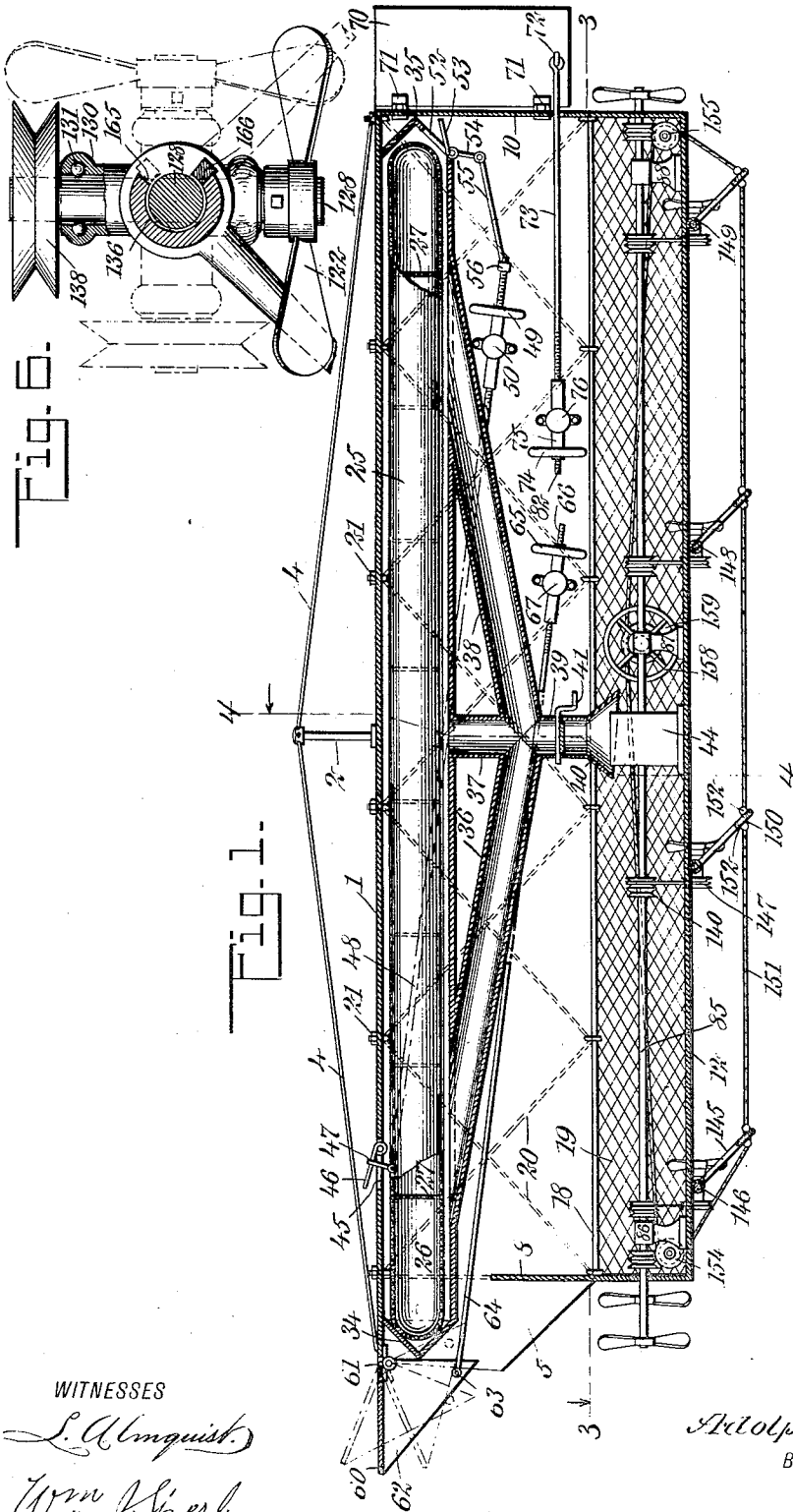


A. E. G. LUBKE.
AIR SHIP.
APPLICATION FILED DEC. 22, 1908

936,141.

Patented Oct. 5, 1909.

3 SHEETS—SHEET 1.



WITNESSES

L. Almqvist.
Wm. J. Spier

INVENTOR

Adolph E. G. Lubke
BY *Mumfords*

ATTORNEYS

A. E. G. LUBKE.

AIR SHIP.

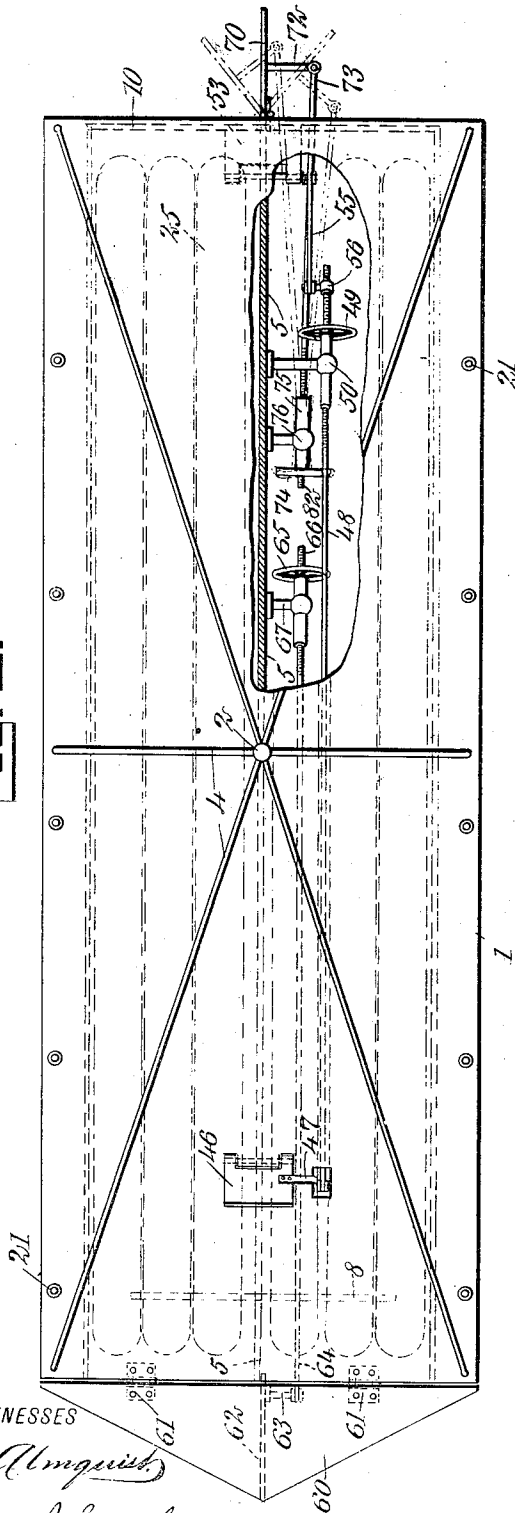
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3 SHEETS—SHEET 2.

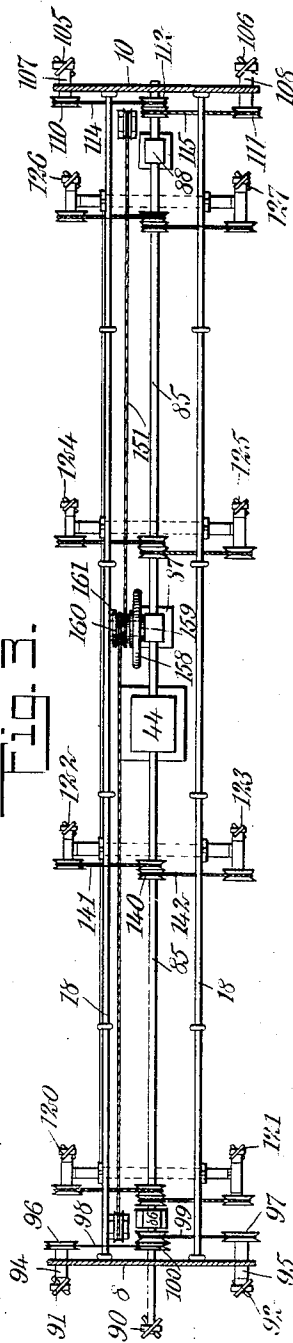
Fig. 2.



WITNESSES

L. Almqvist
Wm. J. Spaul

Fig. 3.



INVENTOR

Adolph E. G. Lubke

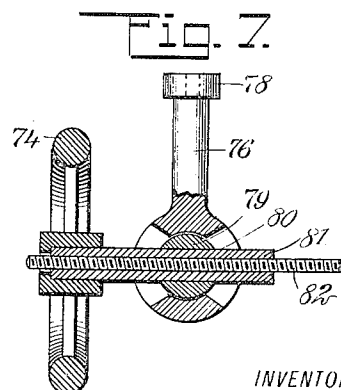
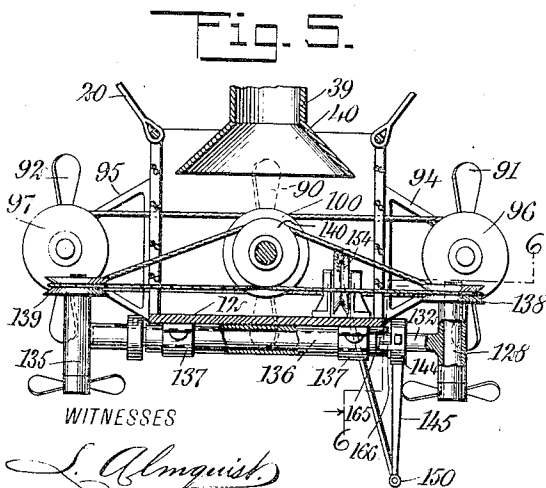
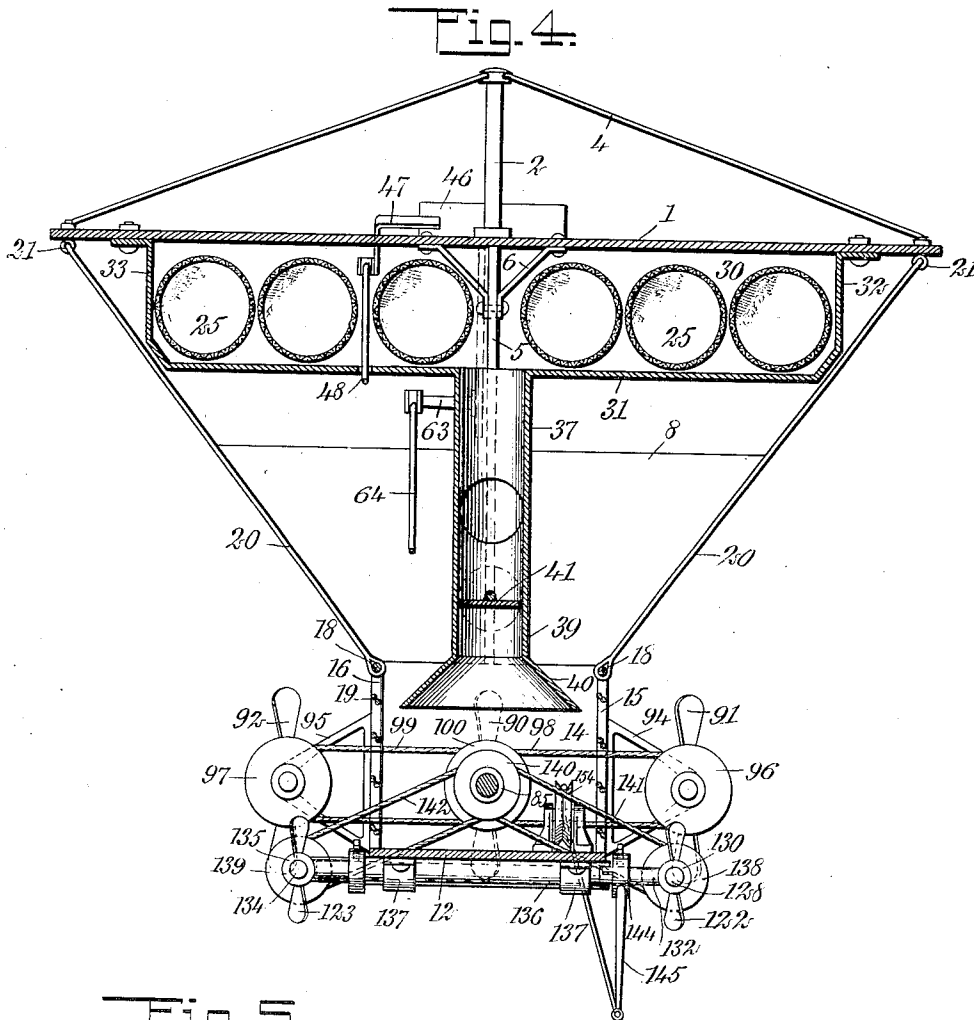
BY

Wm. J. Spaul

ATTORNEYS

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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

ADOLPH EMIL GUSTAV LUBKE, OF SAN FRANCISCO, CALIFORNIA.

AIR-SHIP.

936,141.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed December 22, 1908. Serial No. 468,812.

To all whom it may concern:

Be it known that I, ADOLPH E. G. LUBKE, a citizen of the United States, and a resident of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Air-Ship, of which the following is a full, clear, and exact description.

This invention relates to air ships.

One object of the invention is to provide an air ship having an aeroplane and a balloon or gas-bag connected therewith, together with an improved steadying means.

A further object is to provide a balloon which may be composed of one or more separate gas-bags inclosed within a shell or chamber having means for regulating the temperature thereof.

A further object of the invention is to provide a combined balloon and aeroplane having depending central and end walls, the structure being substantially T-shaped in transverse section.

A further object is to provide a plurality of vertical propellers at the front and rear of the ship, together with a plurality of propellers mounted to rotate at the sides of the ship.

A still further object is to provide a plurality of propellers which may be caused to rotate either horizontally or vertically.

The invention consists in the construction and combination of parts, to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a central vertical section, partly in elevation, through the air ship; Fig. 2 is a plan view, partially broken away to show the screws for controlling the rudders and valves; Fig. 3 is a section taken on the line 3—3 of Fig. 1, showing the means for controlling the various propellers; Fig. 4 is a transverse section, taken on the line 4—4 in Fig. 1, showing the side propellers as vertical; Fig. 5 is a sectional view of the lower portion of the ship, taken on the same line as Fig. 4, but showing the side propellers as horizontal. Fig. 6 is a sectional view on an enlarged scale, taken on the line 6—6 in Fig. 5, and showing both positions of a side propeller; and Fig. 7 is an enlarged

detail view, partly in section, showing the mechanism associated with one of the hand wheels for controlling the rudder and valves.

The embodiment of my invention shown in the drawings comprises a horizontal plane 1, supporting a post 2 centrally thereof. A series of tie-rods or wires 4 extend from the edges of the plane 1 to the post 2 in order to properly support said plane. A depending vertical partition or wall 5 extends longitudinally midway of the plane 1 and may be secured thereto by braces 6. A transverse vertical wall 8 is secured to the partition 5 near its front end, and extends below the lower edge of said partition. A transverse vertical wall 10 is located at the rear edges of the plane 1 and the partition 5, said wall also extending below the lower edge of said partition, and secured thereto and to the plane 1. A bottom or floor 12 connects the end walls 8 and 10, which together constitute the bottom and ends of a car 14. The sides 15 and 16 of the car may be formed of top rails 18 and an intervening latticework of wires or ropes. The top rails 18 are stayed by means of rods or wires 20, which may pass through eyelets 21 on the plane 1, said rods thus aiding in supporting and steadying the car 14.

In order to aid in supporting the ship, I provide a balloon, which may consist of a plurality of elongated cylindrical gas-bags 25. If desired, said bags may be sub-divided into compartments 26 by means of transverse partitions 27.

The balloon is inclosed within a chamber 30 formed by a casing composed of a bottom 31, sides 32 and 33 and ends 34 and 35. Said casing is suitably secured to the under side of the plane 1 by means of bolts. The chamber 30 communicates with pipes 36, 37 and 38, which open at their upper ends into said chamber, and are connected at their lower ends into one pipe 39 having a hood 40 at its lower end, and also a damper 41 for controlling the admission of the air through the same. Said hood 40 is located above the motor 44, which may be of any desired type, and the hot air arising above said motor may be admitted to the pipe 39 and from thence distributed in the chamber 30.

The plane 1 may be provided with an opening 45, which is adapted to be closed by a valve 46 having a stem or post 47 mounted thereon. Said stem 47 is pivotally connected to one end of a rod 48. Said rod

is operatively-connected to a hand-wheel 49, which is mounted within a bearing 50 supported by the wall 5. The rear end 35 of the chamber which incloses the gas-bags is provided with an opening 52, adapted to be closed by a valve 53, which is hinged to the wall of the chamber, and may be provided with a depending arm 54, which is pivotally connected to one end of a rod 55. The other end of the rod 55 may be provided with a collar 56 adapted to co-act with the threads on the end of the rod 48. The construction is such that when the hand-wheel 49 is turned, the valves 46 and 53 are operated to regulate the flow of air through the chamber 30. By means of the valves 46 and 53 and the damper 41, the temperature of the interior of the chamber 30 may be regulated. By utilizing the heated air, the expansion and contraction of the balloon may be controlled somewhat, in order to offset the effects due to the passage of the ship through a fog-bank or clouds, which would tend to reduce the temperature and cause contraction of the balloon. The casing surrounding the balloon may be made of aluminum or any other suitable light material.

In order to aid in the ascension or descension of the ship, I provide a horizontal rudder 60, which may be attached to the plane 1 by means of hinges 61. A web 62 depends from the under side of the rudder 60, and has secured thereon a laterally-projecting post 63. Said post is pivotally connected with one end of a rod 64. The other end of said rod 64 is provided with a hand-wheel 65, which coöperates with the threaded portion 66 of said rod, and is supported in a swivel bearing 67 secured to the wall 5. By the manipulation of the hand-wheel 65, the rudder 60 may be raised or depressed with respect to the plane 1, in order to guide the ship upwardly or downwardly, as desired.

In order to steer the ship laterally, I provide a vertical rudder 70, which may be attached to the rear wall 10 by means of hinges 71, said rudder being in line with the central partition 5. A post 72 is mounted to project laterally from the said rudder 70, and is pivotally connected to one end of a rod 73. The other end of the rod 73 is screw-threaded and adapted to coöperate with a hand-wheel 74 having a sleeve 75, which is supported within a swivel bracket 76 supported by the wall 5.

The construction of the hand-wheels 49, 65 and 74 is alike, and shown in detail in Fig. 7. The bracket 76 is provided with a base 78, which may be fastened to the wall 5. The outer end of the bracket 76 is formed to receive a ball 79 having a cylindrical passage 80 extending therethrough, for the reception of a sleeve 81, fastened therein. Said sleeve 81 is internally thread-

ed to coöperate with the threads 82 on the end of the rod 73. The hand-wheel 74 is secured to the sleeve 81. By this construction, it will be seen that, by turning the hand-wheel 74, the sleeve 81 is caused to rotate and move the rod 73 longitudinally, the angularity of said rod being compensated for by means of the ball 79, which is rotatably held within the end of the bracket 76.

In order to propel the ship, I provide a motor 44, which may be secured upon the bottom 12 of the car and connected to a longitudinally-extending driving shaft 85, which is journaled in bearings 86, 87 and 88, also suitably secured to the floor or bottom 12 of the car.

I may provide three propellers on the front of the ship, one of which, 90, is secured directly to the driving shaft 85. The other two, 91 and 92, are secured to the shafts which are journaled in bearings 94 and 95 respectively. The inner ends of the propeller shafts are provided with grooved pulleys 96 and 97 respectively, over which cords or belts 98 and 99 are passed, said belts also passing over similarly grooved pulleys 100, mounted to rotate with the shaft 85.

At the rear of the ship, I may provide two vertical propellers 105 and 106, secured to shafts which are journaled in bearings 107 and 108 respectively. The ends of these propeller shafts are fitted with grooved pulleys 110 and 111 respectively. Similar grooved pulleys 112 are secured to the driving shaft 85 and adapted to rotate therewith. Belts 114 and 115 are passed over the pulleys 110, 111 and 112, by means of which the propellers 105 and 106 are rotated.

In order to aid in raising the ship, I provide a series of propellers, numbered 120 to 127 inclusive, which are adapted to be rotated either in a horizontal or a vertical plane. When rotated in a horizontal plane, they aid in raising the ship, and when the ship has risen to the desired height, they are turned so that they may rotate in a vertical plane, to aid in propelling the ship longitudinally.

The propeller 122 is secured to a shaft 128, which is journaled in a bearing 130 formed on the end of a shaft 132. Said bearing 130 may be an anti-friction bearing containing balls 131. The propeller 123 is secured to a shaft 134, which is journaled in a bearing 135 also secured to the shaft 132. Said shaft 132 is journaled in a sleeve 136, which may be supported from the under side of the floor 12 by means of straps 137. A grooved pulley 138 is mounted to rotate with the shaft 128, and a grooved pulley 139 is mounted to rotate with the shaft 134. A double-grooved pulley 140 is mount-

ed to rotate with the shaft 85, and receives belts 141 and 142, which pass respectively over the grooved pulleys 138 and 139. The rotation of the driving shaft 85 itself causes the rotation of the propellers 122 and 123. It will be understood that the construction and connections for the other propellers of the series located at the sides of the ship are the same as those described for propellers 122 and 123.

Secured to the shaft 132 is a collar 144 having a depending arm 145. Each horizontal shaft 146, 147, 148, 149 has a similar arm 145 connected thereto. Each arm is provided with an eye 150 at its lower end, through which a cord 151 passes, said cord being provided with stops 152 located on opposite sides of the eyes 150. The cord 151 passes over guide pulleys 154 and 155, suitably journaled in bearings supported by the bottom of the car. A hand-wheel 158 is secured to a shaft 159 journaled in the bearing 87 and also in a bracket 160 supported by the floor 12. A double-grooved pulley 161 is secured to rotate with said hand-wheel, and the cord 151 passes over both portions of the double-grooved pulley 161, so that as the hand-wheel 158 is rotated, the arms 145 will all be swung in one direction or the other, in order to rotate the shafts to which they are connected and change the plane of rotation of the propellers 120 to 127 inclusive. It will be noted by referring to Figs. 4 and 5 that the driving belts which connect the driving shaft 85 with the various propellers on the side of the ship are adapted to be twisted in order to form a quarter-turn drive.

The sleeve 136 has a notch 165 on one end, which receives the lug 166 on the collar 144 in order to limit the rotation of said collar, to determine the horizontal and vertical positions of the side propellers.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an air ship, the combination of a plane, a casing suspended from said plane, a gas bag in said casing, a depending wall midway of said plane, transverse walls at the ends of said depending wall, a horizontal

rudder attached to the front end of said plane, a vertical rudder at the rear in line with the depending wall, and means attached to said depending wall and connected with said rudders for operating the same.

2. In an air ship, the combination of a plane, a casing suspended from said plane, a motor, pipes above said motor communicating with said casing, means for controlling the passage of air through said pipes, a valve at the front and rear ends of said casing, and means for controlling said casing valves.

3. In an air ship, the combination of a plane, a casing suspended from said plane, a gas bag formed with separate compartments and inclosed within said casing, means for supplying heated air to the bottom of said casing, and means for controlling the passage of air through said casing.

4. In an air ship, the combination of a plane, a casing suspended from said plane, a gas-bag in said casing, a depending central wall extending beyond the ends and below said casing, a horizontal rudder pivoted to the front end of said plane, and a vertical rudder in line with said depending wall.

5. In an air ship, the combination of a plane, a casing suspended from said plane, a gas-bag in said casing, a depending central wall extending beyond the ends and below said casing, a horizontal rudder pivoted to the front end of said plane, a vertical rudder in line with said depending wall, and means for varying the temperature of the contents of said casing.

6. In an air ship, the combination of a plane, a casing suspended from the plane, a gas bag in the casing, a horizontal rudder at the front end of the plane, a depending wall midway of the plane, a vertical rudder at the rear of the plane and in line with the depending wall, and means attached to the said wall and connected with the rudders for operating the same.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADOLPH EMIL GUSTAV LUBKE.

Witnesses:

ALBERT EDWARD WRIGHT,
GEORGE SHOEBRIDGE GILBERT.