

R. W. LINVILLE.
AERIAL MACHINE.
APPLICATION FILED FEB. 21, 1910.

1,011,454.

Patented Dec. 12, 1911.

2 SHEETS—SHEET 1.

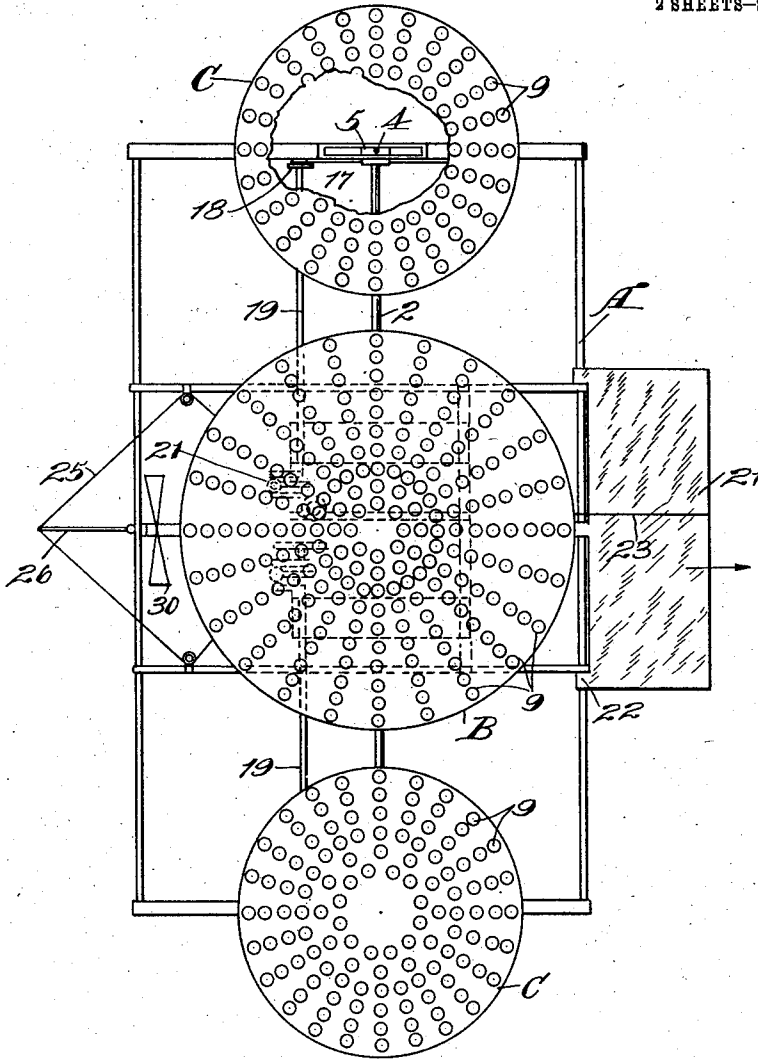


Fig. 1.

Witnesses;

H. E. Maynard.
Charles Pickles

Inventor.
Robert W. Linville,
By *G. H. Strong.*
his Atty.

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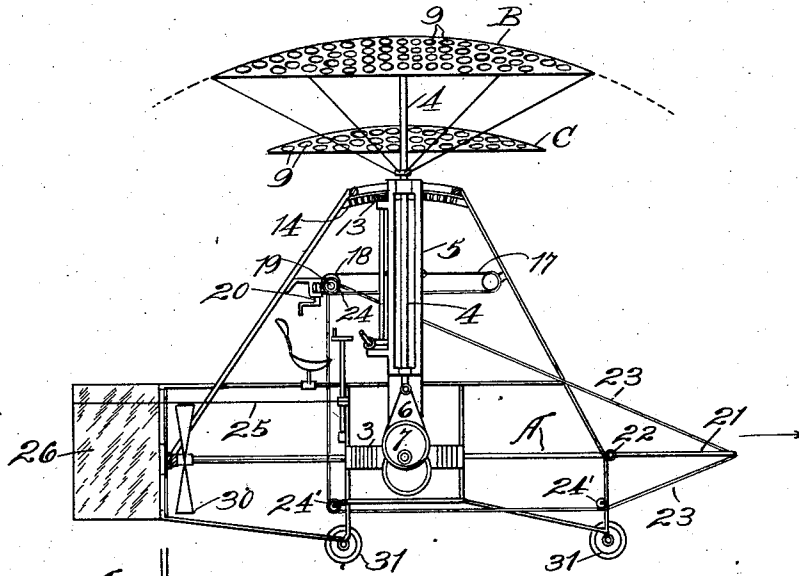


Fig. 2.

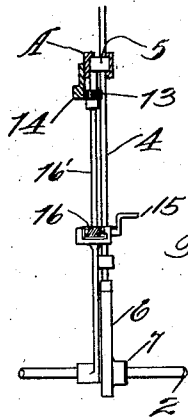


Fig. 3.

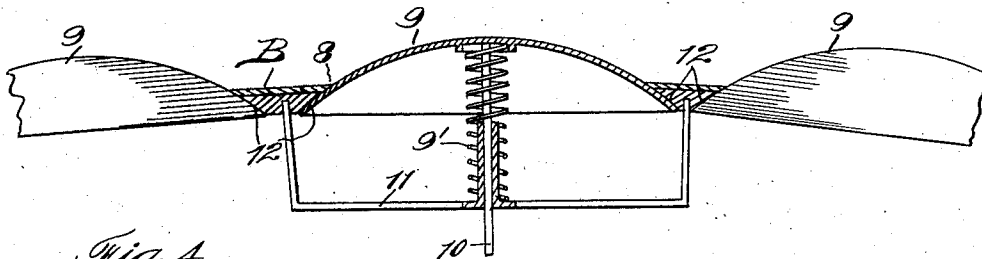


Fig. 4.

Witnesses;
H. E. Maynard.
Charles Pickles

Inventor;
Robert W. Linville,
By G. H. Strong,
his attorney

UNITED STATES PATENT OFFICE.

ROBERT W. LINVILLE, OF LOS ANGELES, CALIFORNIA.

AERIAL MACHINE.

1,011,454.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed February 21, 1910. Serial No. 544,977.

To all whom it may concern:

Be it known that I, ROBERT W. LINVILLE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Aerial Machines, of which the following is a specification.

This invention relates to aerial machines, and particularly to heavier than air-machines.

The object of this invention is to provide an air-ship so designed and constructed that it is capable of lifting itself vertically from the ground without a running start; and one which may be driven either forward or backward without recourse to reversing the engine; and further to provide a novel, reliable and simple lifting mechanism.

The invention consists of the parts and the construction and combinations of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan of the machine, in partial section. Fig. 2 is a central, vertical section. Fig. 3 is a detail of the adjustable slide. Fig. 4 is a detail of the valves.

My invention comprehends the employment of any appropriate style of frame or skeleton structure or chassis A, of suitable material, upon which is mounted a transverse shaft 2, deriving power from a suitable motor 3. (The direction of forward movement of the machine is represented by the arrow, Figs. 1—2.)

B, C represent slightly concaved disks or propeller planes mounted on suitably guided, vertical, reciprocating, non-rotatable stems 4. These disks are preferably disposed athwartships, the outer ones C being about one-half the area of the center disk B.

To make the disks effective as lifting devices and to avoid resistance as they ascend, they are perforated, as at 8, and in these perforations are operable a large number of mushroom or puppet valves 9, each preferably concavo-convex in form and having a rod 10 guided in a bracket 11 securely attached to the under side of the disk. The several valves 9 are individually supported in their closed position by a very light expansion spring 9', or other device, and in operation of the disks the valves 9 will open, as the disks move up, letting air rush through the perforations 8, and will quickly close as

the disks stop. When descending, the valves seat firmly against the valve seats 12 and present a resisting surface in common with the disks, which, when drawn down by the eccentrics, effectively exert a lifting force overcoming gravity and elevating the machine.

In order to reciprocate the disks up and down, the stem 4 of each disk is guided in an adjustable slide or frame 5 pivoted upon the shaft 2, and each stem 4 is connected to pitman straps 6 of eccentrics 7 secured on the shaft 2. The eccentrics are arranged in alternate position so that when the shaft 2 is rotated the central eccentric raises its disk B as the outer disks C are pulled down by their eccentrics.

The rapidity with which the disks are reciprocated determines the speed with which the machine rises, and by tilting the slide frame 5 either forward or backward the angular position of the disks exerts a pulling energy on the machine to drive it forward or backward, or to allow the planes or disks to be set at any desired angle in case the machine is to be driven forward by the propeller 30.

The tilting of the central frame 5 and its disk B is obtained by mounting a pinion 13 (Figs. 2, 3) on the central frame 5 and having it engage a fixed rack 14. A crank 15 also journaled on the central frame 5, and within easy reach of the operator, operates to revolve the pinion 13 through the worm gear 16, and shaft 16' which carries pinion 13. All the frames 5 and their aeroplane propelling disks B, C are tiltable independently. Each of the outer tiltable frames 5 is connected by a cable 17 to a drum 18, which latter is secured on an independent countershaft 19 journaled on the chassis A and turnable by a crank and worm-gear 20. This provides means whereby the outer disks, as well as the central one, may be each adjusted independently by the operator without necessitating his leaving the center of the machine.

In order to steer up and down when in flight, a forward, horizontal lifting plane 21 is pivoted at 22 to the chassis A, and is operable by means of an endless cable 23, having upper and lower sections running to an operating drum 24; the lower section passing over underneath sheaves 24'. Similarly, an endless cable 25 connects with a rear, vertical steering rudder 26.

In addition to and supplementing the lifting and propelling disks B, C, there may or may not be employed the usual propeller 30. If desired, the machine may be provided with wheels 31 to assist in starting and landing. Of course, ordinarily in rising by means of the lifting and propelling planes B, C, there may be no need for either the wheels 31 or the propeller 30. Nevertheless, there are offered by my construction two means of propulsion and of maintaining flight.

When in flight, the planes B, C may be set at any angle desired, and the machine propelled forward by the propeller 30, or by suitably setting the planes B, C and stopping the propeller 30 the device may be used as a glider; additional control of the machine being provided by the front horizontal steering plane 21.

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

1. In an aerial machine, the combination with a suitable chassis, of a plurality of disk-like planes disposed athwartships, a vertical shaft for each plane, and means for reciprocating the planes in a vertical direction, one of said planes being centrally disposed on the machine and being of considerably greater diameter or area than the other planes, said means including a stem for each plane, a guide therefor, pitman straps connecting with the stems, and eccentrics encircled by said straps.

2. In an aerial machine, the combination with a suitable chassis, of a plurality of disk-like planes disposed athwartships, a vertical shaft for each plane, and means for reciprocating the planes in a vertical direction, one of said planes being centrally disposed on the machine and being of considerably greater diameter or area than the other planes, said means including a power

shaft, a vertically guided stem on each plane, pitman straps connecting with the stems, and eccentrics on said shaft and embraced by the straps, said eccentrics being arranged in alternate position whereby the central and outer planes are moved in unison in opposite directions.

3. In an aerial machine, the combination with a suitable chassis, of a plurality of disk-like planes disposed athwartships, a vertical shaft for each plane, and means for reciprocating the planes in a vertical direction, one of said planes being centrally disposed on the machine and being of considerably greater diameter or area than the other planes, said means including a power shaft, a vertically guided stem on each plane, pitman straps connecting with the stems, and eccentrics on said shaft and embraced by the straps, said eccentrics being arranged in alternate position whereby the central and outer planes are moved in unison in opposite directions, each of said planes having numerous openings with vertically guided spring-pressed disk valves therein.

4. In an air-ship, a frame, a plurality of propellers disposed athwartships and of different diameters, each of said propellers consisting of a perforated plane with independent non-contacting, reciprocatory guided valves, a motor whereby said propellers may be reciprocated, forward steering and inclining rudders, and means whereby said propellers may be inclined forward or backward.

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

ROBERT W. LINVILLE.

Witnesses:

CHARLES EDELMAN,
C. C. COOKE.