O. J. LAISY.

AIR SHIP.

APPLICATION FILED NOV. 17, 1904. RENEWED MAY 4, 1907.

916,456. Patented Mar. 30, 1909.

2 SHEETS—SHEET 1.

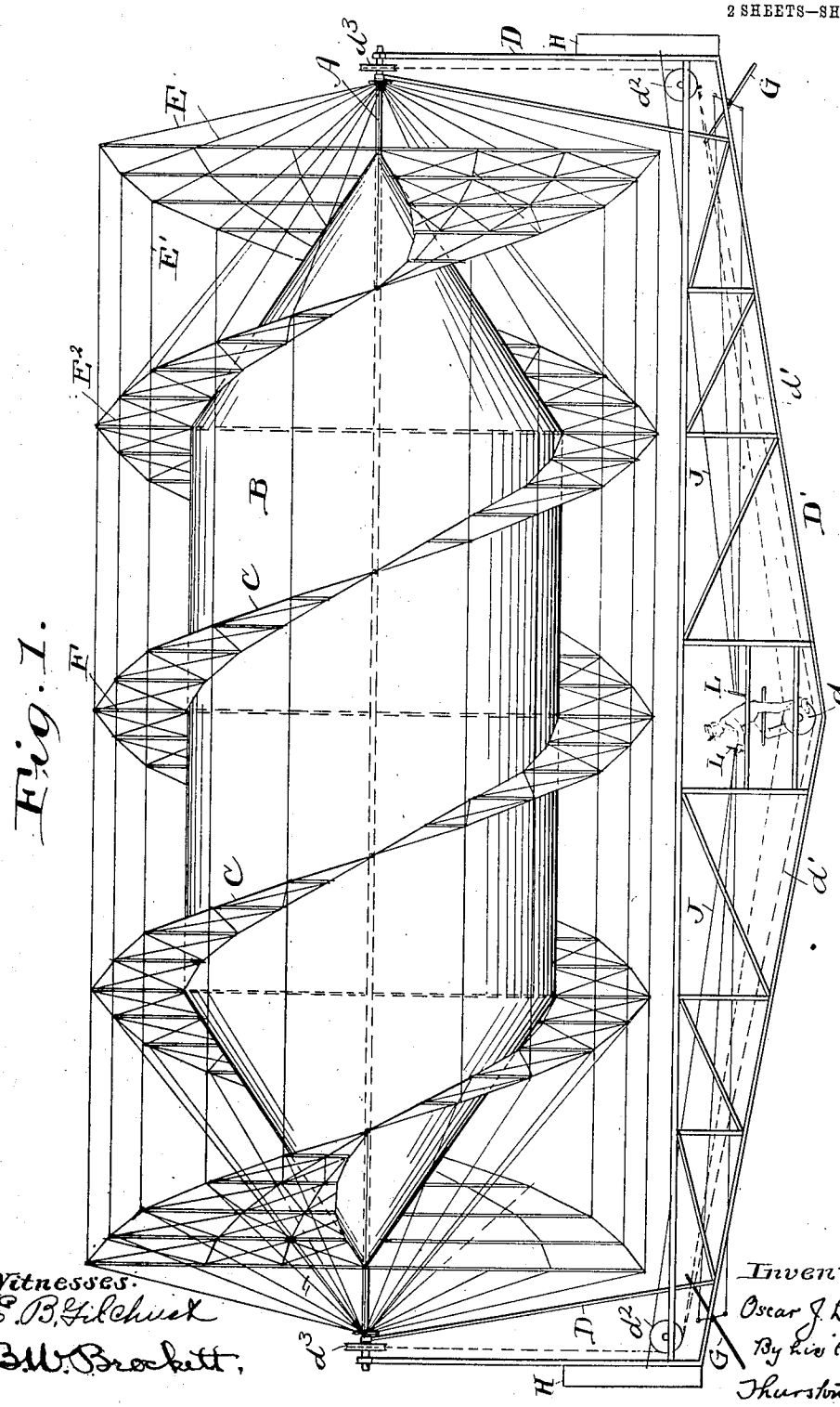


Fig. 1.

Witnesses.
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Inventor:
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2 SHEETS—SHEET 2.

Fig. 3.

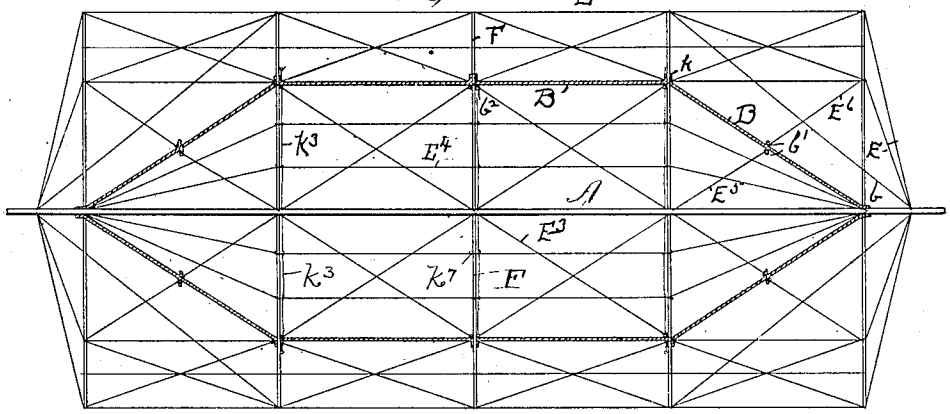


Fig. 5.

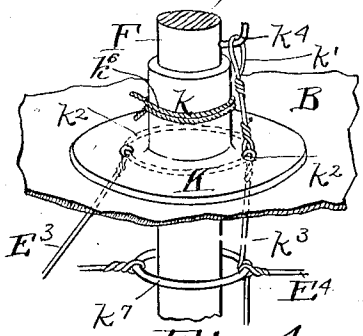
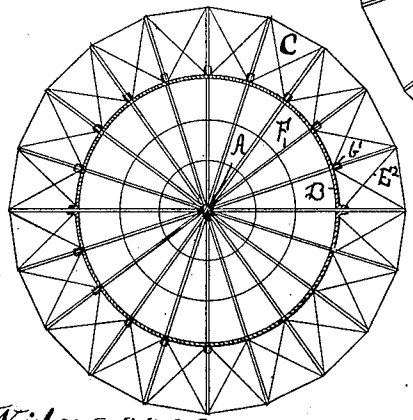


Fig. 4.



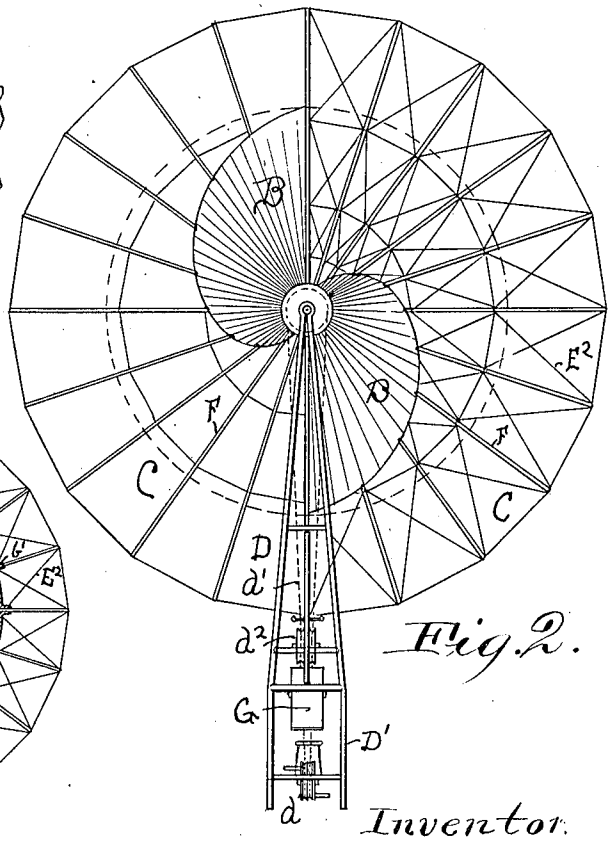


Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

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AIR-SHIP.

No. 916,456. Specification of Letters Patent. Patented March 30, 1909.

Application filed November 17, 1904, Serial No. 233,098. Renewed May 4, 1907. Serial No. 371,922.

To all whom it may concern:

Be it known that I, OSCAR J. LAISY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Air-Ships, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide in a form which shall be very light and strong an air ship which may be easily propelled and shall be thoroughly dirigible. To this end I provide a rotatable gas bag, having around its exterior a fin or blade, and depending from the axis of the same is a bridge for supporting the operator and driving mechanism.

The invention is more fully hereinafter described and its essential characteristics set out in the claims.

In the drawings, which clearly illustrate my invention, Figure 1 is a side elevation of the air ship complete; Fig. 2 is an end view of the same; Fig. 3 is a longitudinal section through the gas bag; Fig. 4 is a cross section of the gas bag, and Fig. 5 is a detail showing the method of attaching the gas bag to the spokes.

Referring to the parts by letters, A represents the main shaft or axle which carries the gas bag B and spiral blades C. Depending from this shaft near its ends are hangers D which carry a bridge D′ extending horizontally beneath the balloon. On this bridge is mounted suitable mechanism for rotating the shaft A and with it the gas bag and blades. The mechanism shown consists of the centrally mounted pulley d from which the belts d' lead around idlers d^2 to the pulleys d^3 on the shaft A. The pulley d may be driven by foot power or otherwise as desired.

Extending radially from the shaft A are series of spokes F. These spokes are secured at their center to the shaft and are arranged continuously in receding planes and each at an angle in advance of the preceding spoke, so that the spokes form two spirals from near one end of the shaft A nearly to the other end. These spokes are held in place by wires indicated by E, running from the shaft to the ends of the spokes, by longitudinal wires E′ running parallel with the shaft, outside of the gas bag, and longitudinal wires E^4 inside the gas bag, by cross wires E^2 running from each spoke to the next and by wires E^3 extending diagonally of the shaft within the gas bag. This complete bracing allows the spokes to be made of very light material.

The gas bag B is of fabric and is cylindrical with conical shaped ends as shown. At each apex it is secured to the shaft A, and each spoke passes through it and the bag is there secured. In order to insure a tight joint I secure to the bag at each spoke a rubber disk K having a tubular flange k snugly embracing the spoke. This flange is tied as by the cord k^6, around the spoke after the balloon is inflated. By this means the gas bag is held in extended position, wherefore the chance of the ship sinking in case of an accident causing leakage, is very much reduced. The diagonal wires E^3 within the balloon are secured at their ends to eyes b carried by the fabric. The gas bag is additionally braced by cross wires E^5 and E^6 which are secured to eyes b' on the inside and outside of the conical portions of the bag.

Before inflation the balloon is collapsed about the shaft A, the wires E^4 sliding down the spokes and the diagonal wires within the balloon being idle. During inflation eyes k' secured to metal rings k^2, embedded in the disks K are drawn outward by the attendants, thus assisting the inflation and also drawing outward wires k^3 within the balloon, which connect the various wires E^4 with the rings k^2. The wires E^4 are thus drawn into place and when inflation is complete the eyes k' are held by hooks k^4 on the spokes.

Outside of the gas bag on the projecting ends of the spokes there is mounted a continuous web of canvas, C, which makes the propelling surface. This surface takes the form of a double spiral wound around the bag as shown in the drawings and at its ends the surface terminates in a sharp blade-like form extending clear across the rotating structure and adapted to easily cut the air.

The air ship is shaped the same at each end, wherefore, it may be driven in either direction, the operator rotating the wheel d in one direction or the other as desired.

The ship is steered horizontally by the rudder H, located at each end, and is directed

up or down by the aeroplanes G. The rudder and aeroplanes are connected by suitable wires, indicated by J with lever L, in position to be conveniently grasped by the operator. The air ship is thus under complete control of the operator, and goes upward or downward and travels forward or backward at will.

I claim:—

1. In an air-ship, in combination, a shaft, a series of radiating spokes secured thereto, a gas bag surrounding the shaft and having the spokes passing through it, the bag when distended being secured to the spokes and when empty sliding down them toward the shaft, and a spiral blade on the outer side of the gas bag secured to the projecting ends of the spokes.

2. In an air ship, in combination, a main shaft, a series of spokes secured to the shaft, a gas bag surrounding the shaft, flexible sleeves carried by the gas bag and surrounding the spokes and adapted to be secured to them.

3. In an air ship, a rotatable shaft, spokes carried thereby and set to form a spiral, brace wires leading from the shaft to the ends of some of the spokes and longitudinal wires leading from various spokes to each other, a gas bag surrounding the shafts and having the spokes projecting through it and canvas or similar material mounted on said spokes near their ends.

4. In an air ship, a rotatable shaft, spokes carried thereby and set to form a spiral, brace wires leading from the shaft to the ends of some of the spokes, canvas or similar material mounted on said spokes near their ends to make a spiral vane, and a longitudinal gas bag surrounding said shaft within said vane and secured to the spokes.

5. The combination of a rotatable structure having outwardly extending spokes, a rotatable gas bag, the spokes projecting through the bag, a propelling surface secured to the spokes outside of the bag, a depending bridge, and means thereon for rotating said structure.

6. In an air ship, a rotatable shaft, radial spokes projecting therefrom so arranged as to form a spiral, a conical ended gas bag surrounding the shaft, the spokes passing through the bag and the bag being secured to the spokes thereat and at its conical ends to the shaft, a propelling surface carried by the projecting ends of said spokes, wires bracing the spokes, the bag and the propelling surface, a bridge supported by said shaft, and means mounted on the bridge for rotating the shaft and for steering the ship.

7. In an air ship, a rotatable shaft, radial spokes projecting therefrom so arranged as to form a spiral, a gas bag surrounding the shaft, the spokes passing through the bag, and the bag being secured to the spokes thereat, a propelling surface carried by the projecting ends of said spokes, a bridge supported by said shaft, and means mounted on the bridge for rotating the shaft.

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

OSCAR J. LAISY.

Witnesses:

ALBERT H. BATES,

E. L. THURSTON.