

Jan. 7, 1958

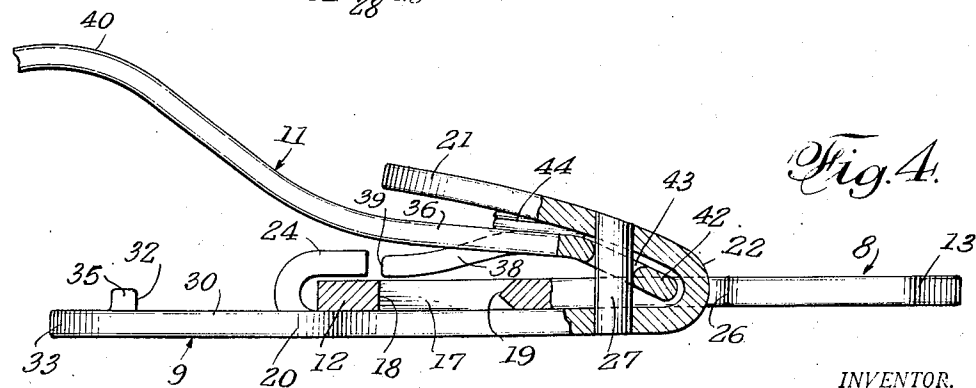
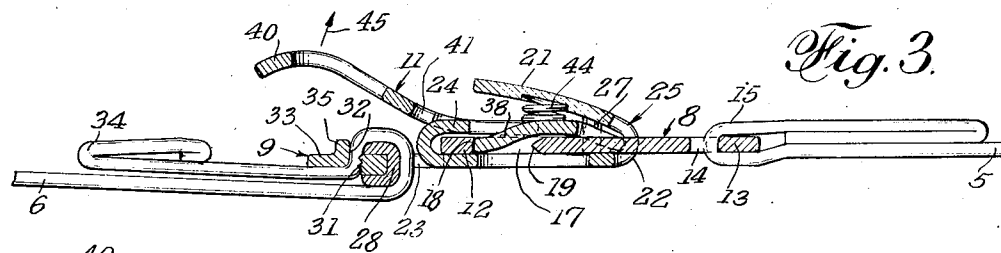
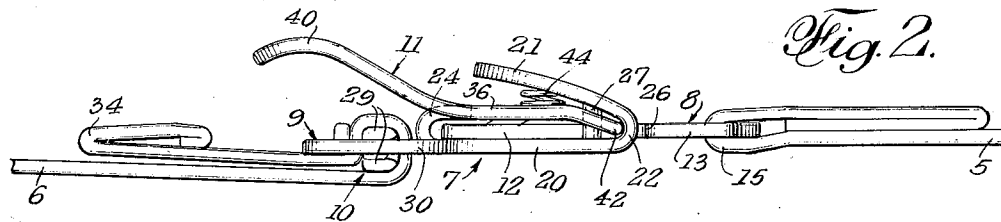
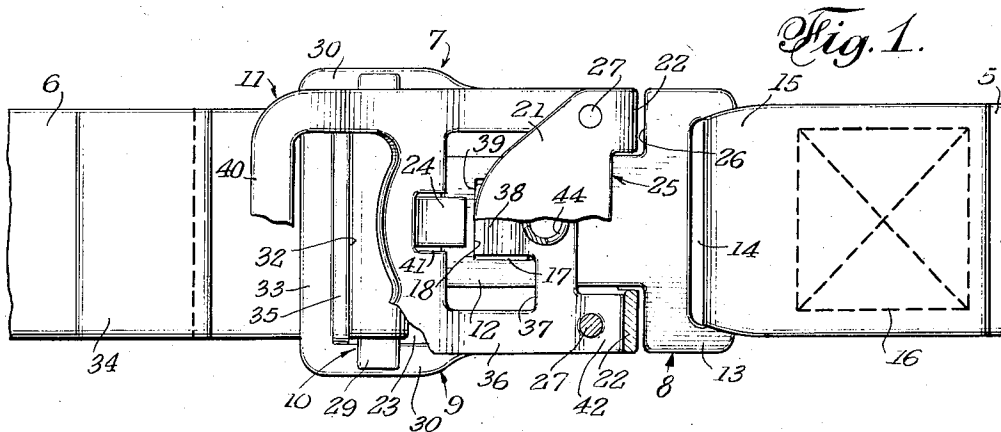
E. C. ELSNER

2,818,623

BUCKLE

Filed July 12, 1954

2 Sheets-Sheet 1



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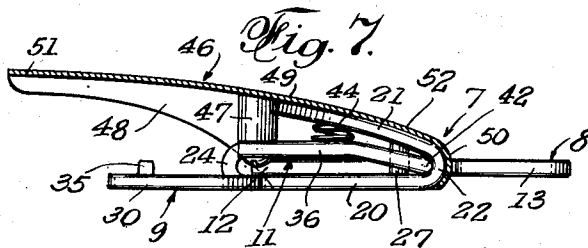
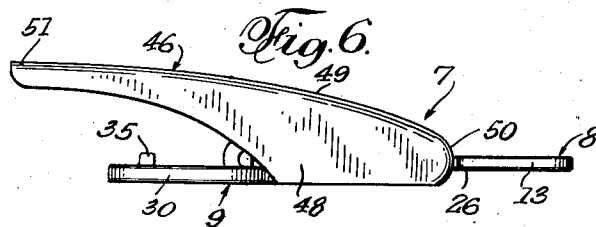
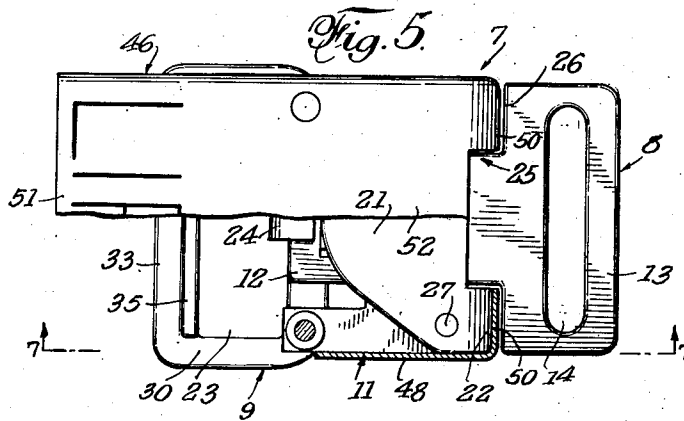
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2 Sheets-Sheet 2



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2,818,623

BUCKLE

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Application July 12, 1954, Serial No. 442,822

7 Claims. (Cl. 24—75)

This invention relates to a buckle construction that may have a variety of uses and is more especially adapted to connect the ends of a safety belt because of the quick release features thereof.

Quick release buckles, particularly of the type referred to, are usually operated by lay people and, therefore, should embody a fool-proof operation, as well as be sturdily constructed and readily operable to released condition with comparatively little effort. Frequently, such buckles are placed under considerable tension force, whether used to connect the ends of a belt or for other purposes, and it is essential that release may be effected easily despite such tension forces. Accordingly, it is an object of this invention to provide a buckle construction that can be readily released by a quite small manually-applied force even though the buckle is being subjected to commensurately greater force, the structure contemplated being such as to enable release under conditions where the tension force is many times greater than the required release force.

Another object of the invention is to provide a buckle comprised of two buckle parts that are capable of effecting connection of two strap ends and under high tension forces applied between said strap ends, and effecting separation of the buckle parts by a relatively small manual force applied in a direction transverse to the direction of said tension forces.

A further object of the invention is to provide a two-part buckle in which one part embodies a transverse abutment and the other part includes a release member in edge abutment with said transverse abutment and is movable transversely to the line of pull between the parts to release the same.

A still further object of the invention is to provide a buckle of the character referred to that is neat and trim in appearance and of such smooth outward appearance as to obviate catching or snagging of clothing, buttons, or other things.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes, preferred embodiments of the present invention, which are given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a plan view, with parts broken away, of a buckle constructed in accordance with the invention.

Fig. 2 is a side elevational view thereof.

Fig. 3 is a longitudinal sectional view taken through the substantial middle of said buckle.

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Fig. 4 is an enlarged longitudinal sectional view, showing the parts of the buckle in released position.

Fig. 5 is a plan view of a modification.

Fig. 6 is a side elevational view thereof.

Fig. 7 is a longitudinal sectional view as taken on line 7—7 of Fig. 5.

The drawings show the ends 5 and 6 of either one strap or two straps that have their other ends relatively fixed. Said ends may comprise the ends of such articles, for example, as a lap-encircling safety belt, a cargo-confining sling, or a life-boat release. In any case, said strap ends 5 and 6 are adapted to be placed under tension while connected by the present buckle 7.

The buckle 7 that is illustrated comprises, generally, a buckle part 8 preferably permanently attached to strap end 5, a buckle part 9 adjustably connected to strap end 6, means 10 to effect such adjustment, and means comprising a member 11 carried by part 9 and combining both an operating handle or lever and an abutment in releasable inter-engagement with part 8.

The buckle part 8, in the present instance, is formed as a flat metallic member having a relatively narrow tongue 12 that extends centrally from a wider portion 13. The latter has a closed slot 14 through which the bight of a loop 15 formed in strap end 5 is trained. Stitches 16 through the plies of said loop permanently captivate member 8 which, therefore, constitutes a metallic end for the strap end 5. Said tongue 12 is formed with a preferably rectangular opening 17 that is defined at one end by an abutment edge 18 and at the opposite end by an oppositely chamfered edge 19.

The buckle part 9, in the form illustrated, is made of a flat metallic member comparable to that of part 8. Said part 9 comprises a back 20 and a front 21 that are formed by bending the member as at 22. The shape thus provided has the general form of a J with the back 20 as the main stem, the front 21 as the leg and the bend 22 as the loop connecting the stem and leg.

The end of back 20 that is remote from bend 22 is provided with a slot 23 that is somewhat wider transversely than the width of strap end 6 and substantially larger in the longitudinal dimension than is slot 14. Part of the material that is removed to form slot 23 is formed as a narrow portion that is bent forwardly to form a hook-like retainer 24.

The end of back 20 at bend 22 is cut away as are adjacent portions of front 21, to form a slot 25 that is defined between the end portions that remain of the bend 22. Said slot 25 is made of a width to freely accommodate tongue 12, being also amply high to loosely pass the thickness of said tongue.

As can be seen from the drawing, the bend 22 limits the inserted position of the tongue 12 into slot 25 because of the edges 26 of portion 13 of part 8 encountering said bend. The parts are so proportioned, with respect to their longitudinal dimensions, that retainer 24 overstands the end of tongue 12 and, therefore, acts to maintain the same in substantial alignment with back 20 when in superposition therewith.

A pair of pins or posts 27 extend across the loop or bight that is formed by bend 22, the same being adjacent the opposite edges of part 9.

The strap end 6 is adjustably connected to buckle part 9 by the means 10 which is shown as comprising a bar 28 that extends transversely across slot 23 and has bifurcated ends 29 in sliding engagement with the side bars 30 which define the end of said slot and are part of back 20. The bar 28, as shown, is provided with a serrated face 31 that is directed toward the edge 32 of the cross bar 33 of buckle part 9. Therefore, when strap end 6 is trained from beneath around bar 28, then between face 31 and

edge 32, and, finally, between back 20 and the main part of said strap 6 to form a free end 34, said strap end becomes wedged between part 9 and bar 28 against any pull between said part and said strap end. Nevertheless, pull on free end 34 will act to draw the strap end 6 around bar 28 so as to increase tension between said strap end and buckle part 9. The latter tensioning movement is rendered easier by bending bar 33 as at 35 to provide edge face 32 with material width. When the pull is on the main portion of strap end 6, bar 28 is drawn toward bar 33 and serrations 31 serve to grip the strap against slippage under such pull. When the pull is on strap end 34, slippage of the strap around bar 28 may occur, but retractive slippage is prevented by said serrations, as indicated above.

The member 11 comprises a metal member that has a main part 36 that is flat or substantially so and has a generally rectangular opening 37 into which extends an abutment tongue 38. The latter tongue is offset with respect to the general plane of part 36 and is so directed that its end 39 is in end abutment with abutment edge 18 of buckle part 8 when part 36 closely overstands tongue 12 of part 8, as best seen in Fig. 3.

Said member 11 further includes a reversely curved handle extension 40 of part 36, the same extending in a direction toward strap end 6 and being notched or otherwise relieved, as at 41, to accommodate retainer 24 which lies in the general plane of part 36. At the end opposite to handle 40, the part 36 is provided with a pair of extensions 42 that have apertures 43 through which posts 27 pass. Consequently, said posts constitute members on which the means 11 is adapted to slidably move while the ends of extensions 42 are in pivotal engagement with the inner side of bend 22.

Apertures 43 are somewhat enlarged with relation to posts 27 and are so formed, as shown in Fig. 4, as to permit pivotal movement of means 11. A coil spring 44 between front 21 and part 36 biases the means 11 in a direction to bring the end 39 of tongue 38 into end abutment with edge 18.

From the above structure, it will be clear that the means 11 is interposed between edge 18 and bend 22. Consequently, tension between strap ends 5 and 6 is taken by said means, which serves as the connector for buckle parts 8 and 9.

Regardless how great the force of such tension, it requires but little force to pull handle extension 40 in the direction of arrow 45 (Fig. 3) and withdraw tongue 38 of means 11 from abutment with edge 18.

In use, with strap end 6 slacked off, the buckle parts are connected by inserting tongue 12 into slot 25. When edges 18 and 39 are engaged, the buckle is connected. Then, the free end 34 of strap 6 is pulled to foreshorten said strap end and create the mentioned tension between the strap ends.

In the form of the invention shown in Figs. 5 to 7, the structure is as described for the form of Figs. 1 to 4, except that the member 11 is of somewhat different design. As shown, the main part 36 of said member terminates short of handle 40, the latter being removed, as can best be seen from Fig. 5. Instead of said handle, a combined handle and cover member 46 is affixed, as by posts 47, to the part 36 of member 11.

The member 46 is preferably formed of thin-walled material and has side walls 48 that enclose the sides of the buckle, and a curved wall 49 that connects walls 48 and extends from a curved end 50 in covering proximity to bend 22, and a handle end 51, and has an intermediate portion 52 substantially following the curvature of front 21 of buckle part 9.

The neat and trim appearance of this buckle is evident, as is the fact that openings that may snag clothing or other articles are enclosed by the member 46. Since the member 11, as above modified, pivots around the inner

side of bend 22, the curved end 50 fulcrums around said bend when the member 11 is lifted away from the buckle to effect release of the buckle parts.

While the foregoing has illustrated and described what are now contemplated to be the best modes of carrying out the invention, the constructions are, of course, subject to modification without departing from the spirit and scope of the invention. It is, therefore, not desired to restrict the invention to the particular forms of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A buckle comprising two buckle parts, one part being provided with a transverse abutment, the other part being provided with a bend, said parts interfitting each other in a plane parallel to the line of pull between said parts, a pivotal member movable in a plane transverse to said line of pull having a portion disposed between said abutment and said bend and carried by the part having the bend, said portion having an edge in abutment with said transverse abutment of said one part and an end engaged with said bend of the other part, said portion being disposed between said transverse abutment and said bend to hold the parts against longitudinal separation during engagement of the abutment and the abutment edge, spring means biasing the member in a direction to engage the edge thereof against said abutment, and said member being provided with a handle remote from the end thereof engaged with the bend and manually movable against the biasing force of the spring means to move the edge of said member out of abutting engagement with the transverse abutment.

2. A buckle comprising two buckle parts, one part being provided with a transverse abutment, the other part being provided with a bend, said parts interfitting each other in a plane parallel to the line of pull between said parts, a pivotal member movable in a plane transverse to said line of pull having a portion disposed between said abutment and said bend and carried by the part having the bend, said portion having an edge in abutment with said transverse abutment of said one part and an end engaged with said bend of the other part, said portion being disposed between said transverse abutment and said bend to hold the parts against longitudinal separation during engagement of the abutment and the abutment edge, the buckle part having the bend being provided with pivot post means and the member having apertures through which said post means extend, spring means biasing the member in a direction to engage the edge thereof against said abutment, and said member being provided with a handle remote from the end thereof engaged with the bend and manually movable against the biasing force of the spring means to move the edge of said member out of abutting engagement with the transverse abutment.

3. A buckle according to claim 1, the edge on the pivotally movable member being provided on a tongue bent and offset from the general plane of said member to be in engagement with the transverse abutment when said member is superposed over the buckle part that has said transverse abutment.

4. A buckle according to claim 1 including a retainer portion provided on the buckle part having the bend, in opposed relation to said bend, and in overstanding relation to the end of the buckle part that has the transverse abutment.

5. A buckle comprising a first buckle part having a back, a front, and a bend connecting said back and front at one end, and a transverse slot in said end, a second buckle part having a tongue enterable in said slot between the front and back of the first buckle part, said second buckle part being provided with a transverse abutment edge, a pivotal member movable in a plane transverse to the plane in which said tongue enters said slot, said mem-

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ber being provided with a portion disposed between the front and back of the first buckle part, one end of said portion being in abutting engagement with said transverse abutment of the second buckle part and the other end in abutting engagement with said bend of the first buckle part, said portion being disposed between said transverse abutment and said bend to hold the buckle parts against longitudinal separation during engagement of the abutment and the abutment edge, spring means biasing said member in a direction to engage the mentioned transverse abutment edge and said one end of said portion, and a handle extending from said pivotal member to move the latter against the biasing force of the spring means to disengage said one end from said transverse abutment edge.

6. A buckle according to claim 5, the first buckle part, between the back and front thereof and adjacent the bend, being provided with post means, and the pivoted member having apertures through which said post means extend.

7. A buckle comprising two buckle parts, one buckle part having a J-shaped cross-section with a slot across the bend of the J, a post on each side of said slot and adjacent said bend, a pivotal member disposed within the bend of

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the J and mounted on said posts, said member having an abutment tongue offset therefrom, spring means to bias said member toward the long leg of the J, a second buckle part having a tongue adapted to enter said slot, said tongue having an abutment edge thereon engaged with the abutment tongue of said member under bias of the spring means, the pivotal member being disposed in the space between the bend of the J-shaped buckle part and the abutment in the tongue of the second buckle part to hold the buckle parts against longitudinal separation during engagement of the abutment tongue and abutment edge, and means to limit the amount of entry of said second buckle part into said first buckle part.

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