March 23 , 1926. 1,578,069

J. E. BROYLES

AIRSHIP

Filed April 9, 1925 2 Sheets-Sheet 1

Fig. 1.

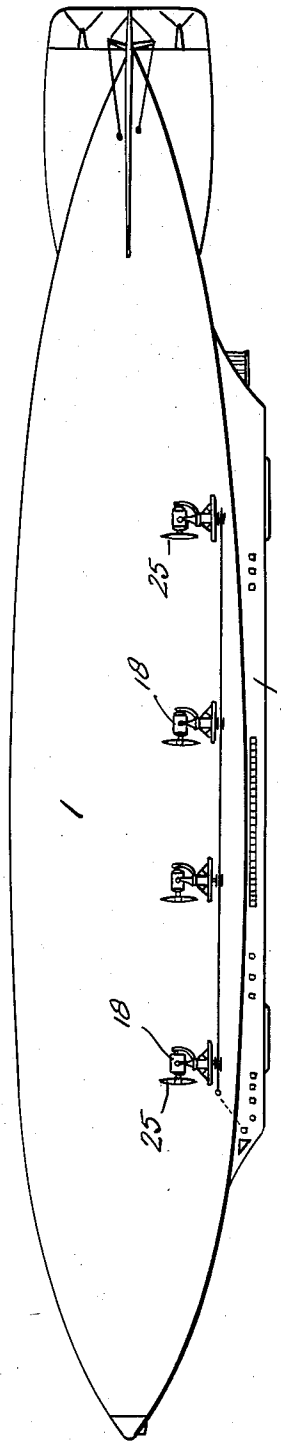
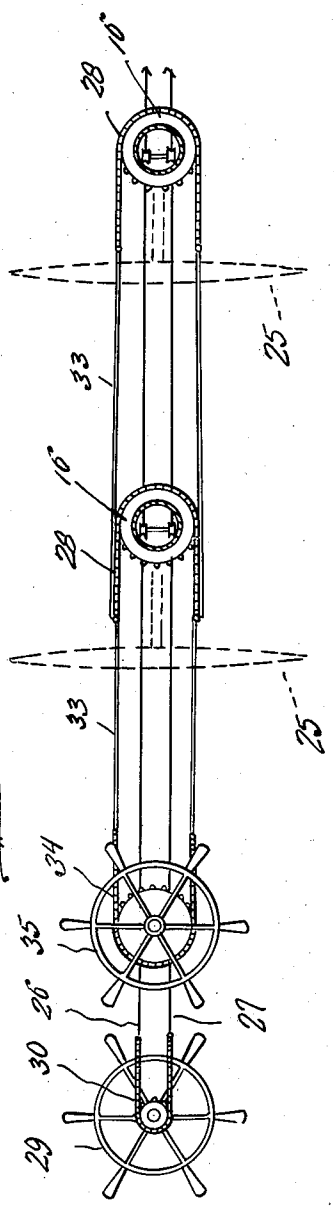


Fig. 5.



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Filed April 9, 1925 2 Sheets-Sheet 2

Fig: 3.

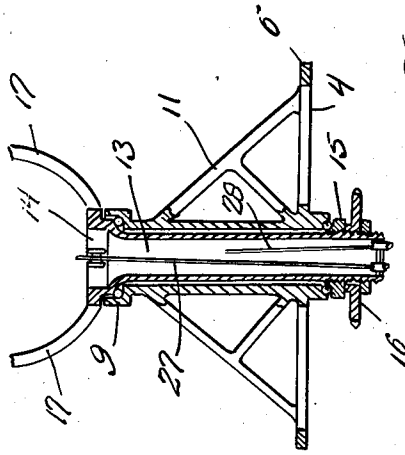


Fig: 4.

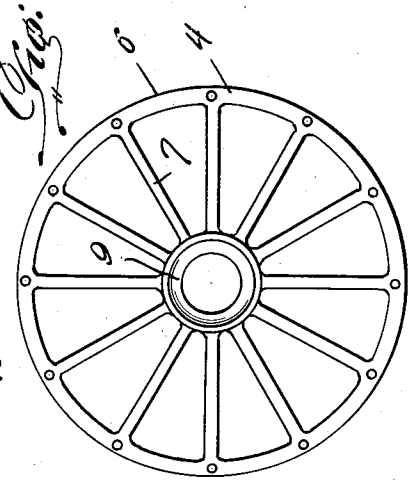
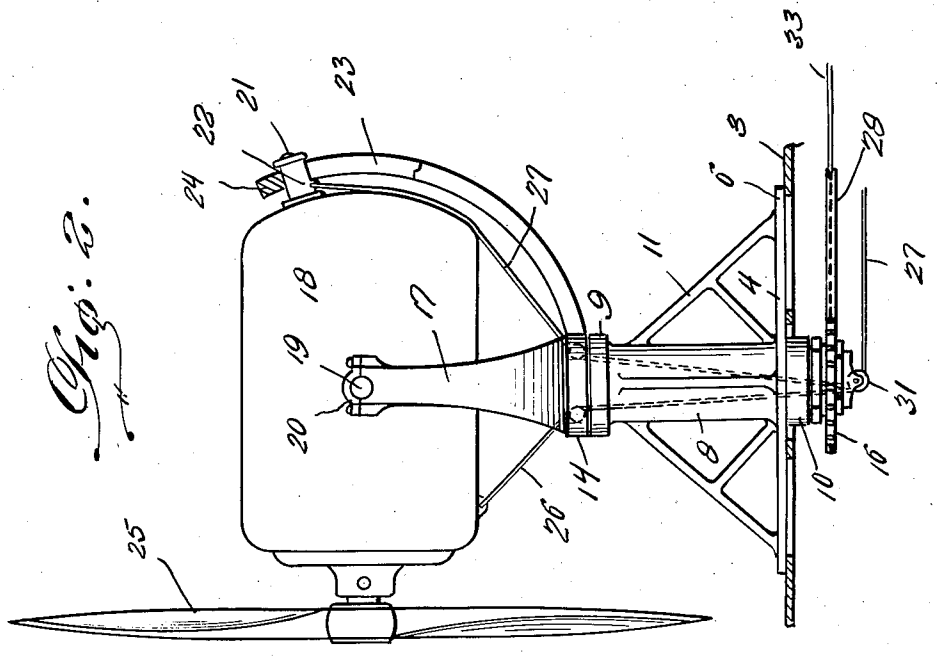


Fig: 2.



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Patented Mar. 23, 1926. 1,578,069

UNITED STATES PATENT OFFICE.

JOHN ENLOE BROYLES, OF COCO SOLO, CANAL ZONE, ASSIGNOR OF ONE-HALF TO H. E. ROBERTSON AND T. H. WEILER, BOTH OF RUSSELLVILLE, MISSOURI.

AIRSHIP.

Application filed April 9, 1925. Serial No. 21,873.

To all whom it may concern:

Be it known that I, JOHN E. BROYLES, a citizen of the United States, residing at Coco Solo, Canal Zone, have invented certain new and useful Improvements in an Airship, of which the following is a specification.

The present invention relates to an air ship of the "lighter than air" type, and has for its principal object to provide a novel assemblage of power plants on the air ship.

Other objects of the invention are to provide an assemblage whereby the power or pull of the propeller to be exerted at any angle desirable or at all angles without any power loss such as is occasioned by a swivel propeller due to gears, drive shafts, etc.; an assemblage which enables the installation or removal of an engine with the minimum amount of labor and inconvenience; an assemblage which reduces the fire hazard in the case of use on "lighter than air" craft by engine being installed outside of hulls or gas envelopes where all sparks, etc. are carried away by the force of air from the propeller; which permits of installation at points on the airship where the force of wind from the propeller is not exerted against the airship when the prime mover is being used to help the airship to ascend vertically, thereby gaining more lift power; which permits the full horsepower of the prime mover installed for the purpose of driving the propeller to be used as an additional source of lift to the airship; which permits the full horsepower of the prime mover installed on it with the propeller to be used in forcing the airship to descend vertically or at any other angle; which permits the guiding of the airship at any desired angle while still maintaining a level keel which will be of great advantage and comfort for passengers of commercial airships of the future; which does away with the necessity of carrying tons of water ballast for maintaining the airship's equilibrium, thereby increasing the useful carrying capacity of the airship to a very profitable extent; which permits an airship to "take off" vertically when loaded until "heavier than air"; which permits the navigator to steer a straight course in spite of cross winds to the direction of the flight; which permits the navigator or pilot to hover over a spot desirable for dropping an anchor or bomb; which enables the air ship to be maneuvered into the hangar without the aid of a large field crew; and which enables all engines in the airship to be controlled by the minimum engineer force.

A still further object of the invention is to provide a propelling device which is exceedingly simple in construction, easy to manipulate and control, efficient and reliable, not liable to readily get out of order, strong, durable, and otherwise well adapted to the purpose for which it is designed.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawing:—

Figure 1 is a side elevation of an airship showing my improved power plants mounted thereon.

Figure 2 is a detail elevation of one of the power plants.

Figure 3 is a vertical section therethrough.

Figure 4 is a plan view of the stationary member thereof, and

Figure 5 is a diagrammatic view showing the control for a group of the propelling structures.

Referring to the drawing in detail, it will be seen that 1 designates the envelope of the air ship having the usual freight or passenger compartment or compartments 2 suspended therebelow. My improvement consists in mounting a plurality of propeller mechanisms alongside of the envelope 1. There may be any number of these devices and as they are all of the same construction, only one will be described in detail as an example of all the others. The numeral 3 represents a platform or other suitable supporting means on which is mounted a base 4 consisting of a ring 6 having radiating spokes 7 connected to a hub 8 which is of an elongated cylindrical construction having bearing races 9 and 10 at its upper and lower ends respectively. A plurality of braces 11 are connected to the top portion of the hub 8, radiate therefrom and incline downwardly to be fixed to the ring 6. A sleeve 13 is disposed in the hub to rotate therein and is provided at its upper end with a bearing race 14 which cooperates with the race 9 for holding suitable

ball bearings therebetween as shown in Figure 3. A race nut 15 is threaded on the lower end of the sleeve 13 and cooperates with the race 10 for holding bearings therebetween as may also be seen in Figure 3. A sprocket 16 is suitably mounted on the sleeve 13 so that upon rotation thereof the sleeve will also be rotated. A pair of arms 17 extend upwardly from the upper end of the sleeve 13 and receive rotatably therebetween a suitable prime mover 18 by means of pintles 19 journaled in bearings 20. The prime mover shown in the drawing is in the form of an electric motor, but of course any other prime mover may be substituted therefor without departing from the spirit of this invention. A shaft 21 projects rearwardly from the prime mover 8 and has journaled thereon an anti-friction roller 22 if desired, which is movable between arcuate guides 23 extending from the upper end of the sleeve 13. These guides 23 are connected at their upper ends as at 24. A suitable propeller 25 is operatively mounted on the prime mover 18.

A pair of cables 26 and 27 extend through the sleeve 13. The cable 26 is attached to the forward end of the prime mover 18 while the cable 27 is attached to the rear end thereof or to the shaft 21. Thus, by pulling these cables 26 and 27 the prime mover may be swung about its transverse axis in a vertical plane. A chain 28 is trained over the sprocket 16 so that the sleeve 13 may be rotated and the prime mover rotated horizontally.

By way of example, in Figure 5, I have illustrated diagrammatically a system whereby two or more of the prime movers may be operated together, the cables 26 and 27 being connected about the sprocket of a steering wheel 29 by means of a chain section 30. These cables are trained over suitable pulleys 31 mounted at the lower end of the sleeve 13. The chain 28 is connected to cable sections 33 which in turn are connected to a chain section 34 which is trained about a sprocket operable by the steering wheel 35. Thus it will be seen that by operation of wheels 29 and 34, two of the prime movers may be adjusted as to both their vertical and horizontal axes as may be desirable. It is further apparent that this arrangement may be multiplied to include as many prime movers as may be desired. This grouping of the control of the prime movers will be governed entirely by the size, nature, and other features of the airship.

With this invention it will be seen that the force of the propeller may be utilized in all different maneuvers of the airship, both in ascending, descending, moving forwardly, moving sidewise, and in compensating for cross winds and the like. Practically any maneuver whatsoever may be made with an airship having the features of this invention incorporated therein.

It is further apparent that numerous changes in the details of construction, in the materials, and in the proportions, in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

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

1. In combination, a base, a hub extending from the base, a sleeve rotatable in the hub, arms projecting upwardly from the sleeve, a prime mover rotatable between the arms, a pair of guides, an extension disposed on the prime mover between the guides, said guides being attached to said sleeve, means for revolving the prime mover in the arms, means for revolving the sleeve, and a propeller operatively connected to the prime mover.

2. In combination, a hub, a sleeve rotatable in the hub, arms projecting upwardly from the sleeve, a prime mover rotatable between the arms, a pair of guides, an extension disposed on the prime mover between the guides, said guides being attached to said sleeve, means for revolving the prime mover in the arms, means for revolving the sleeve in the hub, and a propeller operatively connected to the prime mover.

3. In combination, a hollow hub, a sleeve rotatable in the hub, a prime mover rotatable on the sleeve, means for rotating the sleeve, and flexible members passing through the sleeve and having their ends attached to the prime mover.

4. In combination, a hollow hub, a sleeve rotatable in the hub, a prime mover rotatable on the sleeve, means for rotating the sleeve, and flexible members passing through the sleeve and having their ends attached to the prime mover, and guide pulleys mounted in the sleeve for receiving the flexible members.

5. In combination, a rotatable supporting member of hollow construction, an arm projecting therefrom, a prime mover rotatable on the arm, a guide projecting from the rotatable member, a projection on the prime mover and movable in guiding association with the guide, a propeller operatively connected with the prime mover, and a flexible cable trained through the hollow supporting member and engaged with the prime mover for rotation thereof in respect to the arm.

6. In combination, a hollow supporting member, means for rotating the hollow supporting member, a prime mover rotatably mounted on the supporting member, a flexible cable extending through the hollow supporting member and engaged with the prime mover for rotation thereof in respect to the supporting member.

7. In combination, a supporting member, means for rotating the supporting member, a prime mover rotatable on the supporting member, said supporting member being of hollow construction and provided with a plurality of pulleys mounted therein, a cable trained over the pulleys through the hollow supporting member and engaged with the prime mover in order that it may be rotated in respect to the supporting member, and a propeller operatively connected with the prime mover.

In testimony whereof I affix my signature.

JOHN ENLOE BROYLES.