Sept. 1, 1959 E. PRETE, JR 2,901,794

QUICK RELEASE BUCKLE

Filed Dec. 27, 1955

Fig. 1.

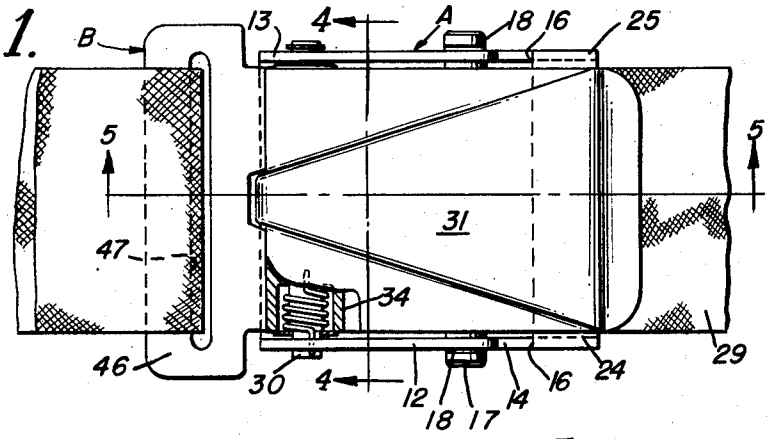


Fig. 2.

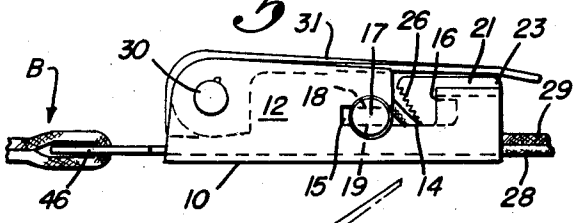


Fig. 3.

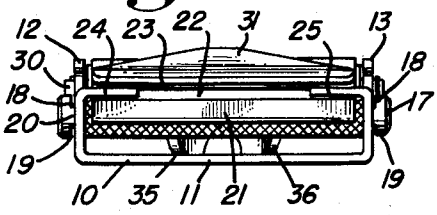


Fig. 5.

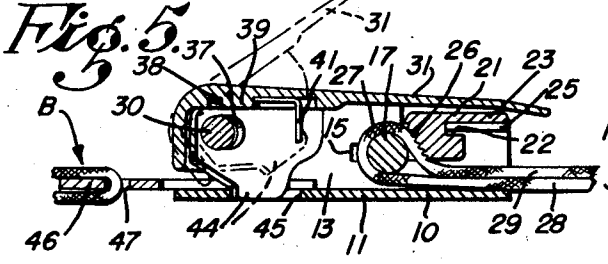


Fig. 4.

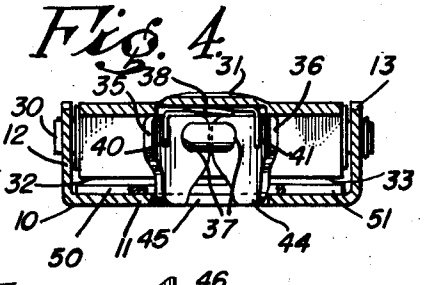


Fig. 6b.

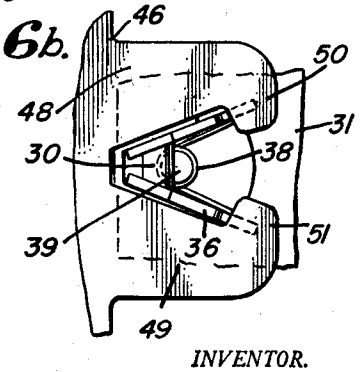
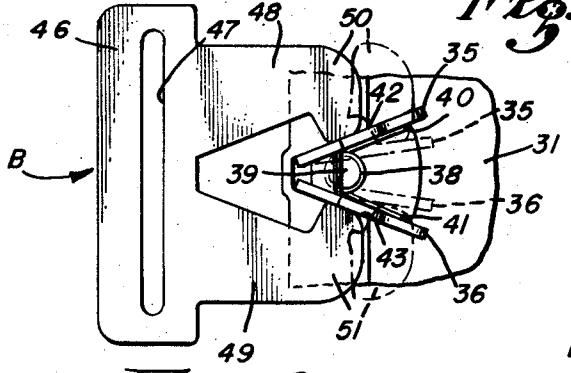


Fig. 6a.



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QUICK RELEASE BUCKLE

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6 Claims. (Cl. 24—75)

The present invention relates generally to buckles and is more particularly concerned with a quick release type buckle as generally utilized in connection with safety belts of the type worn by occupants of high speed vehicles such as aircraft and automobiles, firemen and other personnel.

It is one object of the present invention to provide a quick release belt buckle of simple construction, wherein the operation of connecting and releasing requires no particular skill.

A further object is to provide a quick release buckle construction of the type having a swingable handle for releasing latched separable members, but wherein the separable members may be moved to a latched position without moving the swingable handle.

Another object of the invention is to provide a buckle of the herein described type, wherein readily detachable webbing gripping bars are mounted for floating movement, and are retained in assembled position by the webbing threaded thereover.

Still another object is to provide a buckle for a belt of webbing or other suitable material, which is readily and easily adjustable as to length for different users, and for various conditions, and which will grippingly engage the webbing in the adjusted position.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

Referring to the accompanying drawings, which are for illustrative purposes only:

Fig. 1 is a plan view of a quick release buckle embodying the features of the present invention, a portion being cut away to show certain details of construction;

Fig. 2 is a side elevational view of the same;

Fig. 3 is an end elevational view;

Fig. 4 is a transverse section through the buckle, taken substantially on line 4—4 of Fig. 1;

Fig. 5 is a generally longitudinal section, taken substantially on line 5—5 of Fig. 1; and

Figs. 6*a* and 6*b* are action views successively diagrammatically representing the latching operation of the latching mechanism and connecting belt fitting.

Referring now to the drawings, for illustrative purposes, the quick release buckle of the present invention comprises essentially two structures A and B which are adapted to separably interconnect the ends of a flexible member such as a safety belt of webbing or other suitable material.

Referring more specifically to the drawings, structure A comprises an essentially channel shaped frame **10** in which there is a bottom wall **11** and spaced side flanges **12** and **13** which project upwardly from the bottom wall.

The right end portion of each side wall, as viewed in Figs. 1 and 2, is provided with a generally L-shaped notch **14**, these notches being aligned transversely of the frame **10** and each notch having a leg **15** which extends substantially parallel to the bottom wall **11**, and a leg

16 which extends substantially at right angles or normal to the bottom wall and opens into the upper edge margin of the associated side flange. The L-shaped notches **14** are utilized to facilitate removably mounting a transversely extending slide bar **17** on the side flanges, the slide bar being generally of round configuration and having notches or end grooves **18** and **19** at each end which cooperate to form a web portion **20** adapted to be inserted through the open ends of the notches and to be positioned normally in the leg **15** of the notches so as to slidably support the slide bar for lateral movements in a plane substantially parallel to the bottom wall **11**. The ends of the slide bar project to the exterior of the side flanges to facilitate manually sliding of the slide bar by grasping its projecting ends. The portion of the slide bar extending between the side flanges may be knurled or otherwise roughened to increase its gripping effect.

There is also a locking bar **21** which is cooperatively associated with the slide bar **17**, the locking bar having an edge groove **22**, one wall of this groove being extended to form a projecting ledge **23**. Adjacent the open ends of the legs **16** of the L-shaped notches **14**, the side flanges are inwardly deflected to form fingers **24** and **25** which are adapted to extend into the ends of the groove **22** and provide supports under the associated ends of the ledge **23** upon which the locking bar may be slidably moved towards the slide bar, and may be disassembled and assembled along with the slide bar without the utilization of any tools. The edge of the locking bar which faces the slide bar is angularly inclined as shown at **26** to form a substantially flat surface which is serrated or otherwise roughened to increase its gripping effect.

The slide bar and locking bar cooperate with the bottom wall **11** to form a passage for a web strap or belt which is formed with a loop portion **27** which extends around the slide bar with a lower run **28** passing below the locking bar **21** and along the bottom wall **11**, while an upper run **29** extends from the loop between the slide bar and locking bar, and then thence over the lower run below the locking bar. With this arrangement, tension on the upper and lower runs of the webbing will act to slide the slide bar in a direction towards the locking bar so as to forcibly grip the upper run between their confronting surfaces and thus hold and anchor the structure A to the webbing threaded between the slide bar and locking bar.

The webbing, however, may be readily adjusted by releasing the slide bar simply by grasping the projecting ends of the slide bar between the fingers and moving it away from the locking bar, whereupon the upper and lower runs are freed for adjusting movement.

A further feature of the construction just described resides in the utilization of the webbing to retain the slide bar and locking bar in assembled relation and prevent their being disassembled so long as the webbing extends between the slide bar and locking bar. However, upon removal of the webbing, the slide bar and locking bar may be readily disassembled for replacement, repair or for other purposes.

The latching and quick release mechanism will now be described. At the opposite end of the frame **10**, the side flanges form supports for the ends of a pivot pin **30** upon which there is swingably mounted a handle member **31** of generally plate-like construction, this handle having an enlarged end portion through which the pivot pin extends, and which defines camming surfaces **32** and **33**, as shown in Fig. 4, which are in confronting relation with the facing surface of the bottom wall **11**, but spaced therefrom. As shown in Fig. 1, the handle member **31** is impelled by means of a coiled spring **34** in a direction to move the outer end of the handle into engagement with the upper surface of the locking bar **21**.

One end of the spring 34 is anchored in the adjacent side flange 12, while the opposite end of the spring 34 is anchored in the adjacent material of the handle.

As shown in Figs. 4 and 5, a pair of latch dogs 35 and 36 are supported in divergent relation on the pivot pin 30, the pivot pin being carried through elongate openings 37 respectively provided in each of the latch dogs. The latch dogs are resiliently retained in diverging relation by means of a coiled spring 38 which surrounds a retaining stud 39 on the under surface of the handle 31, and has deflected end portions 40 and 41 which bear against the confronting surfaces of the latch dogs to spread these ends of the dogs apart until they abut movement restraining shoulders 42 and 43 formed in the adjacent material of the handle. As shown in Fig. 5, the latch dogs 35 and 36 have a projecting edge portion 44 in each case which in the normal position of the handle 31 extend into a generally segmental opening 45 in the bottom wall 11.

With the above handle construction and associated latch dogs, the latch dogs and handle will normally occupy a position as shown in Fig. 5, wherein the latch dogs are in operative position in the path of movement of an inserted connection fitting 46 comprising the structure B, and which will subsequently be described in detail. However, by manually swinging the handle 31 in a counterclockwise direction, as viewed in Fig. 5, the handle may be moved to a raised position as shown in dotted lines. In the raised position, the latch dogs will be moved to an inoperative position in which the edge portions 44 will be moved out of the opening 45 and out of the path of movement of the connection fitting 46 to an inoperative position of the latch dogs. In this position, the connection fitting will be released for separation from the structure A.

More specifically, the connection fitting 46, which comprises the structure B, is in the form of a plate member having a transversely extending slot 47 adjacent one end through which an end of a belt of webbing or other material may be threaded and formed into a securing loop. The connection fitting has a pair of spaced finger members 48 and 49 which terminate at their outermost ends in confronting end portions 50 and 51 which are in spaced apart relation, as shown in Figs. 6*a* and 6*b*. To interconnect the structures A and B, the fingers 48 and 49 of the connection fitting 46 are inserted into the end of the frame 10 in the space between the cam surfaces 32 and 33 and the confronting surface of the bottom wall 11. The initial position of insertion is shown in Fig. 6*a* in full lines. It will be observed that the fingers 50 and 51 engage the outer surfaces of the most closely positioned ends of the latch dogs, and that as the projecting ends 50 and 51 ride over the engaged surfaces of the latch dogs, the latch dogs will be moved into substantially parallel relation as indicated in dotted lines, against the force of the spring 38. When the connection fitting reaches fully inserted position, as shown in Fig. 6*b* in full lines, the projections 50 and 51 of the fingers 48 and 49 will have been moved to a position clear of the latch dogs, thus permitting the latch dogs to be impelled by the spring 38 into a latching position behind the projections 50 and 51, thus latchingly securing the connection fitting against withdrawal and separation from structure A. However, at any time that it is desired to quickly release the connection fitting, this is easily accomplished by manually grasping the lever 31 and rotating it in the manner previously explained so as to carry the latching dogs to an inoperative position above the fingers 48 and 49, whereupon the connection fitting is released and may be separated from the structure A.

Various modifications may suggest themselves to those skilled in the art without departing from the spirit of my invention, and, hence, I do not wish to be restricted to the specific form shown or uses mentioned, except to the extent indicated in the appended claims.

I claim:

1. A quick release buckle, comprising: a frame structure having side flanges; a handle; a pivot pin supporting said handle from said side flanges for swinging movements; a pair of latch dogs carried by said handle and movable therewith as a unit, said latch dogs in one position of the handle being disposed in an inoperative position, and in another position of the handle being disposed in an operative position; means supporting said latch dogs for relative independent movements towards each other; a spring opposing said latter movement; and a belt connection fitting adapted for insertion into said frame, said latch dogs in operative position being in the path of travel of said fitting and acting to interlock with said fitting and retain it against separation from the frame, but upon movement by said handle to inoperative position permitting separation of the fitting from said frame.

2. A quick release buckle, comprising: a frame structure having side flanges; a belt connection fitting having a pair of spaced finger elements adapted for removable insertion into said frame; a handle; a pivot pin supporting said handle on said side flanges for swinging movement; a pair of latch dogs supported on said pin for unitary swinging movement with said handle, whereby said dogs may be positioned in operative and inoperative positions, said dogs being further supported for relative movements in said operative position into latching relation with respect to said inserted finger elements; and spring means for normally biasing said dogs towards latching position.

3. A belt buckle, comprising: a frame structure; a belt connection fitting having a pair of spaced fingers adapted for removable insertion into said frame; a pair of latch dogs supported by said frame for independent swinging movements in two planes having 90 degree angular relation; a spring acting to bias said dogs apart in one of said planes of movement into diverging relationship, said dogs being moved towards each other by the insertion of said fingers and upon completion of said insertion being impelled away from each other into said diverging relationship to interlock with and retain said fingers against removal; and manually operable means for moving said dogs as a unit in the other of said planes of movement out of said interlocking position with said fingers, whereupon said fitting may be removed and separated from said frame.

4. A belt buckle, comprising: a frame structure; a belt connection fitting having a pair of spaced fingers adapted for removable insertion into said frame; a latch supported by said frame for independent swinging movements in planes having 90 degree angular relation; a spring acting in one of said planes of movement of the latch to bias it towards an interlocking position with respect to the inserted fingers of said fitting; and manually operable means for moving said latch in the other of said planes of movement from said interlocking position to noninterlocking position with respect to said fingers.

5. A belt buckle, comprising: a frame structure; a belt connection fitting adapted for insertion into said frame structure; a latch supported by said frame for independent swinging movements in planes having 90 degree angular relation; a spring acting in one of said planes of movement of the latch to bias it towards a latching position with respect to the inserted fitting; and manually operable means for moving said latch in the other of said planes of movement to latching and nonlatching positions with respect to said fitting.

6. A belt buckle, comprising: a frame structure; a belt connection fitting adapted for insertion into said frame structure; a latch supported by said frame structure for movement to latching and nonlatching positions with respect to the inserted fitting; a spring biasing said latch towards latching position to automatically oppose separation of the inserted fitting and frame; and manually

operable means for moving said latch to nonlatching position independently of said spring action.

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