

No. 809,093.

PATENTED JAN. 2, 1906.

A. CHIODERA.
NAVIGABLE BALLOON.
APPLICATION FILED APR. 28, 1903

3 SHEETS—SHEET 1.

Fig. 1.

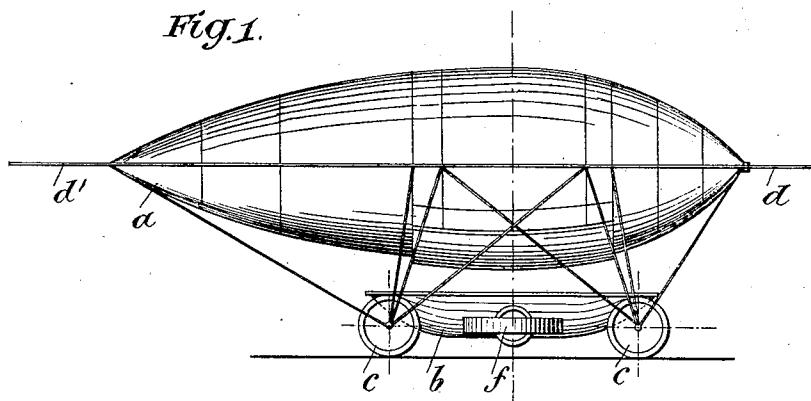


Fig. 2.

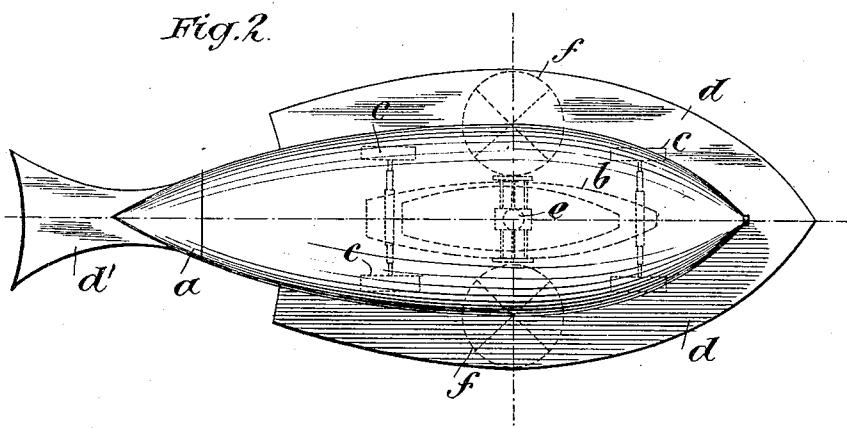


Fig. 3.

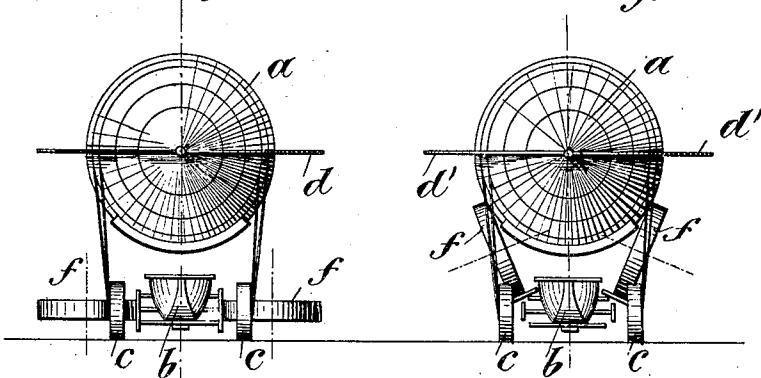
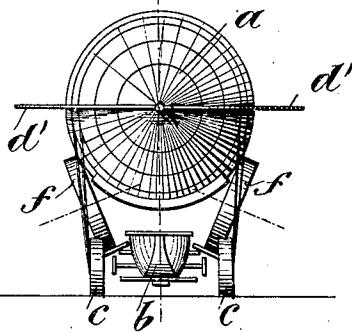


Fig. 4.



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3 SHEETS—SHEET 2.

Fig. 5.

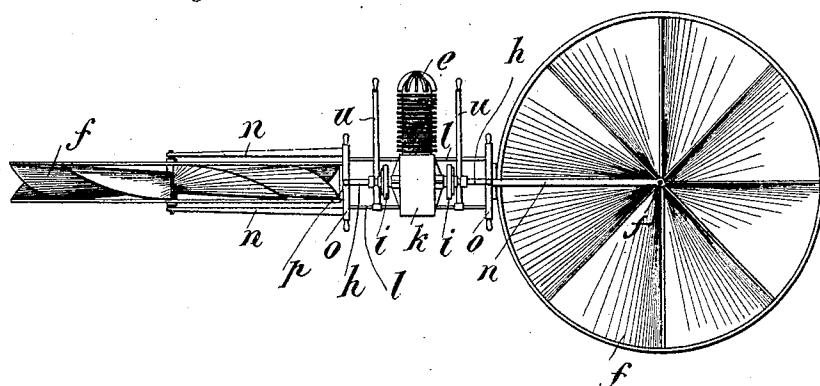
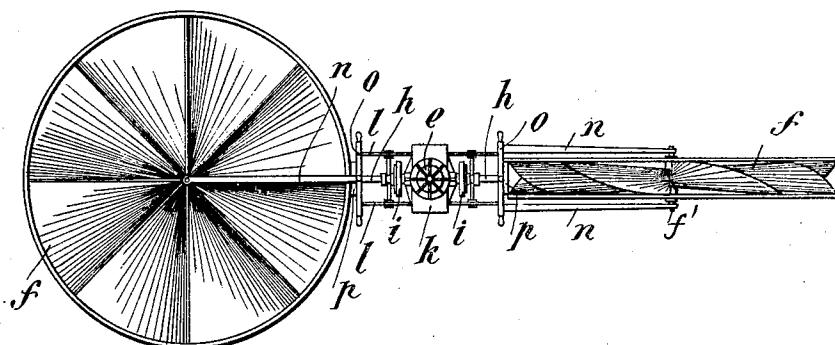


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

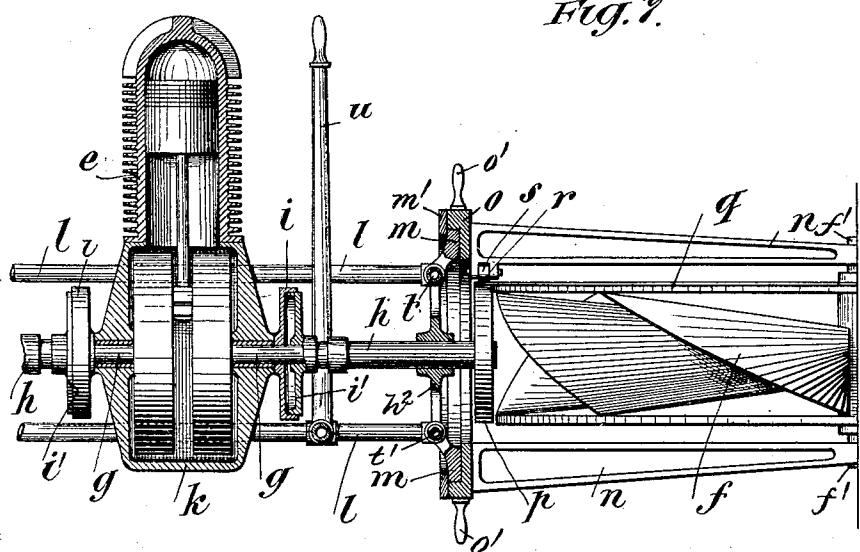
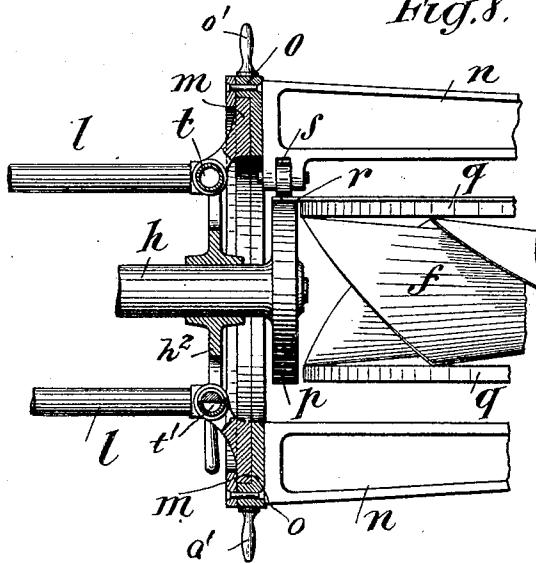


Fig. 8.



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UNITED STATES PATENT OFFICE.

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NAVIGABLE BALLOON.

No. 809,093.

Specification of Letters Patent.

Patented Jan. 2, 1906.

Application filed April 28, 1903. Serial No. 154,676.

To all whom it may concern:

Be it known that I, ALFRED CHIODERA, a citizen of the Republic of Switzerland, residing at Zurich, Switzerland, have invented 5 certain new and useful Improvements in Navigable Balloons, of which the following is a specification.

As is well known balloons as heretofore constructed are not manageable or navigable 10 in all kinds of weather or atmospheric conditions.

My invention relates to navigable air-ships of greater specific gravity than the air and combined with a gas-field of such volume as 15 to counterbalance the excess of weight of the ship; and it has for its object certain improvements hereinafter fully described and specifically set forth in the claims forming a part of this specification; but that my invention 20 may be fully understood I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a plan, and Figs. 3 and 4 front and rear end elevations, respectively, of my improved air-ship. Fig. 5 is a side elevation, and Fig. 6 a plan view, showing the general arrangement of the side propellers and the motor. Fig. 7 is a detail sectional vertical view of the motor and 25 part of one of the propellers, and Fig. 8 is a similar view, enlarged, showing part of a propeller and its support.

In Figs. 1 to 4 and as an example I have shown an air-ship the gas-field *a* of which has the general form of a fish having a tail-fin *d'* 35 and a single body-fin *d* encompassing the gas-field nearly to the tail end. These so-called "fins" *d d'* are more or less rigid flat surfaces performing the function of parachutes or 40 aeroplanes in descending or ascending. A car *b*, mounted on wheels *c*, is suspended from the gas-field in any suitable manner and by any suitable means connected, for instance, to the wheel-axles of the car, as 45 shown, on which axles the car is mounted in any desired or well-known manner. The car contains a motor of any desired type—as, for instance, a gas or vapor engine *e*, that drives side propellers *f*, revoluble about vertical axes 50 *f'* and adapted for adjustment about a horizontal plane—that is to say, about a diameter of the propeller—for the purpose of varying their relative angular relations or positions, means being provided to drive the propellers independently of each other and to 55 turn them on edge in converging planes to-

ward the gas-field and car *b* independently of each other and of the motor-shaft when the air-ship is descending or near or on the ground to avoid possible injury to the propellers by 60 contact with obstructions.

The air-ship as organized can be navigated, as by shifting the center of gravity toward the front, for instance, the ship will take a forwardly and downwardly inclined position 65 and will move downward by reason of the surplus weight, which acts as a dead-weight, the fins *d* and *d'* performing the function of aeroplanes. By shifting the center of gravity toward or to the center again and if the 70 propellers are thrown out of operation the air-ship will be stopped, and it will then descend slowly and substantially in a vertical direction, the fins *d* and *d'* then acting as parachutes, while if the propellers are again 75 set in motion the air-ship will ascend obliquely, said fins again acting as aeroplanes. Finally, according as one or the other propeller *f* is set in operation, the air-ship can be 80 steered to one side or the other, and this may 85 also be done by setting the propellers at different angles.

I will now describe the mechanism by means of which the described operations are performed, referring more particularly to 85 Figs. 7 and 8. The driving crank-shaft *g*, Fig. 7, common to both propellers *f*, carries friction clutch members *i*, coöperating with complementary friction clutch members *i'* on the driven shafts *h*, said members *i'* being 90 moved into and out of contact with the members *i* by shifting-levers *u*. (See also Fig. 5.) The driven shafts *h* have bearing in the hub of the spiders *h'*, whose arms are connected to rods *l*, and at its outer end each driven 95 shaft *h* is provided with a friction-disk *p*. A ring *m* is secured between two rings *m'* and *o* in such manner as to admit of rotation of said rings *m'* and *o* on ring *m*, ring *o* being provided with handles *o'*. The ring *m* has hinge 100 connection at *t* with two of the arms *l*, of which I preferably provide four, while said ring *m* has a separable connection *t'*, of any desired construction, with the other two arms *l*, so that rings *m'*, *m*, and *o* can be 105 swung bodily on said hinge connections *t* for the purpose of turning the propellers *f* in-board on edge from the position shown in Figs. 7 and 8 to the position shown in Fig. 4, thus throwing said propellers out of operation. As the revoluble rings *m' o* adapt a 110 propeller to rotate about a diameter thereof

the angular relation of the two side propellers can be varied *ad libitum*, two examples of the relative angular position of the two propellers *f* being given in Figs. 5 and 6.

5 In order to admit of the described shifting of the propellers, I provide a friction driving mechanism, of which the disk *p*, above described, constitutes one member.

To the ring *o* are secured two radial bracket-arms *n*, in the outer ends of which the shafts *f'* of the propellers *f* have their bearings, one of said bracket-arms carrying at its inner end a friction-wheel *s*, preferably of rubber and mounted in suitable bearings.

15 The friction-wheel *s* and friction-disk *p* act on a peripheral flange *r* on one of the propeller-wheel rims or tires *q*, each of the propellers consisting of a hub or shaft *f''*, having journals revolving in bearings in the arms *n*,

20 and to said shaft and to the peripheral rims or tires *q* are secured the propeller-blades.

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

25 1. In an air-ship, a propeller-frame, a propeller rotatably carried by said frame, a support for the latter, a hinged connection between the support and frame, a driving-shaft and separable driving elements connecting

30 the shaft and propeller.

2. In an air-ship, the combination with a driving-shaft and a friction driving element thereon, of a propeller-frame, a propeller rotatably mounted therein and having a comple-

35 mentary friction-driven element, a support for the propeller-frame and a hinge connection between the support and said frame.

3. In an air-ship, the combination with the driving-shaft of a propeller-frame, a propeller rotatably mounted therein, a support

40 for the propeller-frame to which the latter is hinged and adjustable about an axis at right angles to the axis of rotation of the propeller and separable driving elements connecting

45 said propeller to the driving-shaft.

4. In an air-ship, the combination with a motor having two driving-shafts, each composed of two sections adapted to be coupled and uncoupled; of a propeller for each driv-

50 ing-shaft, a propeller-frame for each propeller in which frames said propellers are rotatably mounted, supports for said frames, a hinged connection between the frames and their respective supports and separable driv-

55 ing elements connecting the propellers to their driving-shafts.

5. In an air-ship, the combination with a motor having two driving-shafts, each composed of two sections adapted to be coupled

60 and uncoupled; of a propeller for each driv-

ing-shaft, a propeller-frame for each propeller in which frames said propellers are rotatably mounted, supports for said frames about which the latter are adjustable about

65 an axis at right angles to the axis of rotation

of the propellers, a hinged connection between the frames and their respective supports and separable driving elements connecting the propellers to their driving-shafts.

6. In an air-ship, the combination with a 70 motor having two motor-shafts, each composed of two sections adapted to be coupled and uncoupled; of a propeller for each driving-shaft, a propeller-frame for each propeller, in which frames said propellers are rotatably mounted, supports for said propeller-frames, separable connections between said supports and frames and means to adjust the frames independently of each other about an axis at right angles to the axis of rotation of the propellers.

7. In an air-ship, the combination with a motor having two motor-shafts, each composed of two sections adapted to be coupled and uncoupled; of a propeller for each driving-shaft, a propeller-frame for each propeller, in which frames said propellers are rotatably mounted, supports for said propeller-frames, a hinge connection and a separable connection between the propeller-frames and 80 their respective supports, and means to adjust the frames independently of each other about an axis at right angles to the axis of rotation of the propellers.

8. In an air-ship, a propeller-frame, a propeller rotatably carried by said frame, a fixed support, a frame-support comprising a normally stationary element, a hinge connection between the latter and the fixed support and a frame-carrying element revolvable about 90 said stationary element and about an axis at right angles to the axis of rotation of the propeller; in combination with a driving-shaft and separable driving elements connecting said shaft to the propeller.

9. In an air-ship, a motor, a horizontal driving-shaft and friction-disks driven thereby; in combination with propeller-wheels having a peripheral flange in contact with their respective friction-disks, the vertical 110 shafts for said wheels, arms in which said shafts have their bearings, a friction-wheel on one of said arms in contact with the aforesaid peripheral flange and a relatively stationary support for said arms, for the purpose 115 set forth.

10. In an air-ship, the combination with a motor having two shafts, each composed of two sections adapted to be coupled and uncoupled, of a plurality of supporting-rods, 120 rings hinged to said rods, a propeller for each driving-shaft and a propeller-frame for each propeller rotatably mounted on said rings.

11. In an air-ship, the combination with a motor having two shafts, each composed of 125 two sections adapted to be coupled and uncoupled, of a plurality of fixed supporting-rods, circular bearing members hinged to said rods, supporting members rotatably mounted on the bearing members, propeller- 130

frames mounted on the supporting members, and a propeller rotatably mounted in each frame.

12. In an air-ship, the combination with a motor having two shafts, each composed of two sections adapted to be coupled and uncoupled, of a plurality of fixed supporting-
5 rods, bearings for one section of each shaft supported by said rods, circular bearing members hinged to said rods, supporting
10 members rotatably mounted on said circular

bearing members, propeller-frames mounted on the rotatable supporting members and a propeller rotatably mounted in each frame.

In testimony whereof I have signed my ¹⁵ name to this specification in the presence of two subscribing witnesses.

ALFRED CHIODERA.

Witnesses:

MORITZ VEITH,
A. LIEBERKNECHT.