(No Model.) 3 Sheets—Sheet 1.

S. B. BATTEY.

AERIAL MACHINE.

No. 502,168. Patented July 25, 1893.

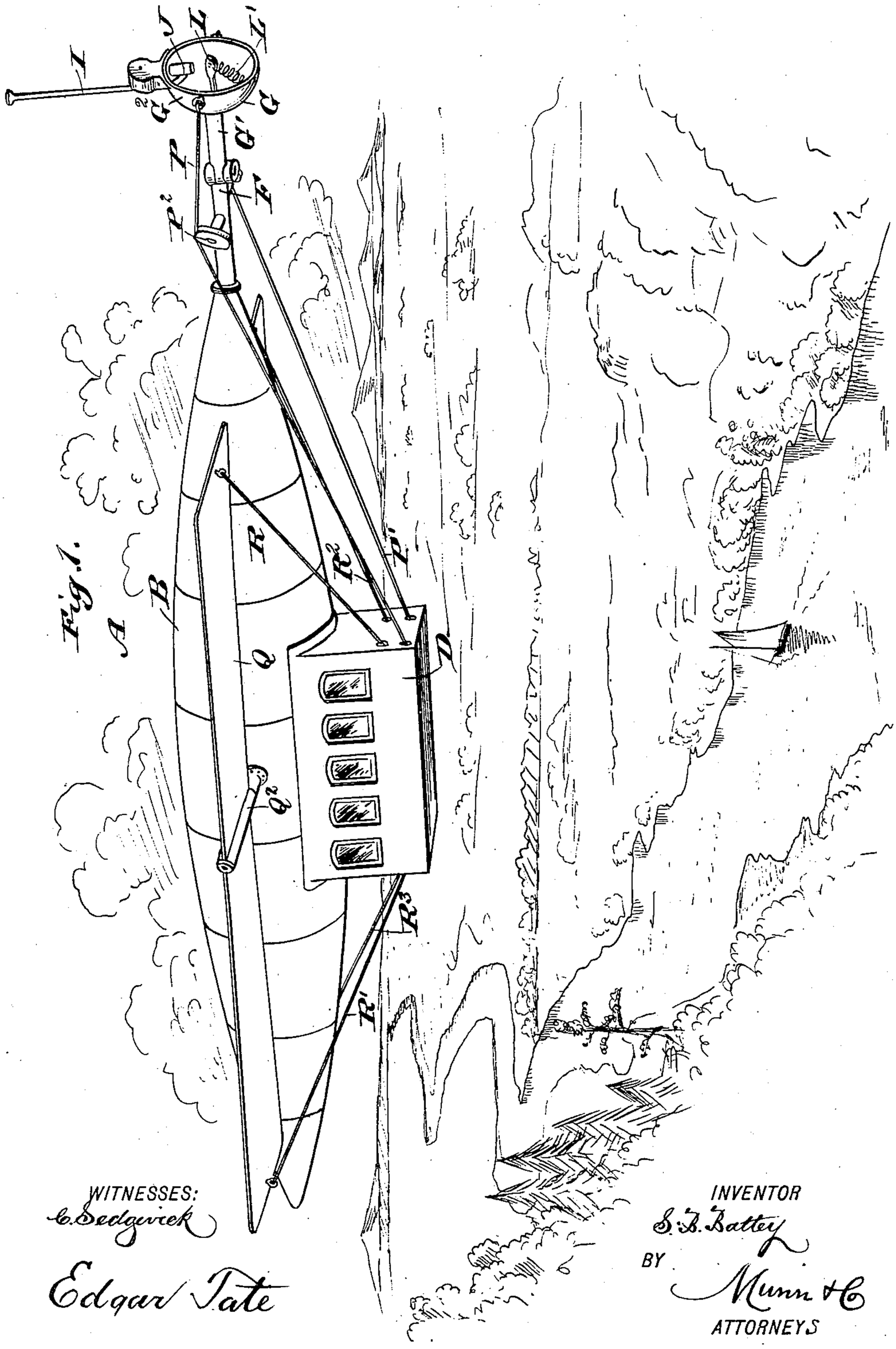

Fig. 1.

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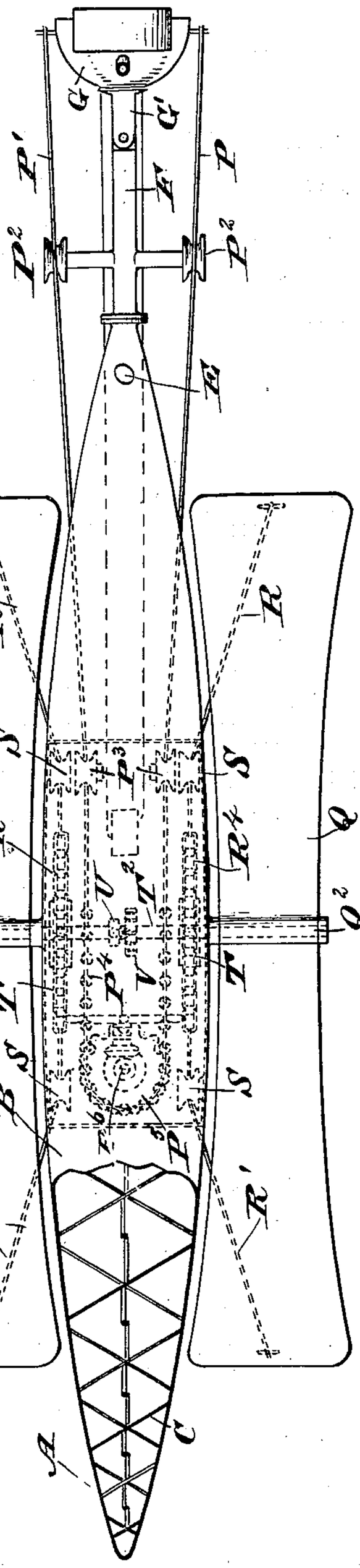

Fig. 2.

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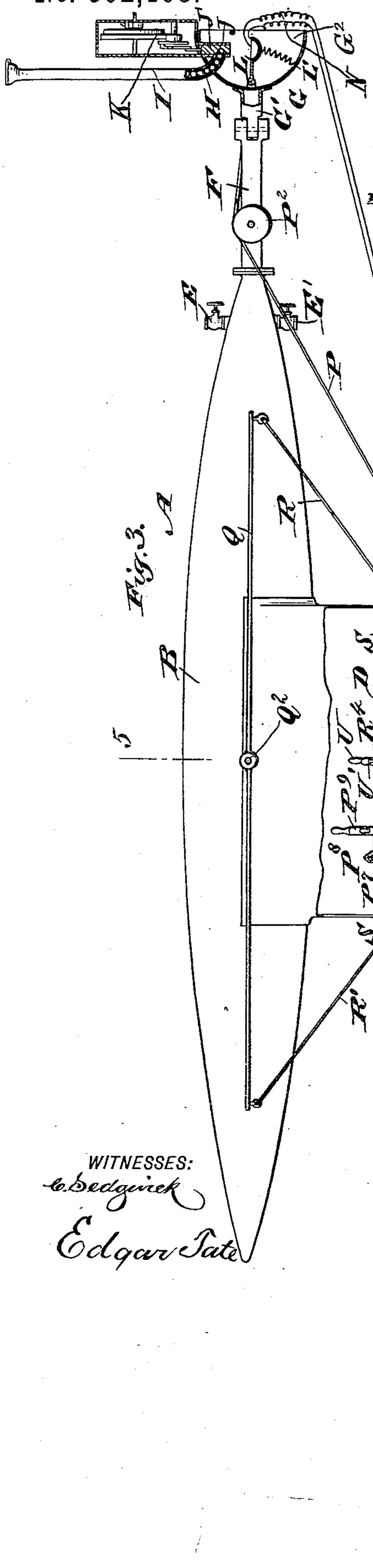

Fig. 3.

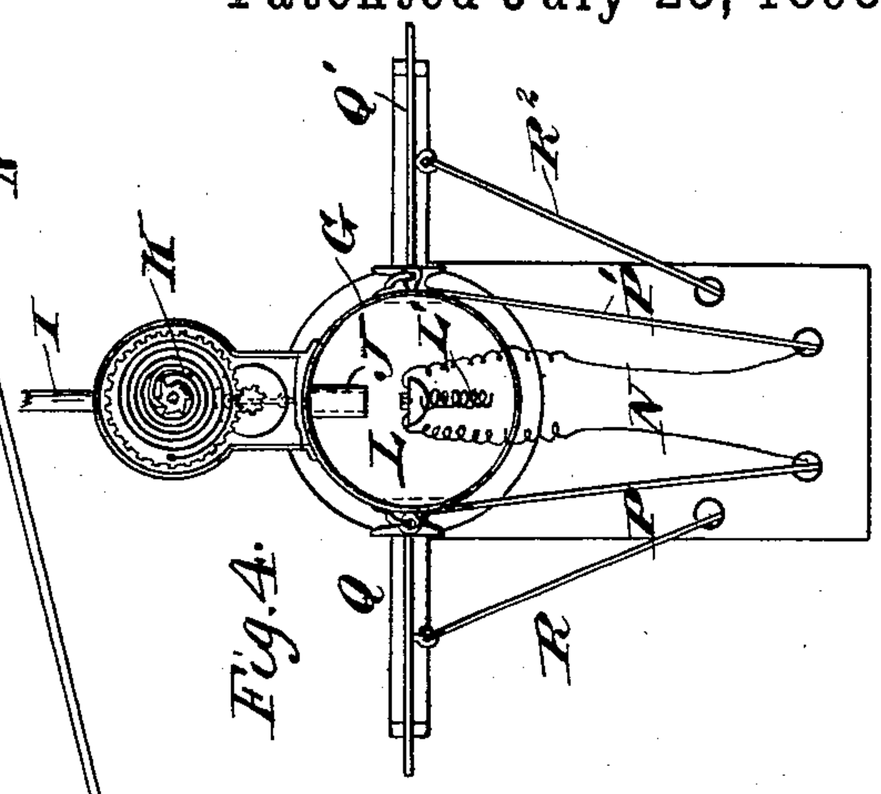

Fig. 4.

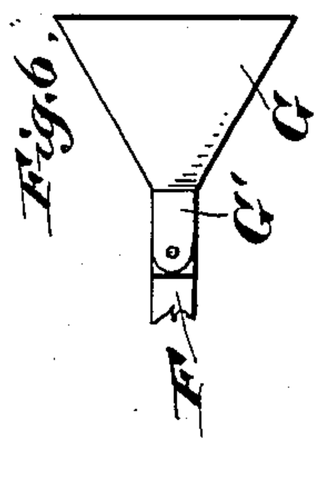

Fig. 6.

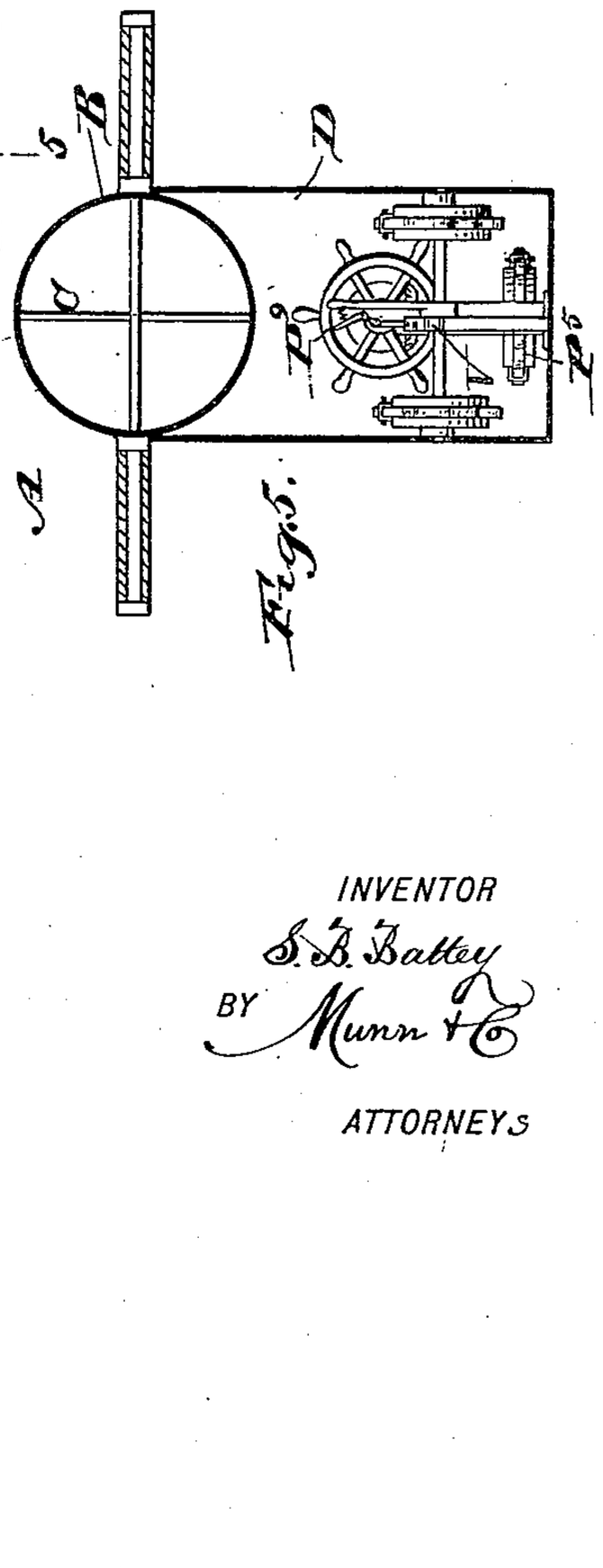

Fig. 5.

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UNITED STATES PATENT OFFICE.

SUMTER B. BATTEY, OF NEW YORK, N. Y.

AERIAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 502,168, dated July 25, 1893.

Application filed August 26, 1892. Serial No. 444,183. (No model.)

To all whom it may concern:

Be it known that I, SUMTER B. BATTEY, of the city, county, and State of New York, have invented a new and Improved Aerial Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved aerial machine which is extremely simple and durable in construction, arranged to be propelled at a high rate of speed and adapted to be easily steered in any desired direction.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the improvement. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the same with parts in section. Fig. 4 is a rear end view of the same. Fig. 5 is a transverse section of the same on the line 5—5 of Fig. 3; and Fig. 6 is a plan view of a modified form of propeller.

The improved aerial machine is provided with a balloon A, having a shell B preferably made in the shape of a double cone with the bases united, as plainly shown in the drawings. This shell B is preferably made of light sheet metal, such as aluminum and is strengthened inside by a suitable framework C, preferably composed of vertical and transversely disposed braces, as indicated in Fig. 2.

The balloon A supports, at its under side at or near the middle, a car or basket D provided in its sides and front end with windows, the said car being sufficiently large to accommodate navigators, passengers, freight, &c. In order to render the balloon buoyant in the air, I preferably exhaust the air in the shell B through a valved pipe E, held in the said shell and adapted to be connected with a suitable exhausting device for exhausting air from the shell at the time the latter is filled with gas. A second valved pipe E′ is also arranged on the shell and is adapted to be connected with a suitable source of gas supply to permit of filling the shell B with a suitable gas, such as hydrogen. The shell of the balloon being filled with gas, is sufficiently buoyant, so that it requires but little power to propel the balloon forward, or to steer the same in any desired direction.

In order to propel the machine I provide the following apparatus: On the rear end of the shell A is secured a bar F on which is pivoted an arm G′, mounted to swing transversely and supporting the propeller G provided with a holder or firing cup G^2 having its open base extending rearwardly, as plainly shown in the drawings. Explosions are caused in this cup-shaped holder G^2 by means of suitable explosives, preferably in the shape of pellets H fed into the said holder G^2 at suitable intervals and ignited therein to cause the explosion, the reaction of which in the holder G^2 causes a forward motion of the balloon A and the car D supported thereon. The pellets H of nitro-glycerine or other suitable explosive material, can be fed into the holder of the said propeller G by any suitable device, but I prefer the apparatus illustrated in the drawings and presently to be described. This feeding device is provided with a magazine feed pipe I, vertically disposed and slightly curved at its lower end, the said pipe being filled with pellets and opening at its lower end into a cylinder J, extending in and supported from the holder G^2 at or near the top thereof. In this cylinder J is mounted to slide a piston J′ formed with a recess for receiving a single pellet at a time from the pipe I. At the downward stroke this piston J′ carries a pellet downward to finally drop the pellet out of the casing J into the cup G^2 to be exploded therein. Any suitable mechanism may be employed to impart the necessary sliding motion to the piston J′ so as to move a single pellet at a time into the cup-shaped propeller, but I prefer a clock-work K of any approved construction, and connected with the said piston J′ to deliver a pellet at regular intervals to the holder G^2 of the propeller G. After the pellet leaves the cylinder J it drops into a receiver L pivoted within the holder G^2 and mounted yieldingly on a spring L′ so that the force of the explosion of the pellet does not injure the receiver L. The pellet discharged into the receiver L is fired by electricity and for this purpose, the said cup is connected by electric wires N with a battery O under the

control of the operator in the car D. When the pellet drops into the receiving cup L, it acts as a circuit closer for the wires N so that the electric charge will ignite the pellet and an explosion will take place, the reaction of the explosion in the propeller G causing a for ward motion of the aerial machine. The propeller G also acts as a rudder and serves for steering the balloon sidewise, and for this purpose the holder G^2 of the propeller is connected at opposite sides with cords or ropes P and P′ passing over pulleys P^2, journaled on suitable brackets extending from the bar F. The ropes P and P′ extend from the pulleys P^2 downwardly, and pass into the car D at the rear end thereof, the inner ends of the said ropes passing over pulleys P^3, and being connected with the ends of a sprocket chain P^4 passing around a sprocket wheel P^5 secured on a vertically disposed shaft P^6 mounted to turn in suitable bearings within the car D. On the upper end of the shaft P^6 is secured a bevel gear wheel P^7 in mesh with a bevel gear wheel P^8, fastened on a shaft carrying a hand wheel P^9, under the control of the operator within the car, so that on turning the said hand wheel, a rotary motion is imparted to the shaft P^6 by means of the gear wheels P^8 and P^7, and the motion of the shaft P^6 causes a traveling of the chain P^4 by the sprocket wheel P^5, so that a pull is exerted on one of the ropes P or P′, according to the direction in which the hand wheel P^9 is turned. This pull on the rope P or P′ causes a swinging of the arm G′ and the propeller G to one side, so that the propeller acts as a rudder and the balloon is caused to travel in the same direction.

In order to permit an ascent and descent of the aerial machine, I provide two steering wings Q and Q′, located on opposite sides of the shell B and pivoted on studs Q^2, projecting from the sides of the shell B at or near the middle thereof. The ends of the steering wings Q are connected with ropes or chains R and R′, and similar ropes R^2 and R^3 are connected with the ends of the other wing Q′. The ropes extend downwardly and through the ends of the car into the latter, to pass under pulleys S, as shown in Fig. 3, the ends of the ropes R and R′ being connected with each other by a sprocket chain R^4 and a similar sprocket chain R^5 connects the other ropes R^2 and R^3 with each other. The two sprocket chains R^4 and R^5 pass over the sprocket wheels T and T′ respectively, secured on a transversely-extending shaft T^2 journaled in suitable bearings within the car D. On the shaft T^2 is secured a lever U provided with a hand lever U′ adapted to engage a notch of a series of notches formed on a segment V, arranged concentric with the shaft T^2 and supported on a suitable bracket attached to the bottom of the car D. This device serves to lock the wings Q, Q′, in any desired position, either horizontally or inclined for the ascent or descent of the machine.

It will be seen that by disengaging the hand lever U′ from the respective notch on the segment V, the lever U can be moved forward or backward so as to turn the shaft T^2, the motion of the latter being imparted to the sprocket wheels T and T′, which thus impart a forward or backward traveling motion to the sprocket chains R^4 and R^5, according to the direction in which the lever U is moved. By moving the lever U forward, the wings Q and Q′ are swung upward at their forward ends and downward at their rear ends, for the ascent of the aerial machine, and when a rearward movement of the lever U is made, the wings Q and Q′ are caused to swing from their normal horizontal positions into an inclined position with the front ends downward and the rear ends upward, for the descent of the aerial machine. Thus, it will be seen that the aerial machine can be readily steered in any desired direction by the action of the steering wings Q and Q′, and the sidewise swinging motion of the propeller G. The devices for steering, as well as for causing the explosions, are fully under the control of the operator located within the car D.

I do not limit myself to any particular construction of mechanism for accomplishing the latter result, the main features being that pellets are exploded in a suitable cup or other vessel, so that the reaction of the explosion propels or drives the machine forward.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An aerial machine provided with a propeller comprising a cup-shaped holder pivoted on the rear end of the balloon and adapted to swing sidewise, a feed pipe secured on the said holder and containing explosive pellets, a feeding device connected with the lower end of said feed pipe to feed one pellet at a time from the pipe into the cup shaped holder, and a pellet receiver mounted yieldingly in the said holder, substantially as shown and described.

2. An aerial machine, provided with a propeller having a holder, and an explosive receiver mounted yieldingly in the said holder, substantially as shown and described.

3. An aerial machine provided with a propelling mechanism comprising a holder, a feed pipe for containing the explosives and connected with the said holder, an automatic delivery device for discharging the explosives one at a time from the pipe into the said holder, an igniting device for firing the explosive after its delivery to the holder, and a yieldingly mounted receiver arranged in the said holder and adapted to support the explosive for firing the same, substantially as shown and described.

SUMTER B. BATTEY.

Witnesses:
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EDGAR TATE.