No. 882,435. PATENTED MAR. 17, 1908.

T. J. WHALEN.

FLYING MACHINE.

APPLICATION FILED OCT. 13, 1906.

3 SHEETS—SHEET 1.

Fig. 1

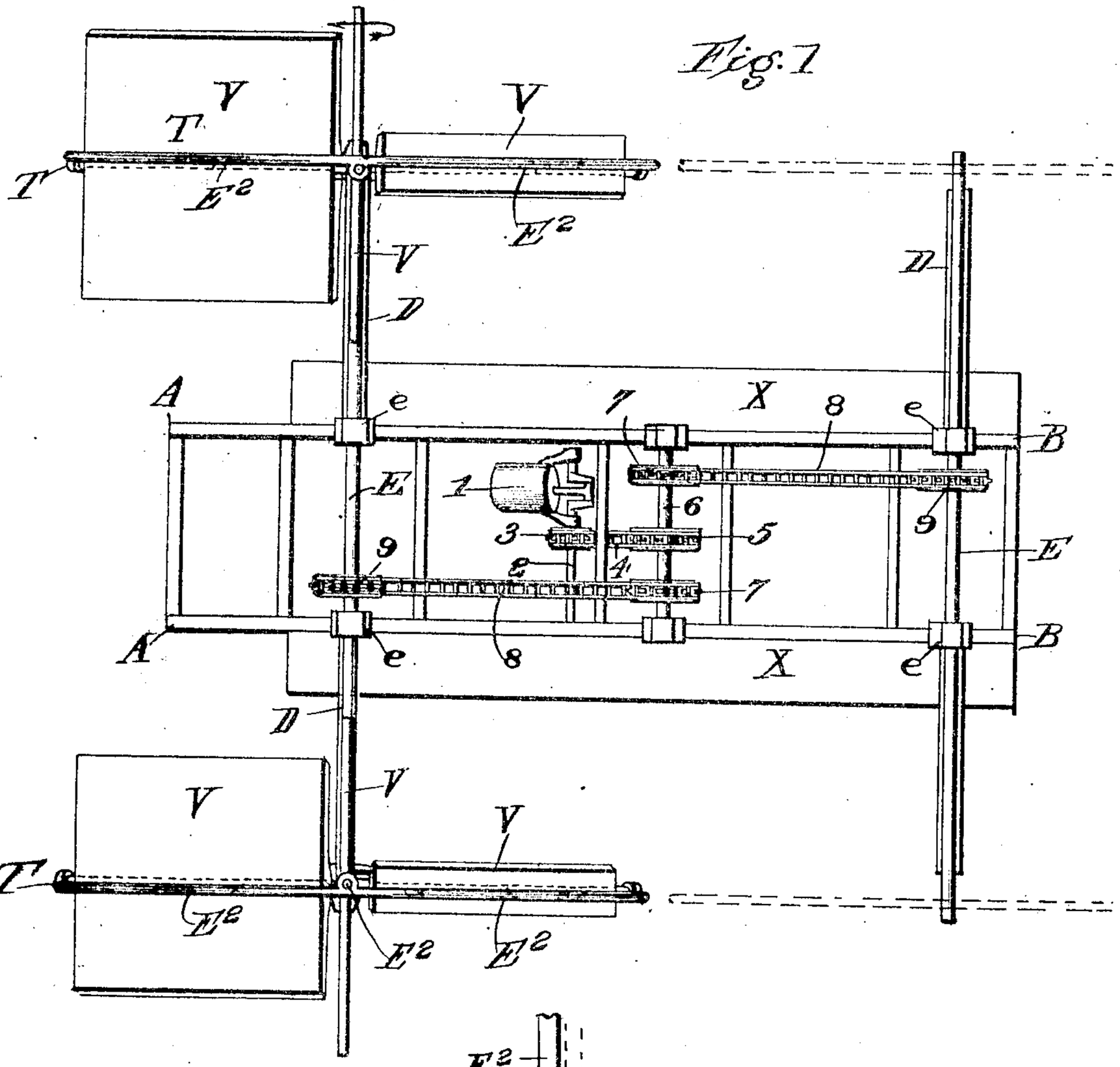
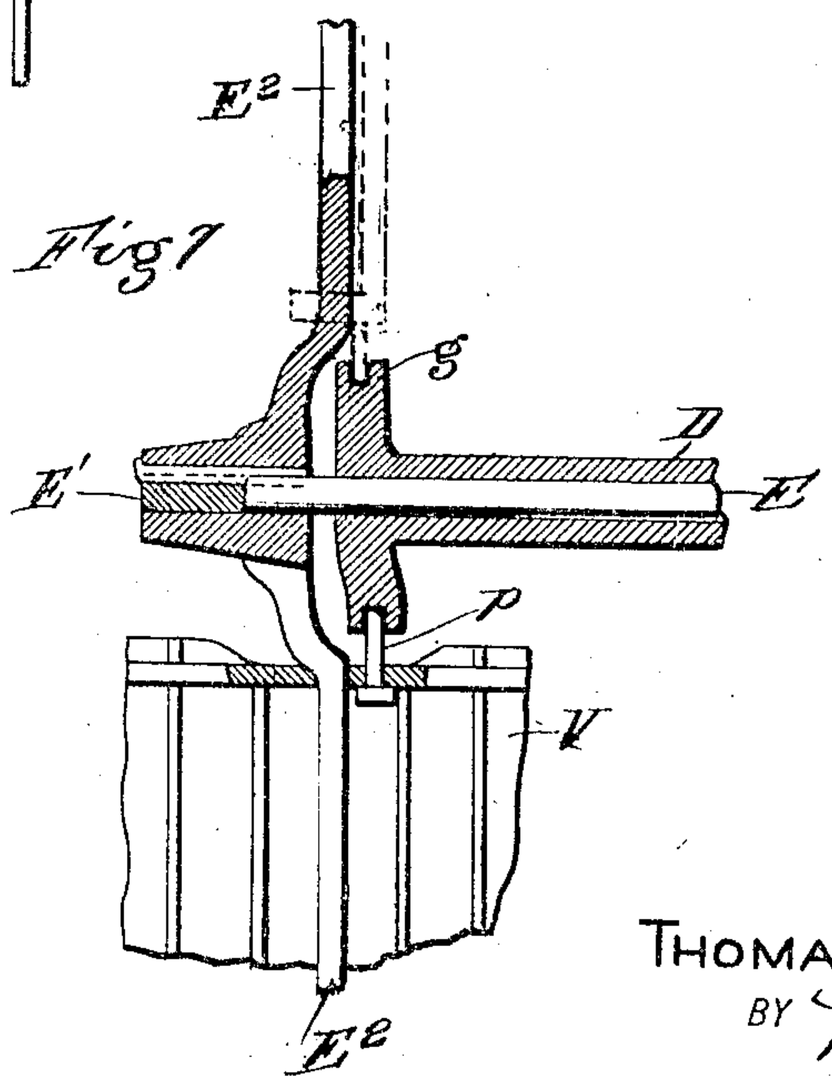


Fig. 7



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3 SHEETS—SHEET 2.

Fig. 2

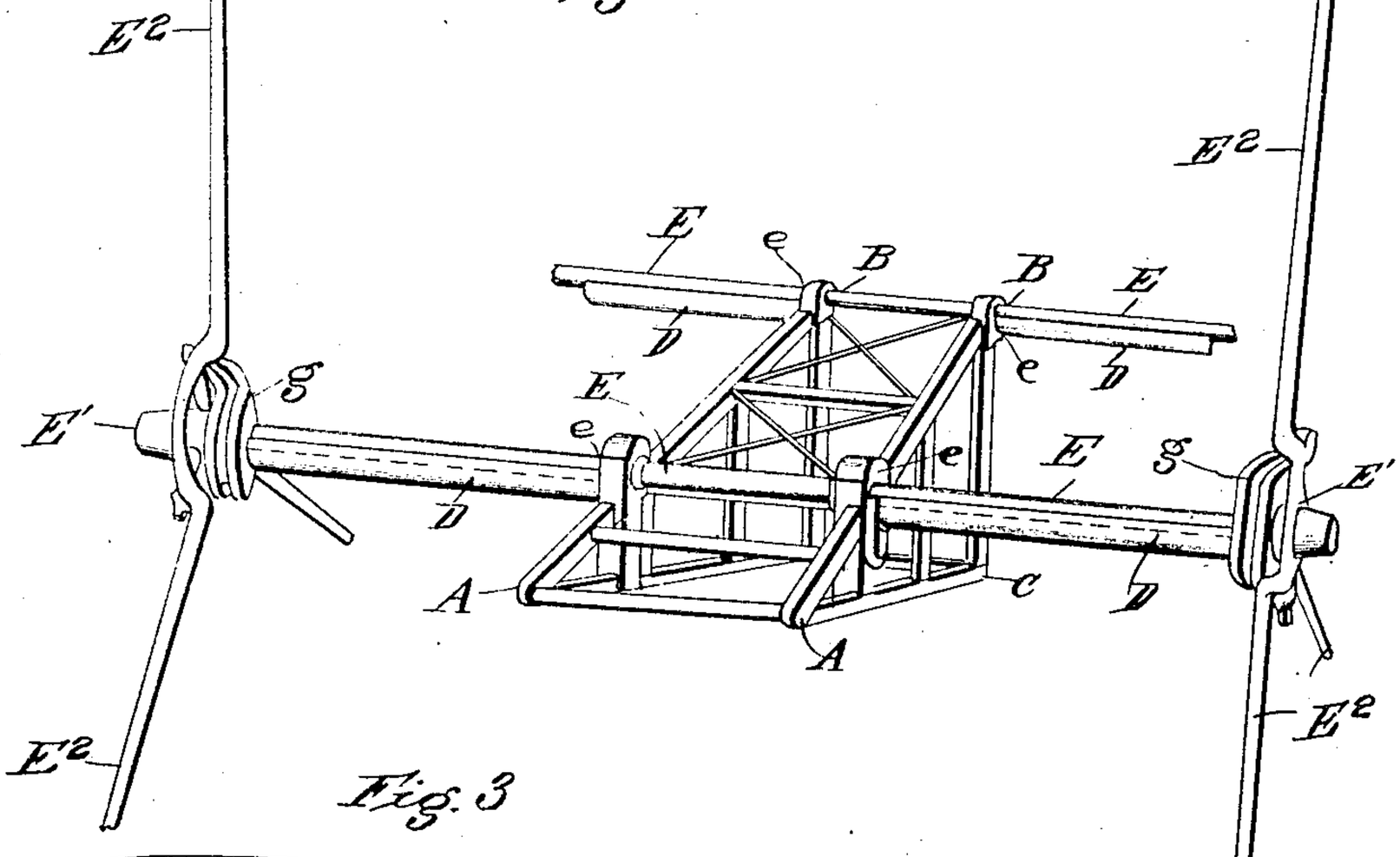
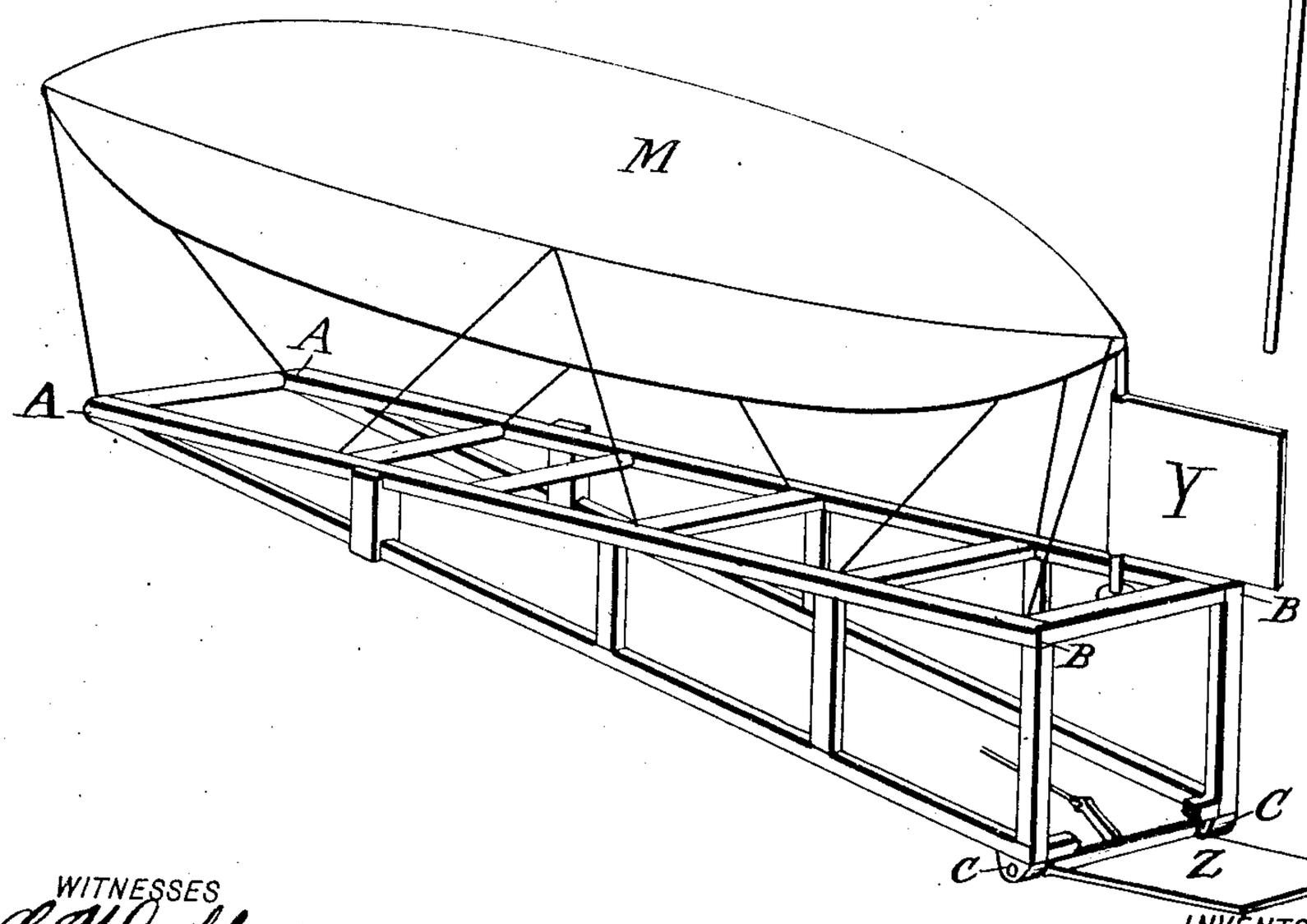


Fig. 3



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3 SHEETS—SHEET 3.

Fig. 4

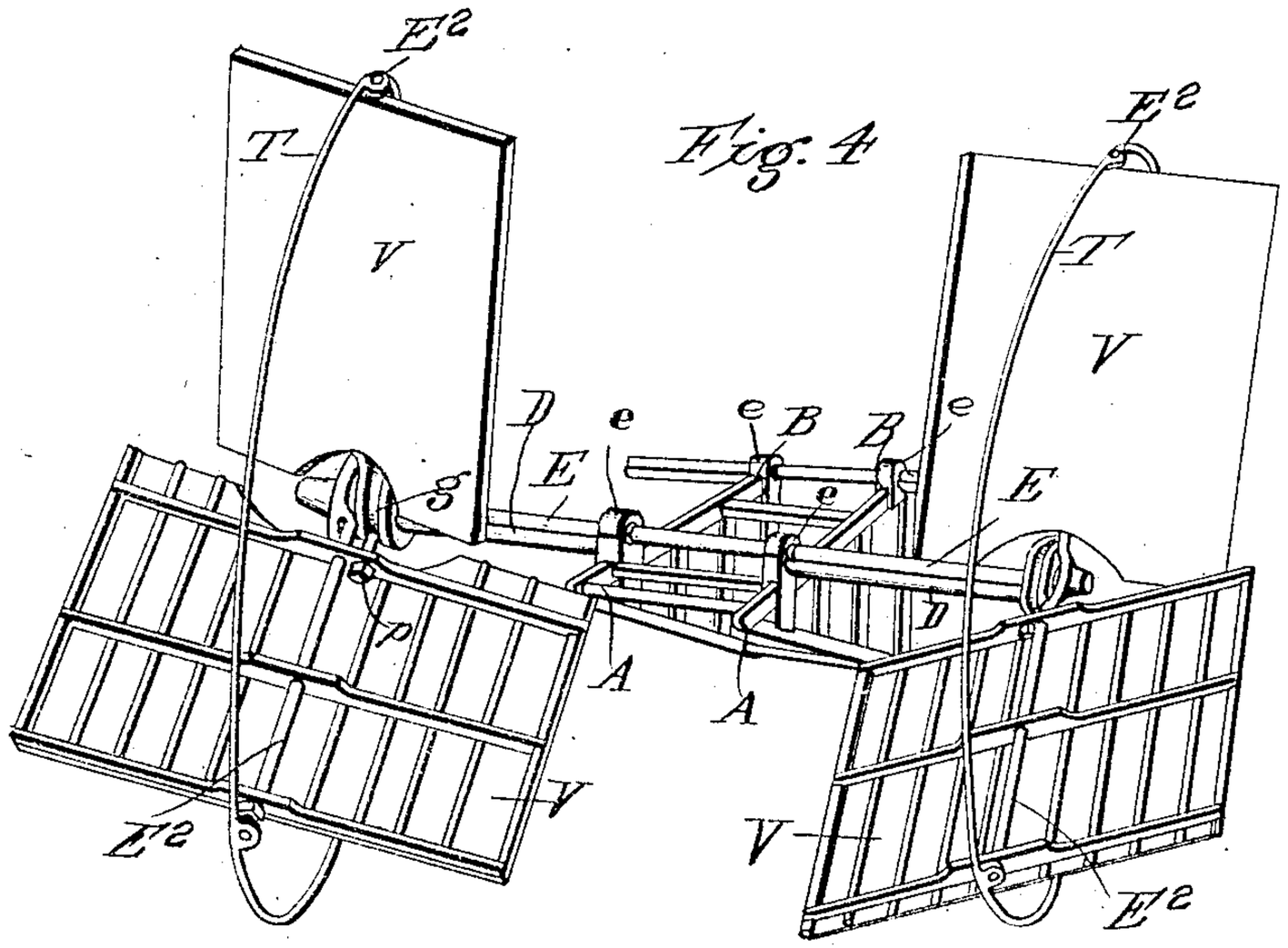


Fig. 5

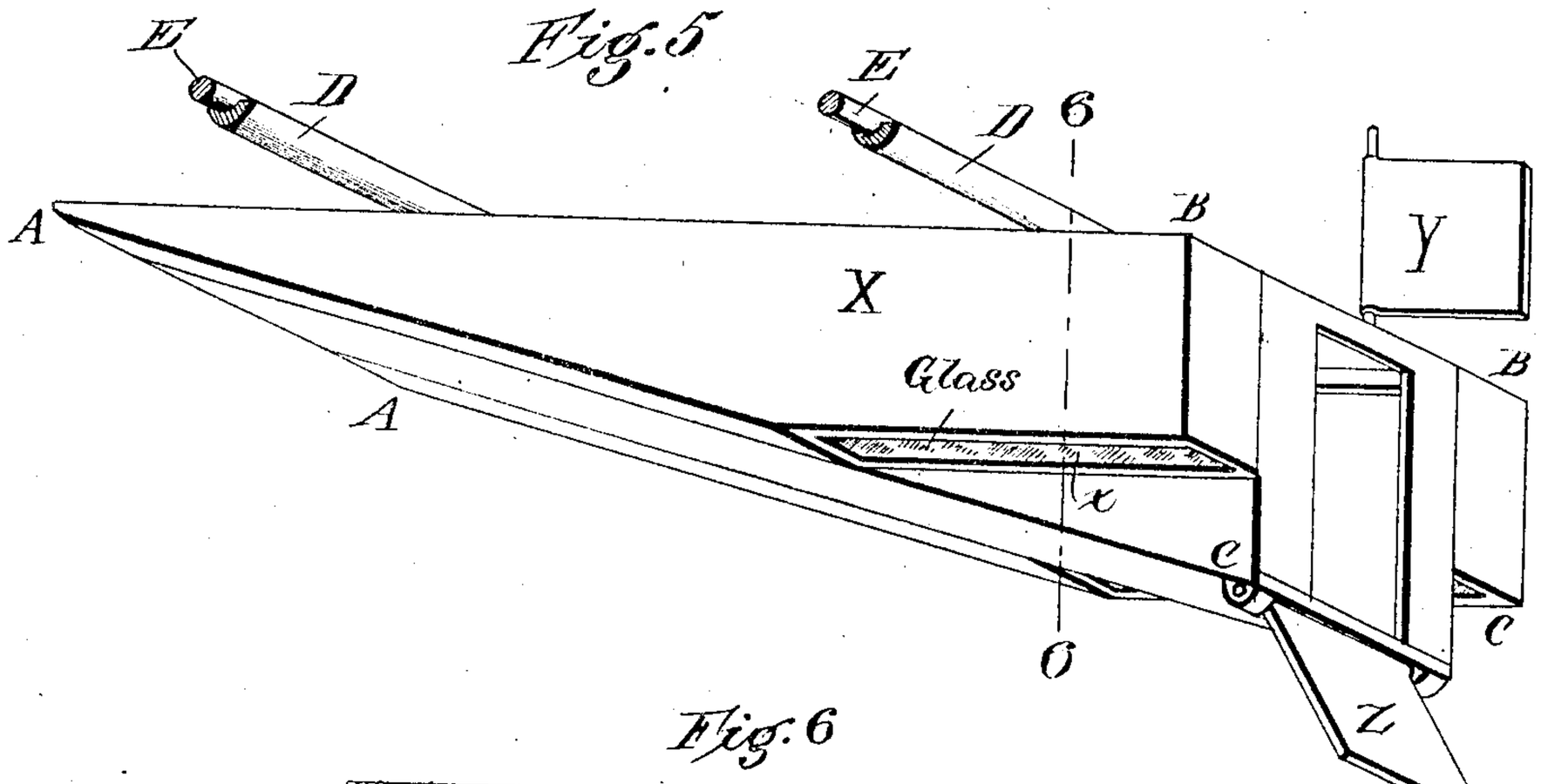
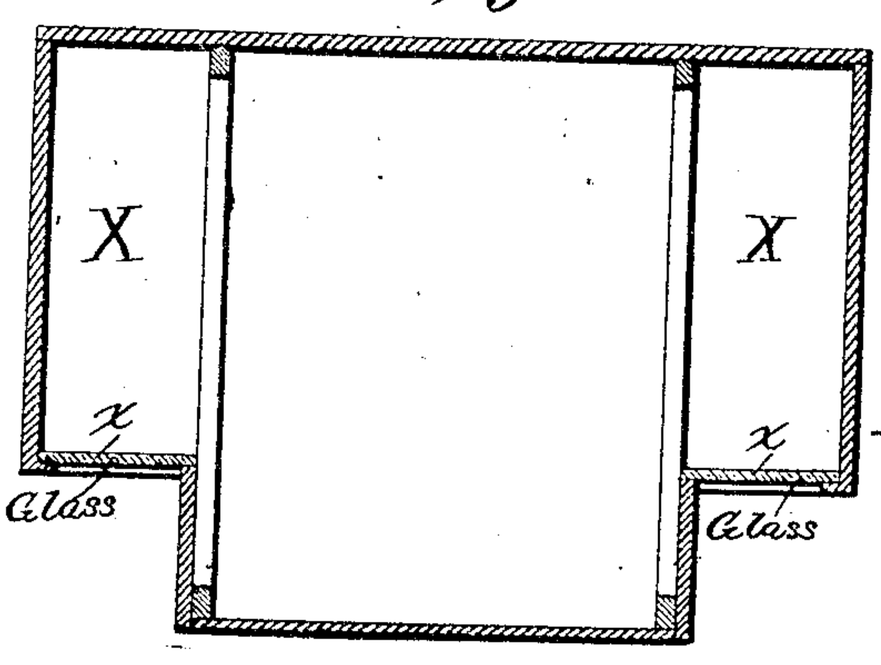


Fig. 6



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UNITED STATES PATENT OFFICE.

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FLYING-MACHINE.

No. 882,435. Specification of Letters Patent. Patented March 17, 1908.

Application filed October 13, 1906. Serial No. 338,781.

To all whom it may concern:

Be it known that I, THOMAS J. WHALEN, a citizen of the United States, and a resident of Middlebrook, in the county of Augusta and State of Virginia, have invented a Flying-Machine, of which the following is a specification.

My invention is in the nature of a flying machine, and it consists in the novel construction and arrangement of the body frame, propelling devices and steering devices, which I will now proceed to describe with reference to the drawings, in which

Figure 1 is a partial plan view showing one pair of propelling wheels. Fig. 2 is a partial perspective view from the front of the skeleton frame of the body and front propeller arms. Fig. 3 is another perspective view taken from the rear and showing the skeleton frame with steering rudders and a supporting gas bag. Fig. 4 is a perspective view from the front, somewhat similar to Fig. 2, but showing the paddles of the front propeller wheels. Fig. 5 is a perspective view of the body of the machine. Fig. 6 is a cross-section of the same on line 6—6 of Fig. 5, and Fig. 7 is an enlarged section of one of the hubs of the propeller wheels.

Similar reference letters indicate the same parts in all the views.

As shown in Fig. 3, a buoyant gas bag M is employed as an auxiliary means of support, but if practicable this may be dispensed with.

A, A, B, B, C, C, represents the skeleton frame of the body which is shaped as a right angular triangular aeroplane having at the front A, A, a sharp horizontal edge and diverging with an increased height or vertical dimension to the rear end B, B, C, C. The bottom of the frame representing the hypotenuse is designed to occupy a slight angle to the horizontal, the front end being raised, so that the bottom surface will tend to rise on the air as the machine advances.

Transversely across the top of the frame are two rotating shafts E, E, see Figs. 1 and 2, on the ends of which are carried the propeller wheels hereafter described. The shafts E extend out a considerable distance on either side of the body frame in order to give room for the paddles of the propeller wheels and these shafts are supported by outwardly projecting rigid arms D projecting horizontally at right angles to the frame and forming outrigger supports. The shafts are journaled in bearings *e*, *e*, on top of the frame and also in bearings formed in an enlargement at the end of each arm D, as seen in Fig. 7.

To rotate the shafts E, see Fig. 1, an engine 1 turns a shaft 2, which bears a sprocket wheel 3. A chain belt 4 connects the sprocket wheel with another sprocket wheel 5 fixed on a transverse shaft 6. On the shaft 6 are keyed two sprocket wheels 7, 7, which by means of two chain belts 8, 8, turn sprocket wheels 9, 9, on the propeller shafts E, E. At each end of each shaft E there is a propeller wheel, the paddles V of which are hung upon radial spoke arms E^2, Fig. 2, and which paddles are adjustable around their radial arms as axes so that the planes of the paddles may be changed as the wheels rotate. The radial arms E^2 are three in number and are rigidly attached to a central hub E′, which is rigidly fixed on the ends of the shafts E. The outer ends of the radial arms are all connected to a circular hoop or tire T which braces the arms and holds them against bending.

The propeller paddles V are arranged to strike flat and horizontally upon the air as they pass down in front on their revolution and then after passing the middle vertical line below the shaft they turn edgewise or toward a vertical plane as seen in Fig. 1, and thus rise through the air with but little resistance. The down stroke of the paddles meets great resistance against the air and consequently produces a buoyant effect on the machine which lifts it up and also moves it forward. The arrangement of the three paddles for each propeller wheel is a very important one. These three paddles are distributed an equal distance apart, (120 degrees) around the circumference and this allows me to use very large and wide blade panels or vanes for the paddles which may be turned on their individual axes, without interfering with each other in turning, thus giving a powerful stroke against the air approximating the efficiency of a bird's wing. The spacing apart of the paddles, 120 degrees, also gives sufficient clearance for the air as to avoid carrying dead air, thus increasing the lifting and propelling efficiency. To impart this rotary adjustment to the vanes V about their axial arms E^2, the paddles near the axial center have each a rigid pin *p*, see Figs. 4 and 7, that plays in a cam groove *g* in a stationary enlargement on the outer end of each shaft support D. This cam-groove is waved so as to alternately

turn the paddle V to a position at right angles to the plane of the hoop T and then to a plane coincident with the vertical plane of the hoop. As the two shafts thus rotate the four propeller wheels beat down forcibly upon the air in front of their axes, lifting the flying machine, but rise edgewise in rear of their axes with comparatively little resistance. The paddles V are made of a light skeleton frame covered on one side by canvas, silk, aluminium, or any light material and they are held and braced a uniform distance apart in the hoops or tire T connecting the outer ends of the radial arms forming the axes of said paddles. As shown there are but two shafts E, E, each designed to carry two propeller wheels, one at each end. I may, however, use any number of shafts E and propeller wheels that may be desired.

On each side of the aeroplane body, see Figs. 5 and 6, are formed overhanging chambers X whose bottoms *x* are slightly above the bottom of the aeroplane at the rear and parallel with the top of the aeroplane. The bottoms *x* of the overhanging chambers are made of glass for observation purposes to permit the occupants of the car to look down toward the earth when in flight without risk. These overhanging side chambers also form storage compartments for carrying ballast, provisions, etc. The bottoms *x* of the overhanging side chambers are sufficiently above the bottom of the car as not to come in contact with the earth when at rest, thus protecting the glass from being broken.

To steer the machine two rudders Y and Z are employed. The upper one Y, see Fig. 3, is arranged about a vertical axis and is for steering to the right or left and the lower one Z is arranged about a horizontal axis, and is to cause the machine to rise or descend. These rudders may be worked by suitable arms and cables in the usual way.

To give access to the interior of the car a door is arranged at the rear and deeper end of the car as seen in Fig. 5.

I claim—

1. A flying machine, comprising a car frame, a motor mechanism and lifting and propelling devices consisting of two rotary shafts each bearing at each end three equally spaced radial arms, a circumferential ring connecting the outer ends of said three arms and three relatively wide blade panels axially mounted along their middle lines on the radial arms and means for changing their plane of action in sequence as described.

2. A flying machine comprising a car frame made in triangular shape with a sharp horizontal edge at front and gradually increasing in vertical height to the rear, motor mechanism within the same, four outwardly extending arms rigidly attached to the car frame and having bearings at their outer ends and two rotating shafts arranged in said bearings in the arms and provided with paddles adjustable about radial axes.

3. A flying machine, comprising a car frame having outwardly projecting rigid arms provided at their outer ends with shaft bearings and a waved cam, rotary shafts journaled on said arms and having at their ends rigid hubs with radial spokes, and paddles hinged about the radial spokes and connected to the waved stationary cam to be turned to different planes.

4. A flying machine having an aeroplane body made as a right triangle having a flat bottom with horizontal sharp edge in front and a gradually increased vertical thickness toward the rear.

5. An aerial car having a triangular shaped body with a sharp horizontal front edge to form an aeroplane and having overhanging side chambers with glazed bottoms arranged above the bottom of the car.

6. A flying machine lifting and propelling wheel, consisting of a rotary shaft bearing three equally spaced radial arms, a circumferential ring connecting the outer ends of said three arms, and three relatively wide blade panels axially mounted along their middle lines on the radial arms, and means for changing their planes of action in sequence.

7. A right angle triangular shaped aerial car having a sharp horizontal front edge and a maximum vertical height at the rear, with a door in the rear end, a rudder on a horizontal axis below said door, and a rudder on a vertical axis above said door.

THOMAS J. WHALEN.

Witnesses:
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JOSEPH L. WHALEN.