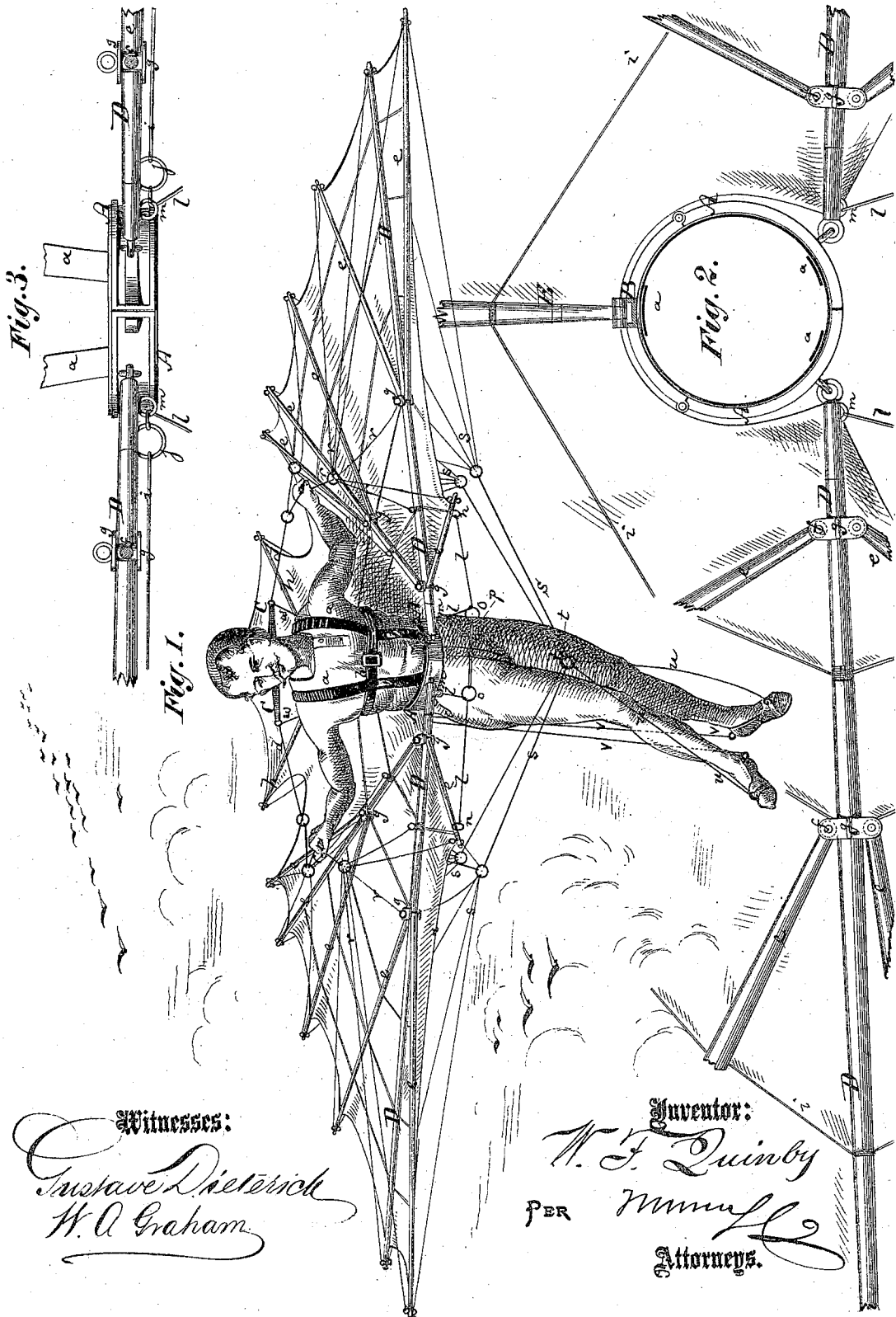


W. F. QUINBY.
Flying Apparatus.

3 Sheets--Sheet 1.

No. 132,022.

Patented Oct. 8, 1872.



Witnesses:
Gustave Dietrich
H. A. Graham

Inventor:
W. F. Quinby
PER *Munnell*
Attorneys.

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Fig. 4.

Fig. 5.

Witnesses:
Justave Dieterich
H. A. Graham

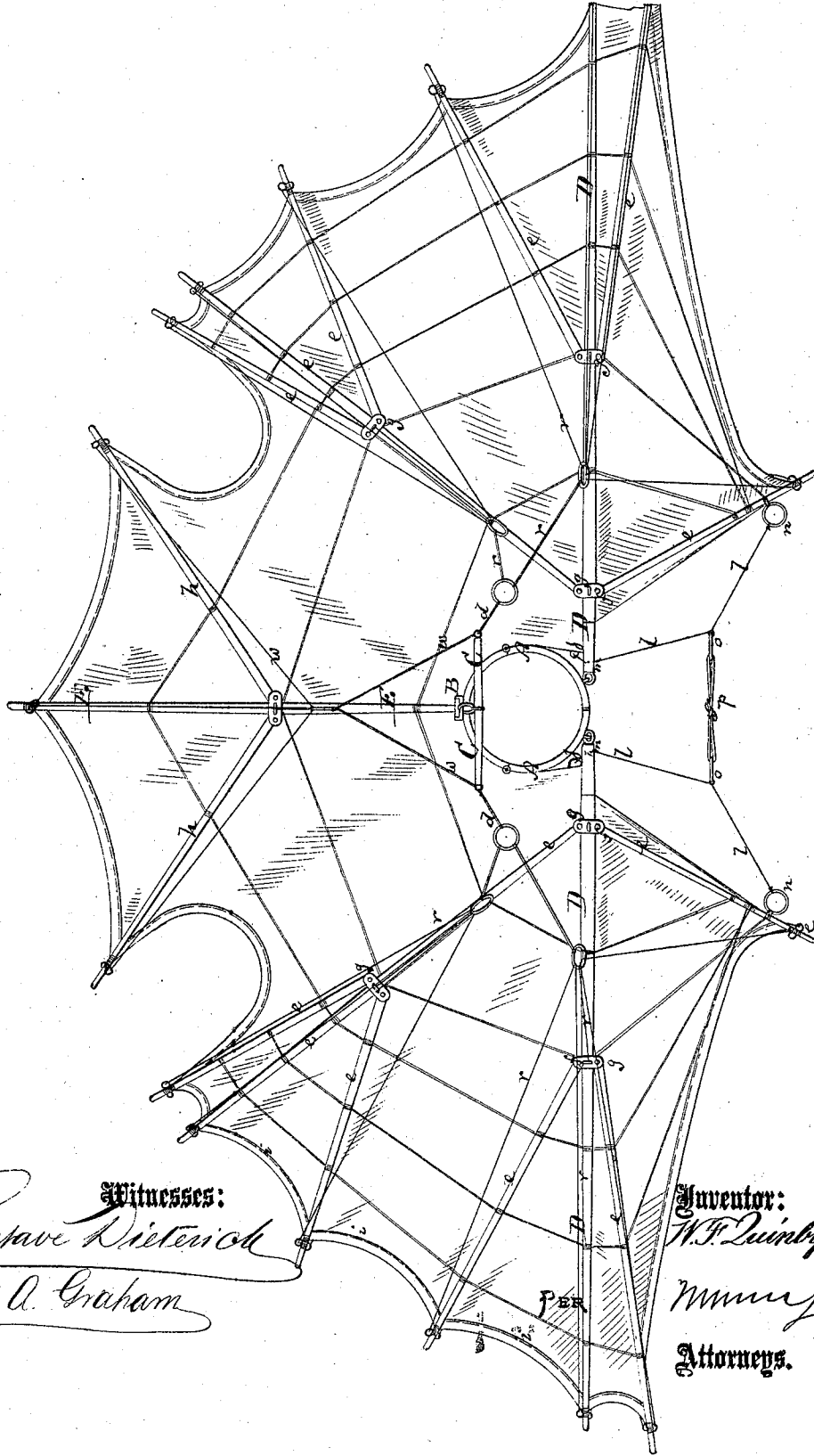
Inventor:
W. F. Quinby
 PER *Wm. L. ...*
 Attorneys.

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Fig. 6.



Witnesses:
Gustave Dietrich
H. A. Graham

Inventor:
W. F. Quinby
Wm. H. [Signature]
 Attorneys.

UNITED STATES PATENT OFFICE.

WATSON F. QUINBY, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN FLYING APPARATUS.

Specification forming part of Letters Patent No. 132,022, dated October 8, 1872.

To all whom it may concern:

Be it known that I, WATSON F. QUINBY, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and Improved Flying Apparatus, of which the following is a specification:

Figure 1 represents a front view, in perspective, of my improved flying apparatus; Fig. 2 is an enlarged top view of the waist-belt and rod-connection; Fig. 3 is a front view of the same; Fig. 4, a sectional side view of the apparatus; Fig. 5, a detail perspective of the back-stay and shoulder-rod; and Fig. 6, a top view of the entire apparatus.

Similar letters of reference indicate corresponding parts.

This invention relates to a new apparatus for enabling men to fly with the use of side and dorsal wings, which are connected with the extremities for operation. The chief object of the present invention is to support the flying apparatus entirely on the trunk of the operator, and remove all weight from the arms and legs, so that they will be free to give their entire strength to the operation. The invention consists in a new arrangement of belt and rigid braces for supporting the apparatus on the body; in a new system of stay-cords in the several wings; novel method of uniting the wings in front and making them adjustable, and in a new arrangement of cords for connecting the wings with the extremities or exposing them to the action of the same.

A in the drawing represents the waist-ring to be worn by the operator for the support of the flying apparatus. This ring is made of metal or other inflexible material, jointed at the sides and locked in front, and is easily applied to the body. With this belt or ring are connected shoulder-straps *a a*, with counter-braces *b b*, all arranged as shown, or in other suitable manner for giving a proper support to the flying-machine, and holding the belt at the desired elevation. Hinged to the back of the waist-ring A is a vertical rod, B, bearing against the operator's back and aiding in bracing the spine, besides keeping the ring in proper position. To the upper end of the back brace B is connected, by means of joints or hinges, a shoulder-bar, C, which rests partly on or against the operator's shoulders, and is at the ends connected by cords *d d* with

the wings, sustaining the same thus to the greater part on the shoulders and spine. To the front of the waist-ring A are hinged, to be movable in every direction, two lateral rods, D D, each having a series of branches, *e e*, as shown, the two main rods projecting in opposite directions from the sides of the operator. The junction of each branch *e* to its main rod D is effected by means of an upright pin, *f*, pivoted in ears *g g* which project from D. By this means each branch is enabled to vibrate horizontally, or in a plane with that of the belt A, but not at right angles thereto. The up-and-down motion of each rod D is therefore followed by all its branches, while horizontally each branch can be moved independent of its rod D, unless forcibly extended to the greatest limit. E is a rod hinged to the back of the ring A, and provided with braches *h h* for the support of the dorsal wing. The attachment of the branches *h* to the rod E is of the same kind as that of the branches *e* to the rods D. The several rods D E and their branches are connected together by means of stay-cords *i i*. Each side wing—*i. e.*, each rod D with its branches—has its own independent system of stay-cords, though it is also connected with the system of the back wing. The stay-cords at each side converge in front at a ring, *j*, from which a cord, *l*, is drawn through a ring or staple, *m*, on the rod D, and thence forward to a ring, *n*, on the frontmost branch *e*. To these cords, between the rings *m* and *n*, are secured other rings *o*. Through the two rings *o o* of both side wings is drawn a cord, *p*, which can be drawn more or less tight, and which, when loosened, allows the wings to be entirely folded back. The dorsal wing has its own system of stay-cords connected with the side wings. A covering of a material impervious to air is drawn over the stay-cords, and constitutes the body of the wings. A series of cords, *r r*, extend from the branches and side rods D, where they are attached, by means of staples or rings or otherwise, to the cords *d*, which connect with the ends of the shoulder-support C. These cords *r* correspond in their positions and numbers with the branches and lateral rods, in such manner that they will move them in the direction of their lengths. They serve for elevating the wings by means of the operator's hands. By

grasping these cords with the hands, as in Fig. 1, and pushing forward and upward, the wings are raised, not fully at once, but gradually, the forward part first, and thence backward, the same as can be observed in the movement of winged animals. Another system of cords, *s s*, distributed with respect to the rods and branches in the same manner as the cords *r r*, extend from the under side of the wings, and converge in a ring, *t*, in front of the operator's knees, said ring being connected with the operator's shoes, or with stirrups thereon, by means of cords *u u*. The dorsal wing is also connected with each foot by a cord, *V*, and with the ends of the bar *C*, by a system of cords, *w*. By means of the feet, the operator can draw the wings exactly in a reverse to the effect on the same by the hands. The system of upper and lower cords on each side wing is divided into two parts, whence branched cords extend to the uniting-rings, thus forming two points of attachment whereby the canting or rolling of the wings will be prevented and a steady motion insured. The rods and branches are principally strained in the direction of their lengths, and can, therefore, be comparatively light. The apparatus is easy to put on, and can, when not in use, be folded together into a comparatively small compass.

The weight of the whole machine need not exceed fifteen pounds. It is constructed inside of a semicircle, all the points touching the periphery. I describe a semicircle on the floor ten or twelve feet in diameter, and bisect this figure with a radius. The main back rod will correspond with this last line. The position of the human body in this figure should be such that when floating forward in the air the balance will be perfect. This is about one-third the length of radius from the center of the circle. Then, having hinged the rods to the waist-ring and each other, I secure the waist-ring to the floor and arrange the rods, having reference to the figure, so as to fill the area of the semicircle. I adjust their angles in such a way that when forcibly extended by the outer cord, their pressure shall mutually counteract that of each other, and not bend the main rods.

The points are the same as those of the bat's

wing, except that in the bat the three rods projecting backward are not branched. The rods are then secured in position and the stay-cords and covering attached to them. The waist-ring may be composed of felines, like a light wheel, or of thin metal curved so as to combine strength with lightness.

The main rods may be composed of bamboo, branches of reeds, or wood, not exceeding an inch and a half in the thickest part, and tapering to half inch. The small rods are in proportion. The covering (which may be composed of oiled silk or gummed cloth) is secured to the cord which extends all around and connects the points of the rods and stay-cords. It is intended to start from the ground. In order to make a beginning one foot is disengaged from the stirrup, when, by raising the other foot and pushing the hands upward and forward, as in swimming, the wings are raised. Then, by suddenly depressing the wings, by means of the elevated leg, the former are intended to elevate the body by their action on the air. This alternate elevation and depression of the wings is continued as long as flight is desired. After rising from the ground the other foot may be inserted in its stirrup and both legs used. The actions are intended to be natural, resembling those of swimming in water.

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

1. The waist-ring *A*, jointed and provided with the radiating rods *DD* and *E*, as specified.
2. The arrangement of converging stay-cords *i i*, and their combination with the cords *l* and front cord *p*, whereby the wings can be extended, as set forth.
3. The cords *r r*, arranged above the wings, and connected with the upper cross-bar *C*, to be used for raising the wings, as set forth.
4. The cords *s s* and *u u*, arranged beneath the wings for connection with the lower extremities, whereby the wings can be moved down, as set forth.

WATSON F. QUINBY.

Witnesses:

JAS. BRADFORD,
D. TAYLOR BRADFORD.