

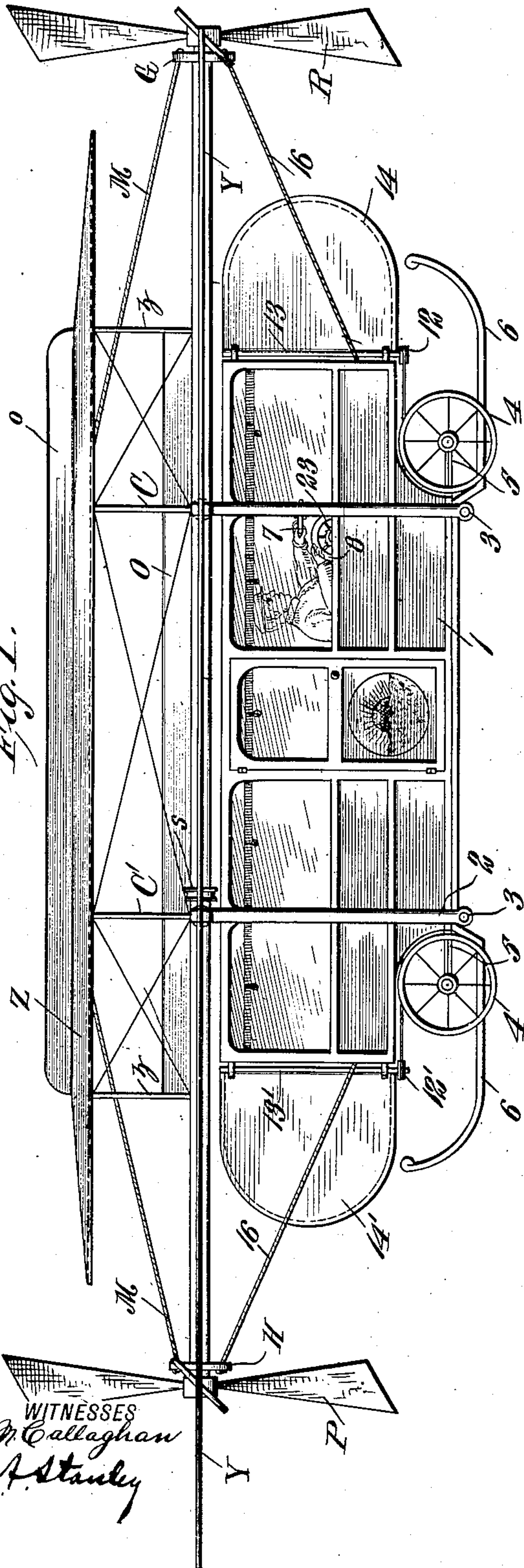
J. M. BIGGS.
AEROPLANE FLYING MACHINE.
APPLICATION FILED JUNE 28, 1909.

968,734.

Patented Aug. 30, 1910.

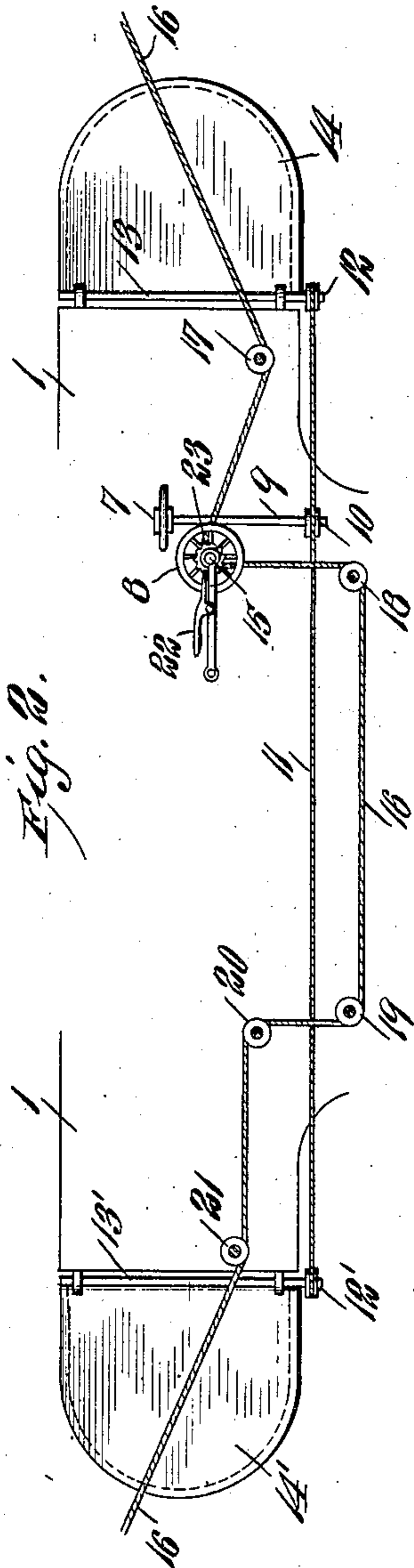
4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
C. P. Callaghan
L. A. Stanley

Fig. 2.



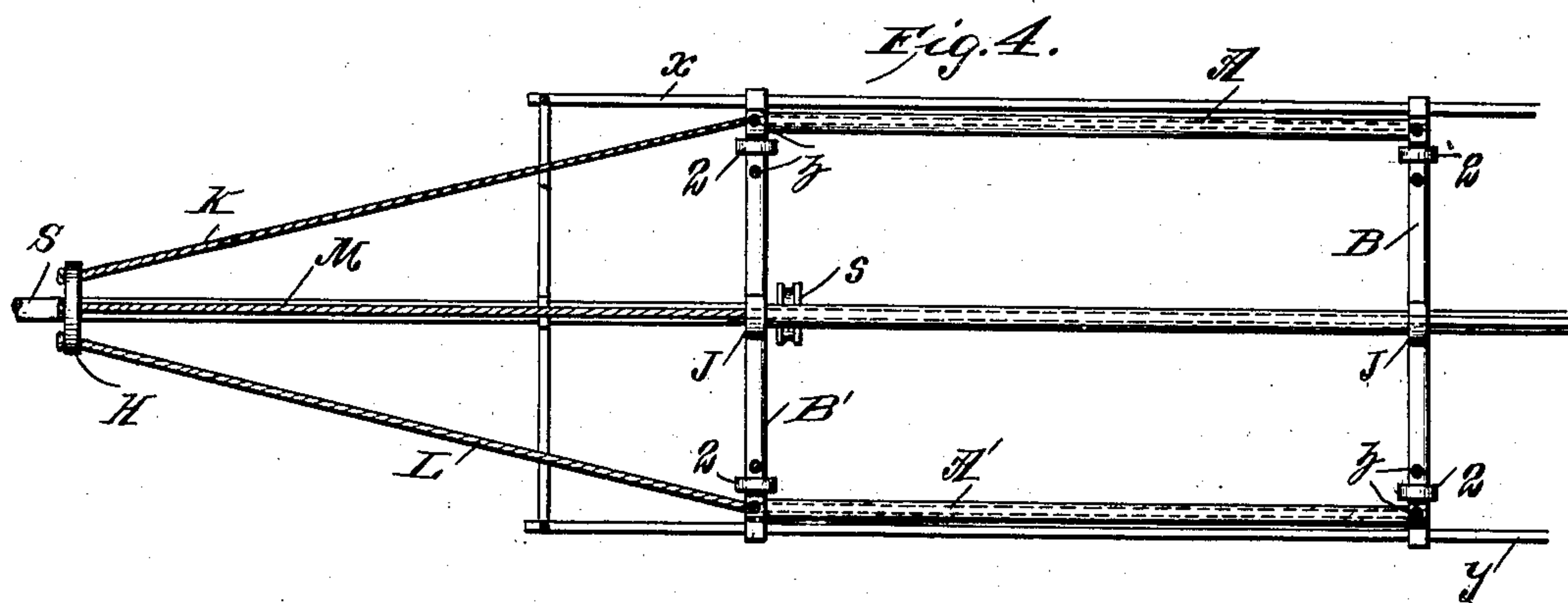
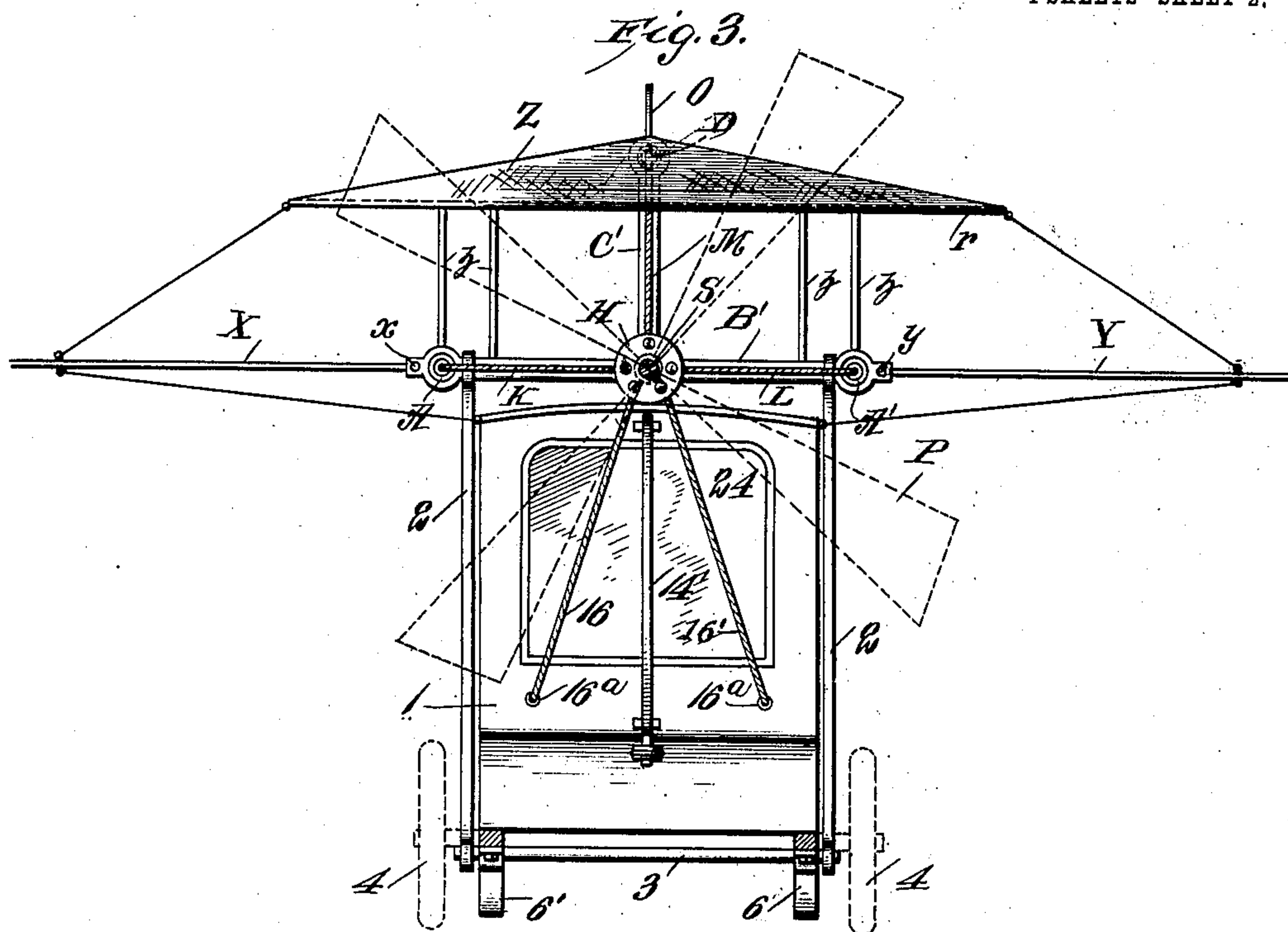
INVENTOR
JOHN M. BIGGS
BY *Munster*
ATTORNEYS

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WITNESSES
E. M. Callaghan
L. A. Stanley

INVENTOR
JOHN M. BIGGS
BY *Munn & Co.*

ATTORNEYS

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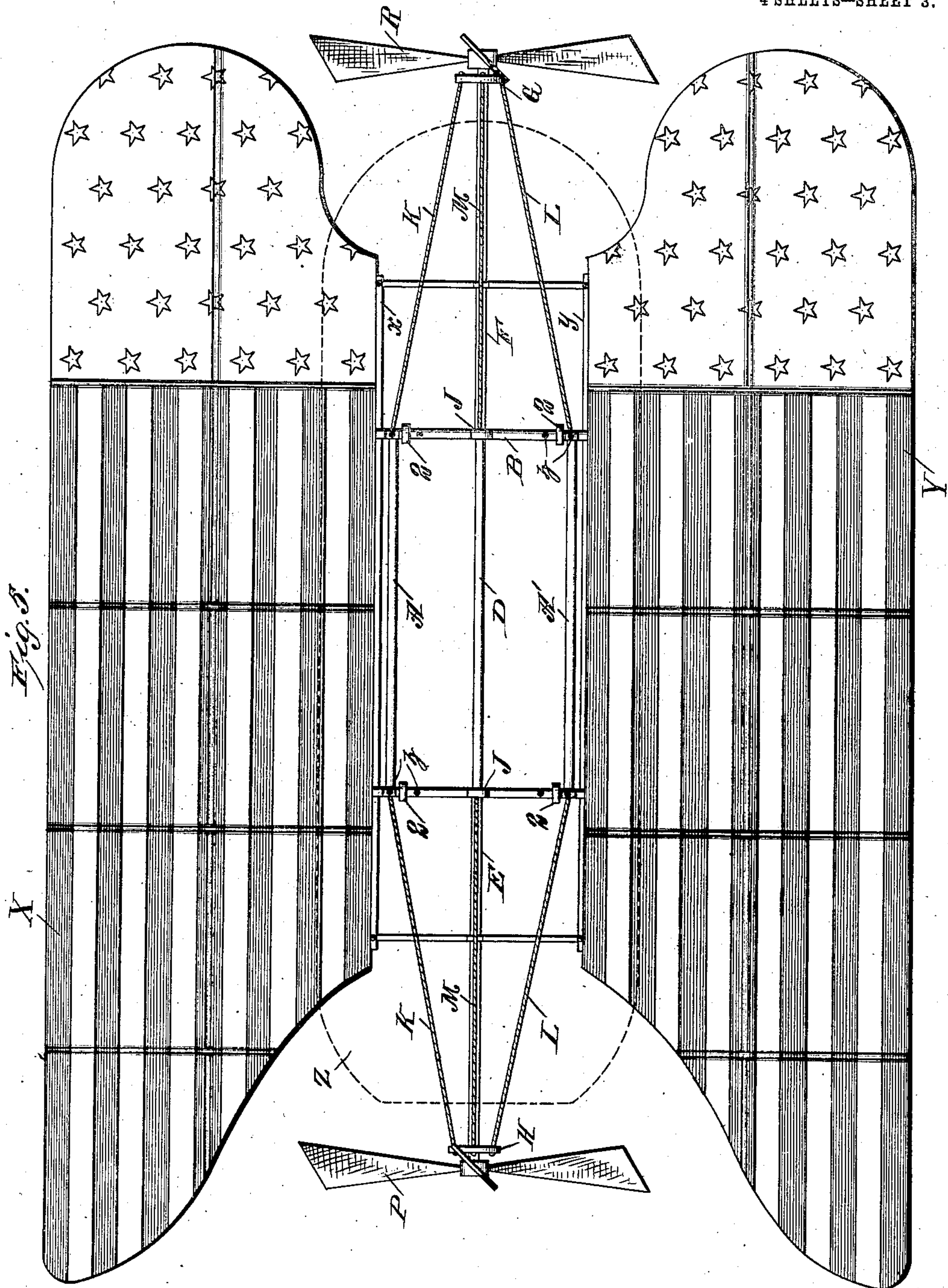


Fig. 3.

WITNESSES
E. M. Callaghan
L. A. Stanley

INVENTOR
JOHN M. BIGGS
BY *Munn & Co.*
ATTORNEYS

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4 SHEETS—SHEET 4.

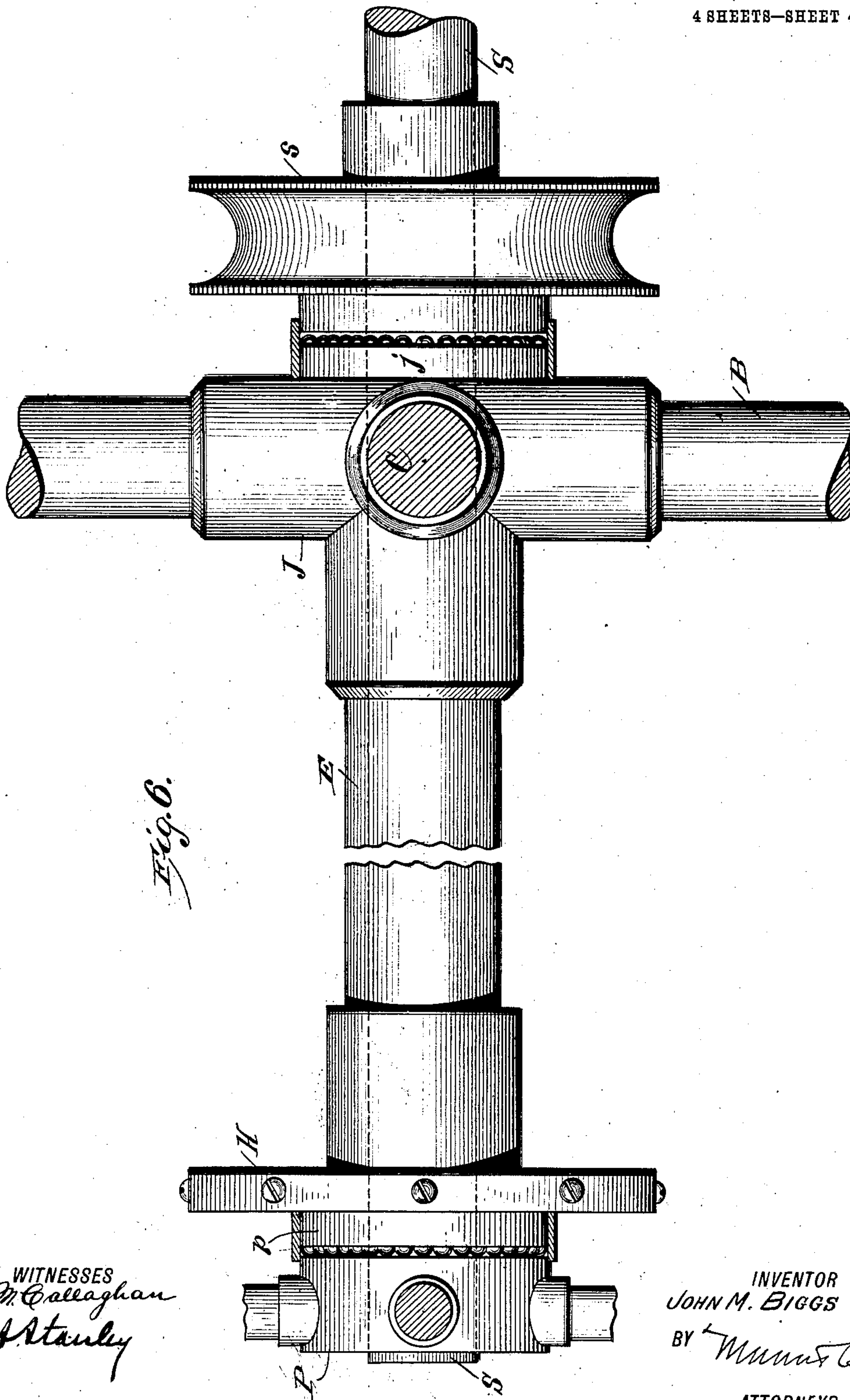


Fig. 6.

WITNESSES
E. M. Gallagher
L. A. Stanley

INVENTOR
JOHN M. BIGGS
BY *W. M. Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN M. BIGGS, OF DAYTON, OHIO.

AEROPLANE FLYING-MACHINE.

968,734.

Specification of Letters Patent.

Patented Aug. 30, 1910.

Application filed June 28, 1909. Serial No. 504,717.

To all whom it may concern:

Be it known that I, JOHN M. BIGGS, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Aeroplane Flying-Machines, of which the following is a specification.

My invention relates to an improved aeroplane and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide an aeroplane of symmetrical and pleasing appearance in which the framework is made of a shape to give the greatest strength and rigidity, with two wing-like planes attached to the edges and a third plane forming a canopy above it.

A further object of my invention is to relieve the sameness of the surface of the side planes. To this end I make use of the stars and stripes and construct the planes of a wing-shaped form, the latter giving an effect far more pleasing than the ordinary unsightly planes used in machines of like character or form.

A further object of my invention is to provide a swinging car body which is pivotally attached to the main frame, in such a manner that the center of gravity of the machine is considerably below the lifting planes so that if the machine is unbalanced by striking a cross or contrary current from any direction it will automatically right itself by the weight of the car.

A further object of my invention is to provide means by which the steering of the aeroplane upwardly or downwardly may be easily accomplished. To attain this I secure to the main frame a wire rope, cable or other connection which passes around the axle of a steering wheel in the suspended car and thence out to the opposite end of the frame. The turning of the steering wheel thus gives a relative movement to the car and the planes and causes the latter to tilt upwardly or downwardly to any desired angle.

A further object of my invention is to provide means for preventing injury to the car and its occupants when the machine descends to the earth, the means by which this is accomplished comprising a set of wheels attached to the body of the car and pairs of spring runners. The wheels pro-

ject below the runners normally and strike the ground first in the descent, but if the pressure is great enough the springs of the car to which the axles are attached, are flexed and the runners come into play thereby relieving the strain on the wheels.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings in which similar characters indicate like parts in the various views, in which—

Figure 1 is a side view of the device; Fig. 2 is a detail view of the means for tilting the planes upwardly and downwardly; Fig. 3 is a rear view of the device, certain portions being shown in section; Fig. 4 is a plan view of a portion of the main framework; Fig. 5 is a plan view of the main supporting planes, and Fig. 6 is a detail view of the ball-bearing joint.

In carrying out my invention, I provide a main frame, such as that shown in the drawings, consisting of the side tubes A, A', see Figs. 4 and 5, and the cross members B and B'. The latter are formed preferably of two pieces screwed into the joint J, of the kind shown in detail in Fig. 6. The upright arms C and C' are secured to the front and rear joint J respectively and form part of the framework. The tube sections E and F connect the joint J with the front and rear end plates G and H respectively. The guy ropes K and L extend from the front plate G through the side tubes A and A' respectively and connect with the rear end plate H. The guy rope M, see Fig. 1, extends from the plate G through a central tube D which joins the uprights C and C', to the rear end plate H. A central shaft S extends from the front to the rear of the device and through the end plates G and H. At the forward end of the shaft is secured a propeller R and another propeller P is secured to the rear end.

Referring now to Fig. 6 it will be seen that the joint J is provided with a ball bearing portion *j* arranged to receive the end-thrust of the shaft S, while the plate H is provided with a ball bearing portion *p* arranged to receive the thrust from the propeller P in the opposite direction. The main shaft S is provided with a pulley or driving wheel *s* secured to the shaft in the manner clearly shown in the figure.

Referring now to Fig. 3 I have shown the car 1 as suspended from the cross members B' by means of the arms 2 which are pivotally attached to the cross bar 3 running underneath the car. The forward end of the car is similarly supported and the car therefore is enabled to swing backward and forward on the pivoted arms. The wheels 4 are secured at the front and rear ends of the car 1 by flat springs 5 which in turn are connected with the bottom of the car. Attached to the bottom of the car on either side thereof are the runners 6 and 6'. These runners it will be observed are inside of the wheels. This enables the wheels to be set far apart to give a wide wheel base.

Referring now to Fig. 5 it will be seen that the main suspending planes consist of two wing like surfaces X and Y respectively. These are pivotally attached to the rods or cables x and y at each side of the main frame, these rods being carried by the ends of the arms B and B'. These planes or wings may be raised or lowered at different elevations, but in their normal position are extended in the manner shown in Fig. 3. To relieve the sameness of so much plane surface stars and stripes are used to give the effect illustrated in Fig. 5.

The central plane Z is shown in Figs. 1 and 3. It is made by placing small up-rights of tubing z on the main frame to which a surrounding rim z' of wire is secured. The frame is covered with a series of strips of wood or aluminum held together with aluminum wire and this framework is covered with silk or canvas.

The steering of the aeroplane is accomplished by the hand wheels 7 and 8. The former is on a shaft 9 having a wheel 10 on its bottom around which a rope or cable 11 is wound, the ends of which are attached to the wheels 12 and 12' on the rods 13 and 13' to which the rudders 14 and 14' are secured. The shifting of the hand wheel 7 turns the rudders on their respective shafts so as to cause a movement in a lateral direction. The hand wheel 8 is on a shaft 15 having a small drum over which the cable 16 passes, the cable being wound with one or two turns around the drum. The cable 16 passes underneath an idler 17 at the forward end of the car and then outwardly and is attached to the front plate G. The opposite end of the cable is passed around the idlers 18, 19, 20 and 21 and is attached to the rear end plate H. The hand wheel 8 may be locked in position by means of the spring actuated dog 22 which engages the ratchet wheel 23 on the shaft 15 but which may be released by pressing down on the handle, thereby withdrawing the dog and permitting the movement of the wheel.

While I have described only one rope 16, it will be understood that there are two, 16

and 16', one on each side of the machine as clearly shown in Fig. 3.

In order to insure equilibrium I may provide a keel O underneath the canopy plane Z and a smaller keel o on top of the same, see Fig. 1.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

The machine may be run by any suitable motor carried in the car or underneath of it by a belt over the pulley s . The engine may be reversed and the machine may be propelled in either direction.

The guidance of the machine is accomplished as stated before by turning the hand wheel 7 which turns the rudders 14 and 14' at either end of the machine. In tilting the machine upwardly or downwardly the hand wheel 8 is manipulated, winding up the rope on one side and paying it off on the other. This causes a relative movement of the suspended car and the rest of the machine, *i. e.*, the planes and the main frame. The center of gravity being low the car automatically retains its position and hence the planes are tilted, thereby causing the device to ascend or descend at will. I desire to call particular attention to this means of tilting the planes upwardly or downwardly, since it forms one of the main features of my invention.

The frame already described is a minimum of weight with a maximum of strength.

The car may be of any approved design but is well lighted and is inclosed on all sides to protect the occupants from the wind and the weather.

It will be observed that the machine runs in a longitudinal direction or in the direction of its length like a boat, bicycle, or a railroad train instead of going sidewise in the manner of certain well known aeroplanes.

The center of gravity of the device is low and therefore the machine is stable. Ordinarily, as when the machine is on the ground, it is supported by means of the wheels 4, but if, in making a descent the impact on the ground is great the wheels are forced upwardly against the tension of the springs 5 and the runners 6 are brought into contact with the ground thereby relieving the wheels of the great strain and preventing them from breaking.

I am aware that other forms of the device based upon the same idea might be made, but I consider as my own and desire to claim all such modifications as fairly fall within the spirit and scope of the invention.

I claim:

1. An aeroplane flying machine, comprising a main frame, a suspending plane secured thereto on each side thereof, a third plane secured at the top of said frame be-

tween the side planes, a car suspended underneath said third plane, said car being provided with wheels and runners, said wheels being arranged to move upwardly under undue weight to bring the runners into operative position.

2. In an aeroplane flying machine, a main frame, supporting planes secured thereto, a car suspended from said main frame, springs secured to said car, wheels carried by said springs, runners secured to said car, said wheels being adapted to project normally below said runners but to move upwardly under increased pressure to bring said runners into operative position.

3. An aeroplane flying machine, comprising a main frame, a suspending plane secured thereto on each side thereof, a third plane secured at the top of said frame, between said side planes, a car suspended centrally of the device, said car being provided at its ends with downwardly projecting flat springs, wheels carried by said springs, runners secured to said car body below said springs said wheels being arranged to pro-

ject normally below said runners and to move upwardly by a flexure of their supporting springs to bring said runners into operative position.

4. An aeroplane flying machine comprising a main frame, a suspending plane secured thereto, at each side thereof, a third plane secured to the top of said frame between said side planes, a car pivotally suspended from said frame, on an axis transverse of the machine, springs at the forward and rear ends of the car, wheels carried by said springs, runners carried by said car, said runners having downwardly projecting portions at the ends of the car and having upwardly curved ends, said wheels normally projecting below said downwardly extending portions of the runners and means operated within the car for causing the tilting of the supporting planes relatively to the car.

JOHN M. BIGGS.

Witnesses:

I. L. HALDERMAN,
H. E. HESSLER.