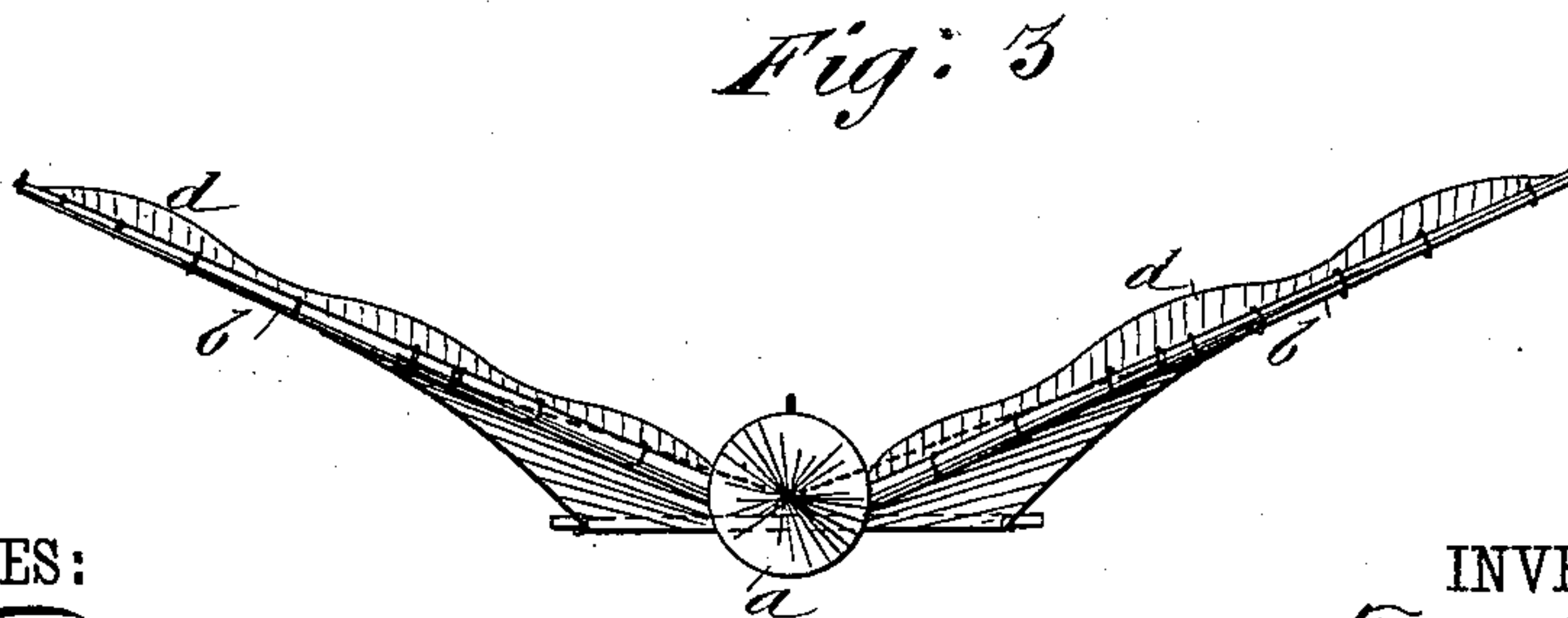
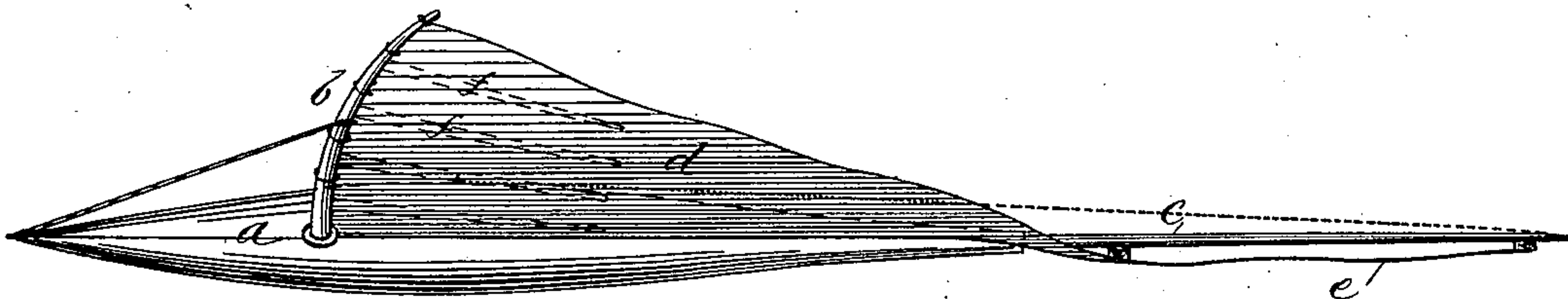
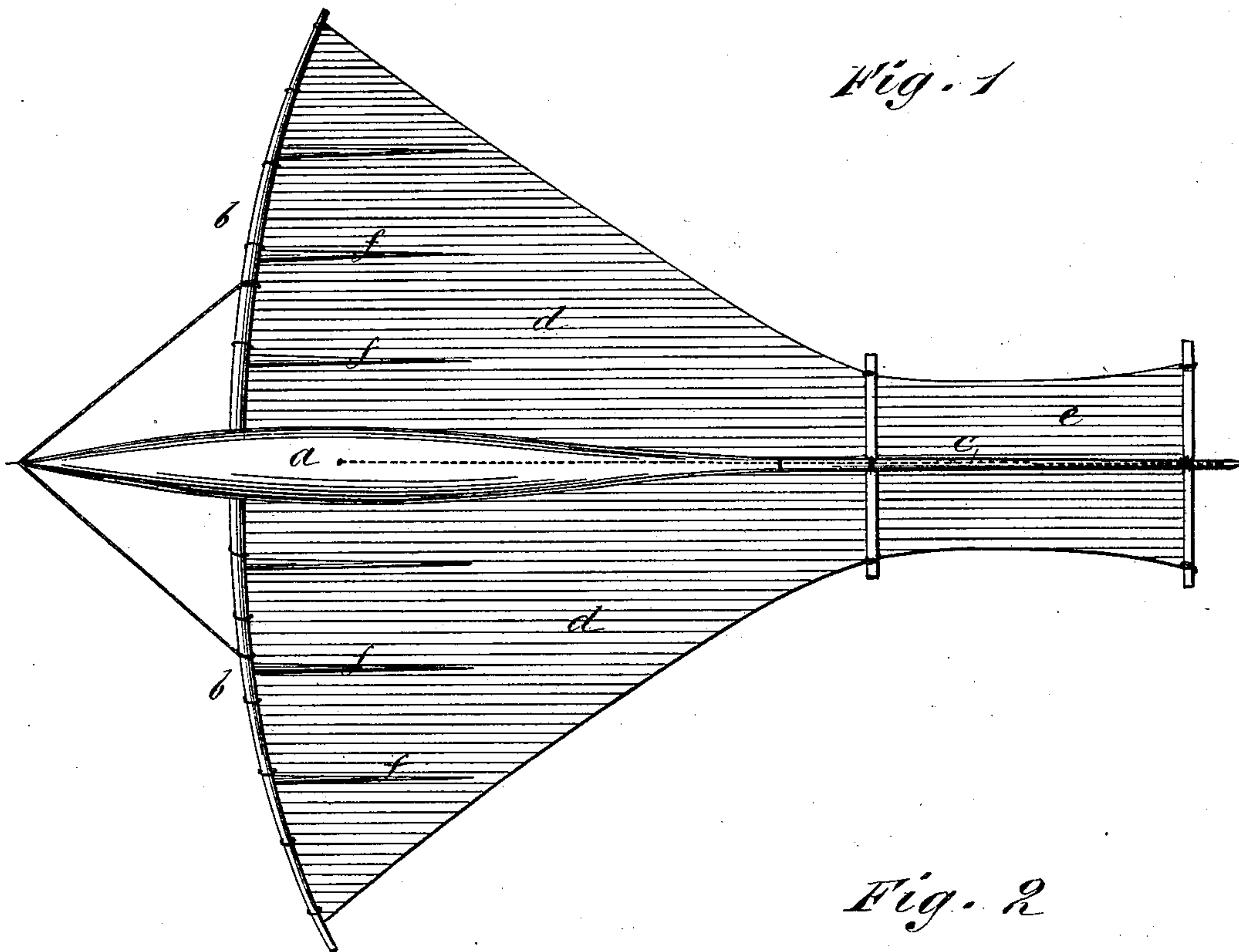


F. W. BREAREY.
Aerial Apparatus.

No. 234,947.

Patented Nov. 30, 1880.



WITNESSES:

C. Neveu
L. Sedgwick

INVENTOR:

F. W. Brearey

BY

Mum & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FREDERICK W. BREAREY, OF MAIDENSTONE HILL, BLACKHEATH, COUNTY OF KENT, ENGLAND, ASSIGNOR OF ONE-THIRD TO JOHN F. MACKENZIE, OF EDINBURGH, SCOTLAND.

AERIAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 234,947, dated November 30, 1880.

Application filed January 23, 1880. Patented in England June 16, 1879.

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM BREAREY, of Maidenstone Hill, Blackheath, Kent, England, have invented a new and Improved Method of Producing Propulsion and Support of Apparatus in the Air, of which the following is a specification.

I make use of a vessel or apparatus the body of which is long and narrow with tapering ends, and of the greatest sectional area at or near the center of gravity, in order to present the least possible resistance to the air, and at the same time furnish suitable space for containing the motive power and other requisite machinery, and also accommodation for passengers. Two or more lever-arms are attached and jointed to the longitudinal body at or near the front thereof, and the said arms are vibrated by suitable power, and give motion to flexible fabric, whereby the apparatus is sustained and propelled, as will be more particularly explained with reference to the accompanying drawings, forming part of this specification.

In the drawings, Figure 1 is a plan view of the apparatus. Fig. 2 is a side elevation, and Fig. 3 is a front view.

Similar letters of reference indicate corresponding parts.

a is the body of the apparatus, and *b b* the lever-arms. *c* is a flexible spar attached to the hinder part of the body, or it may be a component part thereof in continuation of the structure of the body. A flexible fabric, *d d*, of silk, muslin, canvas, or any other suitable material, is attached to and expanded upon the structure, forming wings, as shown. The forward edges of the fabric *d* vibrate with the lever-arms, and by such vibration the whole of the fabric *d* is thrown into a state of wave-like motion, both lengthwise and in a smaller degree also laterally. The effect of the said wave motion, when caused by sufficient power, is such that the whole apparatus is self-supported and propelled in the air, and the form and arrangement of the apparatus are such that a large area of surface can be conven-

iently applied. The large area thus obtained is advantageous, not only for support in the air when traveling, but also for effecting an easy and gradual descent to the ground when desired. The front portion of the fabric *d d* is stiffened by means of short stays *f*, attached to the wing-arms at intervals throughout their whole length, or by other suitable means, so that the flexible portion having the longitudinal wave-like motion may commence at or near the termination of such stiffening. An after plane or tail, *e*, is fitted to the spar *c*, as shown, for the purpose of controlling the direction of flight by varying the inclination of the tail by suitable cords or ropes.

The apparatus may be mounted on wheels, or it may be made water-tight in order to float in water.

I prefer to make the lever-arms of a number of canes or rattans firmly bound together by whipping from end to end with cord, wire, or otherwise. The ends will be tapered or made smaller at and toward their outer ends by reducing the total sectional area thereof, either in the number or size of the canes made use of, or I make the lever-arms of hollow metal sufficiently thin to allow of the necessary elasticity, or of tapered metallic tubes and canes combined.

The arms *b* will be hung to the body *a* in any suitable manner, and vibrated by suitable connection to the motive-power apparatus contained in the body.

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

A flying apparatus consisting of the body *a*, having lever-arms *b b*, the flexible spar *c*, and the fabric *d*, having vibratory forward edges, as shown and described.

FREDERICK WILLIAM BREAREY.

Witnesses:

THOMAS MOY,

37 Farringdon Street, London, E. C.

LILY LASCELLES BREAREY,

Blackheath, S. E.