J. GRABOWIECKI.

SAFETY DEVICE FOR AEROPLANES.

APPLICATION FILED NOV. 2, 1918.

1,320,545.

Patented Nov. 4, 1919.

3 SHEETS—SHEET 1.

FIG. 1.

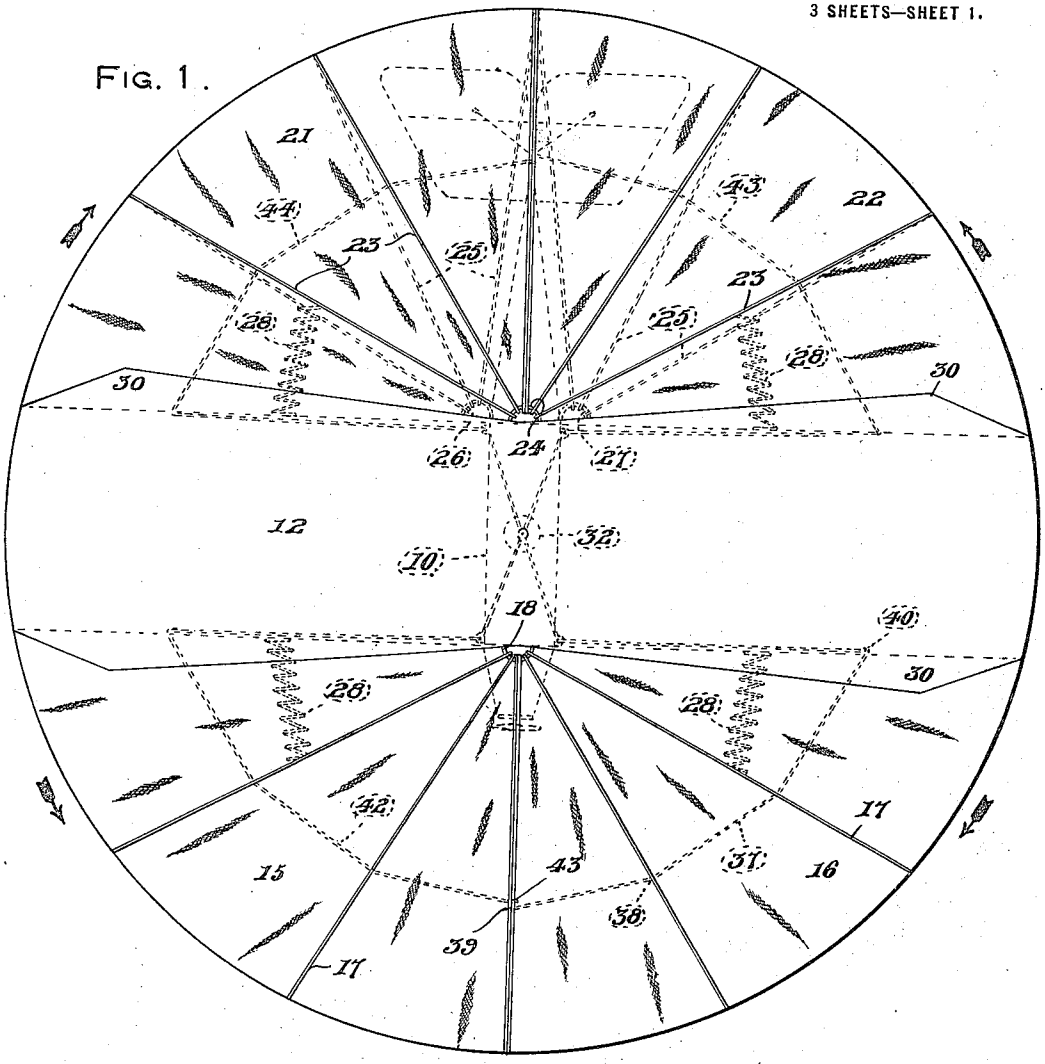
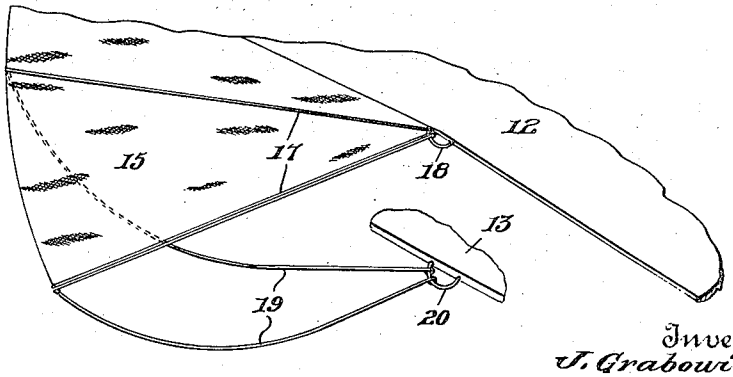


FIG. 8.



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3 SHEETS—SHEET 2.

FIG. 2.

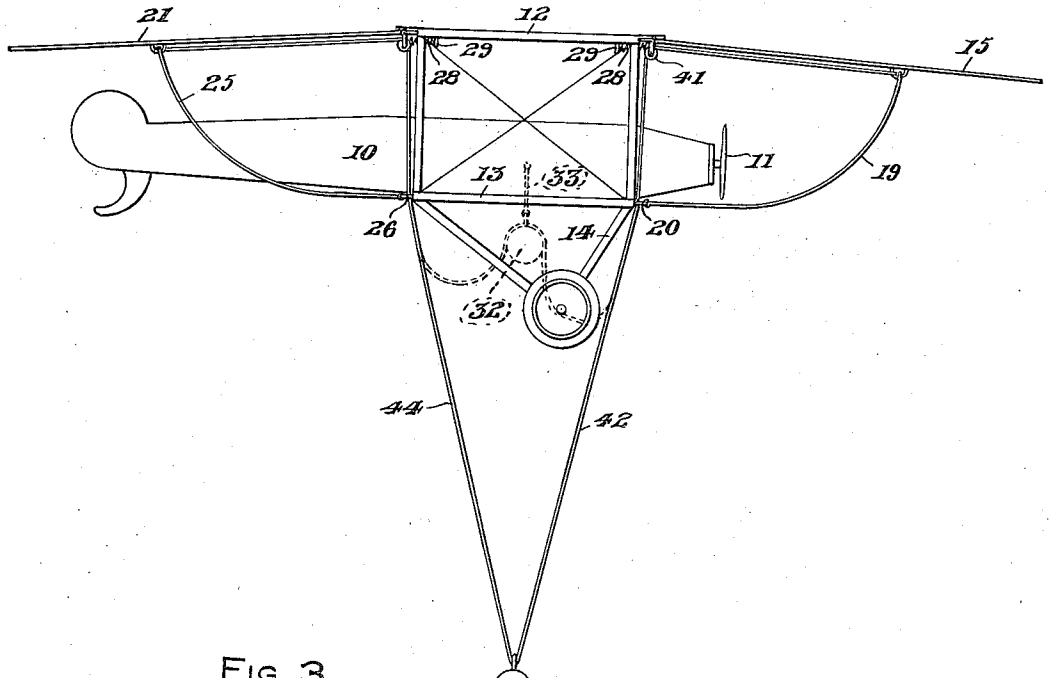
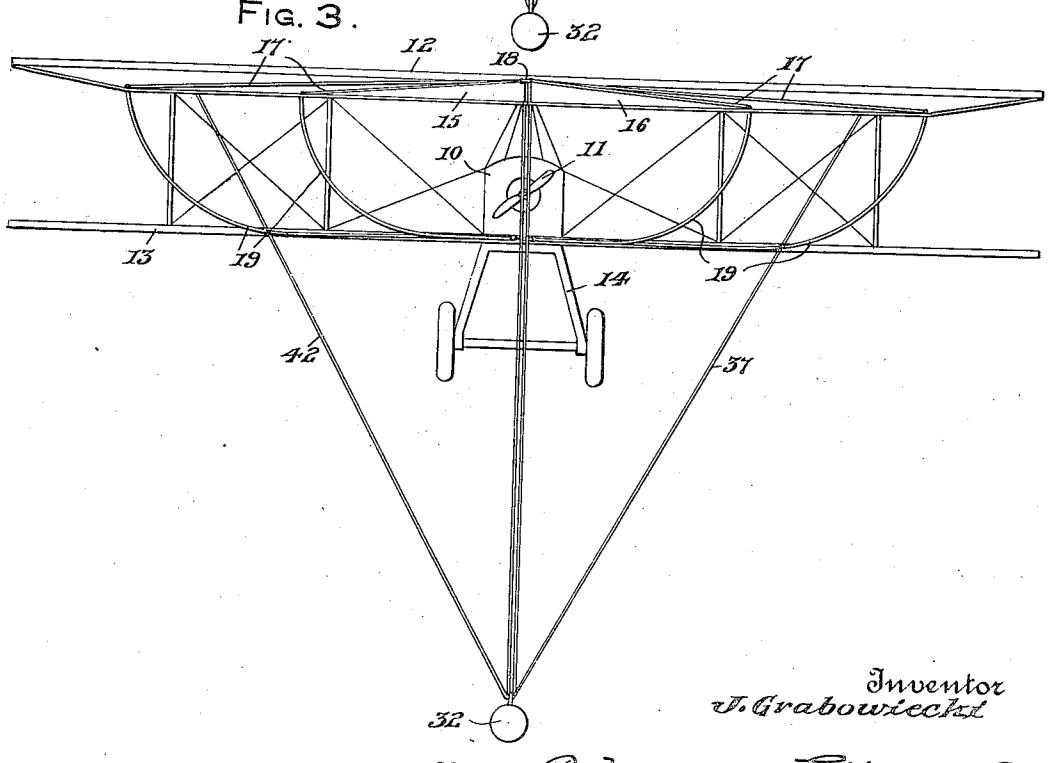


FIG. 3.



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3 SHEETS—SHEET 3.

FIG. 4.

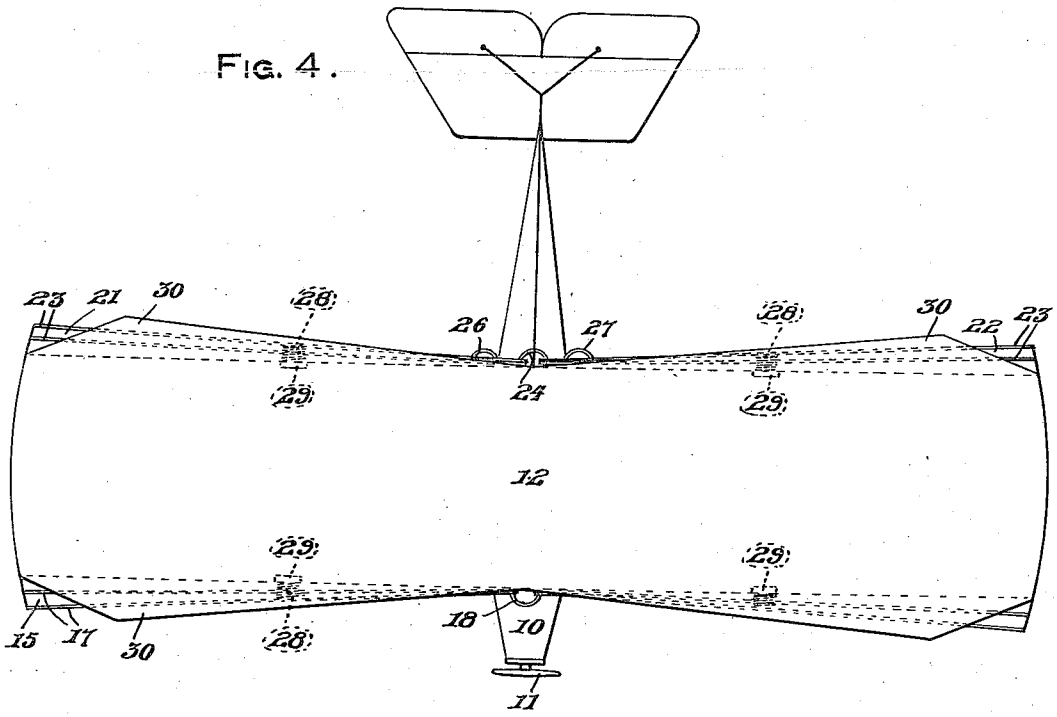


FIG. 5.

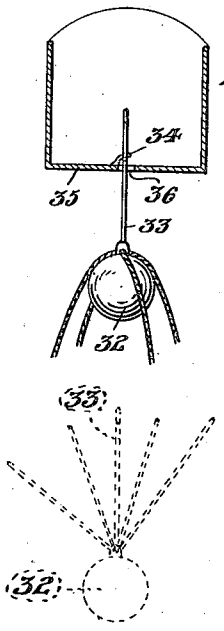


FIG. 6.

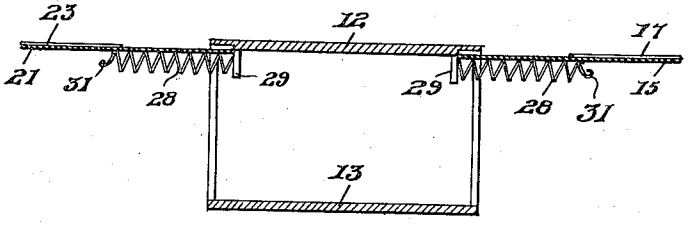
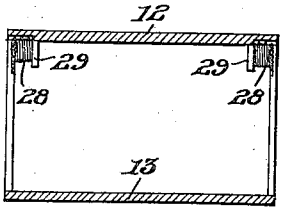


FIG. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH GRABOWIECKI, OF DETROIT, MICHIGAN.

SAFETY DEVICE FOR AEROPLANES.

1,320,545. Specification of Letters Patent. Patented Nov. 4, 1919.

Application filed November 2, 1918. Serial No. 260,824.

To all whom it may concern:

Be it known that I, JOSEPH GRABOWIECKI, a subject of the Emperor of Austria, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Safety Devices for Aeroplanes, of which the following is a specification.

The primary object of the invention is the provision of an attachment for aeroplanes for retarding the fall of the aeroplanes to the ground in the event of an accident such as the failure of the motor to continue its operations or the destruction of portions of the craft by the bullets of the enemy.

A further object of the invention is the provision of a folding parachute attachment carried by an aeroplane adapted to automatically unfold when so desired by the aviator and at such times presenting an enlarged canopy for floating the aeroplane in the air, the opening means for the parachute being adapted for maintaining the craft upright during its gradual downward travel to the earth.

With these general objects in view the invention consists in the novel combination and arrangement of parts hereinafter more fully described and illustrated in the accompanying drawings in which like reference characters designate corresponding parts throughout the several views.

In the drawings,

Figure 1 is a top plan view of an aeroplane provided with the invention illustrated in its open position,

Fig. 2 is a side elevation thereof with the parachute opening means illustrated by dotted lines in its normal elevated position,

Fig. 3 is a front elevation thereof,

Fig. 4 is a top plan view of the same with the parachute folded,

Fig. 5 is a transverse sectional view through the fuselage showing the weight hanging means and illustrating the weight by dotted lines in its lowered position,

Fig. 6 is a vertical sectional view taken transversely of the planes with the parachute open,

Fig. 7 is a view similar to Fig. 6 with the parachute closed and

Fig. 8 is a perspective detail view showing the hinge mounting means employed for the parachute members.

Referring more in detail to the drawings, a bi-plane is illustrated with the invention installed thereon, the bi-plane including a fuselage 10 of the tractor type having a forward propeller 11, transversely arranged upper and lower planes 12 and 13 respectively and a wheeled chassis 14 beneath the fuselage. A parachute substantially semi-circular in form is provided at the front and the rear of the upper plane 12, the forward semi-circular canopy consisting of two foldable sections 15 and 16 each of which is substantially of the form of a quadrant when the canopy is operatively extended. The sections 15 and 16 are formed of suitable material such as canvas with radially projecting ribs 17 secured to the canvas and hinged to a metal loop 18 at their inner ends, centrally of the front edge of said upper plane 12. The outer ends of the ribs 17 at the perimeter of the canopy sections 15 and 16 are attached to bows 19 which have their inner ends swingingly connected to a loop 20 centrally carried by the forward edge of the lower plane 13 directly beneath the upper loop 18 as well as being beneath the fuselage 10.

In a similar manner, a rear semi-circular canopy is provided consisting of two quadrant shaped pieces of canvas 21 and 22 attached to the rear edge of the upper plane 12 and having radial ribs 23 hinged to a loop 24 at the center of the rear edge of the upper plane 12. Curved bows 25 connect the outer ends of the ribs 23 with loops 26 and 27 carried by the rear edge of the lower plane 13 adjacent the opposite sides of the fuselage 10 and beneath the canopy sections 21 and 22 respectively.

Coil springs 28 are connected between the canopy sections 15, 16, 21 and 22 at points adjacent the first ribs 23 and to depending lugs 29 carried by the upper plane 12. These springs 28 normally position themselves closely coiled as illustrated in Fig. 7 of the drawings for holding the canopy sections inwardly beneath oppositely projecting overhanging eaves 30 of triangular form provided adjacent the four corners of the upper plane 12, forwardly and rearwardly thereof. The canopy sections are normally positioned folded out of the way beneath the eaves 30 retained by the aforementioned springs 28 and end clips 31 carried thereby, which clips engage the remaining ribs of each section for temporarily holding the sec-

tion folded until forcibly released. A suitable weight 32 provided with a rod 33 is normally carried beneath the fuselage 10 by the engagement of the rod with a hook 34 upon the bottom 35 of the fuselage 10, adjacent an opening 36 therein through which the rod 33 extends. A cord 37 is freely passed beneath the canopy section 16 being preferably slidably connected as at 38 therebeneath and having one end of said cord attached as at 39 to the adjacent edge of the canopy section 15, while the cord 37 extends through a loop 40 beneath the forward eave 30 of the upper plane 12 and thence over a pulley 41 to the aforementioned weight 32.

In a similar manner, a cord 42 is attached as at 43 to the canopy section 16 passing beneath the section 15 to the weight 32. The canopy sections 21 and 22 rearwardly of the plane 12 are similarly connected to the weight 32 by operating cords 43 and 44 respectively.

With the canopy sections folded beneath the eaves 30 as illustrated in Fig. 4 of the drawings, the aeroplane may be operated in the usual manner and in the event of an accident, the aviator may release the weight 32 by disconnecting the rod 33 from the hook 34 thereby permitting the weight 32 to fall beneath the fuselage 10 and draw the canopy sections 15, 16, 21 and 22 to their outstretched positions with the adjacent edges of each pair of sections touching each other and with each pair of sections forming a semi-circular canopy at one side of the plane 12. The weight 32 is sufficient to release the clips 31 and expand the springs 28 it being understood that the ribs 17 and the bows 19 swinging upon the loops 18 and 20 respectively permit the sections 15 and 16 to open after the manner of an umbrella, while the sections 21 and 22 operate in a similar manner. The weight 32 being suspended considerably beneath the air craft, maintains the same in substantially its normal upright position and with the canopy expanded, the canopy sections together with the upper plane 12 form a substantially circular parachute whereby the air craft and its pilot or contents will gently descend to the earth uninjured.

What I claim as new is:

1. A safety device for aeroplanes comprising normally folded quadrant-shaped canopies at opposite sides of the planes, stretching rods connected to the canopy and pivoted to the upper plane, curved brace rods extending between the canopy and the lower plane, a weight adapted to be dropped from the aeroplane and operative connections between said canopies and weight whereby the sections are adapted to open upon the dropping of the weight.

2. In combination with an air craft having transverse planes, foldable quadrant shaped canopy members at opposite sides thereof, stretching rods connected to the canopy and pivoted to the upper plane, curved brace rods extending between the canopy and the lower plane, means adapted for holding said members in folded relation adjacent said plane, a releasable weight carried by the air craft and operative connections between said weight and canopy members whereby upon a dropping of the weight, the canopy members are adapted to automatically open in substantially semi-circular formations at opposite sides of the plane.

3. A safety device comprising in combination with an air craft having a transverse plane with eaves at its opposite longitudinal edges, semi-circular rings midway the side edges of the planes, two quadrant shaped parachute sections pivoted at each side of the plane to the rings and normally folded substantially beneath the said eaves, retaining means for said parachute sections when folded, a weight detachably suspended from the air craft, operating cords connected between said weight and the separate parachute sections, the said weight being adapted for dropping beneath the air craft whereby the parachute sections are released and shifted to their unfolded positions in substantially circular formation with the said plane providing an expanded air engaging sustaining surface.

4. In combination with air craft embodying upper and lower planes, a safety device including rings secured centrally of the front and rear edges of each plane, parachute sections, strengthening rods secured thereto and pivoted to the rings carried by the upper planes, reinforcing rods extending between the outer edges of the parachutes and the rings carried by the lower planes, and means for opening said parachute.

5. In combination with air craft embodying upper and lower planes, a safety device including rings secured centrally of the front and rear edges of each plane, parachute sections, strengthening rods secured thereto and pivoted to the rings carried by the upper planes, reinforcing rods extending between the outer edges of the parachutes and the rings carried by the lower planes, the parachute at each side of the planes being formed of two sections opening and closing in opposite directions.

6. In combination with air craft embodying upper and lower planes, a safety device including rings secured centrally of the front and rear edges of each plane, parachute sections, strengthening rods secured thereto and pivoted to the rings carried by the upper planes, reinforcing rods extending between the outer edges of the parachutes and the rings carried by the lower planes, the parachute at each side of the planes being formed of two sections open-

ing and closing in opposite directions, and means for simultaneously operating all of the parachute sections.

7. In combination with air craft embodying upper and lower planes, a safety device including rings secured centrally of the front and rear edges of each plane, parachute sections, strengthening rods secured thereto and pivoted to the rings carried by the upper planes, reinforcing rods extending between the outer edges of the parachutes and the rings carried by the lower planes, the parachute at each side of the planes being formed of two sections opening and closing in opposite directions, a plurality of cables, each having connection with a parachute section and a common weight connected to all of the cables for operating the parachute sections.

In testimony whereof I affix my signature.

JOSEPH GRABOWIECKI.