

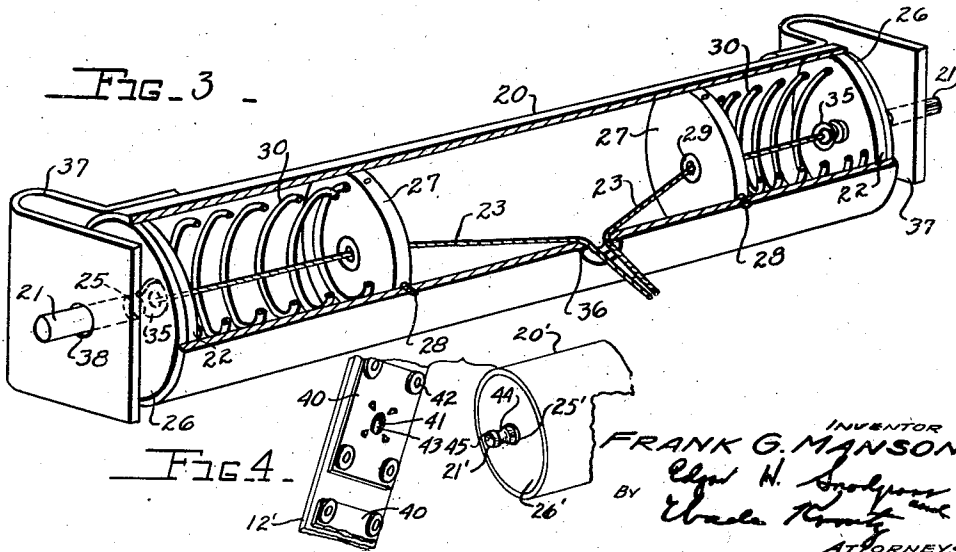
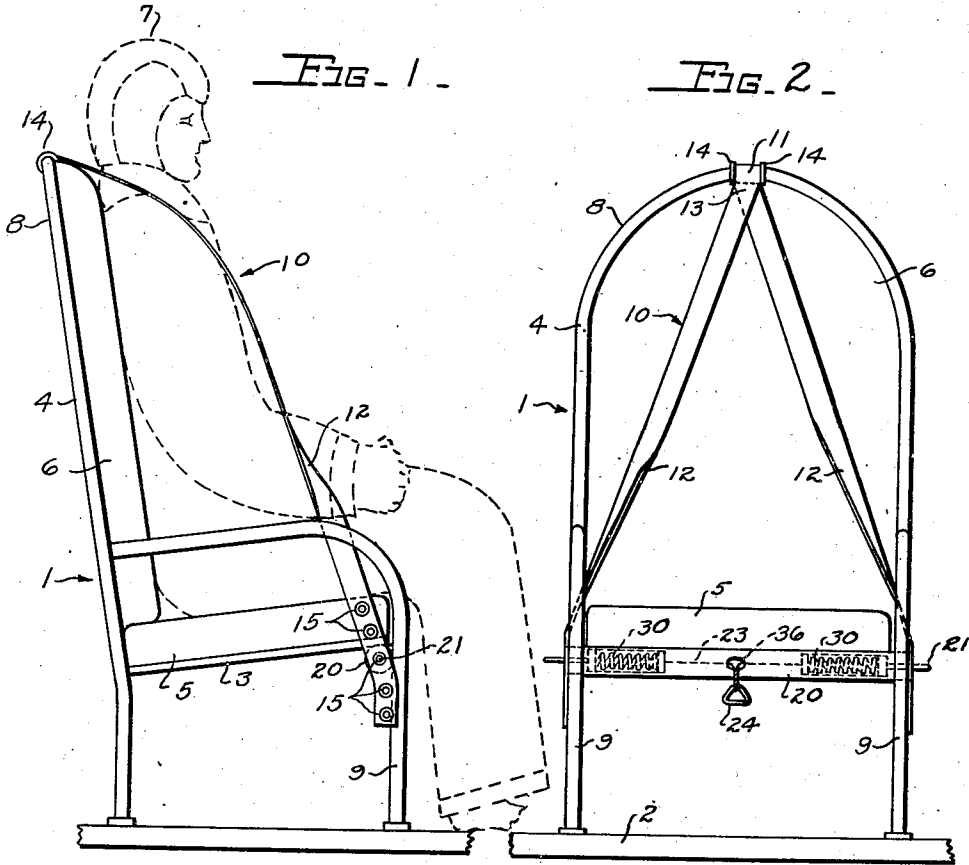
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SAFETY BELT

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SAFETY BELT

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a shoulder type safety belt for use in airplanes and the like.

An object of the invention is to provide an improved safety belt, or harness, to prevent the wearer from being thrown forward, and particularly to prevent the wearer's head from being thrown forward into contact with parts of the airplane or vehicle in which he is riding.

A further object is to provide a novel safety belt for an airplane chair or the like that is permanently attached at one point to the chair, and attached directly to the chair at other points by quick releasable means which also provide for adjustment of the harness.

A further object is to provide a safety belt of simple construction which is independent of the parachute harness or other equipment worn by the user, which is convenient to secure to its attaching means, and which may be instantly released by a single movement or manipulation of the user.

In the drawing, wherein for the purpose of illustration is shown only a preferred embodiment of the invention:

Figure 1 is a side elevation view of a chair in an airplane, or the like, embodying the present invention;

Figure 2 is a front elevation of the structure shown in Figure 1;

Figure 3 is an enlarged perspective view of the belt-securing mechanism with certain parts shown in section; and

Figure 4 is a perspective view showing an alternative form of belt-securing means employing snap fasteners.

A chair for an airplane, or the like, is indicated generally by the reference numeral 1 and is solidly fastened to the floor 2. The chair 1 contains a bottom portion 3 and a back portion 4 carrying in the present instance the cushions 5 and 6, respectively. In Figure 1, the numeral 7 represents an occupant, or pilot, indicated by broken lines. In the present embodiment, the chair 1 is constructed of a welded tubular framework comprising a back frame member 8, the lower portions of which may be formed to serve as the rear legs for the chair. Tubular members 9 constitute the front legs and arms and are preferably welded to the rest of the structure in a manner well understood in the art.

The belt or harness, constituting one of the 55

features of novelty of the present invention, is indicated generally by the reference numeral 10. The belt 10 is of generally inverted V-shape, having a loop portion 11 at the apex and diverging legs 12, 12. The loop 11 is illustrated as formed directly from the material of the belt 10 by lapping and stitching the lapped parts, as shown at 13, but the loop 11 may be formed by a separate attachment secured to the belt 10 at the point 13 by other known means. Flanges, or the like 14, 14 are secured to the back frame member 8 to centrally position the loop 11 thereon. The lower extremity of each leg portion 12 is provided with a plurality of apertures 15, or other suitable spaced means of attachment.

The securing means for the lower ends of the belt 10 comprises the structural elements housed in a tube 20 beneath the forward edge of the bottom portion 3 of the chair. The tube 20 is secured in this position preferably by welding either to the legs 9 or to the bottom portion 3, or both. If the legs 9 are found to be too far forward, the tube 20 may be secured at any desired position beneath the bottom portion 3 to the rear of legs 9. Instead of applying the tube 20 to the chair as an accessory element, the tube may constitute one of the frame members of the chair 1. Projecting from the ends of the tube 20 are the pins, or plungers, 21 adapted to engage selected ones of the apertures 15. Secured to each pin 21 is the disc 22 and the cable 23, the latter having attached thereto the ring or handle 24. The discs 22 are of a size to provide a sliding fit within the tube 20, guiding and carrying therewith the pins 21 for reciprocating movement under the action of the cable 23. The pins 21 are further guided in their movement by apertures 25 in discs 26 secured by welding or other known means in the ends of the tube 20. Spaced from the ends of the tube 20 and from the respective discs 26 are another pair of discs 27, 27 fixedly secured within the tube by means of pins 28 or other equivalent securing means. Central apertures 29 in the discs 27 provide guiding means for the cable 23 extending therethrough. Springs 30, 30 react against the respective discs 27 and resiliently urge the pins 21 carried by the discs 22 into extended positions, as illustrated. The inner ends of the pins 21 may be provided with eyes 35 for convenient attachment of the cable 23. To reduce friction and guide the cable 23 where it leaves the tube 20, a flanged aperture 36, or other equivalent friction reducing means, may be provided. Lever operated means, or any other

convenient device may be employed in place of the ring 24 to apply tension to the ends of the cable 23 to retract the pins 21.

In Figures 1 and 2, the legs 12 of the belt are illustrated as being merely slipped over the outer ends of the pins 21, to be retained in place by the angularity of the pull on the portions 12 converging towards the common point 13, as best shown in Figure 2. Additional positive means may be necessary in certain installations to prevent the disengagement of the apertures 15 from the ends of the pins 21. For this purpose, the tube 20 is illustrated in Figure 3 as provided at its ends with overlapping U-shaped plates 37, 37. Each plate 37 is provided with an aperture 38 in alignment with the pin 21, the opening 38 being larger than the pin to allow for possible deflection or deformation of the pin. By making the plates 37 of U-shape in the manner shown, accommodation is provided for belts of considerably greater width than the diameter of the tube 20. Plates 37 may be conveniently welded directly to the ends of the tube 20, and may be directed either forwardly or rearwardly with respect to the chair.

Figure 4 shows an alternative manner in which the lower end of each belt leg 12 may be secured in adjusted position, parts corresponding to parts in Figure 3 being designated by primed reference characters. In the embodiment shown in Figure 4 a plurality of plates 40, having central apertures 41, are secured in spaced relation along the belt leg 12' by means of rivets, or the like 42. Attached to the back side of each plate 40 adjacent the belt, and in operative relation with respect to, and overlying, the aperture 41 is the female member 43 of a snap fastener of the "lift the dot" variety. The retractable pin 21' is formed with a reduced neck 44 so as to leave a head 45 on the end thereof adapted to cooperate with the fastener element 43. This type of fastener is provided with resilient gripping means to frictionally engage and hold the head of a pin of the shape of pin 21'. The belt ends are fastened by snapping one of the "lift the dot" fasteners 43 over the end of each projecting pin 21'. Instant simultaneous release of the fasteners on both sides of the chair is effected as in the embodiments of Figures 2 and 3, by a quick pull on the ring 24 to retract the pins 21'.

When an occupant is seated in the chair 1, the legs 12 of the belt are disposed over the shoulders in the manner illustrated and secured to the pins 21 or 21' so as to provide the desired snugness or tension in the belt. Thus, it will be seen that the upper portions of the legs 12 converge as they pass upwardly over the shoulders of the occupant and firmly resist any forward bending movement from the hips, which may be occasioned by the impact of sudden shocks, such as may attend the operation of an airplane, or the like, particularly in landing or in case of a head-on collision. Also, belt 10, being disposed throughout most of its length in front of the occupant of the chair, and overlying the shoulders of the occupant, will effectively resist any tendency to displace an occupant from the chair in any direction. It may be found desirable to cross the straps 12 in front of the body, attaching the right hand strap to the pin on the left side, and attaching the left hand strap to the pin on the right side of the chair.

While it is preferred that the apex portion 11 of the belt be attached to the back of the chair at a single point, the invention may be practiced

by attaching the upper ends of each leg 12 at closely spaced points on the back of the chair or at closely spaced points on some other structure behind the chair. Similarly, while the means of attachment for the lower ends of the belt are illustrated as consisting of retractable pins engageable with fixed points on the belt, other detent means, or releasable friction means may be employed. One important requirement, however, regardless of the type of attachment employed in lieu of the pins 21 or 21', is that both of the attaching or securing means for the lower ends of the belt be quickly and simultaneously releasable to immediately free the occupant from the chair by a single convenient manipulation in case of emergency. An advantage of the present construction is the simplicity both of construction and of operation. The belt 10 is intended to be permanently secured to the top of the chair back so that the legs or straps 12 will always be hanging in an accessible position when an occupant assumes his position in the chair. The two points of attachment for the lower ends of the belt are in plain view of an occupant so seated and are readily accessible for quickly securing the ends in position with the desired tension. The action of securing the belt ends on the pins 21 or 21' also performs the function of adjustment of the length of the straps, thereby obviating the necessity for any separate adjusting means. If the occupant may desire to suddenly free himself from the restraint of the belt, he may do so in an instant by merely exerting a pull upon the ring 24 at the same instant that he starts to rise from the chair. As soon as the pins have been withdrawn from engagement with the straps, his rising motion will pull the straps free at their lower ends without further thought or attention.

It is to be understood that my invention is capable of many modifications. Changes, therefore, in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

Having now described my invention and the manner in which the same may be used, what I claim as new and desire to secure by Letters Patent is:

1. A chair for an airplane or the like, comprising a bottom portion and a back portion, a pair of straps secured to said back portion and having depending ends, a plurality of apertures in each of said ends, a tube secured transversely under said bottom portion, plunger elements in the ends of said tube adapted to engage selected ones of said apertures, spring means in said tube to urge said plunger elements into extended position to effect said engagement, a flexible cable in said tube attached to said plunger elements and adapted to simultaneously withdraw both of said plunger elements to release said strap ends, and means in the mid-length of said tube and accessible from the front of the bottom portion of said chair for tensioning said cable to withdraw said plunger elements.

2. In a chair for an airplane or the like, a safety belt adapted to restrain the forward movement of an occupant thereof, said safety belt comprising a pair of straps fixedly secured to the back of said chair so as to have an effective point of attachment therewith at approximately the neck height of a seated occupant, said straps being adapted to be disposed over the shoulders and down the front of said occupant and to be ad-

justably engaged at the sides of said chair seat by quick-release securing means, said means comprising a pair of retractable pins carried in a tubular member mounted transversely of the seat of said chair, said pins being engageable with said straps at a plurality of points therealong so as to accomplish the length adjustments of the belt simultaneously with the fastening thereof, spring means housed in said tubular member for extending said pins, and a single manipulable element carried by said tubular member and accessible at the central front portion of said chair seat for simultaneously retracting said pins from engagement with said belt to free said occupant, said safety belt being independent of any harness worn by said occupant.

3. In a chair for an airplane or the like, a safety belt adapted to restrain the forward movement of an occupant thereof, said safety belt comprising a pair of straps fixedly secured to the back of said chair so as to have an effective point of attachment therewith at approximately the neck height of a seated occupant, said straps being adapted to be disposed over the shoulders and down the front of said occupant and to be adjustably engaged at the sides of said chair seat by quick-release securing means, said means being engageable with said straps at a plurality of points therealong so as to accomplish the length adjustments of the belt simultaneously with the fastening thereof, and a single manipulable element accessible at the front portion of said chair seat for simultaneously releasing said securing means from engagement with said belt to free said occupant, said safety belt being independent of any harness worn by said occupant.

4. In a device of the character described, a chair for supporting a human body in a sitting posture, means behind the body in the region of the shoulders for fastening a safety belt, a belt

secured to said fastening means, said belt comprising two diverging branches extending forward over the shoulders and downward alongside the body, a pin projecting laterally from each side of the chair, a spring for each pin for holding it in the projected position, means carrying a series of sockets spaced apart on the free ends of said branches for fitting around the ends of the pins, resilient gripping means in said sockets for yieldably holding said sockets on said pins, there being a groove in said pins for said resilient gripping means to engage, and means to simultaneously withdraw said pins laterally from said sockets against the yieldable resistance of said resilient gripping means and against the face of said springs.

5. In a device of the character described, a chair for supporting a human body in a sitting posture, means behind the body in the region of the shoulders for fastening a safety belt, a belt secured to said fastening means, said belt having two diverging branches extending forward over the shoulders and downward alongside the body, means for releasably fastening the free ends of said branches to the sides of said chair, said means comprising a fastener part normally projecting laterally from each side of the chair but supported for lateral withdrawal thereinto, a series of laterally engageable co-operating fastener parts spaced one above the other on each of the free ends of said branches, any selected one of said series being laterally movable into co-operative relation with one of the projecting fastener parts, resilient means associated with said fasteners for yieldably holding the one part of an engaged pair from being laterally withdrawn from the other part, and means to simultaneously withdraw the said chair supported fastener parts from the co-operating fastener parts against the yieldable resistance of said resilient means.

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