T. A. EDISON.

FLYING MACHINE.

APPLICATION FILED NOV. 16, 1908.

970,616. Patented Sept. 20, 1910.

2 SHEETS—SHEET 1.

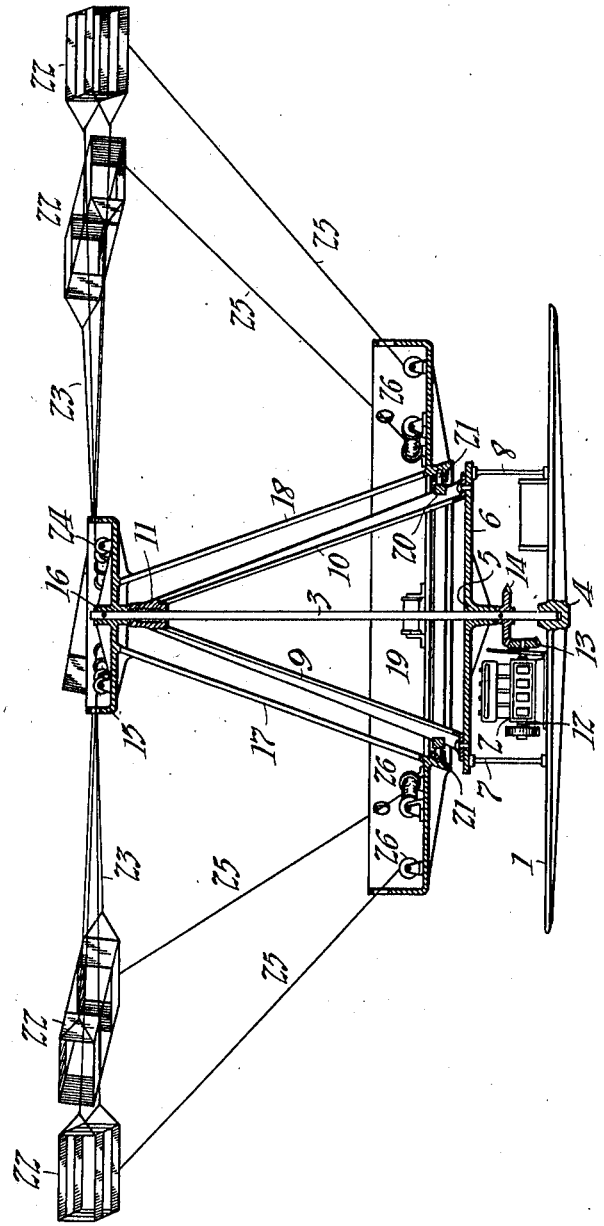


Fig. 1

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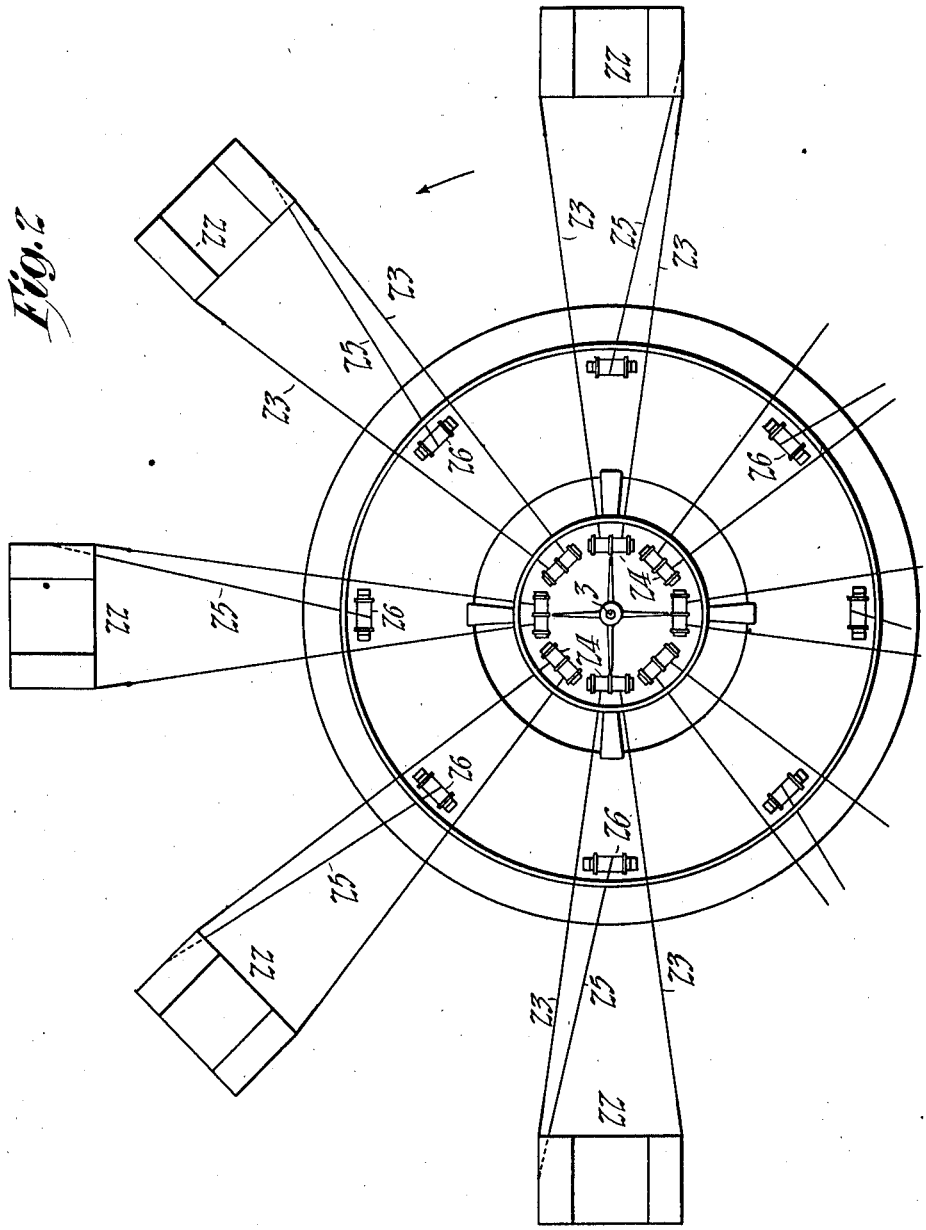
2 SHEETS—SHEET 2.

Fig. 2.

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Inventor:
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# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, ORANGE, NEW JERSEY.

## FLYING-MACHINE.

970,616. Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed November 16, 1908. Serial No. 462,895.

*To all whom it may concern:*

Be it known that I, THOMAS ALVA EDISON, a citizen of the United States, and residing at Llewellyn Park, Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Flying-Machines, of which the following is a full, clear, and concise description.

This invention relates to means for lifting a heavier-than-air flying machine from the ground and to maintain it at any desired distance from the ground, and has for its object the provision of a series of aeroplane members, which, on being rotated through the air about a central axis of the machine as a center, and held at a given angle to the horizontal, will exert a lifting force due to the pressure of the atmosphere upon them as they are rotated therethrough, which lifting force is transmitted to the body of the machine. Preferably, these aeroplane members are in the form of box kites which are connected to the frame of the machine by flexible means as cords or wires, and are sustained during rotation by centrifugal force. Means are provided by which the inclination from front to back of the aeroplane members to the horizontal may be changed, the lifting force exerted by the air on such members depending on the angle of inclination of said members as well as on the speed of rotation.

My invention also comprises the combinations and details of construction described in the following specification and claims.

The preferred form of my invention is shown in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, and Fig. 2 is a plan view of the same.

The machine carries a floor or basket 1, designed to carry passengers, machinery, etc. A gasolene engine or other prime mover 2, as illustrated diagrammatically, is carried by this floor, and means for propulsion, such as propellers, and likewise, steering apparatus, etc., not shown, but well known to the art, may be carried. The apparatus is provided with a central vertical shaft 3, which rotates in a bearing 4 in the floor or staging 1. The shaft 3 is likewise supported by a bearing 5 in horizontal member 6, which is supported from floor 1 as by vertical members 7 and 8. Members 9, 10, etc., mounted on the member 6 support a sleeve 11 which constitutes the upper bearing for vertical shaft 3.

Shaft 3 is rotated within bearing surfaces 4, 5 and 11 from the engine 2 which carries on the shaft 12 thereof, a bevel gear 13 meshing with bevel gear 14, pinned or fastened to shaft 3. Upper and lower members are fastened to shaft 3 to rotate therewith and are likewise fastened together. The upper member 15 is formed with a central hub or sleeve 16 fastened to shaft 3, which bears on sleeve 11 of the stationary frame of the machine whereon it may revolve with the aid of any anti-friction device. This platform 15 is secured as by members 17, 18 to a lower platform or horizontal member 19, which is adapted to rotate about the stationary frame, bearing in its rotation on member 20 of said frame, which constitutes a ring, rollers 21, 21 of the rotating platform 19 having rolling engagement therewith.

The aeroplane consists, as stated, preferably of box kites 22, which are supported preferably by piano wires or other flexible means 23, which extend from loops attached, one to the forward end, the other to the rear end of the inner side of each of the kites. These wires 23 are secured to rotating platform 15 at the upper end of rotating shaft 3, preferably by means of reels 24, by which the length of connections 23 may be regulated. By such connection, when shaft 3 is rotated, the kites 22 are acted on by centrifugal force to rotate in the horizontal plane of reels 24 when the speed of rotation of shaft 3 is sufficiently great. The tendency of the center of gravity of the kites to fly to the greatest possible radial distance from shaft 3 would cause the kites to rotate with the upper and lower members thereof horizontal, the side to which wires 23 are attached being the inner side during such rotation, if no additional means were provided to cause said upper and lower members to assume a fore and aft slant. Piano wires, or other flexible connections 25 constitute such means, however, and are attached to the edges of the kites which constitute the rear edges during rotation, these wires being attached to the lower rotating platform 19 by means of reels 26. By means of these reels a greater or a less amount of wire 25 may be wound in or let out, thus controlling the

horizontal angle of members 22 during their rotation. The kites 22, when so governed, constitute practically a screw, the pitch of which may be changed. The lifting force caused by the revolution of members 22 is due to the vertical component of the force exerted by the atmosphere upon the kites in their rotation. This force increases, of course, with the velocity at which the kites travel in their circular path. This force likewise varies with the angle of inclination of the kites as they are forced through the air, and this may be regulated through reels 26. The tendency of the centrifugal force acting on the kites is to keep the forward end of the kites up to the horizontal plane in which reels 24 are situated. Cords 25 restrain the tendency of the rear ends of the kites to also revolve in the same horizontal plane, and by shortening these cords, the angle of inclination of the kites may be increased. If desired, reels 26 may be connected together so that the angle of horizontal inclination of all of the kites may be instantly changed at will by the operator of the machine, this change of the angle of inclination constituting means for governing the lifting force exerted on the machine. If desired, also, spring connections may be provided between reels 26 and wires 25, adjusted for any desired speed of rotation to allow reels 26 to act in tension between certain limits, and to allow the angle of pitch of the kites to vary somewhat from a given desired angle according to the conditions.

It is obvious that kite members 22 may take the form of any aeroplane members now known to the art, either of flat surfaces or surfaces somewhat curved, and furthermore, that various changes in the construction and details of the device disclosed may be made without departing from the spirit of my invention.

Having now described my invention, what I claim and desire to secure by Letters Patent is as follows:

1. In a flying machine, the combination with a vertical shaft, a frame affixed thereto, and means for imparting continuous rotation to the same, of a series of box kites, flexible means for connecting the same to the frame, and means for regulating the angle at which said kites are rotated by the said shaft, substantially as described.

2. In a flying machine, the combination with a frame and means for rotating the same, of a series of kites, and flexible means for connecting the same to the frame, so arranged that the kites rotate with the frame under the influence of centrifugal force, and at a constant angle to the horizontal, the forward ends being maintained in a plane above that of the rear ends of said kites, substantially as described.

3. In a flying machine, the combination with a frame and means for rotating the same, of a series of kites, and flexible means for connecting the same to the frame, so arranged that the kites rotate with the frame under the influence of centrifugal force, and at a constant angle to the horizontal, the forward ends being maintained in a plane above that of the rear ends of said kites, and means for varying the said angle, substantially as described.

4. In a flying machine, the combination of a plane member, adapted to be flown as a kite, a central frame, flexible connections between said frame and one edge of said member, a flexible connection between the rear part of said member and a point on said frame below the point of attachment of the first mentioned connections, and means for rotating said frame, substantially as described.

5. In a flying machine, the combination of a series of kite members, a central frame, means for rotating the frame, cords connecting the front and rear of the inner edge of each kite member with the central frame, a cord connecting the rear of each kite member with the frame at a point lower than the point of attachment of the first mentioned cords, and means for adjusting at will the lengths of said cords, substantially as described.

This specification signed and witnessed this 20th day of August 1908.

THOS. A. EDISON.

Witnesses:
FRANK L. DYER,
DYER SMITH.