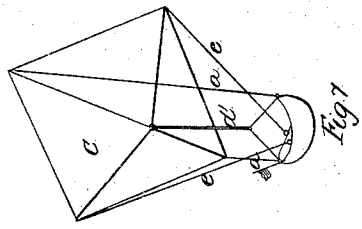
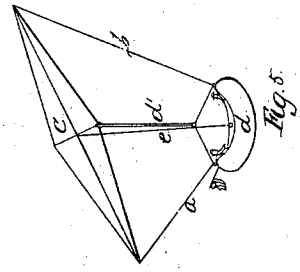
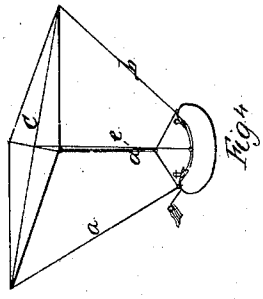
J. P. GAGE.

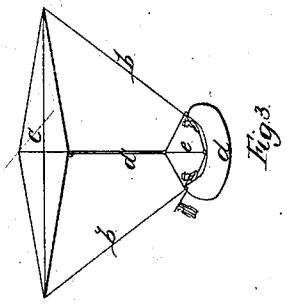
BALLOON.

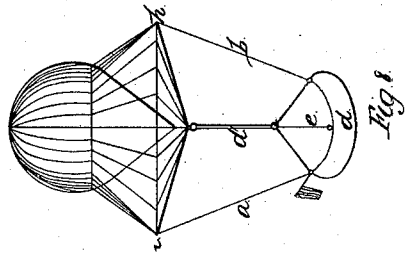
No. 23,163. Patented Mar. 8, 1859.

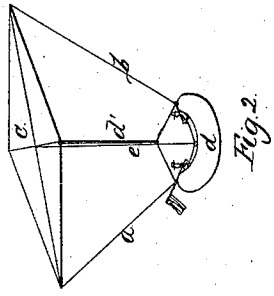


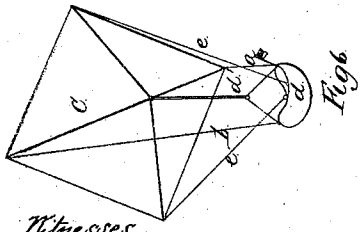


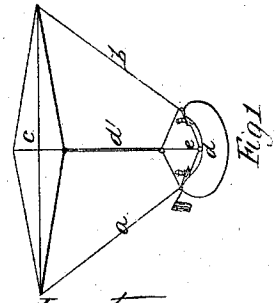












Witnesses.
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Inventor
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UNITED STATES PATENT OFFICE.

JAMES P. GAGE, OF NEW YORK, N. Y.

BALLOON.

Specification of Letters Patent No. 23,163, dated March 8, 1859.

To all whom it may concern:

Be it known that I, JAMES P. GAGE, of the city, county, and State of New York, have invented new and useful Improvements in Aeronautics, with a View to Affecting and Directing the Course of a Balloon in the Air, and that the following is a full and exact description of my said invention, reference being had to the accompanying drawings.

The nature of my invention consists in the resolution of the upward or downward force which a balloon has in ascending or descending into two forces so that one will be a partially ascending or descending and the other a partially diagonal or oblique force, and which I accomplish by means of a peculiar elongated and flattened diamond or lozenge shaped balloon and by suspending the car to the central point thereof, by the means and in the manner hereinafter described.

In the accompanying drawings Figure I, is a side view of my diamond or lozenge shaped balloon in the act of ascension; Fig. II, a view of the same with the forward or front elevated or pointing obliquely upward and in the act of advancing as it ascends. Fig. III, is a view of balloon at rest and about to descend. Fig. IV, is the balloon in the act of descending, the front or upward part being depressed and pointing obliquely downward. Fig. V, shows the balloon in the act of alighting upon the earth. Figs. VI and VII, exhibit the arrangement intended for steering the balloon to left or right. Fig. VIII, is a modification of my invention or plan in which an extended flat surface or frame work is used to effect the horizontal or lateral movement of the balloon while ascending or descending instead of the balloon itself.

In Fig. I, of the drawings C, is the flattened diamond shaped balloon, in a horizontal position, to which the car *d*, is suspended by the rod *d'*, which has a hinge or link joint at each extremity. The upper part of the rod *d'* must be attached to the lowest central point of the balloon so that the balloon when inflated and horizontal will be, as it were, balanced upon it.

a, and *b*, are two ropes or halyards fast at one end to the extreme front and rear ends of the balloon. The other ends of the halyards pass down and through pulley blocks at either end of the car *d*, and thence into the car, where they may be made fast and adjusted at the pleasure of the aeronaut.

e, is a rope or halyard extending from the side extremity or corner of the balloon *f*, on either side, and passing down and through pulley blocks on either side of the car.

Now if the operator within the car should draw on the halyard *a* in the stern of the car and at the same time slacken halyard *b*, it would have the effect to give the balloon the inclined or diagonal position shown in Fig. II, which position of the balloon when it rises with force and rapidity in the air will give the balloon a partially horizontal direction forward, according to the force and rapidity with which it ascends. When the balloon has ascended to the extent of its ascending powers or the gas is discharged so as to permit the balloon to descend, if after the balloon has begun to descend and while in the act of descending (the halyards *a*, *b*, having been previously adjusted so as to bring the balloon to a horizontal position as in Fig. III) the forward halyard *b*, is drawn in and the after halyard *a*, slackened; the balloon will present the inclined position shown in Fig. IV, and the balloon by its oblique or diagonal pressure upon the air through which it is passing be carried forward and advance in proportion to the speed with which it is descending.

In Figs. VI and VII, are represented two different positions of the balloon, with the side ropes *e*, drawn and slackened so as to depress one side of the balloon and elevate the other, by which means while the balloon is ascending or descending a lateral movement to right or left is obtained upon the same principle as before described in producing a forward movement.

A modification of the principle above described is shown in Fig. VIII, where the balloon is made spherical, and the action upon the air to produce the forward or lateral movements desired is not effected by the balloon itself, but by a broad flat piece of frame work, of a lozenge shape on the sides, and capable of being adjusted, arranged and operated by fore and aft and side halyards, as hereinbefore described.

The car attached to the balloon should be sharp and curved at both ends fore and aft, so as to present only an edge to the air as the balloon moves in the desired direction.

Care must be taken in constructing the suspending rod *d'*, that it evenly poises the

car and that the hinge or link joint at the extremities permits only a very slight lateral motion, so that the car and the balloon will point nearly in the same plane.

In alighting upon the ground, to avoid the shock which would follow from the car striking in rapid motion, the position of the balloon in descending having been as shown in Fig. IV, is quickly changed just before alighting to the position shown in Fig. V, whereby the forward and downward motion will be checked and the contact with the earth be easy and safe.

I am aware that the idea of producing an advance or lateral motion of balloons by pressure upon the air of flat surfaces, fans, or wings has been before entertained. I do not therefore claim that as my discovery and invention; but

What I claim as my invention and for which I desire Letters Patent is,

The operating upon the air by the instrumentality of the balloon itself, constructed in a diamond or lozenge shaped figure, or any other substantially similar figure, presenting a flat surface to the air, arranged and adjusted with the car suspended from the lowest central point of the balloon by a rod with link joints or their equivalents, and operated by the fore and aft, and side halyards, in the manner and for the purposes described; and I also claim the manner of arranging and adjusting a diamond shaped flat frame or surface (or any similar shape) to a spherical balloon, with the car suspended underneath, (as shown in Fig. VIII,) operating in the manner and for the purposes described.

JAMES P. GAGE.

Witnesses:

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