R. SCHMIECHEN.

OCEAN AIRSHIP.

APPLICATION FILED MAY 20, 1909.

969,200.

Patented Sept. 6, 1910.

4 SHEETS—SHEET 1.

FIG. 10.

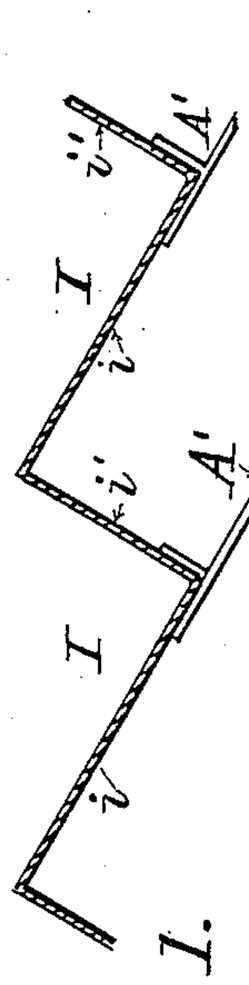



FIG. 1.

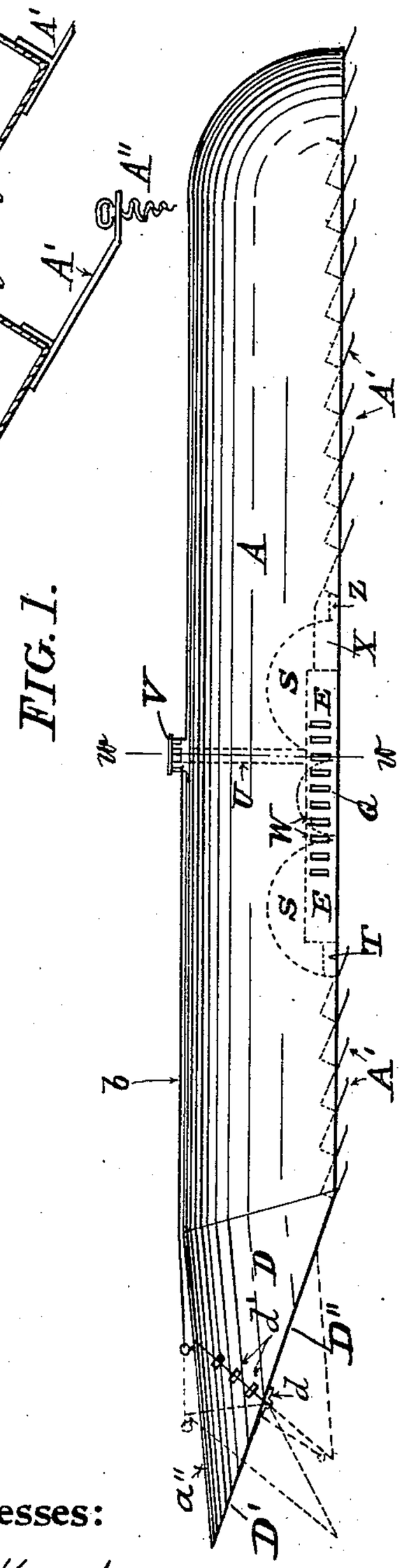
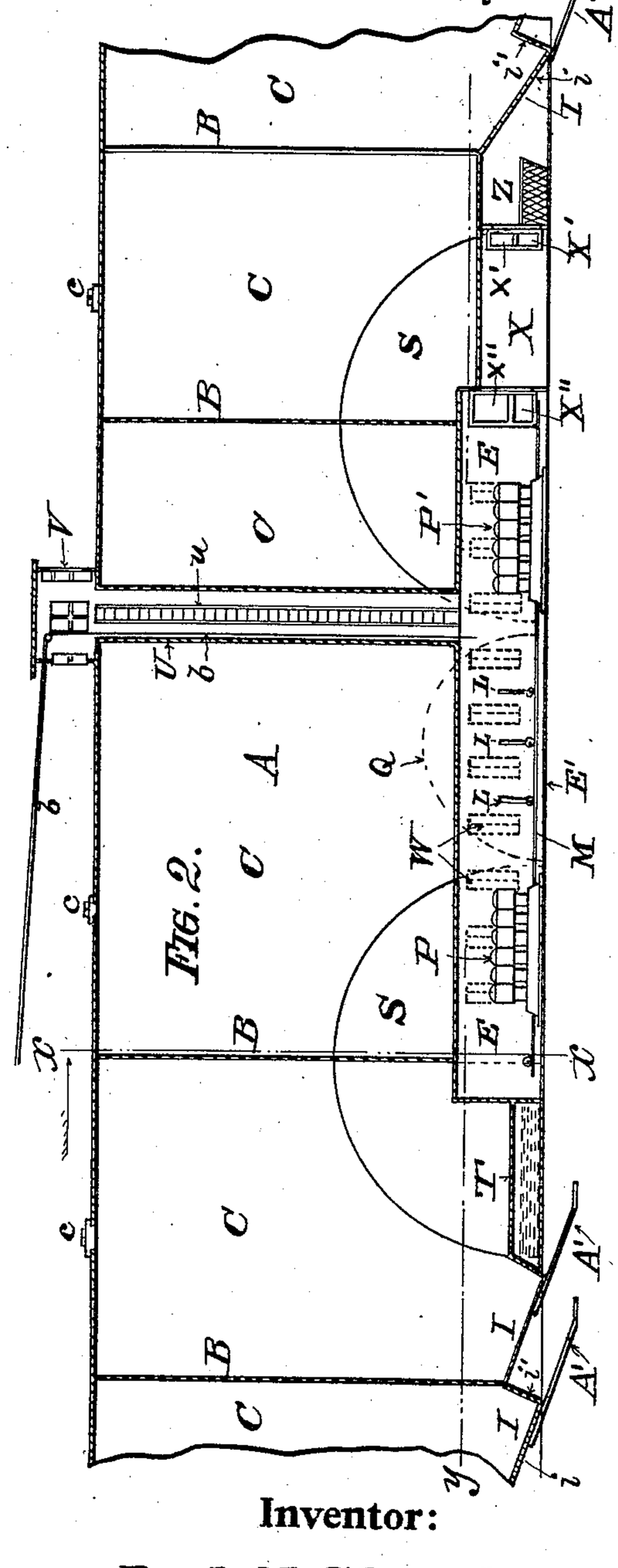



FIG. 2.

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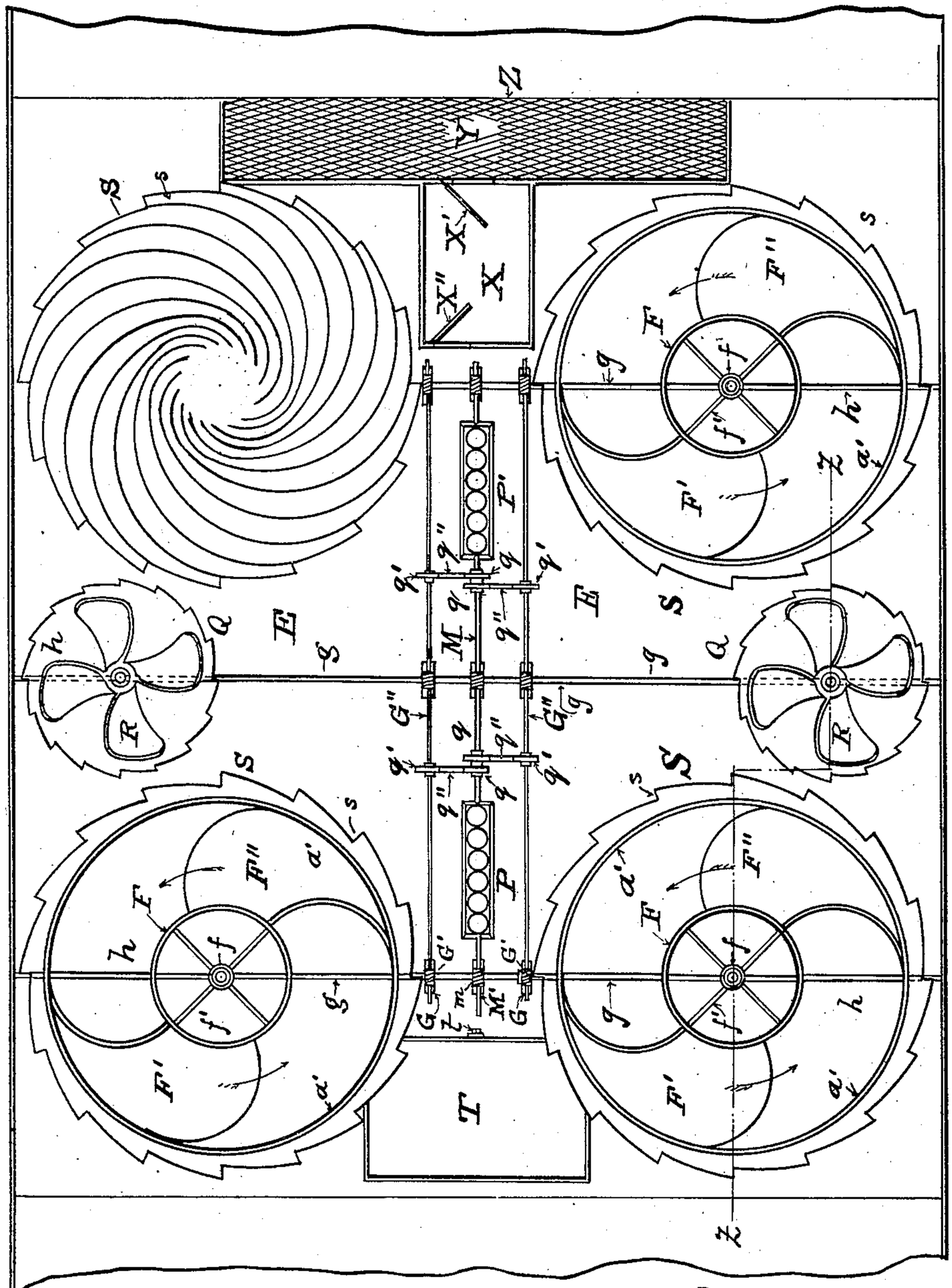
4 SHEETS—SHEET 2.

FIG. 3.

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4 SHEETS—SHEET 3.

FIG. 4.

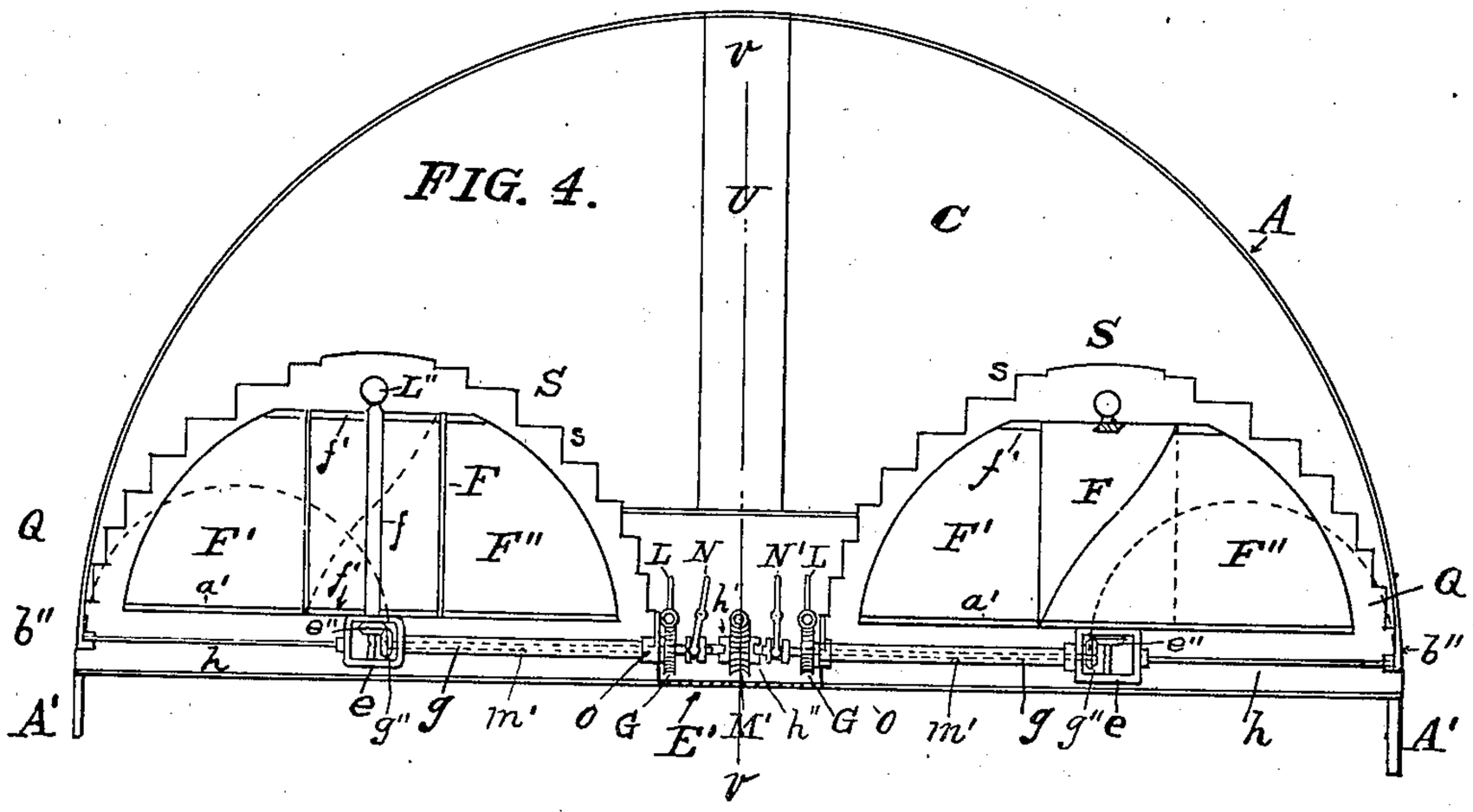
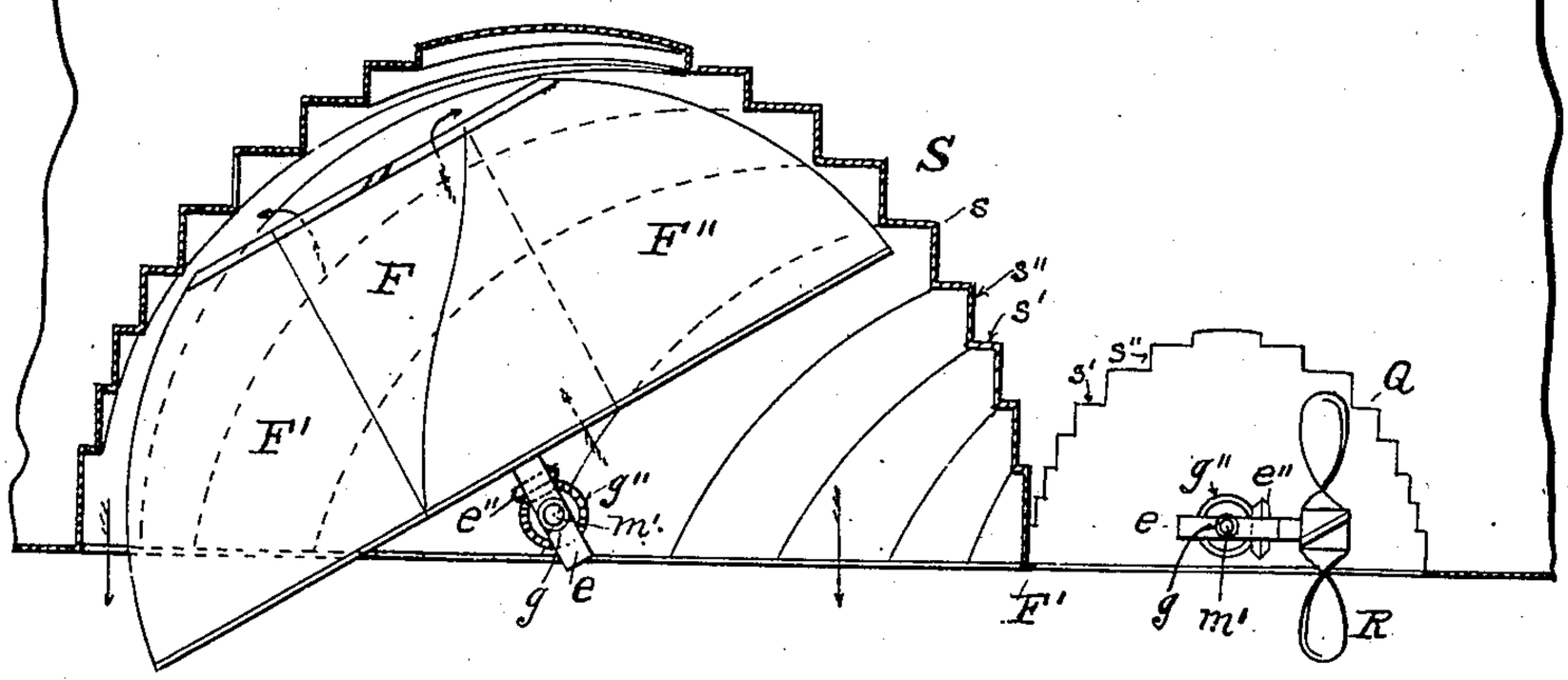



FIG. 5.

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4 SHEETS—SHEET 4.

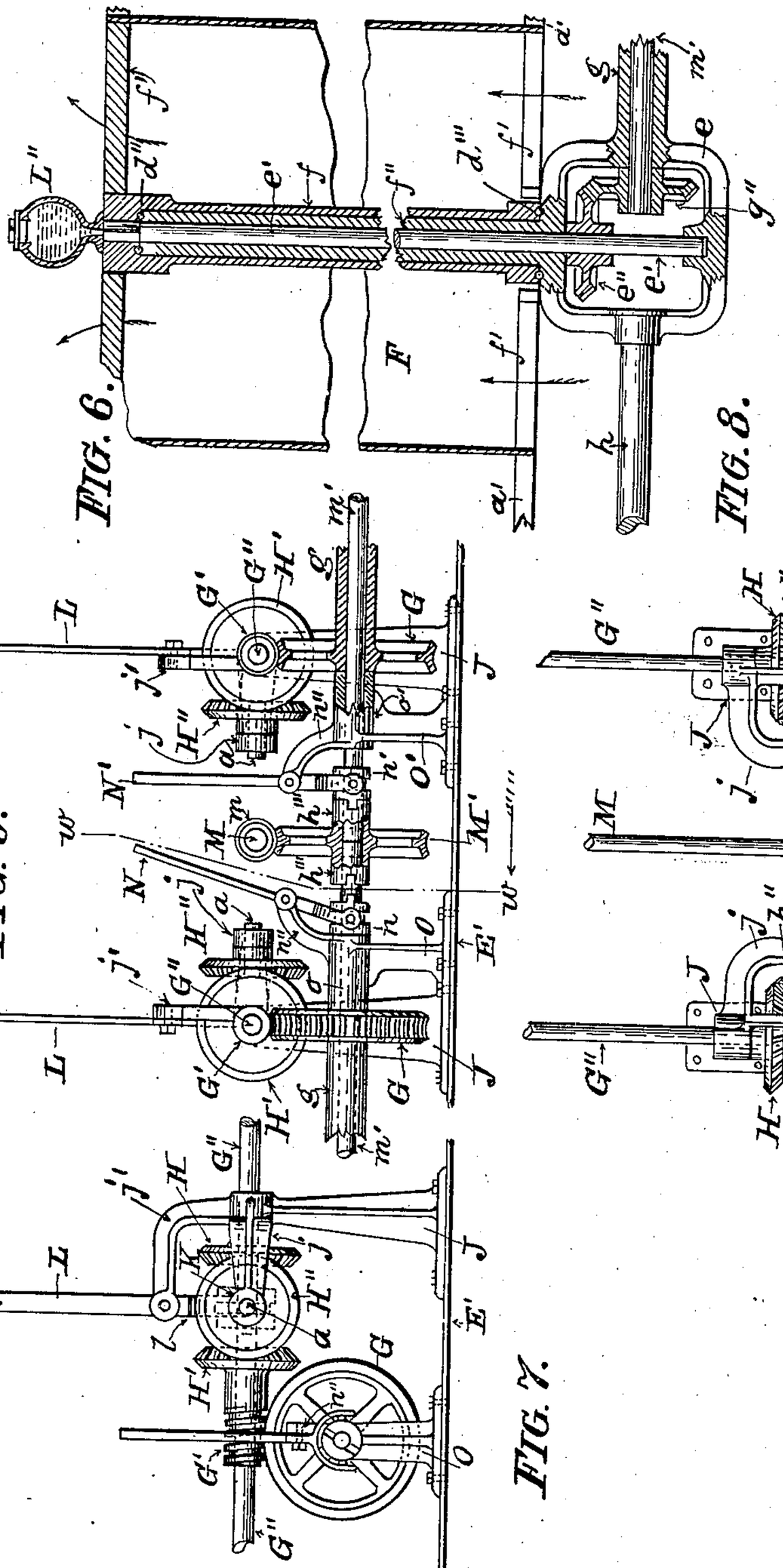


FIG. 6.




FIG. 9.

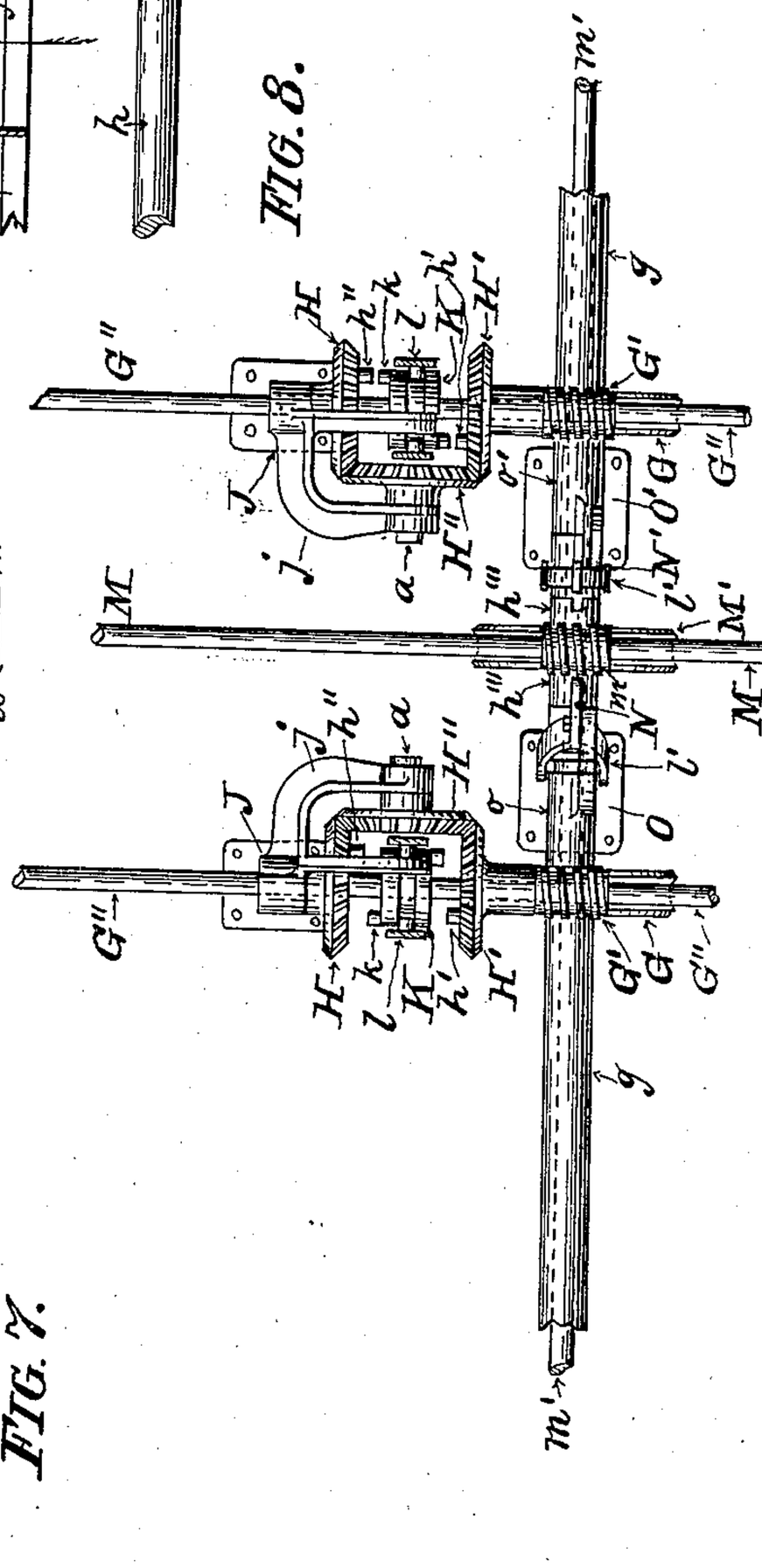


FIG. 8.

FIG. 7.

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# UNITED STATES PATENT OFFICE.

REINHOLD SCHMIECHEN, OF LEDYARD, IOWA.

## OCEAN AIRSHIP.

969,200. Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed May 20, 1909. Serial No. 497,363.

*To all whom it may concern:*

Be it known that I, REINHOLD SCHMIECHEN, a citizen of the United States, and resident of Ledyard, in the county of Kossuth and State of Iowa, have invented certain new and useful Improvements in an Ocean Airship; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheets of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to ocean-air ships, or air-ships adapted to float and move upon water as well as in air; and it consists, essentially, in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described and then pointed out in the claims.

The object of this invention is the production of an ocean-air ship which shall possess the following advantages and produce the results stated:

1. An ocean-air ship which shall be capable of carrying heavier loads than has heretofore been attained, for the reason that it includes two lifting and propelling mediums, viz., a gas lighter than air contained in a body consisting of a series of cells, and propelling and lifting mechanism.

2. An ocean-air ship adapted to reach higher altitudes and to travel longer distances than aeroplanes.

3. An ocean-air ship which is capable of rising vertically in the air, or vertically out of water.

4. An ocean-air ship that needs no ballast to cause it to rise by discharging the same, for the reason that it is capable of rising by virtue of its propelling mechanism.

5. An ocean-air ship that can be lowered vertically by reducing the speed of the propelling and lifting mechanism without discharging gas from the cells.

6. An ocean-air ship which is capable of moving horizontally or in inclined planes either forward or backward by inclining its propelling and vertically moving means in the proper direction.

7. An ocean-air ship that can be turned in a horizontal plane at any particular point by operating the propelling mechanism on one side of the ship in opposite direction to that of the propelling mechanism on the other side of said ship.

8. An ocean-air ship that can be maintained at any particular position by setting the propeller mechanism at an angle and regulating the speed of the said propelling mechanism to resist the influence of air-currents.

9. An ocean-air ship having sufficient mechanical means to lift the heavier-than-air ship without the use of gas in its cells.

10. An ocean-air ship that can move horizontally with the speed of a storm when the mechanical means for lifting and propelling are being utilized for forward propulsion only, the aeroplanes under the body of the ship being sufficient to maintain the ship at whatever elevation it may be moving.

11. An ocean-air ship that cannot drop with considerable speed for the reasons that: *a*, it is not depending upon the superior skill of an operator for directing it; *b*, since by failure of any one of the motors the remaining ones are sufficient to maintain the ship afloat and to propel the same at a reduced speed, and *c*, should one or more of the gas-containing cells be punctured and the gas therein have escaped, the propelling motors are ample to maintain the ship in air, or at least a slow descending thereof; *d*, it contains such a large volume of gas in its gas-cells; *e*, owing to the large area of the bottom of the ship it offers sufficient resistance to the rapid descending thereof; *f*, on account of the hemispherical contour of the casing surrounding the fan-wheels which together with *g*, the space below the bottom of the ship, which is inclosed at its sides and rear by the downwardly-projecting longitudinal walls of the ship's body, act as a parachute and retard the downward movement of the ship.

12. An ocean-air ship which is capable of moving in water in any desired direction on account of the introduction of ships-propellers which are operated independently of the air-propellers, and which can be set so as to move the ship in water either forward, backward or turn it in any direction, and that can be moved in water at such a speed that the inclined planes below the bottom thereof will cause it to rise nearly to the surface thereof, so that when the air-fans

are set in a vertically moving position and operated the ship will—

13, rise vertically out of the water into the air.

14. An ocean-air ship which is more bullet-proof than an aeroplane for the reason that it is capable of rising higher in the air and being practically out of reach of bullets, and in which the operators and passengers are not directly exposed to such bullets.

15. An ocean-air ship in which the passengers and the crew are at all times protected from the inclemencies of the atmosphere, whether anchored at rest, or moving in air or upon water.

16. An ocean-air ship in which the motors are protected from the cold atmosphere by being located in an inclosure which is heated by the heat radiated from said motors.

17. An ocean-air ship which in a storm can be securely anchored on land, and which is so shaped that the effects of a storm tend to press the ship down upon the ground, where the ship may be securely fastened by suitable anchors and thus prevented from being lifted by the storm.

18. An ocean-air ship which owing to its being able to move without gas in its gas-cells, need not be taken apart and loaded upon wagons to transport it from place to place, nor is it necessary that gas in storage cylinders or liquid fuel in tanks be carried after the ship to supply any deficiency.

In order to attain these desirable results, I construct this air-ship as shown in the drawings already mentioned, and in which—Figure 1 is a longitudinal view of the ocean-air ship complete. Fig. 2 is a longitudinal sectional elevation of a portion of the same on line *v v* of Fig. 4. Fig. 3 is a diagrammatic plan of the same below the line *y y* of Fig. 2, one of the shells or casings of the fan-wheels being shown in plan view. Fig. 4 is a transverse sectional elevation on line *w w* of Fig. 1. Fig. 5 is a longitudinal sectional elevation of a portion of the fan-wheel or cyclone producer detached. Fig. 6 is a longitudinal sectional elevation of the cylinder and a portion of the mechanism whereby the fan-wheels in the hemispherical shells are operated. Fig. 7 is a side elevation of the mechanism for operating the cyclone producers. Fig. 8 is a plan of the same, and Fig. 9 a side-elevation of this mechanism. Fig. 10 is a sectional view of a few of the aeroplanes below the ship's body and showing the supporting legs and the means for securing the ship to the ground when anchored thereto.

Like parts are designated by corresponding symbols and characters of reference in all the figures.

This air-ship comprises a body A, which is preferably constructed of metal possessing in the highest degree strength combined with lightness, such as sheet steel as recently manufactured, aluminum, &c., and it is provided with a proper skeleton of frame-work, not shown, whereby the necessary stability is attained. This body A is semi-circular in transverse section, as shown in the drawings, and it is, by a suitable number of bulkheads B, divided into a series of gas-tight cells C, each of which is provided with suitable filling devices *c*, Fig. 2, by means of which the cells can be filled with hydrogen gas. The forward end of this body A terminates in a tapering head D, which is also a gas-tight body and a portion of which, D′, is adapted to be folded downwardly, as shown in dotted lines in Fig. 1, said head having suitable hinges *d*, and removable fastening devices *d′*, to hold the head D′ to the body A in an extended position. It is also provided with means *b*, including ropes secured to the forward end of the head and passing rearwardly into the engine-room E to a suitable winding device, not shown, whereby the head may be raised and lowered as will hereinafter more fully appear. The rear end of the body A is semi-circular so that in case of a storm when the air-ship is anchored to the ground, and the wind is blowing from the stern or rear end, the effect will be to push the ship upon the ground.

The bottom of this ship, except under the engine-room E, is composed of a series of inclined planes I, which are V-shaped in a plane longitudinal with the body of the ship, the forward member *i* of said inclined planes differing in inclination from that of the rear-members *i′*, so that the inclination of the forward members *i* shall be the most appropriate for the purpose of assisting the ship in floating in air or upon water in its forward movement, the angle of the rear members *i′* being approximately 60 degrees, while that of the forward members is approximately 30 degrees, (more or less, as experience shall disclose.)

In the interior of the body A, and upon the floor E′ of the engine-room E there are located four hemispherical shells or casings S, within which are placed air-fans that are adapted to propel the ship in air and which I term cyclone producers, said cyclone producers including a cylindrical shell F, which is of suitable diameter and reaches to within a short distance of the apex of the hemispherical shell, said cylinder F being secured to a tube *f*, by means of spokes *f′*, said tube *f* being located upon a vertically disposed tubular axle *f″*, which latter axle is formed integral with an arched frame *e*. This tubular axle carries the entire cyclone-producing mechanism and may be provided with ball-

bearings $d''$ at its upper end and with similar ball-bearings $d'''$ at its lower end to reduce friction to a minimum, and in order that the moving parts may be properly lubricated, there is placed on the upper end of a vertical shaft $e'$, a lubricator L''. This shaft $e'$ revolves in the tubular axle $f''$ and to its upper end is affixed the tube $f$ and by the spokes $f'$ the shell F. The arched member or frame $e$ has a tubular member or sleeve $g$, projecting from one side thereof, and a solid shaft $h$, projecting from the opposite side thereof and in axial line with the tubular member $g$, both, the tubular member $g$ and the solid shaft $h$, forming the pivotal means for inclining the cylinder F rearwardly and forwardly from a vertical plane as will hereinafter more fully appear. The shaft $e'$ is rotated by a bevel-wheel $e''$ meshing with a similar bevel-wheel $g''$ located upon a shaft $m'$ revolving in the sleeve $g$ already mentioned, and illustrated in Fig. 6.

To the outer periphery of the cylinder F there are secured two curved fan-blades F' F'', Fig. 3, which blades are secured with their lower ends to a ring or band $a'$, in order to strengthen the structure without adding much weight, said wings or fan-blades F' F'' and their appurtenants already described constituting the cyclone-producers already referred to, and they are revolved in the hemispherical shells S in the direction shown by the arrows in Fig. 3, that is to say: with their convex sides foremost.

The hemispherical shells S are formed of a series of helixes or spirals $s$, which have one of their sides $s'$, horizontally, and the other member $s''$ vertically disposed, as clearly illustrated in Figs. 4 and 5. The action of these cyclone producers is substantially as follows: The wings F' F'' being revolved as stated, air is drawn into the cylinder F from below the ship and this air moving upwardly in the cylinder and issuing from the upper end thereof, impinges with considerable force upon the inner upper surface of the hemispherical casing S. The air then moves downwardly on the outside of the cylinder F in the space between this cylinder and the shell S, and is ejected at the lower end thereof where the ejected air meeting with the resisting atmosphere, tends to lift the air-ship vertically. In its passage through the space between the cylinder and the shell S, the air is also projected against the inner surface of the casing by the centrifugal force of the curved blades F' F'', and owing to the helical corrugations $s$ therein, tend to lift the ship by the friction caused by the air moving in said space formed by the helical convolutions in said casing.

The fan-wheels in the casings S are arranged to be forwardly and rearwardly inclined, and in order to accomplish this object, there are placed on the inner ends of the tubular members $g$ worm-wheels G, shown in detail in Figs. 7, 8, and 9. This mechanism for tilting the fan-wheels is alike, that is to say, there are three sets of the mechanism in the air-ship, two of which are used on the cyclone producers, and one on the ship-propellers hereinafter to be described, and I shall, therefore, describe this mechanism in the singular number.

The worm-wheel G is rotated by a worm G', loosely revolving upon a horizontal shaft G''. Upon this shaft G'' there is loosely mounted a bevel-wheel H, and on the worm G' there is affixed a similar bevel-wheel H', both bevel-wheels meshing with a third bevel-wheel H'' loosely revolving upon a stud $a$, secured to an arm $j$, formed on a standard J. Between the bevel-wheels H and H' and feathered to the shaft G'' there is a sliding clutch-member K, having knuckles or pins $k$, adapted to engage with either the pins $h'$ on the bevel-wheel H' or with the pins $h''$ on the bevel-wheel H. This sliding clutch-member K is moved laterally upon the shaft G'' by a lever L, Figs. 7 and 9, having a fork $l$, at its lower end engaging said clutch-member K in the well-known manner. This lever L is pivoted to an arm $j'$ projecting upwardly from the standard J. The operation of this reversing mechanism is well known and needs no detailed description except to state that, the shaft G' being revolved in one direction, and the clutch-member K engaging the bevel-wheel H secured to the worm G', the latter will revolve in the same direction as the shaft G''; but when the clutch-member K engages the bevel-wheel H the worm G' will revolve in the opposite direction.

The mechanism for rotating the fan-wheel with the cylinder F in the casing S, comprises a main-shaft M, which in this instance is the main transmission shaft. Upon it is secured a worm $m$, engaging a worm-wheel M' loosely mounted upon the inner ends of transverse shafts $m'$ revolving in the sleeves $g$ already described. This worm-wheel M' has on both of its hubs $h'''$ clutching means adapted to engage with clutch-members $n$ or $n'$ splined upon a pair of said shafts $m'$, said clutch-members $n$ $n'$ being laterally moved by levers N N' respectively, pivoted to arms $n''$, Fig. 9, formed on standards O O'. These latter standards are also provided with bearings $o$ $o'$ for the transverse shafts $m'$. The operation of this driving mechanism, which always revolves in one direction only, is as follows: The main transmission shaft being revolved and the clutch-members $n$ $n'$ engaging the worm-wheel M' at its hubs, both shafts $m'$ will revolve, (these shafts meet in the center of

the worm-wheel M′,) but by disconnecting one or the other of said clutch-members *n n′* from said worm-wheel M′ the shaft carrying the disengaged clutch-member will cease to revolve. This peculiarity of the driving mechanism for the cyclone-producers will hereinafter be more fully explained. The shafts *h* on the arched members *e* have suitable outboard bearings *b″*, as shown in Fig. 4. Additional bearings may be provided for both, the shafts *h* and the tubular members *g*, if found necessary or desirable.

The longitudinal transmission shafts G″ which operate the tilting mechanism of the cyclone producers, and the main transmission shaft M are actuated by one or more internal-combustion motors P P′, Figs. 2 and 3, (or electric motors, when found adapted to aerial navigation and operated by wireless transmission of electrical energy projected from stations at suitable intervals placed on land,) a storage-tank T, Figs. 1, 2, and 3, preferably located forward of the engine-room E, being provided to carry the necessary liquid fuel for the motors P P′, such as benzin, naphtha, gasolene, alcohol, ether, or other analogous fluids, and piping, not shown, leading from the same to the motors, and proper filling plugs *t*, being in the tank for obvious reasons.

As thus far described, the various mechanisms are adapted for use for aerial navigation, but in order to adapt this ship for navigation upon the seas, I provide this ship, approximately amidship, and close to the side-walls thereof, with two hemispherical casings Q, shown in detail in Figs. 3 and 5, and locate in these casings ship-propellers R, the casings Q being spirally corrugated the same as the casings S, and the propeller-wheels R operated and reversed in position or inclined if desired, the same as, and by mechanism being duplicates of that described with reference to the cyclone producers. When the ship is afloat upon water, the propeller-wheels are turned so that their driving shafts are in a horizontal plane, as shown in Fig. 5, but when the ship is in air or upon the ground, they are placed so, that the propeller-wheels lie horizontally, and in this position may be utilized in aerial propulsion when necessary or desirable. And for this purpose these ship-propellers are made as light as is consistent with the duties which they are called upon to perform.

The engine-room E is provided with a series of windows W, Figs. 1 and 2, whereby light is admitted to the engine-room. These windows are watertight structures so that water cannot enter the engine-room when the ship is afloat on the seas; and in order to supply the interior space occupied by the machinery and the crew with air when these rooms are closed below, an air-shaft U rises vertically from the engine-room through the body of the ship and terminates in an observation house V, which is partly above the upper surface of the ship's body. A step-ladder or circular stairs *u*, in this air-shaft U being provided to obtain access to this observation room V. This room is designed to provide an apartment for the navigator or navigators to direct the ship's course, take observations &c.

The passengers and crew of this ship may be carried in the engine-room E which has ample capacity for this purpose, but to afford a comfortable space wherein passengers may keep themselves when the ship is afloat, there is, preferably abaft of the engine-room a saloon X, and abaft of this room a gallery Z, which gallery is open on three of its sides and has, preferably, a wire-screen floor Y, as shown in Fig. 3, through which the earth below may be observed. When the atmospheric conditions do not permit the passengers remaining upon the gallery, they may stay in the saloon X, and when the ship is afloat upon water, a door X′ leading from the gallery to the saloon will be closed, said door being of watertight construction for this purpose, and when found necessary a further door X″ leading from the saloon to the engine-room may also be watertightly closed to prevent water from entering the engine-room, the passengers, as a matter of course, occupying space in the engine-room in this case.

By reference to Fig. 3 it will be seen that the main transmission shaft M is rotated directly by the motor P P′. This shaft carries preferably two, sprocket-wheels *q*, connected with sprocket-wheels *q′* upon the transmission shafts G″ by means of link-chains *q″*, there being preferably two sets of this driving mechanism to guard against interruption in the operating of the propelling mechanism in case of an accident to one set thereof.

In order that this ocean-air ship may be securely anchored upon ground in case of a storm or for storage-purposes, I provide the body of the ship with downwardly and rearwardly-projecting legs A′, as illustrated in Figs. 1 and 2, and in detail in Fig. 10, these legs being resilient structures secured to the lower edges of the inclined planes I and near the outer walls of the ship's body, and they are adapted for use with screw-eyes A″ which, cork-screw-fashion, can be forced into the ground and which thus hold the ship to the earth, the passengers being in the mean time sheltered by occupying the saloon or the engine-room; and when the ship is being anchored to the ground, the head D is turned down to prevent a storm from lifting the forward end of the ship.

I will here state that while I have shown

the clutch-operating levers L and N N′ in close proximity to the reversing and driving mechanisms at each transverse shaft, I may connect these various levers with a set of levers in the engine-room so that all of the levers are within easy reach of one operator who will thus be enabled to move any one or more of said levers from a central station in order to properly navigate the ocean-air ship, commands being communicated to this operator by the navigator stationed in the observation room V or at any one of the windows W. I have also described in this specification and shown in the drawings clutch-mechanism of the knuckle-type, but I desire it understood that I shall prefer the use of friction-clutches for the reason that this type of clutches starts the machinery gradually and thereby avoids sudden jars and other objectionable features inherent in knuckle-clutches.

The operation of this air-ship, when in air, is as follows: Assuming the ship to rest upon the ground, the cyclone producers in a vertical position, and the power-motors operating: by throwing the clutches which operate the power transmission, the ship will vertically rise in the air, it being assumed that the location of the machinery, the fuel-tanks &c., is such that the ship is in perfect balance and on an even keel. By now forwardly inclining the cyclone-producers by manipulating the clutch-levers L in the proper direction, the air-ship will move forward, and in doing so, the inclined planes I will assist in floating the ship so that the faster the forward speed of the ship, the more the cyclone producers may be inclined owing to the increase in buoyancy caused by said inclined planes. To turn the ship from a straight course to either side or turn about, the respective cyclone producers on the proper side of the ship are moved more forwardly, or the cyclone producers on the opposite side less inclined, (or both) which will cause the ship to swerve from its straight course. And when afloat upon water, the ship is steered by its propeller wheels in a like manner by manipulating one or the other of said propeller wheels.

It will now be observed that by the peculiar construction of this ocean-air ship, and the novel combination of mechanism, I secure all the objects and attain the results set forth in the introductory clauses to this specification. I will here also state that I shall install in this ocean-air ship, if found desirable, suitable electro-dynamos for operating the sparking mechanism of the internal combustion motors and that I may also install electrical illumination in the engine and the passenger rooms so that these rooms may be properly lighted during night. I shall also install all the physical and nautical instruments necessary for taking observations of positions, altitude, and other purposes, such details being within the province of the skilled mechanics and engineers intrusted with the construction of this ocean-air ship, and the experienced navigators of the air and the seas.

It will be further observed that the lower surface D′ of the head D, and the inclined lower portion of the ship's body, D″, form a long inclined plane which when the ship is moving in the air, has a tendency to raise the head and cause the ship to move in a slightly upwardly inclined position, thereby giving the air through which the ship is moving an opportunity to act upon all the inclined planes below the ship's body. This head, however, can be utilized in steering the ship downwardly without operating the cyclone producers for this purpose, by inclining the head D, in a manner readily understood.

Having thus fully described this invention, I claim as new and desire to secure to me by Letters Patent of the United States—

1. An ocean-air ship comprising a body adapted to hold gas in gas-tight cells, said body being of substantially semi-circular transverse section and having an independent, pointed, head, said head being hinged to said body at the forward end, means for raising and lowering said head; a series of means for propelling said body, said means being adapted to operate independently of one another, and aeroplanes projecting from the lower side of said body, said aeroplanes being hollow bodies adapted to hold gas.

2. An ocean-air ship comprising a body adapted to hold gas in gas-tight compartments therein, said body being substantially semi-circular in transverse section; a series of approximately hemispherical shells in said body, said shells having spirally corrugated walls, one member of said corrugations being approximately horizontal and the other substantially vertical; fixed axles in said shells; motor wheels in said shells adapted to revolve around said fixed axles; means for inclining said fixed axles forwardly and rearwardly, and means for rotating said motor wheels in said shells.

3. An ocean-air ship comprising a body adapted to hold gas in gas-tight compartments in said body, said body being approximately semi-circular in cross section, a series of approximately hemispherical shells in said body and forming a part thereof, said shells having spirally-corrugated walls; fixed axles in said hemispherical shells; fan-wheels in said shells and mounted upon said fixed axles; means for separately inclining said fixed axles and means for separately and connectedly operating said fan-wheels.

4. An ocean-air ship comprising a body adapted to hold gas in gas-tight compartments in said body, said body being sub-

stantially semi-circular in cross section, a series of approximately hemispherical shells forming a part of said body and open on their lower ends, said shells having spirally corrugated inner walls; tubular axles in said shells; a cylindrical shell in each of said hemispherical shells; tubular members surrounding said axles; shafts within said tubular members; means for revolving said shafts separately and connectedly, said means including arched members having horizontally-disposed tubular sleeves; transmission-shafts within the last-mentioned sleeves; bevel-gears in said arched members and connecting said shafts and the transmission-shafts; gearing on the free ends of the horizontally-disposed tubular sleeves; gearing on the adjacent ends of the transmission shafts; driving means engaging the gears on the horizontal tubular sleeves; clutch-mechanism adapted to reverse the movement of the horizontally disposed tubular sleeves, and clutch-mechanism adapted to engage and disengage the transmission shafts in said horizontally disposed tubular sleeves.

5. In an ocean-air ship, means for propelling the ship in air, and means for propelling the same in water, said latter means including spirally-corrugated, approximately hemispherical shells, ship's propellers in said shells; means for forwardly and rearwardly inclining said ship's propellers; means for rotating said ship's propellers separately and connectedly, and means for disconnecting the ship's propellers from the means that operate the air-propellers.

6. In an ocean-air ship, a body adapted to hold gas in gas-tight compartments in said body and forming part of said body being approximately semi-circular in cross section; said body having a bottom comprising a series of inclined planes a gas-tight head on said body and pivoted thereto and adapted to be inclined from its normal position, and means in said body for propelling the same in air, and further, separate means for propelling said body in water.

7. In an ocean-air ship, a body adapted to hold gas in gas-tight compartments in said body, said body being approximately semi-circular in cross-section; said body having a bottom comprising two series of inclined planes, the members of one series of inclined planes having angles of inclination differing from the angles of inclination of the other series; a gas-tight head on said body and pivoted thereto and adapted to be inclined from its normal position; means in said body for propelling the same in air, and further, separate, means for propelling said body in water.

8. An ocean-air ship comprising a body adapted to hold gas in gas-tight compartments forming a part of said body, power-supplying motors in said body; fan-wheels in said body and operated by said motors to propel the body in air, means for connecting said fan-wheels with said motors separately and connectedly; means for changing the position of said fan-wheels; means independent of the fan-wheels for propelling the ship in water; means for changing the position of the latter propelling means, and means for connecting the water propellers with the means that operate the fan-wheels.

In testimony that I claim the foregoing as my invention, I have hereunto set my hand in the presence of two subscribing witnesses at Newell, Iowa, this 7th day of May, 1909.

REINHOLD SCHMIECHEN.

Witnesses:
FRANK G. REDFIELD,
E. H. CUNNINGHAM.