

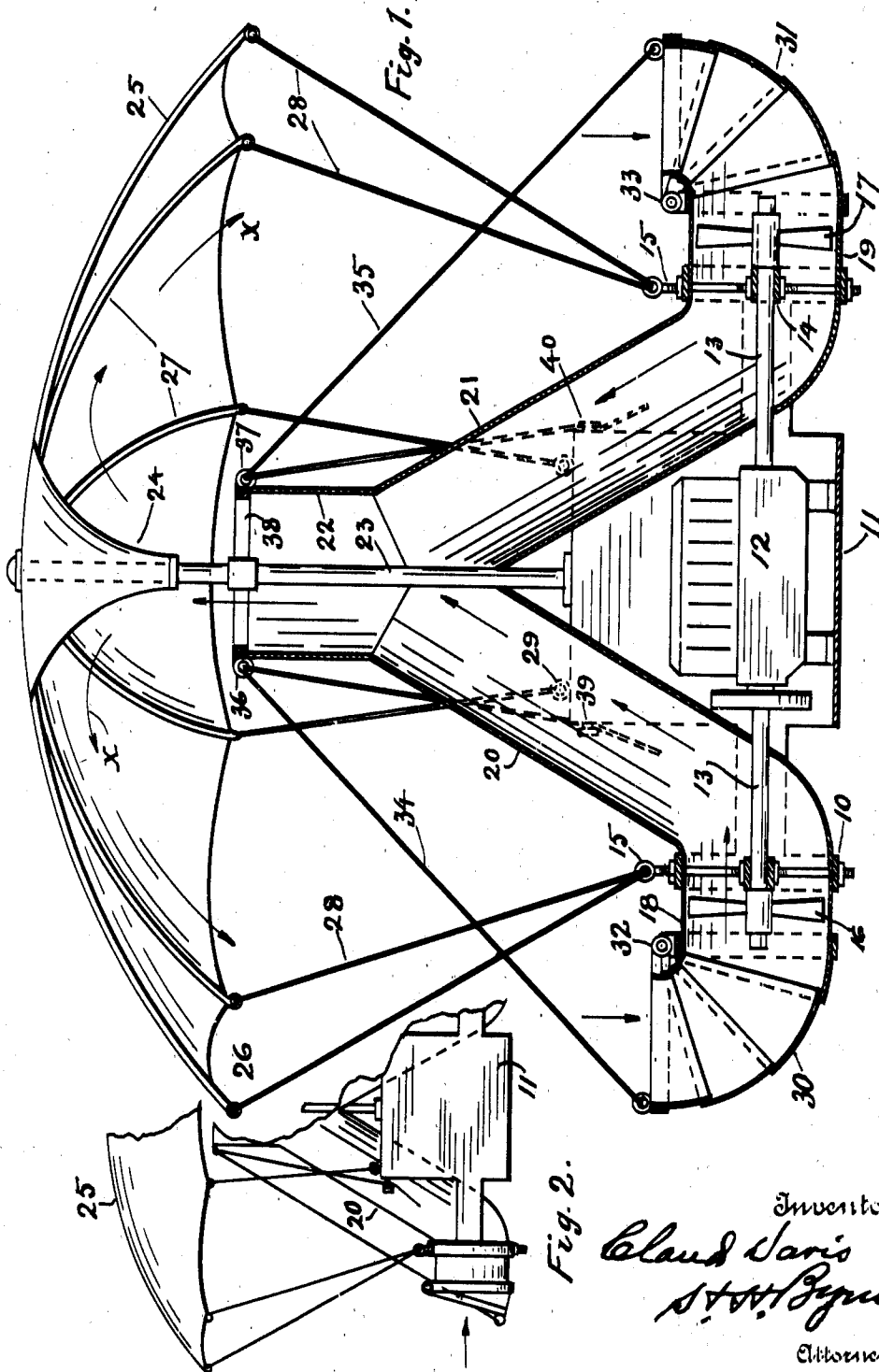
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HELICOPTER

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UNITED STATES PATENT OFFICE.

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HELICOPTER.

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My invention relates to a flying machine of the helicopter type and it has for its object to provide a device of this class, which, after rising perpendicularly from the ground to the desired height, can be made to travel in either of two horizontal directions without reversing the motor.

One advantage of my invention resides in the fact that the flying machine can be stopped suddenly in mid air at any elevation and maintained stationary. This has the advantage that accurate observations may be made or photographs taken or surveys made from such position.

Another advantage possessed by my invention is that instead of turning on a long radius when changing the direction of flight, this machine can be made to reverse its flight so as to run in exactly opposite direction to that in which it has been proceeding and at a moment's notice.

Another advantage of my invention is that the flying machine constitutes in itself a parachute and that landing can be made very safely by slowing down the engine, when the flying machine will descend at a low rate of speed almost perpendicularly and onto any kind of ground, rough or smooth, and without having to taxi.

In the accompanying drawing one embodiment of the invention is illustrated, and

Figure 1 shows a vertical, longitudinal section of the device in position of rising from the ground; and,

Figure 2 a side elevation of the flying machine as arranged for horizontal flight.

In the drawing reference numeral (10) represents the main frame work carrying a central housing (11) for the motor (12). This housing forms preferably a part of the fuselage, which may be of any suitable construction but is not shown on the drawing nor has the necessary accommodation for the aviators been indicated.

A driving shaft (13) extends forwardly and rearwardly from the motor (12) and is supported in bearings (14) carried on eye bolts (15) from the main frame (10). On the forward and rearward end of the driving shaft (13) are secured propellers (16, 17) which are, however, oppositely pitched so as to draw air inwardly in the direction of the motor (12). The propellers are enclosed in tubes (18, 19) respectively, which are coaxial with the shaft (13) and are

joined together by upwardly inclined branches (20, 21) so as to form an inverted Y with a central vertical drum (22).

On the housing or any suitable part of the main frame is erected a central mast or post (23) which at its upper end carries an inverted cone (24) made of any suitable light and strong material. Upon this cone rests an aerofoil (25), preferably in the shape of an umbrella or parachute, the outer edges (26) of which extend fully over the outer edges of the air tubes (18, 19). Ribs (27) strengthen and keep the aerofoil stretched, while cords or wire braces (28) connected the ends of the eye bolts (15) and other eyes (29) on the frame or main housing.

Collapsible air guides in the shape of elbow joints (30, 31) one at the end of each tube (18 and 19) are provided to direct the incoming air either in vertical or horizontal direction. A stout hinge member (32, 33) secured to the respective tubes (18 and 19) and each actuated by a rope (34 and 35) respectively enables the aviator to maintain the air guides in open or closed position. The ropes run through eyes or pulleys (36, 37) secured at the upper, open end of the drum (22) where the latter is braced by bands (38) to the mast or post (23). Suitable securing means (39, 40) are provided for the ends of the ropes.

The steering device has been omitted, as any conventional type thereof may be used.

When the aviator is ready to fly he arranges the collapsible air inlets (30, 31) by means of the ropes (34, 35) as indicated in Figure 1, that is to say, with their openings upward. He next starts the motor (12), thereby causing the shaft (13) with the propellers (16, 17) to revolve and draw in air through the air inlets (30, 31) and tubes (18, 19). This air will then be forced upwards through the branches (20, 21) and the air drum (22) against the inverted cone and under the aerofoil (25) as indicated by arrows (X).

The air pressure will then exert a lifting action against the aerofoil thus raising the flying machine substantially straight up from the ground when the desired elevation has been attained, the aviator releases one of the ropes (34), for instance, when the inlet elbow (30) collapses, permitting air to be drawn in horizontally in the direction of

the collapsed inlet elbow, while the exhausted air will still maintain the flying machine at the desired elevation.

When the aviator wants to reverse his direction of travel, he merely again raises the inlet elbow (30) and lowers the other one (31) when he will fly in the direction of the latter. Deviation in flight from the straight line is, of course, taken care of by an ordinary steering gear.

For landing, the aviator merely slows up the motor, when the device will make a substantially vertical descent and without the aid of any landing gear.

While the preferred embodiment of my invention has been described in detail, it will be understood that I do not wish to be limited to the particular construction set forth, since various changes in the form and arrangement of parts and in the details of construction may be resorted to without departing from the spirit and scope of the invention or destroying any of the advantages contained in the same.

I claim—

1. In a flying machine of the class described having a frame, a motor and an aerofoil supported on the frame; a double ended shaft actuated by the motor, a propeller on each end of said shaft and means for directing the air current, set in motion by said propellers, against the aerofoil in order to raise the flying machine; said means comprising substantially horizontal tubular inclosures for the propellers and upwardly directed extensions of said inclosures and elements at the intake ends of said tubular inclosures adapted to vary the direction of incoming air.

2. In a flying machine of the class described having a frame, a motor and an aerofoil supported on the frame; a double ended shaft actuated by the motor, a propeller on each end of said shaft and means for directing the air current, set in motion by said propellers, against the aerofoil in order to raise the flying machine; said means comprising substantially horizontal tubular inclosures for the propellers and upwardly directed extensions of said inclosures and elements at the intake ends of said tubular inclosures adapted to vary the direction of incoming air; said elements comprising collapsible elbows.

3. In a flying machine of the class described having a frame, a motor and an aerofoil supported on the frame; a double ended shaft actuated by the motor, a propeller on each end of said shaft and means for directing the air current, set in motion

by said propellers, against the aerofoil in order to raise the flying machine; said means comprising substantially horizontal tubular inclosures for the propellers and upwardly directed extensions of said inclosures and elements at the intake ends of said tubular inclosures adapted to vary the direction of incoming air; said elements comprising collapsible elbows and operating members for the elbows.

4. In a flying machine of the class described having a frame, a motor and an aerofoil supported on the frame; a double ended shaft actuated by the motor, a propeller on each end of said shaft and means for directing the air current, set in motion by said propellers, against the aerofoil in order to raise the flying machine; said means comprising tubular inclosures for the propellers and upwardly directed extensions of said inclosures, said inclosures and their extensions having the shape of an inverted letter Y.

5. In a flying machine of the class described having a frame, a motor and an aerofoil supported on the frame; a double ended shaft actuated by the motor, a propeller on each end of said shaft and means for directing the air current, set in motion by said propellers, against the aerofoil in order to raise the flying machine; said means comprising tubular inclosures for the propellers and upwardly directed extensions of said inclosures, said inclosures and their extensions having the shape of an inverted letter Y, and rigid connections between the frame and the inclosures.

6. In a flying machine of the class described having a frame, a motor and an aerofoil supported on the frame; a double ended shaft actuated by the motor, a propeller on each end of said shaft and means for directing the air current, set in motion by said propellers, against the aerofoil in order to raise the flying machine; said means comprising substantially horizontal tubular inclosures for the propellers and upwardly directed extensions of said inclosures and elements at the intake ends of said tubular inclosures adapted to vary the direction of incoming air; said elements comprising collapsible elbows and operating members for the elbows, said inclosures and their extensions having the shape of an inverted letter Y.

In witness whereof, I have hereunto set my hand at Washington, District of Columbia, this ninth day of May, A. D. nineteen hundred and twenty-seven.

CLAUD DAVIS.