

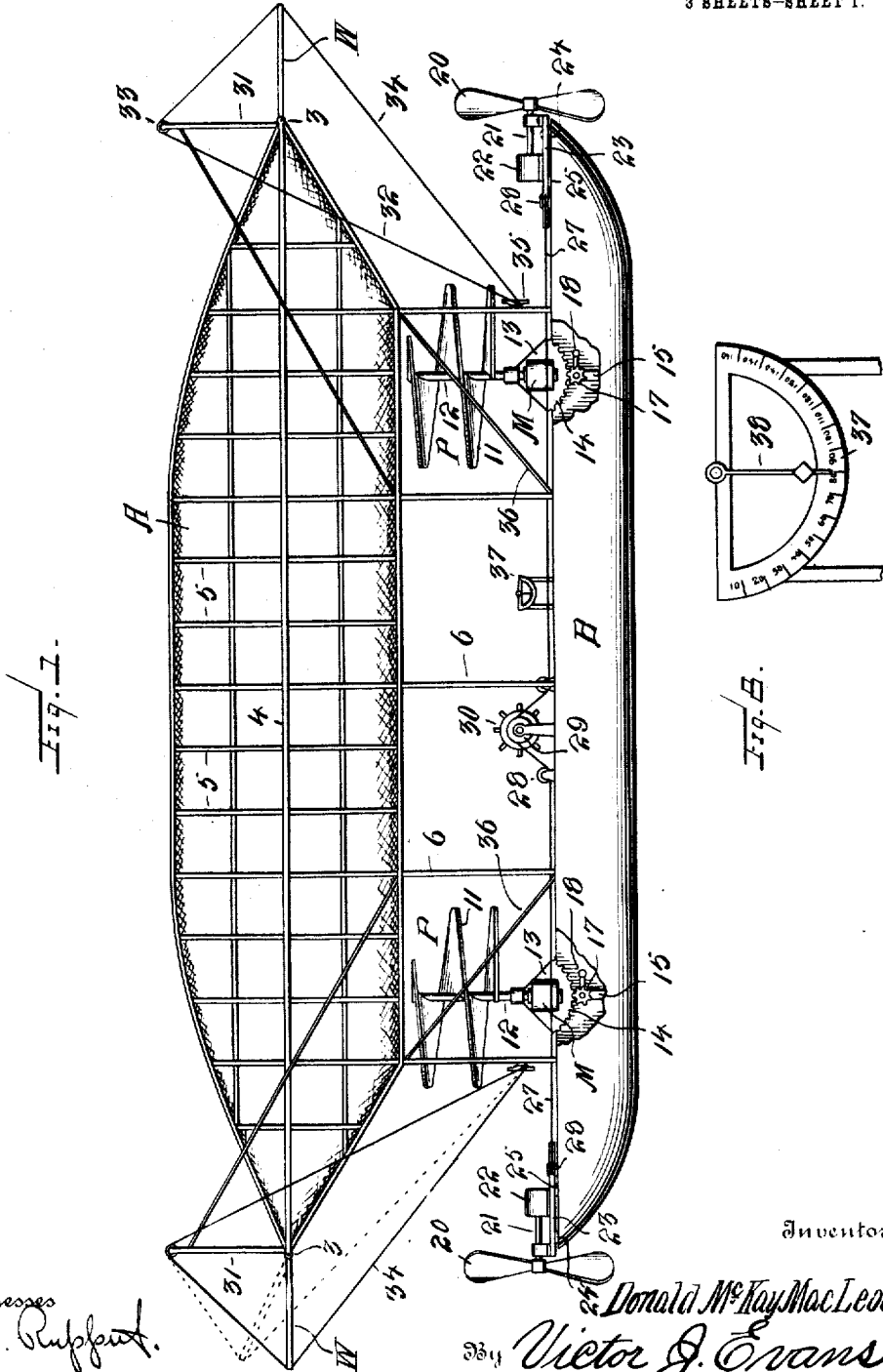
D. MCK. MACLEOD.
AIRSHIP.

APPLICATION FILED APR. 6, 1910.

Patented Apr. 16, 1912.

3 SHEETS—SHEET 1.

1,023,667.



Witnesses
E. R. Ruppert.
Wm. Bagger

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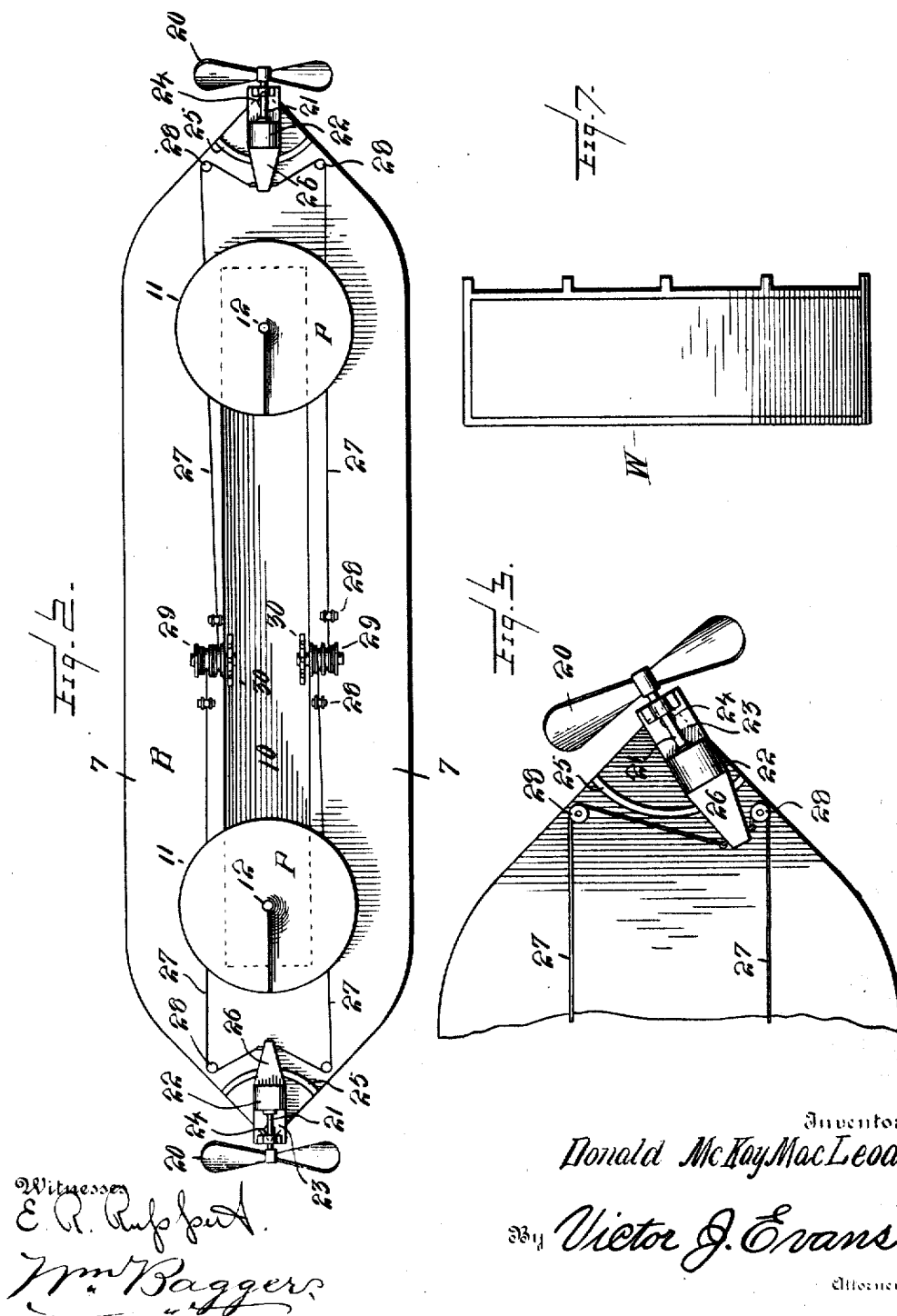
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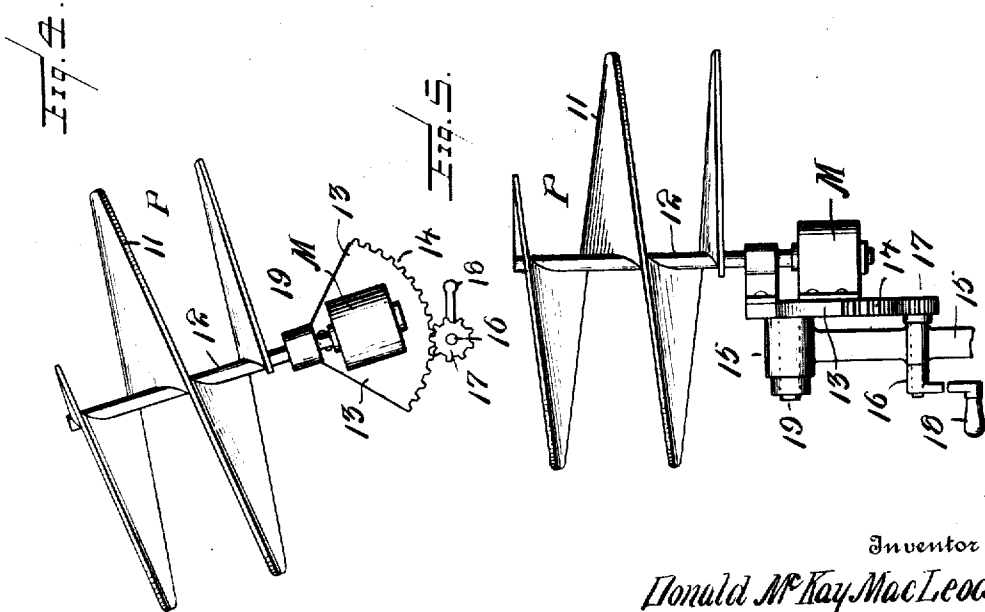
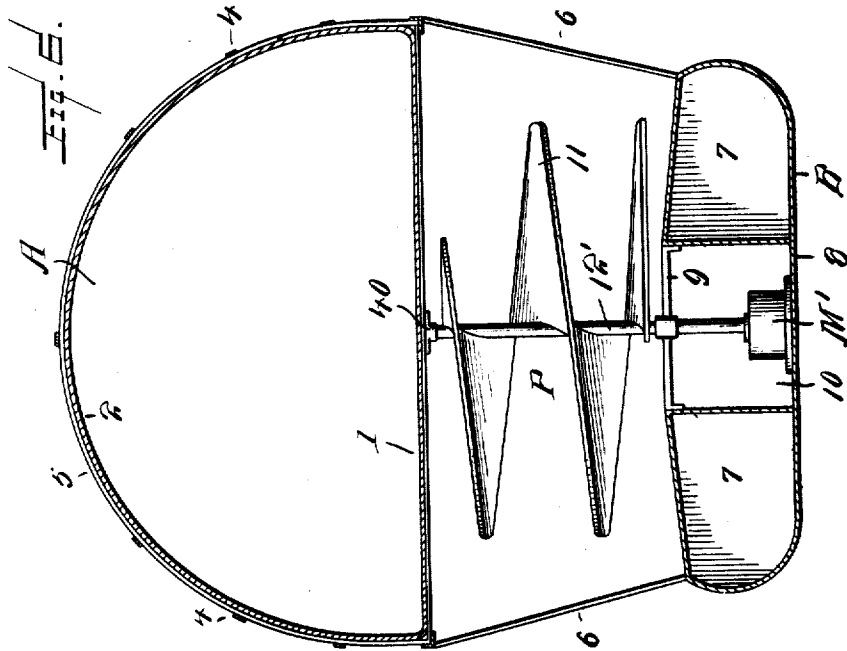
3 SHEETS-SHEET 2.



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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

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AIRSHIP.

1,023,667.

Specification of Letters Patent.

Patented Apr. 16, 1912.

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To all whom it may concern:

Be it known that I, DONALD McKAY MacLEOD, a citizen of the Dominion of Canada, residing at Lake Charles, in the parish of Calcasieu and State of Louisiana, have invented new and useful Improvements in Airships, of which the following is a specification.

This invention relates to air ships of that class which are generally known as dirigible; and it has particular reference to that class of dirigible air ships which are equipped with gas tanks, bags or other receptacles for the purpose of aiding the buoyancy of the vessel and which are also equipped with motor-driven means to assist the vessel in rising, to maintain it at the desired elevation and to effect propulsion and steering.

The invention has for its object to provide a device of the class referred to which shall possess superior advantages in point of simplicity of construction, efficiency of operation and availability for general use.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the invention may be resorted to when desired.

In the drawings,—Figure 1 is a side elevation of an air ship constructed in accordance with the invention. Fig. 2 is a top plan view of the car. Fig. 3 is a top plan view on a larger scale of one end of the car. Fig. 4 is a view in elevation of one of the motor-driven tiltable elevating propellers. Fig. 5 is a side elevation of the same. Fig. 6 is a transverse sectional view of the air ship, showing an elevating propeller driven by a stationary motor. Fig. 7 is a plan view, showing one of the adjustable wings or planes detached. Fig. 8 is a detail side

view in elevation of the device for indicating the inclination of the vessel.

Corresponding parts in the several figures are denoted by like characters of reference.

Referring to the drawings, A designates the main gas bag, tank or other receptacle, and B is the car which is connected with and partly supported thereby.

The gas bag or receptacle A is throughout the greater portion of its length approximately semi-circular in cross section, as will be best seen by reference to Fig. 6; that is to say, it is formed with a flat bottom or underside 1 and an arcuate top portion 2, the side edges of which join the side edges of the bottom member 1. The ends of the bag or receptacle are tapered to present sharp edges 3, 3, as will be best seen in Fig. 1, to present the least possible resistance to the atmosphere when the vessel is in flight. The receptacle A, which may be constructed of any suitable material, is reinforced by a netting formed of longitudinal strips 4 and vertical cross strips 5, which are preferably made of aluminum or an alloy or composition containing aluminum in order that the greatest possible tensile strength may be combined with lightness. This netting or covering not only reinforces the receptacle against the expansive pressure of the gas contained therein, but it also forms a medium for the suspension of the car B which is connected with said netting by means of connecting members 6. The car B is composed of twin tanks or gas compartments 7, 7 which are suitably connected by means including a bottom member 8 and cross braces 9 to form an intermediate passenger compartment 10.

For the purpose of assisting the vessel in rising and for maintaining it at the desired elevation in the air, propellers P are provided, each of said propellers including a blade 11 which is wound spirally about a shaft 12, said shaft being driven by a motor M which is mounted upon a sector 13 having a toothed edge forming a rack 14, said motor-supporting sector being pivotally and concentrically supported upon a bracket 15, as will be best seen in Fig. 5 of the drawings. The bracket 15 also supports for rotation a shaft 16 having a pinion 17 mesh-

ing with the rack upon the sector 18 and a crank 18 whereby it may be rotated to adjust the sector and the motor carried thereby, as well as the propeller at various inclinations.

- 5 The pivot 19 which supports the sector 18 is disposed with its axis transversely of the car, so that when the shaft 16 is manipulated, the adjustment of the propeller shaft 12 will be in a plane longitudinally of the car. It is preferred to install two propellers P, one at a suitable distance from each end of the car, as will be seen by reference to Fig. 1.

- The ends of the car are beveled to form 15 terminal points, and adjacent to each end is arranged to screw propeller 20 carried by a shaft 21 which is driven by a motor 22 supported upon a base plate 23, the latter being mounted for oscillation upon a vertical shaft 24. The base plate 23 is equipped with suitable bearings for the propeller-carrying shaft. A curved track 25 is provided for each of the base plates 23, said track being concentric with the pivot 24. 25 The base plates 23 are extended to form brackets 26, and with each of said brackets is connected two flexible members, such as ropes or cables 27 which are guided over suitably arranged pulleys 28 to drums 29 30 which are suitably mounted about midway between the ends of the car, the ends of the flexible members 27 being connected with and wound upon the drums 29 in such a manner that by the rotation of either drum 35 motion will be transmitted between the pivoted motor and propeller-carrying base plates which may be adjusted in unison in opposite directions, as will be readily understood, for the purpose of guiding or directing the flight or turning of the vessel, 40 if required. The drums 29 are equipped with hand wheels 30 to enable them to be conveniently manipulated.

- Hingedly supported adjacent to the relatively sharp edges 3 at the front and rear ends of the gas bag or receptacle are wings or planes W, and uprights 31 are supported by the framework which includes the aluminum or metallic netting adjacent to said front and rear edges. Halyards 32 for the purpose of raising the wings or planes are connected with said wings or planes adjacent to their outer edges and guided over pulleys 33 at the upper ends of the uprights 31. Sheets 34 for the purpose of lowering the wings or planes are likewise attached adjacent to the outer edges of the latter. Said halyards 32 and sheets 34 extend to suitable arranged cleats 35 where 60 they may be secured for the purpose of maintaining the wings or planes in adjusted position.

- Inclined brace rods 36 for the purpose of reinforcing the construction have been 65 shown in Fig. 1, and it will be readily un-

derstood that additional braces and reinforcements may be used wherever desired. It is also desired to be understood that a more or less rigid framework may be installed for the purpose of connecting the 70 car with the gas receptacle and supporting the same. It is also desired to be understood that the gas receptacle may consist of one or of any desired number of compartments, the latter construction being preferred as a matter of security in the event of a leak occurring at any time or at any place.

For the purpose of enabling the operator to determine the exact angle of inclination 80 when the vessel is tilted, as will sometimes be the case in ascending or descending, I propose to install a suitably supported protractor 37 about midway between the ends of the vessel in connection with a pivotally supported weighted index or pendulum 85 38 constituting a pointer whereby the angle of inclination may be read upon the protractor.

It may sometimes be deemed unnecessary to operate the propellers P by pivotally supported motors, as shown in Figs. 4 and 5. 90 In Fig. 6 of the drawings I have shown the propeller P as being actuated by a stationary motor M', the driven shaft, here designated 12', being supported in an approximately vertical position. When this construction is resorted to it is preferred to install an auxiliary bearing 40 for the upper end of the shaft 12'.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood by those skilled in the art to which it appertains. The buoyancy of the gas tanks or receptacles will be of great assistance in causing the vessel to ascend, but this buoyancy is not depended upon altogether, the propellers P being largely depended upon for this purpose. These propellers are normally supported with their shafts in a vertical position. Being independently driven, the propeller-carrying shafts may be rotated at different speeds if it should be necessary, or one may be stopped altogether in the event 115 of one end of the car being more heavily loaded than the other end, and equilibrium may thus be established. In rising and in descending the propeller-carrying shafts may be tilted so as to guide the vessel in an inclined plane. For the purpose of propelling the vessel in either direction, the fore and aft propellers will be utilized, and the said fore and aft propellers are capable of adjustment in the manner hereinbefore described for the purpose of deflecting the 120 course laterally in either direction.

The improved air ship, as will be seen from the foregoing description, is simple in construction, and it will be found effective 130

and useful for the purpose of transporting freight as well as passengers.

Having thus described the invention, what is claimed as new, is:—

- 5 1. In an air ship, a gas receptacle, a car connected with and suspended from said gas receptacle, said car comprising a pair of longitudinally disposed tanks, a bottom member connecting the lower edges of said
10 tanks and cross bars connecting the upper edges of said tanks, a plurality of segments supported for oscillation intermediate the ends of the car, propellers and motors for driving the same supported by said seg-
15 ments, and means for adjusting the segments about their respective axes.

2. In an air ship, a car comprising longi-
tudininally disposed tanks suitably spaced
and connected to form an intermediate com-
20 partment, motors supported for oscillation in an approximately vertical plane between the ends and the middle portion of said

compartment, propeller carrying driven shafts associated with said motors, base plates supported adjacent to the ends of 25 the car for oscillation in an approximately horizontal plane, motors supported upon said base plates, propeller carrying shafts associated with said motors, means for connecting and actuating the base plates sup- 30 ported at the ends of the car to so adjust said base plates as to maintain the propeller carrying shafts of the motors associated therewith in an approximately parallel relation, and means for effecting in- 35 dependent adjustment of the motors intermediate the ends of the car.

In testimony whereof I affix my signature in presence of two witnesses.

DONALD McKAY MacLEOD.

Witnesses:

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A. N. LIMBOCKER.