

No. 725,981.

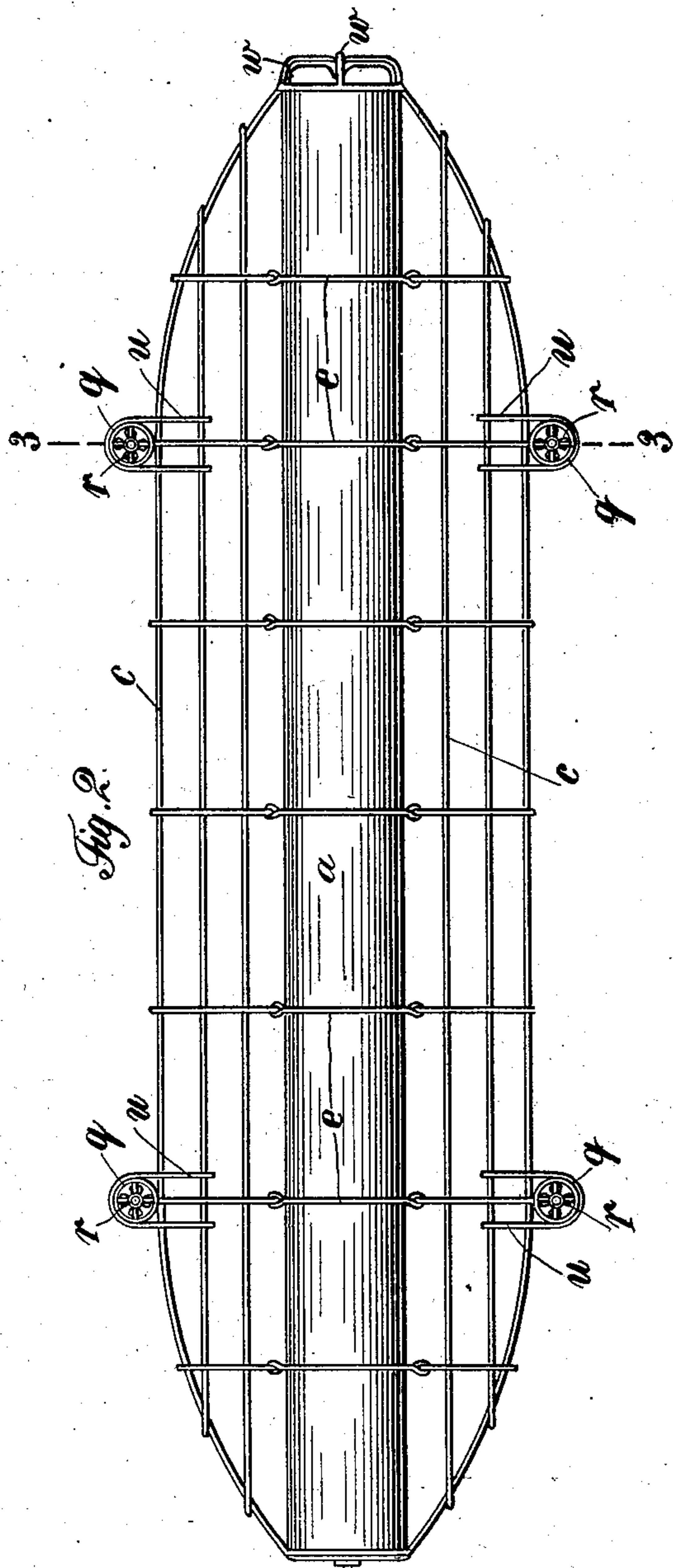
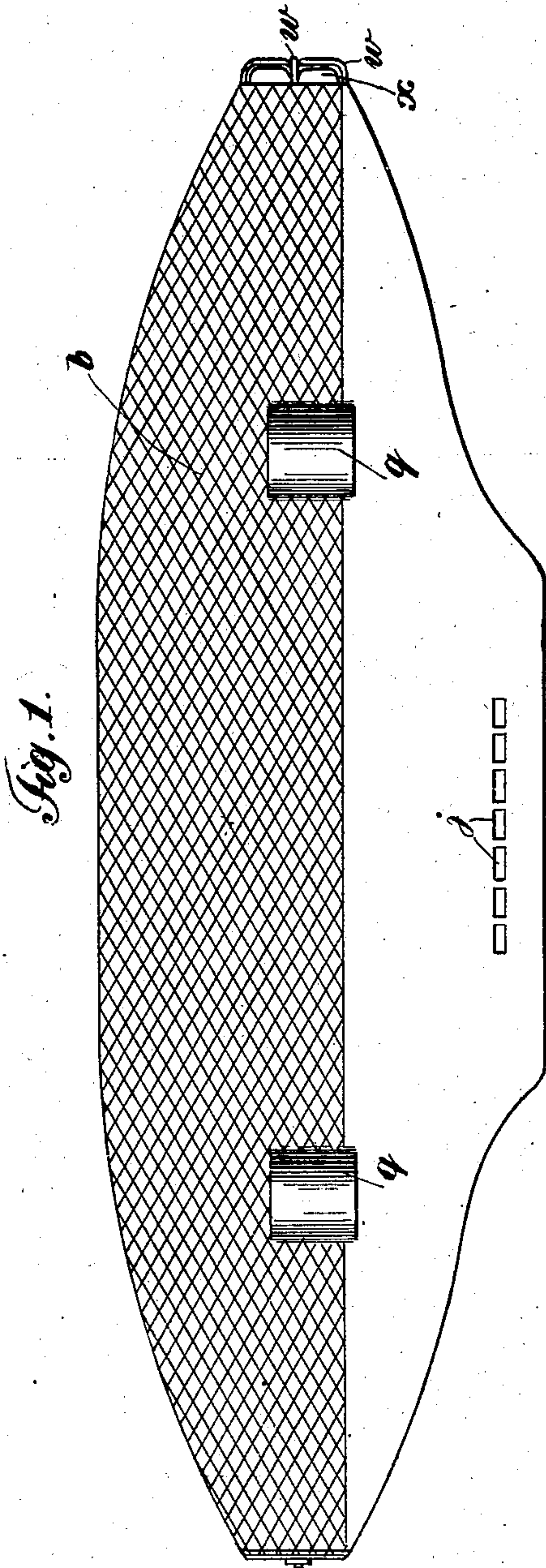
PATENTED APR. 21, 1903.

T. MICHELSEN.
AIR SHIP.

APPLICATION FILED DEC. 28, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 3

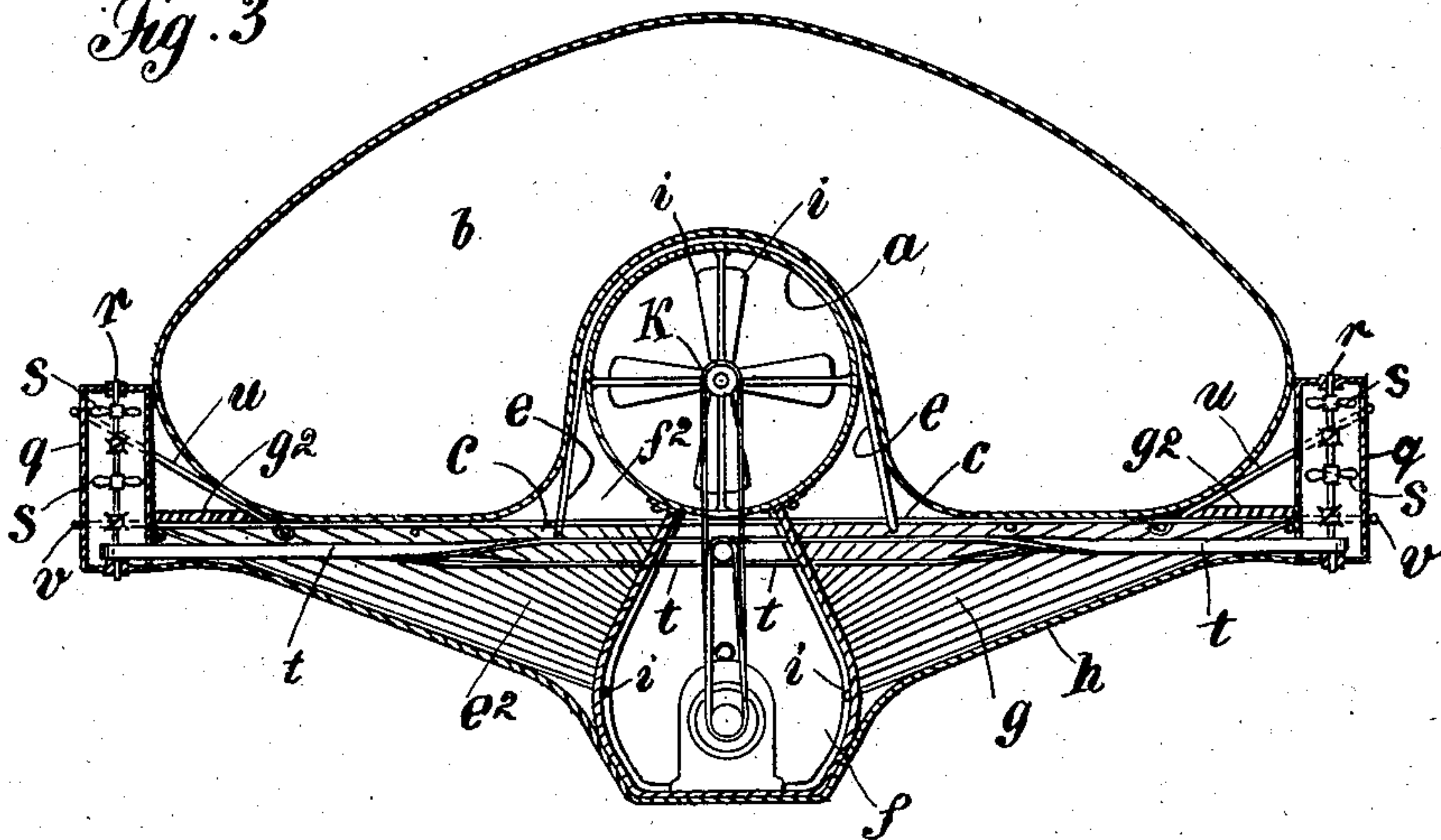
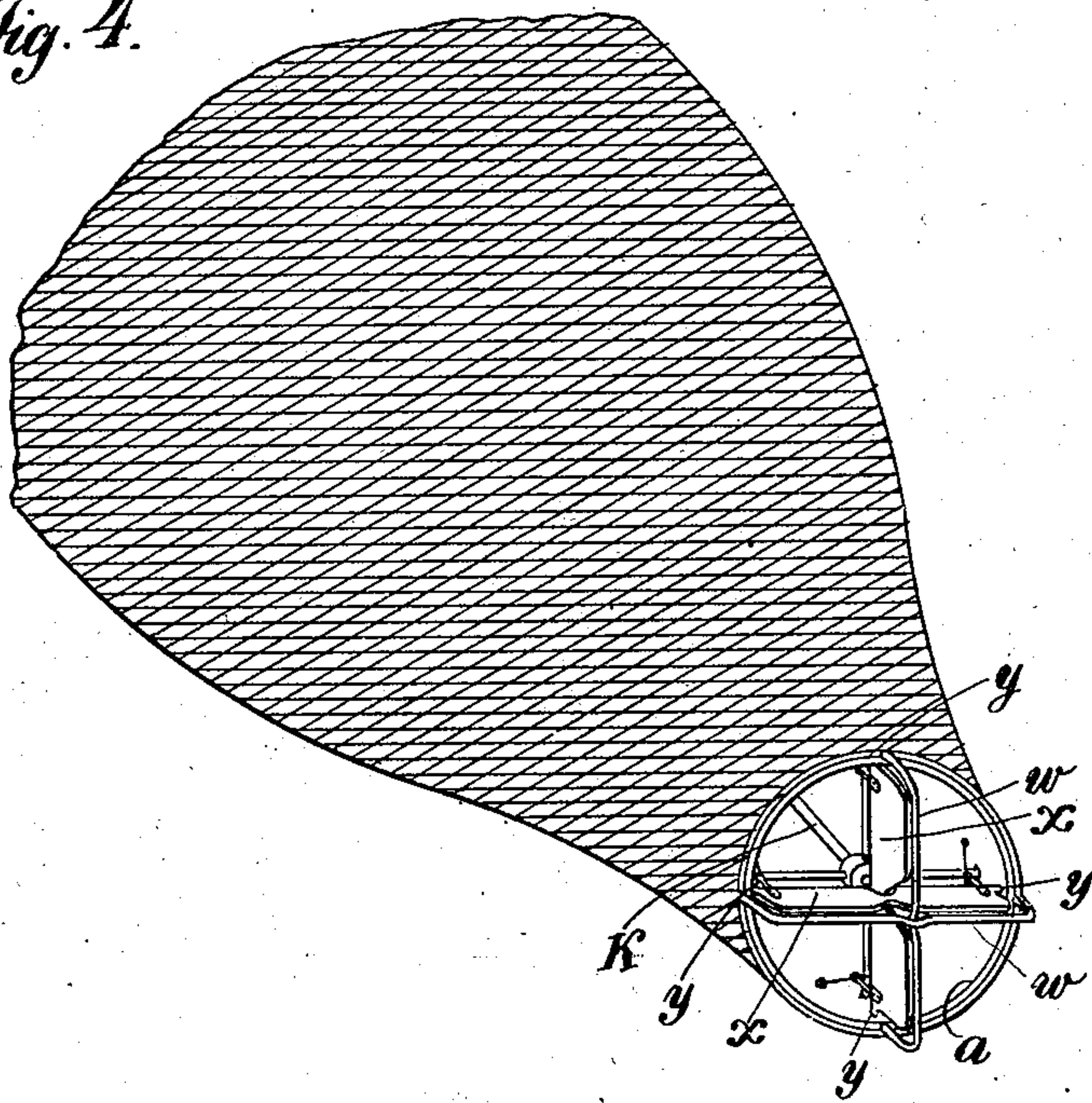


Fig. 4.



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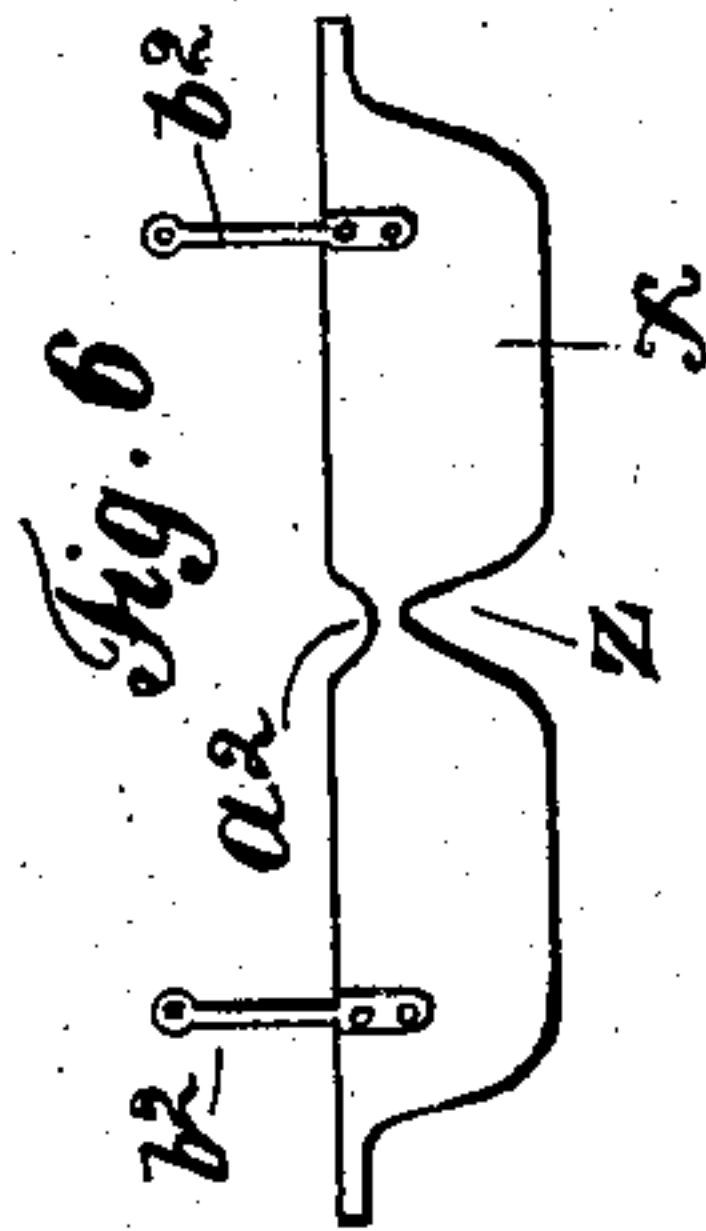
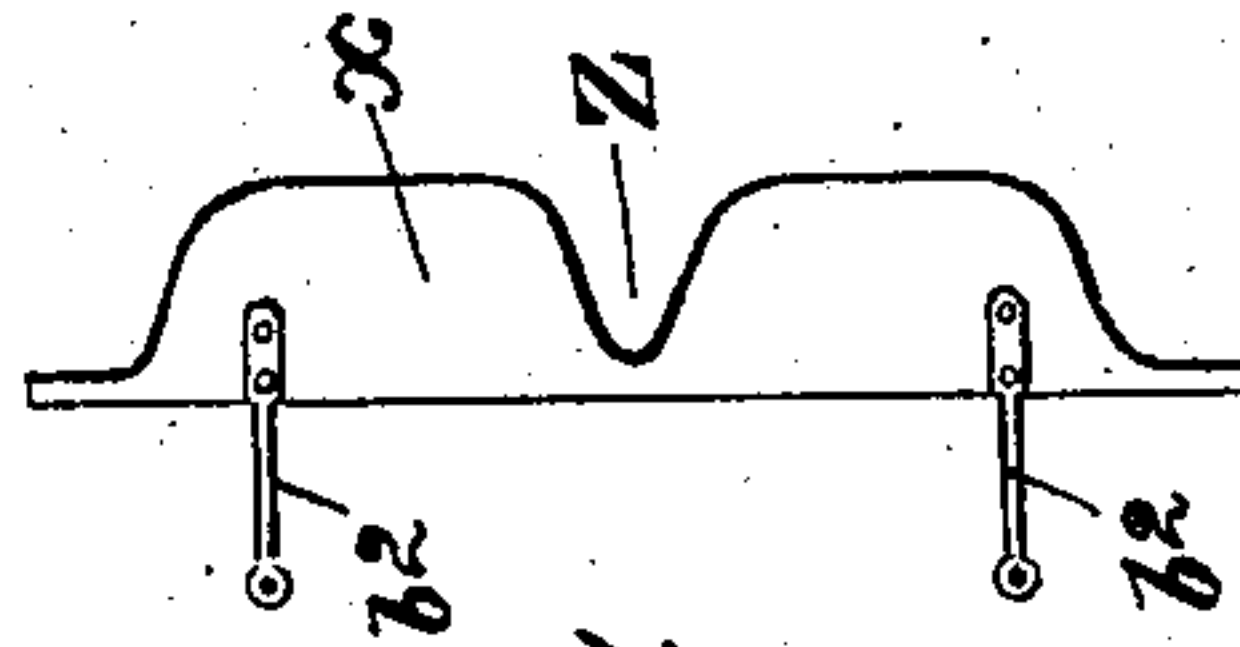
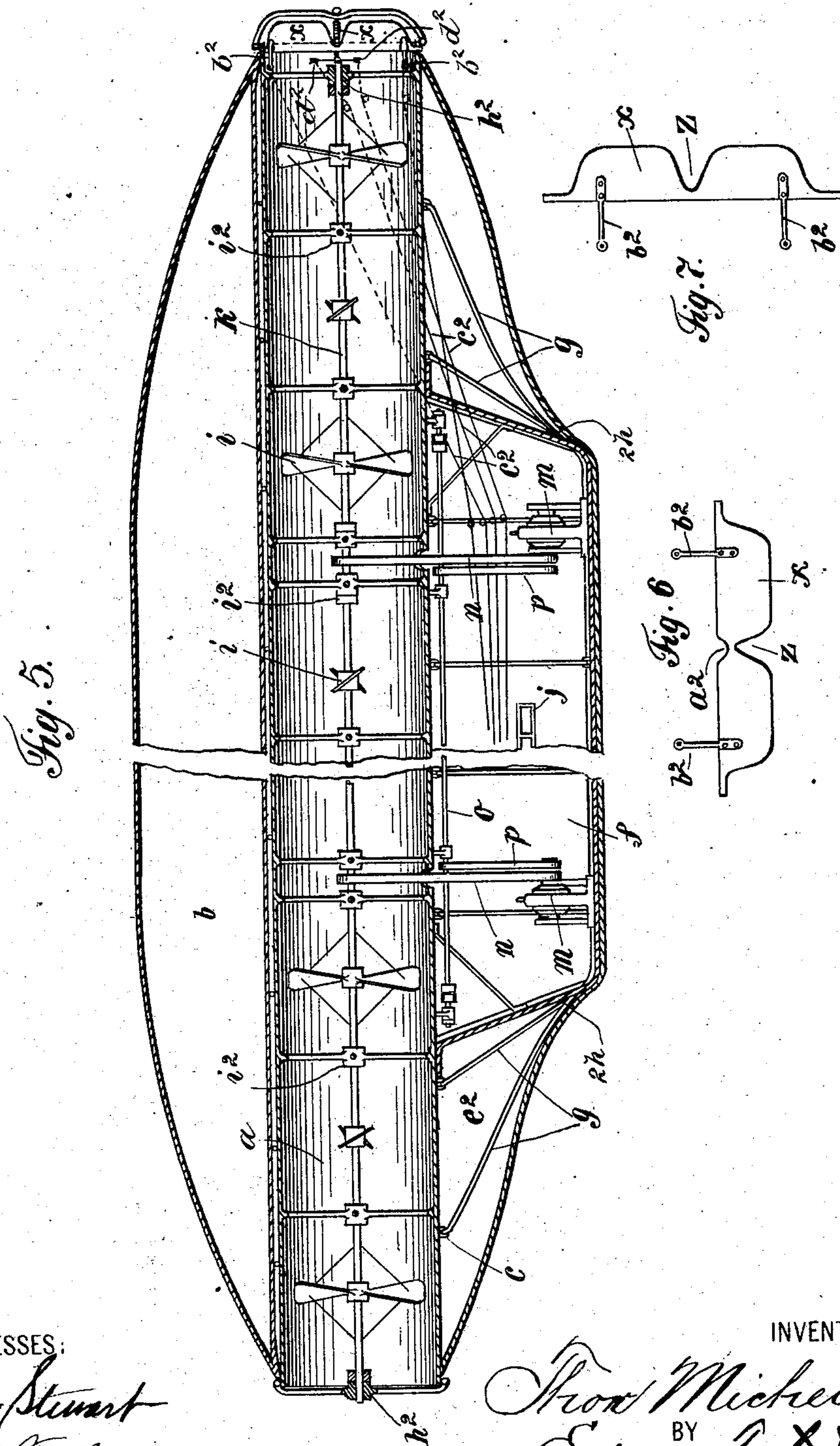
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APPLICATION FILED DEC. 28, 1901.

NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

THOR MICHELSEN, OF LOS ANGELES, CALIFORNIA.

AIR-SHIP.

SPECIFICATION forming part of Letters Patent No. 725,981, dated April 21, 1903.

Application filed December 28, 1901. Serial No. 87,571. (No model.)

To all whom it may concern:

Be it known that I, THOR MICHELSEN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Air-Ships, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to air-ships or flying-machines; and the object thereof is to provide an improved machine of this class which is able to navigate the air and ascend and descend and to alter its direction at will; and with these and other objects in view the invention consists in an air-ship or flying-machine constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by the same reference characters in each of the views, and in which—

Figure 1 is a side view of my improved flying-machine; Fig. 2, a plan view of the framework thereof; Fig. 3, a cross-section of the complete machine on the line 3 3 of Fig. 2; Fig. 4, a perspective rear end view thereof; Fig. 5, a central longitudinal section, and Figs. 6 and 7 are side views of two steering-blades or rudders which I employ.

In the practice of my invention I provide a flying-machine of the general form shown in Figs. 1, 2, 3, and 5, Fig. 2 being a plan view of the framework and showing also some of the operative parts, and the general form of this device in cross-section is that of an ellipse, as shown in Fig. 3, and the body portion is tapered toward each end, where it is exactly cylindrical in form. Passing longitudinally through the central portion of the machine is a tube or tubular casing *a*, over which is placed a hollow inflatable bag or body *b*, composed of canvas, silk, or any other suitable material, and of a length equal to the entire length of the machine; and beneath this bag or inflatable body *b* is placed a horizontal frame *c*, composed of bamboo rods or any other suitable material. The tube or tubular casing *a* is bound to this frame *c* by

ties, cords, straps, or rods *e*, and the bag or inflatable body *b*, at the sides thereof, rests upon the frame *c*, and the tube or tubular casing is entirely inclosed by said bag or inflatable body and by said frame *c*, and the bag or inflatable body *b* also incloses both sides and the top of said tube or tubular casing *a*.

Beneath the tube or tubular casing *a* and extending a predetermined distance under the bottom thereof, and secured to said tube or tubular casing, or to the frame *c* is a car *f*, which may be composed of any desired material and which is preferably composed of light wires or rods covered with canvas, and this car is connected with the frame *c* by rods, cords, wires, or other suitable devices *g*, which are also covered with canvas, and the canvas covering *h* extends downwardly beneath the bottom of the car *f* and incloses the same, and the wires, cords, or other devices *g*, which help to suspend and support the car *f*, are connected with the sides and ends thereof, as shown at 2^h, and with the outer edges of the frame *c*, and said frame *c* is also tapered at the ends, as shown in Fig. 2, and the canvas *h* is connected with the outer edges of the frame *c*, and the general form of the entire apparatus in cross-section is thus made elliptical, as shown in Fig. 3.

Passing longitudinally through the tube or tubular casing *a*, which may be of any desired diameter, is a shaft *k*, provided with air-propellers *i*, any desired number of which may be employed, and said shaft is geared in connection with motors *m*, placed in the car *f* by means of belts *n*, and said motors are also geared in connection with a horizontal shaft *o*, placed in the top portion of the car *f* by means of belts *p*.

At each side of the flying-machine or the main frame thereof are arranged vertical cylindrical casings *q*, in each of which is placed a vertical shaft *r*, provided with propellers *s*, and the shafts *r* are geared in connection with the shaft *o* by a belt *t*, which is crossed, as shown in Fig. 3, and the shaft *k* and propellers *i* operate to propel the machine forwardly, while the shafts *r* and propellers *s* operate to move the machine vertically, and said shafts *r* and propellers *s* may be geared in connection with the motors *m* in any de-

sired manner, or other motors may be provided for operating the same.

The vertically-arranged cylindrical casings in which the shafts r are placed may be secured to the frame c in any desired manner, and in the drawings forming part of this specification I have shown U-shaped braces, which are connected with the frame c and with said cylindrical casings q , and said frame is also provided with bands v , which pass around said cylindrical casings q and aid in holding the same in place.

The tube or tubular casing a is open at both ends and the air is free to pass there-through, and in the operation of the machine the propellers i , which are rapidly revolved, operate on the air within the said tube or tubular casing a and propel the machine forwardly, or this operation may be reversed when desired, and by reason of this construction the air on which the propellers i operate is free from side currents or sudden changes, and said propellers are thereby rendered more effective, as will be readily understood. It will also be apparent that the tube or tubular casing a may be of any desired dimension, and in practice I prefer to make the bag or inflatable body b of such dimensions as to enable the same to freely lift or raise the machine when said bag or body is inflated, and the propellers s in the casings q also operate to assist in raising the machine, as will be readily understood.

At the rear end of the tube or tubular casing a are placed two yoke-shaped frames w , which cross each other at right angles and in each of which is pivoted a steering-blade or rudder x , and the pivotal points of the steering-blades or rudders x are mounted in the end of the tube or tubular casing a at y or in a band or ring secured thereto. Each of the blades or rudders x is provided centrally of its outer edge with a notch or recess z , and one of said blades or rudders is provided at its inner edge with a notch or recess a^2 , and each of said blades or rudders is provided, preferably, with two inwardly-directed arms b^2 , with which are connected cords or ropes c^2 , which are passed outwardly through the tube or tubular casing a and downwardly at the sides thereof and forwardly and into the car f , from which they may be manipulated in any desired manner, and the object of providing the notches or recesses z in the steering blades or rudders x is to afford means whereby they may be crossed at right angles and operated, as will be readily understood, and it will also be apparent that the cords or ropes c^2 may be passed over pulleys d^2 , within the ends of the tube or tubular casing a , and then outside of said tube or tubular casing, as above described, so as to render the operation thereof in the manipulation of the steering-blades x more efficient and practical.

In Fig. 1 of the drawings the inflatable bag or body b is shown covered by a netting, which gives strength thereto, while the lower portion

of the machine, or that part thereof below the frame c , is shown clear or without netting, and in practice I prefer to connect the bag or inflatable body b with the outer edge of the frame c and with the bottom covering h , of canvas or other material, as shown at g^2 , so as to exclude air from the spaces e^2 and f^2 between the sides of the car f and the bottom portion of said bag or inflatable body and the space between the bottom side portions of the tube or tubular casing a and the sides of said bag or inflatable body, and in order to accomplish this result the bag or inflatable body may be extended to the outer edge of the frame c and be closely connected therewith; but this connection in order to close said spaces may be made in any desired manner.

It is not intended, of course, to exclude all air from the spaces e^2 and f^2 , the object of this connection being only to prevent air from rushing into said spaces so as to affect the operation of the machine, it being understood that these spaces and the car f are always filled with air under normal pressure.

It will be observed that the shaft k in the tube or tubular casing a is provided with suitable bearings h^2 at the ends thereof and with other intermediate bearings i^2 , arranged longitudinally thereof and any desired number of which may be employed, and my invention is not limited to the form of the propellers i and s , and any suitable devices may be employed for this purpose, and the same is also true of the motors m and the method of gearing the same in connection with the shaft k and also of the means employed for gearing the motors in connection with the shafts r .

By excluding the air from around the car f and around the bottom and sides of the tube or tubular casing a and closing in these parts, as described, and making the shape of the entire machine elliptical in cross-section and tapered at the ends I provide a form of flying-machine which is less apt to be affected by counter-currents, side currents, or changes in the directions of currents of the air than is usual in machines of this class, and by inclosing the car or the frame thereof with canvas or other suitable material, except where the windows are arranged, I also aid in accomplishing this result, and it will be apparent that any suitable means may be provided for affording ingress to and egress from the car.

The lifting power of the machine will depend to a large extent upon the size and capacity of the bag or body b , which may be of any desired length and width, and the power of the propellers i will also depend to a large extent upon the diameter of the tube or tubular casing a , and this diameter may also be regulated as desired.

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

1. A flying-machine which is oblong in form

and substantially elliptical in cross-section centrally thereof, the end portions being tapered and cylindrical in form, said machine comprising a tube or tubular casing extending longitudinally and centrally therethrough and open at both ends, an inflatable bag or body placed over said tube or tubular casing longitudinally thereof and inclosing the tube and side portions thereof, a propeller-shaft passing centrally through said tube or tubular casing and provided with propellers, a car supported beneath and longitudinally of said tube or tubular casing, and motors mounted in said car and geared in connection with said propeller-shaft, said machine being also provided at the opposite sides thereof with vertically-arranged casings and vertically-arranged propeller-shafts mounted therein and provided with propellers, said last-named propeller-shafts being also geared in connection with the motors in the car, substantially as shown and described.

2. A flying-machine which is oblong in form and substantially elliptical in cross-section centrally thereof, the end portions thereof being tapered and cylindrical in form, said machine consisting of a main frame passing hori-

zontally therethrough, a tube or tubular casing arranged over said frame and centrally thereof and open at both ends, an inflatable body placed over said tube or tubular casing and inclosing the sides and the top thereof, a car suspended beneath and longitudinally of the tube or tubular casing, and provided with motors, a propeller-shaft passing longitudinally through said tube or tubular casing, and geared in connection with said motors, vertically-arranged casings at the opposite sides of said machine and provided with propeller-shafts which are geared in connection with said lowermost main frame, and the supports of said tube or tubular casing being provided at the rear end thereof with steering devices adapted to be operated from the car, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 26th day of December, 1901.

THOR MICHELSEN.

Witnesses:

T. A. STEWART,
F. F. TELLER.