M. ROZBORIL & P. BURSKY.

AIRSHIP.

APPLICATION FILED APR. 9, 1909.

980.840.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

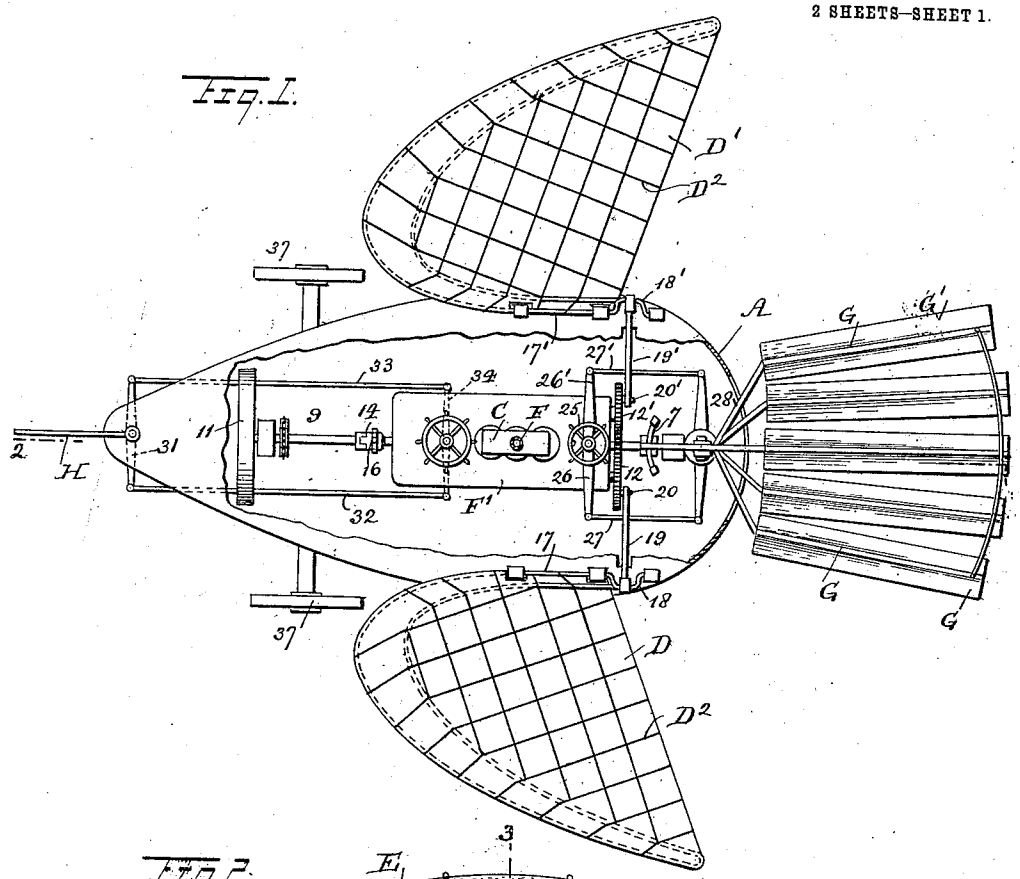
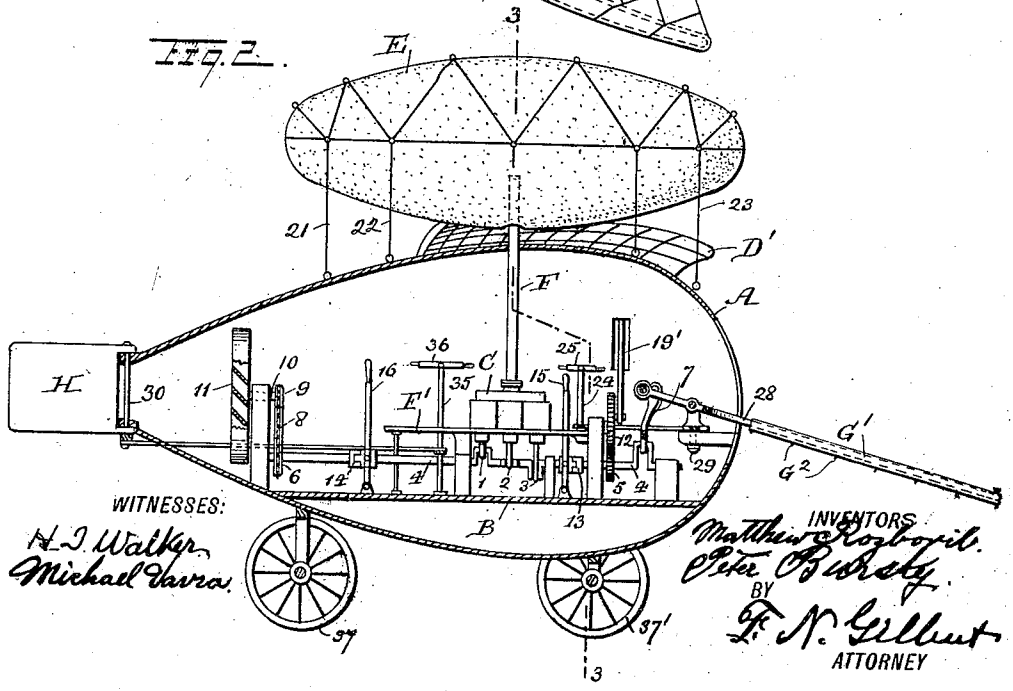


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

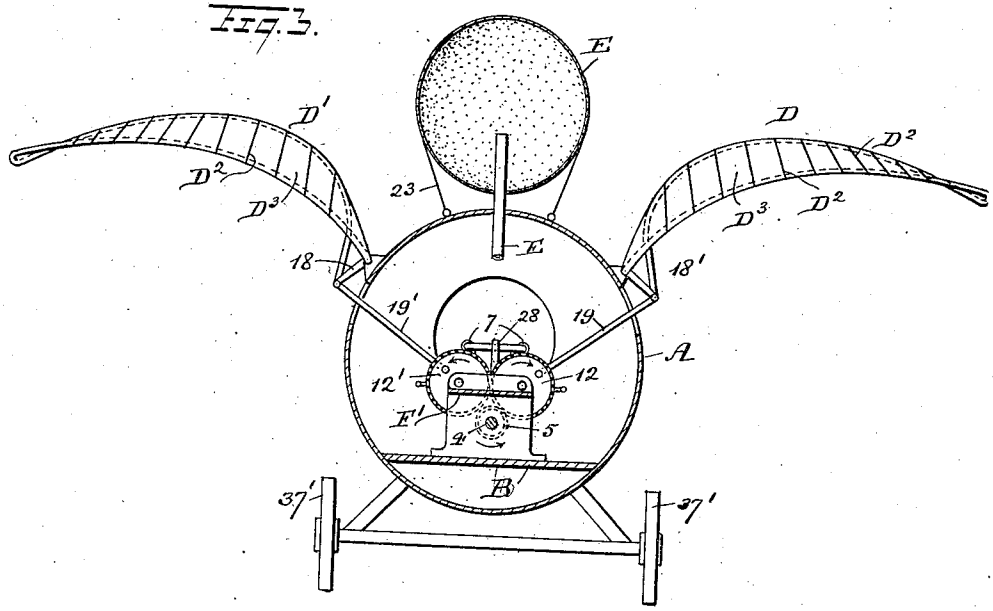


Fig. 4.

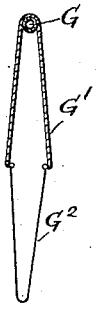


Fig. 5.

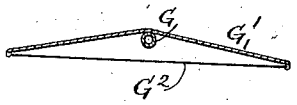


Fig. 6.

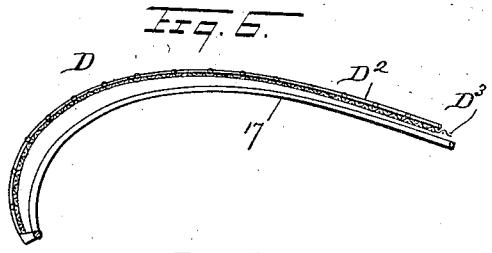
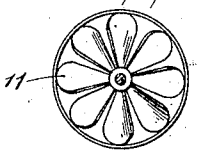


Fig. 7.



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AIRSHIP.

980,840. Specification of Letters Patent. Patented Jan. 3, 1911.

Application filed April 9, 1909. Serial No. 489,016.

To all whom it may concern:

Be it known that we, MATTHEW ROZBORIL and PETER BURSKY, citizens of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Airships, of which the following is a specification.

Our invention relates to improvements in air ships, and the leading object of our invention is the provision of an improved dirigible.

A further object of the invention is the provision of a device of this character embodying the principles of flying as exemplified by various birds.

Another object of the invention is the provision of a flying machine which will utilize the waste gas from the engine in aiding in sustaining the device.

With these and other objects of a similar nature as hereinafter disclosed to view, our invention comprises an air ship embodying novel features of construction and combination and arrangement of parts for service substantially as described and as illustrated in the accompanying drawings which illustrate one of the physical embodiments of our idea constructed according to the best method we have so far devised for the application of the principles thereof.

In the drawings, in which similar characters of reference denote corresponding parts in the various views: Figure 1, represents a top plan view of the device, the gas bag and part of the top of the machine being removed. Fig. 2 represents a longitudinal sectional view of the device. Fig. 3 represents a vertical cross-sectional view thereof. Figs. 4 and 5 represent enlarged sectional detailed views of the members forming the tail, said members being shown in closed and open position respectively. Fig. 6 represents a longitudinal sectional view of one of the wings, and Fig. 7 represents a front view of the propeller.

The letter A designates the body of the machine, said body being hollow and ellipsoidal in shape, and on the under side of said body we secure the wheels 37 and 37′ which support the machine when on the ground and permit of its movement thereon.

Located above the body portion A is the cigar shaped gas bag E, said bag being secured to the body of the device by means of the customary net work of cords, as 21, 22, and 23.

To guide the device when in the air, we secure on the front end of the body the vertically disposed rudder H, while to regulate its vertical movement we secure to the rear of the body the tail portion having the frame G provided with the blades or feathers G′, the purpose of which will be hereinafter explained.

To give motion to the device we employ the propeller 11, said propeller being mounted at the front of the body on the platform B located within the body, the propeller being driven by a suitable engine C located on the platform and having its pistons connected with the cranks 1, 2, 3, of the driving shaft 4, said shaft bearing a sprocket 6 which rotates the shaft 10 of the propeller through the medium of the chain 8 and sprocket 9 on shaft 10. To further aid in driving the machine and for lifting the same other than through the medium of the gas bag and the action of the tail on the air, we provide the wings D on the sides of the body, said wings consisting of one or more pairs, as is desired.

Mounted on the platform B of the machine is a second platform F′ on which the operator stands, and on the forward part of said platform is a wheel 36 mounted on a shaft 35. Secured to the lower end of the shaft 35 is a rod 34, while the links 32 and 33 serve to connect this rod with the ends of the rod 31 carried by the shaft 30 of the rudder H, the revolution of the wheel 36 serving to control and regulate the movement of the rudder.

Mounted in brackets on each side of the body are the shafts 18 having cranks formed therein, while to the straight portion of the shafts are secured the wings D. Connected to the crank of each shaft is a link 19 the other end of the link being secured by means of the eccentrically disposed pins 20 and 20′ to the wheels 12 and 12′ as will be understood by reference to Fig. 3. By reference to this figure it will be seen that these wheels have gears on their periphery, the gears of the wheels 12 and 12′ being in mesh, while the gears of the wheel 12 are also in mesh with the pinion 5 carried by the shaft 4, said pinion thus serving to drive the wheels, which by this connection move in opposite directions. It will be under-

stood that as the wheels revolve they, through the medium of the links 19 rock the shafts 18, the cranks of the shafts 18 being of such size that the movement of the links is insufficient to revolve the shafts but only to impart a rocking movement thereto which causes the wings to swing up and down with a flapping motion. The wings, as is best shown in Fig. 6 are curved in such manner as to present a convexed surface which will offer the least resistance when rising, while the under side is concaved and thus grips the air and is able to exert a greater pressure on the air to force the device upward. To aid in effecting this result, we form the wings of a frame work of curved bars 17, said bars being secured to the shaft 18, while secured to the frame and curving thereabove is the light lattice framework D^2, while interposed between the two is the suitable textile fabric D^3, said fabric being secured at the sides of the device but being free in the center, and in operation as the wings are depressed or swung downward the fabric is forced against the framework D^2 and forms a practically air-tight covering therefor which contacts with the air and exerts its pressure thereon to force the body of the machine upward, while on the reverse or upward movement of the wings the fabric falls onto the bars 17 and hangs there loosely, in which position it offers but little resistance to the air. The amount of resistance thus offered is lessened by the fact that the wings, as has been previously stated are not flat but convexed on their upper surface, the fabric when the wings are being raised dropping from its position against the frame D^2 onto the smaller convexed frame 17, thus presenting to the air a curved surface which will offer a minimum amount of resistance and also a surface which is smaller than the lifting surface of the wings as presented when the wings are being depressed and the fabric is against the frame D^2. It will be observed that the wings are so shaped as to round downward at the rear portion thereof, thus at all times presenting an upwardly inclined plane which being forced against the air by the propeller will tend to constantly lift or raise the device.

To aid in guiding the machine, we secure to the rear of the body the tail having a frame G, said frame being carried by the shaft 28 which extends into the casing and is intermediately pivoted to the bracket 29 secured to the body, while the inner end of the shaft is engaged by the rod 7, said rod having a slot formed in its upper end in which the shaft has lateral play. Said lateral movement of the shaft is governed by a wheel 25 mounted on the upper end of the shaft 24 and located on the platform F, links 27, 27′ serving to connect the cross-bar 26, 26′ secured on the lower end of the shaft with a cross-bar secured to the pivot, the revolution of the wheel 25 through the medium of the shaft, cross-bars and links serving to swing the pivot and thus the shaft 28 secured thereto as will be understood more clearly by reference to Fig. 1. The rods G forming the frame of the tail extend longitudinally and are spaced apart and pivotally mounted thereon are the blades G′, there being a pair of blades for each rod. Stretched across the under surface of said blades and connecting their outer edges is a strip of textile fabric G^2, said fabric extending the length of the blades and being of such width as to prevent the blades from assuming a position of horizontal alinement but only a slightly convexed position. The action of the blades of the tail is similar to that of a parachute. Upon the upward stroke of the tail the blades swing toward each other, the fabric hanging loosely therefrom, as will be understood by reference to Fig. 4, and the tail thus offers very slight resistance to the air on this stroke. As the tail moves downward, however, the air strikes the blades and they open, assuming the position shown in Fig. 5, striking the air and forcing the machine forward and upward. To cause the tail to have this swing motion as above described, we form in the shaft 4 a crank near the rear end thereof, and secured to said crank is the lower end of the rod 7, the movement of the shaft imparting a reciprocal motion to the rod which in turn rocks the shaft 28 on its pivot, as is clearly illustrated in Fig. 2.

It will be understood that if desired we may dispense temporarily with the services of either the propeller or wings and tail, and to provide for this we place in the shaft intermediate the engine and propeller the clutch 14 controlled by the lever 16 for operatively connecting the two portions of the shaft 4 at this point, while at a point intermediate the engine and the wing and tail operating mechanism we provide the clutch 13 for operatively connecting the two portions of the shaft 4 at this point, said clutch being controlled by the lever 15 extending onto the platform F′.

To enable our machine to remain for a considerable period in the air without losing its buoyancy from loss of gas in the gas bag, we provide the pipe F which leads from the exhaust of the engine to the bag and conveys the waste gases into the gas bag, thus keeping the same inflated and enabling the machine to remain in the air for a much greater period than would otherwise be the case.

From the foregoing description taken in connection with the drawings the construction and operation of our device will be easily understood and its advantages will

be apparent to all, and it will be seen that we provide a practical flying machine of great and lasting buoyancy which is also provided with improved lifting, guiding and propelling means.

We claim:

In a flying machine, the combination with the body, of wings secured thereto, and means located within the body for imparting a flapping movement to the wings, said wings being composed of a supporting framework, a lattice work carried by the frame, and a fabric interposed between the lattice and the frame and loosely secured in position therebetween in such manner as to present a concaved lifting surface when the wings are depressed and a smaller convexed surface to the pressure of the air when the wings are raised.

In testimony whereof we have affixed our signatures, in presence of two witnesses.

MATTHEW ROZBORIL.
PETER BURSKY.

Witnesses:
MICHAEL VARRA,
JOSEPH BERRY.