

T. F. PEARSON.
FLYING MACHINE.

APPLICATION FILED MAR. 25, 1909. RENEWED DEC. 14, 1911.

1,033,827.

Patented July 30, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

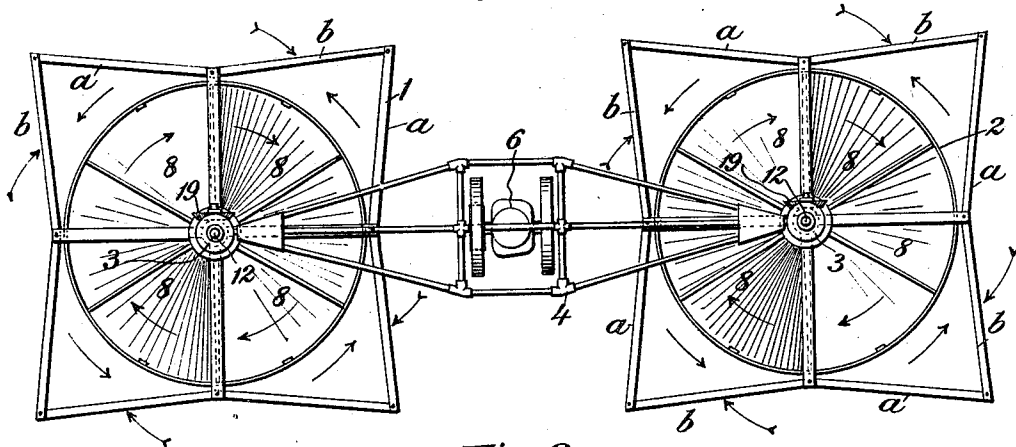
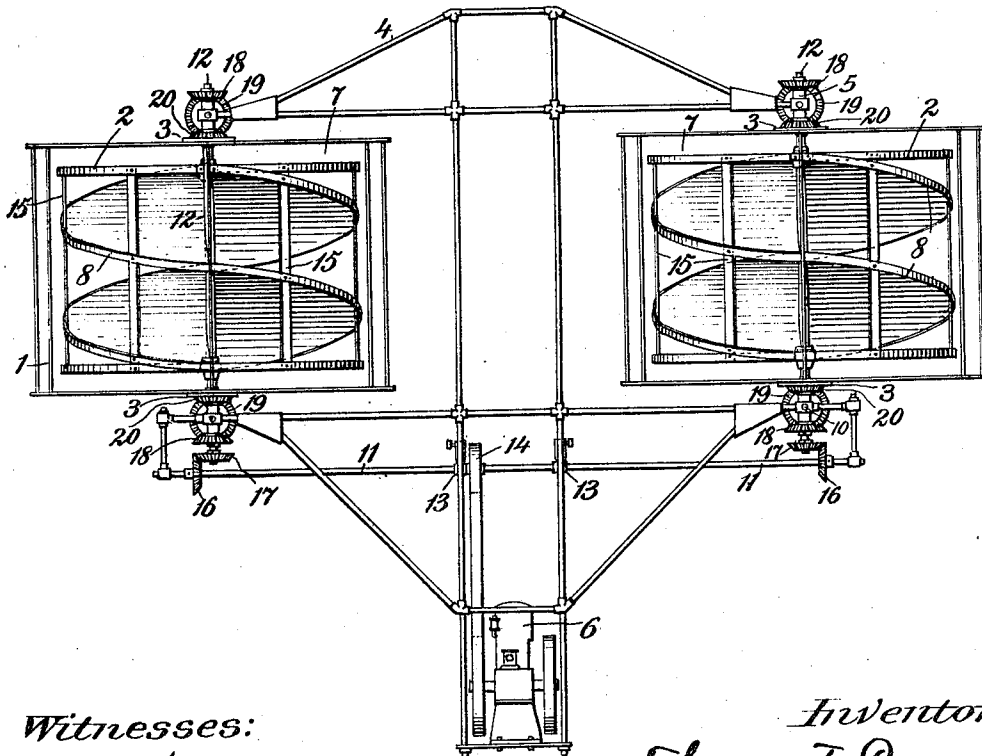


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 4.

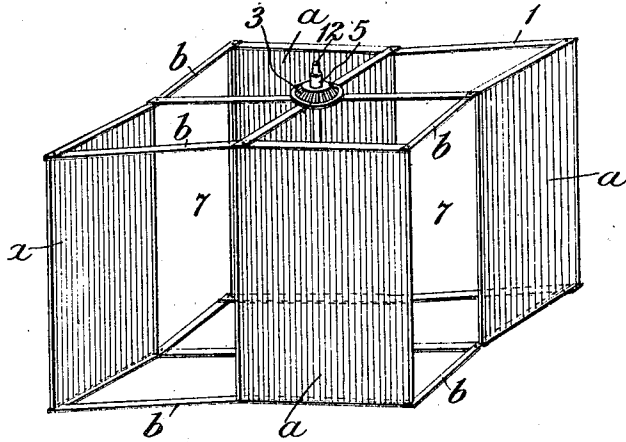


Fig. 3.

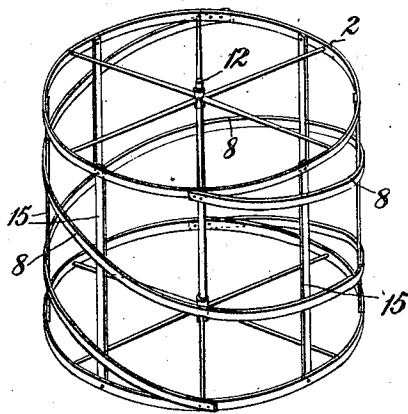


Fig. 6.

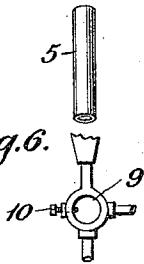
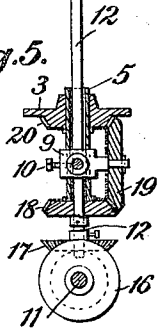


Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS F. PEARSON, OF BILLERICA, MASSACHUSETTS, ASSIGNOR TO BURNETT B. MART, OF LOWELL, MASSACHUSETTS.

FLYING-MACHINE.

1,033,827.

Specification of Letters Patent.

Patented July 30, 1912.

Application filed March 25, 1909, Serial No. 485,802. Renewed December 14, 1911. Serial No. 665,750.

To all whom it may concern:

Be it known that I, THOMAS F. PEARSON, a citizen of the United States, and resident of Billerica, county of Middlesex, and State of Massachusetts, have made a new and useful Invention in Flying-Machines, of which the following is a specification.

My invention is directed particularly to improvements in that type of flying-machines which are heavier than air, and it has for its object, to provide a novel means whereby greater efficiency is obtained in the use of rotary screws or propellers, both for lifting and propelling machines of this nature.

To this end my improvement comprehends the use of means whereby greater lifting and propelling efficiency is effected in connection with rotary screws or propellers, by giving to the air surrounding the same an increased density, and I bring this result about by constantly forcing the surrounding air inwardly against the faces of the vanes or blades of the screws, through the agency of a plurality of inclined rotatable surfaces or planes which surround the screws and are adapted to rotate in a reverse direction from the direction of rotation of such screws.

My invention will be fully understood by referring to the accompanying drawings, in which,

Figure 1 is a plan view of a flying-machine embodying my improvements, showing also a driving engine supported by the frame of the entire machine. Fig. 2 is a front elevational view, as seen looking at Fig. 1 from the bottom toward the top of the drawings. Fig. 3 is a perspective view of one of the rotary frames within which the propelling screw vanes or blades are secured; and, Fig. 4 is a similar view of the means for bringing about the improved lifting and propelling effects upon the vanes or blades of such screws or propellers. Fig. 5 is a detail, part sectional, part side elevational view of the driving gearing and operative connections between the devices illustrated in Figs. 3 and 4; and, Fig. 6 is

a detail elevational view illustrating the manner of securing the driving gearing to the supporting frame of the machine.

Referring now to the drawings in detail, in all of which like numerals and letters of reference represent like or equivalent parts, 4 represents the frame of the machine consisting of a plurality of tubes made preferably of aluminum or very light metal and secured together so as to constitute a trussed structure of relatively great strength.

6 represents the propelling engine secured below the entire frame and operatively connected by a belt with a driving pulley 14, carried by a driving shaft 11, journaled in the frame near its center at two points, 13, 13, above the engine, and at its outer ends in hangers, the upper ends of which are connected directly to the bottom stringer of the frame. At the opposite ends of this frame there are provided pairs of journal bearings vertically aligned and adapted to support rotary screw frames 2, which frames are constructed as shown in Fig. 3, preferably of light metal, such as aluminum, and provided each with a rotary shaft 12 and spirally disposed metallic bands 8, there being two such bands for each frame to which are attached the outer edges of two screw vanes or blades, the inner edges thereof being connected directly to the shafting, (see Fig. 2) so as to constitute in each instance two complete screws or propellers, said frame being braced vertically and provided with the necessary radial end supporting arms, as clearly shown.

1 represents a substantially rectangular frame constructed as shown in Fig. 4, so as to have four compartments, each open at its opposite ends and each inclosed on one side only, as indicated by the letter *a* and in vertically disposed shaded lines, so as to constitute inclined rotatable surfaces or planes, this frame being supported at its opposite ends, as clearly shown, by a hollow or tubular shaft 5 which surrounds the shaft 12, 3, 3, constituting hubs for securing the frame directly to the shaft. Each of these hubs is provided with a gear-wheel

20 integral therewith for rotating the frame. The shaft 11 is geared at its opposite ends through bevel gear-wheels 16, 16 with corresponding bevel gear-wheels 17, 17, which
 5 gear-wheels in turn drive corresponding pairs of bevel gear-wheels 18, 18 connected to the opposite ends of the shafting 12, through the agency of idle bevel gear-wheels 19, 19, which in turn drive the bevel gear-
 10 wheels 20, 20. Both sets of gear-wheels and their interconnected shafting are secured directly to the frame by set-screws 10 extending through openings 9 in the enlargements at the ends of said frames, and the
 15 entire arrangement is such that through the agency of these interconnected gear-wheels reverse motions are given to the screws and the surrounding frames.

On examination of Fig. 1 it will be seen
 20 that when the apparatus is set in motion the screws in the cylindrical frames 2 will be given rotation as indicated by the inner set of tailless arrows in a direction from left to right. It will also be seen that the rotary
 25 frames 1 will be given a reverse rotation as indicated by the outer set of tailless arrows from right to left, so that the indrawn air, as indicated by the enlarged tailed arrows in both instances, will be forced in through
 30 the open faces 7 of the frames (see Fig. 4) by the inclined rotary surfaces *a, a* (see also Fig. 4) thereby tending to condense the same in such manner as to give to the rotary screws which are moving in reverse
 35 direction a much greater lifting effect.

It will be understood, of course, that such a machine may be provided with well known forms of air supporting wings, steering devices and means such as are generally in use
 40 for varying the elevation of the machine and that a seat may be provided for the operator at any desired point upon the frame, accessible to the engine and control apparatus, such matters coming well within
 45 the skill of those versed in the art, my improvement herein described being directed broadly to the application of a principle which I believe to be new with me.

I do not limit my improvement to the
 50 especial details of construction shown in the drawings; nor to any definite number or arrangement of such combined screws or propellers and rotary air compressing frames, as these may be utilized in any preferred
 55 manner, either singly or any plurality of such combined parts may be utilized, the essence of my invention lying in the producing of an increased lifting and propelling effect because of the fact that the rota-
 60 table surfaces which are rotated reversely to the direction of the screw cause the air through which the screw is being rotated to assume a greater density, so that the vanes or blades of such screw acting thereon will
 65 give a proportionately better lifting effect.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is—

1. A power driven screw or propeller adapted to rotate in one direction; in combination with a plurality of inclined rotatable surfaces or planes surrounding said screw or propeller and provided with means for rotating them in a reverse direction to that of the screw, the rotatable surfaces being so located that they will, when in motion, concentrate or condense the medium upon which they act about the vanes or blades of the screw or propeller, substantially as described. 80

2. A flying-machine embracing a frame; a driving motor therefor; a screw or propeller secured thereto; in combination with a plurality of inclined rotatable surfaces or planes surrounding the screw and provided with means for rotating them in a reverse direction to that of the screw, the rotatable surfaces being so located that they will, when in motion, concentrate or condense the medium upon which they act about the vanes or blades of the screw or propeller, substantially as described. 90

3. A flying-machine embracing a frame; a motor secured therein; a plurality of propelling screws operatively connected with the motor; a plurality of inclined rotatable surfaces or planes surrounding each screw and operatively connected with the same motor through mechanism adapted to rotate them in reverse directions, the rotatable surfaces being so located that they will, when in motion, concentrate or condense the medium upon which they act about the vanes or blades of the screws or propellers, substantially as described. 105

4. A flying-machine embracing a frame; a propelling motor secured therein; a pair of lifting screws located at opposite ends of the frame and geared to the motor; a plurality of inclined rotatable surfaces or planes located around each one of the lifting screws and geared also to the same motor through mechanism adapted to rotate them in reverse directions, the rotatable surfaces being so located that they will, when in motion, concentrate or condense the medium upon which they act about the vanes or blades of the screws or propellers, substantially as described. 115

5. A flying-machine embracing a frame; a motor suspended beneath the same; a pair of lifting propelling screws operatively journaled at the opposite ends of the frame and with their rotatable shafts extending in a vertical direction; a plurality of inclined rotatable surfaces surrounding each screw or propeller; the rotatable surfaces and the screws being geared directly to the motor through mechanism adapted to rotate them in reverse directions, the inclined and pro- 130

5 pelling effect of the rotatable surfaces in each instance being such as to concentrate the medium upon which they and the screws act about the vanes or blades of such screws, substantially as described.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

THOMAS F. PEARSON.

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