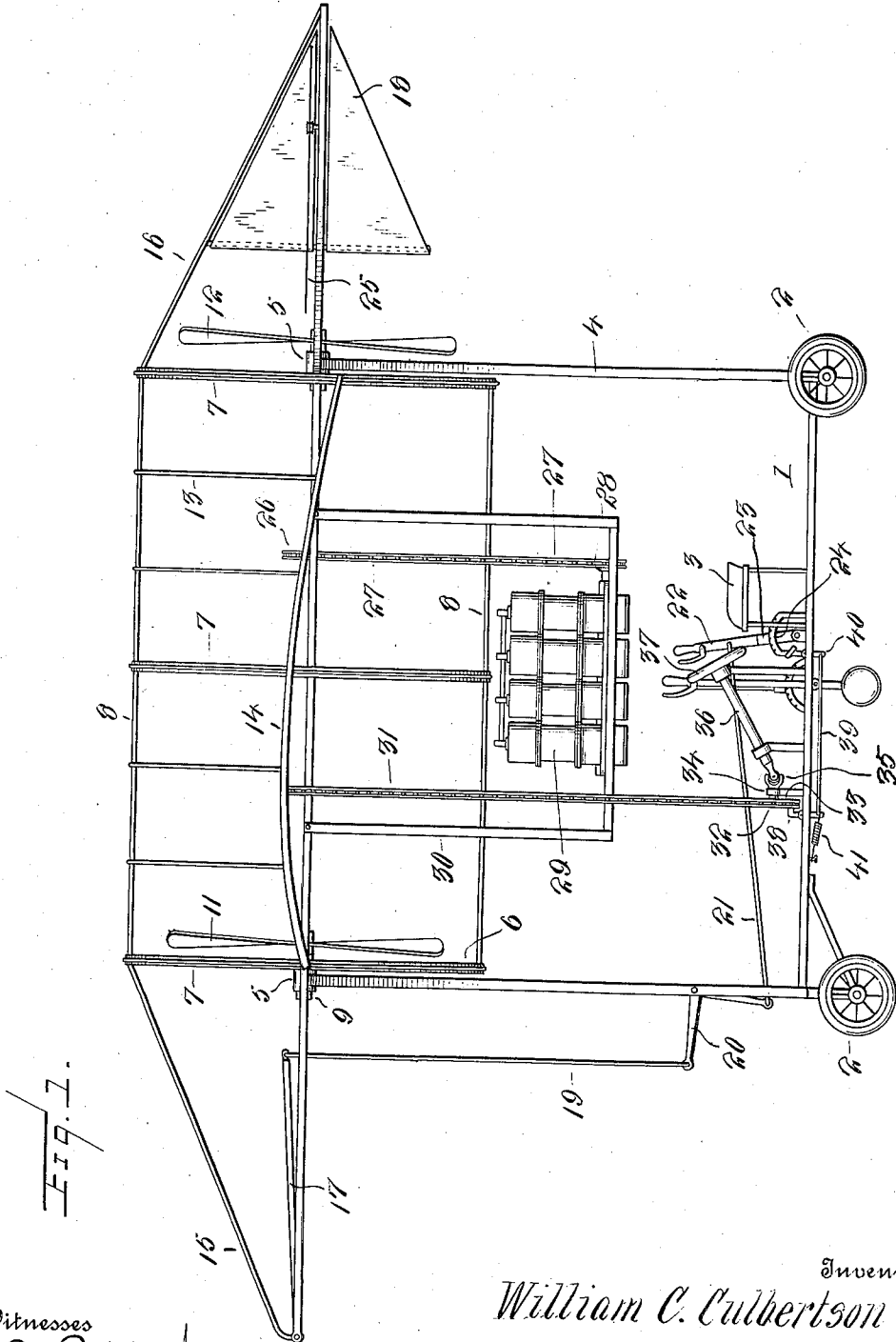


W. C. CULBERTSON.
FLYING MACHINE.
APPLICATION FILED FEB. 18, 1911.

1,002,138.

Patented Aug. 29, 1911.

4 SHEETS—SHEET 1.



Witnesses

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4 SHEETS-SHEET 2.

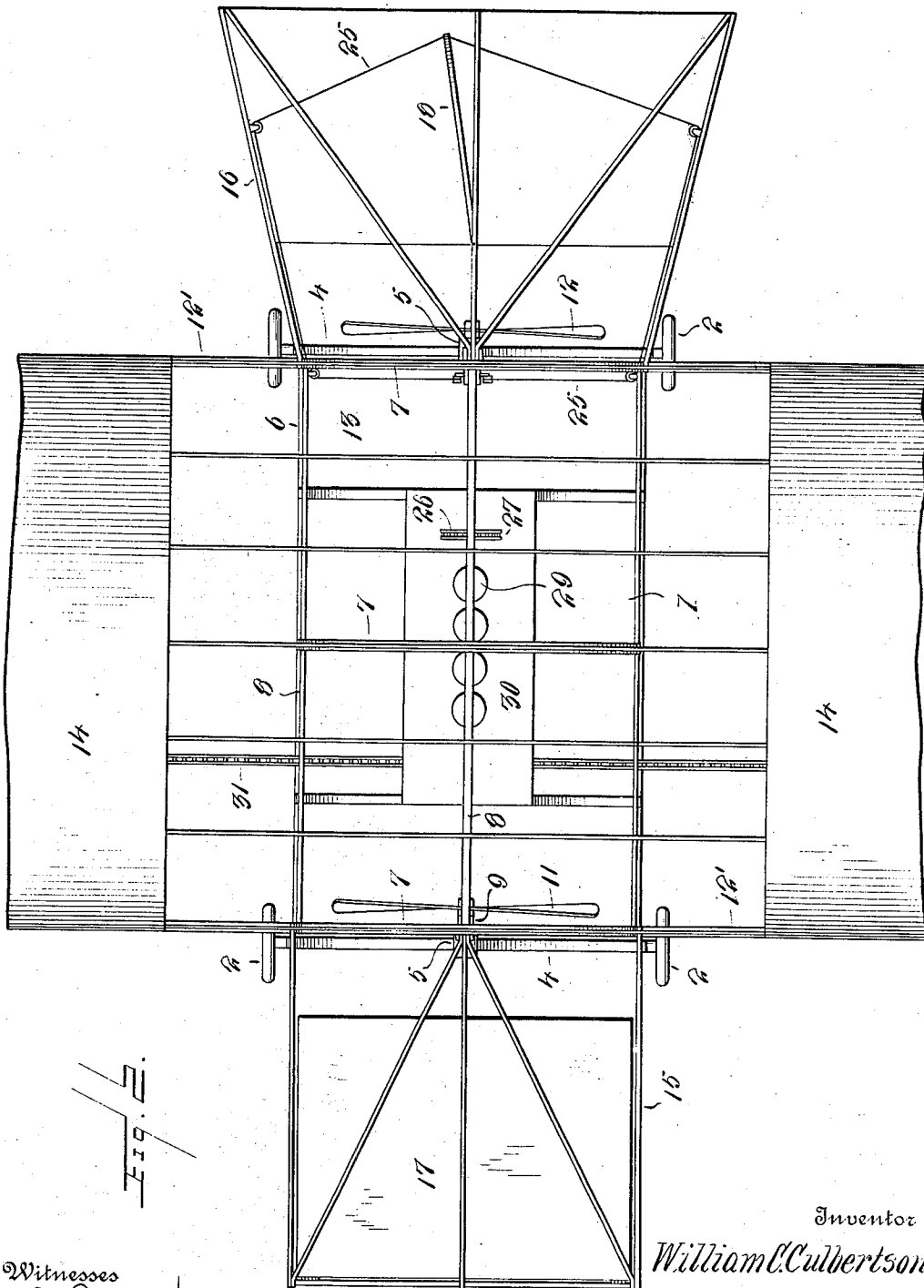


Fig. 2.

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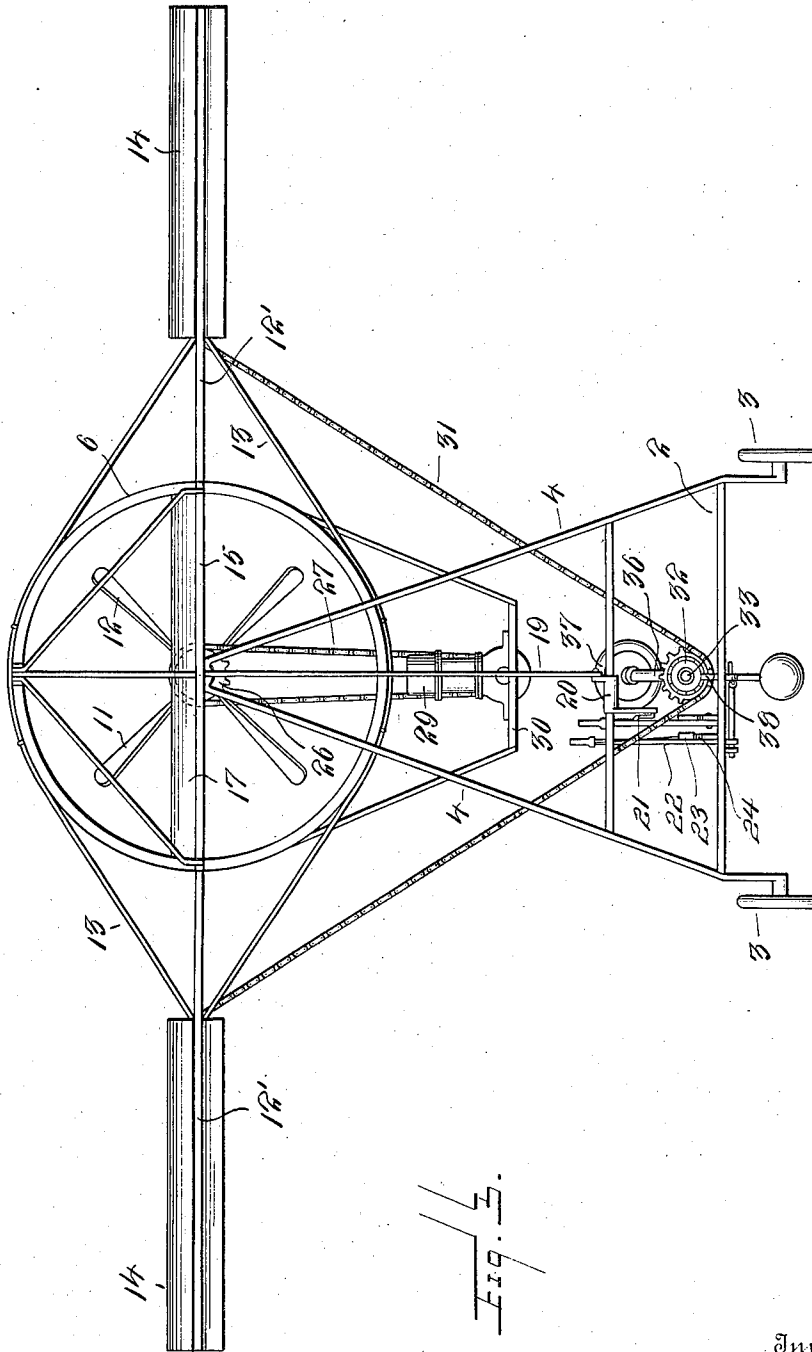


Fig. 3.

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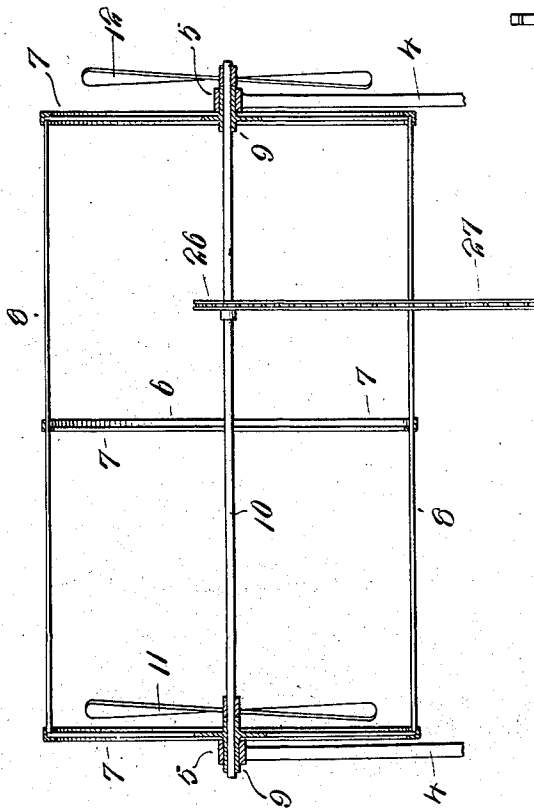


Fig. 4.

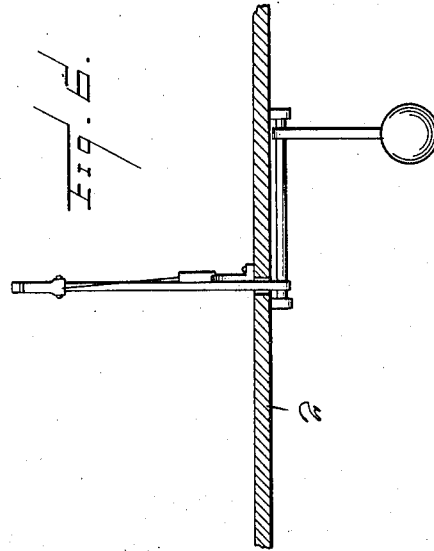


Fig. 6.

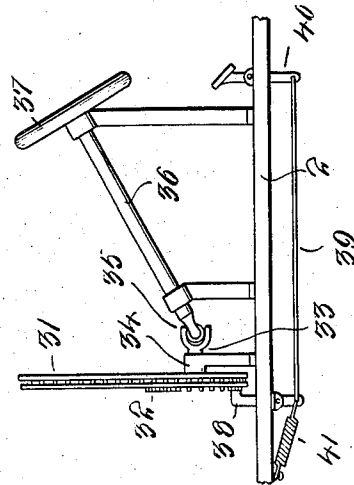


Fig. 5.

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UNITED STATES PATENT OFFICE.

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FLYING-MACHINE.

1,002,138.

Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed February 18, 1911. Serial No. 609,419.

To all whom it may concern:

Be it known that I, WILLIAM C. CULBERTSON, a citizen of the United States, residing at Rushville, in the county of Rush and State of Indiana, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

This invention relates to flying machines of the heavier-than-air class, and consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of a flying machine embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a front elevation of the machine. Fig. 4 is a vertical longitudinal section through the center of the drum and the supporting standards of the car. Fig. 5 is a detail view of the means for turning the drum and locking the same against movement. Fig. 6 is a transverse section, showing the adjustable weight.

Referring to the drawings, 1 designates a car, comprising a platform provided with suitable launching and landing wheels 2, and on which is mounted the aviator's seat 3. Extending upwardly from the car are substantially V-shaped standards 4 suitably braced and provided with bearings 5, which bearings support a drum 6 extending longitudinally in the line of flight and open at each end. The drum comprises a frame formed of spaced rings 7 connected by longitudinal bars 8, the front and rear end rings of the drum being formed with hollow bearing sleeves or trunnions 9 journaled in the bearings 5, by which the drum is mounted to turn or rotate laterally on its trunnions, or in a direction at right angles to the line of flight. Journaled at its front and rear ends in the bearing sleeves or trunnions 9 is a shaft 10 carrying front and rear driving propellers 11 and 12 respectively, arranged within the front portion of the drum and behind the rear end thereof.

Outriggers or side frames 12' project laterally from the opposite sides of the drum and are reinforced therefrom by suitable braces 13. These outriggers carry supporting planes 14, properly curved for the dynamical reactions of the air thereon, said planes being fixed to the drum to tilt or swing vertically when the drum is turned or partially rotated laterally in one direction or the other.

The drum forms an air channel, and may be covered with a suitable fabric to operate as a supporting medium. Frames 15 and 16 project forwardly and rearwardly from the front and rear ends of the drum and respectively support a horizontal rudder or elevator 17 and the vertical rudder 18. The rudder 17 is pivoted to swing in a vertical plane and is connected by a link 19 with a bell crank lever 20 coupled by a link 21 to a lever 22, whereby said rudder may be adjusted. The lever is provided with a pawl 23 to engage a rack 24 on the car, whereby it may be locked in adjusted position. The rudder 17 is mounted to swing with the drum and supporting planes, and the operating connections are loosely jointed to permit of such movement. The rudder 18 is mounted upon a vertical shaft to which are suitably connected controlling cords or wires 25, which may lead in practice to a suitable operating device, (not shown) on the car, whereby the rudder may be adjusted for horizontal steering.

The shaft 10, which drives the propellers 11 and 12, is provided with a sprocket wheel 26 connected by a chain 27 with a sprocket wheel 28 on the shaft of a motor 29, supported in a frame 30 arranged above and free from connection with the car, but coupled to the drum for swinging movement therewith. Through this gearing motion is transmitted to drive the propellers for propelling the machine forward. In practice, suitable means may be provided for throwing the gearing into and out of operation, or the gearing may be controlled by stopping and starting the motor.

Connected at its ends with the outriggers 12' is a sprocket chain 31 which extends downwardly to and passes intermediately around a sprocket wheel 32 on a longitudinal shaft 33 mounted on a suitable bearing 34 on the car, which shaft 33 has a knuckle joint connection 35 with a rod or shaft 36 provided with a hand wheel 37, so that by turning said shaft laterally in one direction or the other motion may be imparted to the sprocket wheel 32 to tilt the planes 14 and turn or rotate the drum 6 together as a unit in one direction or the other. A pivoted locking dog 38 is provided to engage the gear 32 or chain 31 to lock the same against movement, said dog being connected by a link 39 with a treadle lever 40, by which the dog may be retracted. A spring 41 con-

nects the dog with the car and operates to normally hold the dog projected to lock the sprocket wheel against movement.

In the operation of the machine, it will be understood that the propellers will be driven from the motor, and that the machine may be steered vertically and horizontally by means of the rudders 17 and 18. The drum and planes serve as supporting surfaces for the action of the air to sustain the machine in flight, and it will be observed that the drum and planes are normally held in a fixed position by the weight of the motor 29 and locking of the dog 38. When the dog is retracted, the drum and planes are free to turn or swing in a vertical plane about the shaft 10 as an axis, and through the resistance set up by the weight of the motor 29 are constantly maintained in a stable position. If any vertical deflections of the planes occur, however, under strong side gusts of air, the motor will serve as a pendulum weight for automatically returning the same to normal position, thus maintaining an automatic balance. By means of the shaft 36 and the sprocket gearing connecting the same with the drum and planes, said drum and planes may be turned in either direction to adjust the planes for banking the machine in making a turn or for manually controlling the stabilizing action as occasion may require. Swinging motion of the motor may thus be prevented when such motion is not desirable and a prescribed adjustment of the planes is necessary. It will be seen that as the load weight is arranged considerably below the supporting surface, a machine having a high degree of inherent lateral stability is produced.

40 Having thus described the invention, I claim:—

1. In a flying machine, the combination of a car or platform, a shaft from which the same is pivotally hung, a propeller driven by said shaft, a drum extending longitudinally in the line of flight and journaled to turn laterally upon the shaft, supporting planes at the opposite sides of and carried by the drum, a motor suspended from the drum and in gear with the shaft, and gearing for turning the drum in either direction laterally.

2. In a flying machine, the combination of a car or platform, a longitudinal shaft from which said car or platform is pivotally sus-

pending, a drum extending longitudinally in the line of flight and journaled to turn laterally on said shaft, supporting planes at the opposite sides of and connected with the drum, means for turning the drum in either direction laterally including a sprocket chain, a gear for actuating the sprocket chain; and manually operable means for turning the gear.

3. In a flying machine, the combination of a car or platform, a longitudinal shaft from which said car or platform is pivotally suspended, a drum extending longitudinally in the line of flight and journaled to turn laterally on said shaft, supporting planes at the opposite sides of and connected with the drum, means for turning the drum in either direction laterally including a sprocket chain, a gear for actuating the sprocket chain, manually operable means for turning said gear, a locking device to engage and hold the gear from movement, and means for throwing said locking device into and out of action.

4. In a flying machine, the combination of a car or platform, a longitudinal shaft upon which said car or platform is pivotally suspended, a drum extending longitudinally in the line of flight and mounted to turn laterally upon said shaft, propellers mounted upon the shaft, supporting planes at opposite sides of and carried by the drum, a motor suspended from the drum and in gear with said shaft, and means for turning the drum in either direction laterally and holding the same from turning movement.

5. In a flying machine, the combination of a car or platform, a longitudinal shaft from which said car or platform is pivotally hung, a drum arranged longitudinally in the line of flight and mounted to turn laterally upon said shaft, propellers upon the shaft, supporting planes at opposite sides of and connected with the drum, a motor suspended from the drum and in gear with said shaft, gearing for turning the drum laterally in either direction, and means for locking said gearing from operation.

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

WILLIAM C. CULBERTSON.

Witnesses:

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KATHRYN CARROLL.