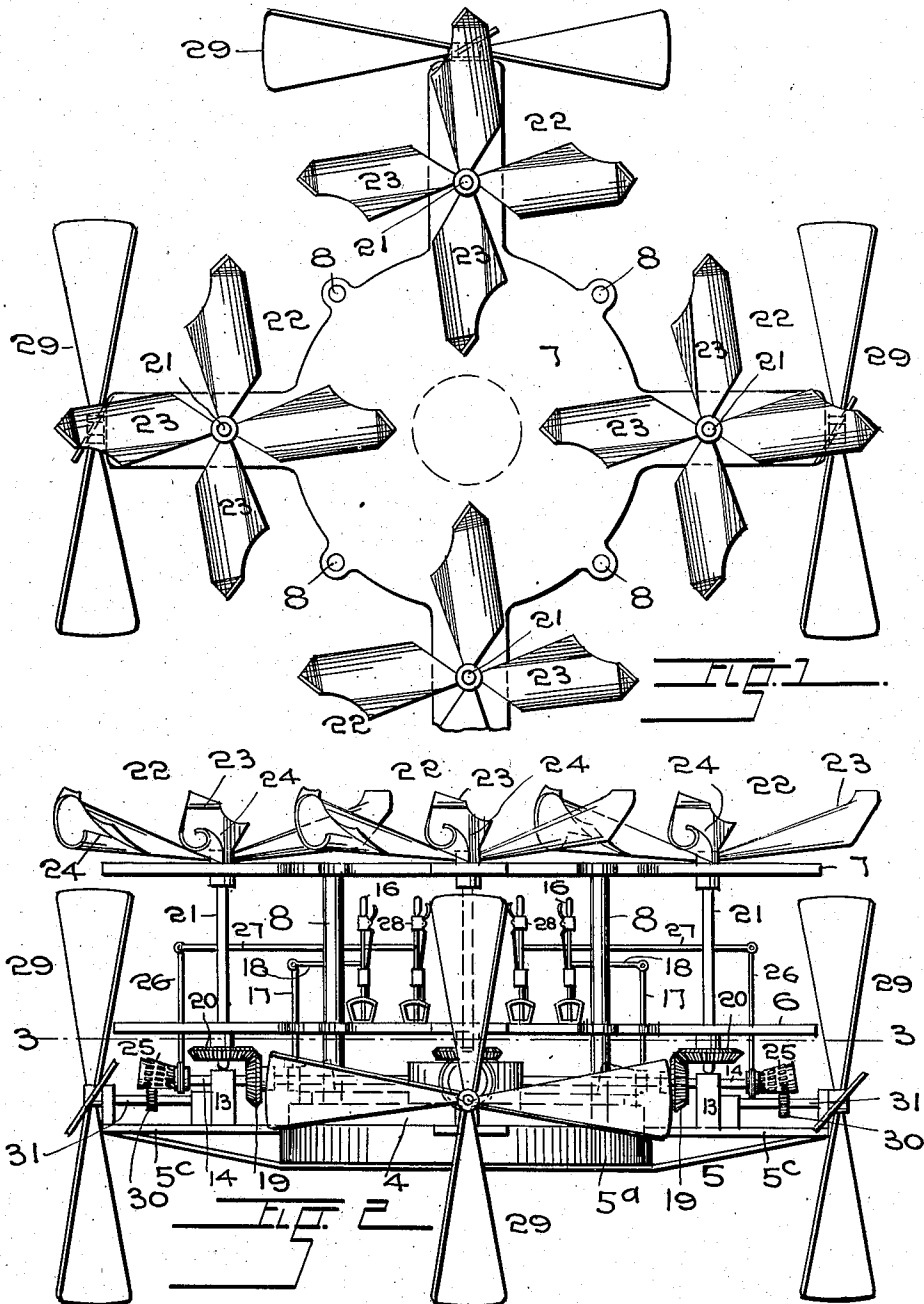


B. F. SEYMOUR.
AIR SHIP.
APPLICATION FILED JAN. 9, 1908.

937,187.

Patented Oct. 19, 1909.

3 SHEETS—SHEET 1.



WITNESSES:
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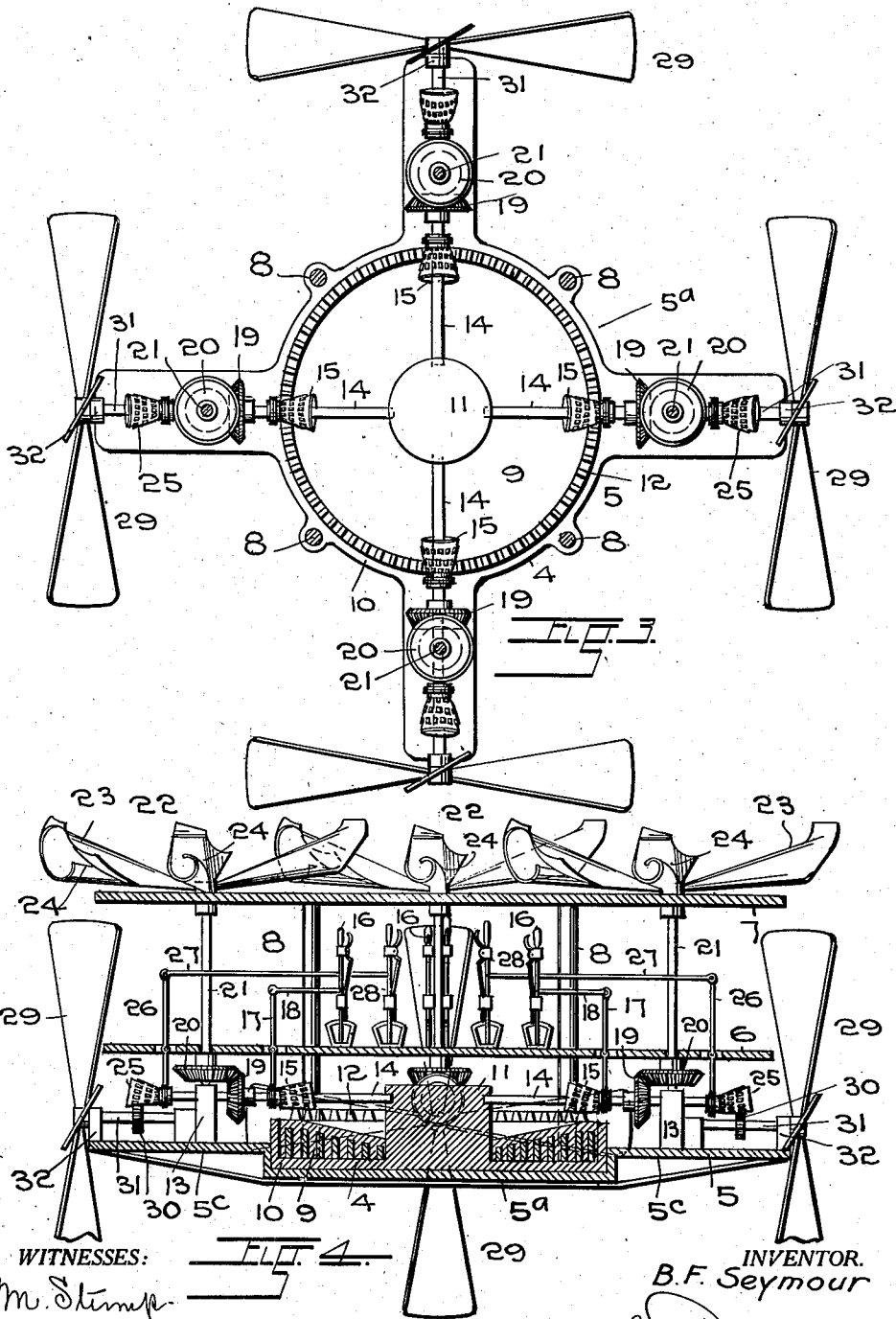
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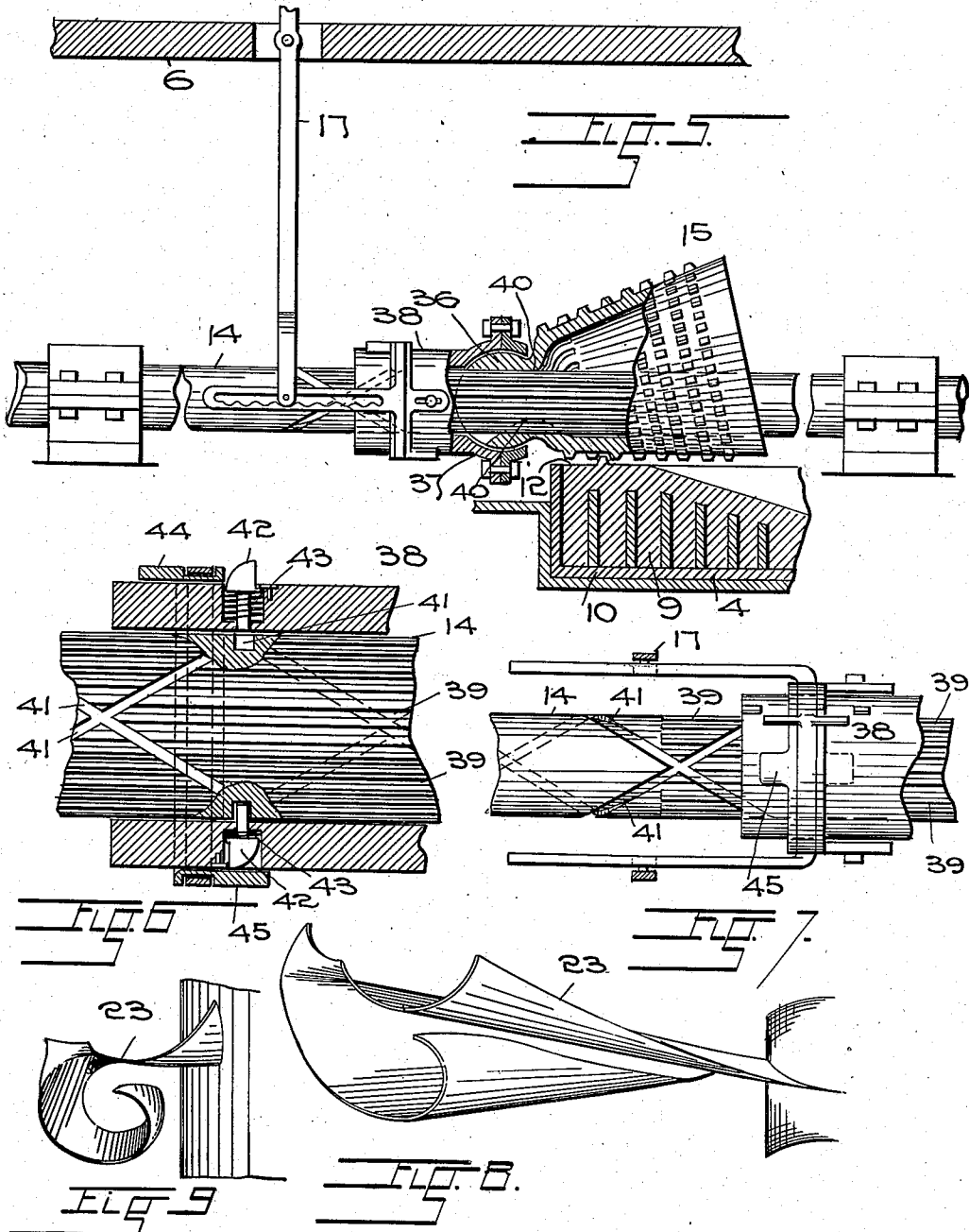
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. SEYMOUR, OF DENVER, COLORADO.

AIR-SHIP.

937,187.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed January 9, 1908. Serial No. 410,040.

To all whom it may concern:

Be it known that I, BENJAMIN F. SEYMOUR, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Air-Ships, of which the following is a specification.

This invention relates to improvements in air ships, its object being to provide an aerial vessel which may be operated to readily ascend or descend by simple mechanical means, and without resort to the use of a gaseous fluid as in the so-called dirigible balloons and which while floating in the atmosphere, may be propelled horizontally in any desired direction regardless of adverse air currents, or other impeding influences of the elements. I attain this object by the mechanism illustrated in the accompanying drawings in the various views of which like parts are similarly designated and in which—

Figure 1—represents a plan view of the apparatus, Fig. 2—a side elevation thereof, Fig. 3—a horizontal section taken on a plane 3—3, Fig. 2, and Fig. 4—a central vertical section, Fig. 5, an enlarged, partly sectional elevation of one of the speed varying apparatus included in the construction, Fig. 6—an enlarged, fragmentary, sectional elevation of the driven shaft and the sliding sleeve which forms part of the speed varying apparatus, Fig. 7—a fragmentary plan view of the said shaft, sleeve and therewith associated parts, and Fig. 8—an enlarged view of one of the vanes of the lifting propellers, in a rearwardly tilted position, and Fig. 9—an end view of the same.

The vessel, as illustrated in the drawings, consists of a structure composed of three decks 5, 6 and 7, held in parallel relation to each other by means of interposed vertical pillars 8. The three decks are alike and regular in contour, each being formed with a circular center portion and four arms, ranging radially therefrom at right angles to each other. The central portion 5^a of the lower or engine deck supports a turbine or rotary motor 4 which may be actuated by steam explosive gas, compressed air or other suitable impulsion fluid.

The boiler, reservoir or other source from which the fluid is derived during the operation of the apparatus, may be supported on or suspended from the structure in any de-

sired manner and, as the shape or application thereof is immaterial and does not form part of my invention, the said source of supply has not been illustrated in the drawings.

The motor 4 may be of any suitable construction, preference being had to a turbine in which a driven element 9 has a rotative movement in a circular housing 10 and around a core 11 and which is provided upon its upper surface with a circular gear or rack 12 through the instrumentality of which the rotary motion of the element is transmitted to the various propellers by means of which the vessel is operated.

Revolubly mounted in the upper portion of the core 11 of the turbine and in journal bearings 13 on the arms 5^c of the lower deck are four shafts 14, arranged at right angles to each other and each carrying a gear 15 which meshes into the circular rack 12 on the revoluble element 9 of the motor. These gears are longitudinally adjustable on the respective shafts for the purpose of varying the velocity of the latter in ratio to the speed of the turbine, and they are controlled by means of hand levers 16 upon the intermediate or operating deck 6, with which they are associated by means of levers 17 and connecting rods 18.

The speed varying contrivance 15 which has been illustrated in detail in Figs. 5 to 7 inclusive of the drawings, consists of a hollow conical gear 35 whose globular extremity 36 is movably disposed within a correspondingly shaped socket 37 at the end of a sleeve 38 which surrounds the shaft 14. The latter is formed with a series of longitudinally extending equidistant flutes 39 and the gear 35 has at the juncture of its conical portion with the globular extremity 36, a series of inwardly projecting teeth 40 which are adapted to mesh with the aforementioned flutes. The shaft 14 is furthermore provided with two grooves 41 winding spirally in opposite directions and the sleeve 38 carries two oppositely disposed dogs 42 adapted to project, when forced inwardly, into the respective grooves. The dogs 42 are held in their normal position by means of springs 43, their heads projecting beyond the peripheral surface of the sleeve so that they may be engaged and depressed by a collar 44 which slidably surrounds the sleeve and which connects with the before-mentioned lever 17. The collar 44 is formed with

laterally and oppositely extending lips 45 and its movement upon the sleeve is limited so that at all times one or the other of the two dogs 42 is in the depressed position in which it engages the respective spiral groove 41. The conical portion of the gear 15 has upon its peripheral surface, a plurality of series of circularly arranged equidistant teeth which are adapted to separately mesh with those of the circular rack 12. Premising that the rack 12 travels at a uniform rate of speed, the velocity of the shaft 14 may be varied by moving the gear 15 longitudinally so as to bring a circumferentially smaller or larger series of teeth in engagement with those of the rack and the movement of the gear is accomplished through the instrumentality of the lever 17 and the therewith associated parts. When the collar 44 is in its middle position on the sleeve 38, both the dogs 42 project into the respective grooves 41 and the sleeve and the therewith connected cone are, in consequence locked against longitudinal movement. By moving the collar laterally one way or the other, one of the dogs is disengaged from the respective groove, as is shown in Fig. 5 and the rotative movement of the shaft 14 will be transposed into a longitudinal movement of the sleeve 38 in the direction in which the spiral groove 41 engaged by the opposite dog, winds.

Beveled gears 19 mounted upon the shafts 14 mesh into corresponding gears 20 at the lower extremities of vertical shafts 21 which projecting through the middle and upper decks of the structure, carry upon their upper ends the propeller wheels 22, which co-operatively constitute the ascending and descending medium of the apparatus. Each of the propellers 22 consists of a plurality of radially arranged, coniform wings 23, each formed of a spirally wound metallic sheet, the edges of which overlap in spaced relation to form a longitudinal orifice 24 through which air may enter into the interior of the wing. The outer corner of each wing is bent upwardly to facilitate the passing of the air into the wings during the rotary movement of the propellers.

Adjustably mounted upon the outer extremities of the shafts 14 are speed varying devices 25 identical to those which engage the circular rack 12, and likewise connected by means of levers 26 and rods 27, with operating levers 28, which are supported upon the middle deck 6.

Detailed representation of the transmission members 15 and 25 has been omitted from the drawings as their construction has been made the subject of a separate application for patent filed by me in the United States Patent Office on the twelfth day of December, 1907, Serial Number 406,193.

The transmission gears 25 operatively en-

gage spur wheels 30, which are mounted upon horizontal shafts 31, rotatably supported in suitable bearings 32 upon the outer portions of the arms 5^c of the deck 5 and below the shafts 14. The shafts 31 projecting beyond the outer extremities of the arms 5^c carry at their ends, screw-propellers 29 which, rotating in vertical planes, are employed to propel the vessel horizontally and which furthermore perform the function of steering the vessel in any desired direction while floating in the atmosphere.

The manner in which the vessel is operated is as follows: To ascend, the operator of the vessel occupying a position on the middle deck in proximity to the hand levers by which the speed varying transmission devices are controlled, brings the gears 15 by means of which the propeller wheels 22 are actuated, in operative engagement with the circular rack 12 after which the motive fluid is directed from the source of supply to the turbine causing the rotary motion of its revoluble element. The reason of the great difference in circumferential dimensions of the driving gear 12 and the driven gears 15, the rotary movement of the latter will effect a many times greater velocity of the wheels 22 and it is this great velocity together with the peculiar shape of the wings 23 and the form of the decks of the vessel which permits unobstructed vertical motion of the air displaced by the movement of the horizontal propellers that will cause the vessel to rise against the gravitative force of its own weight which, it will be understood, is made as light as is possible with regard to strength and durability. After the vessel has ascended to the desired height, the velocity of the propellers may be diminished by adjustment of the speed varying gears 15 and one of the vertical propellers is actuated to propel the vessel in the direction in which it is desired to travel, the speed of the propeller being regulated by adjustment of the respective gear 25.

To vary the direction of travel of the vessel or to counteract currents of air which tend to deviate it from its course, one or both of the side propellers may be put in motion when it is desired to reverse the direction, the forward propeller is actuated and that at the stern stopped. It will thus be observed that the arrangement of the various propelling wheels and the ready means for varying their rotative velocity, provide absolute control of the operator over the movements of the vessel either in a vertical or horizontal direction, thereby rendering the apparatus thoroughly practical under all conditions, and insuring great speed and utmost safety.

Having thus described my invention what I claim is:—

1. An air ship comprising a suitable struc-

ture, means to impart a vertical movement thereto, and four propellers arranged to independently rotate about horizontal axes extending from a common point at right angles to each other.

2. An air ship comprising a suitable structure, means to impart a vertical movement thereto and four propellers arranged equidistantly from the center of the structure to rotate independently about horizontal axes ranging from the said center at right angles to each other.

3. An air ship comprising a suitable structure and a lifting wheel mounted thereon to rotate in a horizontal plane and including a plurality of radiating wings each formed of a coniform sheet whose edges overlap in spaced relation to each other.

4. An air ship comprising a suitable structure, a motor thereon including a revoluble, horizontal, circular rack, lifting wheels arranged to rotate in a horizontal plane and transmission means adapted to transmit the motion of the said rack to the said wheels at any one of a plurality of different rates of speed.

5. An air ship comprising a suitable structure, a motor thereon including a revoluble horizontal, circular rack, propellers arranged to rotate independently about axes extending from a common point at right angles to each other and transmission means adapted to transmit the motion of the said rack to the said propellers.

6. An air ship comprising a suitable structure, a motor thereon including a revoluble, horizontal, circular rack, propellers arranged to rotate independently about axes extending from a common point at right angles to each other and transmission means adapted to transmit the motion of the said rack to the

said propellers at any one of a plurality of different rates of speed.

7. An air ship comprising a suitable structure, a motor thereon including a horizontal, revoluble, circular rack, shafts mounted to rotate in axes radiating from the center of the rack at right angles to each other, lifting wheels arranged to rotate in horizontal planes, propeller wheels arranged to rotate about axes ranging from a common point at right angles to each other, and transmission means upon the said shafts, adapted to transmit the movement of the said rack to each of the said wheels and the said propellers at any one of a plurality of rates of speed.

8. An air ship comprising a suitable structure, a driving mechanism centrally mounted thereon, lifting wheels arranged to rotate about vertical axes equidistant from the center of the structure, propellers equidistant from the center of the structure mounted to rotate independently about horizontal axes extending at right angles from the said center and transmission means operatively connecting the said wheels and the said propellers with the said mechanism.

9. An air ship comprising a suitable structure and a lifting wheel mounted thereon to rotate in a horizontal plane, and including a hub and wings radiating therefrom and each formed of a spirally wound, substantially coniform sheet, secured to the hub at its smaller end near its outer edge, whereby a current of air may pass continuously through its interior.

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

BENJAMIN F. SEYMOUR.

Witnesses:

G. J. ROLLANDET,
K. M. STUMP.