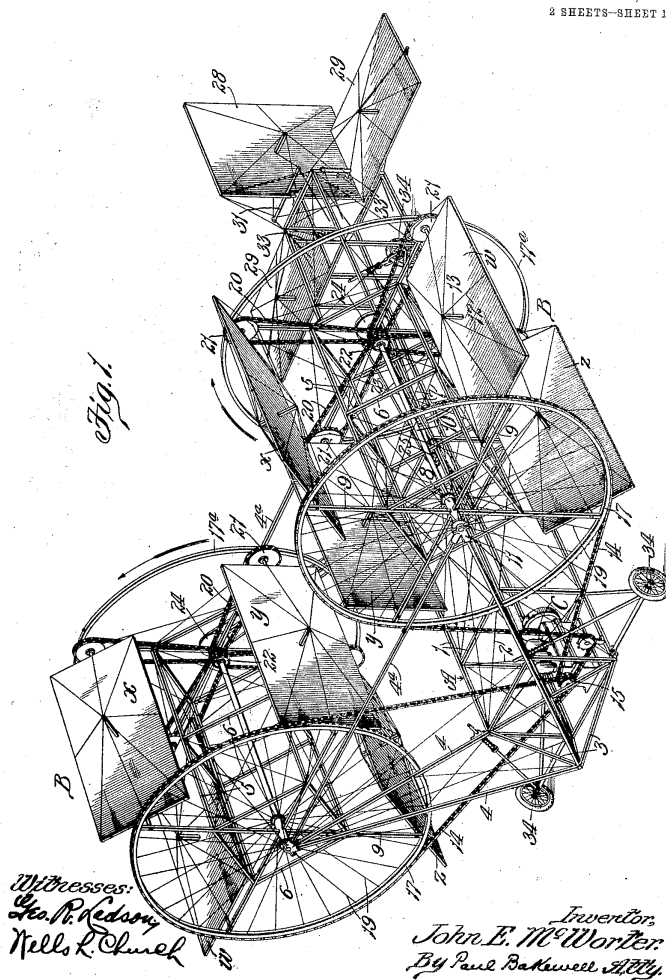
1,115,710.

J. E. McWORTER.
AEROPLANE.

APPLICATION FILED JUNE 26, 1911.

Patented Nov. 3, 1914

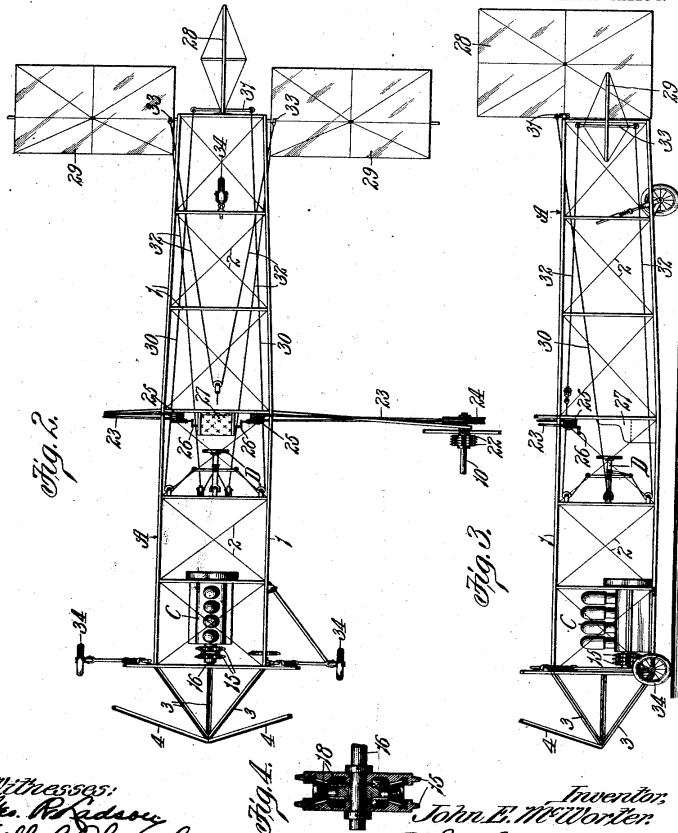
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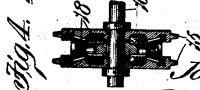
1,115,710.

J. E. McWORTER.
AEROPLANE.
APPLICATION FILED JUNE 26, 1911.

Patented Nov. 3, 1914.
2 SHEETS-SHEET 2.



Witnesses:
Geo. R. Adams
Wells R. Church



Inventor:
John E. McWorter
By Paul Bakewell Atty.

UNITED STATES PATENT OFFICE.

JOHN E. McWORTER, OF ST. LOUIS, MISSOURI.

AEROPLANE.

1,115,710.

Specification of Letters Patent.

Patented Nov. 3, 1914.

Application filed June 26, 1911. Serial No. 635,440.

To all whom it may concern:

Be it known that I, JOHN E. McWORTER, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Aeroplanes, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to aeroplanes.

One object of the invention is to provide an aeroplane having combined propelling and sustaining planes which are so arranged that they give a constant lift and any increase in the speed of the machine through the air causes a greater volume of air to be brought into contact with the planes and thus, by reason of the greater resistance offered by the air, the rotary movement of the blades is retarded, thereby producing an aeroplane in which the efficiency of the propellers increases as the speed of flight increases for the amount of power required to drive the propellers decreases as their rotational velocity decreases.

Another object of the invention is to provide an aeroplane which is so constructed that it can rise directly from the ground through the action of propellers with a vertical lift, thereby producing an aeroplane less subject to the ordinary variations or changes in the velocity of the wind and one not wholly dependent upon the velocity with which its lifting and supporting planes cut through the air in the direction of flight.

Another object is to provide an aeroplane of novel construction in which the means that propels the machine through the air also acts to sustain the machine in the air.

Another object is to provide an aeroplane of the character described in which the combined propelling and sustaining planes are so constructed and arranged that they offer very little resistance to the forward flight of the machine.

Another object is to provide an aeroplane having propeller planes or blades which are so designed, arranged and operated that a machine of practical size can be equipped with a relatively great area of propeller blade surface, thereby greatly increasing the propeller thrust per applied horse-power above that obtained from the ordinary screw form of propeller under working conditions.

Another object is to provide an aeroplane

in which the means that sustains the machine in the air is located above the center of gravity of the machine, thereby enabling the equilibrium of the machine to be maintained easily.

Another object is to provide a combined propelling and sustaining device for aeroplanes that is light and strong and in which the area of the propelling planes is as great as that of the sustaining planes of the aeroplanes now in general use. And still another object is to provide a light and strong aeroplane which is so constructed that the strains are equalized and distributed uniformly to all parts of the body of the machine and to the propelling and sustaining devices when the machine is in operation, thereby permitting said elements to be formed from comparatively small, lightweight members.

Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a perspective view of an aeroplane constructed in accordance with my invention; Fig. 2 is a top plan view of the body or framework of the machine which supports the operator and the motor used for actuating the propellers; Fig. 3 is a side elevational view of the body of the machine; and Fig. 4 is a sectional view of the gears and sprocket wheels on the shaft of the motor which cooperates with the driving members that actuate the propellers.

Briefly described, my improved aeroplane consists of a body or frame of any preferred design which carries the operator, the motor, and the devices for controlling and guiding the machine, one or more pairs of combined propelling and sustaining devices, each of which comprises a plurality of planes, wings or blades which are so disposed that the resistance which the air offers to the rotary movement of same is in a vertical direction, means for rotating said propelling and sustaining devices in opposite directions, and means for causing the planes or wings of same to feather or turn from a horizontal position into a vertical position when they reach such a point in the cycle of operations of the devices that the air will exert downward pressure on same instead of a lifting or upward pressure. The machine herein shown, which represents the pre-

the combined propelling and sustaining devices B when the speed of the machine increases. In other words, the rotative velocity of the wings or planes to maintain a certain lift becomes less and less as the forward speed of the machine increases. The wings or planes of the machine are so arranged that the thrust of same directly counteracts any tendency of the machine to descend, and by slightly tipping the forward end of the machine downwardly this thrust will directly counteract both the forward resistance of flight and the force of gravity combined. As some of the wings or planes of the machine always occupy a vertical position or a substantially vertical position said wings prevent the machine from skidding sidewise and thus enables the operator to accurately control the direction of the machine by manipulating the rudders at the rear end of same.

By dividing up the plane surface of the machine in the manner above described I am able to provide a machine of practicable size with a very large area of propeller plane surface and thus attain a high degree of efficiency per horse-power, and by applying the rotative power to the devices B in the manner above-described, namely, directly to the longitudinal axes of the planes or wings, said wings are not subjected to any excessive leverage or strains and I am thus enabled to mount said wings on a comparatively light frame-work or supporting structure which is strong enough to successfully withstand the strains to which it is subjected when the machine is in service. All rotative parts of the machine move at a relatively slow rate of speed so that there is very little waste of energy at the bearings of the rotative parts, and as the devices B and the body A of the machine consist of skeleton-shaped trussed frames, comparatively light members or small rods can be used to form said frames as the truss-wires equalize and distribute the strains uniformly to the various members used to form the frame.

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

1. An aeroplane comprising a substantially box-shaped frame of skeleton-like construction in which the operator sits, braces that project upwardly and laterally from said frame, combined propelling and sustaining devices rotatably mounted in said frame, each of said devices consisting of a horizontally disposed axle provided with radially projecting supports in which wings or planes are rotatably mounted, driving wheels on the axles of said devices whose rims lie outside of the bearings of said planes, a

motor on the operator's frame, flexible driving members actuated by said motor and passing around the rims of said driving wheels, means for causing the rotative velocity of the combined propelling and sustaining device at one side of the machine to be accelerated automatically when the rotative velocity of the device on the other side of the machine is retarded by varying air currents, and tail-planes or rudders at the rear end of the machine under control of the operator for guiding the machine.

2. An aeroplane comprising the combination of a frame or body portion for carrying the operator and motor, rotatable propelling and sustaining devices arranged above and on opposite sides of said body portion and each comprising a plurality of pivotally mounted planes or blades whose longitudinal axes extend in the same general direction as that in which the machine travels through the air, means for causing said planes or blades to feather during their rotative movement around their respective central propelled shafts, said feathering means comprising sprocket wheels rigidly attached to the shaft of each blade and corresponding sprocket wheels rigidly attached to their respective central propeller shafts and the two coöperatively connected by a sprocket chain, means for controlling and adjusting said feathering means whereby the direction of lift of the propelling and sustaining means may be maintained in an approximately vertical direction, means for rotating said propelling and sustaining devices in opposite directions, and automatic means associated with the driving means adapted to maintain the center of lift at a point midway between the right and left propelling and sustaining devices.

3. An aeroplane comprising the combination with a main frame or body portion for carrying the motor, operator, controlling and steering devices, propelling and sustaining devices arranged above and on opposite sides of said body portion and rotatable on central shafts parallel to the longitudinal axis of the machine and each of said devices comprising a plurality of pivotally mounted planes or blades whose longitudinal axes extend parallel to said central shafts, means for rotating said devices in opposite directions and at such equal or varying rotative speeds that the center of lift will be maintained at a point midway between the two, means for causing said planes or blades to feather during their rotative movement around their respective central shafts, said feathering means comprising sprocket wheels rigidly attached to the shaft of each blade and corresponding sprocket wheels rigidly attached to their respective central propeller shafts and the two coöperatively

connected by a sprocket chain, means adapted to rotate and adjust said normally stationary central propeller shafts, said rotating and adjusting means comprising an actuating device situated in the body portion of the machine, having a rotative member, sprocket wheels or drums rigidly attached to the central shaft of each propeller and the two rotative members coöperatively con-

nected by flexible means, all substantially as described and for the purpose set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this twenty third day of June 1911.

JOHN E. MCWORTER.

Witnesses:

W. L. CHURCH,
GEORGE BAKEWELL.

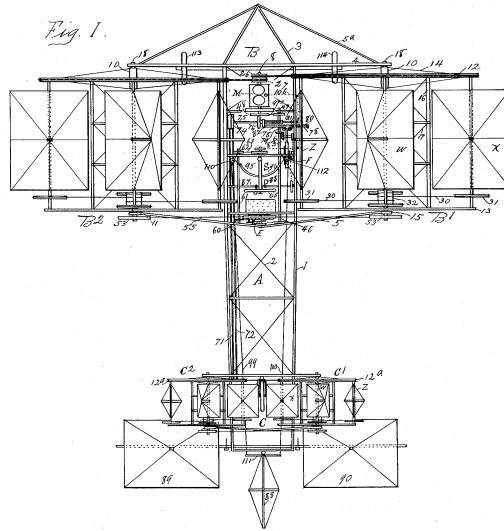
This is not the full patent document.

On October 20, 1914 John E. McWorter, of St. Louis, Missouri, born in New Philadelphia, IL, was issued Patent Number 1,114,167, for "flying machine," <http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,114,167>. The United States Patent Office assigned McWorter's Patent to class 244/20 "beating wing sustained." The Wright Brothers' airplanes were classed under 244/16, "Glider."

J. E. McWORTER.
FLYING MACHINE.
APPLICATION FILED MAY 9, 1913.

Patented Oct. 20, 1914.
5 SHEETS-SHEET 1.

1,114,167.



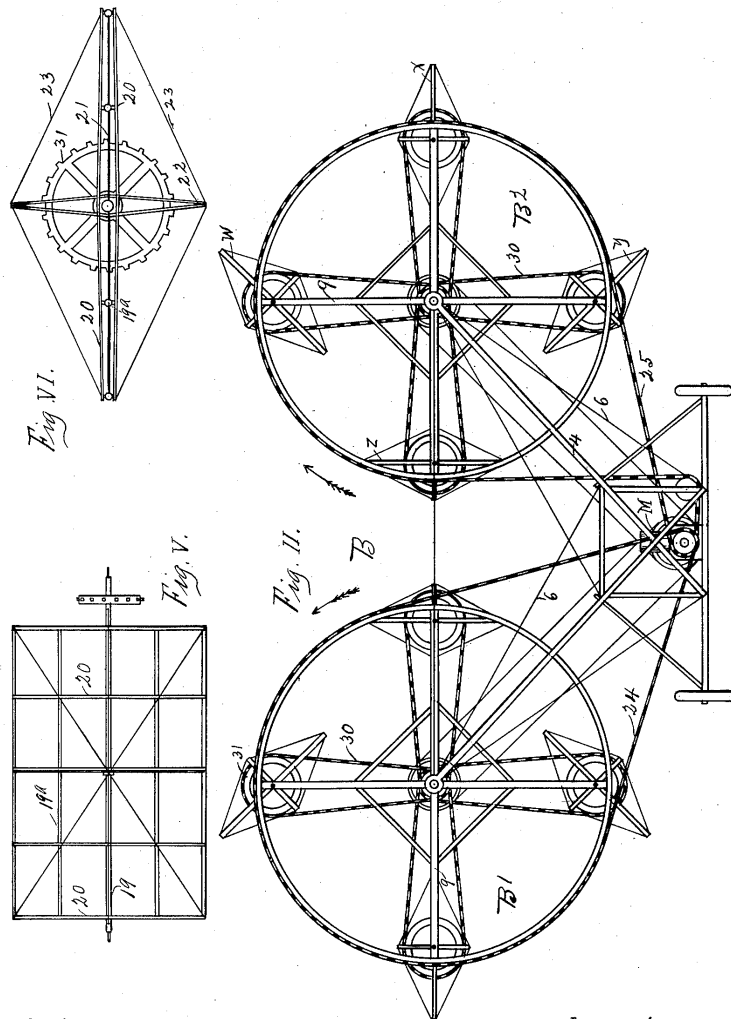
Witnesses:
Albert C. Brown
Andrew J. Brown

Inventor:
John E. McWorter

J. E. McWORTER.
FLYING MACHINE.
APPLICATION FILED MAY 9, 1913.

1,114,167.

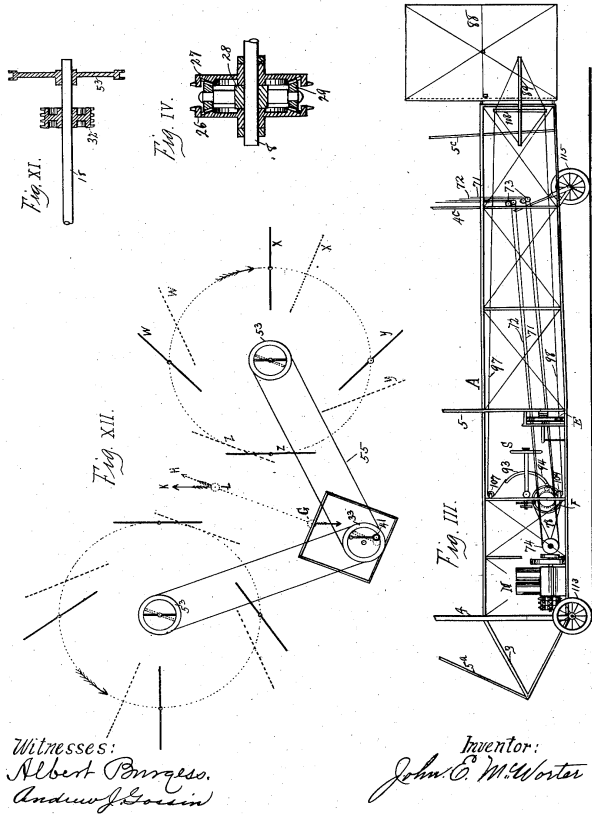
Patented Oct. 20, 1914.
6 SHEETS—SHEET 2.



Witnesses:
Albert Burgess.
Andrew J. Gossin.

Inventor:
John E. McWorter

1,114,167.



Witnesses:
Albert Burgess.
Andrew J. Loring.

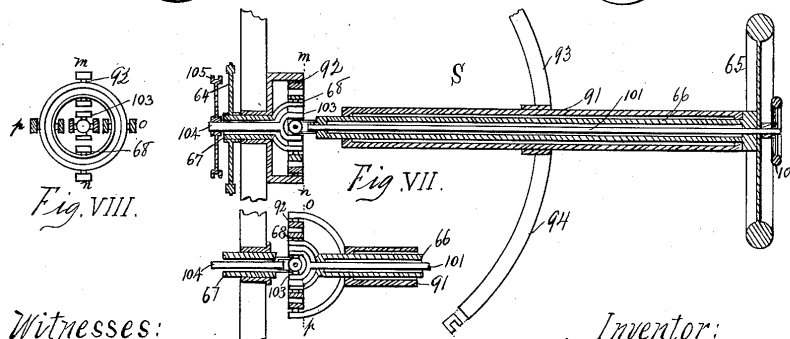
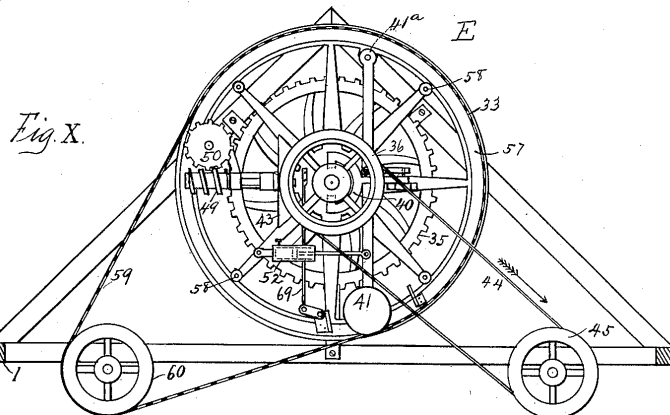
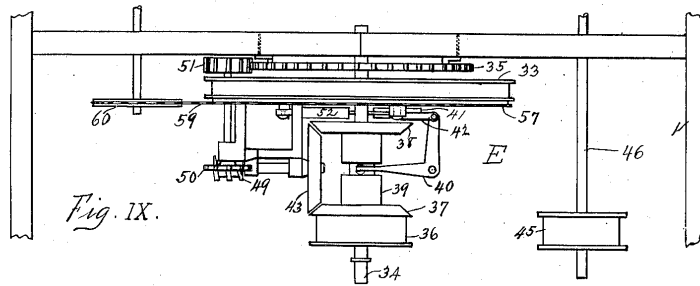
Inventor:
John E. McWorter

J. E. McWORTER.
FLYING MACHINE.
APPLICATION FILED MAY 9, 1913.

1,114,167.

Patented Oct. 20, 1914.

5 SHEETS—SHEET 4.



Witnesses:
Albert Burgess
Andrew J. Gossin

Inventor:
John E. McWorter

J. E. McWORTER.
FLYING MACHINE.
APPLICATION FILED MAY 9, 1913.

Patented Oct. 20, 1914.
6 SHEETS—SHEET 5.

1,114,167.

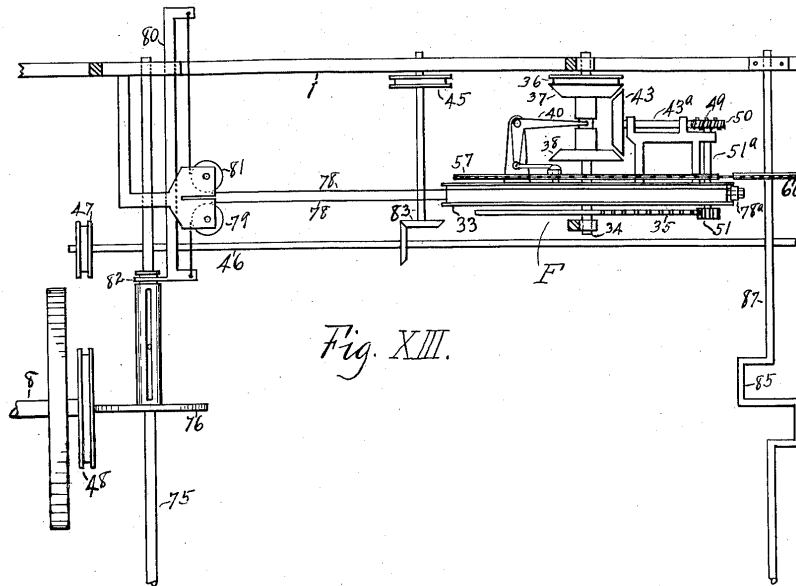


Fig. XIII.

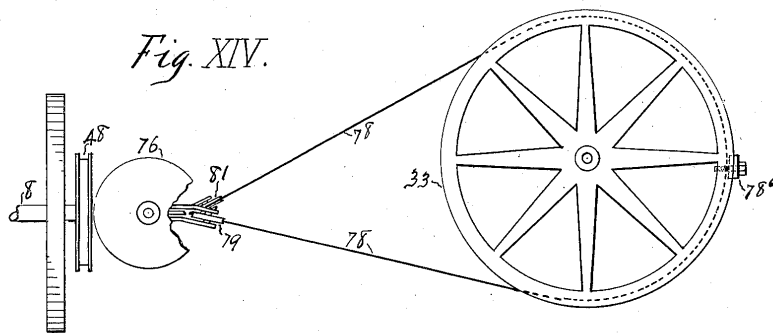


Fig. XIV.

Witnesses:
Samuel J. Braush.
Andrew J. Gossin

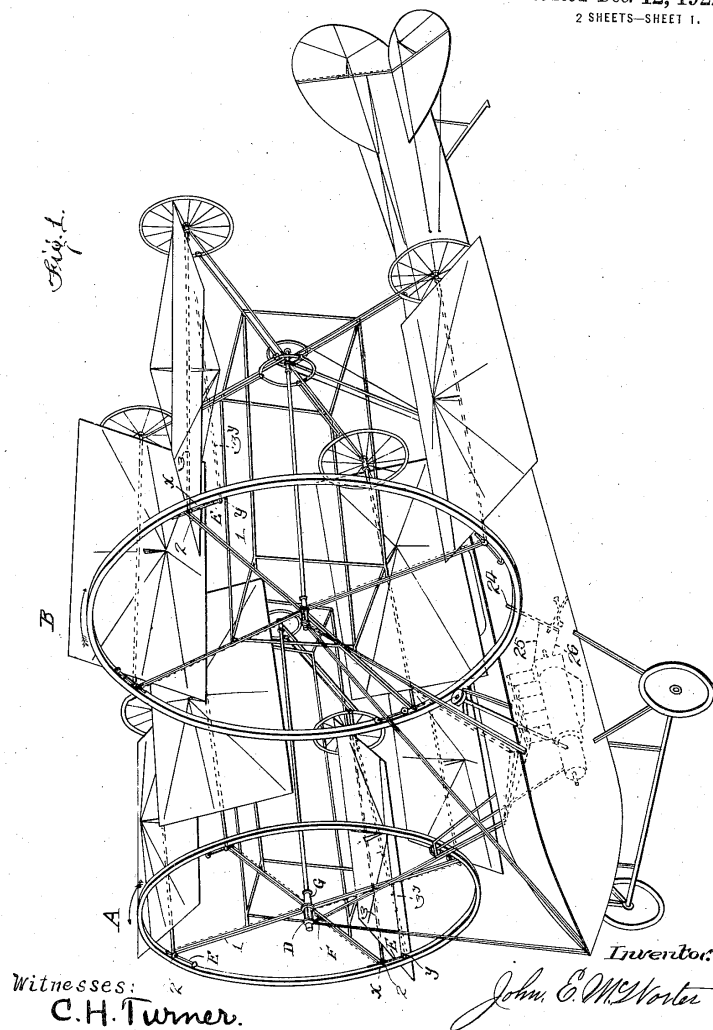
Inventor:
John E. McWorter

On December 12, 1922, John E. McWorter, of St. Louis, Missouri, was assigned patent number 1438929 for the "flying machine," <http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1438929>. This invention was classed under "feathering," by the United States Patent Office.

J. E. McWORTER,
FLYING MACHINE.
APPLICATION FILED JULY 18, 1921.

1,438,929.

Patented Dec. 12, 1922.
2 SHEETS—SHEET 1.



J. E. McWORTER.
 FLYING MACHINE.
 APPLICATION FILED JULY 18, 1921.

1,438,929.

Patented Dec. 12, 1922.
 2 SHEETS—SHEET 2.

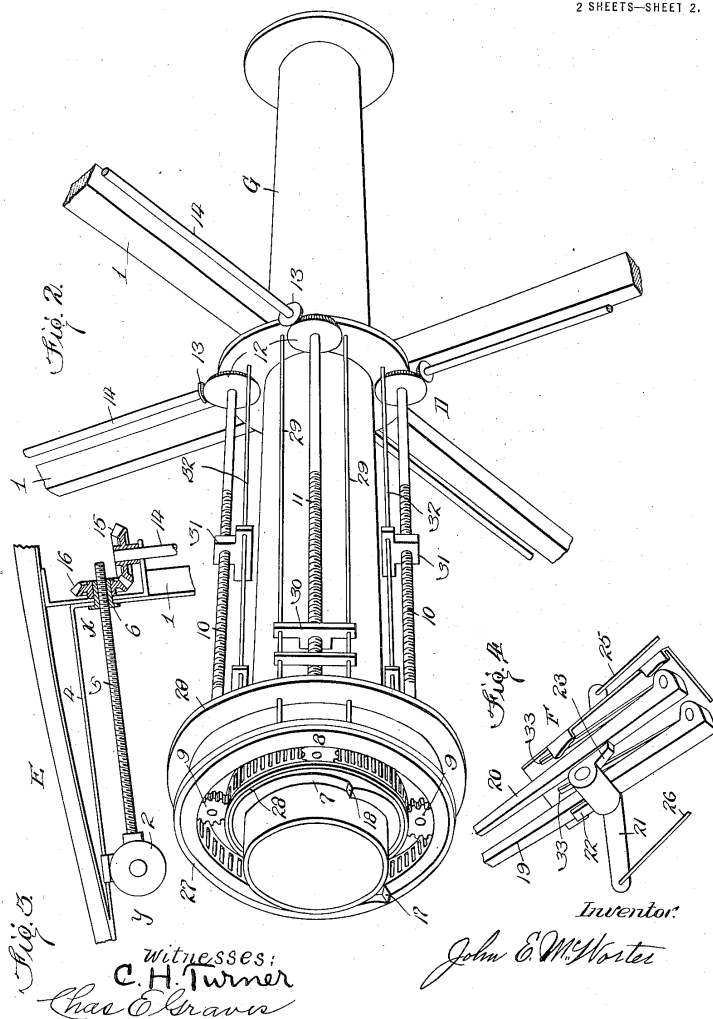


Fig. 3
 witnesses:
 C. H. Turner
 Chas. E. Kravus

Inventor:
 John E. McWorter

Patented Dec. 12, 1922.

1,438,929

UNITED STATES PATENT OFFICE.

JOHN E. McWORTER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO AUTOPLANE COMPANY OF AMERICA, OF ST. LOUIS, MISSOURI.

FLYING MACHINE.

Application filed July 13, 1921. Serial No. 435,760.

To all whom it may concern:

Be it known that I, JOHN E. McWORTER, a citizen of the United States, residing at 4331 Garfield Ave., in the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Flying Machines, of which the following is a specification.

My invention relates to improvements in flying machines having rotating wings or propellers of the feathering blade type.

Briefly described, my invention consists of a mechanism designed to give to the propellers of this general type of flying machine a variable horizontal component of air resistance in the direction of flight.

One object of my invention is to so adjust the relative position of the propeller blade shaft with respect to the central propeller shaft that its operation will not only sustain the machine in the air but will also propel it forwardly without having to depend wholly upon the forward tilt of the machine.

Another object of my invention is to provide an adjustable means for increasing or decreasing the relative forward pull of the propellers.

Another object of my invention is to provide a means which will enable the operator to make a running start on the ground when necessary or desirable.

Another object of my invention is to provide a means by which a greater or less speed of flight may be given the machine without changing its relative position with respect to its line of flight.

Other objects and desirable features of my invention will be hereinafter pointed out.

Similar numbers and letters refer to similar parts throughout the several views.

Figure I. of the drawings represents a preferred form of an airplane of the rotating-wing feathering-blade type with the principal parts of the improvement hereinafter described located at D, E, and F respectively;

Figure II. represents that part of the improvement located on the hub G of the propellers A and B of the machine;

Figure III. represents the parts located at the front end of each propeller blade; and

Figure IV. represents a pair of ratchet

bars which are designed to cooperate with that part of the improvement located on the hub of the propellers.

As illustrated in the drawings my improvement consists of a mechanism comprising a bearing at the front end of each propeller blade-shaft 3. Said bearing 2 is slidably mounted as upon bar 4, and is suitably arranged to be adjusted to different positions upon said bar by means of screw 5 and nut 6, as shown in Fig. III. Adjusting nut 6 is turned in one direction or the other as desired by means of two annular concentric rims 7 and 8 suitably mounted on the propeller hub as shown in Fig. II. The smaller of the two rims is provided with gear teeth in or on its outer face and the larger with gear teeth in or on its inner face, and the two are cooperatively connected with adjusting nut 6, preferably by means of spur gears 9 located between inner and outer rims 7 and 8, shafts 10 and 11, bevel gears 12 and 13, shafts 14, and bevel gears 15 and 16. Rims 7 and 8 are provided with a suitable number of ratchet teeth so that one or the other may be held from rotation with the propeller by means of the ratchet device F shown in Fig. IV. of the drawings. The ratchet bars 19 and 20 are brought in contact with the ratchet teeth 17 and 18 of their respective annular rims by means of lever 21 and the two lugs 22 and 23 rigidly connected therewith. The lever 21 is connected with a suitable controlling device in the body of the machine, as for example lever 24, by means of double flexible wire lines 25 and 26, one line of each running to one propeller ratchet means and one of each to the other. When the operator pushes forward on lever 24 the ratchet bar 19, for example, is brought in contact with the ratchet teeth 17 of rim 8 and holds it from rotation. This causes adjusting nut 6 to turn in that direction that will force blade bearings 2 forward in the direction of rotation as nuts 6 and their respective screws are suitably threaded either right or left as the case may require for each of the propellers. When the operator pulls back on lever 24 the opposite movement of blade bearings 2 is accomplished. Ring 27 mounted on rods 29 is provided to disengage ratchet bar 19 when bearing 2 has reached the Y position. This is accomplished by means of nuts and

Hubert Julian of Montreal Quebec, Canada, was granted Patent Number 1,379,264, On May 24, 1921, for "Airplane Safety Appliance," <http://patft.uspto.gov/netacgi/nph->

[Parser?patentnumber=1,379,264](#). This invention was classed under "safety lowering device for the entire aircraft."

H. JULIAN.
AIRPLANE SAFETY APPLIANCE.
APPLICATION FILED MAR. 9, 1921.

1,379,264.

Patented May 24, 1921.

Fig. 1.

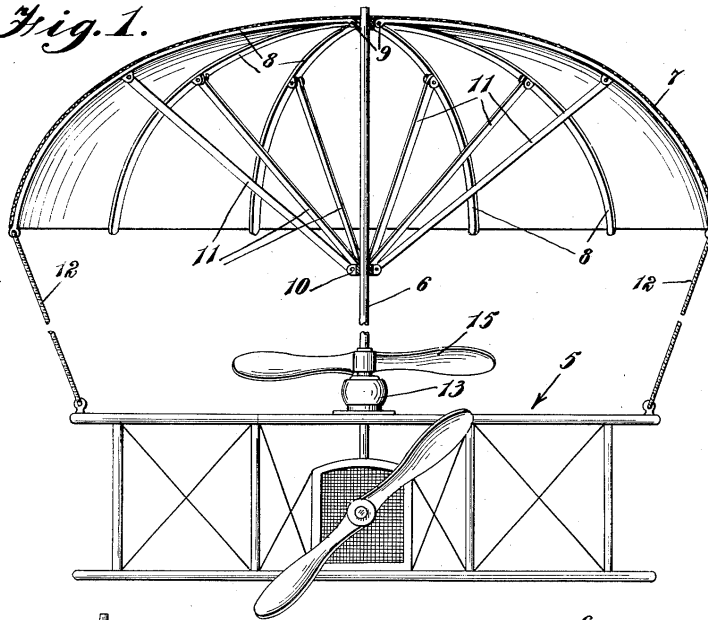


Fig. 2.

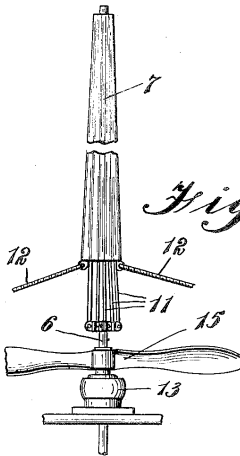
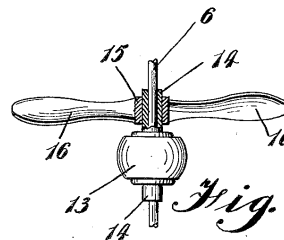


Fig. 3.



Inventor
Hubert Julian

By
William C. Linton
Attorney

UNITED STATES PATENT OFFICE.

HUBERT JULIAN, OF MONTREAL, QUEBEC, CANADA.

AIRPLANE SAFETY APPLIANCE.

1,379,264.

Specification of Letters Patent.

Patented May 24, 1921.

Application filed March 9, 1921. Serial No. 450,801.

To all whom it may concern:

Be it known that I, HUBERT JULIAN, a subject of the King of Great Britain, residing at Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Airplane Safety Appliances; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to new and useful improvements in safety appliances for airplanes.

The primary object of the invention is the provision of a safety appliance for airplanes so constructed as to prevent the machine from falling in case of engine trouble and thereby preventing resultant damage to the machine or injury to the occupants.

Another object of the invention is the provision of a machine having a collapsible parachute attachment secured thereto and positioned preferably thereabove, together with means for raising the said parachute attachment from inoperative to operative position.

A further object of the invention is the provision of a safety appliance for airplanes including a parachute attachment adapted to be secured thereto and which is normally disposed in closed position, together with a suitable fan or propeller adapted to raise the said parachute mechanism to its extended position when desired.

A still further object of the invention is the provision of a safety appliance for airplanes, which will be comparatively simple and inexpensive to manufacture, reliable, and efficient in use, and readily operated.

With the above and other objects in view, the present invention resides in the novel features of construction, formations, combinations and arrangements of parts to be hereinafter more fully described, claimed, and illustrated in the accompanying drawing forming a part of the present application, and in which:

Figure 1 is a front view of an airplane showing the invention applied thereto and in operative position;

Fig. 2 is a view showing the attachment in its normal or inoperative position; and,

Fig. 3 is a detail view illustrating the means of actuating the fan.

Referring now to the accompanying drawing by corresponding characters of reference throughout the several views, the numeral 5 designates in general a conventional form of airplane from the central portion of which extends a vertical shaft 6, the latter extending above the upper plane as clearly shown in Fig. 1.

A parachute attachment is shown at 7 and includes a plurality of ribs 8 pivoted at their upper ends, as at 9, to the upper end of the shaft 6, and connected to a sliding ring 10 located upon the shaft by the stays 11. As the ring moves downwardly, the parachute 7 will collapse from the extended position shown in Fig. 1 to the position shown in Fig. 2.

Certain of the lower ends of the ribs 8 are connected to the upper portion of the machine 5 by flexible cables designated at 12.

A motor 13 is mounted upon the upper portion of the machine and has rotatably connected thereto a sleeve 14 which surrounds the shaft 6 for rotation thereon.

A fan 15 is carried by the sleeve 14 being preferably keyed thereto and includes the fan blades 16 which are positioned below the lower end of the parachute.

This motor 13 may be actuated by a suitable storage battery, not shown.

The operation of the device is as follows:

In case of engine trouble or any other difficulties which would cause the machine to fall to the ground without control, the motor 13 is set in operation, which rotates the fan 16 with sufficient rapidity to raise the parachute from the position shown in Fig. 2 to that shown in Fig. 1, and the speed of the fan is so controlled that the air driven against the underside of the parachute will allow the machine to descend gradually and without danger of injury thereto or to the occupants.

From the foregoing description taken in connection with the accompanying drawing, it will be manifest that a safety appliance for airplanes is provided which will fulfil all of the necessary requirements of such a device, and it should be understood in this connection, that various minor changes in the specific details of construction can be resorted to within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

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

- 5 1. The combination of an airplane and an extensible safety attachment secured thereto, a fan for moving the safety attachment to its extended position, and an independent motor for actuating said fan.
- 10 2. The combination with an airplane of a safety attachment secured thereto, and including an extensible mechanism, a fan for forcing the extensible mechanism to extended position, and an independent motor for actuating said fan.
- 15 3. The combination with an airplane of a safety attachment carried thereby and including a vertical shaft, an extensible member slidable upon the shaft, a sleeve rota-

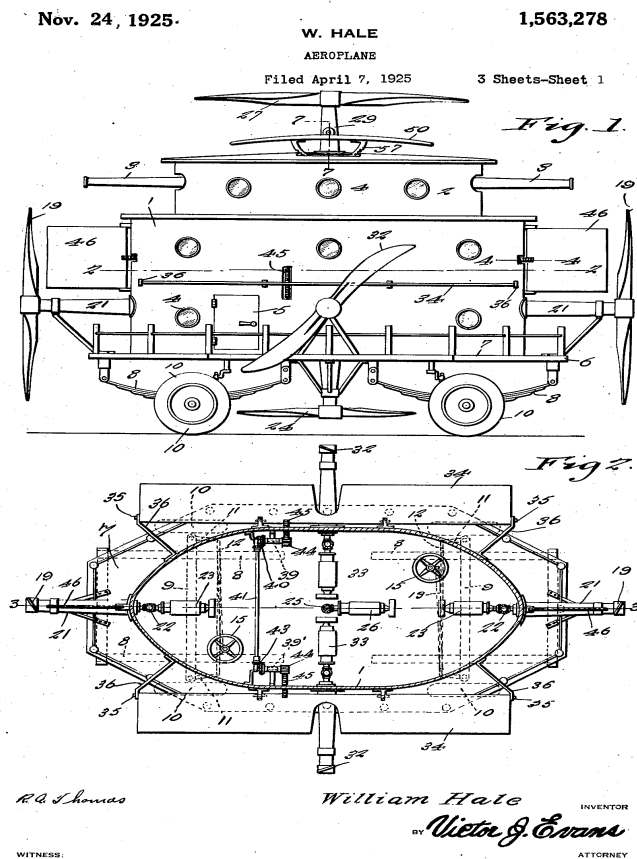
table upon the shaft, a fan secured to one end of the sleeve for forcing the extensible mechanism to extended position, and a motor secured to the opposite end of the sleeve for actuating the fan.

4. The combination with an airplane, of a shaft extending thereabove, a parachute attachment carried by the shaft, a motor mounted adjacent said shaft, a sleeve actuated by the motor and surrounding the shaft, a fan carried by the sleeve and positioned below the parachute mechanism, and flexible cables connecting the parachute attachment with the airplane.

In witness whereof I have hereunto set my hand.

HUBERT JULIAN.

William Hale, of Litwar, Vest Virginia , was granted Patent Number 1,563,278, on November 25, 1925, for " Aeroplanes"
<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,563,278>.
This invention was classed under class 244/16, "airplane and helicopter



substained."

Nov. 24, 1925.

1,563,278

W. HALE
AEROPLANE

Filed April 7, 1925

3 Sheets-Sheet 2

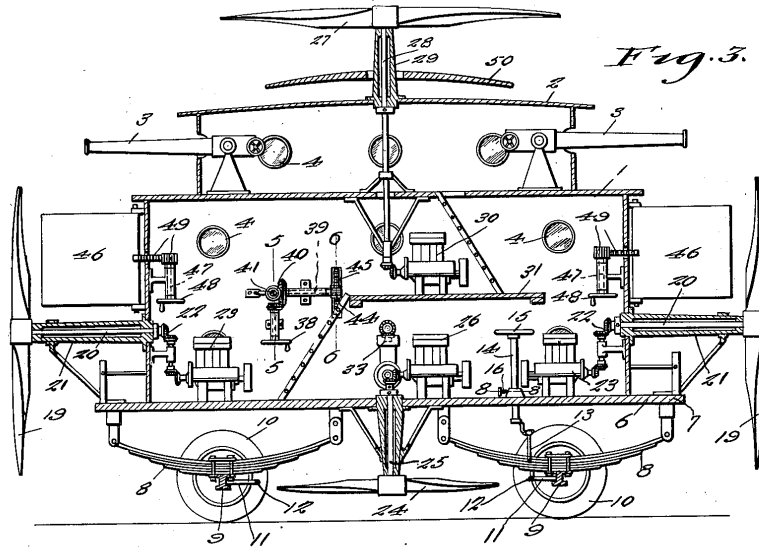


Fig. 3.

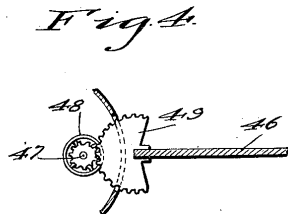
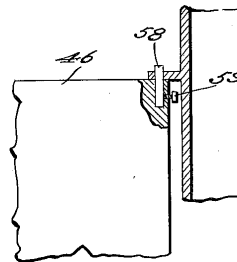


Fig. 4.

Fig. 5.



R. C. Thomas

WITNESS:

William Hale

INVENTOR

BY Victor J. Evans

ATTORNEY

Nov. 24, 1925.

1,563,278

W. HALE

AEROPLANE

Filed April 7, 1925

3 Sheets-Sheet 3

Fig. 5.

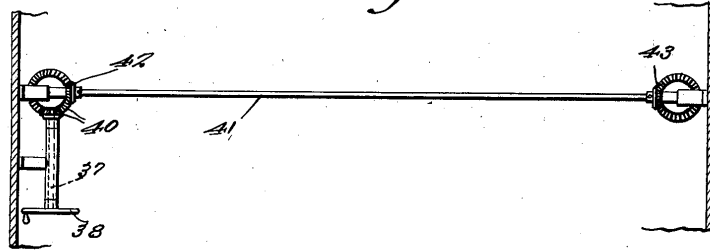


Fig. 7.

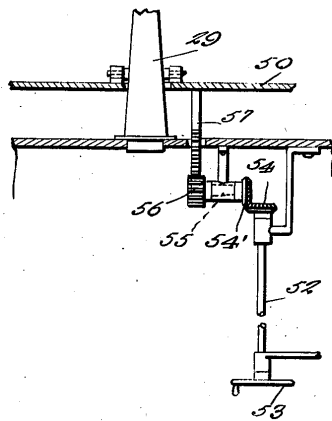


Fig. 6.

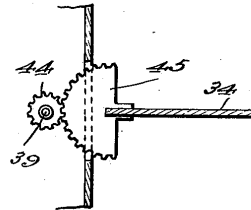
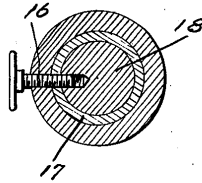


Fig. 8.



R. L. Thomas

WITNESS:

William Hale

INVENTOR

BY *Victor J. Evans*

ATTORNEY

Patented Nov. 24, 1925.

1,563,278

UNITED STATES PATENT OFFICE.

WILLIAM HALE, OF LITWAR, WEST VIRGINIA.

AEROPLANE.

Application filed April 7, 1925. Serial No. 21,397.

To all whom it may concern:

Be it known that I, WILLIAM HALE, a citizen of the United States, residing at Litwar, in the county of McDowell and State of West Virginia, have invented new and useful Improvements in Aeroplanes, of which the following is a specification.

This invention relates to improvements in aircrafts, the general object of the invention being to provide means whereby the craft can be made to hover in the air and can ascend and descend vertically, as well as be propelled horizontally.

Another object of the invention is to provide means whereby the device can be caused to run along the ground the same as a wheeled vehicle and either in a forward or reversed direction, with means for steering the vehicle when moving in either direction.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an elevation of the improved device.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a section on line 4—4 of Figure 1.

Figure 5 is a section on line 5—5 of Figure 3.

Figure 6 is a section on line 6—6 of Figure 3.

Figure 7 is a section on line 7—7 of Figure 1.

Figure 8 is a section on line 8—8 of Figure 3.

Figure 9 is a sectional detail.

In these views, 1 indicates the body of the device which is formed with a super-structure 2 which may contain guns 3. The body 1 is provided with the usual port holes 4 and has one or more doors 5 therein, the base 6 being made of greater dimensions than the body so as to form a deck 7 which extends around the body. Springs 8 are

attached to the base at the front and rear thereof and these springs support the axles 9 to which the wheels 10 are connected. The spindles of these wheels are pivoted to the axles and the spindles of each pair of wheels have their arms 11 connected together by a connecting rod 12 and a rod 13 connects the rod 12 with the lower part of a steering column 14 which is provided with the usual hand wheel 15. As will be seen there are two sets of these steering means so that the apparatus can be steered from either end and in order to render inactive the steering means which are not being used I provide a hand bolt 16 which is adapted to pass through the steering column casing 17 and engage a hole in the movable part 18 of the column to prevent movement thereof. This arrangement permits the device to be steered along the ground in either direction so that it is not necessary to turn the device around when it is to retrace its route.

A propeller 19 is placed at each end of the body, each propeller having a shank 20 arranged in a housing 21 extending from each end of the body and each shaft is connected by the driving means shown generally at 22 to a motor 23 placed in the body. These propellers can be used for causing the vehicle to travel along the ground as well as to propel the device horizontally when in the air. A horizontally arranged propeller 24 is arranged under the body between the two sets of wheels thereof and the shaft 25 of this propeller extends vertically into the body where it is connected with the motor 26. A horizontally arranged top propeller 27 is arranged above the device and has its shaft 28 passing through an upright housing 29 on the super-structure 2 and through said super-structure into the body where it is connected with a motor 30 placed on a platform 31 in the body. I also provide a propeller 32 at each side of the body, the shafts of these propellers being connected to motors 33 placed in the body, one at each side thereof. Thus it will be seen that each propeller is driven by its own motor so that the propellers are independent of each other.

A wing 34 is hingedly connected with each side of the body by having their pintles 35 engaging the brackets 36 fastened to the body and these wings are tilted simultaneously by an operator through means of the shaft 37 supported on the body and provided

with a hand wheel 38 and connected with the shaft 39 by the gears 40 and with the shaft 41 by means of the pin 42 which meshes with one of the gears 40, this shaft 41 being
 5 connected with the shaft 39' by the gears 43, the shafts 39 and 39' having pinions 44 thereon which engage the segmental gears 45 connected with the wings 34. Thus when the operator turns the wheel 38 both planes
 10 34 will be adjusted simultaneously.

I also provide a rudder 46 at each end of the device, each rudder being manually adjusted by means of a shaft 47 having a handle 48 at its lower end and connected by
 15 the gears 49 with the rudder so that by turning the hand wheel 38 the rudder can be adjusted. A plane 50 is arranged at the top of the device and is pivoted at its center to the post 29 and this plane is adjusted manually by means of the shaft 52 having a hand
 20 wheel 53 at its lower end and the gear 54 at its upper end, which gear 54 meshes with a gear 54' on a stub shaft 55 which has a pinion 56 at its other end engaging a curved rack 57 which is attached to the plane. Figure 9 shows how the pivot pins 58 for the rudders are held in the rudders by the set
 25 screws 59.

From the foregoing it will be seen that I
 30 have provided an aircraft which can be caused to travel over the ground in either direction by operating either one of the horizontal propellers 19, with means for steering the craft from either end, with means for
 35 locking the steering mechanism which is not in use. By operating the propeller 27 the device may be caused to ascend in a vertical direction and by operating the propellers 24 and 27 and both propellers 19 as well as the
 40 side propellers 32 the device can be made to hover in the air and thus permit the gunners in operating the guns 3 to fire from a sta-

tionary ship. The planes and rudders in conjunction with the propellers are used for giving the ship its various movements.

It is thought from the foregoing description that the advantages and novel features
 45 of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the
 50 combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

1. An aircraft of the class described comprising a body, running gears for the same, a propeller at each end of the body, an engine for each propeller, steering mechanism at each end of the device and connected with the wheels of the running gears, means for
 60 locking the steering mechanism not being used and means for causing the vehicle to rise and descend.

2. An aircraft of the class described comprising a body, a propeller at each end thereof, a propeller under the body, a propeller at the top thereof, a propeller at each side of the body, a motor for driving each propeller and adjustable planes connected with the
 70 body.

3. An aircraft of the class described comprising a body, a running gear for the same, a propeller at each end of the body, a propeller at each side of the body, a horizontal propeller below the body, a horizontal propeller above the body, a motor for driving each propeller, a rudder at each end of the body, a wing at each side of the body, a plane at the top of the body and manually operated means for adjusting each wing,
 75 each rudder and plane.

In testimony whereof I affix my signature.

WILLIAM HALE.

On March 11, 1930, James C. Evans, of Miami, FL, was granted Patent Number 1,749,858 for "airplane appliance."
<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,749,858>

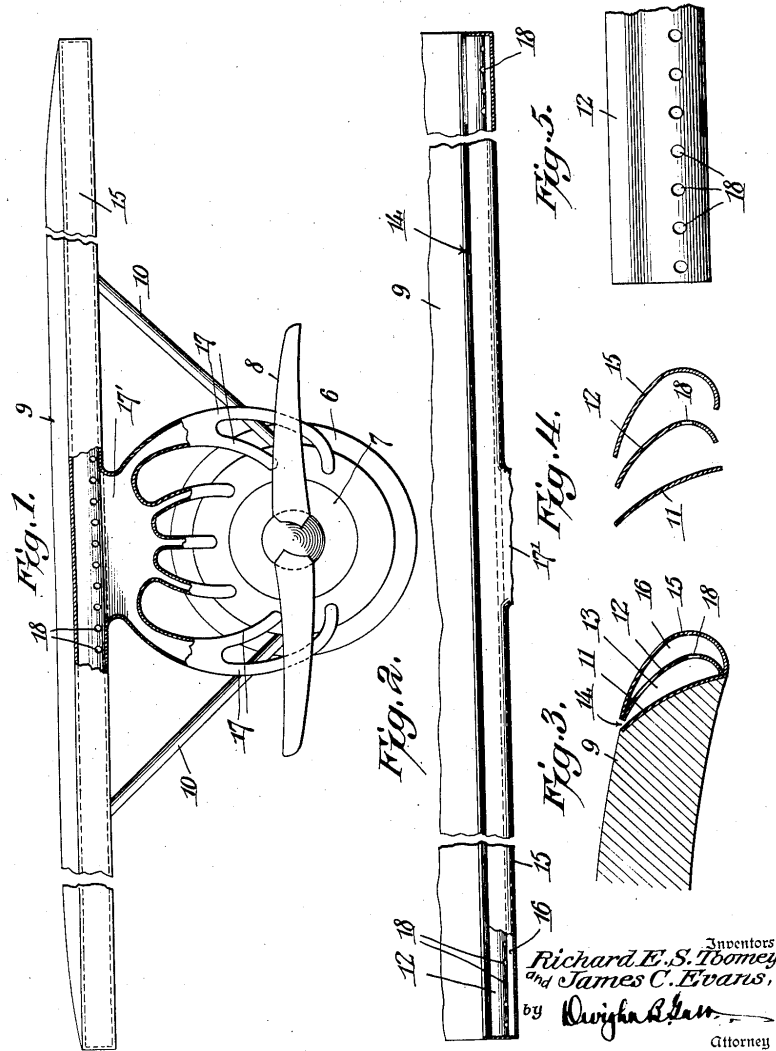
March 11, 1930.

R. E. S. TOOMEY ET AL.

1,749,858

AIRPLANE APPLIANCE

Filed April 24, 1928



Inventors.
Richard E. S. Toomey
and James C. Evans,
by *Dwight Allen*
Attorney

UNITED STATES PATENT OFFICE

RICHARD E. S. TOOMEY AND JAMES C. EVANS, OF MIAMI, FLORIDA, ASSIGNORS TO S. GROVER MORROW, TRUSTEE, OF MIAMI, FLORIDA

AIRPLANE APPLIANCE

Application filed April 24, 1928. Serial No. 272,472.

This invention relates generally to airplane construction, and particularly to means for preventing the accumulation or collection of sleet, snow or other deposits upon the wings or other parts of the airplane.

It is generally known that in airplane flights a source of danger is always present, due to the fact that snow or sleet may at any time be encountered, or heavy mist and rain may collect upon the plane or other parts of the airplane and freeze, thus rendering the plane extremely difficult if not impossible to properly manage. The common source of danger is the collection or accumulation of ice or sleet upon the wings of the airplane, and it is the aim of the present invention to provide means whereby this may be prevented.

A further object of the invention is to provide means of simplified and improved nature for utilizing heat generated by the motor in its normal operations as an agent to raise the temperature upon the wings above the freezing point, whereby to prevent accumulation as mentioned.

A still further object is to so construct the heat transmitting means as not to interfere with other parts or operations of the airplane, so as to evenly distribute the heat over a prescribed area, and which is of such nature as not to add materially to the weight of the airplane.

With these objects in view, together with others which will appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts, all as will be disclosed more fully hereinafter, illustrated in the accompanying drawings and particularly pointed out in the claims.

In the drawings:

Fig. 1 is a front elevation of a portion of an airplane of conventional form and illustrating as associated therewith a heat distributing means embodying the invention,

Fig. 2 is a top plan view, parts broken away, of the forward edge portion of the airplane wing,

Fig. 3 is an enlarged fragmentary trans-

verse sectional view taken through the forward edge of the wing,

Fig. 4 is a view somewhat similar to Fig. 3 and showing the parts of the heat distributing chamber in separated position, and

Fig. 5 is a front elevation of a portion of the heat distributing plate.

Referring now more particularly to the drawings, the body of the airplane is represented at 6, the forward end of which has mounted thereon the motor 7 equipped with the usual propeller blades 8. The motor and other parts of the airplane are illustrated only in conventional manner, and details of the structure and assemblage of the airplane per se are omitted.

The wing of the plane is represented at 9, and is braced upon the structure by means of struts 10, or may be secured to the fuselage in any other desired manner.

The forward edge of the wing 9 is provided with a protective member 11, preferably formed of metal and of a size corresponding to the length and thickness of the wing. This member may be formed integral with the wing at the time of its construction, or may be removable therefrom as desired. Associated with the member 11 is a plate 12, secured rigidly to the member 11 at its lower edge and corresponding to the length of said member 11. The plate 12 is concave longitudinally, and is free and spaced from the member 11 at its upper edge. The members 11—12 thus spaced apart, provide a heat chamber 13, with a restricted neck or discharge opening 14 at the upper forward edge of the plane 9. It will be understood, of course, that the neck or opening 14 corresponds to the length of the plane.

Arranged in advance of the plate 12 is a shell 15 which corresponds with the length of the said plate. This shell is secured at its lower longitudinal edge to the corresponding edge of the member 11, and is concave longitudinally with its upper edge secured to the corresponding edge of the plate 12. The shell 15 is spaced throughout its width from the plate 12, thus providing a compartment 16 between the shell and the said plate. This compartment 16 receives heat through a plu-

ality of pipes or tubes 17 leading from the motor 7. In the present instance the heat utilized is derived from the exhaust gases from the motor, and may be led from an exhaust manifold or manifolds to the compartment 16 either by individual pipes or through the media of the manifold represented at 17'.

The plate 12 is provided throughout its length with a series of spaced openings 18, located either midway between the lateral edges of the said plate or possibly nearer the lower than the upper edge.

In operation, the exhaust gases from the motor 7 pass through the pipes 17 and into the manifold 17', from whence they are distributed throughout the entire length of the compartment 16, and pass from that compartment through the openings 18 and into the distributing chamber 13. The heated gases are then delivered through the restricted neck 14 onto the upper surface of the plane or wing 9, so that the temperature of this upper surface will be maintained at a degree well above the freezing point. Distribution of the gases is accomplished by direct force of the exhaust gases in the compartment 16 as well as by an induced draft at the neck 14 caused by rapid passage of the plane through the air. The member 11 fully protects the forward edge and associated parts of the wing 9 against excessive or burning heat, and direct contact of the highly heated gases with the member 11 is prevented because of the compartment 16 arranged in advance of the chamber 13.

The device herein illustrated contemplates the use of exhaust gases as the heating medium, but it will be understood that the other heating agencies may be utilized to deliver heated fluid to the chamber and compartment. No means is shown in the present disclosure for cutting out the flow of heated gases to the chamber and compartment at times when no heat is necessary, but it will be understood that such means may be employed for establishing or breaking the communication between the heat generating agency and the compartment. It is obvious that in addition to supplying heat to the wing of the plane for the purposes mentioned, the attachment performs the function of a plane heater and muffler for the explosions.

While the foregoing is a description of the invention in its preferred form, it is apparent that minor changes in the details of construction and assemblage of parts may be resorted to without departing from the spirit of the invention as set forth in the claims.

Having thus described our invention, we claim:—

1. The combination with an airplane, of a heat transmitting chamber associated with the forward edge of the wing of said airplane, a compartment in advance of said

chamber and in restricted communication with the latter, and means for conveying exhaust gases from the motor of said airplane to said compartment.

2. The combination with an airplane, of a heat insulating member covering the forward edge of the wing of said airplane, a plate secured at one edge to said member and spaced from the latter, the free edge of said plate coinciding with the upper edge of said wing and spaced a short distance therefrom, a shell secured at its edges to the upper and lower edges of said plate and spaced from the latter to provide a compartment, the said plate having spaced openings therein, and pipes establishing communication between said motor and said compartment for the delivery of hot gases from the former to the latter.

In testimony whereof we hereby affix our signatures.

RICHARD E. S. TOOMEY.
JAMES C. EVANS.

On May 23, 1933, Jay H. Montgomery of San Gabriel, CA was assigned Patent Number 1, 910,626, for "Aeroplane Aerofoil Wing," <http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=1,910,626>

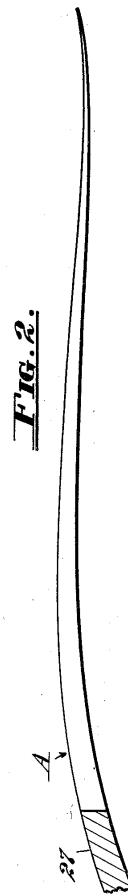
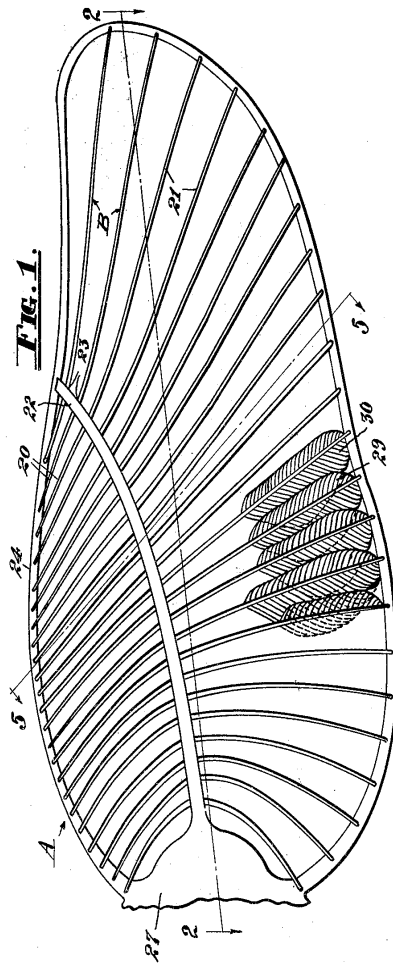
May 23, 1933.

J. H. MONTGOMERY
AEROPLANE AEROFOIL WING

1,910,626

Filed Feb. 18, 1931

3 Sheets-Sheet 1



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May 23, 1933.

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1,910,626

AEROPLANE AEROFOIL WING

Filed Feb. 18, 1931

3 Sheets-Sheet 2

Fig. 3.

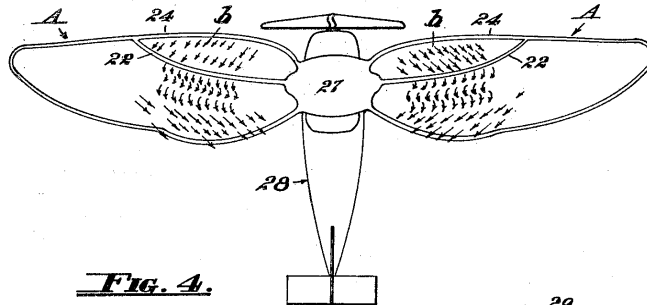


Fig. 4.

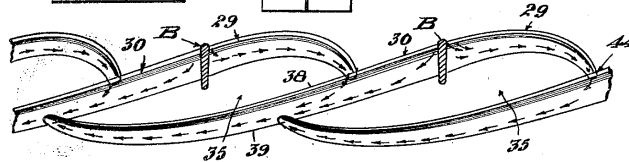


Fig. 5.

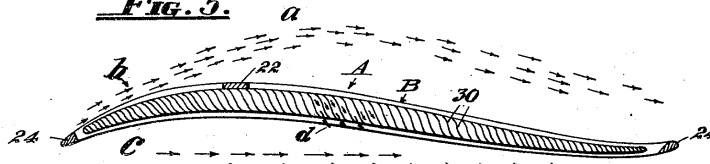


Fig. 6.



Fig. 7.



Fig. 8.

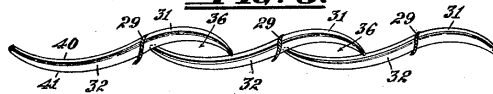


Fig. 9.



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UNITED STATES PATENT OFFICE

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AEROPLANE AEROFOIL WING

Application filed February 18, 1931. Serial No. 516,532.

This invention relates to aerofoil wings for aeroplanes and flying machines, and its objects are to provide wings which, in flight, tend to create and retain a high vacuum within their limits, whereby higher speed with decreased power may be attained, piloting may be accomplished with minimum effort and maximum efficiency, take-off and landing speed may be reduced to fifteen miles per hour, a much smaller motor may be used for successful flight, and whereby less fuel may be used.

These objects are attained by constructing the wing with an aerofoil contour from base to tip, an aerofoil contour from the leading edge to the trailing edge, and embodying therein a plurality of spaced apart supporting ribs, primary aerofoil blades superimposed on and leading from the ribs, secondary aerofoil blades superimposed on and leading from the primary blades, and tertiary blades or vanes superimposed on and leading from the secondary blades, all blades and vanes having cooperative degrees of overlap or underlap, cooperative leading and trailing edges, cooperative aerofoil displacement, cooperative angles of incidence, cooperative contours, and collectively forming a multiplicity of vacuum spaces within the limits of the wing, a multiplicity of channels around the vacuum spaces, and a multiplicity of intersections of the channels, whereby impinging air currents are entrained, deflected, stepped up in velocity, transformed into a multiplicity of vortices circulating around the vacuum spaces, and finally discharged with their augmented velocity from the trailing edge of the wing; having in the meantime, drawn the air from the enclosed vacuum spaces and produced a high vacuum within the limits of the wing.

The invention comprehends an organization of aerofoil elements, whereby air flows, torques, and increased velocities and pressures thereof, created by primary elements, intercommunicate with and augment secondary air flows, torques, and increased velocities and pressures thereof, thereby securing lateral and longitudinal stability, preventing deflection of an aeroplane from its course of travel, and facilitating and render-

ing safer the operations of launching and landing.

With the foregoing objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the combination, construction and arrangement of parts, hereinafter described and claimed and illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a top plane view of an aerofoil wing, embodying the features of the invention, and showing the outer frame, the supporting ribs, and a few of the primary blades leading from the ribs;

Figure 2 is a diagram in longitudinal section of the wing as seen on the line 2—2 of Figure 1, with the ribs and blades removed, depicting the general longitudinal curvature of the wing;

Figure 3 is a top plane view of an aeroplane having aerofoil wings, embodying the invention and indicating by arrows, the general flow of air currents relative to the wings as a whole;

Figure 4 is a fragmentary detail view, showing adjacent ribs of the wing in section, the underlap of primary blades, the vacuum spaces formed thereby, and indicating by arrows the flow of air currents;

Figure 5 is a transverse section of a wing, taken on line 5—5 of Figure 1 showing the curvature of the wing from the leading edge to the trailing edge thereof;

Figure 6 is a perspective detail view of a major primary trailing blade as detached;

Figure 7 is a perspective detail view of a minor primary leading blade as detached;

Figure 8 is a fragmentary detail view showing the overlap of primary and secondary blades on the trailing portion of the wing;

Figure 9 is a fragmentary detail view showing the overlap of secondary blades and tertiary vanes on the leading portion of a wing;

Figure 10 is a diagram showing the relative position of the aerofoil blades and vanes, by single lines;

Figure 11 is a diagram, showing by arrows, 100

Alfred Prather of Lahnam, Maryland was granted Patent Number 3,715,011, on February 1973, for "Gravity Escape Means,"
<http://patft.uspto.gov/netacgi/nph-Parser?patentnumber=3,715,011>.

Feb. 6, 1973

A. G. B. PRATHER
GRAVITY ESCAPE MEANS

3,715,011

2 Sheets-Sheet 1

Filed April 10, 1972

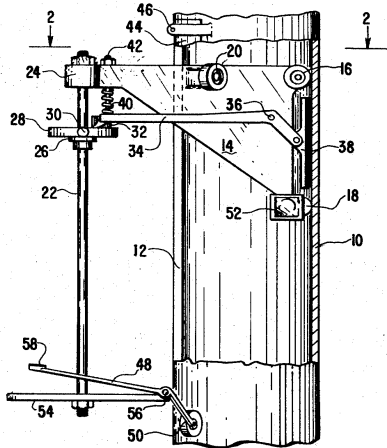


Fig. 1

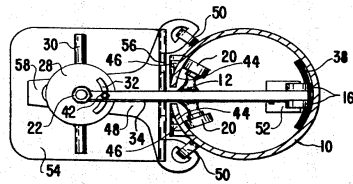


Fig. 2

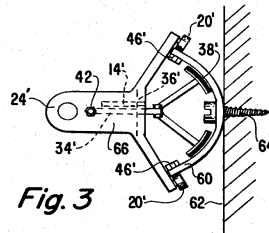


Fig. 3

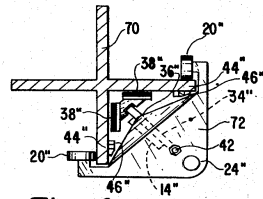


Fig. 4

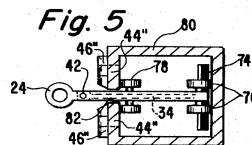


Fig. 5

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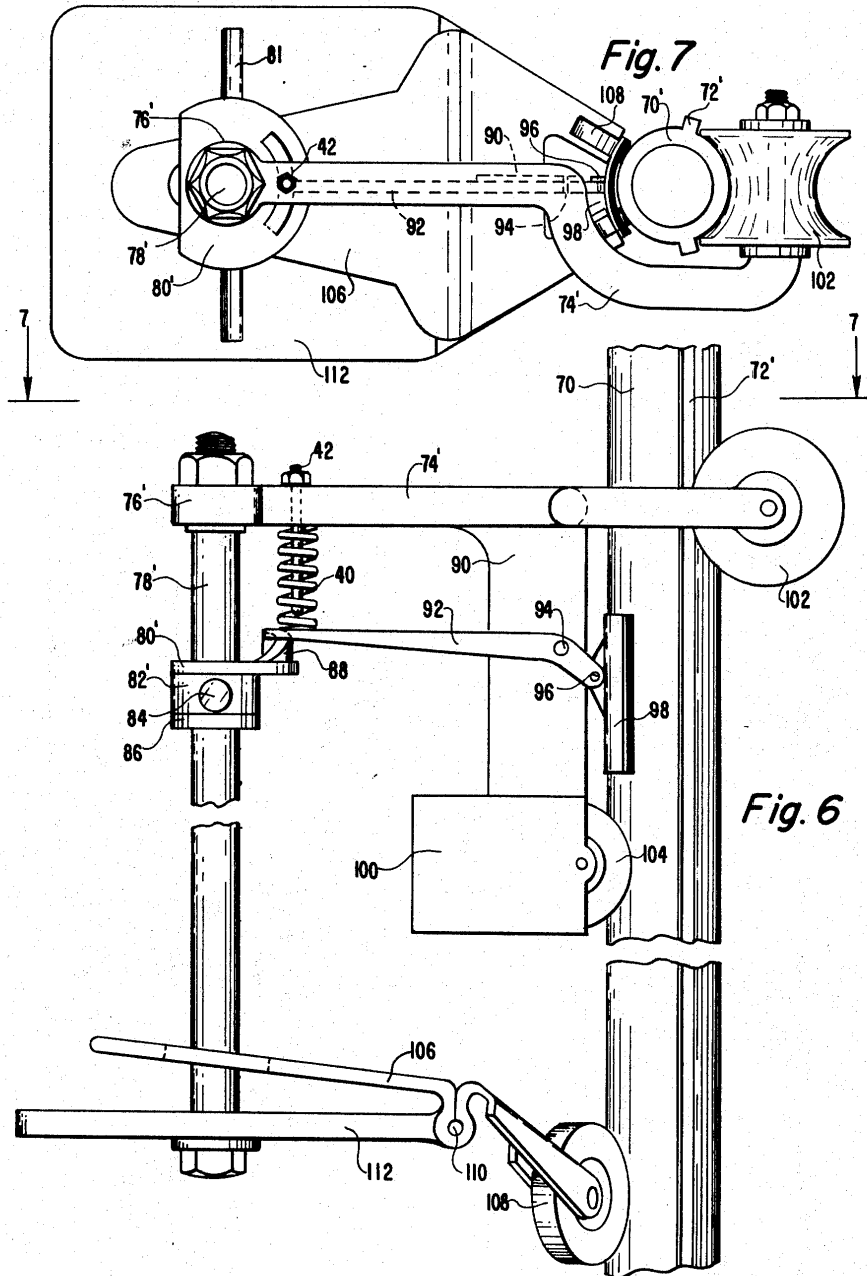
A. G. B. PRATHER

3,715,011

GRAVITY ESCAPE MEANS

Filed April 10, 1972

2 Sheets-Sheet 2



1

3,715,011

GRAVITY ESCAPE MEANS

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Filed Apr. 10, 1972, Ser. No. 242,404

Int. Cl. A62b 1/20

U.S. Cl. 182—100

10 Claims

ABSTRACT OF THE DISCLOSURE

The post extends upwardly from the ground level alongside of a building to one or more windows of the floors above the ground, and provides opposed tracks for roller and brake means of the portable carriers placed near the windows for use of occupants of those floors to lower themselves to the ground in case of fire or other imminent danger. In an emergency, the occupants can easily escape through said windows by each one seizing a carrier and mounting it on the post and releasing the brakes from the platform of the carrier carefully to lower himself or herself, with due regard for other carriers at lower levels, to the ground or other safe level, where the carriers are removed from the post to permit other escapees to follow and make their escape.

A pulley system may be used for automatically returning the removed carriers back to their original floors by means of a counter-balance slightly heavier than the carrier.

The prior art is replete with various means for lowering one's self by means of ropes and carriers attached thereto to enable the escapee to slide down the rope, but none of these devices make use of a rigid post having roller and brake tracks for portable carriers that can be easily mounted on the post in normally braked position, and then controlled from the carrier platform to release the brakes only sufficiently to permit controlled descent from an elevated station of danger in an emergency to safety at a lower level.

The object of the present invention is to provide a simple and safely operable fire escape device.

A further object is to use a rigid post in this fire escape and a portable carrier easily mountable thereon in braked position with a platform and control means thereon for releasing the brakes only sufficiently to lower the carrier by gravity at a controlled speed.

Other and more specific objects will become apparent in the following detailed description of some forms of the invention, as illustrated in the accompanying drawings, wherein:

FIG. 1 is an elevational view partly in section of a hollow post and a carrier mounted thereon and having an arm extending through an axial slot in said post for supporting a platform on the outside thereof for an escapee to stand on, in accordance with one form of the invention,

FIG. 2 is a sectional plan view thereof taken on the line 2—2 in FIG. 1,

FIG. 3 is a corresponding sectional view of a modification using a post with an arcuate cross-section,

FIG. 4 is a corresponding sectional view of a modification using a rectangular sectioned post,

FIG. 5 shows an adaptation to a hollow rectangular post slotted through one of its sides,

FIG. 6 is an elevational side view of a carrier device hooked over the outside of a round post, and

FIG. 7 is a sectional plan view of this modification taken on the line 7—7 in FIG. 6.

As illustrated in FIGS. 1 and 2, the post may be a hollow cylinder 10 with a slot 12 in one side thereof for

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the bracket plate 14 of the portable carrier to extend through to support the platform 54 at the bottom of a rod 22 which is suspended from the outer end 24 of said bracket plate. The platform has a pair of rollers 50 at the end of a lever plate 48 extending over the platform and being hinged to its inner end at 56 so as to brace the platform against the outside of said post and tilt the brakes 38 away from their track inside the cylinder 10, when the lever is stepped on, causing a release of the brake pressure thereon to any extent desired for controlling the speed of descent of the carrier with its passenger-driver, who may be the escapee in an actual emergency, who has first mounted the carrier on the post by inserting its guide roller portion into the hollow of the post through a pair of trap doors 44 at the sides of the slot 12 in a position causing the the weight of the platform to brace the brakes against the brake track inside the cylindrical post to prevent its sliding downwardly. Adding the weight of the passenger-driver when he steps on the platform merely wedges the brakes more tightly against the brake track. Thus the carrier will hold from slipping under any load placed on it until the driver releases the brakes by stepping on the foot pedal 58 of lever plate 48 sufficiently to release the brake pressure under fine control to regulate the speed of descent.

Alternatively the high mechanical advantage lever 34 which is pivoted to the plate 14 at 36 may be used to release the brakes under fine control of the wedging cam 32 under the end of the lever 34 by operating the handle bars 30 on disc 28 which is rotatably mounted on rod 22 over a shoulder collar 26 fixed to the rod at a suitable height. The lever 34 is normally resiliently biased by spring 40 to press the brakes 38 into engagement with the track inside the cylinder wall of the post and the friction thereagainst is sufficient to prevent sliding of the carrier down the post, and in fact increases if any weight is added to the platform to overcome the additional force of gravity and to frictionally hold the carrier from sliding no matter how much the platform load is increased.

When the escapee steps onto the platform 54, he takes hold of the handle bars 30 to support himself thereon and he can then start and control his descent either by stepping on the pedal 58 to release the brakes by tilting the carrier to relieve their pressure on the brake track to a sufficient degree to suitably control the descent, or by turning the handle bars 30 to move the annular wedge cam 32 to the desired lift of the end of the lever 34 for relieving the brake pressure for the same purpose.

Obviously it is not necessary to have both means of control on these carriers, since either one of them would normally be sufficient, but it is believed that it might be safer to have both means available in case of malfunction of one of them due to unexpected damage, such as freezing or jamming of the pivoting joints of either control in its normally braked position so that it cannot immediately be used for releasing the brakes to the extent desired.

The guide roller 18 at the lower end of the bracket plate 14 is normally lightly biased against the track even when the foot pedal control is used to tilt the bracket plate away from the post, so as to maintain good frictional contact with the brake track to operate the centrifugal brake means 52 to prevent a free fall of the carrier in case the brakes 38 are accidentally fully released even for an instant.

A stop bolt 42 is adjustably mounted over the end of lever 34 to stop the wedge cam 32 from further turning after the brakes are fully released, so that it may be immediately turned back to apply a desired brake pressure to properly control the speed of descent.

The carriers may be adapted to different forms of cross-sections of the post, as is illustrated in the other figures of the drawings.

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In FIG. 3, an arcuate sectioned post 60 is mounted on a building wall 62 by means of screws 64, and the carrier has a bracket plate 14' on which the plate release lever 34' is pivotally mounted at 36' to operate the brakes 38'. The plate 14' has an arm plate 66 on top with its outer end 24' bored to receive the platform suspension rod, and a stop bolt 42 is mounted in it over the end of lever 34'. The arm plate 66 further has a pair of radial arms extending to the guide rollers 20' which are pushed through the trap doors in the edges of the arcuate post 60 when mounting the carrier thereon.

FIG. 4 illustrates the use of a cross beam form of post 70, two adjacent webs of which provide the opposed roller and brake tracks for the rollers 20'' and the brakes 38'' respectively. The rollers are passed through the trap doors 44'' which are mounted on hinges 46'' in the edges of these webs during mounting of the carriers thereon.

The bracket plate 14'' has an arm plate 72 at its top which has a triangular portion extending to the point where the lever 34'' is pivoted to the bracket plate for operating the brakes 38'' which are normally spring biased against their tracks and released by either of the two control means described above, and similarly mounted on the platform and rod suspended from the arm plate 72 at 24''.

FIG. 5 shows an adaptation of a bracket plate similar to that shown in FIGS. 1 and 2, to a rectangular hollow beam post 80, where the guide rollers 76 and 78 are mounted on bearings extending normally from the arm 82 at the top of the bracket plate for engaging the opposed roller and brake tracks inside the hollow rectangular post 80. The brakes 74 are connected for operation by the lever 34 which is pivoted on the bracket plate extending below said arm 82.

The post 70', shown hollow, does not have to be hollow since the roller and brake tracks are on the outside of the post, and the roller track is flanked by side ridges 72' for axial guidance of the roller 102 thereon, so that the carrier when mounted on the post will not tend to revolve about the post during its descent. The horizontal cantilever arm 74' is formed to hook the roller 102 against the roller track on the back of the post and brace the fulcrum guide roller 104 mounted at the bottom of the bracket plate 90 against the front on the brake track side of the post 70', the brakes 98 being simultaneously biased against the brake track by spring 40 as in FIGS. 1 and 2. Roller 104 is of the high friction type and is connected to a centrifugal speed governor 100 to prevent a free fall of the carrier should the brakes be accidentally fully released even for an instant, by carelessly turning the cam 88 too far under the end of lever 92, or by stepping too much on the foot pedal 106, or both. The platform 112 is suspended by rod 78' from the outer end 76' of the cantilever carrier.

The stop bolt 42 is adjustable as in the other modifications to stop the wedge cam 88 from being turned before the end of lever 92 has reached the top of the cam so that the control handle bars may be immediately moved in the reverse direction to resume brake pressure control.

The roller 104 is lightly spring biased outwardly to maintain good frictional contact with the brake track when the foot lever 106 is operated to control the brake pressure by tilting the bracket plate away from the post.

Many obvious modifications in details and arrangement of parts to adapt these devices to other uses may be made without departing from the spirit and scope of the present invention.

What is claimed is:

1. A gravity operated emergency device for escaping from danger at an elevated level to safety at a lower level, comprising

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a post extending between said levels and having opposed vertically extending roller and brake tracks, and one or more portable carriers with suspended load platforms slidably mountable on said post and having rollers and brake shoes and means responsive to the weight of the platform for biasing them against said tracks in opposed directions to hold said carrier in braked position, and

control means for adjustably releasing said brakes to regulate the speed of descent of said carrier.

2. An escape device as defined in claim 1, said post being solid and having external tracks for said rollers and brakes.

3. An escape device as defined in claim 1, said post being hollow and having internal tracks for said rollers and brakes,

said carriers having bracket plates with support arms extending through an axial slot running the length of the post,

said arms having load platforms suspended from their outer ends.

4. An escape device as defined in claim 2, the cross section of said post being arcuate, the outer edges thereof providing said tracks,

5. An escape device as defined in claim 2, the cross section of said post being a cross, two adjacent webs of said cross providing said tracks.

6. An escape device as defined in claim 3, the cross section of said post being rectangular, the inner surfaces of said slotted side and the side opposite thereto providing said tracks.

7. An escape device as defined in claim 3, and hinged trap doors at suitable levels along the sides of said slot for passing said rollers and other structure of said portable during their insertion or removal from said hollow post.

8. An escape device as defined in claim 3, said brakes having means on said carrier for normally biasing them against said brake track, and cam means for adjustably releasing said brakes to control the speed of descent of said carrier.

9. An escape device as defined in claim 3, said platform being rigidly suspended from the end of said support arm,

the inner edge of said platform having a lever plate hinged thereto and extending upwardly over the top of the platform,

the other arm of said lever plate extending downwardly from the hinge to the post for adjustably bracing thereagainst by pressing down on said lever to tilt said carrier so as to relieve the brake pressure to the desired extent for controlling the speed of descent.

10. An escape device as defined in claim 9, and a high friction roller at the lower end of said carrier normally biased to make good contact with the brake track in any tilted position of said carrier, and

a centrifugal governor operated by said high friction roller to check the speed of descent if the brakes are accidentally fully released even for an instant.

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REINALDO P. MACHADO, Primary Examiner

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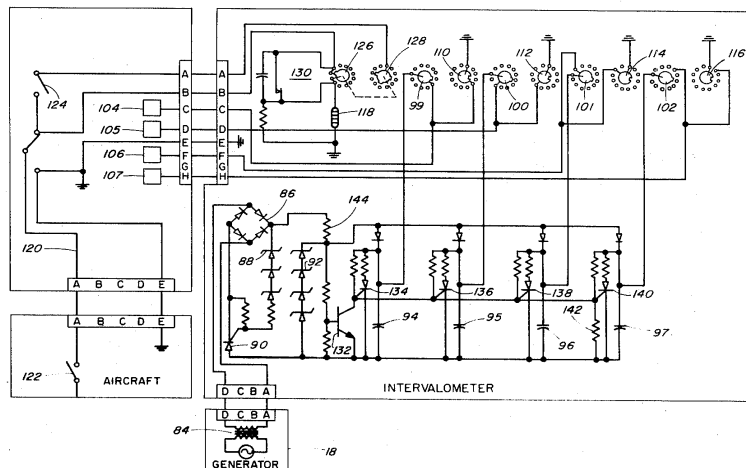
[45] **Jan. 23, 1973**

- Primary Examiner*—Samuel W. Engle
Attorney—R. S. Sciascia, J. A. Cooke and R. J. Erickson

A system for firing aircraft rockets including a fluidic generator exposed to the airstream passing the launching aircraft in flight for generating the electrical power necessary to operate the firing circuit. The fluidic generator produces a voltage output when a predetermined minimum air speed is achieved to charge capacitors in the firing circuit. Silicon controlled rectifiers are shunted across the capacitors to immediately discharge them when the aircraft decelerates below the predetermined minimum air speed.

UNITED STATES PATENTS

- ### 3 Claims, 3 Drawing Figures



On February 28, 1984, Alfred C. Carrington, of Mt. Clemens, MI, was granted Patent Number 4,433,819, for "Aerodynamic Device, "

United States Patent [19]

Carrington

[11] 4,433,819

[45] Feb. 28, 1984

[54] AERODYNAMIC DEVICE

[76] Inventor: Alfred C. Carrington, 33811 Morse St., Mt. Clemens, Mich. 48043

[21] Appl. No.: 345,788

[22] Filed: Feb. 4, 1982

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 22,068, Mar. 19, 1979, abandoned.

[51] Int. Cl.³ B64C 29/00; B64C 39/06

[52] U.S. Cl. 244/12.2; 244/52

[58] Field of Search 244/12.1, 12.2, 12.4, 244/23 R, 23 C, 23 A, 17.11, 17.19, 29, 52; 416/20 R, 21, 22; 60/39.34

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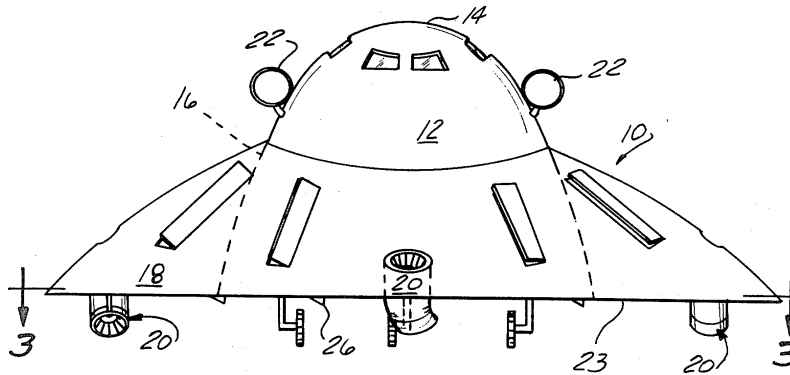
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Primary Examiner—Galen L. Barefoot
Attorney, Agent, or Firm—Basile, Weintraub & Hanlon

[57] ABSTRACT

An aerodynamic device which can take off and land vertically is disclosed. The device comprises a non-rotating central body surrounded by an outer rotating disc concentric with the central body. A plurality of jets affixed to the disc are selectively vectorable between a vertical, tangential, or radial direction. One or more reaction jets are affixed to the central body and vectored to counteract a torque generated by the rotating disc. The jets affixed to the central body so that as the disc rotates relative to the body the jets are rotated in a counter direction to have a common longitudinal axis with the central body. Pairs of radial vanes disposed along the upper and lower walls of the disc are hinged to their respective walls, and when open impart a lifting action to the disc. The pairs of upper and lower vanes are interconnected by a slot which makes the lifting action of the vanes aerodynamically more effective. The slots also serve as a means for causing the disc to rotate relative to the central body in the event of a total power failure and give the device a degree of stability and control during a non-powered decent.

7 Claims, 8 Drawing Figures



On December 17, 1991, Alfred C. Carrington, of St. Clemens, MI, was granted Patent Number 5,072,892 for "Aerodynamic Device,"

United States Patent [19]
Carrington

[11] **Patent Number:** 5,072,892
[45] **Date of Patent:** Dec. 17, 1991

[54] **AERODYNAMIC DEVICE**

[76] **Inventor:** Alfred C. Carrington, 33811 Morse St., Mount Clemens, Mich. 48043

[21] **Appl. No.:** 444,319

[22] **Filed:** Dec. 1, 1989

[51] **Int. Cl.:** B64C 29/04; B64C 29/02; B64C 29/00; B64C 15/00

[52] **U.S. Cl.:** 244/23 C; 244/12.2; 244/23 R

[58] **Field of Search:** 244/23 C, 12.2, 23 A, 244/23 R

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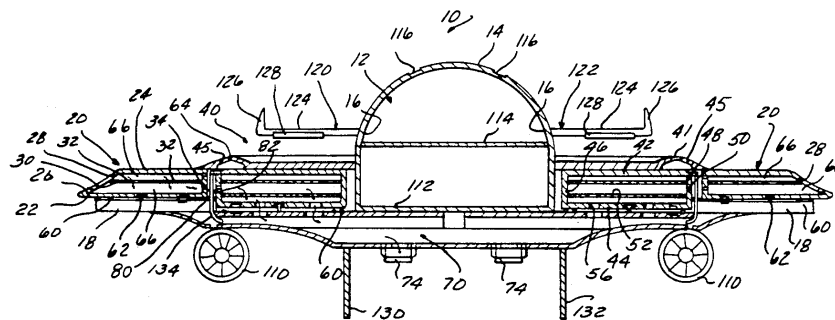
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[57] **ABSTRACT**

An aerodynamic vehicle includes a central body with a vertical axis, an outer wall and a bottom wall, a first rotatable disk concentric with the central body axis and rotatable in a first direction, a second rotatable disk concentric with the central body axis and rotatable in a second direction opposing the first direction, first and second blade members respectively mounted in the first and second disks draw fluid radially inward and vertically downward to compress the fluid into a funnel-shaped fluid passageway. Selectively vectorable nozzle members are in communication with the passageway for discharging the compressed fluid below the central body to provide lift for the aerodynamic vehicle. Jet engines are mounted on the device for providing additional thrust and for generating hydraulic and electric power for the vehicle control system. A second embodiment of the aerodynamic vehicle includes a generator for producing electrical power by forming the first and second blade members of magnetic material with alternating magnetic polarity which induces an electric current flow through a wire coil member disposed adjacent to the first and second rotating disks.

3 Claims, 3 Drawing Sheets



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