

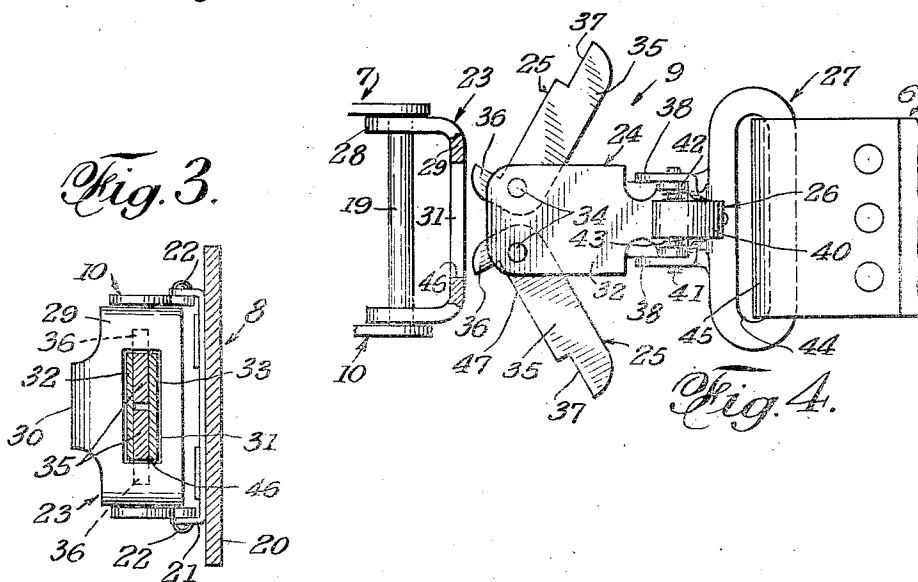
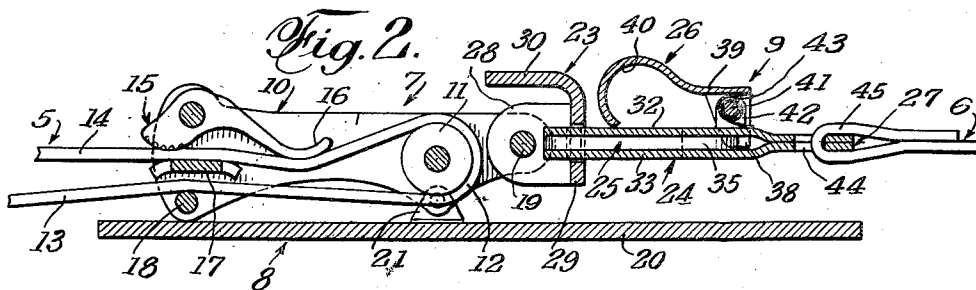
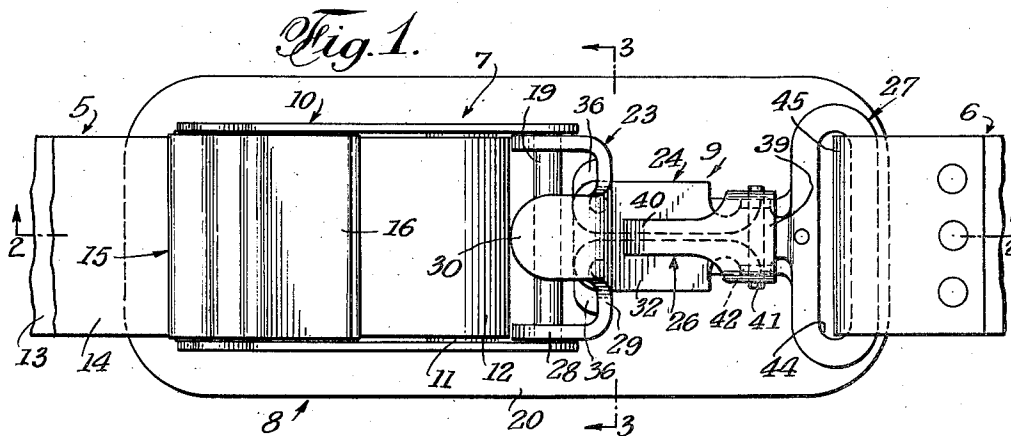
April 1, 1952

E. C. ELSNER

2,590,851

QUICK-RELEASE BUCKLE

Filed July 10, 1948



Inventor

EDWIN C. ELSNER

C. H. Stratton

Attorney

UNITED STATES PATENT OFFICE

2,590,851

QUICK-RELEASE BUCKLE

Edwin C. Elsner, North Hollywood, Calif., assignor
to C. J. W. Corporation, North Hollywood,
Calif., a corporation of California

Application July 10, 1948, Serial No. 38,004

4 Claims. (Cl. 24-211)

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This invention relates to buckles for connecting the ends of a strap, and while the same has many uses, is more particularly adapted for connecting the ends of safety belts as employed in aviation.

An object of the present invention is to provide a strap buckle that is readily adjusted by a pull on one strap end to take up on the buckle and by a cam release to free said strap end to slack off on the buckle, said buckle having, in combination, quick-release means that effects rapid separation of the strap ends when such is desired.

Another object of the invention is to provide a buckle, as indicated, that includes novel quick-release means that is actuated by a simple pull on a readily available hook to effect rapid separation of the strap end connected by the buckle.

Another object of the invention is to provide quick-release means that functions equally efficiently regardless of the degree of force that seeks to separate the ends of a strap connected by said means.

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 one embodiment of the present invention, which is 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 front view of a quick-release buckle constructed according to the present invention.

Fig. 2 is a longitudinal sectional view thereof as taken on line 2-2 of Fig. 1.

Fig. 3 is a cross-sectional view as taken on line 3-3 of Fig. 1.

Fig. 4 is a front view of the quick-release means of said buckle in released condition.

This application embodies an improvement of my application entitled "Quick-Release Automatic Strap Buckle," Serial No. 767,875, filed August 11, 1947, now U. S. Letters Patent No. 2,538,641. The present buckle is shown as connecting strap ends 5 and 6. Said ends may comprise the ends of a single strap as shown in said pending application or they may comprise end

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of separate straps connected to a common member, such as a seat, whereby the buckle may be employed to connect the ends of a safety belt or the like.

The buckle that is illustrated comprises generally a strap-gripping buckle part 7 for the strap end 5, a pliable plate member 8 connected to said buckle part and adapted to reside against the stomach or chest of a person confined by a safety belt of which said buckle is the connection means, and quick-release means 9 separably connecting the buckle part 7 and strap end 6.

The buckle part 7 is substantially similar to the buckle shown in said pending application and the same comprises, generally, a frame 10; a roller 11 mounted transversely of the frame at an intermediate part thereof for a loop 12 of the strap end 5 trained therearound to provide said strap end with a bight 13 that connects either to strap end 6 or to a member to which said end 6 is connected, and a free end 14; and cam-wedge means 15 for gripping strap end 5 to maintain the tension thereof, the latter means embodying an extension 16 engaged with said strap end to urge the cam-wedge means into strap-gripping position.

The above generally described buckle part 7 further includes a transverse plate 17 between which and the cam-wedge means the strap end 5 is gripped, a transverse rod 18 below said plate 17 for guiding the bight 13, and a transverse rod or bar 19 at the end of the frame 10 opposite to the cam-wedge means 15 to which the quick-release means 9 is connected.

In use, take-up on strap end 5 is effected by a pull on free strap end 14, the same freely sliding between the cam-wedge means 15 and plate 17. Release of said pull permits the force transmitted to extension 16, by said end 14, between roller 11 and plate 17, to so rock means 15 that the same effectively grips said strap end against any pull of bight 13. By pushing down against extension 16, the cam-wedge means 15 is rocked to release said grip and the pull on bight 13 is effective to slacken the strap. So long as the extension 16 is held depressed, more slack, if desired, can be formed in strap end 5. Release of extension 16 and pull on bight 13 automatically restores means 15 to a strap gripping position. The above is more fully set forth in said pending application.

The plate 8 is formed as a sheet 20 of leather or other suitable pliable material and the same, by means of a bracket 21, is hingedly connected

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at 22 to the frame 10 of buckle part 7. Said plate effectively protects the clothing of the user from the metal parts of the buckle. Said plate, for other uses of the buckle, comprising a non-marring separator interposed between the buckle and the article or articles encompassed by the strap.

The quick-release means 9 comprises, generally, a bail 23 hingedly connected on rod 19 of the buckle part 7, a connector 24 that includes latch members 25 adapted for separable connection with bail 23, hook release means 26 hingedly carried by the connector and releasably holding said latch members, and a loop 27 formed on the connector for the strap end 6.

The bail 23 is formed with ears 28 that engage rod 19, with a transverse connecting part 29 for said ears, and a handle part 30 facilitating positioning of the bail to receive the connector 24. Said connecting part 29 is formed with a transversely disposed rectangular opening 31 that receives the connector 24.

Connector 24 comprises a pair of spaced plates 32 and 33 that are narrow enough to freely enter opening 31. Near one end said plates are connected by pins 34 that comprise pivots for latch members 25 that are free to swing on said pivots between a position between plates 32 and 33, as in Fig. 1, and an angular position outwardly of said plates, as in Fig. 4.

Each latch member 25 comprises a bar 35 that, at one end, is formed with a lug or hook 36 which is laterally directed when the bar is disposed within connector 24 between the plates thereof, and at the other end is notched as at 37.

The means 26 releasably engages the notched ends 37 of the latch bars. The same comprises a lever having a pair of ears 38, a transverse connecting part 39 connecting said ears, and a hook or curved extension 40 of said connecting part that forms a hook adapted to be lifted by the finger. The ears 38 are apertured for a hinge pin 41 carried by ears 42 struck from plate 32, and a torsion spring 43 is loosely wound on said hinge pin and arranged to normally urge said hook 40 down against plate 32 to bring ears 38 into engagement with notched end 37 of the latch members. With the latch members so retained and the connector inserted into opening 31, the laterally directed lugs 36 will extend into engagement with connecting part 29 of bail 23. Rod 19 limits the degree of insertion of the connector into opening 31.

The loop 27 comprises an integral extension of plates 32 and 33, the same having an opening 44 for a loop 45 formed on strap end 6.

In use, hook release means 26 is swung up to rock ears 38 out of engagement with latch members 25. By holding buckle part 7 in one hand and quick release means 9 in the other with the latch members outwardly tilted or swung as in Fig. 4, the means 9 may be inserted into opening 31, the lugs 36 entering first. During insertion, the edges 46 of opening 31 will engage against edges 47 of the latch members to rock said members on their pivots 34 and thereby swing said latch members into place between plates 32 and 33. Then when means 26 is released, spring 47 becomes effective to swing the same down to the position of Fig. 1 wherein ears 38 fit into notches 37 and have retention engagement with the latch members. It will be evident that considerable force may be applied seeking to separate strap ends 5 and 6 and said force will be fully met

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due to lugs 36 by their engagement with bail part 29.

Should a rapid release of the quick release means 9 become necessary to effect separation of the strap ends 5 and 6, no matter how great is the force seeking to separate said strap ends, a simple lift by any finger, engaged in hook 40, will easily withdraw ears 38 from engagement with the latch members and the latter will pivot outwardly so that lugs 36, pivoting inwardly, will pass out through opening 31. The strap end will thus fall away to release the person retained thereby.

It will be noted that the latch members swing in one plane while the ears 38 pivot in a transverse plane. The slight friction between said parts is readily overcome by the finger pull imparted to the considerable lever that terminates in hook 40. It will also be seen that hook 40 is so formed that the same cannot be inadvertently actuated, since it nests adjacent bail 23. Only by deliberately hooking the same with a finger and exerting outward pull is release obtained.

The terms "grips," "gripping," "holds" and "holding" are intended as interchangeable terms in this disclosure and in the appended claims.

While I have illustrated and described what I now regard as the preferred embodiment of my invention, the construction is, of course, subject to modifications without departing from the spirit and scope of my invention. I, therefore, do not wish to restrict myself to the particular form of construction illustrated and described, but desire to avail myself of all modifications that may fall within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a buckle, quick-release means comprising a bail-like member having an opening, a connector comprising a pair of spaced connected plates insertable into said opening, a pair of latch members between said plates and carried on separate pivots, each latch member having a laterally directed lug extending outward of the connector and adapted to have hooking engagement with the bail-like member after insertion through the opening in the latter, said latch members extending from their pivots in substantially parallel relationship when in hooked position, and a latch release member pivotally carried by one plate and having opposed ears engageable with the free ends of the latch members, said release member extending toward and nesting adjacent to the bail-like member while the ears are engaged with the latch members, whereby inadvertent movement of the release member is obviated.

2. In a buckle, quick-release means comprising a member having an opening, a connector insertable into said opening, a pair of latch members carried by the connector on separate pivots adjacent the insertable end of the connector, each latch member having a laterally directed lug extending laterally from its pivoted end outward of the connector and adapted to have hooking engagement with the member having the opening after insertion of the connector through said opening, said latch members extending from their pivots longitudinally of the connector in substantially parallel relationship when in hooked position, and a latch release lever pivotally carried by the connector and having opposed ears engageable with the free ends of the latch members, said lever extending toward and nesting adjacent to the member having the opening while

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the ears are engaged with the latch members, whereby inadvertent movement of the release member is obviated.

3. In a buckle, quick-release means comprising a bail-like member having an opening, a connector comprising a pair of spaced connected plates insertable into said opening, a pair of latch members between said plates and having front ends carried on separate pivots adjacent the insertable end of the connector, said latch members having laterally directed lugs at their front ends extending outward of the connector from opposite sides thereof and adapted to have hooking engagement with the bail-like member at opposite sides of the opening after insertion through the opening in the latter, said latch members extending from their pivots in substantially parallel relationship when in hooked position, and a latch release member pivotally carried by one plate and having opposed ears engageable with outer side edges of the free ends of the latch members, said release member extending toward and nesting adjacent to the bail-like member while the ears are engaged with the latch member, whereby inadvertent movement of the release member is obviated.

4. In a buckle, quick-release means comprising a bail-like member having an opening, a connector comprising a pair of spaced connected plates insertable into said opening, a pair of latch

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members between said plates and at their front ends carried on separate pivots, each latch member having a laterally directed lug at its front end extending outward of the connector and adapted to have hooking engagement with the bail-like member after insertion through the opening in the latter, said latch members extending from their pivots longitudinally of the connector in substantially parallel relationship when in hooked position, and a latch release member pivotally carried by one plate and having opposed ears engageable with the free ends of the latch members, said release member extending toward and nesting adjacent to the bail-like member while the ears are engaged with the latch members, whereby inadvertent movement of the release member is obviated.

EDWIN C. ELSNER.

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