Nov. 10, 1931. J. M. FELLS 1,831,166

AEROPLANE

Filed Feb. 24, 1930 2 Sheets-Sheet 1

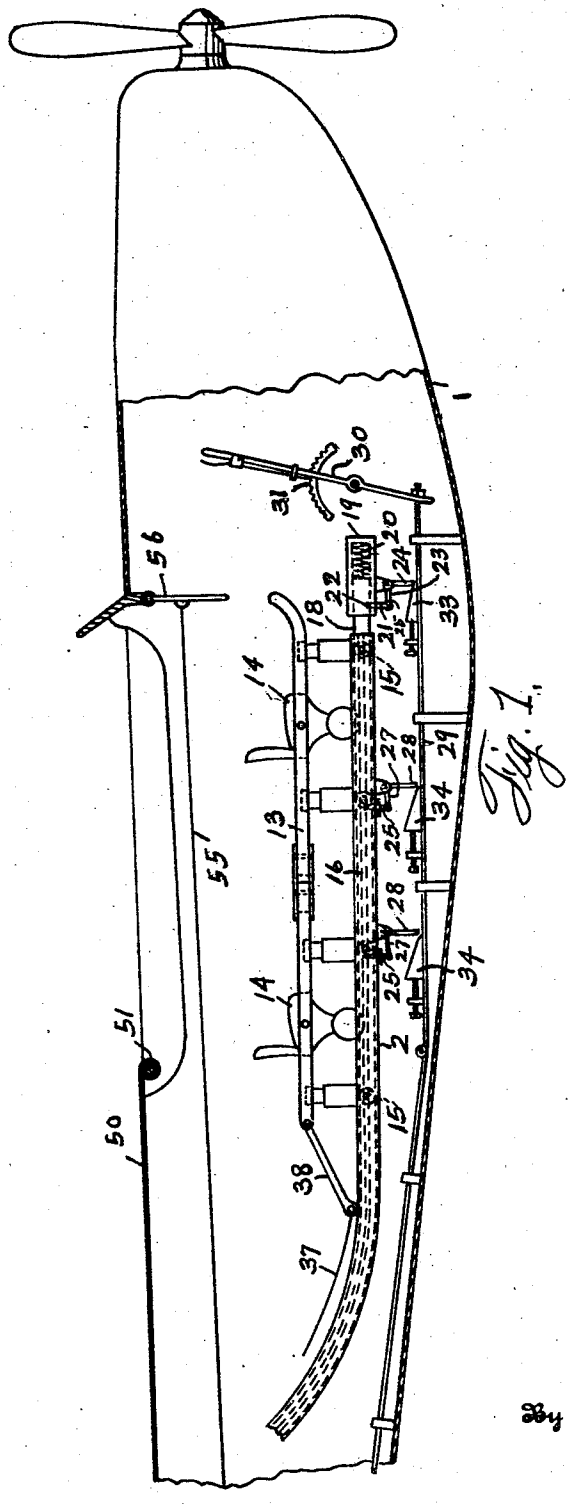

Fig. 1.

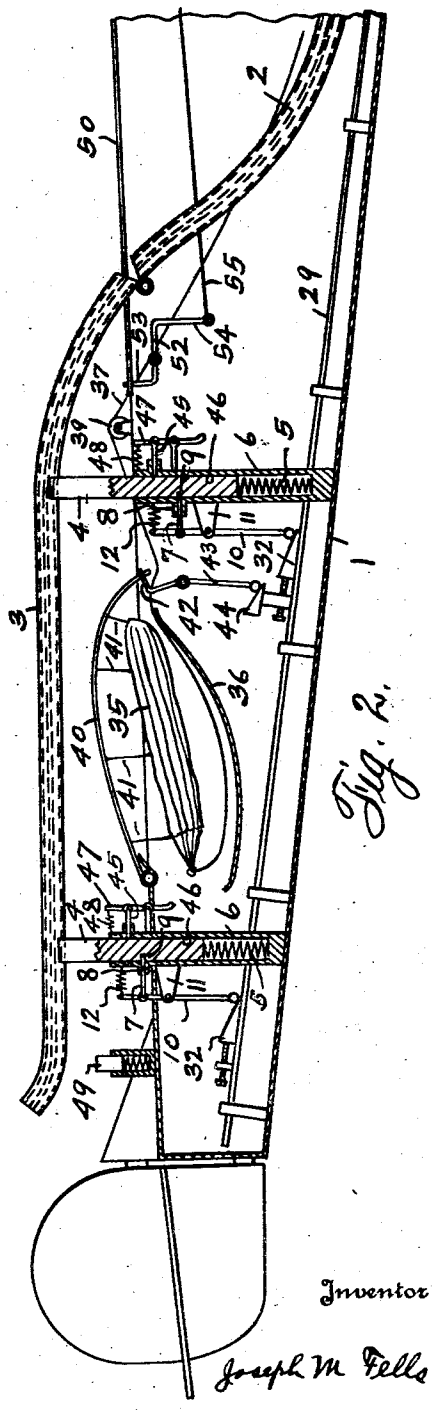

Fig. 2.

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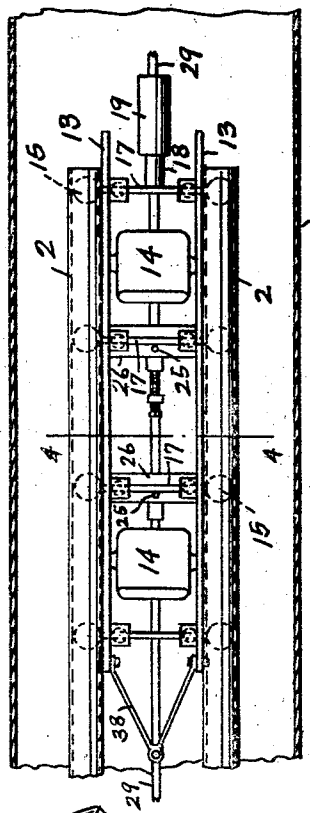

Fig. 3.

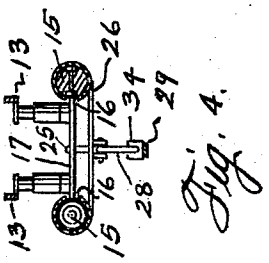

Fig. 4.

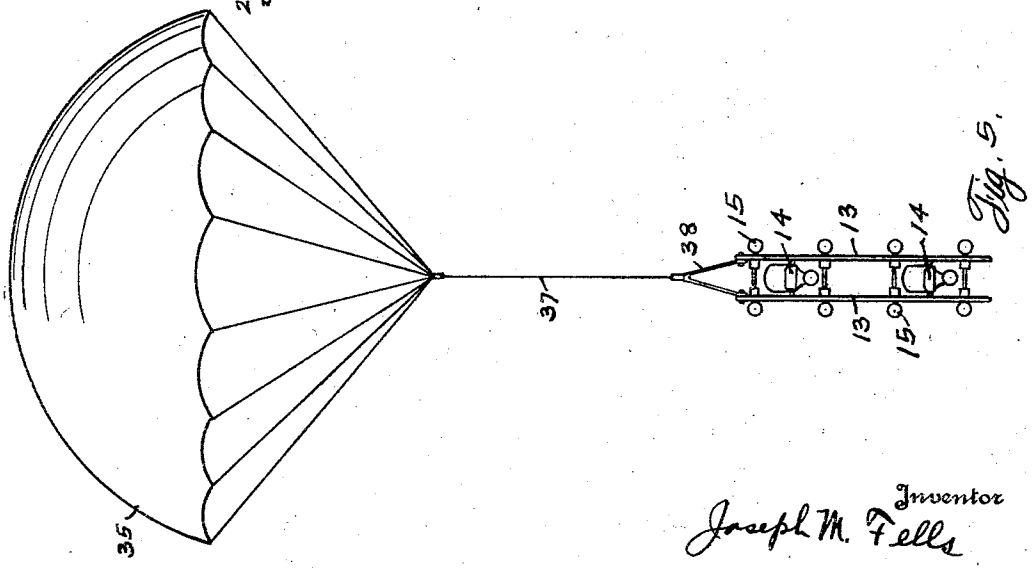

Fig. 5.

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1,831,166

UNITED STATES PATENT OFFICE

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AEROPLANE

Application filed February 24, 1930. Serial No. 430,680.

This invention relates to new and useful improvements in an aeroplane and has particular relation to a safety landing attachment through which the occupants of the craft may land safely in case the aeroplane becomes disabled and cannot be safely landed.

Another object of the invention is to provide air craft of the character described which embodies a landing device for the occupants that may be released from the craft and which will then clear the disabled plane and descend, with the occupants therein, without danger to or further effort on the part of, passengers or crew.

With the above and other objects in view this invention has particular relation to certain novel features of construction, operation and arrangement of parts an example of which is given in this specification and illustrated in the accompanying drawings wherein:—

Figure 1 shows a vertical sectional view of the front end of an aeroplane showing the safety attachment with which the same is equipped.

Figure 2 shows a vertical sectional view of the rear end thereof.

Figure 3 shows a fragmentary horizontal sectional view.

Figure 4 shows a fragmentary cross sectional view taken on the line 4—4 of Figure 3, and—

Figure 5 shows a front elevation of the safety attachment in descent.

Referring now more particularly to the drawings, the numeral 1 designates the fuselage, or body as a whole, which may be of any desired construction and design. In this body are the longitudinal tubular tracks 2, 2 spaced apart and suitably anchored to said body. The forward ends of these tracks are substantially parallel with the longitudinal axis of said body and their rear ends are upwardly curved and rearwardly extended above the body of the plane, said rearward extensions 3, 3 being hinged to the fixed tracks 2, 2.

Said extensions are supported on the plungers 4, 4 which are mounted on strong coil springs 5, 5 in the vertical guides 6, 6. These plungers are normally held in retracted position by means of the pawls 7, 7 which work through bearings 8, 8 in the guides 6 and engage in the sockets 9, 9 in said plungers. The pawls are pivoted to the levers 10, 10 above the bearings 11, 11 on which the levers are supported, and the pawls are normally held in said engaging position by means of pull springs 12, 12 which are attached to the upper ends of said levers and to the corresponding guides 6.

There is a seat frame having the side members 13, 13 between which the seats 14, 14 are pivoted. This frame has the lateral bearing members 15 which work through the inside slots 16, of the tracks 2, 3 and fit within said tubular tracks. The side members 13 are connected by suitable cross bars, as 17 which extend out each way beyond the seat frame and support said bearing members 15, and the front cross bar has a forwardly extending plunger 18 which works in the cylinder 19 against a strong coil spring 20 in said cylinder. The plunger 18 is normally held in position to maintain said spring 20 under compression by means of a pawl 21 which works through a bearing in the under side of the cylinder 19 and whose inner end engages in a socket 22 in said plunger 18. The outer end of the pawl 21 is pivoted to one arm 23 of a bell crank which is pivoted to the under side of said cylinder 19, and the other arm 24 of said bell crank depends and is free. The seat frame is normally held against rearward movement along the tracks 2 by means of the latches 25, 25 which work upwardly through bearings in the cross bars 26, 26 connecting said tracks, and engage behind the corresponding cross bars 17. The lower ends of the latches 25 are pivotally connected to the free ends of the arms 27, of bell cranks which are pivoted to the under sides of the cross bars 26. The other arms 28, of said bell cranks depend and are free.

There is an actuating rod 29 whose forward end is connected to the lower end of the hand lever 30.

This lever is located in front of the seat frame and is pivoted at an intermediate

point. It may be held in any desired position by a rack and dog arrangement 31. The rod 29 extends along the floor of the fuselage to the rear end thereof and has the adjustably mounted cams 32, 32, 33 and 34, 34 thereon whose cam faces are arranged to engage the lower ends of, and to actuate, the levers 10, 10 the arm 24, and the arms 28, 28, respectively, when said rod 29 is actuated forwardly.

At the rear end of this fuselage there is a parachute 35, in folded position and protected underneath by the guard 36, and the load carrying cable 37, of the parachute, is attached to the clevis 38, which in turn, is attached to the rear ends of the side members 13 of the seat frame. The cable 37 operates over one, or more, pulleys, as 39. The folded parachute 35 is suspended from the flexible throw-arm 40 by means of easily breakable ties 41. The rear end of the arm 40 is firmly attached to the fuselage and said arm is held under tension by means of a latch 42 which is engaged through a suitable eye in the forward end of said throw-arm. The trigger 42 is pivotally mounted and its lower end is extended forming an arm 43 whose lower free end rides against a cam 44 carried by the rod 29.

In case the plane becomes disabled and cannot be controlled or safely landed the operator may grasp the upper end of the lever 30 and pull the same rearwardly which will result in the forward movement of the rod 29. Thereupon the cams 32, 32, and 44, operate to force the lower ends of the levers 10, 10 and 43, respectively, forwardly thus releasing the pawls 7, 7 and the trigger 42, from the plungers 4, 4 and the throw arm 40, respectively. The throw arm is immediately, by its own tension, thrown rearwardly, thus carrying the parachute into position to open and the plungers 4 are at the same time moved upwardly by the springs 5 and they carry the tracks 3 upwardly so that the seat frame will be held clear of the fuselage as said seat frame and the occupants thereof, leave the plane.

When the plungers 4, 4 reach the limit of their upward movement the pawls 45, 45 will engage in the recesses 46, 46 in said plungers 4 and the plungers will be securely held in elevated position to form firm supports for the tracks 3, 3. These pawls 45 are pivoted, at their outer ends to the pivoted levers 47, 47 and are caused to engage in said recess 46 by the pull springs 48, 48. The throw-arm 40 is of a shield like form to protect the parachute, when the latter is not in use, and when said throw-arm is released and is thrown backwardly it strikes the yieldable bumper 49 which prevents injury thereto.

There is a curtain like covering 50 which is wound on a conventional transverse spring roller 51 mounted just behind the cock pit and this curtain extends back forming a roof, or covering, for the craft. There is a lever 52 pivotally mounted in the fuselage whose forward end 53 is upturned and extends through an eye in the rear edge of said curtain and the forward end of the lever 52 is downwardly turned forming an arm 54 to the free end of which the cord 55 is attached. The forward end of the cord 55 is attached to the depending lever 56 and said lever 56 may be actuated forwardly by the aviator. This will operate, through the mechanism described, to release the end 53 from the curtain 50 and the roller 51 will then roll the curtain 50 up out of the way.

When the rod 29 is moved forwardly, as above explained, the cams 33, 34, 34 will operate to withdraw the pawl 21, and latches 25, 25 and the plunger 18 being released will move the seat carrier rearwardly along the tracks 2, and when the parachute opens the ties 41 will be broken and the seat carrier and seats, with the occupants therein will be drawn out along the tracks 2, 3 and freed, as the craft falls.

As stated the seats 14 are pivotally mounted between the side members 13 and they will assume an upright position at all times and when the parachute and seat carrier are freed from the aeroplane they will assume the position shown in Figure 5 and will gradually descend to the ground without injury to said occupants.

What I claim is:—

1. The combination with an air craft, of an independent passenger carrier mounted therein, releasable means holding said carrier in said craft, a collapsed parachute in said craft attached to said carrier, means for releasing said parachute to permit the opening thereof, a track arranged in the craft along which said carrier may move free of said craft and means for moving the rear ends of the tracks outward from the craft.

2. The combination with an air craft, of a track therein one end of which is movable into position clear of said craft, releasable means for moving said end into said position, a carrier in the craft mounted on said track, releasable means securing said carrier against movement along said track, a parachute in collapsed position in the craft and attached to said carrier, releasable means maintaining said parachute in said collapsed position, means for releasing said respective releasable means to permit said parachute to open and to move said track end into said clear position and to permit said carrier to move under the influence of said parachute, clear of said craft.

3. The combination with an air craft, of a parachute in collapsed position therein, releasable means effective, when released, to move said parachute into position to open, a track mounted on said craft, a carrier on said

track attached to the parachute, releasable means for holding said carrier against movement on the track, means for releasing said parachute moving means and said carrier holding means, the rear end of said track being movable into position to clear said craft, means for moving said end into such clear position, releasable means for normally holding said track moving means in inactive position and means for releasing said last mentioned holding means.

4. The combination of an air craft, of an independent passenger carried mounted therein, releasable means holding said carrier in the craft, a track on which the carrier is mounted to move, said track having a movable free end, releasable means holding said end in one position relative to the craft and yieldable means arranged to throw said end outwardly upon the release thereof.

In testimony whereof I have signed my name to this specification.

JOSEPH M. FELLS.