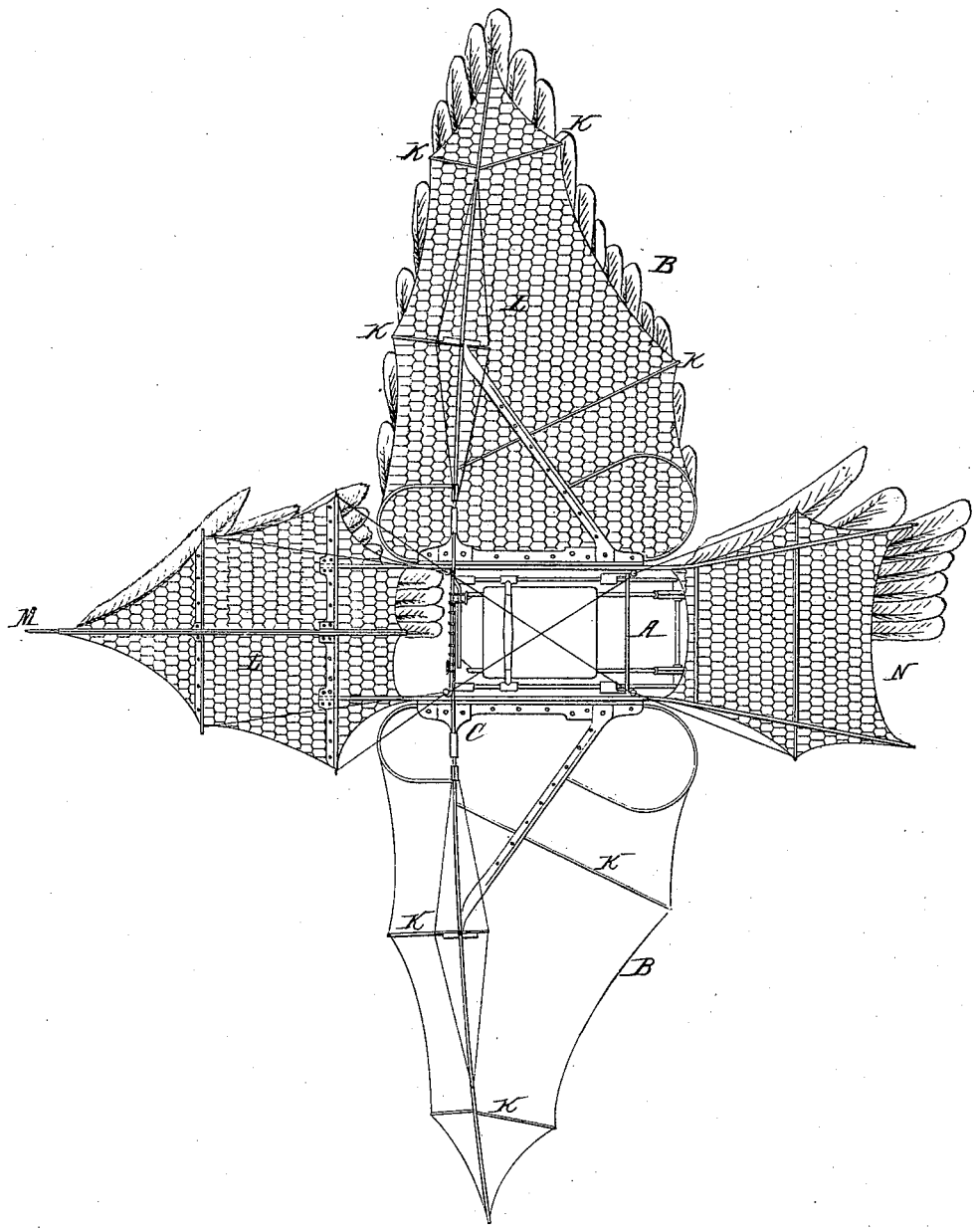
2 Sheets—Sheet 1.

# F. X. LAMBOLEY.

## FLYING-MACHINE.

No. 181,186. Patented Aug. 15, 1876.

FIG. 1.




WITNESSES.

Henri Berlie

Boyd Eliot

François X. Lamboley

INVENTOR.

2 Sheets—Sheet 2.

# F. X. LAMBOLEY.

## FLYING-MACHINE.

No. 181,186. Patented Aug. 15, 1876.

FIG. 2.

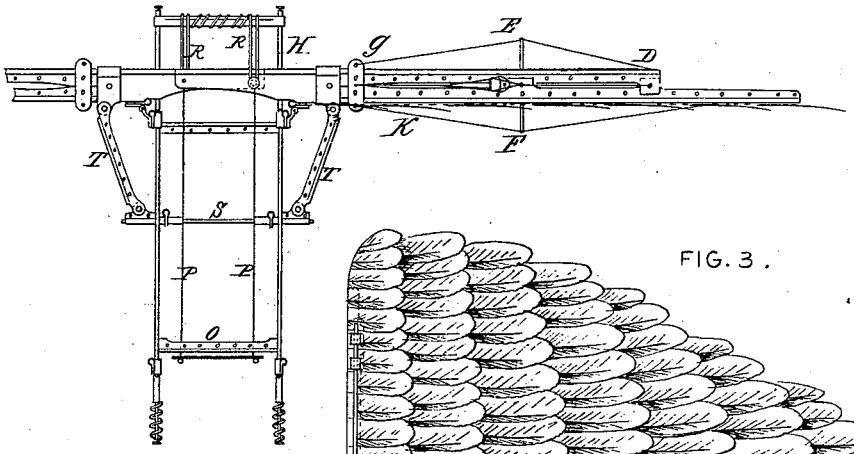



FIG. 3.

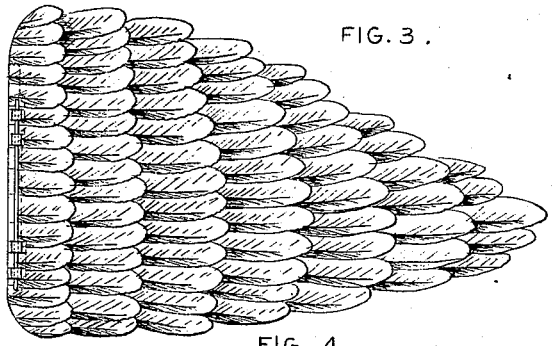


FIG. 4.


FIG. 5.

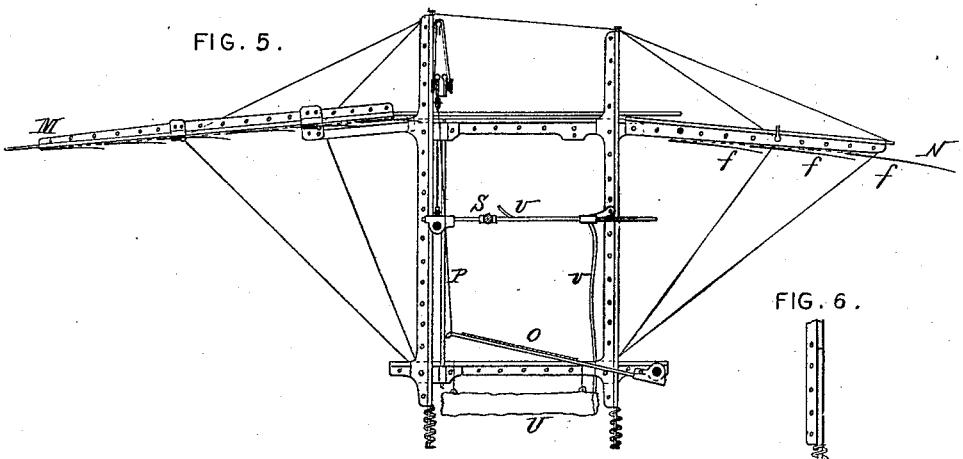



FIG. 6.

WITNESSES.

Henri Berlie

Boyd Elliot

François X. Lamboley

INVENTOR.

# UNITED STATES PATENT OFFICE.

FRANÇOIS X. LAMBOLEY, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRI BERLIE, OF SAME PLACE.

## IMPROVEMENT IN FLYING-MACHINES.

Specification forming part of Letters Patent No. **181,186**, dated August 15, 1876; application filed July 19, 1876.

*To all whom it may concern:*

Be it known that I, FRANÇOIS X. LAMBOLEY, of the city, county, and State of New York, have invented a new and Improved Machine for Flying; and I do hereby declare the following to be a clear and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan or view seen from above the machine. Fig. 2 is a transverse section, and shows one of the wings in longitudinal section. Fig. 3 is a plan of the under side of a wing, and shows the plan of arranging feathers on it. Fig. 4 is a side elevation of one of the arms or ribs of the wings. Fig. 5 is a section from the beak to the tail; and Fig. 6 is a section of the foot of the frame with the spring in elevation.

The object of this invention is set forth in the title to be for the purposes of flying; and the invention consists in combining with a frame for supporting the body a pair of wings and intermediate mechanism, whereby the weight of the body may co-operate with the other portions of the mechanism to depress the wings with the greatest possible action, in order to utilize the greatest possible lifting effect upon the atmosphere, as will hereinafter appear. Such a result is accomplished by combining with the main frame a pedal-platform and a trapeze-lifting arm, a spring or springs connecting the ends of the arms of the wing with the frame in such a manner that as the wings are raised the springs are strained, and serve as a reaction force to depress the wings quickly, for the purpose of lifting the operator and the machine.

The body of the machine consists of a rectangular frame of very light metal-work, preferably made of sheet-steel, and having a strip cut to represent the sides of a post, as at A, and then doubled over on itself, forming a rib at the fold, and then having the edges riveted together, and in this manner the parts are very light, but exceedingly stiff. Said rectangular frame is provided with springs at the lower ends of the posts to give a sort of cushion in alighting. Near the upper end of the frame is hinged the frame-work of the wings, as at B B, one on each side, being attached to a cross-bar of the frame A. The frame-work of the wings consists, chiefly, of a trussed arm of metal made similar to the parts of the frame, as already described, and it consists of two members, one of which extends the whole length of the wings, and over the frame sufficiently far to form a lever of the first order, with its fulcrum at the hinged connection with the frame, as shown plainly at C, Fig. 4. The other member of the arm, as shown at D, Fig. 2, only extends a portion of the distance out toward the tip of the wing, and is connected to the first at a point about half-way between the center and the tip, to give additional strength, and then both are trussed by chords and struts, as at E and F.

A brace, as at G, is fastened to the main arm at or near the center, and extends back to one end of the hinged bar H, which is attached to the frame, and thereby a triangle of metal is formed to serve as the main frame of the wing.

Struts or stays of metal, as at K, are then projected out at various points from the main arm, and upon their outer ends there is stretched a wire or chord of metal, to form the boundary or outline of the metal work of the wings, and which also serves to support the net-work of wire that supports the feathers and serves as the metal backing to them. This net-work is shown at L, Fig. 1, on one wing, the other being left off to show more clearly the frame-work by itself. A similar kind of frame-work is also projected at the front of the machine, and at the rear end, at about the same plane as the hinged portion of the wings, the part as at M forming the beak, and the part as at N the tail, portion. A similar net-work is also formed over the center, between the two, when the machine is completed, and the whole or all these parts are covered with feathers, being fastened at their quill ends to the net-work, and they are laid on in rows or courses, so that they can bend down easily, as indicated in the sections at *f f f;* but, when pressed upon by the air, they close instantly upon each other and against the net-work, to close the interstices like valves.

It is evident that, with such a construction, very little resistance will be caused in rising,

as all the feathers will easily bend down; but the greatest possible resistance will be produced upon the air in descending or in depressing the wings, as the entire surface will be closed on the under side.

To give motion to the wings a combination of devices are used, as follows: A platform, on which the operator stands, (shown at O,) is suspended to the inner ends of the wings by cords, as at P, so that the weight of the body tends to raise the wings, and also to strain the springs, as shown at R R. Then, in addition to this force, a hand-lever, as at S, extends across the main frame, and is attached at each end to connecting-links, as at T, which are pivoted to the wing-arms at a point outside of the fulcrum, by which arrangement the operator can lift the wings as he presses with his weight upon the platform, and thereby exerts the combined powers of the weight of his body and his lifting energy to raise the wings to a horizontal position, as shown at Fig. 2. Then, when it is desired to depress the wings with the greatest possible energy, the operator presses upon the trapeze-bar with his entire weight, and lifts his feet from the platform, so that he has the reactive force of the springs, and the weight of his body transferred in the opposite direction upon the wings, to force them down upon the atmosphere, and thereby lift the machine and himself with it.

It is evident that such a combination of mechanism is also applicable to other apparatus where a quick and powerful action is desired upon vibrating levers, as, for example, in propelling boats, &c.

It will be observed that the parts forming the front or beak and the tail are depressed a little at their outer ends to form a parachute, and by changing the center of gravity of the body upon the machine, the direction of the machine through the air will be accomplished and varied.

At or near the lower end of the main frame there are attached one or more flexible sacks of rubber, or some other impervious material, as at U, which may be inflated with air by blowing through a tube, as at V, that extends up to a convenient point to be easily reached by the operator, and thereby serve as a means of floating on the water in case of falling thereon.

For convenience, the trapeze or hand bar is mounted on two rods, as at W, the ends of which are connected with the wing-arms, and in this way the bar itself may be moved to and fro to suit the convenience of the operator.

Having fully described my invention, I desire to claim—

1. A machine for flying or moving through the air, consisting of a frame for supporting the parachute, as described, and wings operated by the combined force of the weight and lifting energy of the operator.

2. In combination with a flying-machine, the trapeze or hand-bar connected with the wing-arms at a point outside of the pivoted connection with the frame, and a platform connected to the wing-arms at a point of the opposite side of the fulcrum, substantially as described, and for the purposes set forth.

3. In a flying-machine, the skeleton frames covered with net-work and covered with feathers or similar material overlapping each other, in the manner as described, and for the purposes set forth.

4. The combination of the wings, the platform, trapeze-bar, and springs R R, for reacting upon the wings to depress them, substantially as described.

5. The trussed arms and skeleton frame covered with net-work, substantially as described.

6. The spring-feet, in combination with the main frame, as and for the purposes set forth.

7. In combination with a flying-machine, one or more sacks, and a tube for inflating the same in case of falling upon the water, as described.

8. The combination of two levers attached to a frame by a pivoted connection for fulcra, and having a pedal attachment and springs attached to other short arms, with a hand-lever connected to the same levers at points on the opposite side of the fulcra, for giving rapid and powerful motion to the levers, substantially as described.

FRANÇOIS X. LAMBOLEY.

Witnesses:
HENRI BERLIE,
BOYD ELIOT.