C. T. ROGERS.

FLYING MACHINE.

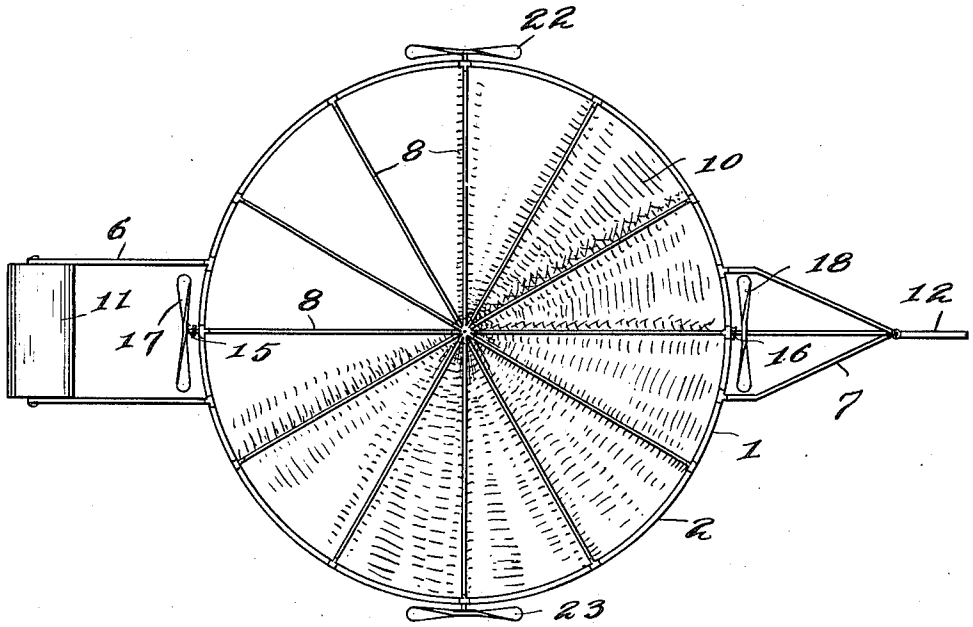
APPLICATION FILED SEPT. 5, 1911.

1,038,964.

Patented Sept. 17, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



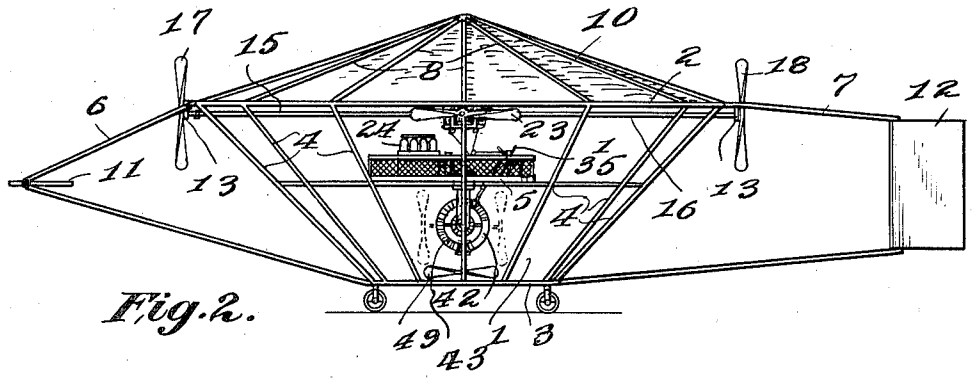


Fig. 2.

Witnesses

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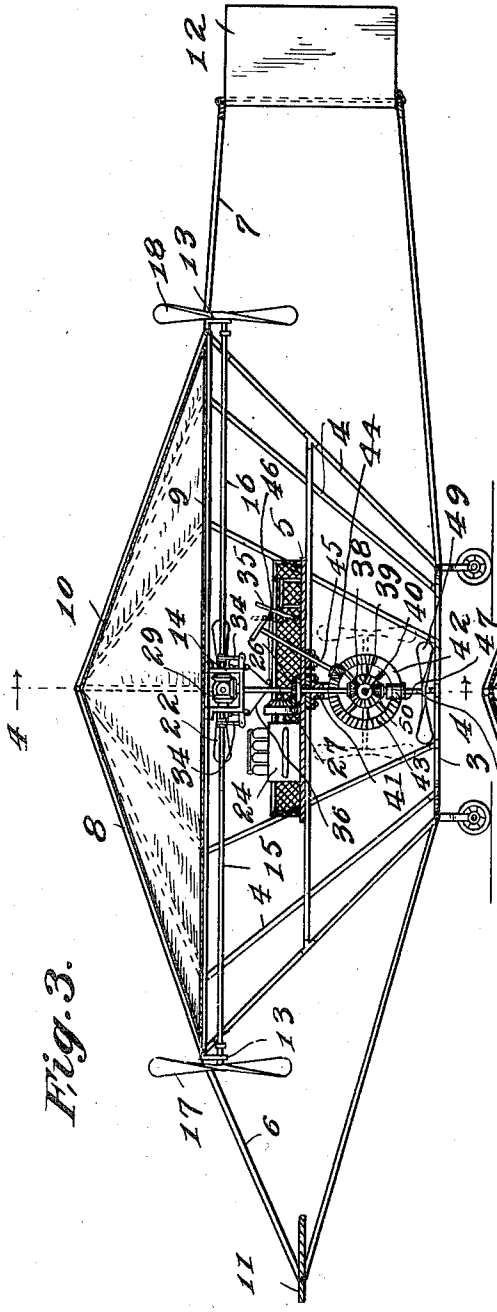

Fig. 3.

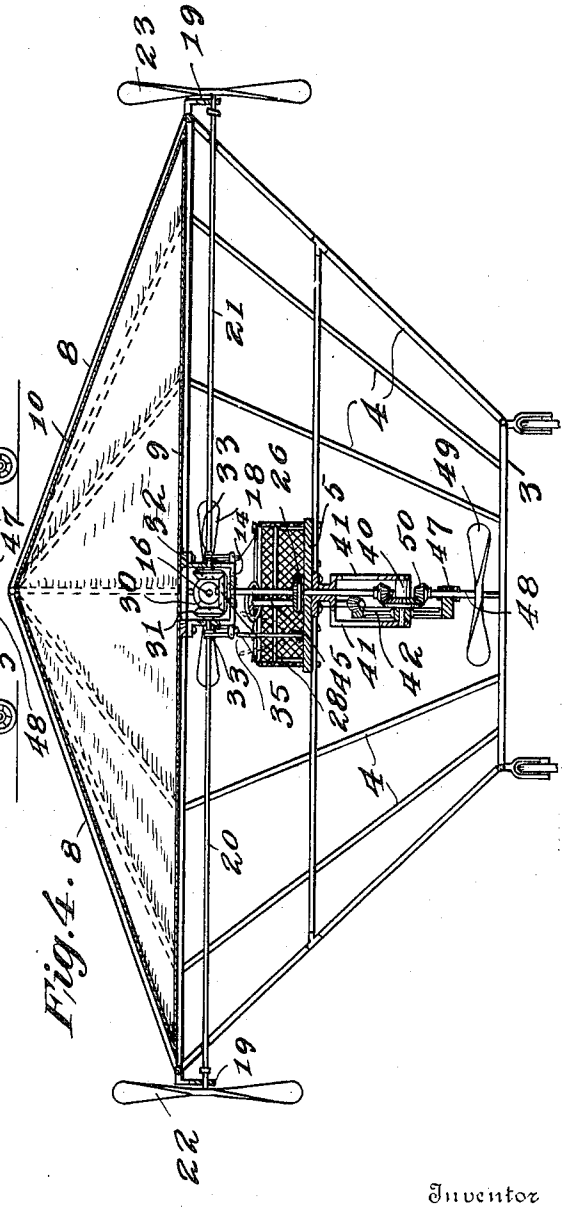

Fig. 4.

Witnesses

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3 SHEETS—SHEET 3.

Fig. 5.

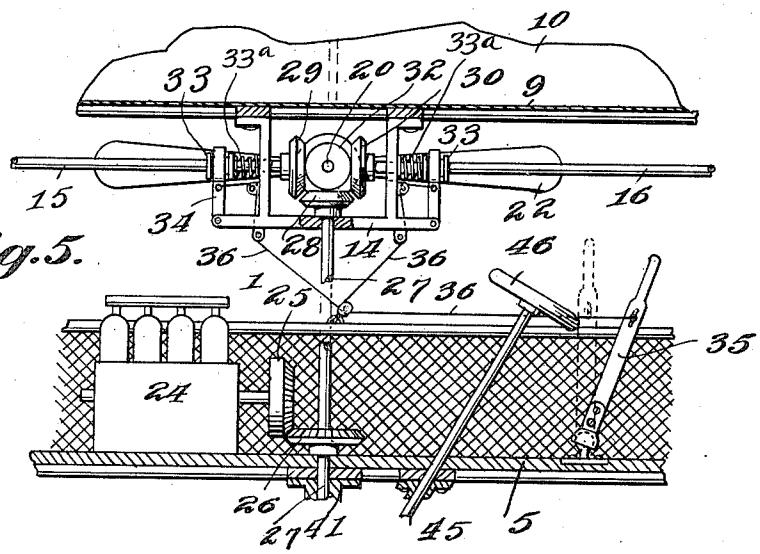
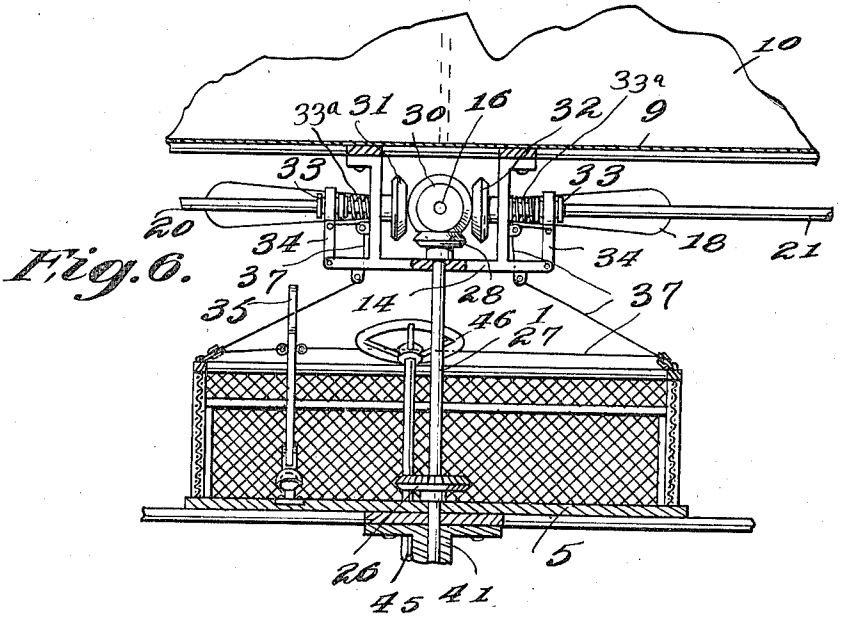


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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FLYING-MACHINE.

1,038,964. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed September 5, 1911. Serial No. 647,494.

To all whom it may concern:

Be it known that I, CHARLES T. ROGERS, a citizen of the United States, residing at Newton, in the county of Dale and State of Alabama, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to flying machines, the main object of the invention being to provide a supporting surface which will operate as a combined aeroplane and aerostat, whereby the weight of the machine will be to a large extent sustained and an aerodynamical reaction secured for the proper support of the machine in flight.

A further object of the invention is to provide a supporting surface which will perform the function of a parachute in supporting the machine to a sufficient extent to insure its slow descent and safe landing in the event of the failure of the motive power.

A still further object is to provide a machine having a novel frame structure and a novel arrangement of driving and lifting propellers, whereby the machine may be caused to ascend or descend in a straight vertical path, and whereby, through the use of suitable gearing, the speed of descent of the machine may be controlled and the machine quickly checked or stopped in landing.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a top plan view of a flying machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal section through the machine. Fig. 4 is a vertical transverse section thereof. Fig. 5 is an enlarged detail longitudinal section through the gearing for operating the driving propellers. Fig. 6 is a transverse section of the same.

Referring to the drawings, 1 designates the main frame of the machine, which is approximately of frusto-conical form with its reduced end projecting downwardly. This frame comprises an upper frame ring 2, a lower frame ring 3, and an annular series of rods 4, connecting said frame rings and arranged to provide a cage or inclosure. Within this cage or inclosure, at a point about midway of the height thereof, is arranged a car or platform 5, to support the aviator, passengers, if any, and the controlling devices. The frame structure is completed by short head and tail frames 6 and 7 connected with the top frame and main frame.

Rising from the central, circular portion of the top frame formed by the ring 2, is an annular series of upwardly converging rods 8, suitably connected at their upper ends. These rods 8 form, in connection with the ring 2, a conical or head portion, constituting the frame structure of the supporting surface 9, which is completed by a covering 10 of balloon silk or any other suitable material capable of holding hydrogen gas, or any gas lighter than air.

The silk or other fabric is stretched over and suitably fastened to the frame portions 2 and 8, forming a surface whose base is flat or curved fore and aft for the supporting action of the air thereon, and whose top inclines from all points upwardly toward its center, giving it a substantially conical form, whereby a gas bag or receptacle of sufficient internal area to contain a comparatively large quantity of hydrogen gas is provided. The supporting surface will thus act not only as an aerostat to partially sustain the weight of the machine at all times, but will utilize the reactions resulting from the pressure of the air against its lower surface when the machine is in flight, to adequately sustain the machine at a low rate of speed, as well as to act as a parachute to decrease the rate of fall of the machine and insure its safe descent to the ground in the event of the failure of the motive power.

Mounted upon the head frame 6 is a horizontal rudder 11, and mounted upon the tail frame 7 is a vertical rudder 12, from which rudders suitable connections lead in practice to suitable controlling devices (not shown) on the car or frame of the machine, whereby the rudders may be adjusted to steer the machine vertically and horizontally. In practice, a launching and landing gear of any desired type may be employed, to support the machine upon the surface of the ground and to prevent injury thereto from shocks or jars in landing. Journaled at their outer ends in suitable bearings 13 on the main frame, and at their inner ends in a bracket

14, are longitudinally extending shafts 15 and 16 carrying front and rear driving propellers 17 and 18. Similarly supported at their outer ends in bearings 19 and at their inner ends in the bracket 14, are alined transverse shafts 20 and 21 carrying at their outer ends driving propellers 22 and 23.

The platform 5 supports a motor 24 on the shaft of which is a beveled gear 25 meshing with a gear 26 on a vertical shaft 27. This shaft carries at its upper end a beveled friction disk 28 engaging the faces of beveled friction disks 29 and 30 coöperating with the shafts 15 and 16 and beveled friction disks 31 and 32 coöperating with the shafts 20 and 21, each of the disks 29, 30, 31 and 32 being feathered to slide upon its shaft and normally held retracted by a spring 33^a and provided with a grooved collar 33 engaged by the forked end of a shipper arm 34 pivotally connected with the bracket, whereby said disk may be adjusted into and out of engagement with the driving disk 28, to start or stop the motion of the propeller shafts at will.

Mounted upon the car or platform is a universally jointed lever 35, connected by cables 36 with the shipper arms of the disks 29 and 30, and by cables 37 with the shipper arms of the disks 31 and 32, which cables pass over suitable guide pulleys. The sets of cables are connected with the lever 35 in such manner that a fore and aft movement of said lever will throw the disks 29 and 30 into and out of operation, while reverse lateral movements of said lever will throw the disks 31 and 32 into or out of operation. Such movements of the lever will draw upon the respective sets of cords and slide the sets of friction disks inward against the resistance of their retracting springs, while upon the return of the lever to normal position the springs will throw the disks out of engagement with the disk 28. It will be apparent that this construction permits of a combination of movements whereby the driving disks of either one or both sets of propeller shafts may be simultaneously thrown into and out of action.

The lower end of the shaft 27 carries a beveled gear 38 meshing with a gear 39 revolubly mounted on a transverse shaft or spindle 40 journaled in a supporting bracket 41 below the platform, and on which shaft or spindle is also loosely mounted a wheel 42 provided with gear teeth 43 on one of its faces meshing with a pinion 44 on the lower end of an adjusting shaft 45 provided at its upper end with a hand wheel 46. Said wheel 42 carries a laterally projecting arm 47 in which is journaled a shaft 48 of a lifting and driving propeller 49, which shaft is provided with a gear 50 meshing with the gear 39, whereby the propeller is driven from the motor. By turning the hand wheel 46, the wheel 42 may be adjusted to position the propeller 47 in either of the full or dotted-line positions shown in Fig. 3, so that said propeller may be employed as a lifting propeller, a driving propeller or a braking propeller, at the will of the aviator.

It will be understood from the foregoing description that by the construction of supporting surface employed, the necessity of driving the machine at an extremely high rate of speed for sustentation is avoided. In starting a flight the lifting propeller is set in action, enabling the machine to rise straight from the ground. When the desired elevation is reached, the driving propellers are set into action and the lifting propeller thrown out of action or operated at a reduced speed or adjusted to serve as a driving propeller. By regulating the speed of the lifting propeller the machine may be supported stationary in the air or its speed of descent regulated in order to secure an easy and safe landing, and by adjusting said propeller to exert a backward driving action it may be employed as a wind-brake to check or stop the machine in landing. If from any cause the motive power should fail, the supporting surface will still sustain the machine to a sufficient extent to break its fall and lessen its speed of descent, so that it will alight safely upon the surface of the ground.

Having thus described the invention, what I claim as new is:

In an aerial vehicle, the combination of a frame structure, a supporting surface therefor, a motor, a car or platform supporting said motor, a vertical drive shaft in gear with the motor and extending above and below said platform, driving propellers, gearing for connecting said driving propellers with and disconnecting them from the drive shaft, a secondary drive shaft in gear with the lower end of the vertical drive shaft, an auxiliary propeller mounted to swing in an arc concentric with said shaft, gearing between said shaft and the propeller, and means for adjusting said propeller within an arc of 180°.

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

CHARLES T. ROGERS.

Witnesses:
W. C. KIRKLAND,
J. L. HAND.