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H. W. RACETTE ET AL

3,042,986

QUICK RELEASE SAFETY BELT BUCKLE

Filed Feb. 5, 1960

FIG. 1

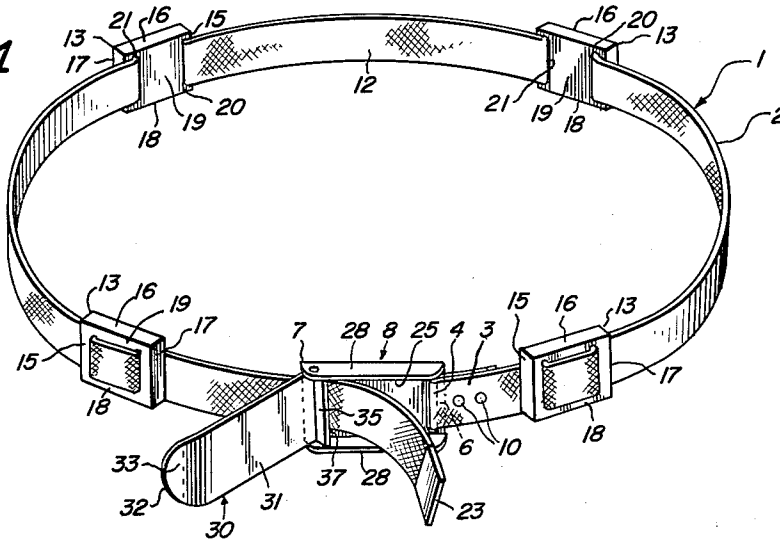


FIG. 2

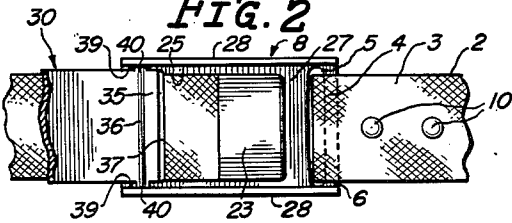


FIG. 3

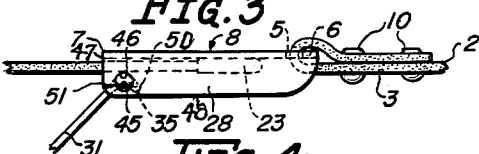


FIG. 4

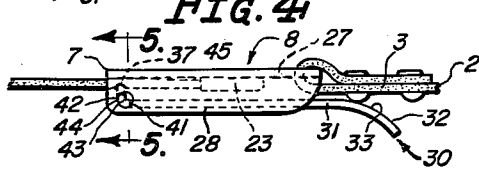


FIG. 5

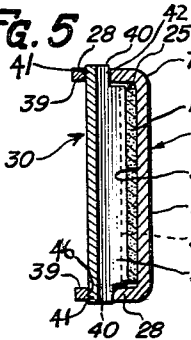


FIG. 6

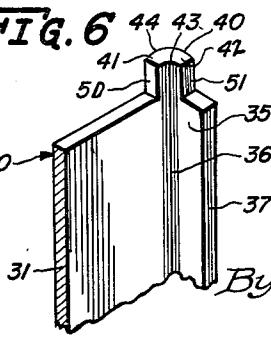


FIG. 7

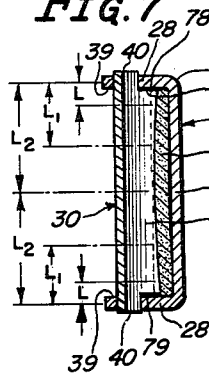


FIG. 8

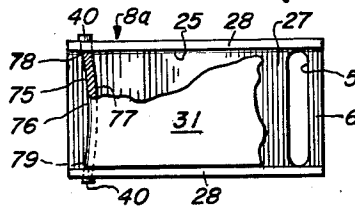
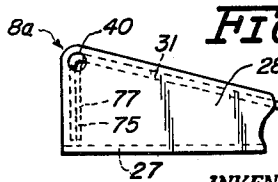


FIG. 9



INVENTORS  
Lloyd L. Grant, Jr.  
Henry W. Racette  
By John J. Kowalik  
Atty.

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3,042,986

## QUICK RELEASE SAFETY BELT BUCKLE

Henry W. Racette, Chicago, Ill. (1013 Brookwood, Bensenville, Ill.), and Lloyd L. Grant, Jr., 524 Clarendon St., Addison, Ill.

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1 Claim. (Cl. 24-170)

This invention relates to belt buckles and more particularly to a quick release safety buckle.

Aquatic sports especially of the underwater type have been gaining in popularity in recent years but the development in the art has lagged in many respects. Belt buckles, if inexpensive, have been poorly constructed so that they present a serious hazard not only to the experienced diver but especially to the novice who must rely upon the equipment functioning properly. In skin diving it is also desirable to be able to conveniently and simply add or remove weights to adjust for correct buoyancy and therefore a properly functioning buckle is essential to permit ready removal of weights particularly when the user is submerged.

A general object of the invention is to provide a novel buckle which is of rugged construction, simple to make and relatively inexpensive and which functions efficiently under all conditions.

A further object of the invention is to devise a novel buckle which comprises a frame and a latch pivoted on the frame, the latch having integral pintle portions formed as lateral extensions of the corners formed between the angularly arranged latch or cam portion and the keeper or handle portion, such construction materially strengthening these areas so that they do not deform or bend under loading pursuant to locking and unlocking of the buckle and also in sustaining the weights.

A corollary object is to devise the pintle portions as arcuate segments which provide inherently greater strength than flat elements and to obtain adequate bearing surfaces for smooth operation and to prevent galling and coincidental rapid wear due to the concentration of loading on limited areas.

The invention contemplates an arrangement and construction of pintles such that they present convex bearing areas seating against complementary aperture surfaces in the latched position of the buckle.

A further object of the invention is to provide a novel latch structure wherein a corner formed between the cam portion and handle is utilized as the backbone for the latch which opposes loading on the latch through integral pintles which project from opposite lateral edges of the latch as continuations of the corner whereby obtaining U-section beam strength with one of the flanges of the U in the latched position of the buckle extending generally perpendicular to the belt and the other flange projecting generally parallel to the belt and thus whereby each flange resists the opposing load in the plane of its maximum strength.

In one of the embodiments of the invention the cam portion is curved transversely and lowering toward the handle portion to improve its transverse strength and also to concentrate loading at the ends of the cam portion in areas immediately adjacent to the respective pintles transversely thereof to minimize the lever arm and thus efficiently orient the loading on the pintles.

These and other objects and advantages inherent in and encompassed by the invention will become more readily apparent from the following specification and drawings, wherein:

FIGURE 1 is a perspective view of my novel belt and buckle assembly;

FIGURE 2 is an enlarged plan view of the buckle in

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open position with the strap partially withdrawn and the latch shown fragmentarily;

FIGURE 3 is a side elevational view of the structure shown in FIGURE 2, the buckle being open;

FIGURE 4 is a side elevational view of the belt and buckle, the buckle being closed.

FIGURE 5 is an enlarged sectional view taken substantially on line 5-5 of FIGURE 4;

FIGURE 6 is a fragmentary enlarged isometric view of the latch particularly showing the pintle construction;

FIGURE 7 is a sectional view similar to FIGURE 5 illustrating another embodiment of the invention with the latch being partly open.

FIGURE 8 is a fragmentary reduced plan view of the modified form of the invention; and

FIGURE 9 is a fragmentary side elevational view of the construction of FIGURES 7 and 8.

Describing the invention in detail and having particular reference to the drawings there is shown in FIGURES 1-6 a belt and buckle assembly generally designated 1 including a belt 2 which is preferably formed of a webbing and comprising a secured end 3 which is formed into a loop 4 extending through a slot 5 behind an anchor bar 6 of the body portion 7 of a belt buckle generally designated 8. The overlapped portions of the end 3 are secured as by rivets 10, 10.

The length 12 of the belt is threaded through a plurality of weights 13 each of which is a rectangular structure having side portions 15, 16, 17 and 18 and an intervening bar 19 which is united integrally with the portions 16 and 18 and defines therewith and with the side portions 15 and 17 a pair of laterally spaced slots 20 and 21 which admit the strap length 12 therethrough, the said length 12 passing behind the portion 15 in front of portion 19 and then behind portion 17. Thus it is an easy matter to remove or add weights to the belt simply by sliding them onto or off the belt over the free end portion 23 thereof.

The free end portion of the belt is adapted to extend through the strap way 25 of the frame or body 7 of the buckle 8 over the base portion 27 thereof and the side flanges 28, 28 which are preferably normal to the generally flat base wall 27, at one end of which is provided the anchor rib 6 spaced transversely of the wall 27.

The frame portion 7 of the buckle 8 pivotally mounts a keeper or latch part generally indicated 30 which comprises a handle or lever portion 31 terminating in an up-turned distal extremity 32 which admits the fingers of the user beneath the underside 33 thereof to facilitate rotating the latch to unlocked position as shown in FIGURES 1 and 3.

The lever portion 31 merges into a camming portion 35 through a corner structure 36, the portion 35 extending angularly with respect to the portion 31 and having a free edge 37 which is adapted to engage the belt and urge it tightly against the opposing surface 38 of the base wall 27 of the buckle frame. It will be seen that in the locked position the plane of the flat cam portion 35, which extends between the inner sides 39, 39 of flanges 28, 28, is positioned slightly past dead center position with respect to the pintles 40, 40 so that the reactive forces developed by compressing the belt tend to maintain the latch in locked position.

The pintles 40 are formed as continuations of the corner structure and each comprises a pair of flanges 41 and 42 and an arcuate bight portion 43, the portion 43 and the flanges 41 and 42 presenting an outer arcuate contour 44 generally approximating the cylindrical peripheral outline 45 of the aperture 46 through which it extends, the apertures 46 being formed in the flanges 28 and coaxially disposed transversely of flanges 28 adjacent

the juncture of the end and outer edges 47 and 48 thereof.

The pintle flanges 41 and 42 extend planewise respectively generally coplanar with the lever portion 31 and the cam portion 35 and in effect are channel section. The forming of the corner and particularly of the pintles obtains sharp edges 50 and 51 which serve to scuff or shear off any encrustations or irregularities in the apertures due to manufacturing practices and insure and develop a smooth peripheral surface 45 to prevent binding and the like. The construction of the pintle portions from the corner continues a rigid backbone and at the same time develops strength in the pintles without any cost penalty.

Referring now to the embodiment of FIGURES 7-9, parts which are identical with the previous embodiment are identified by corresponding reference numerals. In this embodiment the buckle 8a has the same frame as the previous design. However, cam portion 75 is bowed or curved transversely on a single radius from edge to edge and has a concave side 76 and the convex side 77 faces toward the lever portion. This feature strengthens the cam portion against planar collapse and also increases the rigidity thereof in opposing the stresses developed by the belt in tending to withdraw from the buckle. Further it obtains an application of loading on the pintles of a changing lever arm in that the greatest loading is obtained initially at the ends 78 and 79 of the cam adjacent to respective pintles and gradually shifts toward the center depending upon the distance the latch turns to closing position as shown at L, L<sup>1</sup> and L<sup>2</sup>. Great resistance is developed to bending of the cam in closed position.

While several forms of the invention have been shown, it should be recognized that other forms and variations will be suggested. It should therefore be understood that while the preferred forms of the invention are shown and described in detail for purposes of fully and concisely illustrating the invention, there is no intent to narrow or

limit the invention beyond that set forth in the appended claim.

We claim:

A belt buckle comprising a frame including a flat base wall and a pair of generally parallel flanges defining a flat belt-receiving way, a latch between said flanges opposing the wall and having a handle portion and a cam portion merging into a corner structure therewith and providing a backbone extending transversely of said flanges, and pintles projecting from opposite ends of the backbone into apertures in the respective flanges, each pintle having a first flange portion coplanar with the cam portion and a second flange portion coplanar with the handle portion, said first and second flange portions presenting an arcuate contour engaging the peripheral edge of the associated aperture and terminating in sharp edges disposed in scuffing relation to the peripheral edge of the respective aperture whereby any incrustations in the apertures are removed by swinging of the latch, said cam portion being transversely curved only in one plane and presenting a flat belt-engaging edge and side edges, the curvature of the cam portion extending from one side edge to the other on a single radius and oriented to progressively engage an associated belt from the side edges toward the center of said cam portion in said way with attendant change in the position of said lever arm and loading upon the pintles during locking of the latch so that said pintles are loaded gradually to facilitate locking and opening of the buckle.

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