

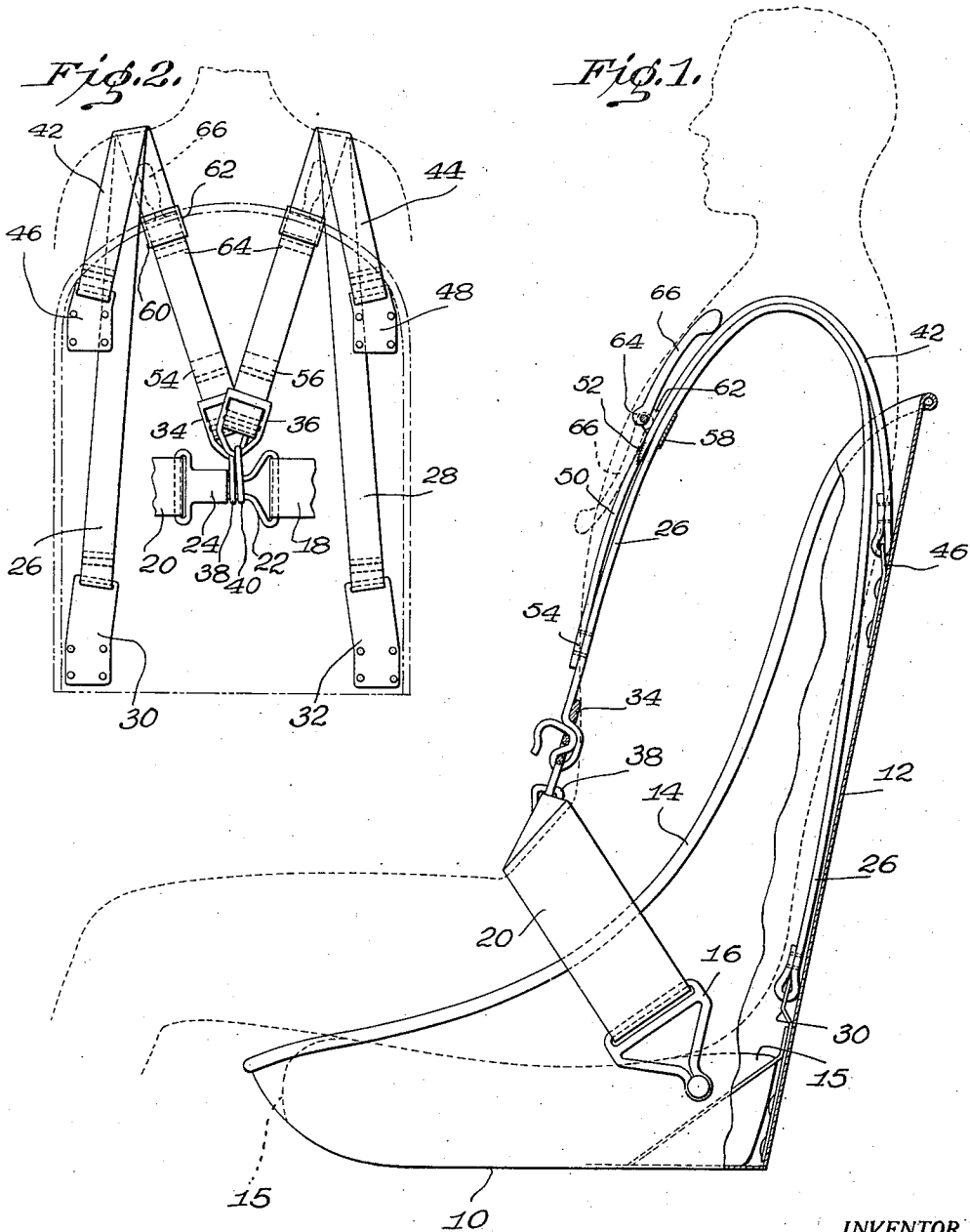
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SEAT HARNESS

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SEAT HARNESS

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This invention relates to a safety harness for retaining pilots of aircraft in their seats during aerobatics and for preventing them from moving forward during hard landings or crack-ups and striking the instrument panel. The invention may be applicable to other types of vehicles or boats as may appear.

The present invention is directed to a harness assembly which may be an integral part of the typical bucket-type seat, the harness being adapted to permit free movement of the pilot in the exercise of control and yet be quickly adapted for adjustment to restrain the pilot from any substantial forward movement away from the seat resulting from accident or shock.

An object of the invention is to provide a harness in connection with a seat which is adapted to restrain a person within the seat from moving forward or upward, however, permitting the person to lean forward when such freedom is desired, but yet adapted to secure the person against forward movement when desired, in a manner least likely to injury during accident or unusual shock.

Another object of the invention is to provide a harness of extreme simplicity capable of integral assembly with a minimum of weight to a standard bucket seat.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawing. It is expressly understood, however, that the drawing is employed for purposes of illustration only and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing wherein like reference characters indicate like parts

Figure 1 is a side elevation of a typical pilot seat provided with the harness of the present invention, parts of the pilot seat at the rear being broken away for purposes of clear illustration.

Figure 2 is a rear elevation illustrating the harness as it would appear when positioned over the shoulders of a pilot within the seat, the seat and the pilot for the purpose being indicated as invisible.

Referring to the drawing there will appear a common type of bucket seat having a bottom seat portion 10, back 12 and sides 14 with the usual parachute pack 15 arranged on the seat 10 thereof. Secured to either side 14 on the outside thereof is a strap terminal anchor 16 between which extends the lap straps 18 and 20 which

are secured together centrally by a quick release buckle 24 and a tongue member 22 adapted to extend into a recess thereof. This lap strap is adapted to restrain a seated pilot from upward or forward movement below the waistline but permits the pilot to lean forward to operate controls and exercise such other freedom as is required.

In order to restrain a person in the seat satisfactorily against extreme upward moving forces, shoulder straps 26 and 28 are provided, the same being anchored to terminal anchor plates 30 and 32 on the inside and near the base of the back of the seat. The forward ends 36 and 38 of the straps are adjustably secured in links 34 and 36, the latter links being provided with links 38 and 40 adapted to be threaded upon the tongue 22 releasably held in the buckle 24 of the lap straps 18 and 20. The shoulder straps 26 and 28 being anchored on the inside of the back of the seat and at a point near the base thereof permit the seated pilot to lean forward without interference and yet when an upwardly exerted force acts to remove him from the seat, the shoulder straps 26 and 28 in combination with the lap straps 18 and 20 restrain such movement.

In order to prevent the pilot from being thrown forward into the dash in the event of an accident or crash, additional shoulder straps 42 and 44 are provided, the latter being secured to the inside of the back of the seat to terminal anchor plates 46 and 48.

In practice the ends of the straps 42 and 44 will be secured at a point located substantially opposite the average height of the shoulder blades of the pilot when seated. The other ends of the shoulder straps 42 and 44 extend over the shoulders of the pilot and substantially along the straps 26 and 28 to a point approximately adjacent the chest of a seated pilot. At this point a resilient extensible strap extension portion 50 is secured as at 52 to each of the straps 42 and 44 and is secured to the shoulder straps 26 and 28 respectively at points 54 and 56 adjacent the lower ends thereof and the links 34 and 36.

A chest latch is secured to each of the shoulder straps 26 and 28 and is adapted to engage and grip the shoulder straps 42 and 44, so as to secure the shoulder straps 26 and 42 and 28 and 44 securely together when desired. Each chest latch may consist of a plate 58 secured to the shoulder straps 26 and 28, the plate having upstanding ears 60 and 62 embracing both straps and adapted to pivotally support therebetween

an eccentric grip cam 64 having a lever handle 66. When the lever 66 is swung to the position shown in dotted 66', the cam grip 64 will be seen to engage and clamp the strap 42 to the strap 26 against the chest latch plate 58, thus causing the strap 42 to be forced against the strap 26, so that support for the shoulder strap 42 is obtained from the lap straps 18 and 20.

By positioning the shoulder straps 42 and 44 within the seat and securing them to the seat back at a point adjacent the pilot's shoulder blades a certain amount of forward movement is permitted the upper portion of the back of the pilot in the event of a serious mishap. By permitting a limited movement of the upper back portion in the manner described, the chances of breaking the neck of the pilot are considerably reduced, since the body is permitted to yield over a greater length. Thus, securing the straps 42 and 44 to the inside of the seat, rather than extending them over the outside, renders the harness less liable to injure the pilot since the full force of a shock tending to throw the pilot forward would not have to be absorbed by the neck, but partially by the back.

In practice the terminal anchor plates may be arranged on the inside of the back of the seat adjacent to such supporting members as are provided on the outside of the back of the seat, so that no substantial alteration in the seat structure is required to accommodate the harness. In practice it will be readily understood that the straps 26 and 28 may be adjusted at the links 34 and 36 to suit the particular pilot, this adjustment taking care of the necessary adjustment for both sets of shoulder straps.

The pilot, as long as he retains the chest latches open and swung upwardly as illustrated in Figure 1, will be free to lean forward and to move as is necessary to perform operations in connection with the piloting of an airplane, through the yielding and resiliency of the resilient sections 50 in each of the straps 42 and 44, but in the event that an accident is imminent or that additional security against possible injurious forward movement is desired, the pilot may quickly turn the levers of the chest latches downward to engage the cam grips 64 and fasten the adjacent straps over each shoulder rigidly together so as to provide him with support sufficient to prevent injury if the forces contended with in the accident or mishap are not too great. It will readily appear that for the pilot to release himself from the seat, if it should be necessary to parachute from the plane, it is merely necessary to release the tongue 22 from the buckle 24, so as to separate the lap straps 18 and 20 and thereupon the links 38 and 40 as the ends of the shoulder straps 26 and 28 become released, thus freeing the pilot completely from the harness.

Although but a single embodiment of the invention has been illustrated and described, it is to be understood that the invention is not to be limited thereto but may be embodied in other equivalent arrangements and forms. As many changes in construction and arrangement can be made without departing from the spirit of the invention as will be apparent to those skilled in the art, reference will be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. In combination with a seat having a back substantially shoulder high, a shoulder strap secured at one end to the inside of the back of said seat at a point substantially in the region of the shoulder blade of an occupant thereof, said strap being adapted to extend over the shoulder of the occupant to a position adjacent the waist of the occupant, and means for securing the waist portion of said strap to the seat and connecting with said strap at a point adjacent the waist of an occupant, said strap having a resilient section therein adjacent the waist end, and means for rendering said resilient portion ineffective to permit elongation of said strap.

2. In combination with a seat having a back, a lap strap extending transversely across the seat, said lap strap comprising two parts, each secured to said seat and releasable means connecting said strap parts, a shoulder strap secured to the inside of the back of the seat adjacent the base thereof and adapted to extend over the shoulder of an occupant thereof to a position adjacent said lap strap, a second shoulder strap, said second shoulder strap comprising a non-resilient section and a resilient section, said non-resilient section being secured to the inside of the back at a point adjacent the region of an occupant's shoulder blade, and adapted to extend over the occupant's shoulder and said resilient section having one end secured to said non-resilient section and its other end secured to a portion of said first shoulder strap adjacent said lap strap, and releasable means for attaching said portion of said first shoulder strap to said first-mentioned releasable means.

3. In combination with a seat having a back, a lap strap extending transversely across the seat, a shoulder strap secured to the inside of the back of the seat adjacent the base thereof and adapted to extend over the shoulder of an occupant thereof to said lap strap, a second shoulder strap secured to the inside of the back at a point adjacent the region of an occupant's shoulder blade, and adapted to extend over the occupant's shoulder and extend to said lap strap, said second named shoulder strap having a resilient section therein adjacent the lap strap end thereof and means for rendering said resilient portion ineffective to permit elongation of said strap.

4. In combination with a seat having a back, a lap strap extending transversely across the seat, a shoulder strap secured to the inside of the back of the seat adjacent the base thereof and adapted to extend over the shoulder of an occupant thereof to said lap strap, a second shoulder strap secured to the inside of the back at a point adjacent the region of an occupant's shoulder blade, and adapted to extend over the occupant's shoulder and extend to said lap strap, said second named shoulder strap having a resilient section therein adjacent the lap strap end thereof and means for rendering said resilient portion ineffective to permit elongation of said strap, said means comprising a manual clamp adapted to secure both shoulder straps together at a point above the resilient section.

5. In combination with a seat having a back, a shoulder strap secured to the inside of the back of the seat adjacent the base thereof and adapted to extend over the shoulder of an occupant thereof to a position adjacent the occupant's waist, a second shoulder strap com-

prising a non-resilient section and a resilient section, said non-resilient section being secured to the inside of the back at a point adjacent the region of an occupant's shoulder blade, and adapted to extend over the occupant's shoulder and said resilient section being secured to the extending portion of said non-resilient section and being adapted to extend to a position adjacent the occupant's waist, and means extending from said seat and being adapted to connect with the waist end portions of said first shoulder strap and said resilient section.

6. In combination with a seat having a back, a shoulder strap secured to the inside of the back of the seat adjacent the base thereof and adapted to extend over the shoulder of an occupant thereof, a second shoulder strap secured to the inside of the back at a point adjacent the region of an occupant's shoulder blade, and adapted to extend over the occupant's shoulder, and means for connecting both of said straps to the seat and connecting therewith at a point adjacent the waist of the occupant, said second named shoulder strap having a resilient section therein adjacent the waist end thereof, and means for rendering said resilient portion ineffective to permit elongation of said strap.

7. In combination with a seat having a back, a shoulder strap secured to the inside of the back of the seat adjacent the base thereof and adapted to extend over the shoulder of an occupant thereof, a second shoulder strap secured to the inside of the back at a point adjacent the region of an occupant's shoulder blade, and adapted to extend over the occupant's shoulder, and means for connecting both of said straps to the seat and connecting therewith at a point adjacent the waist of the occupant, said second named shoulder strap having a resilient section therein adjacent the waist end thereof and means for rendering said resilient portion ineffective to permit elongation of said strap, said means comprising a manual clamp adapted to secure both shoulder straps together at a point above the resilient section.

8. In combination with a substantially shoulder high seat back, a shoulder strap secured to the inside of the back adjacent the base thereof, a strap secured to the inside of the back a short distance down from the upper end thereof, both said straps being adapted to extend over the shoulder of an occupant adjacent said seat back, and down to substantially the waist of the occupant, said straps being joined together substantially at their ends, a resilient section in the shorter strap adjacent the joined ends, and means secured to the other strap for fastening the straps together at a point above the resilient section.

9. In combination with a seat having a back, substantially shoulder high, a lap strap secured at either side of said seat and adapted to secure a person within the seat below the waist, a pair of shoulder straps secured to the inside of the back of said seat at a point a short distance down from the upper end, said straps being adapted to pass over the shoulders of an

occupant and be connected to said lap straps adjacent the waist of the occupant, means in each of said straps adjacent the waist end thereof for rendering them yielding, and means for rendering said yielding means ineffective.

10. In combination with a seat having a back substantially shoulder high, a lap strap extending transversely across the seat, and a shoulder strap secured to the inside of the back of said seat at a point substantially in the region of the shoulder blade of the occupant thereof, said strap being adapted to extend over the shoulder of the occupant and be secured to said lap strap, said strap having a yielding section therein adjacent the lap strap end, and means for rendering said yielding portion ineffective to permit elongation of said strap.

11. A seat and seat harness for aircraft and the like, comprising a seat having a back, a lap strap secured to the sides of said seat and adapted to extend across the seat at a point to engage an occupant seated therein and prevent relative movement of the occupant upward or forward at said point, two shoulder straps secured to the inside of the back of said seat and adapted to extend over the shoulders of the occupant and connect with said lap strap, one of said straps being connected to the back of said seat adjacent the base thereof and the other being connected at a point intermediate the base and top of the back of said seat, said latter strap having a yieldable section therein adjacent the connection to said lap strap, and releasable means for frictionally securing said straps together adjacent the yieldable section in said latter strap and on the side of said yieldable section toward the connection to the back of said seat.

12. In combination with a seat having a back substantially shoulder high, a lap strap extending transversely across the seat and having a release buckle centrally thereof, a pair of shoulder straps secured to the inside of the back of said seat at a point a short distance below the top thereof and adapted to be releasably secured to said buckle, said straps having a resilient section therein adjacent the end adapted for securing to said buckle, and means for rendering said resilient sections ineffective to permit elongation of said straps.

13. In combination with a seat having a back, a lap strap extending transversely across the seat and having a release buckle centrally located thereof, two pairs of shoulder straps secured to the inside of said seat back, one longer pair adjacent the base thereof, and the other shorter pair adjacent the top thereof in a region adjacent the shoulder blades of an occupant, means for detachably securing the longer straps to said release buckle, resilient means securing said shorter straps to said longer straps adjacent the buckle end of said longer straps and means for frictionally securing said straps together above the resilient portion of the shorter straps.

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