

July 4, 1933.

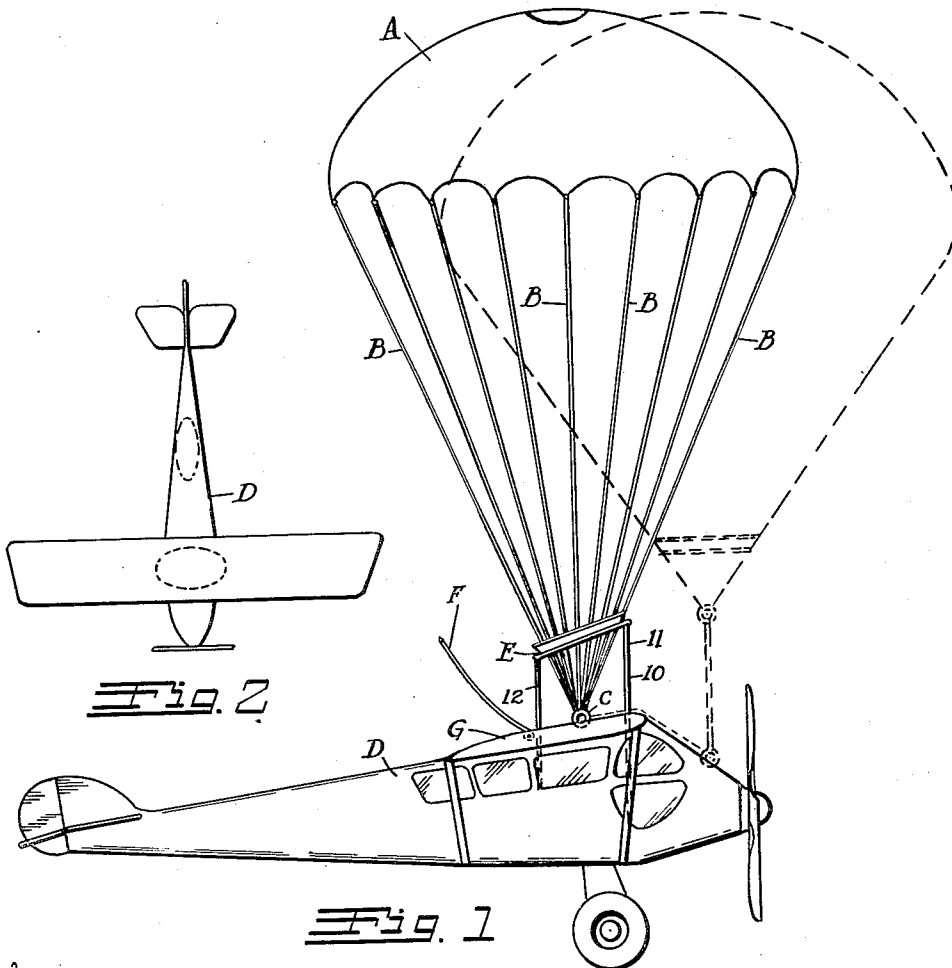
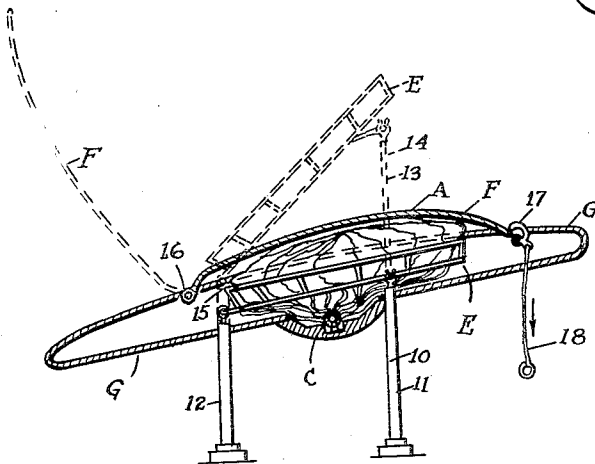
N. P. SOFTIS

1,916,340

FLYING MACHINE

Filed Aug. 1, 1930

2 Sheets-Sheet 1



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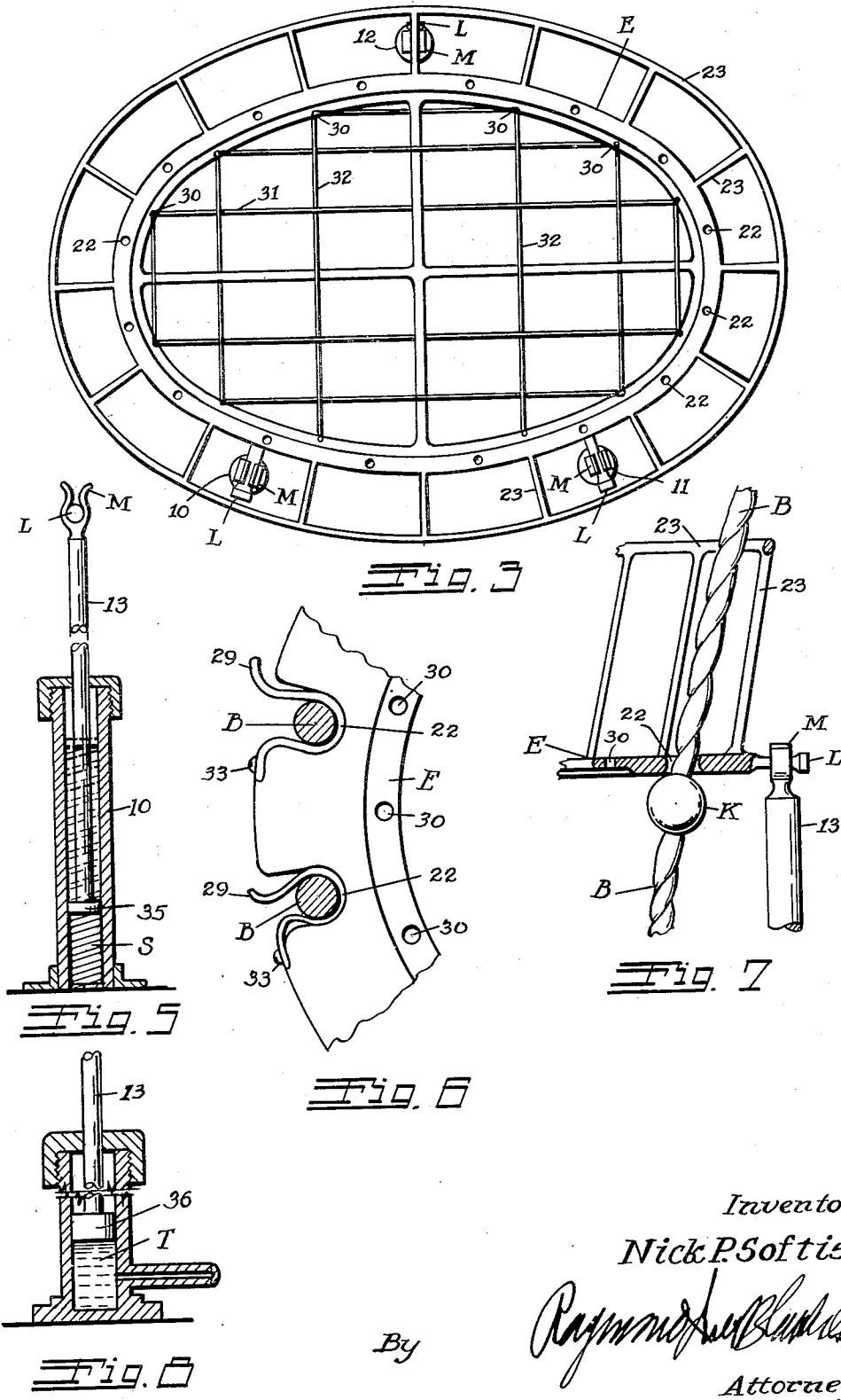
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

NICK P. SOFTIS, OF ST. LOUIS, MISSOURI

FLYING MACHINE

Application filed August 1, 1930. Serial No. 472,455.

This invention belongs in the class of safety devices for air-ships.

The objects of the invention are to provide a means which can be caused to operate immediately and at the will of any occupant of an air-ship, which, when operated, will sustain the entire craft and load; which is operable and effective regardless of the cause of falling of an air-ship, or of the position it may take in falling; which shall be compact, carried on the air-ship without imposing a serious load or obstruction to flight; is easily operated; low in cost, and applicable to any existing airplane of any type.

Other objects will appear as this description proceeds.

In general, this invention provides a parachute having sufficient expanse and strength to sustain, or lower gently, the air-ship to which it may be attached. This parachute is folded in a small compass, its ropes being spread apart and separated by an open ring or annulus laced across on which lacing the folded cloth lies and is supported. This ring is mounted on vertical supports, which, in turn, rest on compressed springs, the entirety being positioned in a hollow space in a wing or the top of the air-ship. A door, adapted to open upward, covers the parachute and apparatus. It is latched down, thereby holding the parts in place against the upward thrust of the springs, and providing a smooth, streamlined surface over the containing space.

With the foregoing, and other objects in view, the invention consists in the novel and useful formation, construction, inter-relation and combination of parts, members and features, as well as mode and methods of use thereof, and steps and performances taken and had, all as hereinafter described, shown in the drawings and finally pointed out in claims.

In the drawings:

Fig. 1 is an elevation showing in full lines an air-ship in horizontal position, supported by a fully open parachute, the dotted lines indicating an alternative position of the point of suspension and position of the bag when opened.

Fig. 2 is a plan view to a smaller scale with two dotted indications of a pair of folded parachutes, spaced apart on the upper parts of the air-ship.

Fig. 3 is a plan view to a larger scale of an elliptically shaped annulus having lacings over the hole therethrough and supported on three vertical standards.

Fig. 4 shows in full lines a vertical section transversely through an air-ship wing showing an opening in the wing in which is placed the supporting annulus, the parachute piled thereon, spring supported standards underneath and a covering door latched down in the entirety, while the dotted lines show the door unlatched and thrown back clearing the opening, the ring being sprung upward angularly.

Fig. 5 is a vertical section of a ring-supporting post, working in a tube and with a spring underneath same, with connecting means at the upper end for joining to an annulus.

Fig. 6 is a fragmentary portion of an alternative kind of annulus to a larger scale.

Fig. 7 is a fragmentary detail showing a section through one form of annulus with a portion of a supporting post, having a spring catch cooperating therewith, and a rope stop.

Fig. 8 is a vertical section of a ring-supporting member alternative to that shown in Fig. 5.

In the figures, A is the cloth portion of the parachute, B, B, B are the ropes, attached to A, their lower ends being connected to the airplane by ring C. The point of attachment of the parachute to the air-ship is preferably above the centre of gravity of the air-ship, and as mechanical considerations will usually make it convenient to fasten the parachute cords to a suitable ring, as C, attached to the upper surface of the air-ship, the point of attachment would be somewhere above or over the centre of gravity of the loaded ship.

Since this exact point will change with the load, the position of attachment of the parachute ropes to the air-ship, or of ring C, will best be somewhere near the point above the centre of gravity when a normal or usual load is imposed. E is a comparatively large

annulus, preferably elliptical in plan, which acts as a rope spreader and forms a support for the piled up cloth of the parachute. As more particularly indicated in Figs. 3 and 7, a series of holes, 30, 30, pass through the annulus adjacent the inner periphery, through which holes are laced cords, 31 and 32, to form an open support for the cloth, or bag, A, to rest on when folded, and through which lacing air can freely pass. A second series of holes, 22, 22, 22, pass through the annulus adjacent the outer periphery, one of the ropes, B, passing through each hole, 22, as shown. In this manner, the ropes, B, are kept spaced and spread apart, so that they cannot become entangled but will all assume their respective appropriate positions when air passes under and into the bag A.

In order to retain the folded bag in position over the laced annulus, a light wire structure, 23, is placed around the outer periphery of the annulus E, which projects upward and inclined outward as indicated. This makes an effective enclosure for holding the bag compactly folded, supporting it from below yet leaving the air free to pass under the annulus and up through it into the bag lying folded thereon.

Annulus E is supported on three legs or posts, 13, 14, 15, each whereof works in a surrounding tube, 10, 11, 12 respectively, the post being free to move vertically in its tube. Under each post, and resting on the bottom of the tube, is a coil compression spring, S. A flange, 35, on the lower end of post 13 is provided for reception of upper end of spring S. At the upper ends of posts are strong spring metal clamps or clips M, into which fit trunnions, L, there being three trunnions projecting radially outward from the periphery of the annulus. By this means, the posts are connected, substantially swivel-fashion, to the ring.

The lengths of the posts are so related that when the springs, S, are fully expanded, the annulus, E, is tilted, the forward edge being higher than the rear edge, so that the air will rush under and through the ring, thereby inflating the bag A.

By forming an opening of appropriate diameter in the upper surface of wing, G, or of fuselage, D, and setting the tubes, 10, 11, and 12, in their proper relative positions, portions whereof will project downward through the wing, and placing the several parts in their respective places, the annulus, E, will be supported at three points, and in a space to accommodate the annulus, and the folded bag atop of it all, with the ropes, B, spaced apart by the spreading-holes through annulus E. Door F, hinged at 16 and latched at 17 as shown, is pressed down on top of the bag with sufficient force to depress the annulus and compress the springs, S, enough to latch the door down. This completes the installation,

except for carrying the ropes to some common point of support on the air-ship, as C, Figs. 1 and 4. Latch 17 is operated by any convenient link or cable extending from the operator's section to the latch as cable 18. The operation is obvious from the foregoing description. A pull on cable 18 releases latch 17. The pressure of the three compressed springs in tubes 10, 11 and 12, immediately shoots the annulus and the folded bag A, upward, throwing door, F, backward to the rear, about hinge line 16. As annulus, E, moves upward, the forward edge rises higher than the rear edge, as shown by the dotted lines in Fig. 4, so that the air pressure or velocity becomes effective to force air into bag A which begins to unfold, rising as it unfolds, until the condition becomes the same as that depicted in Fig. 1.

Obviously, it is not necessary to arrange the parachute and spreading annulus over the position of attachment of the ropes to the air-ship. The parachute and annulus may be placed in the position shown by the full lines in Fig. 1, or the ends of the ropes, B, may be twisted together and carried forward to the parachute ring shown by the dotted lines. Then, the parachute would be installed and released in one place, but when inflated and giving support to the airship, the point of suspension would be far forward or rearward of the position where the parachute was released, and after the bag begins exerting a suspension force on the ropes, it will change its position relative to that of the air-ship and the conditions may become as shown by the dotted lines in Fig. 1.

From which it is obvious that the folded parachute and its rope spreading and supporting ring may be located in any convenient place on the upper surface of a wing, G, or the body of the air-ship, D, and the suspension ropes, B, carried from the spreading ring, or annulus, to any preferred suspension point.

The annulus may take any convenient form or cross-section. A circular form is the preferable one, but in order to give maximum spread of ropes and of area for entry of air below the bag, and yet not have any part of the annulus extend beyond the wing width, it sometimes becomes necessary to flatten one side of the circle which makes the form elliptical as shown.

Since the annulus is connected to the posts, as 13, by spring snaps which swivel about trunnions, a heavy jerk will release the ring. By providing stops, as K, Fig. 7, on a few of the ropes, B, the annulus, E, will be jerked loose from spring snaps, M, by upward pull of the stops, K, under the ring, so that the ring, E, will leave the air-ship with the parachute, as indicated by the dotted lines in Fig. 1.

Of course, the ropes, B, may be spread by

the ring, E, in a number of ways, as, for instance, by peripheral grooves, 22, spaced around the ring and having spring naps, 29, placed in the grooves and held on one side thereof, as by screw, 33. This construction permits the ropes to be placed in the grooves without threading through holes—a great saving of time and trouble—and under radial forces, the ropes, B, will snap out of the spring clips in the grooves, thereby leaving the parachute completely disassociated from the annulus, E, which latter is left attached to the supporting standards on the air-ship, or if the ropes, B, are provided with stops, as K, the ring, E, will necessarily be attached to the parachute and it will snap free from the spring clevises, M, attached to standards, 10, 11 and 12, and continue with the parachute instead of remaining on the air-ship.

While springs have been shown and described as the members which act to spring the distributing annulus, E, and the bag, A, upward, it is obvious that any other mechanical equivalent or substitute may be employed, as, for instance, compressed fluids, T, acting under pistons, 36, as indicated in Fig. 8, or any other convenient method of producing upward pressure on the annulus, E, and bag A, superimposed thereon, so that the annulus and bag are thrust upward when occasion arises and the latch, 17, or other controlling device is operated to allow cover, F, to be urged upward and rearwardly to clear the way for bag, A, to expand and exert a tension on ropes, B. It is also clear that the door, F, and its direction of swing are merely illustrative of a preferred form.

Having described my invention in connection with illustrative embodiments, forms, proportions, and arrangement of parts, it will be understood that many variants thereof are possible to those skilled in the art, and my invention, in its broader aspects, is not limited to the specific construction herein described and shown, as changes in the sizes proportions, configurations, arrangements, assemblage, interaction, juxtaposition and mechanical relations, as well as additions, omissions, substitutions, combinations and alterations of forms, parts, members and features, may be made without departing from the broad spirit of this invention.

I claim:

1. In a parachute supporting device having an openwork undersurface, a plurality of channels for the ropes of the said parachute each having a resilient member adapted to hold a rope in its channel, and to release the rope under a predetermined force acting to draw the rope away from the said annulus.

2. The combination of an annulus having an openwork under the surface adapted to receive and support a folded parachute ropes on said parachute connected with an air-ship, a rope channel in said annulus for each rope of

the parachute, springing means for projecting the said annulus and its load upward when operated, and connecting means between the annulus and the said springing means adapted to release said annulus from said springing means when said parachute is distended and exerts a pull on said ropes.

3. In a safety device for aeroplanes, a member adapted to receive a folded parachute, movable supporting arms for said member whereby it may be moved into the aeroplane slip stream, and means on said supporting arms, releasably engaging said member.

4. A safety device for aeroplanes including a member adapted to receive a folded parachute, said member having apertures for holding the parachute suspension ropes in relatively spaced relation, movable supporting arms for said member, and resilient means on said arms releasably engaging said member.

5. A safety device for aeroplanes, including a parachute having suspension cords secured to the aeroplane, a member adapted to carry the parachute when folded and be carried by said suspension cords when the parachute is open, supporting arms for said member, and means on said arms releasably engaging said member.

6. A safety device for aeroplanes including in combination, a parachute, an annulus adapted to receive the parachute when folded, and having openings disposed about its periphery for spacing the parachute suspension cords, studs projecting from said annulus, supporting arms for said annulus and spring clips on said arms adapted to releasably engage said studs.

7. In parachute means for supporting an air-ship, the combination of a supporting framework having a lacing there-across adapted to receive a collapsed parachute, said frame having openings adjacent its periphery, each to accommodate a parachute rope, said frame adapted to be lifted and disconnected from the air-ship when the parachute is inflated, and to take a position below and substantially co-axial with the axis of the parachute.

8. The combination of an air-ship, a parachute attached thereto, a container therefor, a support within said container comprising an open framework having a lacing across it adapted to receive the collapsed parachute and to pass air through said lacing to inflate the parachute, said frame having openings adjacent its periphery, each to accommodate a parachute rope and guide same, and a rope clamp in each guide adapted to release the rope therein under forces normal to the frame periphery.

9. The combination of an air-ship; a parachute connected therewith, a container therefor, a parachute support in the container comprising an open framework having a lacing adapted to receive the collapsed parachute,

said frame having openings adjacent its periphery, each to accommodate a parachute rope, said frame being supported on members adapted to thrust said frame and load outward from said container; a connection between said support members and the frame adapted to release the frame under the action of forces normal to the plane of the frame.

10. The combination of an air-ship; a parachute, a frame near the lower end of the parachute, grooves in the periphery of the frame wherein parachute ropes are slidably and releasably held, means for thrusting said frame and parachute outward from the air-ship angularly to the axis of the air-ship, said ropes being detachable from said frame by radial forces acting thereon outward from the center of the frame.

11. A parachute support and inflation means on an air-ship including a container, an open frame in the container, a lacing across the inner periphery of said frame adapted to receive a folded parachute, grooves spaced around the outer periphery of said frame and adapted each to accommodate a parachute rope and hold the ropes in separate, spaced positions; means within said container for supporting said frame and parachute, and adapted to thrust them outward from said container, and connecting means between the said support means and the frame adapted to be separated by the drag of the parachute.

12. Safety means for air-ships comprising a parachute having ropes fastened adjacent a centre of gravity line of the air-ship; a container for the parachute mounted on said air-ship; means for supporting the parachute when folded comprising an open frame having spaced rope grooves around the outer periphery and a foraminous bottom across the inner periphery thereof; means for springing the said frame and parachute outwards from said container angularly to the ambient air stream, and releasable connecting means between the frame and said supporting means.

13. In a safety device for air-ships, the combination of a parachute attached to the air-ship, a container for the parachute; spring means for ejecting the parachute from the container in a position angular to the axis of the air-ship, an open frame at the bottom of the parachute having rope guides at the periphery thereof, said guides having rope clamping means therein adapted to release the ropes when a force is applied to the ropes outwardly in the plane of the frame.

14. In an air-ship safety device the combination of a parachute attached to the air-ship, a supporting frame therefor having an open bottom whereon the folded parachute rests, means for springing the frame and parachute outward, connections between said springing means and the said support frame adapted to release the frame when the para-

chute becomes inflated and produces a vertical drag on the air-ship.

15. An air-ship safety device including a folded and confined parachute attached to the air-ship; a support therefor, means for freeing the parachute and thrusting it outward from the air-ship and setting it angularly to the ambient air stream, separating means for the parachute ropes, and means for releasing the said support from the parachute when this latter is inflated and exerts an upward pressure on the said support.

16. The combination of an air-ship; a parachute; an open frame near the lower end of the parachute having rope grooves wherein the parachute ropes are slidably held; and releasable means in said grooves adapted for withdrawal of the ropes therefrom and operable by a force acting in the plane of the said frame.

17. A receiving and supporting device for a folded parachute, comprising a compartment, a foraminous member on which the folded parachute bag may rest in said compartment, said foraminous member being adapted to admit air there-through and into said bag when same is released, ejecting means for thrusting said support and parachute out from the compartment, and connections between said support and ejecting means which are released by pull of the parachute.

18. In combination a frame carrying a foraminous support for a parachute, through the under portion of which support air may enter the parachute bag, spaced recesses adjacent the periphery of said frame for the parachute ropes wherein the ropes are slidably and resiliently held, supporting means for said frame, and separable connections between said frame and said supporting means.

19. A safety device for air-ships, comprising a parachute, suspension members connecting the parachute bag and the air-ship, and a structure on the air-ship adapted to receive and support the parachute, and having a plurality of rope-guiding channels therein, a bag-confining member above and encircling said support, means for moving said support and connecting means between said support and moving means releasable by the parachute pull.

20. A safety device for air-ships, comprising a parachute, suspension members connecting the parachute bag and the air-ship, and a structure on the air-ship adapted to receive and support the parachute, rope-spreading means around said support providing an individual guide channel for each parachute rope, in which the rope is slidable, a guard railing above and encircling said support adapted to hold the folded parachute bag within the boundary of said support, and pressure means adapted to move the entirety upward from the air-ship and angular to the

air stream past the air-ship, said structure being releasably engaged on the air-ship and adapted to follow the released parachute.

21. A support for a parachute mounted on the upper surface of an air-ship, comprising an open frame having lacings across the opening therein, a plurality of open-sided rope channels adapted to space apart the parachute ropes, resilient means for retaining the ropes in said channels, a guard rail above and encircling the frame adapted to confine the folded bag over said frame, means for springing the entirety upward at an angle with the air stream past the said air-ship, with the forward edge higher than the rear edge, thereby admitting air to the bag through the under open parts of the frame.

22. The combination of a folded parachute having a rope-spacing frame placed in an opening in an upper surface of an air-ship and covered over with a door hinged to open upwardly, said parachute being connected to the said air-ship, and spring means for simultaneously throwing open said door and moving the parachute upward out of said opening, and connecting means between said spring means and said spacing ring which are adapted to be separated by pull of the parachute.

23. A safety device for an air-ship including a parachute flexibly attached to the said air-ship and folded into a space in the upper surface of the air-ship, and means whereby the parachute is thrust upward out of said confining space and into unobstructed space by an occupant of the air-ship, said means comprising a resilient pressure device adapted to exert a constant pressure upwardly on the said parachute and a covering and downwardly holding member held in position by a movable latching means operable from with-

in the air-ship, a rope separating ring releasably attached to said upward thrusting means and having a channel for each rope where through the rope is slidable.

24. In combination with an aeroplane, a parachute, a parachute holder, means mounting said holder on the aeroplane and tending constantly to project the holder into the aeroplane slip stream, and releasable means normally restraining said holder against projection, said mounting means comprising projectible members mounted permanently on the aeroplane, and releasable connections between the holder and said projectible members, said connections being of a type to be released by the pull of the parachute shrouds.

25. In combination with an aeroplane, projectible members mounted permanently thereon, a parachute, a parachute holder, releasable connections between said projectible members and the parachute holder, said connections being of a type to be released by the pull of the parachute shrouds, the parachute being disposed normally in said holder and being connected to the aeroplane independently of the holder.

26. In combination with an aeroplane, projectible members mounted thereon, a parachute, a parachute holder, releasable connections between said projectible members and the parachute holder, said connections being of a type to be released by the pull of the parachute shrouds, the parachute being disposed normally in said holder and being connected to the aeroplane independently of the holder.

In testimony whereof, I have signed my name to this specification at Los Angeles, California, this 16th day of July, 1930.

NICK P. SOFTIS.