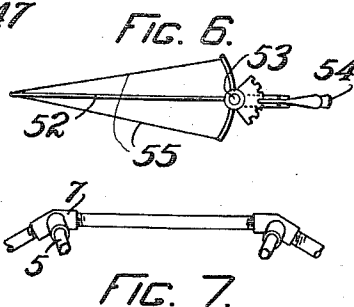
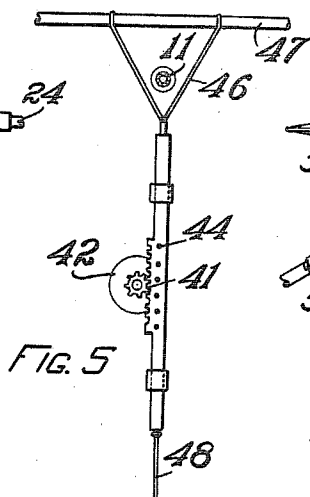
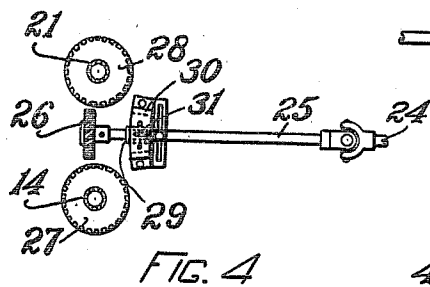
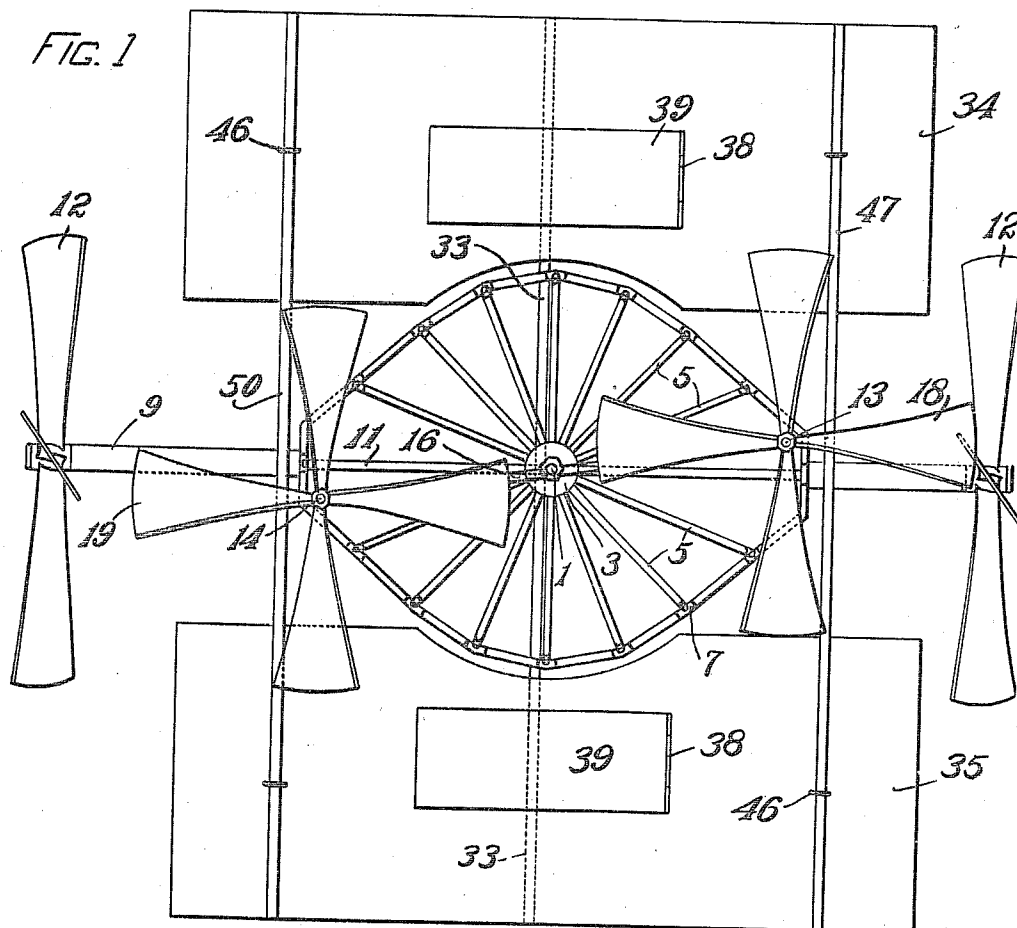


AERO-TRAVELER.

Patented Mar. 7, 1911.

2 SHEETS--SHEET 1.

985,925.



Glachs R. Friese.

A. T. Palmer

INVENTOR

JOHN H. NOLAN

BY *Charles F. A. Smith*

ΑΤΤΥ.

J. H. NOLAN.
AERO-TRAVELER.

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2 SHEETS-SHEET 2.

FIG. 2.

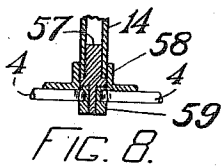
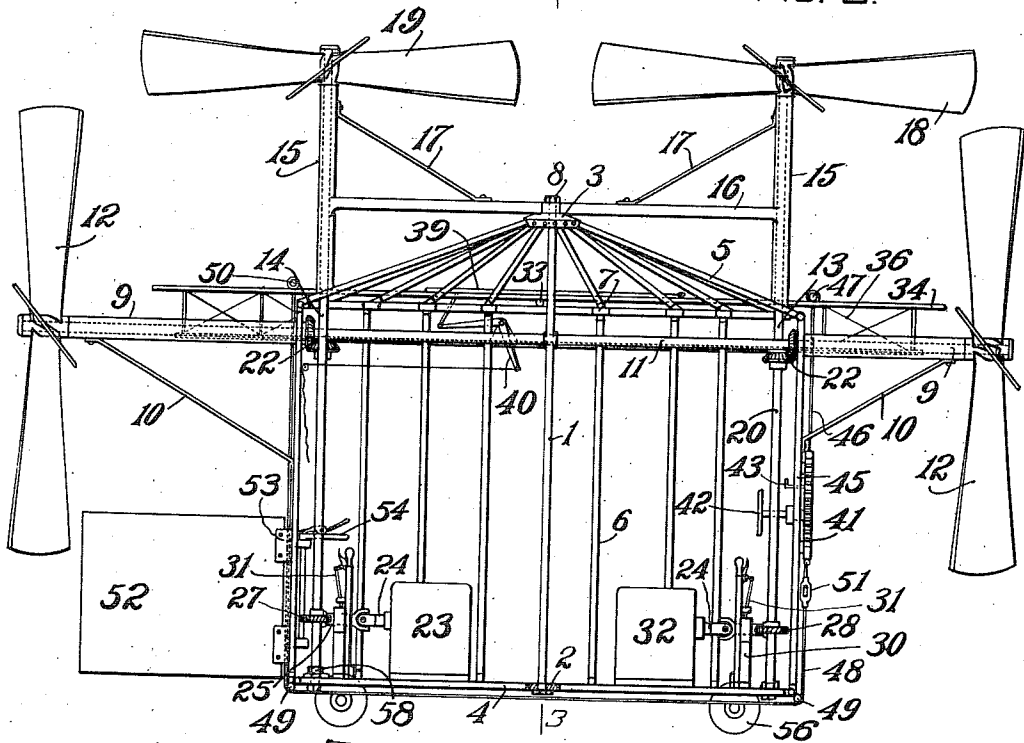
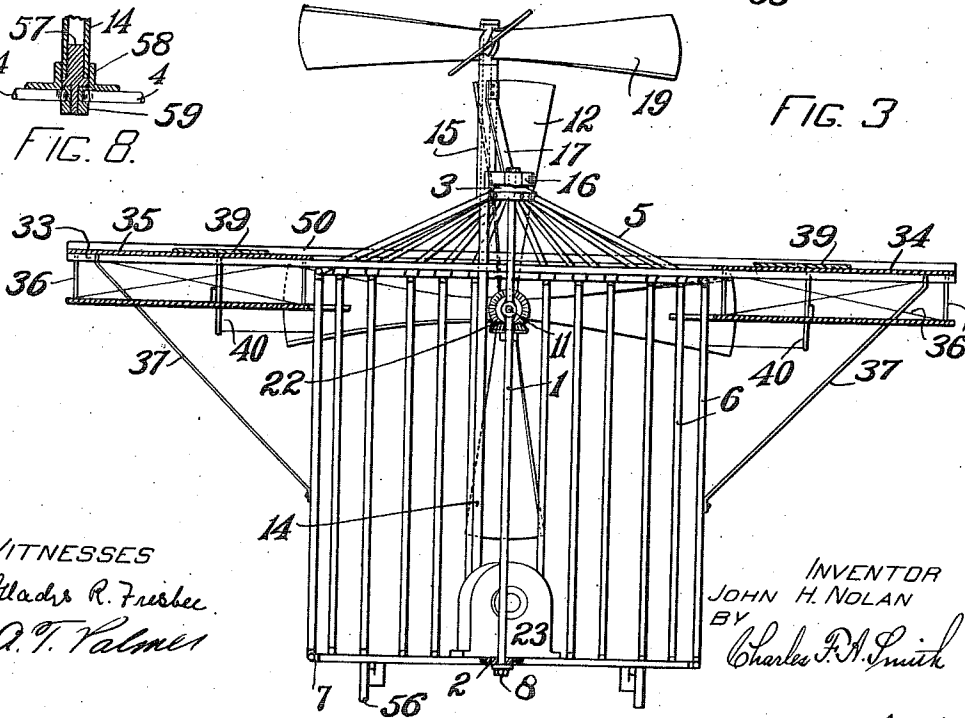


FIG. 8.

FIG. 3



WITNESSES

Gladio R. Fisher
A. T. Palmer

INVENTOR
JOHN H. NOLAN
BY Charles P. Smith

ATTY.

UNITED STATES PATENT OFFICE.

JOHN H. NOLAN, OF BOSTON, MASSACHUSETTS.

AERO-TRAVELER.

985,925.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed December 29, 1909. Serial No. 535,719.

To all whom it may concern:

Be it known that I, JOHN H. NOLAN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Aero-Travelers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in aero travelers adapted to be propelled vertically upward, horizontally or soar like a bird.

The invention also consists in the improved and novel ways of constructing the car or cage and in the arrangement of the horizontal-flight propellers, vertical-flight propellers and the operation of the same.

The invention consists in the novel construction, arrangement and combination of parts, substantially as described and particularly set forth in the claims annexed hereto, and it is carried out substantially as illustrated on the accompanying drawings, which form an essential part of this specification, and whereon like characters of reference refer to like parts wherever they occur thereon.

In the drawings, Figure 1 represents a plan view of my improved aero traveler. Fig. 2 is a side elevation of the same but with the cage in central section. Fig. 3 is a transverse section on the lines 3—3 of Fig. 2 looking aft. Fig. 4 is a plan view of a part of the driving mechanism. Fig. 5 is a front elevation of a portion of the wings controlling mechanism. Fig. 6 is a plan view of the rudder and contiguous parts. Fig. 7 is a detail showing a portion of the spokes and T connection. Fig. 8 is a detail of a shaft end-bearing.

Latitude is allowed herein as to details, as they may be changed or varied at will without departing from the spirit of my invention and the same yet remain intact and be protected.

The cage portion of my apparatus is constructed of the standard 1 having the centers 2 and 3 at opposite ends thereof. The floor of the cage consists of a series of spokes 4, preferably of cold drawn steel tubing, which are attached to the center 2; the roof consists of a series of similar spokes 5 attached to the center 3; the wall of a series of similar spokes 6 which are connected by T's 7 to the spokes of the roof and floor, and nuts or

stays 8 on each end of the standard 1 bind the roof and floor together.

On the fore and aft-ends of the cage, which is preferably longer from front to rear than from side to side, as shown in Figs. 1, 2 and 3 of the drawings, are rigidly affixed the sleeves 9 which are supported by braces 10, and a horizontal shaft 11 passes through the upper portion of the cage and through said sleeves carrying at each end horizontal-flight propellers 12, the propellers having blades, the blades of one propeller being inclined in the same direction as those of the other propeller. At the opposite ends of the cage and on opposite sides of the horizontal shaft 11 are vertical masts 13 and 14 which are rotatably mounted in the fixed sleeves 15 supported and braced as at 16 and 17 on the upper portion of the cage. These masts have a pivot pin 57 screwed into their lower portion, which pin is rotatably pivoting in and upon a metal socket 58, which socket is formed in a T in its lower portion to receive the ends of the opposite spokes 4 but allowing of the lower end of the pivot pin passing through to receive a securing nut 59, see Fig. 8. These masts carry at their top vertical-flight propellers 18 and 19, the propellers having blades, the blades of one propeller being inclined in a direction opposite to those of the other propeller, although if desired they may be inclined in the same direction.

Rotatably mounted at each end of the cage adjacent to the mast in suitable bearings carried by the cage, and having pivot ends similar to those carried by the masts, are the two perpendicular shafts 20, 21, the shaft 21 being immediately in the rear of mast 14 in Fig. 2, and the bevel gearing 22 connects the top of each perpendicular shaft with the horizontal shaft so that the horizontal shaft 11 is driven by the perpendicular shaft 20, 21 which horizontal shaft turns from left to right. On the floor of the cage in the rear portion of same is affixed a right-hand motor 23 of any suitable style which has a two-part driving shaft 24, 25, operating from left to right, the two parts being connected by a universal joint so that the outer portion 25 of this driving shaft may be swung so that the spiral gear 26 carried at its outer end may be meshed with the gear 27 of the vertical mast 14 turning said gear 27 from right to left to drive said mast from right to left and its vertical-flight pro-

peller from right to left or may be swung
 to mesh with the gear 28 of the perpendicular
 shaft 21 turning said gear from left to
 right and turning that portion of the bevel
 gear on the perpendicular shaft 21 from
 left to right so as to drive the horizontal
 shaft 11 from left to right. Said portion
 25 of the driving shaft carries a collar 29
 slidably mounted in a lock-way 30 carrying
 a locking lever 31 whereby the spiral gear
 26 may be held in mesh with the gear 27 or
 with the gear 28, or in a neutral position
 midway between the two gears, as shown in
 Fig. 4. The forward mast 13 and perpen-
 dicular shaft 20 are similarly operated by
 like gears 27, 28 driven by a like gear 26 of
 the two part driving shaft 24, 25 having a
 similar universal joint 26; the method of
 throwing the gears in mesh and locking the
 forward driving shaft so that the gears are
 held in mesh, or in a neutral position is
 similar to that shown for the rear driving
 shaft. A left-hand motor 32 in the forward
 portion of the cage operates this forward
 driving shaft. Ground wheels 56 may be
 used when desired.

On each side of the cage pivotally mount-
 ed on the rod 33 braced by suitable supports
 37 are the side wings or aeroplanes 34, 35;
 each wing preferably consisting of a plu-
 30 rality of leaves lying in different planes
 and braced by suitable wires and rods 36.
 In or upon the upper leaf of each wing
 is pivotally mounted or hinged as at 38 a
 lid or shutter 39 provided with lifting and
 35 lowering means 40 of any suitable design.
 The hinges 38 of the lids or shutters 39 are
 toward the front of the machine so that
 when the shutters are raised the top surface
 40 of the shutters is face to the wind as the
 aero traveler goes forward.

The wings are tilted as desired by a rack
 and pinion 41 operated by a hand wheel 42
 and which rack and pinion may be locked
 45 by the pin 43 passing into one of the holes
 44 of the rack, after first having passed
 through the plate 45. The rack is connect-
 ed by suitable connecting means such as
 ropes or wires 46 to the forward bar 47
 50 which extends from one of the wings 34 to
 the opposite wing 35 forward of the cage
 and above the horizontal shaft and by addi-
 tional connecting means such as ropes or
 wires 48 which extend from the bottom of
 55 the rack around pulleys 49 at the forward
 and aft portion of the cage and below the
 flooring and upward to the rear bar 50; the
 wires 46 and 48 preferably are connected
 with the bars 47, 50 about half-way of the
 60 breadth of each wing, but if desired they
 may be connected at a point on the bars 47,
 50 nearer each other as shown in Fig. 5.
 Slack in said rope or wire is taken up by
 suitable tightening means 51, which may be
 65 a turn-buckle or any other tightening means.

Should the cage be over loaded on one side
 so as to throw it out of plumb one or both of
 the shutters can be lifted the desired amount
 to level the cage and cause the aero traveler
 to travel in an upright position. Should
 70 the direction of the wind from the forward
 propeller or from direction from which it
 is blowing cause the cage to tilt so that the
 aero traveler is out of plumb, then by man-
 ipulating the shutters in the wings the cage
 75 can be brought to a perpendicular or up-
 right position.

A suitable rudder 52 is attached by hinges
 53 to the central rear spoke of the wall of
 the cage and is swung into the desired po-
 sition by the hand-operated locking lever 54.
 Said rudder's outer end is strengthened by
 the guys 55. When desired a canvas tent
 can be erected near a motor with an opening
 to admit the exhaust heat to keep it warm.
 85 In preparing the floor for supporting heavy
 weights such as motors or shafting, it is
 preferable to insert pieces of wood or its
 substitute between the spokes and have it
 flush with top and bottom and then bolted
 90 to a board running crosswise on the top and
 bottom; the same can be applied on the
 sides for shafting or other uses.

It is to be understood that my invention is
 not limited to the specific details of con-
 95 struction shown in the accompanying draw-
 ings, but that said details may be varied in
 the practical carrying out of my invention.
 It is also to be understood that the combina-
 tions specifically set forth in the several
 100 claims are intended to be separately claimed
 without limitation to the use in connection
 therewith of other features and details of
 construction illustrated.

Having thus fully described the nature,
 105 construction and operation of my invention,
 I claim and desire to secure by Letters Pat-
 ent:—

1. In a machine of the character de-
 scribed, a mast, a vertical flight propeller
 110 mounted on the mast, a horizontal shaft, a
 horizontal flight propeller mounted on the
 shaft, a vertical shaft parallel with the mast
 and geared to the horizontal shaft, a motor,
 and means for driving either the mast or the
 115 vertical shaft by the motor.

2. In a machine of the character de-
 scribed, the combination with a car of a
 shaft extending longitudinally through the
 car, horizontal flight propellers mounted on
 120 the ends of the shaft beyond the fore and
 aft ends of the car, a vertical shaft within
 the car geared to the horizontal shaft, a
 rotatable mast parallel with the vertical
 shaft and extending above the car, a vertical
 125 flight propeller mounted on the mast, a mo-
 tor, and means for alternately driving from
 said motor the vertical shaft and mast.

3. In an aero traveler, the combination
 with a car of rotatable vertical masts at op- 130

posite ends of the car, vertical-flight propellers mounted on the top of the masts, the propellers having blades, the blades of one propeller being inclined in a direction opposite to those of the other propeller, a horizontal shaft, longitudinal-flight propellers mounted on the ends of the horizontal shaft, the propellers having blades, the blades of one propeller being inclined in the same direction as those of the other propeller, vertical shafts, means connecting the vertical shafts and horizontal shaft, driving shafts, a motor for each driving shaft, gears carried by the masts and vertical shafts, and a gear carried by each driving shaft and each one adapted to be thrown into driving contact with either of the gears adjacent to it and operate either one of the vertical flight-propellers or both of the horizontal-flight propellers.

4. An aero traveler comprising a car, a pair of vertical rotatable masts at opposite ends of the car and extending above the car, vertical flight propellers mounted on the top of the masts, the propellers having blades, the blades of one propeller being inclined in a direction opposite to those of the other propeller, mechanisms for driving the masts independently, a horizontal shaft, longitudinal-flight propellers mounted on the ends of the horizontal shaft, the propellers having blades, the blades of one propeller being inclined in the same direction of those of the other propeller, and means whereby the horizontal shaft may be driven by either or both of the mast driving mechanisms.

5. An aero traveler comprising a car, a pair of vertical rotatable masts at opposite ends of the car, vertical-flight propellers mounted on the masts, the propellers having blades, the blades of one propeller being inclined in a direction opposite to those of the other propeller, mechanisms for rotating the vertical-flight propellers simultaneously in mutually opposing directions, a horizontal shaft, longitudinal-flight propellers mounted on the ends of the horizontal shaft, the propellers having blades, the blades of one propeller being inclined in the same direction as those of the other propeller, means whereby the horizontal shaft may be driven by either one of the mast driving mechanisms while the opposite mechanism is driving its respective mast, but each mechanism adapted to drive the horizontal shaft, and wings pivotally mounted on each side of the car.

6. In an aero traveler, the combination with a car, of a non-rotatable sleeve attached to the top of the car, a rotatable vertical mast passing through the sleeve, a vertical-flight propeller mounted on the mast, a horizontal shaft, longitudinal-flight propellers mounted on the ends of the horizontal shaft, a vertical shaft, a driving shaft,

gears carried by the mast and vertical shaft, a gear carried by the driving shaft and adapted to be thrown into driving contact with either of said gears, and bevel gears connecting the vertical and horizontal shafts.

7. In an aero traveler, the combination of a cage comprising a roof portion, a floor portion, a connecting wall portion, all said portions being formed of rods and the whole connected together by T's, a pair of vertical rotatable masts at opposite ends of the cage and extending above the cage, vertical-flight propellers mounted on the masts, the propellers having blades, the blades of one propeller being inclined in a direction opposite to those of the other propeller, mechanisms for driving the masts independently, a horizontal shaft, longitudinal-flight propellers mounted on the ends of the horizontal shaft, and means whereby the horizontal shaft may be driven by either or both of the mast driving mechanisms.

8. In an aero traveler, the combination with a cage of a shaft extending through the cage, longitudinal-flight propellers mounted on the ends of the said shaft, a vertical shaft within the cage, a gear on the vertical shaft in mesh with a gear on the other shaft, a rotatable mast parallel with the vertical shaft and extending above the cage, a vertical-flight propeller mounted on the mast, means for alternately driving the vertical shaft and mast, aeroplanes movably mounted on each side of the car, extending forward and back of the car, provided with central movable shutters, and means for opening and closing said shutters.

9. In a machine of the character described, wings pivotally mounted on each side of the machine and extending fore and aft in the direction of travel of said machine, a lid hinged on the forward top portion of each wing and extending rearward and normally lying flat on top of the wing, and means for raising and lowering the lid.

10. An aero traveler comprising a cage, a horizontal shaft extending through the cage, non-rotatable sleeves rigidly affixed to the fore and aft ends in the direction of travel of said aero traveler and through which sleeves the horizontal shaft passes, longitudinal-flight propellers mounted on the ends of the horizontal shaft, vertical masts movably mounted in the frame work of said cage and passing above the roof of said cage, sleeves carried by the roof and through which the masts pass, vertical-flight propellers carried by said masts, said masts being at opposite ends of said cage and on opposite sides of said horizontal shaft, perpendicular shafts rotatably mounted within the cage adjacent to and parallel with said masts, bevel gearing connecting the perpendicular shafts and horizontal shaft, a driv-

ing motor for each mast, means connecting
each mast with its motor, means for discon-
necting said driving power from its mast
and connecting it with the perpendicular
5 shaft whereby the horizontal shaft is driven,
a rudder at the aft-end of said cage, wings
pivotally mounted on each side of the cage
and extending fore and aft in the direction
of travel of said aero traveler, lids pivotally
10 mounted in said wings, means for raising

and lowering said lids, means for tilting
the wings, ground wheels adapted to sup-
port the body portion of the aero traveler,
and means for controlling the rudder.

In testimony whereof I affix my signature 15
in presence of two witnesses.

JOHN H. NOLAN.

Witnesses:

CHARLES F. A. SMITH,
WM. H. MITCHELL.