L. C. KINCANNON.

FLYING MACHINE.

APPLICATION FILED MAR. 15, 1910.

1,003,756. **Patented Sept. 19, 1911.**

Fig. 3

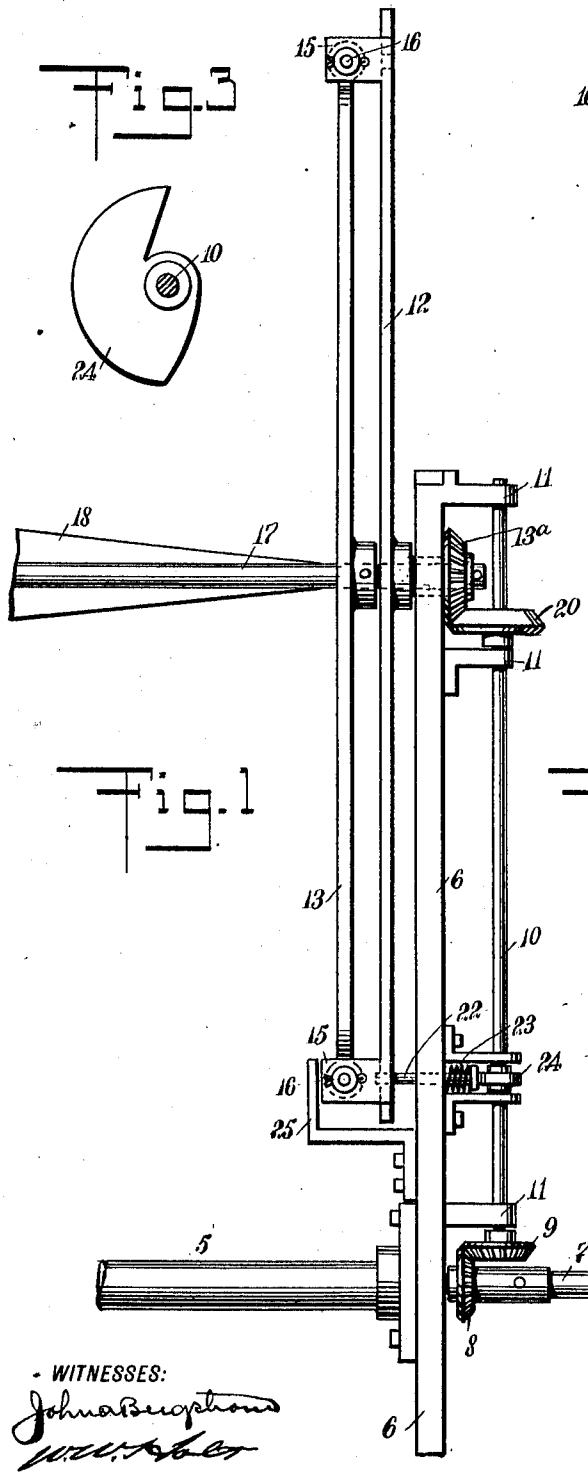

Fig. 1

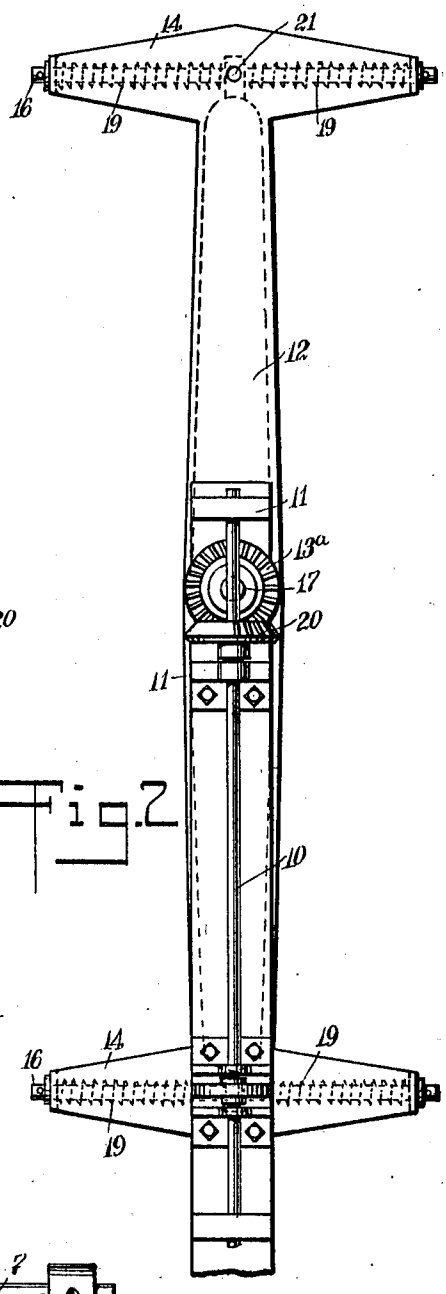

Fig. 2

WITNESSES:

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LEO COVINGTON KINCANNON, OF SEABRIGHT, CALIFORNIA.

FLYING-MACHINE.

1,003,756. Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed March 15, 1910. Serial No. 549,399.

To all whom it may concern:

Be it known that I, LEO C. KINCANNON, a citizen of the United States, and a resident of Seabright, in the county of Santa Cruz and State of California, have invented a new and Improved Flying-Machine, of which the following is a full, clear, and exact description.

The invention is an improvement in flying machines of the character disclosed in Letters Patent granted to me March 8, 1910, Number 951,615, the machine embodying in its construction a number of rotary carriers each having wings or vanes arranged about its axis and which are intermittently revolved to prevent the upwardly-moving vanes or wings vertically and the downwardly-moving vanes or wings horizontally.

The object of the present invention is to relieve the vanes and the mechanism which intermittently turns them, of shock in the operation of the machine, and to positively lock each vane when it is revolved to position.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a partial side view of a rotary carrier having an intermittently-driven vane and constructed in accordance with my invention; Fig. 2 is an outer end view of the same; and Fig. 3 is a cross-section through the rotary shaft, showing the cam for operating the locking bolt.

I have shown only so much of the machine as embodies my improvement and is necessary to a clear understanding of the construction and operation, the shaft 5 being preferably hollow and forming the axis of a rotary vane or wing carrier having a number of radiating arms 6. Suitably supported concentrically of the shaft 5 is a fixed shaft 7 having an attached bevel pinion 8, which is in mesh with a similar bevel pinion 9 secured to the inner end of a radiating shaft 10, the latter being journaled in suitable bearings 11 fixed to the outer side of the arm 6. In the outer end of the arm 6 is journaled the hub portion of a cross-bar 12, which is rigid with a bevel gear 13^a at the outer side of the arm 6, and at each end is provided with cross-members 14, each cross-member at each end having an inwardly-turned ear 15. Through the ears of each cross-member 14 extends a shaft 16 keyed at the ends or otherwise held against longitudinal movement. On the shafts 16 are slidably engaged the opposite ends of a second cross-bar 13, both cross-bars being arranged on the axle or journal 17 of a flying machine vane or wing 18, the cross-bar 12 being loose on the vane journal, and the cross-bar 13 pinned or otherwise secured thereto. The cross bar 13 is normally restrained to extend in the same direction with the cross-bar 12, as shown in Fig. 2, by springs 19, one of these springs being arranged on each shaft 16 between each ear of each cross member and adjacent end of the cross bar 13.

The gear 13^a meshes with a mutilated gear 20, secured to the shaft 10 and constructed and arranged relatively thereto to give the proper turn to the vane or wing at the required period. At each end of the bar 12 is an aperture 21, and into these apertures is adapted to pass in successive order in the operation of the wing, a locking bolt 22, the bolt being slidably supported on the arm 6 and normally forced outwardly under the influence of a spring 23, which, as shown in Fig. 2, presses the head of the bolt against a cam 24 fixed to the shaft 10, the arrangement of the cam being such that as the teeth of the mutilated gear 20 pass into engagement with the teeth of the mutilated gear 13, to revolve the vane or wing, the bolt is released, the cam again returning the bolt into locking position with the opposite arm of the cross-bar 12 when the vane has revolved half a revolution. A guide 25, to keep the arms of the cross-bars in place, is arranged at the inner side of the cross-bar 13 and is secured to the arm 6. By reason of the manner of operatively connecting the driving mechanism to the vane or wing, the mechanism and vane are relieved of shock when the turning of the vane is started and stopped. Thus, as the teeth of the mutilated gears engage, certain of the springs on the shafts 16, depending on the direction of the revolution, will be compressed until the vane has an opportunity to take up the motion, the opposite springs being likewise com-

pressed as the revolution of the vane, axle or shaft stops, and operating to return the cross-bar 13 to its neutral position.

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

1. The combination of a revoluble carrier, a flying machine vane revolubly supported on the carrier outwardly from the axis thereof, a driving mechanism to intermittently turn the vane on its axis as the carrier revolves, and a cushioning device through which the power of the driving mechanism is transmitted to the vane.

2. The combination of a revoluble carrier, a flying machine vane revolubly supported on the carrier outwardly from the axis thereof, an intermittently-revoluble power-transmitting member, and means operatively connecting the member to the vane, having a resilient device through which the power of the said member to the vane is transmitted.

3. The combination of a revoluble carrier, a flying machine vane revolubly supported on the carrier outwardly from the axis thereof, a driving mechanism to intermittently turn the vane on its axis, having a shaft arranged radially of the carrier, a bolt arranged to lock the vane successively as it is intermittently revolved, and a cam arranged on the shaft to return the bolt to locking position.

4. The combination of a revoluble carrier, a vane revolubly supported on the carrier and arranged outwardly from the axis thereof, a fixed gear arranged concentric to the axis of the carrier, a radially-arranged shaft, a gear secured to the inner end of the shaft in mesh with the fixed gear, gears, one of which is mutilated, respectively carried by the vane and radial shaft and arranged to intermesh and cause the intermittent revolution of the vane, and a locking device to secure the vane in its successive positions, actuated from the radial shaft.

5. The combination of a revoluble carrier, a flying machine vane revolubly supported on the carrier outwardly from the axis thereof, an arm revolubly supported concentrically to the axis of the vane, an arm fixed to the axis of the vane, resilient devices interposed between the outer portions of the arms, adapting the arm secured to the vane axis to have a slight movement relatively to the other arm, and means to intermittently turn the said other arm on its axis.

6. The combination of a revoluble carrier, a flying machine vane revolubly supported on the carrier and arranged outwardly from the axis thereof, an arm revolubly supported concentrically of the axis of the vane, having a cross-member at its outer end, a shaft carried by the cross-member, an arm fixed to the axis of the vane and movably engaged with the shaft, springs arranged on the shaft and forcing the last-named arm to a neutral position, and means to intermittently revolve the last-named arm in the revolution of the carrier.

7. The combination of a revoluble carrier, a flying machine vane revolubly supported on the carrier outwardly from the axis thereof, a member driven step by step in the same direction, and a device operatively connecting the member to the vane, having a cushion to relieve the vane of shock, incident to the intermittent movement of the vane.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEO COVINGTON KINCANNON.

Witnesses:

W. D. DALTON,

J. W. ANDERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."