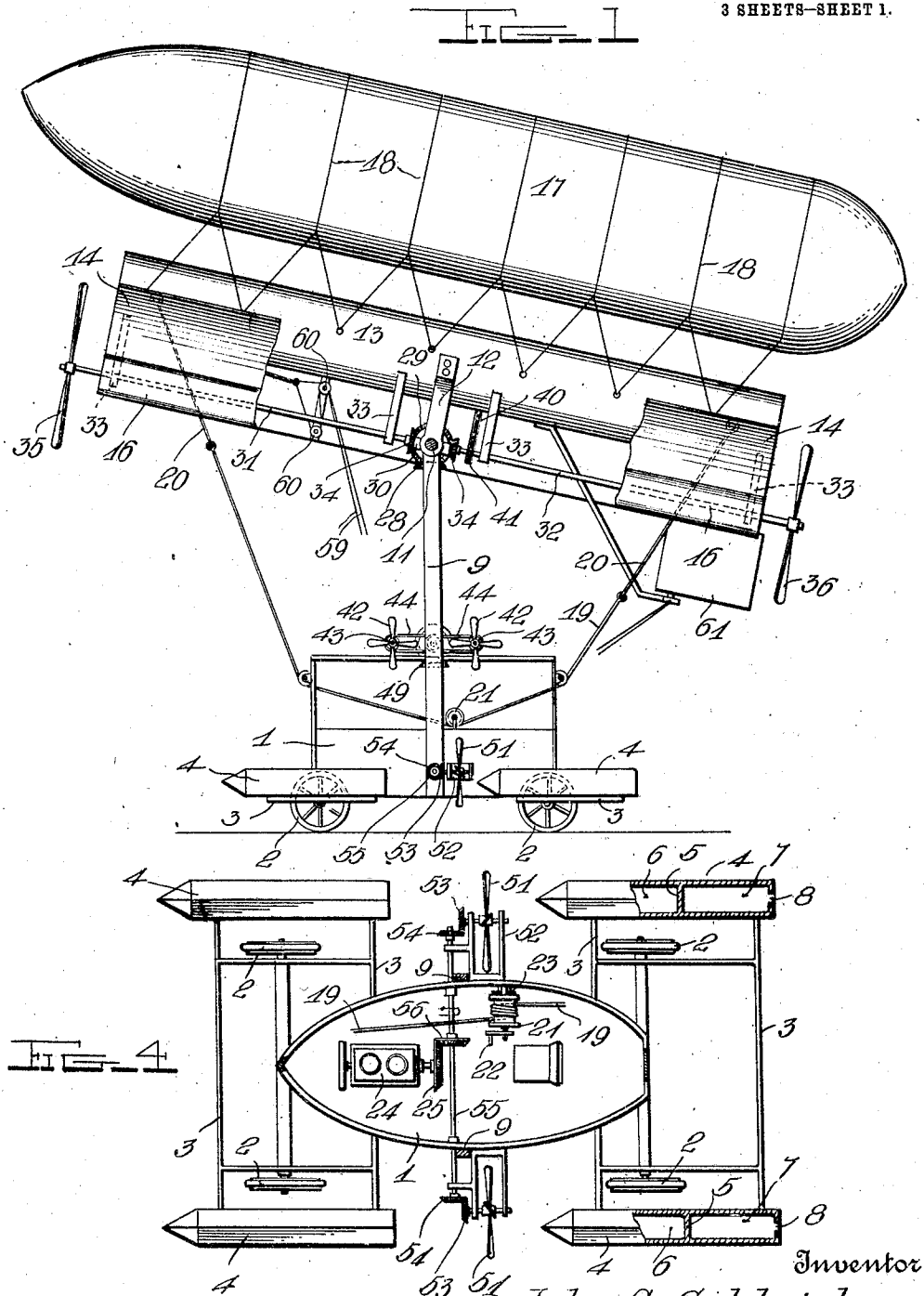


J. C. SCHLEICHER.  
FLYING MACHINE.  
APPLICATION FILED FEB. 28, 1910.

998,553.

Patented July 18, 1911.

3 SHEETS-SHEET 1.



Witnesses

*E. H. Grisham*  
*E. H. Grisham*

Inventor  
*John C. Schleicher*

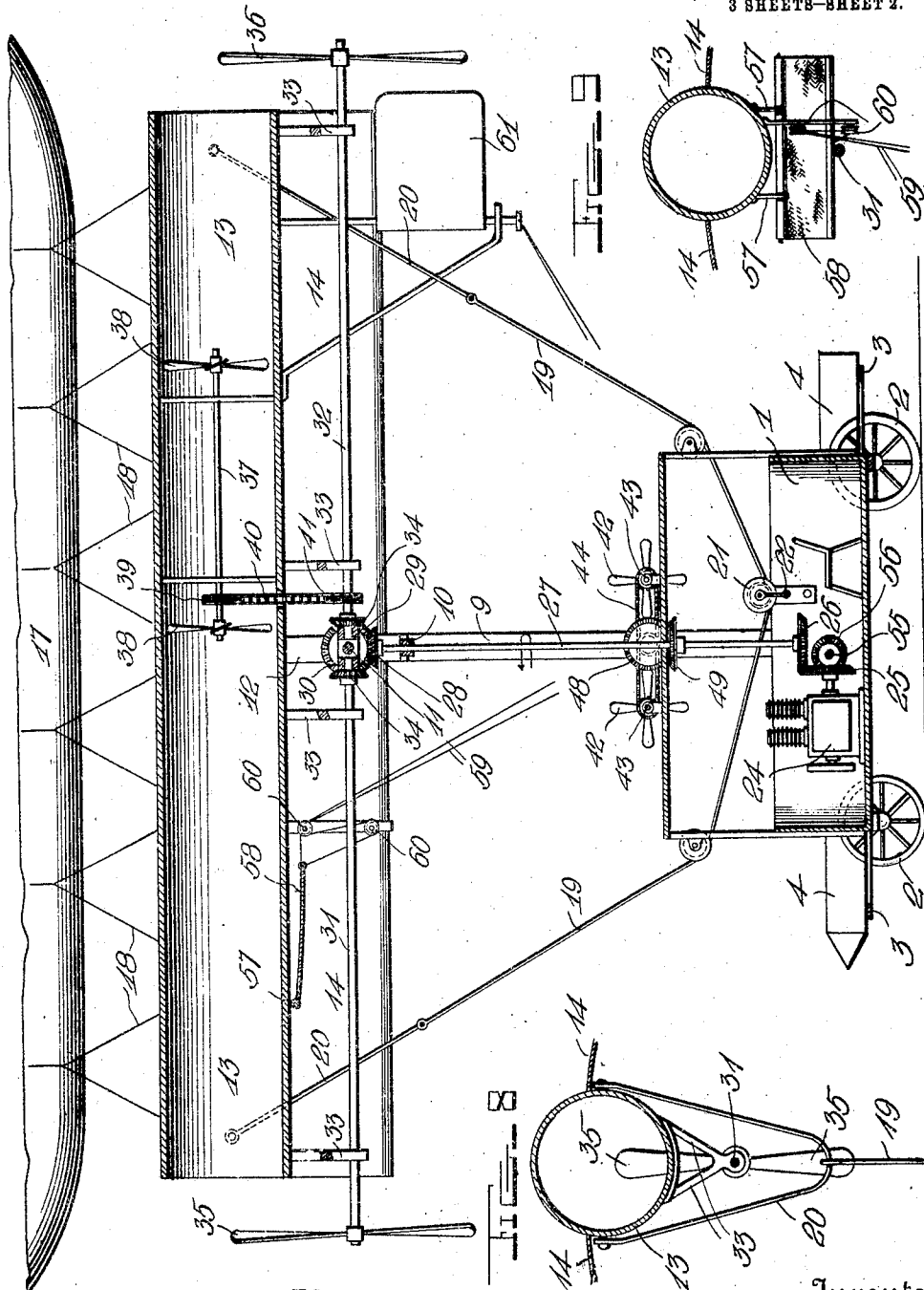
by *A. B. Wilson & Co.*  
Attorneys

J. C. SCHLEICHER.  
FLYING MACHINE.  
APPLICATION FILED FEB. 28, 1910.

998,553.

Patented July 18, 1911.

3 SHEETS—SHEET 2.



Witnesses

*W. H. G. G. G.*  
*C. H. G. G. G.*

Inventor

*John C. Schleicher*

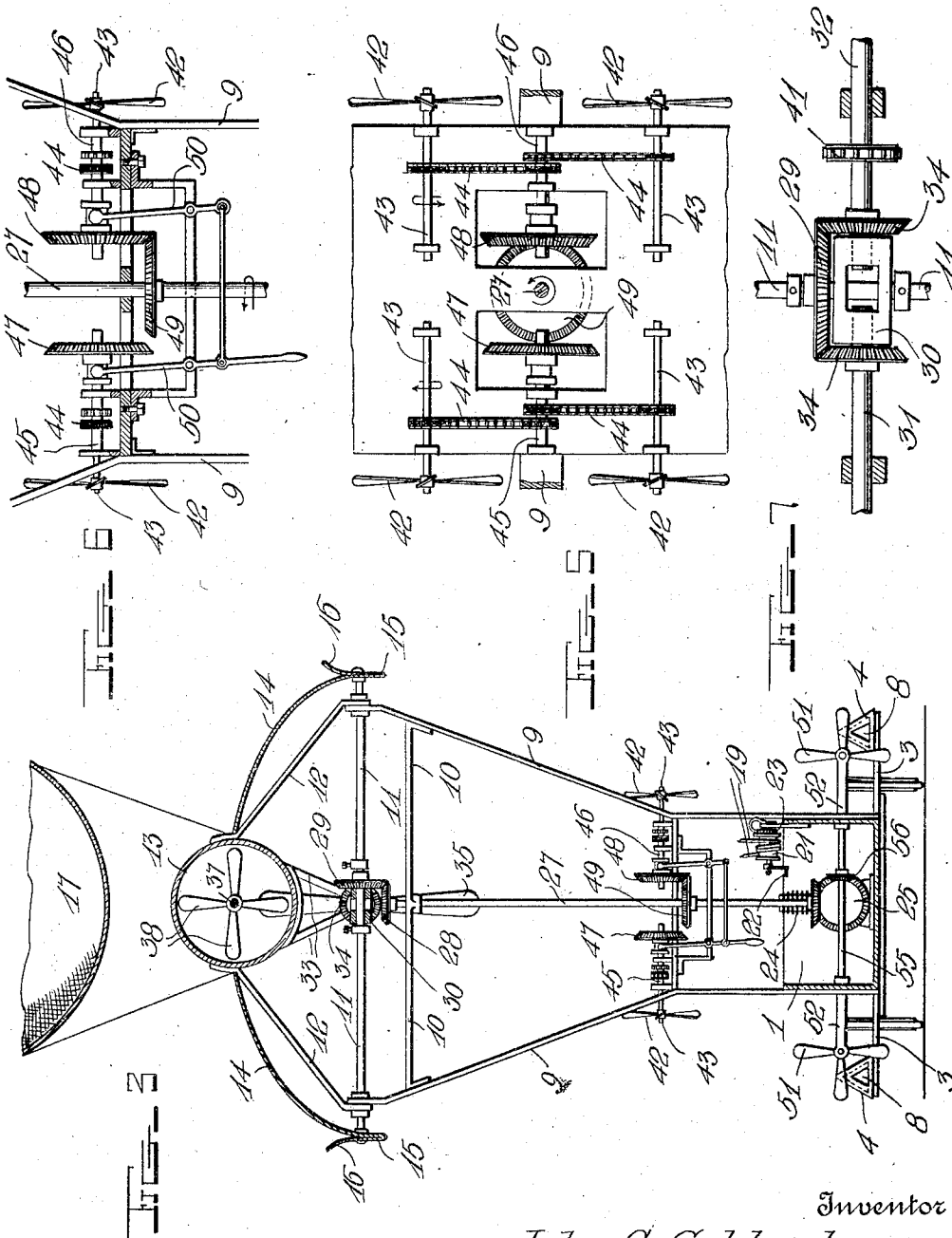
by *A. B. Wilson & Co.*  
Attorneys

J. C. SCHLEICHER.  
FLYING MACHINE.  
APPLICATION FILED FEB. 28, 1910.

998,553.

Patented July 18, 1911.

3 SHEETS—SHEET 3.



Witnesses

*C. H. Griesbauer*

Inventor  
*John C. Schleicher*

by *A. B. Wilson & Co.*  
Attorneys

# UNITED STATES PATENT OFFICE.

JOHN C. SCHLEICHER, OF MOUNT VERNON, NEW YORK.

## FLYING-MACHINE.

998,553.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed February 28, 1910. Serial No. 546,481.

*To all whom it may concern:*

Be it known that I, JOHN C. SCHLEICHER, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Flying-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in flying machines.

One object of the invention is to provide a flying machine having an improved construction and arrangement of propellers and an improved arrangement of aeroplane which is adapted to serve as a parachute when the machine descends.

Another object is to provide a machine having a balloon and means whereby the balloon, the propellers and aeroplane may be tilted up or down longitudinally to facilitate the raising and lowering of the machine, and having means to retard the backward movement of the machine when descending with the parts in an upwardly tilted or inclined position.

A further object is to provide an improved construction of car mounted on supporting wheels and having means for safely floating the same should the machine descend onto a body of water.

Still another object is to provide means whereby the machine may be turned to the right or left to avoid obstructions when making a landing.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side view of the machine showing the supporting and propelling mechanism arranged at an angle for making an ascent; Fig. 2 is an enlarged vertical longitudinal sectional view of the machine; Fig. 3 is a vertical cross sectional view of the same; Fig. 4 is a horizontal sectional view through the lower portion of the machine showing more particularly the means for floating the same; Fig. 5 is a plan view of the propellers and their operating mechanism for turning the machine to the right or left to avoid obstruc-

tions when making a landing; Fig. 6 is a side view of the gearing shown in Fig. 5 illustrating the manner in which the latter is controlled to operate the propellers on either side of the machine; Fig. 7 is an enlarged plan view of the gears for operating the main propellers; Fig. 8 is a detail sectional view through the propeller tube showing the manner in which the tilting cable is connected thereto; Fig. 9 is a cross sectional view through the propeller tube showing the arrangement of the blade or pocket by means of which the backward movement of the machine is retarded.

In the illustrated embodiment of the invention, I provide a car 1, the lower portion of which is of water tight construction, while the upper portion is in the form of an open frame. The car 1 is mounted on supporting wheels 2 and has attached to its front and rear ends frames 3 to the outer sides of which are connected front and rear pairs of pontoons 4, which are here shown and are preferably of triangular shape in cross section and are divided intermediate their ends by a transverse partition 5, which forms in the forward end of the pontoons air chambers 6 and in the rear ends water chambers 7 which are provided with water inlet and discharge passages 8 whereby, when the machine descends on a body of water, said water chambers will fill and form a ballast and, when the machine ascends, said water will run out of the openings 8 in the rear ends of the pontoons. The car 1 is preferably of substantially elliptical shape and is pointed at its forward end, as shown, to offer the least resistance to the air pressure when the machine is moving in a forward direction.

To the upper portion of the car frame are secured the lower ends of centrally disposed upwardly projecting inclined connecting bars 9, which are secured together near their upper ends by a horizontal cross brace 10. In the upper ends of the connecting bars 9 is arranged a transversely disposed shaft 11, with which adjacent the upper ends of the bars 9 are pivotally connected upwardly and inwardly projecting supporting bars 12 to the upper ends of which is secured a longitudinally disposed propeller tube 13. To the opposite sides of the tube 13 are connected the inner edges of laterally projecting downwardly curved aeroplanes 14, the lower edges of which are reinforced or strengthened.

ened by being bent or doubled upwardly upon themselves, as shown at 15, said upwardly bent edges being curved outwardly to a slight extent to form air resisting blades 16, which aid in keeping the machine in a straight course, as will be understood. The opposite ends of the shaft 11 project through the doubled lower edges of the aeroplanes, said double edges being secured to and  
10 braced by said projecting ends of the shaft.

Arranged above the propeller tube 13 is a balloon or gas bag 17 which is held in position and secured to the tube 13 by a series of suitably arranged fastening cords 18.  
15 The balloon 17 is not absolutely essential to the operation of the machine, but is provided as a means for sustaining the weight of the car and propelling mechanism whereby the latter may be employed entirely for the propulsion of the machine and need not  
20 be used for raising the same. By pivotally connecting the supporting bars 12 with the ends of the shaft 11, the propeller tube 13, aeroplanes 14 and the balloon 17 may be tilted up or down longitudinally to any desired angle. In order to tilt these parts, when desired, I provide tilting cables 19, the outer ends of which are connected by  
25 yokes 20 to the opposite sides of the propeller tube 13 adjacent its opposite ends. The cables 19 pass around suitable guide pulleys and are connected at their inner ends to and adapted to be wound in opposite directions upon a winding drum 21 arranged  
30 in the car within convenient reach of the operator and provided with a suitable handle 22 and a pawl and ratchet locking mechanism 23, whereby the drum is held against retrograde movement, thus holding the propeller tube and the parts connected there-  
35 with at the desired angle of inclination.

In the car 1 is arranged a suitable motor 24 on the drive shaft of which is arranged a beveled gear 25, which is operatively engaged with a similar gear 26 mounted on  
40 the lower end of a vertically disposed drive shaft 27, suitably mounted in the top of the car and in the cross brace 10 and having on its upper end a beveled gear 28, which is engaged with a similar gear 29 loosely  
45 mounted on the shaft 11. On the shaft 11 is arranged a bearing block 30 in the opposite ends of which are journaled the inner ends of longitudinally disposed propeller  
50 shafts 31 and 32, which are revolubly mounted in suitable hangers 33, secured to the lower side of the propeller tube 13. On the inner ends of the shafts 31 and 32 are fixedly mounted beveled gears 34 which are  
55 operatively engaged with and driven by the beveled gear 29 on the shaft 11. On the outer ends of the shafts 31 and 32 are fixedly mounted main propellers 35 and 36, the blades of which are properly arranged for  
60 driving the machine in a forward direction.

Revolubly mounted in suitable bearings in the propeller tube 13 is an auxiliary propeller shaft 37 on the outer ends of which are mounted auxiliary propellers 38. The shaft 37 has also fixedly mounted thereon a  
70 sprocket gear 39 which is connected by a sprocket chain 40 with a sprocket gear 41 on the main propeller shaft 32. The chain 40 passes through a suitable opening in the lower side of the tube 13 and by means of  
75 the same the movement of the shaft 32 is imparted to the shaft 37 to drive the auxiliary propellers in the tube.

In order to permit the machine to be turned to the right or left to avoid obstructions when making a landing, I preferably provide suitable guiding propellers 42  
80 which are arranged in pairs on opposite sides of the machine and are fixedly mounted on the outer ends of driving shafts 43 mounted in suitable bearings on the top of  
85 the car. The shafts 43 for each pair of the propellers are connected by a sprocket chain gearing 44 to independent drive shafts 45 and 46 which are also revolubly mounted in  
90 suitable bearings on the top of the car. On the inner ends of the shafts 45 and 46 are slidably keyed beveled gears 47 and 48.

On the shaft 27 is fixedly mounted a beveled gear 49 with which the gears 47 and  
95 48 are engaged to drive the propellers 42 on one side or the other of the machine whereby the latter is turned in the desired direction. The gears 47 and 48 are shifted into and out of engagement with the gear  
100 49 by means of an arrangement of shifting levers 50 or any other suitable form of shifting mechanism.

In addition to the propellers arranged at the upper portion of the machine and in  
105 the tube 13 for propelling the machine, I also provide additional auxiliary propellers 51, which are suitably mounted in supporting frames or brackets 52 secured to the opposite sides of the lower portion of the  
110 car near the center of the same. On the shafts of the propellers 51 are mounted beveled gears 53, which are engaged by similar gears 54 on the outer ends of an operating shaft 55, which extends through and  
115 is mounted in suitable bearings in the sides of the car. On the shaft 55 in the car is fixedly mounted a beveled gear 56 which is operatively engaged with the drive gear 25 on the drive shaft of the motor. The propellers 51 while serving as additional auxiliary  
120 propellers for driving the machine through the air may also be employed to force the machine through the water when floating thereon.

Hingedly mounted in suitable supporting brackets 57 secured to the lower side of the propeller tube 13 near the forward end of  
125 the machine is a retarding blade 58, which is adapted to be swung down to form a

pocket which will catch the air currents and thus assist in retarding the backward movement of the machine when the latter is descending with the propelling mechanism and balloon in an upwardly inclined position. When the machine is descending with the propelling mechanism and balloon in a horizontal position, the use of the retarding blade is not required and in this case, the blade is drawn upwardly to an inoperative position beneath the tube 13. The blade is raised and lowered by suitable operating cables 59, which pass over suitable guide pulleys 60 and extend downwardly into the car within convenient reach of the operator. Any suitable steering mechanism or rudder 61 may be arranged on the rear end of the machine for steering the same, said rudder being controlled by any suitable mechanism (not shown).

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention as defined in the appended claims.

Having thus described my invention, what I claim is:—

1. In a flying machine, the combination of a car, supporting bars rising from the sides of the car, a transverse shaft in the upper ends of said bars, a propeller tube pivotally connected with said shaft and supported by and above the same, aeroplanes secured to said tube and extending outwardly and downwardly therefrom and fitting on the ends of the transverse shaft, propellers carried by said tube, and means for tilting the propeller tube endwise about the transverse shaft.

2. In a flying machine, the combination of a car, supporting bars rising from the sides of the car, a transverse shaft in the upper ends of said bars, inwardly and up-

wardly converging bars pivoted on said shaft, a propeller tube secured to the upper ends of said converging bars, propellers carried by said tube, aeroplanes secured to the sides of the tube and extending downwardly and outwardly therefrom and fitted on the ends of the transverse shaft, means for operating the propellers and means for tilting the propeller tube.

3. In a flying machine, the combination of a car, supporting bars rising from the sides of the car, a transverse shaft in the upper ends of said bars, a propeller tube pivotally connected with said shaft and supported by and above the same, aeroplanes secured to said tube and extending outwardly and downwardly therefrom and doubled on themselves, the free edges of the aeroplanes being curved outwardly and upwardly and the doubled portions thereof being fitted on the ends of the transverse shaft, a propeller carried by said tube and means for tilting the propeller tube endwise about the transverse shaft.

4. In a flying machine, the combination of a car, a propeller tube above the car and connected therewith, propeller shafts on the under side of the tube, a propeller shaft within the tube, propellers on said shafts, a driving shaft rising from the car, a motor in the car, gearing connecting the motor with the driving shaft, gearing connecting the driving shaft and said propeller shafts, transverse shafts mounted on the car at the top thereof and projecting beyond the sides of the same, steering blades on the ends of said shafts, gearing between said shafts and the driving shaft, propellers mounted on the sides of the car near the bottom thereof, a transverse shaft in the car, gearing between said shaft and the motor, and gearing between said shaft and the last mentioned propellers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN C. SCHLEICHER.

Witnesses:

E. EDMONSTON, Jr.,  
S. M. McCOLL.