Dec. 2, 1947. D. C. JALBERT 2,431,938

KITE BALLOON

Filed April 15, 1944 2 Sheets-Sheet 1

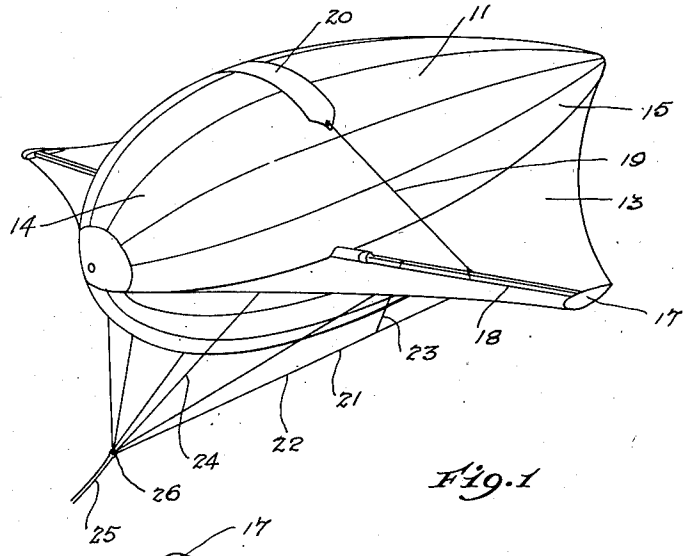

Fig. 1

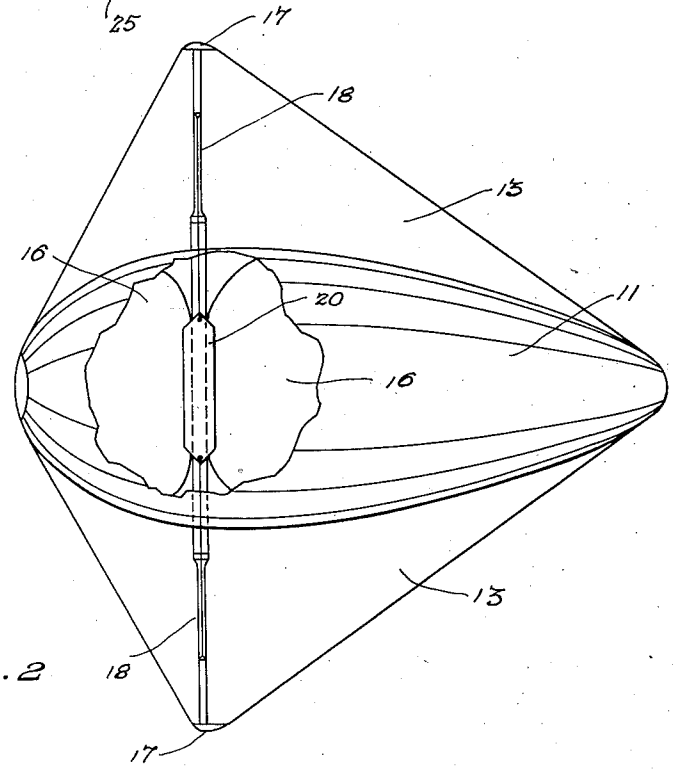

Fig. 2

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KITE BALLOON

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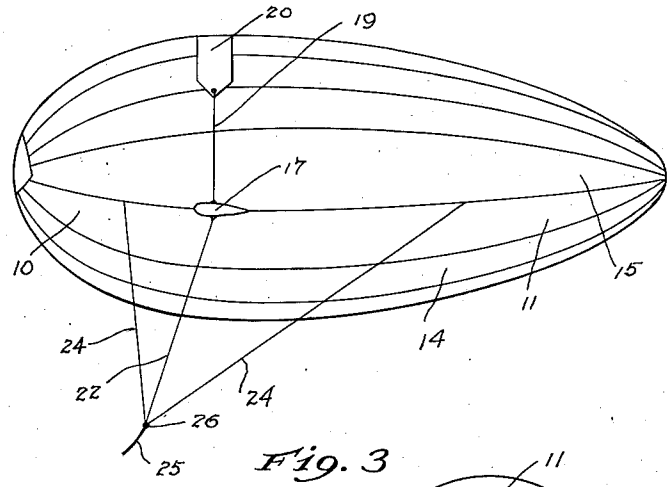

Fig. 3

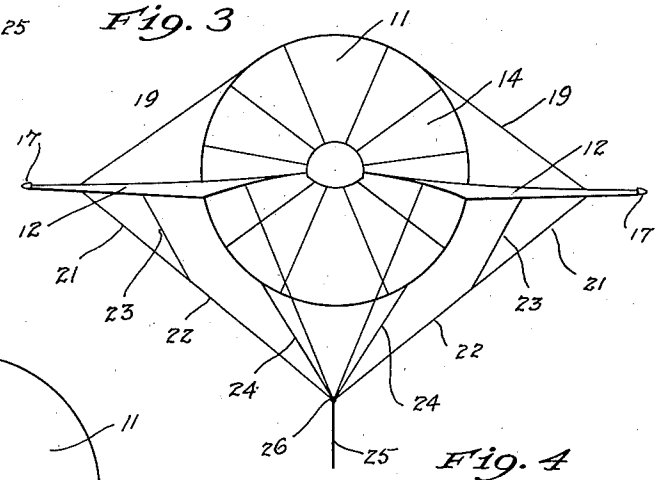

Fig. 4

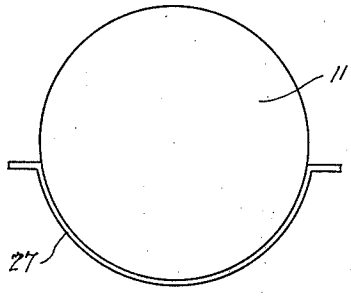

Fig. 5

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UNITED STATES PATENT OFFICE

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KITE BALLOON

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Application April 15, 1944, Serial No. 531,247

1 Claim. (Cl. 244—33)

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The present invention relates to aerodynamic apparatus, and has particular reference to a novel kite balloon construction.

The principal object of the invention is to provide an aerodynamic kite balloon construction which will fly in calm as well as in the wind.

Another object of the invention is to provide a kite balloon construction which utilizes both static lifting force and dynamic air pressure force in a practical manner.

Stilll another object of the invention is to provide a kite balloon construction which utilizes the lifting pressure created by wind velocity in a simple and effective manner.

With the above and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claim appended thereto.

In the drawings,

Fig. 1 is a perspective view of an apparatus which embodies the novel invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a side elevation thereof;

Fig. 4 is an end view thereof; and

Fig. 5 is a detail view showing a modified arrangement for supporting the wings.

It has been found desirable to provide a kite balloon construction which will fly both in calm and in wind, thus rendering it useful for carrying instruments to determine weather conditions, flight ceilings, radiation, and the like, for photography, advertising and similar uses, and in larger sizes for carrying an observer for signalling, visual inspection of terrain, aerial support, barrage effects, and other war uses. With very large constructions the novel kite balloon arrangement is adapted for power propulsion and for carrying loads, as it combines the lifting characteristics of lighter than air craft with the power driven effect of heavier than air craft. The novel combination reduces the power requirements for operation, as no power is required for initial lifting, thus providing maximum load capacity and large safety factors, and the speed of operating is facilitated by the quick take-offs and the short landings feasible with the novel combination.

In carrying out the invention, I provide a novel device which rises on static lift, and before its ceiling is attained is engaged by air currents which create dynamic pressure on the wings, thus giving the device a practical and effective lifting pressure which is transmitted to the anchorage point. An illustrative embodiment of the invention comprises a central balloon portion which has laterally extending kite type wings, which may be of the airplane type, whereby the buoyant effect of the balloon is supplemented by the effect of wind pressure on the wings, and by the vacuum created by the airfoil when the wings are of the airplane type.

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Referring to the drawings, the novel kite balloon 10 includes a central balloon section 11 and a kite wing arrangement 12, which in the illustrative embodiment shown in the drawings includes two laterally disposed wings 13. The balloon section comprises an envelope 14, preferably of textile material and made of a plurality of gores 15, the envelope housing one or more inflated balloons 16. For high ceiling work one of the gores may be made of an expansible material such as latex to take care of excessive expansion, or any standard type of shock cord controlled relief valve may be provided. If preferred, the envelope may be made of suitable gas retaining material, thus eliminating the use of inner bladders.

The wings are preferably made of fabric, although any suitable light material such as sheet metal of the requisite strength, or non-metallic material such as laminated plywood or plastics may be used, depending on the purpose and the size of the apparatus required. Each fabric wing is provided with a suitable socket or pocket 17 for receiving the end of a spreader or reinforcement bar 18 which passes through and is secured to the envelope. and serves to hold the wings outwardly in horizontal spread relation to the central balloon section.

Referring now to Fig. 4, the wings are additionally supported by wing support wires 19 which depend from a reinforcement strap or patch 20 which is secured to the upper portion of the envelope in any desired manner. A wing wire suspension rig 21 is provided consisting of wires 22 which have their ends secured to the forward and rear portions of the wings, additional wire bridles or supports 23 being provided if desired, and a balloon section wire suspension rig which consists of one or more wire sets 24 is also provided; a flying wire 25 is secured to the lower ends of the wire rigs as indicated at 26, the point of securing being adjustable along the rig wire lengths to control the inclination of the kite balloon and the resulting change in wing lift. Vertical fins may be used to increase stability.

Although it is preferred to use a spreader bar which extends through the envelope, a semi-circular frame support such as indicated at 27 in

Fig. 5 may be used to receive spreader bar sections, when it is desirable to use an exterior support, as when the envelope contains a single inflated bladder. The semi-circular frame support is attached to the envelope in any suitable manner.

With the above described arrangement of parts, the novel kite balloon utilizes both the buoyant effect of the central balloon portion and the aerodynamic lift of the wings. When large size arrangements are to be equipped with motive power it is preferred to mount the load carriage which carries the load directly below the balloon envelope, and to mount the motors on the load carriage or directly in the wings, which in such case would be of the airplane type, such additional braces and supports as are needed to carry the load being provided from the balloon envelope.

While I have disclosed an illustrative embodiment of my invention, it is obvious that changes in the size, shape and arrangement of the parts, and in the materials used, may be made to meet the requirements for different uses and different loads, without departing from the spirit and the scope of the invention as defined in the appended claim.

I claim:

An aerodynamic device, comprising an inflatable bag, a single rigid bar secured to, and extending through and to both sides of, said bag, wings secured to, and outwardly projecting from, opposite sides, respectively, of said bag and fastened to said bar, a flying wire, a wire rig connecting said flying wire with said bar on opposite sides of said bag, and a strap passed over said bag and fastened with its ends to said bar on opposite sides of said bag.

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