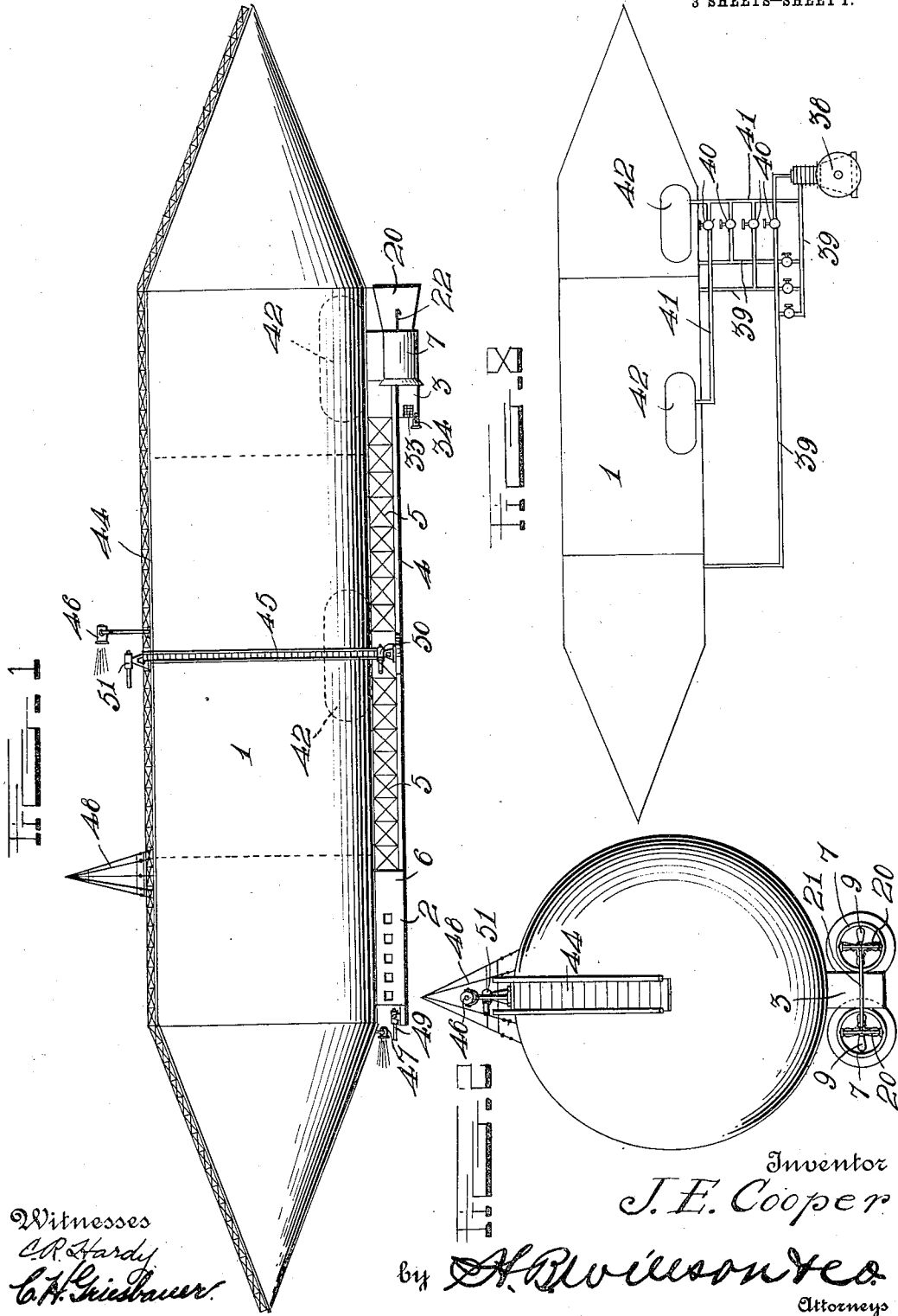


J. E. COOPER.
MILITARY AIRSHIP.
APPLICATION FILED APR. 7, 1910.

984,076.

Patented Feb. 14, 1911.

3 SHEETS-SHEET 1.



Witnesses
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C. H. Giesbauer

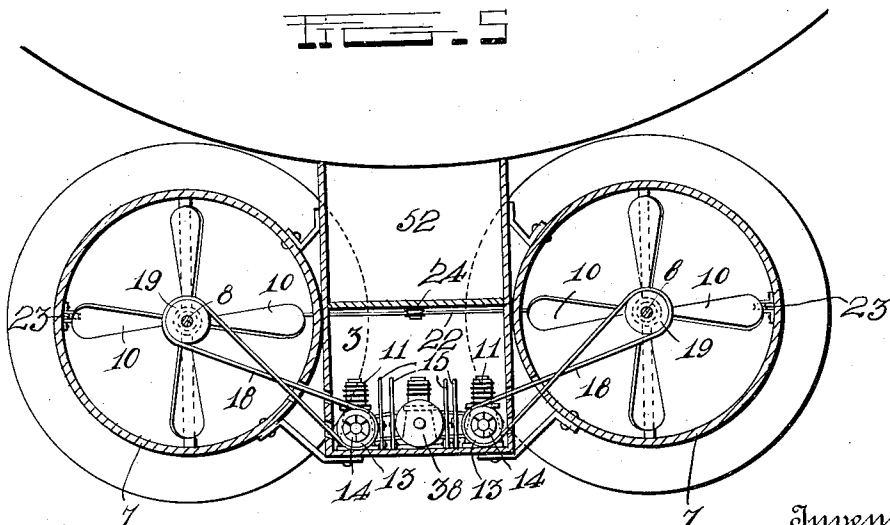
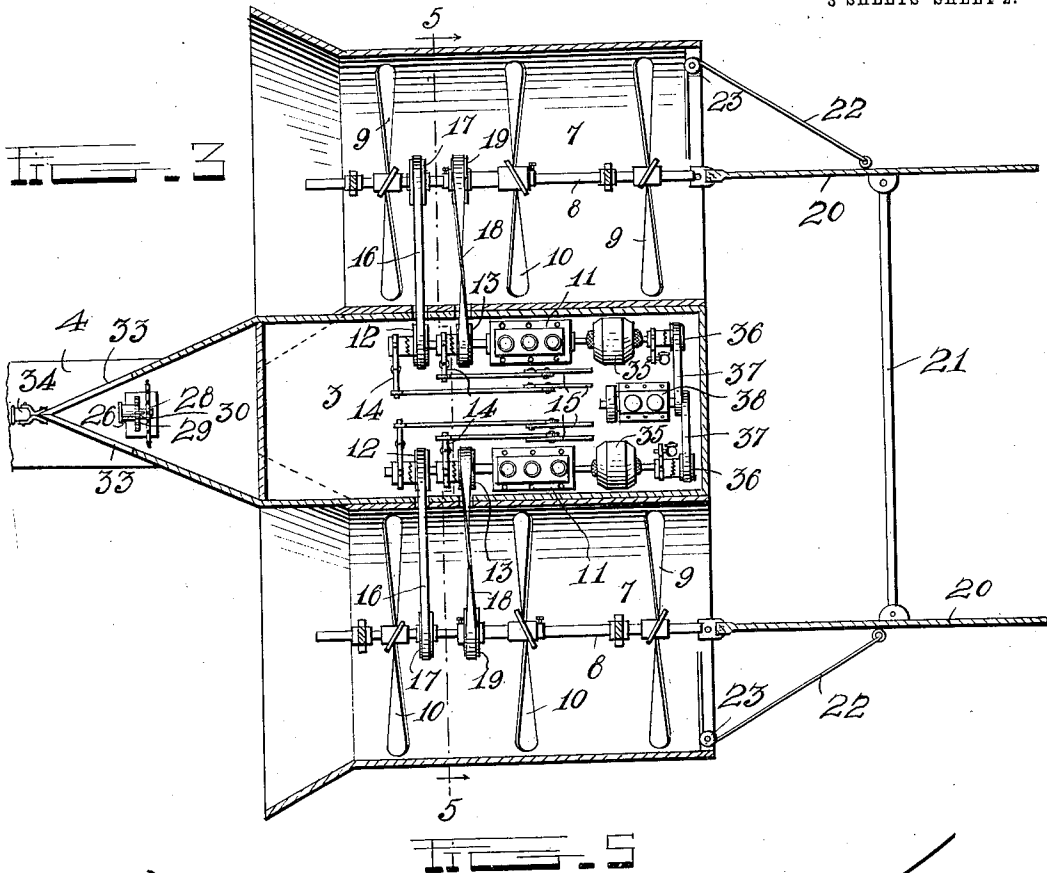
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3 SHEETS—SHEET 2.



Witnesses
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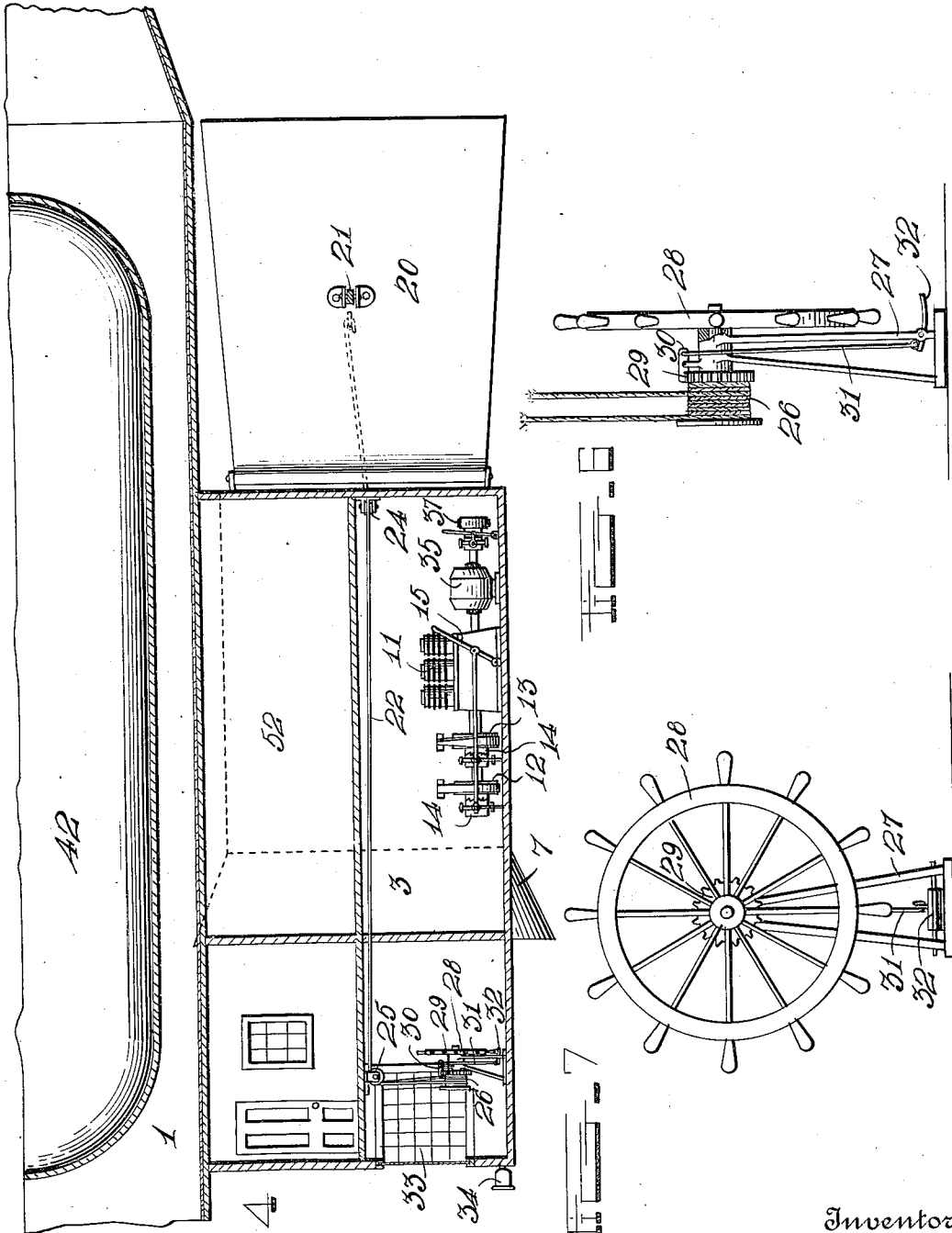
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOSEPH EVANS COOPER, OF CRIPPLE CREEK, COLORADO.

MILITARY AIRSHIP.

984,076.

Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed April 7, 1910. Serial No. 554,018.

To all whom it may concern:

Be it known that I, JOSEPH EVANS COOPER, a citizen of the United States, residing at Cripple Creek, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Military Airships; 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 air ships for military use.

One object of the invention is to provide an air ship having an improved construction and arrangement of parts whereby the same is particularly adapted for military purposes.

Another object is to provide an air ship of this character having a main supporting or sustaining cylinder provided with a series of separate gas tight compartments each of which has an independent connection with means for removing the gas therefrom or refilling the same whereby should one of the compartments be punctured the gas in the other compartments will support the ship.

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 an air ship constructed in accordance with the invention; Fig. 2 is a rear end view of the same; Fig. 3 is an enlarged horizontal sectional view of the engine room, propelling and steering devices of the ship; Fig. 4 is a central vertical longitudinal section through the same showing the arrangement of the engine room and the fuel storage room above; Fig. 5 is a vertical cross section through the parts shown in Fig. 3; Fig. 6 is an enlarged side view of the steering wheel; Fig. 7 is a front view of the same; and Fig. 8 is a diagrammatic sectional view of the gas tank and pump showing the arrangement of the pipes and valves whereby the gas may be removed from any of the compartments of the gas tank and pumped into compression tanks from which the gas may again be let into the compartments of the main tank.

Referring more particularly to the drawings 1 denotes the main gas tank or balloon

of the machine whereby the latter is sustained or supported in the air. The tank 1 is preferably formed of aluminum and is pointed at its opposite ends as shown.

Attached to the lower side of the tank 1 in any suitable manner is a car consisting of a closed cabin 2 arranged beneath the forward end of the tank 1 and an engine room and pilot house 3 arranged beneath the rear end of the tank as shown. The cabin 2 and engine room 3 are connected along the under side of the tank 1 by a gangway or walk 4 said gangway being suitably connected and braced to the under side of the tank 1 by truss brace rods 5 as shown. In the forward cabin 2 are arranged the rooms of the captain and crew of the ship and a magazine or ammunition storage room 6.

Arranged on opposite sides of the engine room 3 and directly against the side of the same are propeller tubes 7, said tubes having flared front ends immediately adjacent the tapering front end of the pilot house so that the air is positively and effectually directed into the tubes in sufficient quantities to obtain the highest efficiency from the blades in the tubes.

Revolubly mounted in suitable bearings in the propeller tubes 7 are propeller shafts 8 on which are fixedly mounted front and rear propeller blades 9 and intermediate propeller blades 10 are loosely mounted on said shafts between the propellers 9 as shown. In opposite sides of the engine room 3 are arranged engines 11 which may be of any suitable type. The drive shafts of the engines project beyond the forward ends thereof and have mounted thereon drive pulleys 12 and 13 which are controlled or thrown into and out of operative engagement with the shafts by suitable clutch devices 14 having operating handles 15 which extend back toward the rear end of the engine room in convenient reach of the operator. The pulleys 12 are connected by suitable belts 16 with pulleys 17 on the shafts 8 of the propellers 9 whereby the latter are driven. The pulleys 13 are connected by crossed belts 18 with pulleys 19 having an operative connection with the intermediate propeller blades 10 as shown. By arranging and mounting the propeller blades as herein shown and described in independent sets, should either of said sets of blades or the steering mechanism become disabled, the machine may still be propelled by the other blades at a reduced speed.

It will be observed that although the blades 9 are rotated in the opposite direction to the blades 10, they are also arranged reversely thereto so that the action of all the blades upon the air passing through the tubes will be to propel the air-ship in the same direction, but as the blades rotate in the air in opposite directions they more effectively act upon the body of air so that it will be prevented from merely passing around the blades without imparting any movement to the air-ship.

Hingedly mounted on the rear end of the propeller tubes 7 are steering blades or rudders 20 said blades or rudders being connected together midway between their ends by a connecting bar 21. By thus connecting the blades together they are moved in unison in one direction or the other to steer the machine. The blades 20 are moved or swung in one direction or the other to steer the machine by steering cables 22 the outer ends of which are connected to the opposite blades preferably at the ends of the connecting bar 21. The cables pass over guide pulleys 23 arranged in the rear ends of the propeller tubes 7 and thence extend inwardly toward the center of the engine room where they pass over guide pulleys 24 and extend forwardly through the engine room and into the pilot room in which they pass over a guide pulley 25 and thence are extended downwardly and connected to a winding drum 26 revolvably mounted in suitable bearings in the upper end of a pedestal 27 as shown. On the shaft of the drum 26 is mounted a steering wheel 28 whereby the drum is rotated in one direction or the other to wind up and unwind the steering cables 22 thereby swinging the steering blades back and forth in the desired direction for steering the machine. On the drum 26 is arranged a toothed gear 29 with which is adapted to be engaged a pivoted pawl 30 one end of which is connected by a rod 31 to a foot pedal 32 whereby said pawl is held up out of engagement with the gear 29. When the foot pedal 32 is released the pawl 30 will drop into engagement with the teeth of the gear 29 thereby locking the winding drum and steering wheel against further revolution and thus holding the steering blades at their adjusted position. The sides of the pilot room are inclined or converged to a point to offer the least resistance to the air pressure and also to direct the air into the propeller tubes as before stated. In the opposite sides of the forward ends of the converging sides of the pilot room are arranged large windows through which the pilot may observe the course of the ship. On the front end of the pilot room is also arranged a search light or pilot's light 34 for the convenience of the pilot when landing or maneuvering.

On the rearwardly projecting ends of the engine drive shafts are connected dynamos 35 which are adapted to be independently thrown into and out of gear with the shafts by any suitable clutch mechanism. By means of the dynamos electricity is generated for illuminating and heating the air ship. On the extreme rear ends of the engine shafts are mounted shaft pulleys 36 which are adapted to be drawn into and out of connection with the shafts by suitable clutch devices as shown. The pulleys 36 are connected by suitable belts 37 with an air or gas pump 38 arranged in the rear end of the engine room whereby said pump is operated from the engines on either side of the engine room.

The main gas tank or cylinder 1 is preferably divided into a series of independent gas tight compartments of which there may be any suitable number said compartments being preferably lined with silk. The compartments of the tank are independently connected by a series of gas conducting pipes 39 with the pump 38 said gas conducting pipes having formed therein valves whereby any of the same may be closed when desired. The pump 38 is connected by suitable gas conducting pipes 41 to high pressure gas tanks 42 which are preferably arranged in some of the compartments of the main gas cylinder whereby should any leakage occur in the high pressure tanks the gas would not be wasted but would remain in the compartment in which the high pressure tank is located. The pipes 41 are also provided with suitable valves for opening and closing the same. By forming the main gas cylinder in a series of compartments as shown and described the gas may be pumped from the forward or rear compartment and into the high pressure tanks so that the end from which the gas has been removed will become heavier when thus relieved of its buoyancy thus causing an inclination of the machine thereby effecting the downward or upward flight of the same as desired. The separation of the main gas tank into compartments also prevents the escape of gas from the entire tank should any portion of the same become punctured so that while the gas may escape from one or more of the compartments by such puncturing the machine will still be sustained by the gas in the remaining compartments. The arrangement of the compartments of the main tank and the arrangement of the high pressure tanks and their various pipe connections with the pump and with the compartments of the main cylinder is shown in diagram in the last figure of the drawing.

On the upper side of the main gas tank and extending from one end to end of the same is a walk or runway 44 which is guarded along its opposite sides by suitable

hand rails and is connected by a suitable ladder 45 with the gangway 4 along the under side of the tank as shown. The ladder 45 is here shown as arranged midway
 5 between the opposite ends of the balloon and at the upper end of said ladder on the upper side of the tank or balloon is arranged a search light 46 while a similar search light 47 is arranged at the forward end of the
 10 cabin 2 as shown. On the upper side of the tank or balloon 1 is also arranged a wireless telegraph apparatus 48 which connects with suitable receiving and transmitting apparatus arranged in the cabin of the air ship.
 15 At the forward end of the cabin is arranged a machine gun 49 while similar guns 50 are arranged on the gangway midway between the opposite ends thereof and projecting from the opposite sides of the same. A machine gun 51 is also arranged on the upper
 20 runway 44 preferably midway between the ends of the ship as shown. Above the engine room is preferably arranged a fuel storage room or compartment 52 in which may
 25 be stored sufficient gasoline or other fuel for making long voyages.

By providing an inclosed cabin for the accommodation of the captain and crew they are provided with comfortable quarters
 30 when cruising in extreme weather or high altitudes, the cabin and other rooms of the car being preferably heated by electricity from the dynamos hereinbefore described. The cabin and the other parts of the car
 35 have a sufficient capacity for carrying a large crew and ample supplies for long flights and also having a magazine capacity for high explosives which may be carried in considerable quantities. The gas tank is of
 40 sufficient size to support the air ship at an altitude beyond the reach of an enemy's guns and the propelling mechanism is sufficient to drive the ship at great speed when desired.

45 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 50 and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims. 55

Having thus described my invention what I claim is:

1. An air ship comprising a supporting tank, a cabin secured to said tank at the rear end thereof and having a tapered front 60 end, open-ended tubes mounted directly on the sides of the cabin and having flared front ends immediately adjacent the tapered front end of the cabin, propeller shafts within said tubes, propellers fixed on said 65 shafts, propellers loosely mounted on said shafts, and arranged reversely to the fixed propellers, and operating mechanism within the cabin connected through the sides of the same with the several propellers to rotate 70 the fixed and loose propellers in opposite directions.

2. An air ship comprising a supporting tank, a cabin secured to the under side thereof divided into upper and lower compart- 75 ments, a runway secured to the bottom of the tank and extending forwardly from the cabin, said runway being entirely above the lower compartment of the cabin, and steering and propelling mechanism mounted on 80 the sides of the cabin in advance of the rear end thereof and operated from within the same.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 85

JOSEPH EVANS COOPER.

Witnesses:

H. C. HARRIS,
 HOWARD A. CASE.