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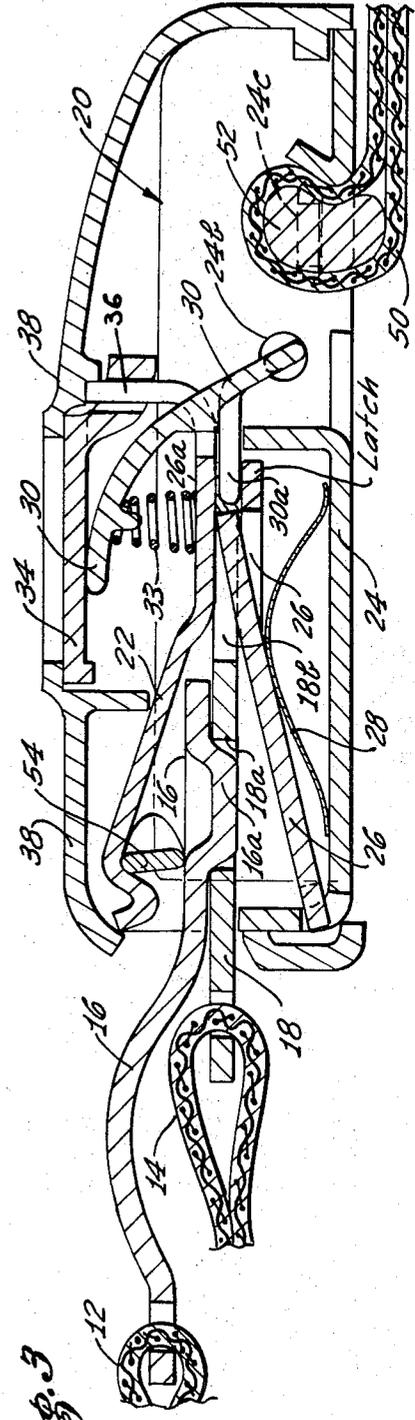
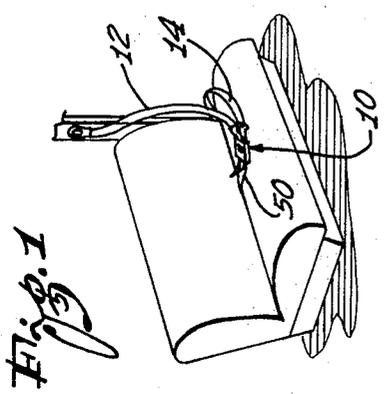
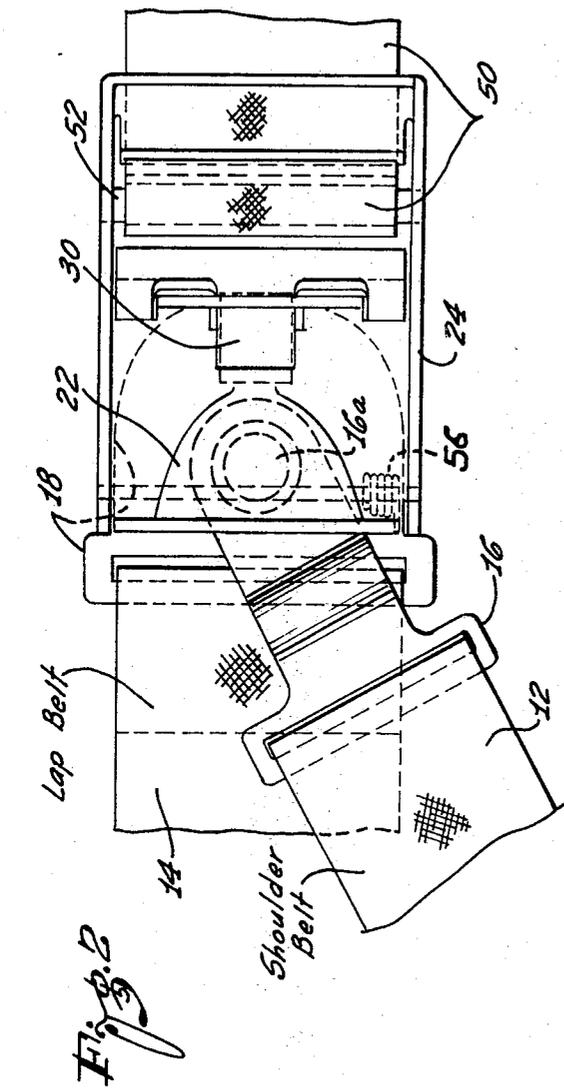
F. G. HUGHES

3,534,448

DUAL BUCKLE ASSEMBLY FOR LAP AND SHOULDER BELTS

Filed July 24, 1968

4 Sheets-Sheet 1



INVENTOR:
 Frederick G. Hughes
James and Beecher
 By *Keith D. Beecher*
 ATTORNEYS

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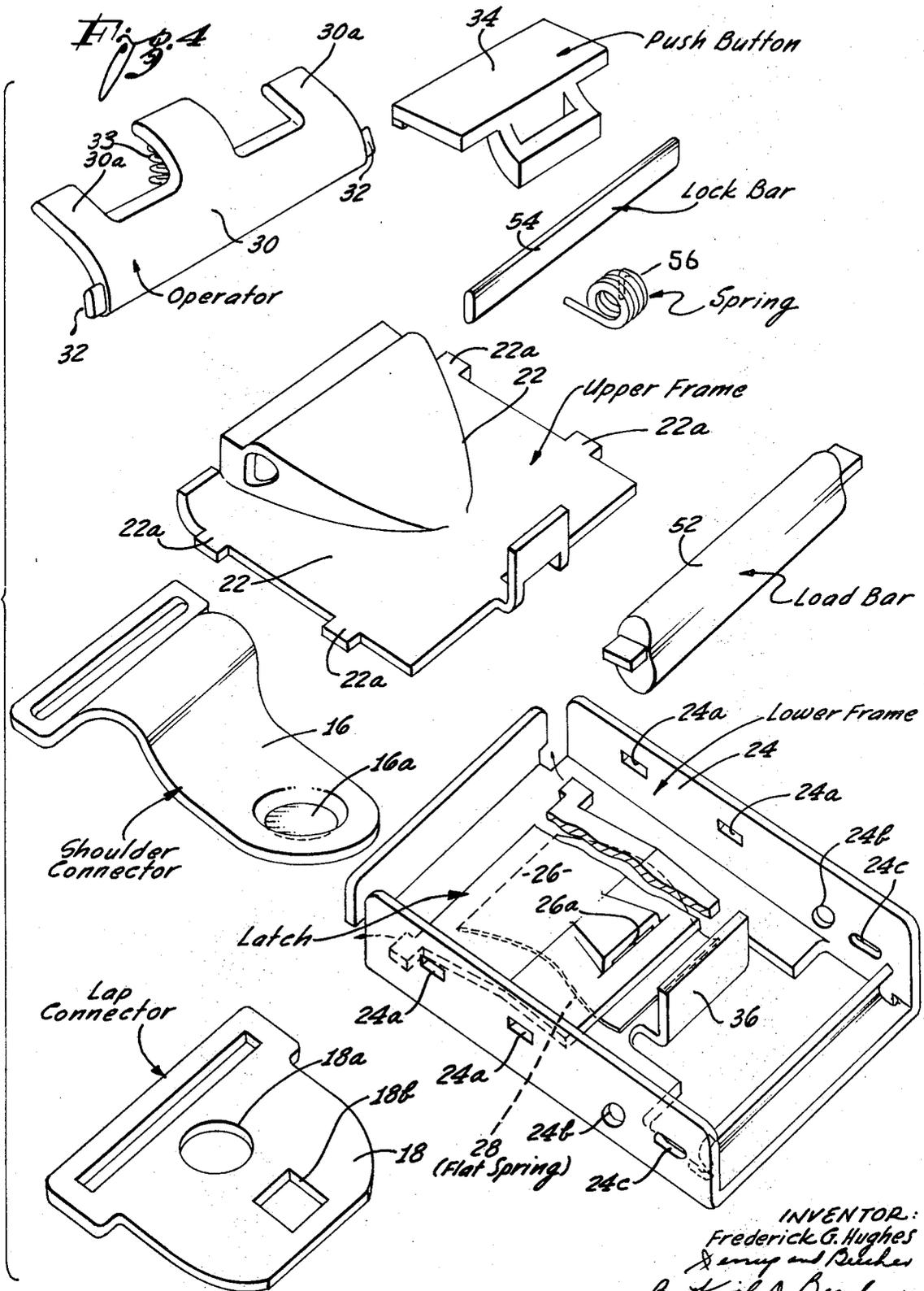
F. G. HUGHES

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DUAL BUCKLE ASSEMBLY FOR LAP AND SHOULDER BELTS

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4 Sheets-Sheet 2



INVENTOR:
Frederick G. Hughes
By *[Signature]*
Keith D. Beecher
ATTORNEYS

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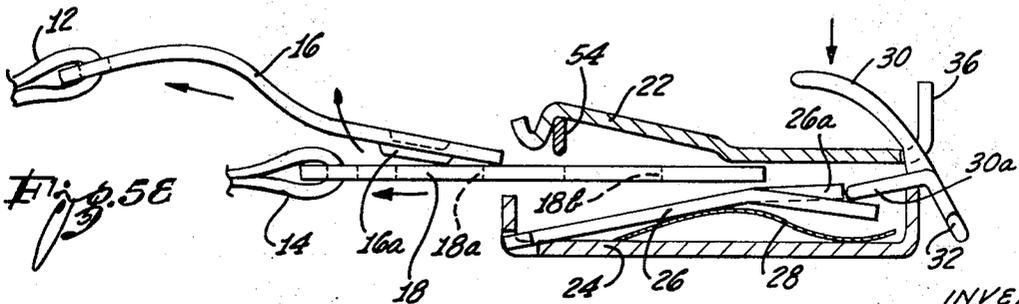
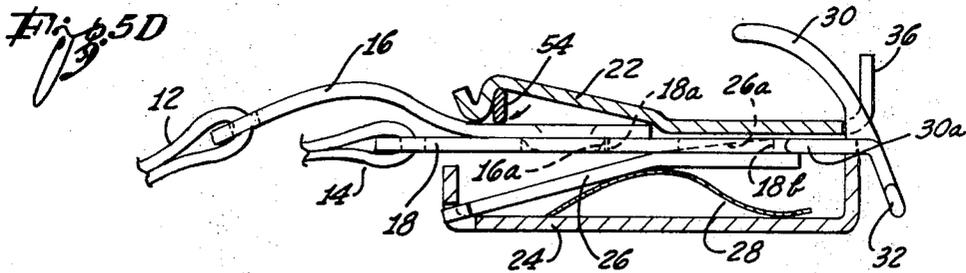
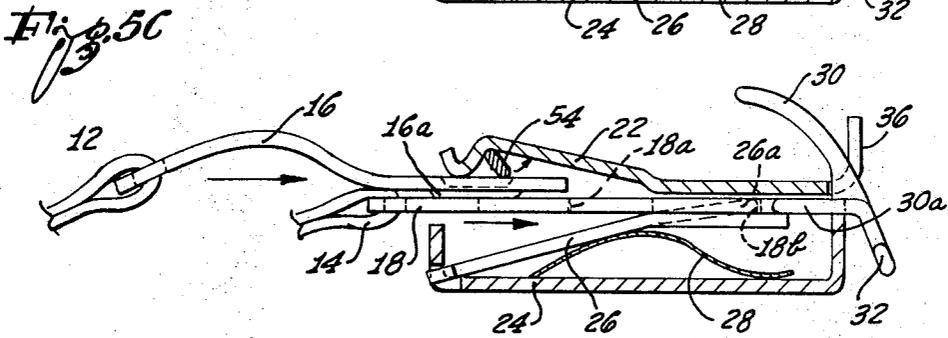
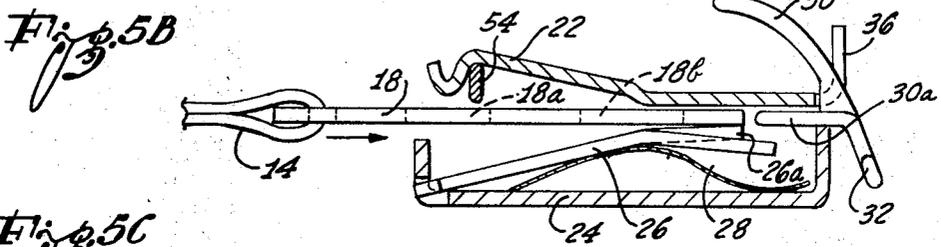
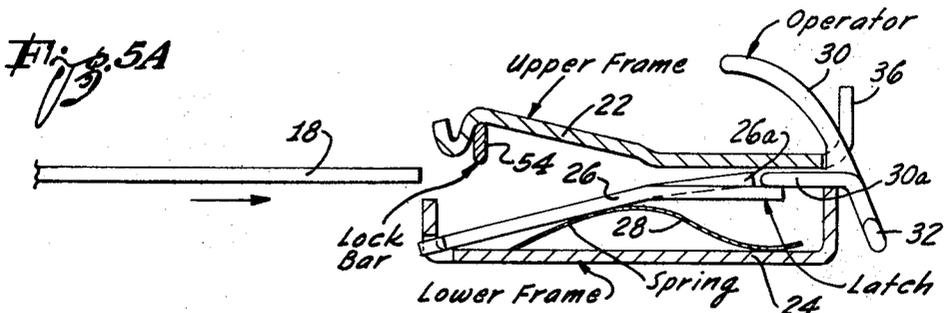
F. G. HUGHES

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DUAL BUCKLE ASSEMBLY FOR LAP AND SHOULDER BELTS

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4 Sheets-Sheet 3



INVENTOR:
Frederick G. Hughes
James and Beecher

By Keith D. Beecher
ATTORNEYS

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DUAL BUCKLE ASSEMBLY FOR LAP AND SHOULDER BELTS

Frederick G. Hughes, 11122 Brunswick Way,
Santa Ana, Calif. 92705

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8 Claims

ABSTRACT OF THE DISCLOSURE

A dual buckle for a seat belt assembly is provided for releasably securing a lap strap and a shoulder strap in a motor vehicle, or the like, in which the metal tongue plates for the two straps are held one over the other within the buckle assembly in a juxtaposed relationship, to be released together when the buckle is released. The buckle assembly is constructed so that the lap tongue plate may be fastened alone, but the shoulder tongue plate may not be fastened alone, for safety reasons.

BACKGROUND OF THE INVENTION

Present day federal law requires that the seat belt assemblies in the front seats of all presently manufactured motor vehicles include both lap and shoulder straps. This requirement has created problems, not only from an economical standpoint, but also from a usage standpoint. Car manufacturers are now faced with the problem of providing three sets of lap straps and two sets of shoulder straps in the front seat of the motor vehicle, all of which has a tendency to result in a confused tangle of seat straps, buckles, and tongue plates.

For example, in order to comply with the requirements of the law, and when prior art practices are followed, eight straps are required in the front seat with two additional straps hanging overhead. This results in a total of ten dangling straps, each equipped with its own buckle or tongue plate, in accordance with the usual practice in the field. This multiplicity of straps gives rise to difficulties in matching the various buckles with their mating tongue plates so that the proper restraint of the lap and chest of each occupant may be carried out.

The situation outlined above tends to reduce the effectiveness and intendment of the law, since it creates a condition which most people find the belts too cumbersome to use. In addition, recent tests carried out by the car manufacturers have indicated that if shoulder straps are used alone, and not in conjunction with lap straps, a more hazardous condition is created than would be the case if no seat belts at all were used.

The improved buckle assembly of the present invention corrects to a large extent the situation outlined in the preceding paragraphs. As mentioned above, the buckle assembly of the invention serves a dual purpose of providing a common clasp for the tongue plates of both a shoulder strap and a lap strap. This means that the number of straps for each shoulder/lap set is reduced from four to three, and the number of buckles is reduced by 50%. Moreover, the dual buckle assembly of the invention enables the tongue plates of the various straps of each set to be easily matched up and inserted into the proper buckles.

An important feature of the buckle assembly of the invention is that it is constructed, in a manner to be described, so that although the tongue plates of a lap strap may be fastened alone into the buckle if the user so desired, this is not possible with the shoulder strap. The shoulder strap may be retained by the dual buckle assembly of the invention only if the lap strap has first been inserted and latched into place. With this construction,

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the possibility is obviated of anyone using a shoulder strap alone which, as indicated by tests, creates a dangerous and hazardous situation.

BRIEF DESCRIPTION OF THE DRAWINGS

5 FIG. 1 is a perspective view of a seat to which the principles of the present invention have been applied;

FIG. 2 is a plan view, with the cover removed, and showing the details of one embodiment of the dual buckle assembly of the present invention;

10 FIG. 3 is a sectional view of the buckle assembly of FIG. 2, taken essentially along the line 2—2 of FIG. 2, and showing the various internal components of the assembly in greater detail;

15 FIG. 4 is a perspective exploded representation of the various components which make up the assembly of the embodiment illustrated in FIGS. 2 and 3;

20 FIGS. 5A—5E are views, similar to the view of FIG. 3, and showing the manner in which the dual buckle assembly of the invention operates to perform its intended function; and

FIGS. 6 and 7 are plan and sectional views, similar to the views of FIGS. 2 and 3 respectively, of a second embodiment of the invention.

25 DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The improved buckle assembly of the present invention is designated as 10 in FIG. 1, and, as illustrated, it serves as a common buckle for a shoulder strap 12 and a lap strap 14. As shown in the embodiment of FIGS. 2 and 3, for example, the shoulder strap 12 is provided with a metallic tongue plate 16, whereas the lap strap 14 is provided with a metallic tongue plate 18. The tongue plates 16 and 18 are attached to their corresponding straps by usual coupling means.

30 The tongue plate 16 is provided, for example, with a boss portion 16a which protrudes from the plane of the plate. Also, the rear portion of the plate 16 has an arcuate shape, as shown in FIG. 3, to facilitate its insertion and removal from the buckle without interference with the protruding portion of the tongue plate 18 and its strap 14. This arcuate shape of the tongue plate 16 also serves to prevent it from being inserted into the buckle upside down.

35 The plate 18 is provided with an opening or recess 18a for receiving the boss 16a, when the plate 16 is inserted into the buckle over the plate 18 in a juxtaposed relationship, such as shown in FIG. 3. The sides of the boss 16a are inclined to facilitate the insertion of the boss into the opening 18a in the connector 18, and also to prevent false latching of the shoulder tongue plate 16 should it be inserted without first inserting the lap tongue plate 18.

40 The buckle assembly itself is designated 20, and, as shown in FIG. 3, it includes an upper frame 22 and a lower frame 24. The upper frame may be mounted over the lower frame, and held in position, by lugs 22a which extend out from the sides of the upper frame, and which are received in corresponding recesses 24a (FIG. 4) in the sides of the lower frame 24.

45 A latch member 26 is supported in an inclined position in the lower frame 24, and the latch member is biased in a counterclockwise direction in FIG. 3, by means, for example, of a leaf spring 28. The counterclockwise movement of the latch member 26 is limited by an operator member 30 which also is mounted in the lower frame for pivotal movement, by means of a pair of protruding pins 32 which are received in holes 24b in the sides of the lower frame.

50 The operator 30 is biased in a clockwise direction by means of a spring 33. The spring 33 being interposed, as best shown in FIG. 3, between the upper frame 22 and the

underside of the operator. The clockwise movement of the operator 30, in turn, is limited by the upper frame 22. A push button 34 fits over and is guided by an upturned end wall 36 of the upper frame 22, and its upward movement is limited by a cover 38 which extends over the entire assembly. The upturned end wall 36 also serves to support the cover 38, and thereby prevent it from being crushed when a load is applied to the top of the cover.

As shown in FIG. 3, the push button 34 is accessible through an opening in the cover 38, so that it can be depressed, when it is desired to turn the operator 30 and release the latch member 26. When the push button 34 is depressed, the operator 30 is moved in a counterclockwise direction against the bias of the spring 33, and portions 30a of the operator move down against the latch member 26, to move the latch member angularly downwardly against the bias of the leaf spring 28.

The latch member 26 has a protruding section 26a which normally engages the side of an opening 18b in the tongue plate 18, when the plate is inserted into the buckle assembly between the upper frame 22 and the lower frame 24. The upper and lower frames 22 and 24 define an opening in the front of the buckle for receiving the tongue plate 18, as well as the tongue plate 16, as shown in FIG. 3. The common strap for the assembly is designated 50, in FIG. 3, and this strap is supported by the lower frame 24 by means of a load bar 52 which permits adjustment of the effective length of the strap.

As illustrated in FIG. 3, the shoulder strap tongue plate 16 is inserted into the buckle assembly between the upper and lower frames 22 and 24, to overlie the lap belt tongue plate 18 in a juxtaposed relationship. A pivotally mounted lock bar 54 is positioned adjacent the opening in the front of the assembly between the frames 22 and 24, and is spring biased in a clockwise direction by a spring 56. The lock bar is shown as having a flattened cross-section, and the spring 56 biases the lock bar in a clockwise direction about its pivot point, so that its flattened cross-section assumes an upright position, such as shown in FIG. 3 under normal circumstances.

When the shoulder tongue plate 16 is inserted into the buckle assembly, the lock bar 54 is turned by the tongue plate in a counterclockwise direction in FIG. 3, and against the bias of spring 56. However, when the boss 16a of the shoulder tongue plate 16 moves down into the recess 18a, the spring 56 biases the lock bar 54 back to its illustrated upright position in FIG. 3, so that the shoulder tongue plate 16 is firmly retained in the buckle assembly, since the lock bar 54 prevents the boss 16a from being withdrawn from the opening 18a in the lap tongue plate 18.

The various operating steps of the buckle assembly are best explained by reference to FIGS. 5A-5C. For example, in FIG. 5A, the latch member 26 is normally spring biased to an upper position. However, when the lap tongue plate 18 is inserted between the upper and lower frames 22 and 24, and as shown in FIG. 5B, the latch member 26 is biased down against the leaf spring 28 (FIG. 3). Then, when the tongue plate 18 is fully inserted into the frame, as shown in FIG. 5C, the protruding portion 26a of the latch 26 enters the opening 18b in the tongue plate 18, so that the plate is securely latched within the buckle assembly.

The above-described operation enables the buckle of the invention to be used in a simple and uncomplicated manner when used, for example, only with the lap belt. That is, the user merely inserts the tongue plate of his lap strap into the buckle assembly, until it latches into place to be firmly retained within the assembly, exactly as if he were latching the lap belt to the usual prior art single strap buckle. However, if it is desired also to fasten the shoulder strap into the buckle assembly, and as shown in FIG. 5C, for example, the tongue plate 16 is inserted into the buckle assembly through the

opening in the front end of the buckle assembly, and directly on top of the tongue plate 18.

As the shoulder tongue plate 16 is moved into the assembly, the lock bar 54 is pivoted against its spring bias, as shown in FIG. 5C. Then, when the plate 16 is fully inserted into the buckle assembly, its protruding portion 16a falls into the recess or opening 18a in the lower lap plate 18 and the lock bar 54 turns back to its upright position, as shown in FIG. 5D, and locks the plate 16. The assembly shown in FIG. 5D shows the buckle in the latched position, whereby both plates 16 and 18 are firmly and securely held within the assembly.

To release the two tongue plates 16 and 18, it is merely necessary to push the push button 34 of FIG. 3, so that the operator 30 is turned to the position shown in FIG. 5E. In the latter position of the operator 30, the latch 26 is pushed down to release its protruding portion 26a from the aperture 18b in the plate 18. The plate 18, and therefore the plate 16, may both be then removed from the buckle assembly, as shown in FIG. 5E.

If the plate 16 is inserted into the assembly, it does not have the necessary opening for receiving the protruding portion 26a of the latch 26. Therefore, under no circumstances will the buckle assembly operate to fasten the shoulder tongue plate 16, unless the lap tongue plate 18 has first been inserted and latched in the buckle. This is desirable, as mentioned above, since a safety hazard results when one uses only the shoulder harness.

The buckle assembly of the invention is simple in its construction, as is evident from the foregoing. Also, it may be constructed inexpensively and yet to be strong and rugged. The buckle is easy to use, since it is merely necessary first to insert the lap belt tongue plate 18 and snap it into place, and subsequently to insert the shoulder belt tongue plate 16 over the lap plate. As shown, for example, in FIGS. 5C-5E, and as mentioned above, the tongue plate 16 has an arcuate configuration towards its rear end to facilitate its insertion into the buckle assembly over the belt 14 attached to the plate 18.

It will be appreciated, of course, that although a push-button type buckle assembly has been shown and described herein, the invention is equally applicable to the lever-operated type of buckle.

The buckle assembly of the invention is constructed to provide some degree of angular freedom to the shoulder strap tongue plate 16 when it is inserted into the buckle. Also the assembly is constructed so that the buckle may be mounted for use on either side of the seat of the vehicle.

The embodiment of FIGS. 6 and 7 is similar in some respects to the embodiment described above and like components have been designated by the same numerals.

In the latter embodiment the lock bar 54 is eliminated; and the boss 16a in the tongue plate 16 is replaced by a spring loaded latch 16'a, the tongue plate itself being designated 16' in FIGS. 6 and 7. The upper frame 22' in the second embodiment has a different configuration, and it serves as a guide for the tongue plate 16'. The overall thickness of the buckle of FIGS. 6 and 7 is somewhat less than the buckle of FIGS. 2 and 3.

The operations of the two embodiments of the invention are essentially the same. In the case of the latter buckle assembly, the tongue plate 16' is slipped in over the previously inserted tongue plate 18 and under the frame 22'. The tongue plate is inserted until the latch 16'a drops into the recess 18a in the lower tongue plate. The tongue plate 16' is held in its latched position in the buckle assembly by the upper frame 22'. Otherwise, the two embodiments operate in the same manner.

What is claimed is:

1. A dual buckle assembly for fastening a first strap tongue plate and a second strap tongue plate one over the other in a juxtaposed relationship with one another, one of said tongue plates having a protruding portion

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and the other of said tongue plates having a recess for receiving said protruding portion, said buckle assembly including: a frame; a latch member mounted in said frame for releasably retaining said first tongue plate within said frame; said frame including means for permitting said second tongue plate to be inserted into said frame over said first tongue plate until said protruding portion thereof mates with said recess and then preventing subsequent withdrawal of said second tongue plate; and means mounted in said frame in position to be moved against said latch member and release said first tongue plate and thereby further to release said second tongue plate from said frame.

2. A buckle assembly for fastening a first strap tongue plate and a second strap tongue plate one over the other in a juxtaposed relationship with one another, one of said tongue plates having a protruding portion and the other of said tongue plates having a recess for receiving said protruding portion, said buckle assembly including: a frame; a latch member mounted in said frame for releasably retaining said first belt tongue plate within said frame; a locking member mounted in said frame in position to permit said second belt tongue plate to be inserted into said frame over said first tongue plate until said protruding portion thereof mates with said recess and then to prevent subsequent withdrawal from said frame of said second tongue plate, and a member mounted in said frame in position to be moved against said latch member and release said first tongue plate and thereby further to release said second tongue plate from said frame.

3. The combination defined in claim 2 in which said locking member comprises a transverse lock bar pivotally mounted in said frame.

4. The combination defined in claim 2 in which said first tongue plate has an opening therein to receive said latch member, and in which said latch member is spring biased into a latching position with respect to said first tongue plate when said first tongue plate is inserted into said frame.

5. The combination defined in claim 4 and which includes a manually operated spring-biased push-button

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mounted in said frame in position to engage said operator member and actuate said last-named member so as to cause said latch member to release the first and second belt tongue plates.

6. The combination defined in claim 3 in which said lock bar is pivotally mounted, and which includes spring means coupled to said lock bar angularly to bias said lock bar to cause said lock bar normally to assume a first angular position with respect to said frame, so that the insertion of said second tongue plate into said frame causes said lock bar to pivot in one direction against said spring bias, said spring bias causing said lock bar to assume the aforesaid first angular position when the aforesaid protruding portion of one of said belt plates is received by the aforesaid recess of the other of said belt plates.

7. The combination defined in claim 2 in which said frame defines an opening at its front end for receiving said tongue plates, said opening having sufficient width to permit limited angular movement of one of said tongue plates with respect to said frame.

8. The dual buckle assembly defined in claim 1 in which said protruding portion of said one of said tongue plates comprises a spring-loaded latch.

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BERNARD A. GELAK, Primary Examiner

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