H. B. SCHILLER.

FLYING MACHINE.

APPLICATION FILED JUNE 13, 1907.

901,486. Patented Oct. 20, 1908.

3 SHEETS—SHEET 1.

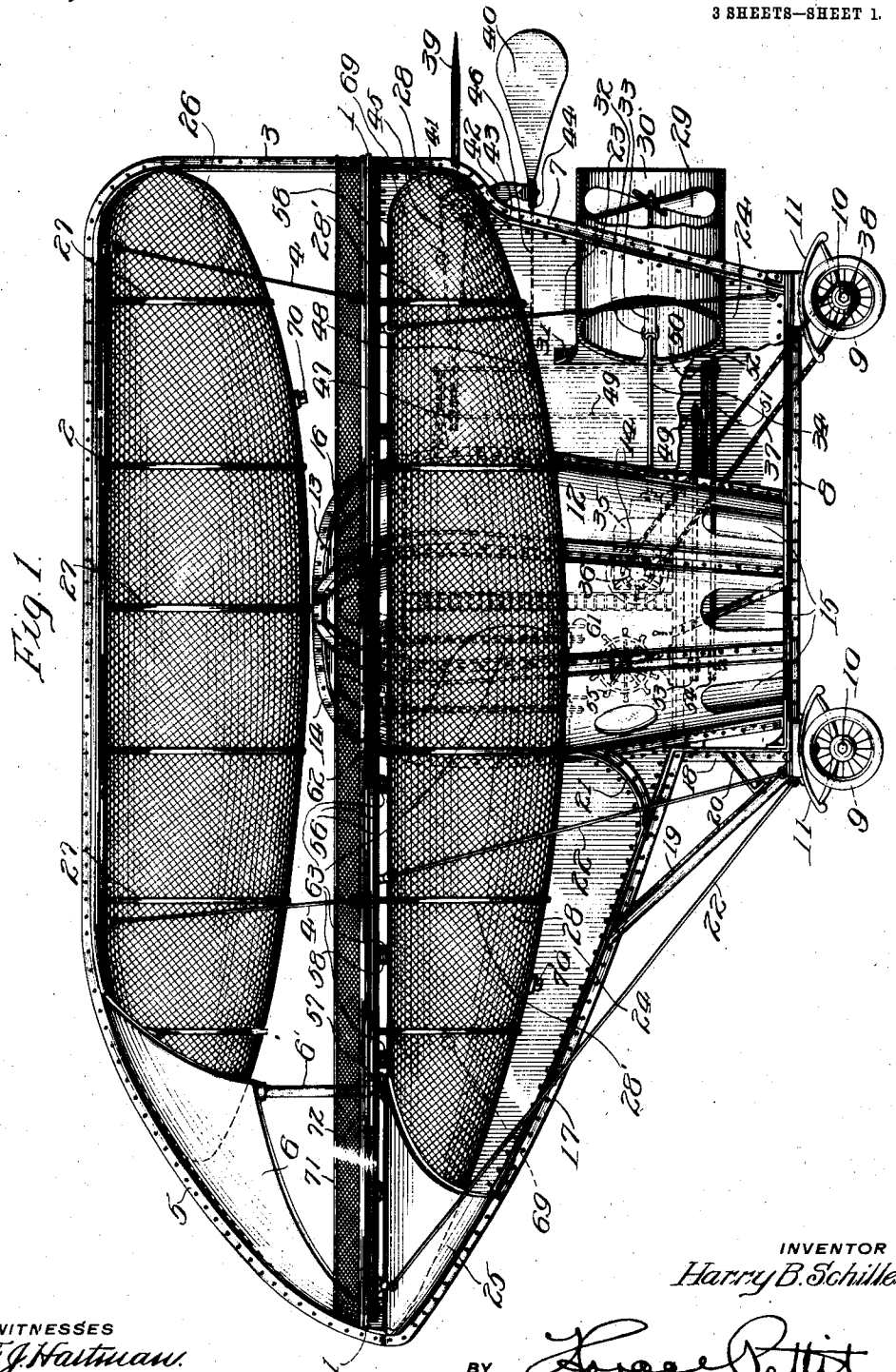


Fig. 1.

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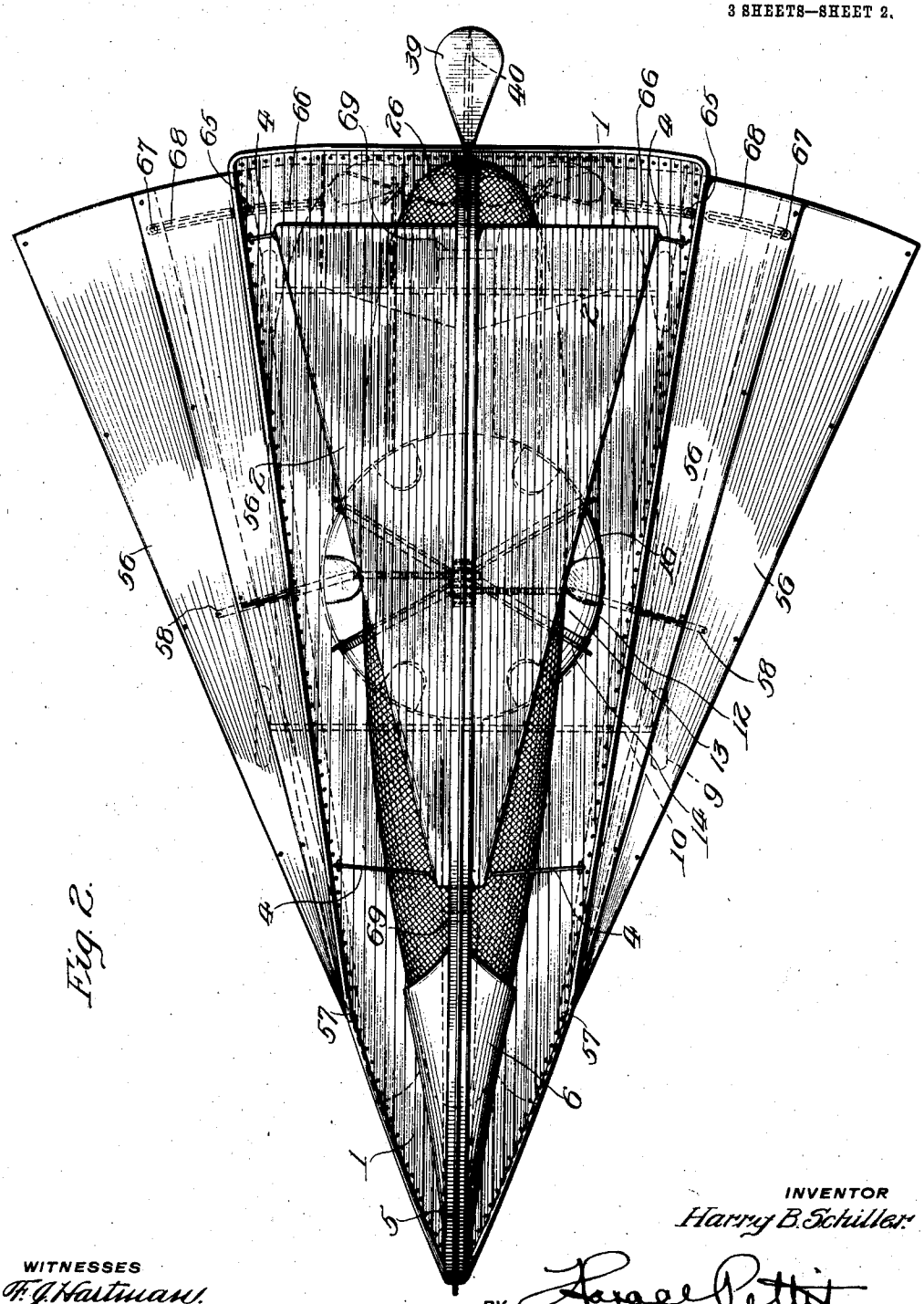


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

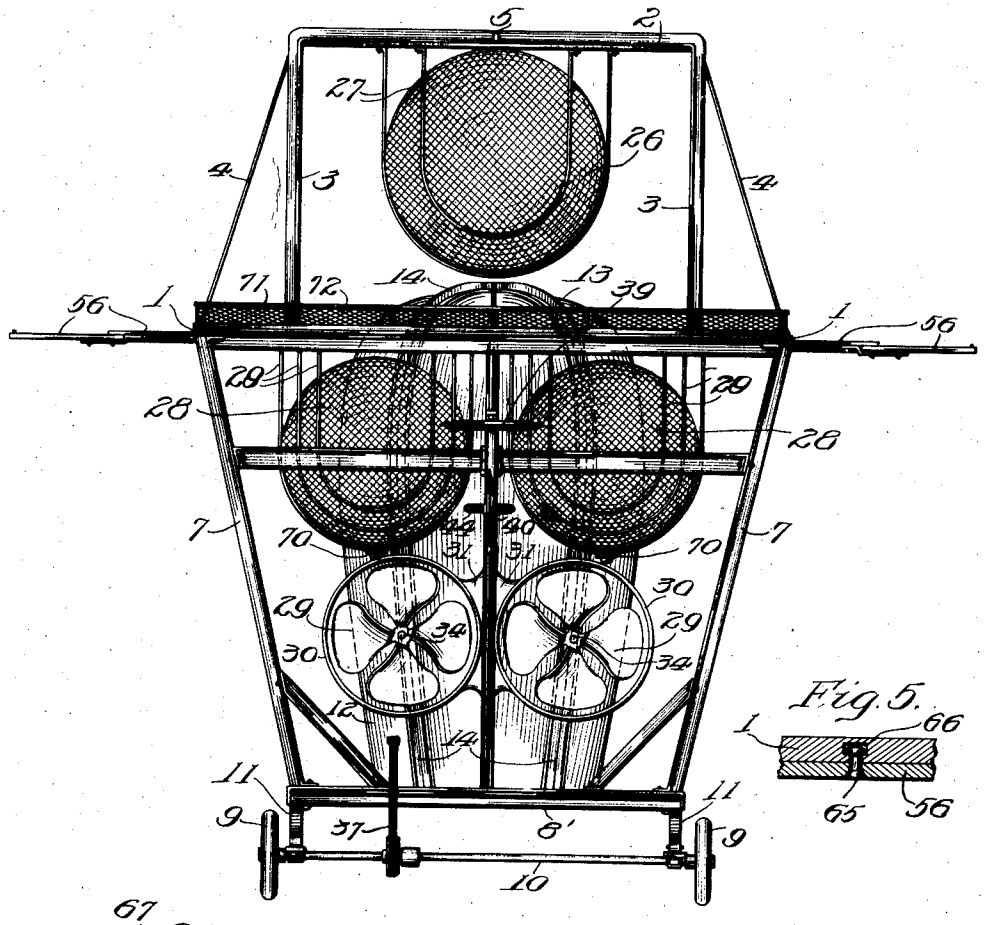


Fig. 5.

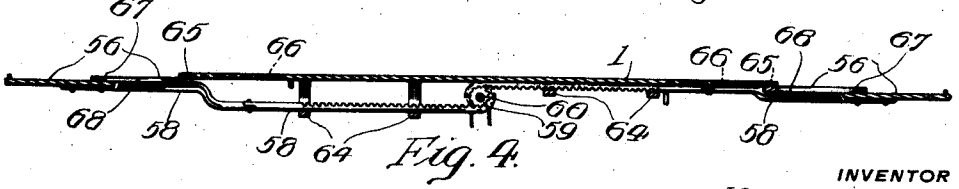


Fig. 4.

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UNITED STATES PATENT OFFICE.

HARRY B. SCHILLER, OF READING, PENNSYLVANIA.

FLYING-MACHINE.

No. 901,486. Specification of Letters Patent. Patented Oct. 20, 1908.

Application filed June 13, 1907. Serial No. 378,688.

To all whom it may concern:

Be it known that I, HARRY B. SCHILLER, a citizen of the United States, and a resident of Reading, State of Pennsylvania, have invented certain new and useful Improvements in Flying-Machines, of which the following is a full, clear, and complete disclosure.

The main objects of this invention are to provide a flying machine combining one or more balloons or gas tanks, and one or more aeroplanes with suitable propellers, rudders, and motor mechanism, so that the ship may be propelled and guided in any direction through the air; to provide a machine that will offer a minimum resistance to the air in its flight; to provide a machine with supplementary aeroplanes or wings, which may be extended laterally when it is desired to present extended planes to the atmosphere for facilitating navigation or in case of accident to have the planes act as a parachute to prevent a too rapid descent of the ship; to provide the machine with a novel form and arrangement of car for the convenience and safety of passengers; to provide wheels for the machine arranged to support it in starting and stopping its motion upon the ground, the wheels being suitably connected to the motor mechanism of the machine, so that the machine may be propelled either upon land or in the air; and to provide other improvements as will appear hereinafter.

In the accompanying drawings Figure 1 represents a side elevation of a flying machine built in accordance with my invention; Fig. 2 a top plan view of the same; Fig. 3 an end elevation of the same; Fig. 4 a transverse sectional detail showing the means for operating the supplementary lateral planes of the machine; and Fig. 5 a sectional detail of the pin and groove constructions connecting the supplementary planes.

Referring to the drawings, the machine, as herein embodied, comprises a substantially triangular main aeroplane or deck 1, extending longitudinally and horizontally of the machine, the pointed end constituting the front or bow of the machine. Above and parallel to this is a somewhat smaller aeroplane 2, supported from the lower aeroplane by means of the rear vertical standards 3, and front and rear tie-rods 4, and the forwardly and downwardly extending front brace 5, carrying shield 6 supported by the side standards 6′.

Suspended from the main deck 1 by means of the rear side braces 7 and by a frame-work extending from the bow of the plane downwardly and rearwardly is a lower horizontal rectangular frame-work of side beams 8 and transverse beams 8′, the forward end of this lower frame being covered over to form the floor of the car of the machine, and this lower frame-work is supported upon four wheels 9 of the automobile type, carried upon suitable axles 10 and springs 11, and provided with the usual steering gear and a steering wheel located in the car of the machine. This steering gear for the wheels forms no part of this invention, and therefore is not shown. The car 12 is centrally arranged in the machine upon the floor carried by the lower frame of the car, already described, and is approximately cylindrical in shape, having a domed top 13 extending through an aperture of the main plane or deck of the machine. The sides and top of the car are constructed of longitudinal ribs 14 supporting a suitable covering, and provided at the lower part of the car with the doors 15, and at the upper part of the car with the openings 16 to the main deck.

The frame-work referred to, which supports the forward end of the floor of the car, comprises a main brace 17, extending rearwardly and downwardly from the bow of the machine to a point adjacent the forward side of the car, and just above the forward end of the lower supporting frame, where it is secured to one of the ribs of the car. From this point a vertical brace 18 extends downwardly, and has its lower end secured to the transverse beam 8′ of the lower frame. Between the diagonal brace 17 and its vertical supporting brace 18 extend the angular braces 19 and 20, and between the brace 17 and adjoining the rib of the car is a curved brace 21. Tie-rods 22 connect the forward end of the lower frame with forward portions of the main deck, and tie-rods 23 connect the rear end of the lower frame with rear portions of the main deck. The central spaces between the car and the frame-work of the machine are covered by any suitable sheathing 24, such as sheet aluminum arranged in two thicknesses, one on each side of the frame-work with an intervening nar-

row space. This sheathing stiffens the frame of the machine and also furnishes a space through which the steering mechanism may be operated from the car. At the forward end of the frame-work between the forward edges of the main deck upon each side, and the centrally downwardly extending supporting brace 17 supporting the lower frame are wind shields 25.

Arranged centrally and longitudinally of the machine and secured to the lower side of the upper plane is a substantial cigar shaped balloon or gas tank 26, the point of which extends forward under the forward shield 6. Straps 27 secure this balloon to the under side of the upper plane. Upon each side of the machine in the angles formed between the main plane and the central sheathing of the machine are similar balloons 28 secured to the main plane by the straps 28', and extending at their forward ends into the inclosures of the forward shields 25. These lower balloons fit close within the angles of the machine and are recessed centrally to conform to the shape of the sides of the car.

The steering and propelling mechanisms of this machine are arranged to be actuated and controlled from the car. The propelling mechanism comprises two propellers 29 arranged in the rear and upon opposite sides of the machine, inclosed in cylindrical casings 30, open at each end and secured to the central frame of the machine by brackets 31. These propellers are journaled in bearings 32, which are carried by cross bars 33 of the casings. The shafts 34 carrying the propellers in these bearings extend through the rear side of the car, and are connected within the car to a suitable motor 35. This motor may be of the ordinary internal combustion type or any other class preferred, and the propellers' shafts are connected to the motor by clutches or any other suitable mechanism, the details of which being old are not shown herein. Attached also to the motor by any of the well-known forms of clutches is a sprocket wheel 36 carrying a chain 37, and extending over a sprocket 38 upon the rear axis of the supporting wheels. By this means the motor may be used to drive the propellers and wheels either separately or simultaneously. The propellers are inclosed in cylindrical casings to increase their efficiency by confining the air, thereby offering a greater resistance to their action.

The steering mechanism of the machine is arranged centrally above and between the propellers and comprises upper and lower planes or rudders 39 and 40 respectively, the upper plane being arranged horizontally and upon a shaft 41 horizontally pivoted in a bracket 42 to the central frame of the machine, and the lower plane being arranged vertically upon a vertically pivoted shaft in the lower end of the bracket 42. These rudders are controlled by means of sprocket wheels 43 and 44 connected to the supporting shafts of the rudders and carrying sprocket chains 45 and 46 respectively, which extend over corresponding sprocket wheels 47 and 48, arranged on the upper ends of vertical shafts 49 and 50 supported upon the inner frame-work of the machine, and controlled by sprockets 51 and 52 at the lower ends of the shafts, having chains extending through the side of the car, and over sprocket wheels 53 and 54 respectively upon separate vertical shafts within the car, operated by independent hand-wheels 55. By this arrangement of steering-gear, the horizontal and vertical rudders are operated independently to guide the machine vertically or horizontally in any direction. This machine is so proportioned that the balloons when filled will nearly but not quite lift the machine when loaded with the weight of passengers or ballast, which it is designed to carry. The driving force of the propellers in conjunction with the lifting force of the upper and lower aeroplanes, when properly directed by means of the steering mechanism is designed to lift the machine into the air, and to drive it in any desired direction.

Supplementary triangular over-lapping aeroplanes 56 are arranged upon each side of the machine and pivoted at their pointed ends to the opposite edges of the forward part of the main plane of the machine, upon the under side thereof by the pivots 57. The lower supplementary planes are pivotally connected to the outer ends of jointed rack bars 58, extending upon their under sides inwardly, the inner ends of the bars extending respectively above and below a centrally arranged pinion 59 upon a shaft 60 supported centrally of the machine within the car and arranged to be turned in either direction by means of a hand-wheel 61 and intervening sprockets 62, and a sprocket chain 63 to drive the racks transversely in or out to retract or to extend the supplementary planes. The inner ends of the rack bars are slidably connected to the under side of the deck or plane by straps or loops 64. The upper supplementary planes are slidably connected to the under side of the deck by means of headed pins 65, sliding in flanged slots 66 and the lower supplementary planes are slidably connected to the under sides of the upper supplementary planes by similar pins 67 and slots 68, the pin and slot arrangement being shown in cross section in Fig. 5. Ordinarily these planes are held in their inner position beneath the main plane of the machine, but when it is desired to extend the aerial planes for coasting or to act as a parachute, the plane may be extended by turning the hand-wheel.

The lower balloons are connected by tubes 69 forming communicating passages, so that

in case one balloon should be punctured, the machine will not be unbalanced, as both balloons will empty at the same time, and the balloons are also provided with the usual valves 70 whereby they may be filled. A rail 71, and netting 72 are also shown extending around the edges of the main plane or deck.

While I have shown this invention as embodied in a particular form, yet I do not wish to be limited to this exact form, as it is evident that modifications can be made in the shape and proportions of the machine, and in the details of construction without departing from the spirit of this invention or the scope of its claims.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States, is:

1. In a flying machine, the combination with a triangular aeroplane, of a car depending centrally therefrom, and balloons depending from the said plane upon opposite sides thereof, the uppermost surfaces of said balloons being beneath the under surface of said aeroplane and substantially parallel thereto.

2. In a flying machine, the combination with a horizontal aeroplane, of a car depending centrally therefrom and having a dome extending through an aperture in said plane, and balloons depending from said plane upon opposite sides thereof inclosing a portion of said car.

3. In a flying machine, the combination with a horizontal aeroplane, of a car depending centrally therefrom balloons depending from said plane upon opposite sides thereof, supplementary overlapping aeroplanes pivoted to the first mentioned aeroplane, and means for swinging said supplementary aeroplanes laterally in and out from said first mentioned aeroplane in substantially the same plane therewith.

4. In a flying machine, the combination with a horizontal aeroplane, of a car depending centrally therefrom, balloons depending from said plane upon opposite sides thereof, supplementary aeroplanes pivoted to the first mentioned aeroplane, means for swinging said supplementary aeroplanes laterally in and out from said first mentioned aeroplane in substantially the same plane therewith, said means comprising racks attached to said supplementary aeroplanes, pinions engaging said racks and means to rotate said pinions.

5. In a flying machine, the combination with a horizontal aeroplane, of a car depending centrally therefrom, balloons depending from said plane upon opposite sides thereof, an aeroplane arranged above said first mentioned plane, and a balloon extending longitudinally and centrally upon the under side of said upper aeroplane.

6. In a flying machine, the combination with a horizontal aeroplane, of a car depending centrally therefrom, balloons depending from said plane upon opposite sides thereof, an aeroplane arranged above said first mentioned plane, a balloon extending longitudinally and centrally upon the under side of said upper aeroplane, and shields carried by said aeroplanes inclosing the said ends of said balloons.

7. In a flying machine, a horizontal aeroplane, a frame depending therefrom, a car supported in said frame, spaced coverings for said frame extending longitudinally of the machine between the rear edge thereof and the rear side of said car, steering blades arranged in the rear of said frame, and mechanism for controlling said blades, said mechanism extending through the space between said covering and into the car.

8. In a flying machine, the combination with a horizontal aeroplane, of a frame depending therefrom, a car supported in said frame, spaced coverings for said frame between the rear edge thereof and the rear side of the said car, and cylindrical casings containing propellers mounted upon said coverings upon opposite sides of said machine.

9. A flying machine comprising an aeroplane, a pair of oblong balloons having axes converging forwardly towards said aeroplane, wheels for supporting the machine, a motor, a propeller and means between the motor and the propeller and between the motor and the wheels whereby the motor may be used to drive either the propeller or the wheels.

10. In a flying machine, the combination with a horizontal aeroplane, of a frame depending therefrom, a car supported in said frame, balloons arranged upon opposite sides of and beneath said aeroplane, a spaced partition between said balloons and covering the rear portion of said frame, independent horizontal and vertical blades pivoted at the rear end of said frame to guide said machine, sprockets attached to said blades, vertical shafts extending in the space between said partitions and having sprockets at each end, chains between the sprockets at the upper end of said shaft and the sprockets upon said blades, and chains upon the sprockets at the lower ends of said shafts extending into the said car, and independent steering wheels within said car to actuate said latter chains separately in either direction to control the said blades.

11. In a flying machine, the combination with a triangular aeroplane, of a frame depending therefrom, a car supported in said frame and having a dome extending through an aperture in said aeroplane, a second triangular aeroplane arranged above the first aeroplane, frame work between said aero-

planes, a substantially cigar shaped balloon extending beneath and longitudinally of the upper aeroplane, substantially cigar shaped balloons extending upon opposite sides and beneath the lower aeroplane, said latter balloons being recessed to inclose the sides of the car, shields supported upon said machine covering the forward ends of the balloons, central vertical spaced coverings extending from the forward and rear edges of the frame to the forward and rear sides of the car respectively, steering mechanism and propelling mechanism supported upon said frame beneath said lower aeroplane, means within the car for actuating said steering and propelling mechanism, wheels supporting said machine, and a chain, sprockets and clutch mechanism connecting said wheels to said motive power, supplementary triangular planes hinged to the opposite edges of said lower aeroplane, and means depending from said car for swinging said planes laterally in or out with respect to said machine, substantially as described.

12. In a flying machine, the combination with an aeroplane, of a balloon connected thereto, supplementary overlapping aeroplanes pivoted at one end to the first mentioned aeroplane, and means to swing said supplementary aeroplanes in and out from the edge of the first mentioned aeroplane.

13. In a flying machine, the combination with a triangular aeroplane, of a supplementary aeroplane pivoted to the side of the said triangular aeroplane, and means for swinging said supplementary plane outwardly upon its pivot, said means comprising a rack attached to said supplementary aeroplane, a pinion engaging said rack, and means to rotate said pinion.

14. In a flying machine, the combination with an aeroplane, of supplementary aeroplanes pivoted to the opposite sides of the said aeroplane, and means for swinging said supplementary planes outwardly upon their pivots, said means comprising oppositely facing racks attached to said supplementary aeroplanes, a shaft carrying pinions engaging said racks and means to rotate said shaft whereby said supplementary planes are simultaneously actuated.

15. In a flying machine, the combination with an aeroplane, of balloons arranged upon each side thereof, a second aeroplane arranged above said first mentioned plane, a balloon extending longitudinally and centrally of said upper aeroplane, and means carried by said planes to propel said machine.

16. In a flying machine, the combination with two aeroplanes, of a balloon intermediate of said planes, and a shield connecting the adjacent ends of said planes and covering the forward end of said balloon.

17. The combination with an aeroplane converging forwardly, of a pair of oblong balloons arranged longitudinally of said plane and having axes converging toward the apex of said plane, the uppermost surfaces of said balloons being beneath and adjacent the under surface of said aeroplane and being substantially parallel thereto.

18. A flying machine comprising an aeroplane and a pair of oblong balloons beneath said aeroplane having axes converging forwardly and toward said aeroplane.

19. In a flying machine, the combination with a horizontal aeroplane, of a car depending centrally therefrom, balloons depending from said car upon opposite sides thereof, said balloons conforming to the shape of the car and inclosing a portion thereof, a frame secured to said aeroplane, wheels supported by said frame at the lower side thereof, propellers carried by said frame, a motor supported within said car and clutch mechanism between the propellers and the motor and between the wheels and the motor whereby the motor may be used to drive either the propeller or the wheels, or both.

20. In a flying machine the combination with an aeroplane of a car depending centrally therefrom and balloons depending from the said plane upon opposite sides, the upper surfaces of said balloons being beneath the under surface of said aeroplane.

21. In a flying machine the combination with an aeroplane of a car depending centrally therefrom and balloons depending from the said plane upon opposite sides, the upper surfaces of said balloons being beneath the under surface of said aeroplane and means of communication between said balloons.

22. In a flying machine the combination with a balloon of an aeroplane and a shield secured to said aeroplane and inclosing a portion of said balloon.

23. In a flying machine, the combination with a main aeroplane of supplementary aeroplanes overlapping each other, and secured to said main aeroplane and means to move said supplementary aeroplanes in and out with respect to said main aeroplane.

In witness whereof I have hereunto set my hand this sixth day of June, A. D., 1907.

HARRY B. SCHILLER.

Witnesses:

CHAS. A. SCHAUFERT,

IRVIN E. HOERECK.

Corrections in Letters Patent No. 901,486.

It is hereby certified that in Letters Patent No. 901,486, granted October 20, 1908, upon the application of Harry B. Schiller, of Reading, Pennsylvania, for an improvement in "Flying-Machines," errors appear in the printed specification requiring correction, as follows: In lines 125–126, page 2, the clause "when it is desired to extend the aerial planes" should be stricken out; line 127, same page, the word "plane" should read *planes;* line 74, page 3, the word "said," second occurrence, should read *front*, and line 114, page 4, after the word "aeroplane," the words *and to each other* should be inserted; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of December, A. D., 1908.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.