

J. C. CLANCY.  
AIR SHIP AND PROPELLER THEREFOR.

APPLICATION FILED FEB. 5, 1904.

3 SHEETS—SHEET 1.

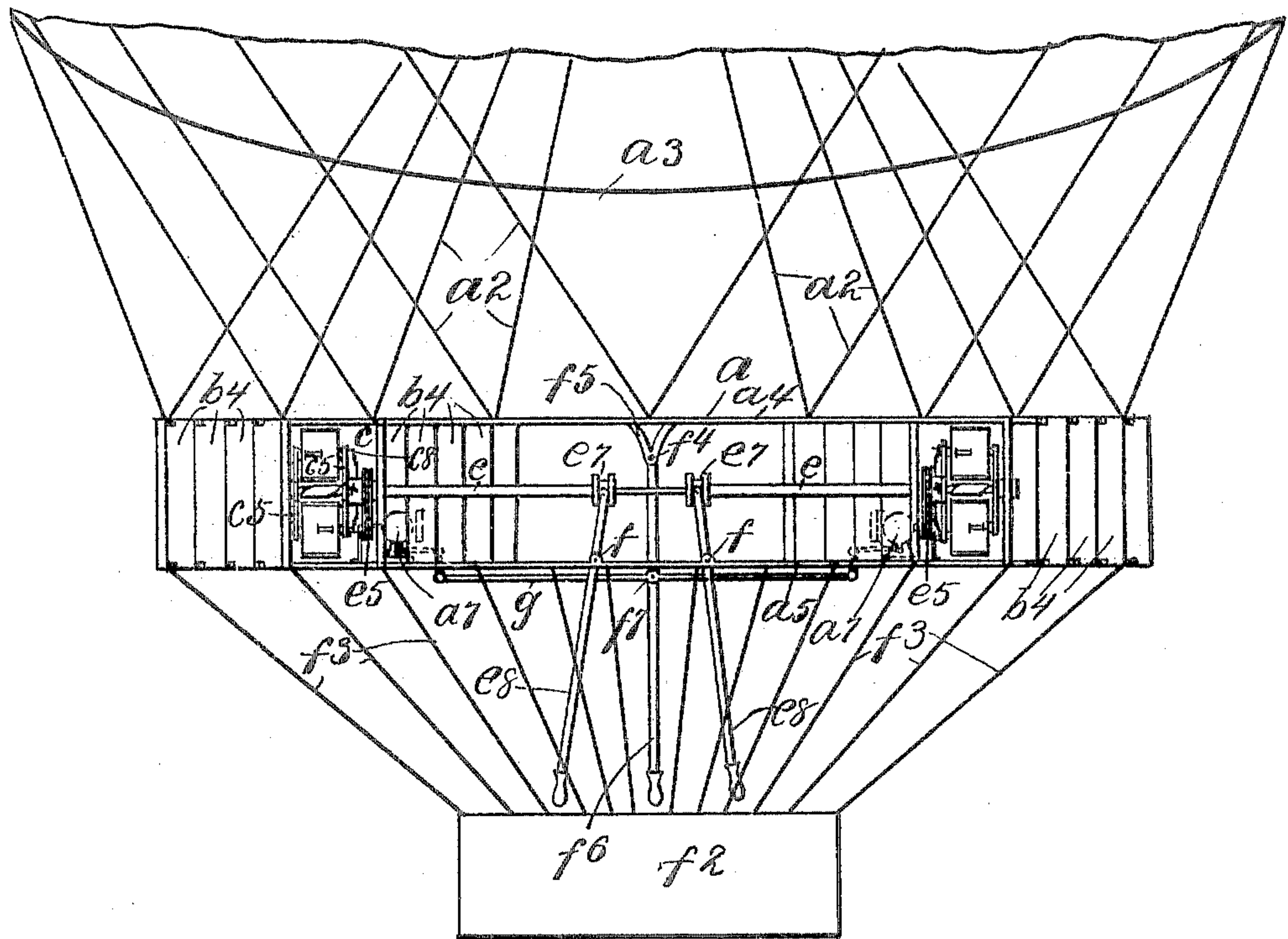


Fig. 1.

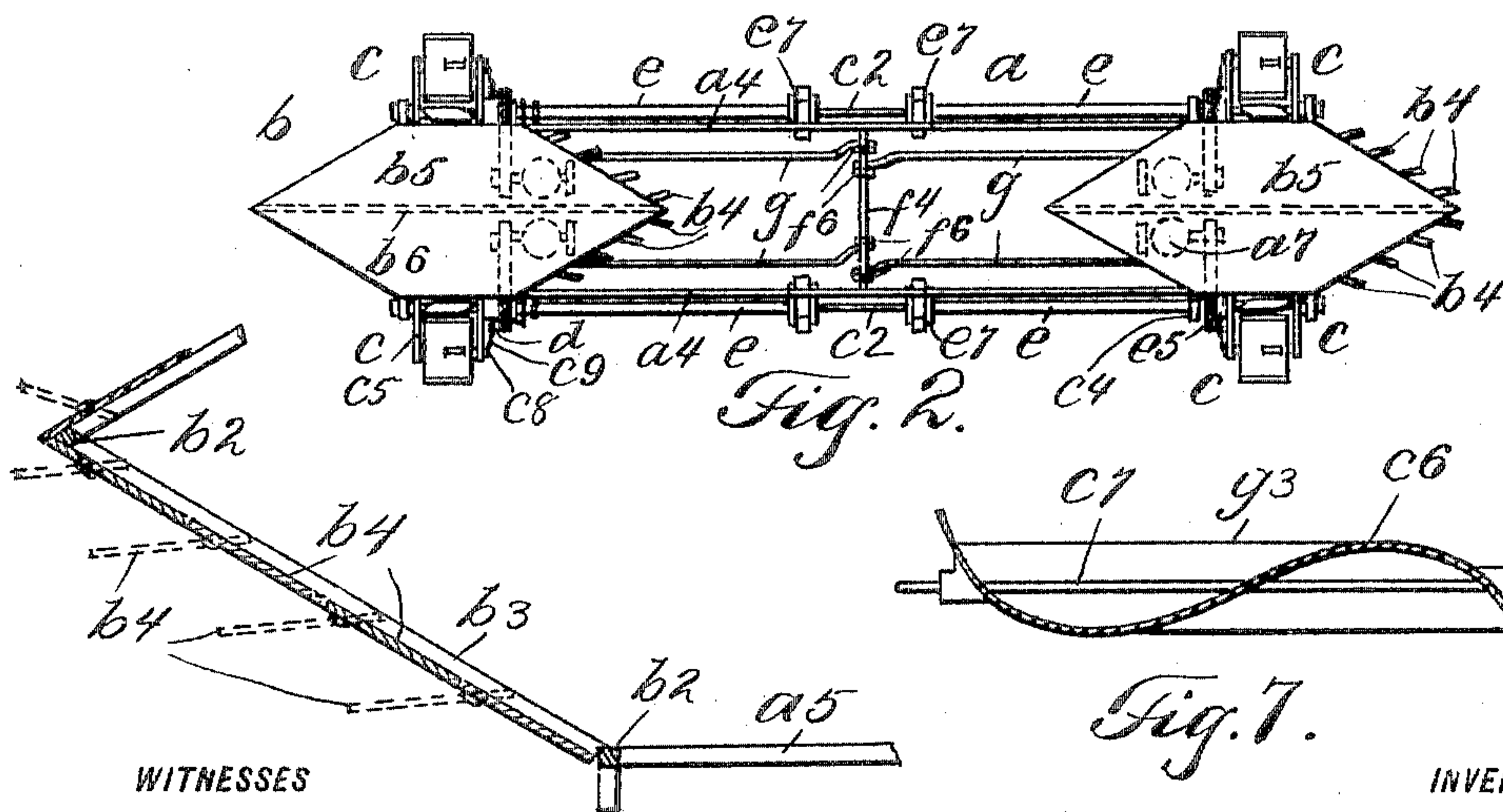


Fig. 2.

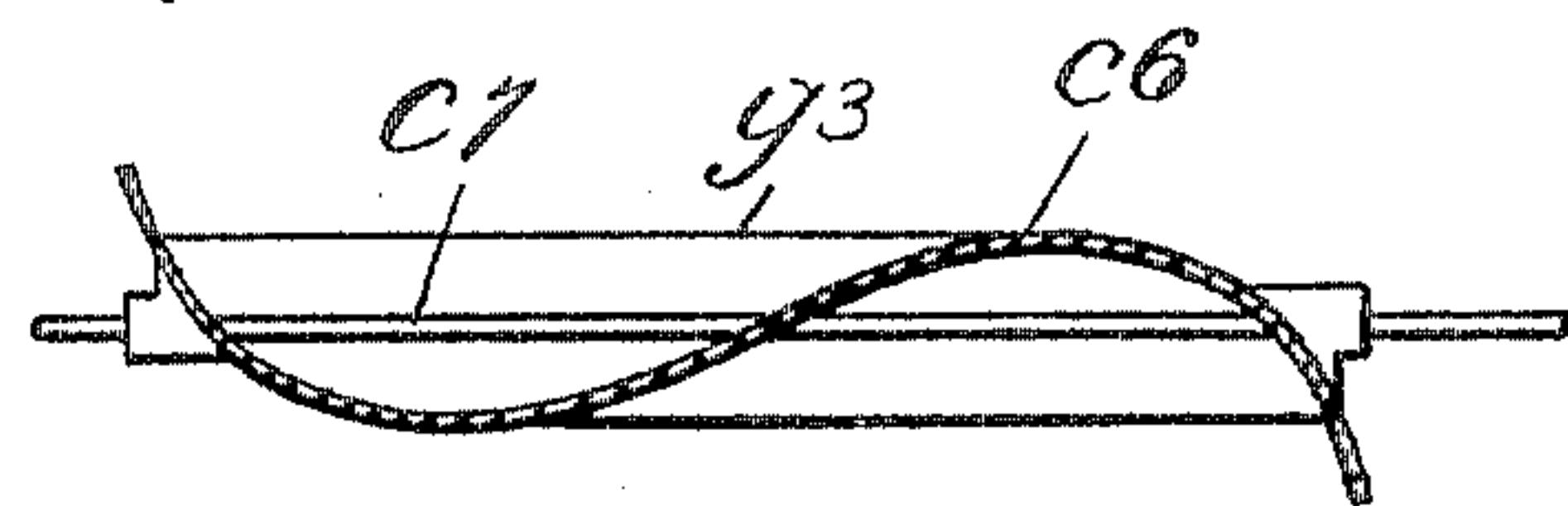


Fig. 7.

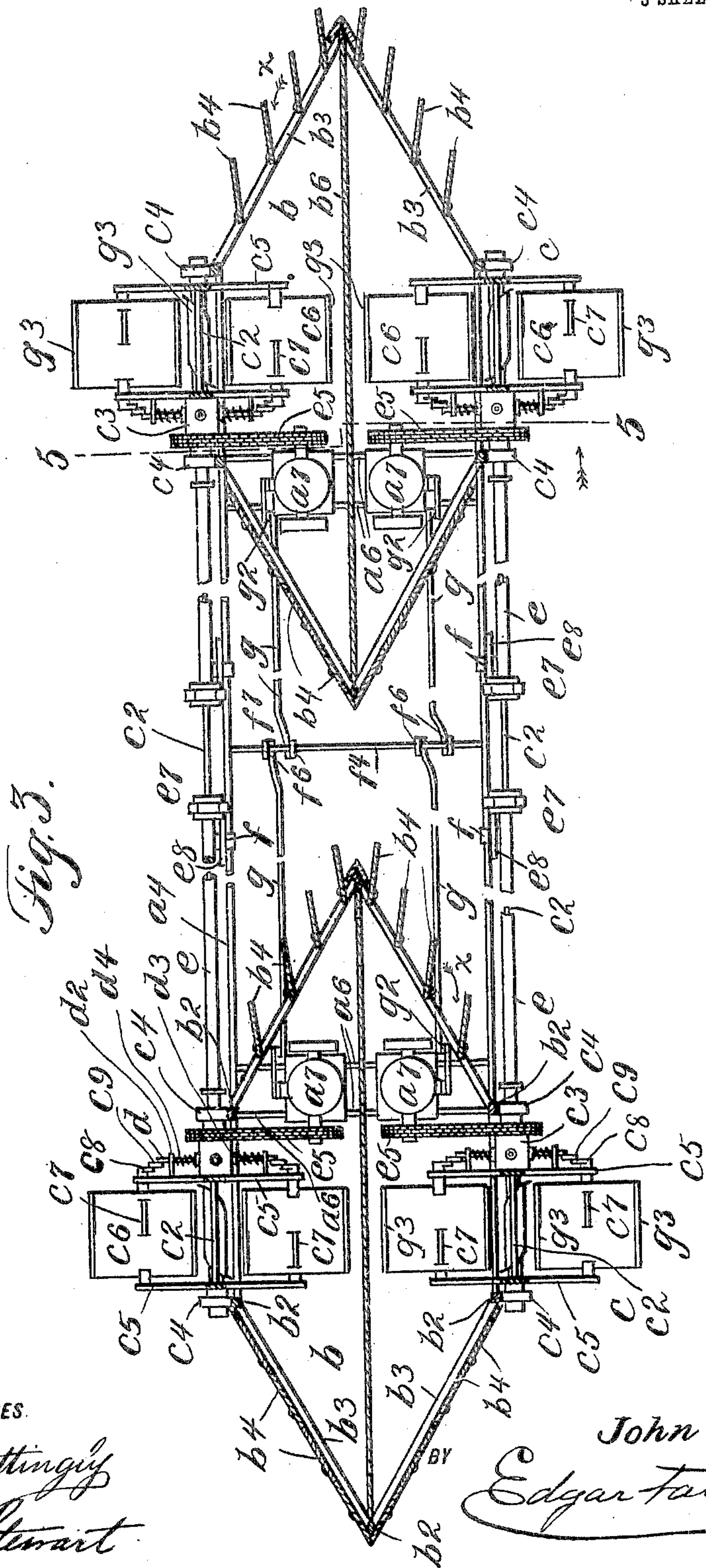
WITNESSES  
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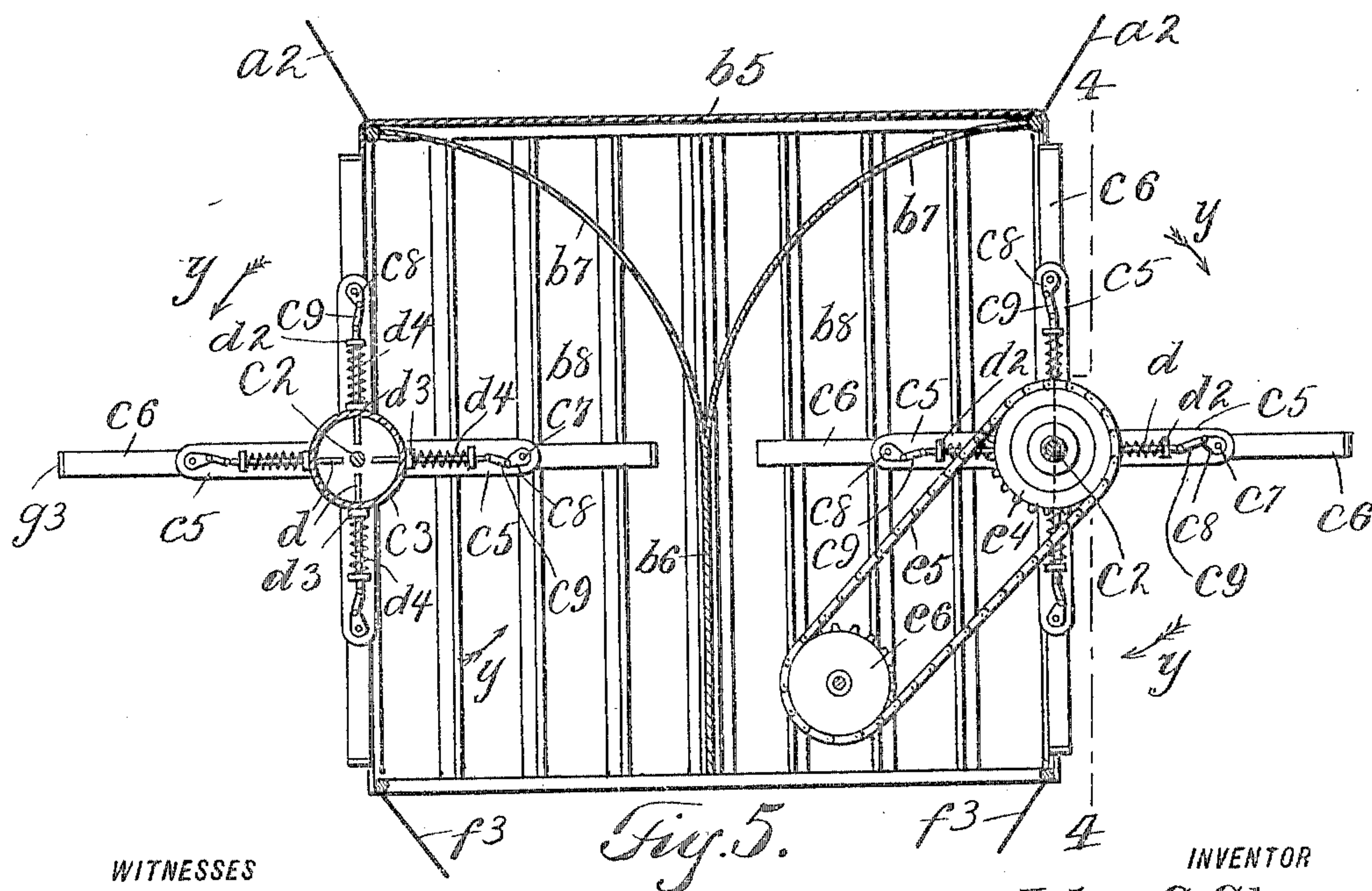
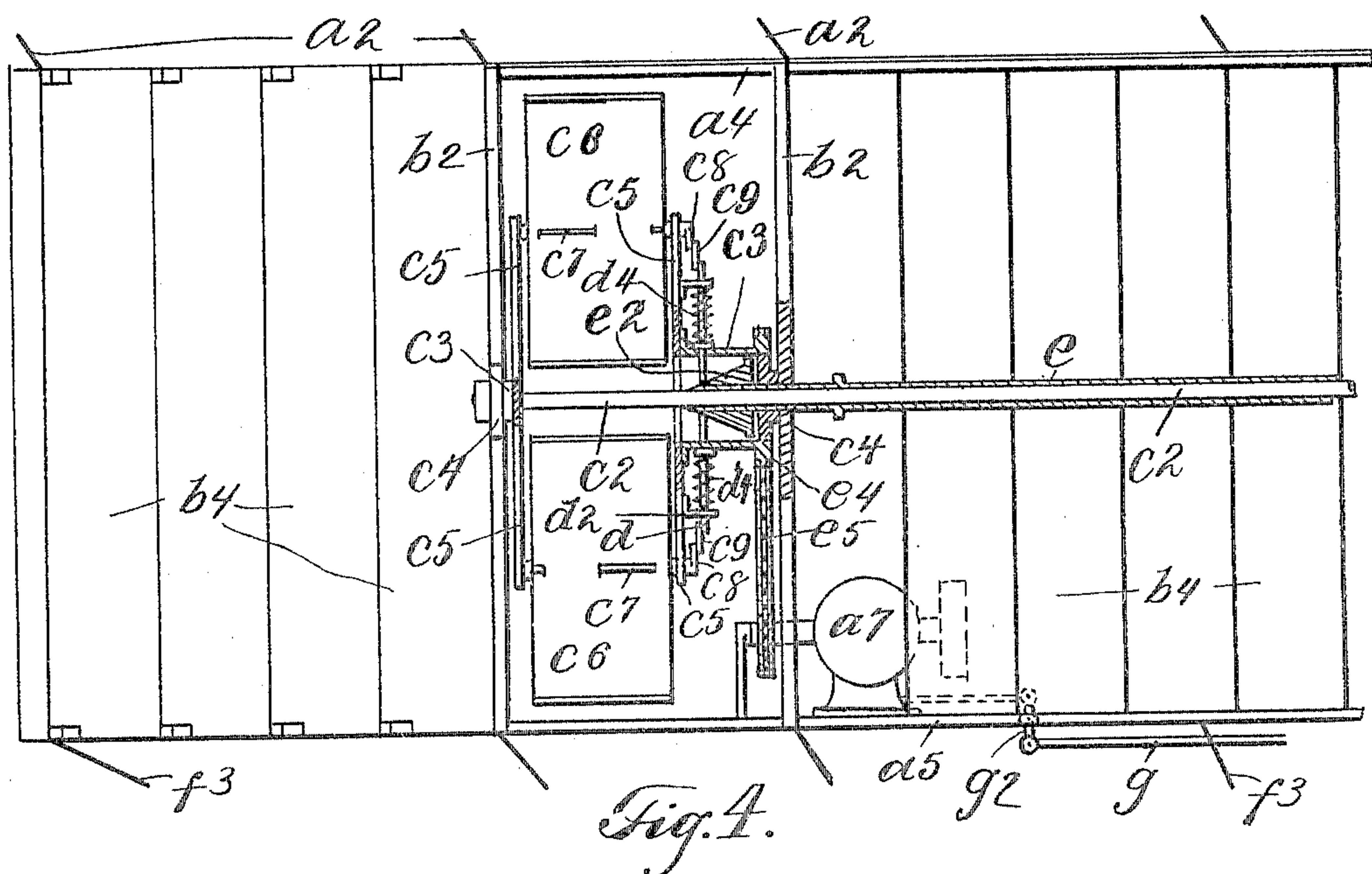
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3 SHEETS—SHEET 3.



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*F. A. Stewart*

INVENTOR

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# UNITED STATES PATENT OFFICE.

JOHN C. CLANCY, OF NEW YORK, N. Y.

## AIR-SHIP AND PROPELLER THEREFOR.

No. 804,583.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed February 5, 1904. Serial No 192,098.

*To all whom it may concern:*

Be it known that I, JOHN C. CLANCY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Air-Ships and Propellers Therefor, of which the following is a 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 and propellers therefor; and the object thereof is to provide improved apparatus of this class, and particularly an improved form of propeller to be used in connection with an air-ship and for other purposes; and with this and other objects in view the invention consists in the construction, combination, and arrangement of parts 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 suitable reference characters in each of the views, and in which—

Figure 1 is a side elevation of the bottom portion of an air-ship provided with my improvement; Fig. 2, a plan view of the carrying-frame; Fig. 3, a view similar to Fig. 2, but showing the parts on an enlarged scale and partially in section; Fig. 4, a side view of one end of the carrying-frame and showing one of the propellers partially in section, the section being on the line 4 4 of Fig. 5; Fig. 5, a section on the line 5 5 of Fig. 3; Fig. 6, a sectional plan view of a part of one end of the carrying-frame, and Fig. 7 a longitudinal section through one of the propeller-blades.

In the practice of my invention as shown in the drawings I provide a main carrying-frame *a*, which is suspended, by means of wires, cords, or similar devices *a*<sup>2</sup>, from a balloon *a*<sup>3</sup>, a portion of the balloon-body being shown in Fig. 1, and the balloon *a*<sup>3</sup> may be of any desired shape and construction, and the wires or cords *a*<sup>2</sup> may be connected therewith in the usual or any preferred manner.

The carrying-frame *a* is made of bamboo rods, steel tubes, or any desired material, and the main part thereof is oblong in form and composed of parallel top rods *a*<sup>4</sup> and parallel bottom rods *a*<sup>5</sup>, which are connected at the ends by transverse end rods *a*<sup>6</sup>, which are arranged in the bottom portion of said frame and on which are supported the motors *a*<sup>7</sup>.

At each end of the main frame is a supplemental frame *b*, the front and back ends of which are V-shaped or triangular in form, and these frames are composed of vertical rods *b*<sup>2</sup> and horizontally-arranged rods *b*<sup>3</sup>, which are preferably arranged at the top and bottom of said frames *b*, and the front and back ends of these supplemental frames *b*, which are triangular in form, are provided with vertically arranged and pivoted or hinged shutters *b*<sup>4</sup>, and these shutters are always closed at the forward ends of said supplemental frames and open at the rear ends thereof, according to the direction in which the machine is moving, and these shutters operate automatically and in closing swing in the direction of the arrows *x* in Fig. 3.

Although I have described in detail the construction of the main carrying-frame *a* and the supplemental frames *b*, it will be apparent that these frames may be constructed in any desired manner and may be composed of any preferred material, and the supplemental frames *b* are in practice provided with covers *b*<sup>5</sup>, as shown in Fig. 2, but are open at the bottom and at the end portions, except when the latter are closed by the shutters *b*<sup>4</sup>. Each of the supplemental end frames *b* is also preferably provided with central partitions *b*<sup>6</sup>, the top portions of which are curved outwardly, as shown at *b*<sup>7</sup>, and these partitions form side spaces *b*<sup>8</sup>, which open outwardly and downwardly, and in the opposite sides of each of the frames *b* is mounted a propeller *c*, and said propellers *c*, four of which are employed, are arranged transversely of the supplemental frames *b*, and the shafts *c*<sup>2</sup> of the propellers *c* are mounted in bearings *c*<sup>4</sup>, connected with the side portions of the main carrying-frame and extending the full length thereof.

The propellers *c* consist of a hub *c*<sup>3</sup>, provided with four sets of radially-arranged arms *c*<sup>5</sup>, and each set of the arms *c*<sup>5</sup> is provided with a propeller-blade *c*<sup>6</sup>, mounted therein by means of a shaft *c*<sup>7</sup>, with which the blades *c*<sup>6</sup> are connected in any desired manner, and the shafts *c*<sup>7</sup> of the propeller-blades *c*<sup>6</sup> are provided at their inner ends with a short crank *c*<sup>8</sup>, with which is connected a link *c*<sup>9</sup>, and connected with the links *c*<sup>9</sup> are rods *d*, which pass through keepers *d*<sup>2</sup>, connected with the arms *c*<sup>5</sup>, and the rods *d* project into the hubs *c*<sup>3</sup> of the propeller *c* and are movable radially thereof, and each of said rods is provided with a collar *d*<sup>3</sup>, between which and the keepers *d*<sup>2</sup>



are springs  $d^4$ , which serve to force the rods  $d$  inwardly and holding them in their innermost position. The shafts  $c^2$  each carry two of said propellers, and mounted on the shafts  $c^2$  are sleeves  $e$ , and the sleeves  $e$  pass through the bearings of the shafts  $c^2$ , and each is provided at its outer end with a conical head  $e^2$ , and the heads  $e^2$  are inclosed in the inner ends of the hubs  $c^3$  of the propellers  $c$ , said inner ends of said hubs being projected inwardly, as clearly shown in Figs. 3 and 4.

The inner ends of the hubs  $c^3$  of the propellers  $c$  are each provided with a sprocket-wheel  $e^4$ , and these sprocket-wheels are geared in connection with the motor-shafts of the motors  $a^7$  by means of drive-chains  $e^5$ , said motor-shafts of the motors  $a^7$  being provided also with sprocket-wheels  $e^6$ .

Suspended from the inner ends of each of the sleeves  $e$ , as shown at  $e^7$ , and by means of a grooved collar in the usual manner are operating-levers  $e^8$ , two of which are employed at each side of said frame  $a$ , and these levers are pivoted at  $f$  to the frame  $a$  and extend downwardly and are adapted to be operated from a car  $f^2$ , which is suspended from the main frame  $a$  by cords or wires  $f^3$  in the usual manner, and arranged transversely of the main carrying-frame  $a$  is a rod  $f^4$ , which is suspended from any suitable support  $f^5$  and with which are connected four levers  $f^6$ , which are also adapted to be operated from the car  $f^2$ , and the levers  $f^6$  are connected at  $f^7$  with rods  $g$ , which are connected with crank-arms  $g^2$ , by means of which the motors  $a^7$  are controlled, and as thus constructed it will be seen that each of the propellers (four of which are employed) is provided with a motor, and these motors are all separately controlled by means of the levers  $f^6$ .

The propeller-blades  $c^6$  are of the form in section parallel with the longitudinal axis of the machine shown in Fig. 7, said form being substantially that of a compound curve, and each propeller-blade is provided at its end with a cross-plate  $g^3$ , and the front and back edges of the blades  $c^6$  project beyond the end plates  $g^3$ , as shown in Fig. 7.

It will be understood that the propellers  $c$ , each of which is provided with four blades, are turned as a whole, the blades being simply carried around, and when the blades are in one position they exert a lifting and driving force and in the other position they exert a lifting and backing force.

In starting the machine the propellers are turned so that the blades  $c^6$  exert a lifting and pulling or driving power, which operation aids the balloon-body to raise the machine, and the machine may be controlled at will by varying the operation of the various propellers, and it will be understood that the position of the propeller-blades may be fixed as desired, and the said propeller-blades may be secured in the desired position by manipulat-

ing the levers  $e^8$ , by which the sleeves  $e$  are operated.

The motors  $a^7$  may be of any desired form or construction, and they may be supported in the main carrying-frame in any preferred manner. It will be understood also that the separate propellers at each end of the main frame are always turned in opposite directions, as indicated by the arrows  $y$  in Fig. 5; but the operation of the propellers or the result produced thereby may be varied by changing the position of the blades, which is done by means of the levers  $e^8$ , and by thus manipulating the parts the propellers may be used in steering or guiding the machine, and an independent steering or guiding device may be provided, if desired.

Although I have shown and described my improved propellers as applied to a flying-machine, the same may be employed for other purposes, and my invention, in as far as its relation to the propellers is concerned, is not limited to the use of said propellers herein shown and described.

It will be understood that the front ends of the supplemental frames  $b$ , no matter in what direction the machine is moving, are closed by the shutters  $b^4$ , while the rear ends thereof are open, so that the air can pass freely in at the bottoms of said frames and out at the rear ends, and the partitions  $b^6$  when used prevent cross-currents in said supplemental frames and also prevent currents of air from interfering with the propeller-blades as they turn within said frame.

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

1. A propeller, comprising a central hub having radially-arranged pairs of arms, propeller-blades mounted between said arms and adapted to be carried around thereby with said hub, said blades being also adapted to turn between said arms, and means for turning said blades and holding them in position, the form of said blades transversely of their supports being that of a compound curve, said blades being also provided at their opposite sides with side plates, substantially as shown and described.

2. A propeller, comprising a central hub having radially-arranged pairs of arms, propeller-blades mounted between said arms and adapted to be carried around thereby with said hub, said blades being also adapted to turn between said arms, and means for turning said blades and holding them in position, the form of said blades, in section parallel with the longitudinal axis of the machine being that of a compound curve, said blades being also provided at their opposite sides with side plates, and the ends of said blades being projected beyond said side plates, substantially as shown and described.

3. In an apparatus of the class described, a



main oblong frame, supplemental frames in the ends thereof and projecting therefrom, the ends of said frames being V-shaped in form, said supplemental frames being open at the bottom and provided with vertically-arranged partitions, propellers mounted in the opposite sides of the supplemental frames and projecting therefrom, said propellers comprising a central hub having radially-arranged pairs of arms and blades mounted between said pairs of arms, means for reversing the position of said blades between said arms, and devices for operating each of said propellers, substantially as shown and described.

4. A propeller, comprising a central hub having radially-arranged pairs of arms, propeller-blades mounted between said arms and adapted to be carried around thereby with said hub, and means for turning said blades between said arms and holding them in position, substantially as shown and described.

5. A propeller, comprising a central hub provided with radially-arranged pairs of arms and propeller-blades mounted between said arms and arranged radially of said hub and adapted to be carried around by said arms and to be turned between said arms, the shape of said blades in cross-section parallel with the longitudinal axis of the machine being that of a compound curve, and devices for turning and adjusting the blades between said arms and for holding said blades in position, substantially as shown and described.

6. A propeller, comprising a central hub provided with radially-arranged pairs of arms and propeller-blades mounted between said arms and arranged radially of said hub and adapted to be carried around by said arms and to be turned between said arms, the shape of said blades in cross-section parallel with the longitudinal axis of the machine being that of a compound curve, and devices for turning and adjusting the blades between said arms and for holding said blades in position, said blades being also provided with side plates, substantially as shown and described.

7. An apparatus of the class described, comprising a main oblong frame, supplemental frames in the opposite ends thereof, propellers mounted in the opposite sides of the supplemental frames and partially inclosed thereby, said propellers comprising a central hub having radially-arranged pairs of arms, and propeller-blades mounted between said arms and adapted to be carried around thereby, means for turning the propellers as a whole, and means for turning the blades between said arms and for holding them in the desired position, substantially as shown and described.

8. An apparatus of the class described, comprising a main oblong frame, supplemental frames in the opposite ends thereof, propellers mounted in the opposite sides of the supplemental frames and partially inclosed thereby,

said propellers comprising a central hub having radially-arranged pairs of arms and propeller-blades mounted between said arms and adapted to be carried around thereby, means for turning the propellers as a whole, means for turning the blades between said arms and for holding them in the desired position, the form of said blades in section parallel with the longitudinal axis of the machine being that of a compound curve, substantially as shown and described.

9. An apparatus of the class described, comprising a main frame, supplemental frames at the opposite ends thereof, propellers mounted in the opposite sides of the supplemental frames and partially inclosed thereby, said propellers comprising a central hub having radially-arranged pairs of arms, propeller-blades mounted between said arms and adapted to be carried around thereby, means for turning the propellers as a whole, and means for turning the blades between said arms and holding them in the desired position, said propellers being each provided with a separate motor, and each motor with a separate controlling device, substantially as shown and described.

10. An apparatus of the class described, comprising a main frame, supplemental frames at the opposite ends thereof, propellers mounted in the opposite sides of the supplemental frames and partially inclosed thereby, said propellers comprising a central hub having radially-arranged pairs of arms, propeller-blades mounted between said arms and adapted to be carried around thereby, means for turning the propellers as a whole, and means for turning the blades between said arms and locking them in the desired position, said propellers being each provided with a separate motor, and each motor with a separate controlling device, and the ends of the supplemental frames being V-shaped in form and provided with vertically-arranged and pivoted shutters which operate automatically, substantially as shown and described.

11. In an apparatus of the class described, a main oblong frame, supplemental frames at the ends thereof and having V-shaped front and back ends provided with vertically-arranged shutters which operate automatically, said supplemental frames being closed at the top, propellers mounted in the opposite sides of the supplemental frame and partially inclosed thereby and motors geared in connection with each of said propellers and provided with separate controlling devices, substantially as shown and described.

12. In an apparatus of the class described, a main frame having supplemental end frames, the supplemental end frames being V-shaped in form at their opposite ends and provided with vertically-arranged and pivoted shutters which open and close automatically, propeller-



lers mounted in the opposite sides of the supplemental frames and partially inclosed thereby, and comprising a central hub having radially-arranged pairs of arms, blades pivotally supported between said arms and adapted to turn therewith and independently thereof, a motor geared in connection with each of said propellers and adapted to turn the same as a whole, means for changing the position of the blades of the propellers and separate

controlling devices for said motors, 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 3d day of February, 1904.

JOHN C. CLANCY.

Witnesses:

F. A. STEWART,

C. E. MULREANY.