Aug. 1, 1950 O. H. GRISWOLD 2,517,424

SAFETY BELT BUCKLE

Filed April 18, 1947 3 Sheets-Sheet 1

Fig. 1.

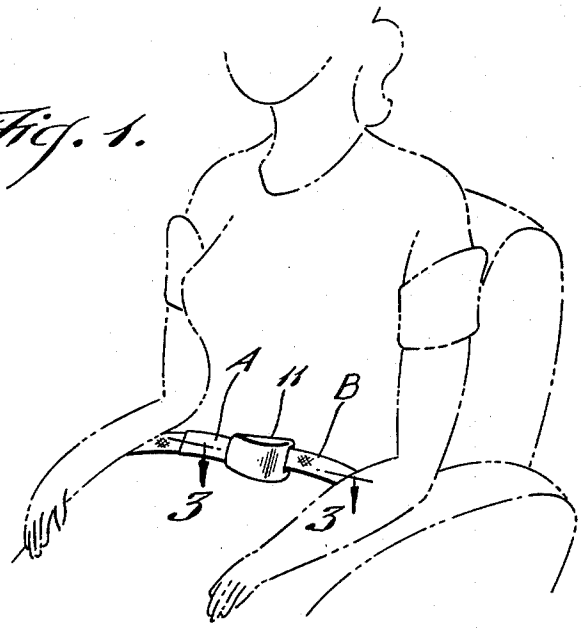
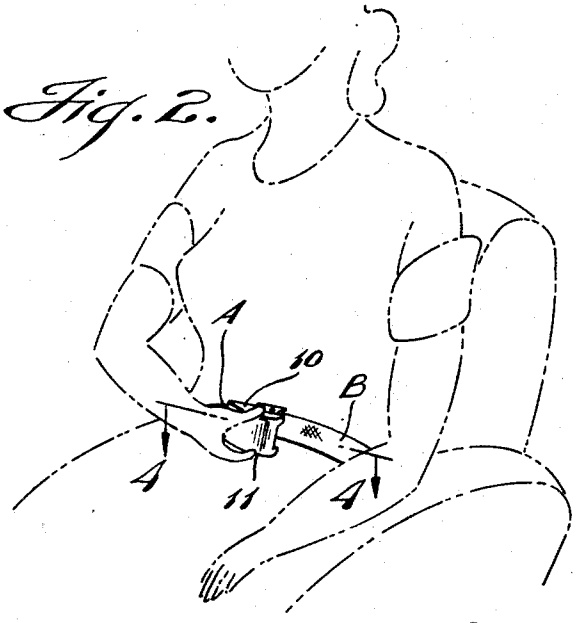


Fig. 2.



INVENTOR.
OWEN H. GRISWOLD
BY
Clark & Att
ATTORNEYS

Aug. 1, 1950 O. H. GRISWOLD 2,517,424

SAFETY BELT BUCKLE

Filed April 18, 1947 3 Sheets-Sheet 2

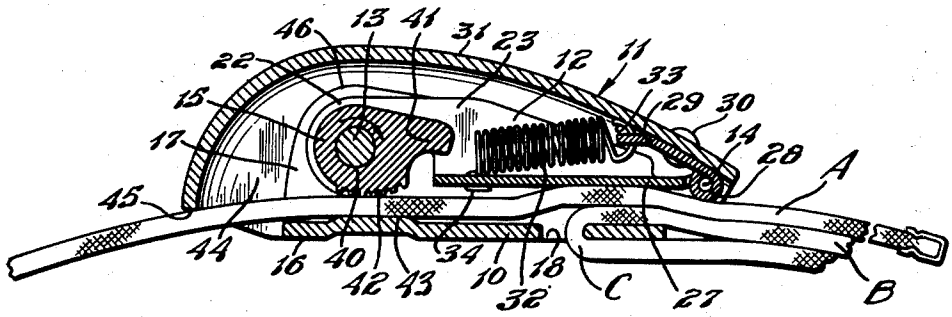


Fig. 3.

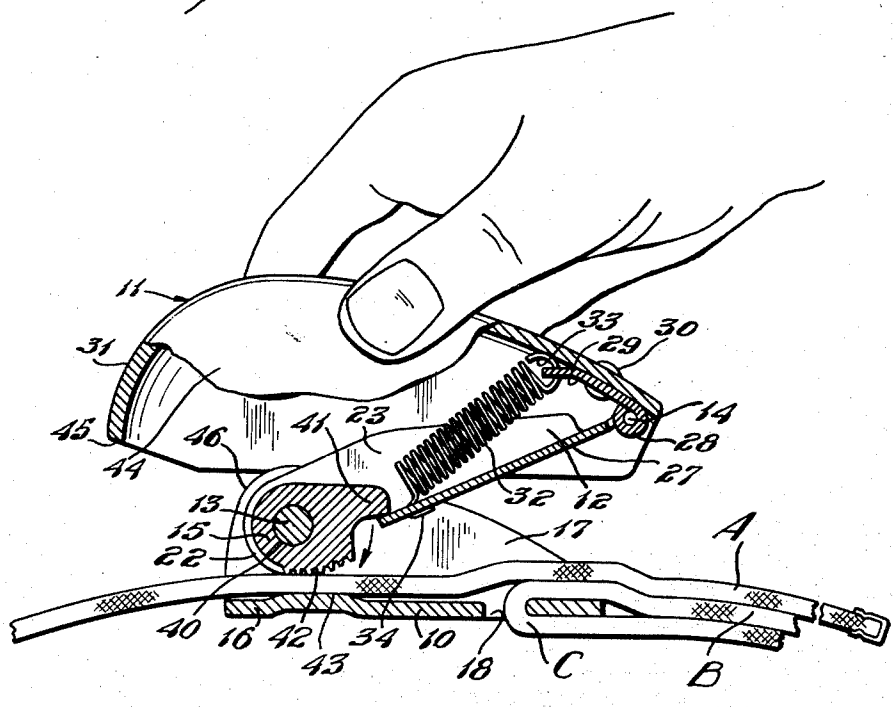


Fig. 4.

INVENTOR.
OWEN H. GRISWOLD
BY
Clark & Att
ATTORNEYS

Aug. 1, 1950 O. H. GRISWOLD 2,517,424

SAFETY BELT BUCKLE

Filed April 18, 1947 3 Sheets-Sheet 3

Fig. 5.

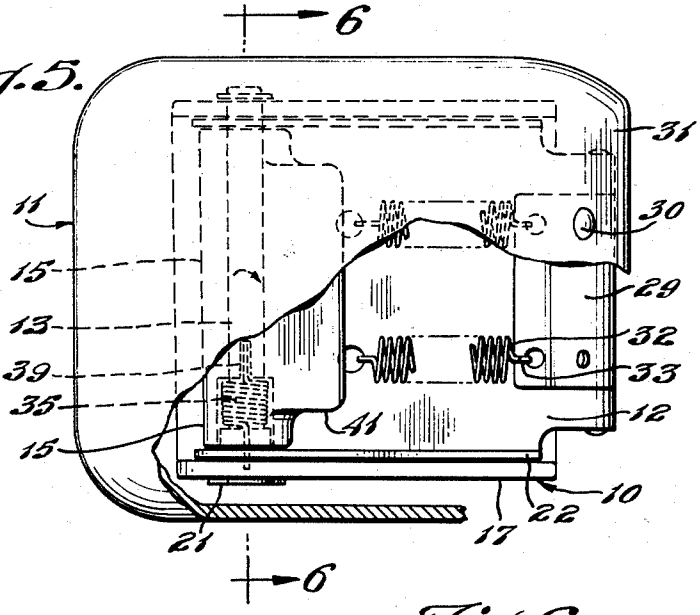


Fig. 6.

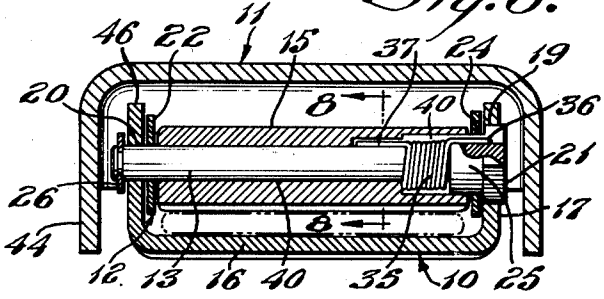


Fig. 8.

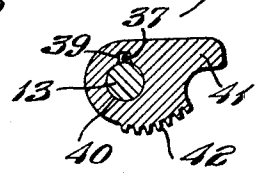
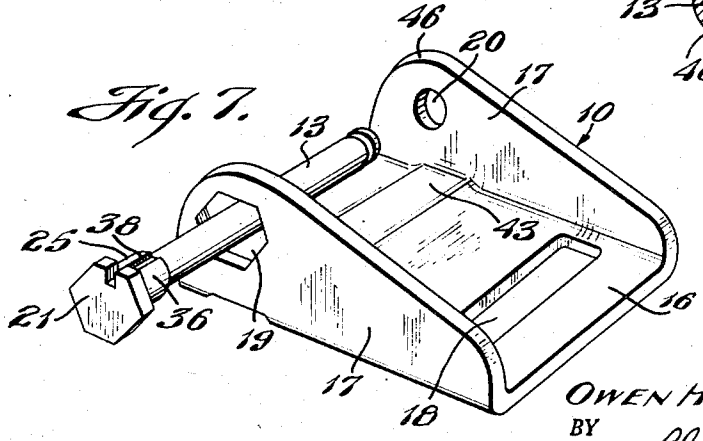


Fig. 7.



INVENTOR.
OWEN H. GRISWOLD
BY
Clark + Ott
ATTORNEYS

Patented Aug. 1, 1950 2,517,424

UNITED STATES PATENT OFFICE

2,517,424

SAFETY BELT BUCKLE

Owen H. Griswold, Santa Monica, Calif., assignor to Air Associates, Incorporated, Teterboro, N. J., a corporation of New Jersey

Application April 18, 1947, Serial No. 742,270

6 Claims. (Cl. 24—170)

1

This invention relates to safety belts worn by occupants of aircraft, speed boats and the like and the invention has particular reference to a buckle for securing the belt in coupled relation against accidental or unintentional uncoupling thereof to thereby insure the safety of the wearer, and which belt may be instantaneously released from coupled relation when desired.

The invention has for an object the provision of a buckle consisting of frame parts between which one end of the belt is adapted to be trained for engagement by a pivotally mounted latch member adapted to engage with and retain the belt in coupled relation and which is released from coupled relation by relative separation of the said parts.

The invention has for a further object the provision of a buckle of said character in which the frame parts are normally retained in nested relation and the latch element is pivotally mounted for independent rocking movement into clamping engagement with the belt.

The invention also has for an object the provision of a buckle for a safety belt in which the frame parts of the buckle are pivotally connected together for movement from adjacent or nested relation to relative separated condition and in which the latch element is pivotally carried by one of the pivotal elements for rocking movement with one of the parts of the buckle to thereby free the belt from coupled relation when the parts are moved to separated condition.

With the foregoing and other objects in view reference is now made to the following specification and accompanying drawings in which the preferred embodiment of the invention is illustrated.

In the drawings:

Fig. 1 is a perspective view of a safety belt provided with a buckle constructed in accordance with the invention and illustrating the same in coupled relation as worn by an occupant of aircraft and the like.

Fig. 2 is a similar view with the buckle in released position.

Fig. 3 is an enlarged longitudinal sectional view taken approximately on line 3—3 of Fig. 1.

Fig. 4 is a similar view taken approximately on line 4—4 of Fig. 2 and illustrating the casing or cover of the buckle partly broken away.

Fig. 5 is a top plan view of the buckle with the casing or cover partly broken away to show the underlying parts.

Fig. 6 is a transverse sectional view taken approximately on line 6—6 of Fig. 5.

Fig. 7 is a perspective view of inner frame member with the cross shaft in juxtaposition thereto.

Fig. 8 is a vertical sectional view taken approximately on line 8—8 of Fig. 6.

2

Referring to the drawings by characters of reference, the buckle includes three pivotally connected frame members consisting of an inner frame member 10, an outer frame member or cover 11 of hollow formation and an intermediate or channel shaped frame member 12. The intermediate frame member 12 is pivotally connected at its opposite ends on a cross shaft and cross pin 13 and 14 respectively to the inner and outer frame members 10 and 11 for movement of said outer and intermediate frame members from adjacent or nested relation with the inner frame member to an expanded or relative separated relation therewith.

The free end A of a safety belt B is trained through the buckle between the inner and intermediate frame members 10 and 12 and is engaged by a latch element 15 for securing the belt in coupled relation when the frame members are in adjacent or nested relation and for releasing the belt from coupled relation by the movement of the frame members to expanded or relative separated relation.

The inner frame member 10 is of channel shaped formation in cross-section consisting of a bottom wall 16 provided with oppositely disposed outwardly projecting side flanges 17. The wall 16 is formed with a transverse slot 18 adjacent one end thereof through which the opposite end C of the safety belt is trained and is doubled over to form a loop with the doubled over portion secured to the body of the belt. Adjacent the opposite end of the inner frame member, the side flanges 17 thereof are formed with aligned hexagonal and circular apertures 19 and 20 respectively for receiving the cross shaft 13 with the hexagonal shaped head 21 thereof located in the hexagonal aperture 19.

The latch element 15 is pivoted on the cross shaft 13 between apertured projecting ends 22 of side flanges 23 of the intermediate frame member 12, through which apertured ends the cross shaft 13 extends to pivotally connect the intermediate and inner frame members together. The aperture 24 in one of said projecting ends 22 receives the shank 25 of the cross shaft 13 with the projecting end engaging against the inner face of the hexagonal head 21 thereof for retaining the head in the aperture 19 in the inner frame member. The opposite end of said cross shaft 13 is provided with an annular recess in which is disposed a snap ring 26 for retaining the said parts in assembled relation.

The intermediate frame member 12 extends longitudinally of the inner frame member 10 and includes a bottom wall 27 having the side flanges 23 projecting outwardly at the opposite longitudinal edges thereof. The bottom wall 27 extends beyond the flanges 23 at one end thereof and is pivotally connected to the cover

11 by the cross pin 14 engaging through rolled terminals 28 formed on the bottom wall 27 and on a bracket 29 riveted as at 30 to the inner face of the peripheral wall 31 on the cover 11.

Spring means is provided for normally tensioning the cover 11 and the intermediate frame member 12 against relative separation which as illustrated may consist of one or more coiled contractile springs 32 having opposite ends 33 and 34 respectively connected to the bracket 29 and to the bottom wall 27 of the intermediate frame member 12 to thereby dispose the axes of the springs at an angle to the plane of the bottom wall 27. Arranged on the cross shaft 13 is a torsion spring 35 having its terminal ends 36 and 37 secured in slots 38 and 39 respectively formed in the shank 25 of the cross shaft and in the bore 40 of the latch element 15, which spring tensions the latch element for movement in the direction of the arrows shown in Figs. 3 and 4 of the drawings. The latch element is formed with a projecting lug 41 which is spaced from the bottom wall 27 of the intermediate frame member 12 when the frame members are in nested relation. When the cover member 11 and the intermediate frame member 12 are moved outwardly the bottom wall 27 engages with the lug 41 so as to rock the latch element 15 against the tension of the torsion spring 35. Constructed in this manner, the cover member 11, the intermediate frame member 12 and the inner frame member 10 are normally retained against relative separation and the intermediate frame member 12 and the inner frame member 10 are normally disposed in nested relation within the cover member.

The latch element 15 is formed with a serrated or toothed cam face 42 on the inner periphery thereof which is cammed into gripping engagement with the belt end A by the torsion spring 35. Adjacent said cam face the bottom wall 16 of the inner frame member 10 is offset as at 43 between the flanges 17 to provide a restricted passageway between the cam face 42 and the offset portion 43 through which is trained the belt end A of the safety belt with the free end thereof protruding from the buckle between the bottom walls 16 and 27 of the inner and intermediate frame members 10 and 12 respectively.

The cover member 11 is adapted to be grasped by the wearer for outward movement thereof against the tension of the springs 32 to thereby swing the intermediate frame member 12 on its pivotal connections into relative separated relation with the inner frame member and the cover 11 as shown in Figs. 2 and 4 of the drawings. This movement effects the engagement of the projecting lug 41 of latch 15 with the bottom wall 27 of intermediate frame member 12 and rocks the latch element 15 on the cross shaft 13 so as to free the belt end A from coupled engagement with the buckle, the belt end A remaining in uncoupled relation so long as the cover 11 is held in relative separated relation. When the cover 11 is released by the wearer the same together with the intermediate frame member 12 snaps back into adjacent or nested relation so that the latch element 15 will again grippingly engage and hold the belt end A in coupled relation and disengage from bottom wall 27 of intermediate frame member 12.

The peripheral wall 31 of the cover 11 is of generally arcuate formation and when in adjacent or nested relation with the intermediate and inner frame members the opposite side walls

44 thereof extend inwardly in covering relation with the side flanges 17 of the inner frame member.

It will be understood that the torsion spring 35 tensions the latch element 15 for rotation in a clockwise direction as shown by the arrows in Figs. 3 and 4 so that the serrated cam face 42 is rocked into impinging relation against the face of the belt end A to thereby connect the belt in coupled relation, and the only manner in which the same may be released is by outward movement of the cover member 11 and intermediate frame member 12 to effect a rocking of the latch member 15 in counter clockwise direction against the tension of the torsion spring 35. Furthermore the cam face 42 of the latch element 15 is so arranged that the tighter the pull on the belt B about the body of the wearer the deeper the cam face 42 will be impinged in the belt end A.

When the parts of the buckle are in nested relation and the belt is in coupled condition, the edge 45 of the cover 11 and the pintle rolls 28 at the opposite end of the cover are in contact with the belt end A. When, however the belt end A is withdrawn from the buckle, the rim 46 of the inner frame member 10 is engaged by the peripheral wall 31 of the cover 11.

What is claimed is:

1. A buckle for a safety belt comprising an inner frame member to which the belt is affixed, an outer cover member, an intermediate frame member pivotally connected at one end to said inner frame member and at its opposite end to said cover member for movement of said cover member and said intermediate frame member from adjacent relation with the inner frame member to a relative separated relation, said intermediate and inner frame members having superposed walls disposed in spaced relation for receiving the end of the belt therebetween, a latch member pivoted on the pivotal connection of the intermediate and inner frame members and having a serrated cam face adapted to engage against the belt end for securing the belt in coupled relation, spring means tensioning said cover and intermediate frame member for normally retaining the same in adjacent relation, spring means tensioning said latch member for normally retaining the same in engagement with the belt end, and said intermediate frame member extending under a projecting portion of said latch member for engaging and rocking said latch member on its pivotal connection to release the belt end from coupled relation upon movement of said cover and intermediate frame members to relative separated relation against the tension of said spring means.

2. A buckle for a safety belt comprising an inner frame member to which the belt is affixed, an outer member, an intermediate frame member arranged between the inner and outer members, said inner and intermediate frame members having bottom walls and parallel side walls arranged with the bottom walls disposed in spaced relation and the side walls of the intermediate frame member located between the side walls of the inner frame member and adapted to receive the end of the belt between the bottom walls thereof, a cross shaft mounted in said side walls pivotally connecting the inner and intermediate members together, a latch member pivotally mounted on said cross shaft and having a serrated cam face adapted to impinge against the belt end for securing the same between the latch

member and the bottom wall of the inner frame member for connecting the belt in coupled relation, means connecting the outer member to move with the intermediate frame member, spring means tensioning said latch member for normally retaining the same in engagement with the belt and said intermediate frame member extending under a projecting portion of said latch member for engaging and rocking said latch member for releasing the belt from coupled relation against the action of said spring means upon swinging movement of the intermediate frame member on its pivotal connection.

3. A buckle for a safety belt comprising an inner frame member to which the belt is affixed, an outer frame member, an intermediate frame member arranged between the inner and outer frame members, said inner and intermediate frame members having bottom walls and parallel side walls arranged with the bottom walls disposed in spaced relation and with the side walls of the intermediate frame member located between the side walls of the inner frame member and adapted to receive the end of the belt between the bottom walls thereof, means extending through said side walls pivotally connecting the inner and intermediate members together, means pivotally connecting the opposite end of said intermediate frame member to said outer frame member for movement of said intermediate and outer frame members from adjacent relation with the inner frame member to relative separated relation, a latch member pivoted on the pivotal connection of the intermediate and inner frame members and having a serrated cam face adapted to impinge against the belt end for securing the same between the latch member and the bottom wall of the inner frame member for connecting the belt in coupled relation, spring means tensioning said outer and intermediate frame members for normally retaining the same in adjacent relation, spring means tensioning said latch member for normally retaining the same in engagement with the belt end, and said intermediate frame member extending under a projecting portion of said latch member for engaging and rocking said latch member on its pivotal connection to release the belt end from coupled relation upon movement of said outer and intermediate frame members to relative separated relation against the tension of said spring means.

4. A buckle for a safety belt comprising an outer cover member and a pair of channel shaped members nested one within the other and between which an end of the safety belt is adapted to engage to dispose said channel shaped members in overlying and underlying relation with the belt end, means pivotally connecting the cover member to said overlying channel shaped member at one end thereof and means pivotally connecting the opposite end of said overlying channel shaped member to said underlying channel shaped member for movement of said members from adjacent relation to a position in which the cover member and said overlying channel shaped member are disposed in angular relation to the underlying channel shaped member, a latch member pivotally mounted on the pivotal means connecting the channel shaped members for independent movement of said latch member, said latch member having a projecting portion extending over said overlying channel-shaped member and having a serrated cam face adapted to impinge against the belt end when trained between said nested frame members, and means

tensioning said cover member and channel shaped members and said latch member for normally retaining the said cover member and channel shaped members in adjacent relation and the latch member in impinging relation with the belt end, said latch member being released from impinging relation with said belt end by engagement of said overlying channel shaped member therewith when the cover member and overlying channel shaped member are moved to relative angular relation with the underlying channel shaped member.

5. A buckle for a safety belt comprising an inner member, an outer member, an intermediate member pivoted at one end to said inner member and at its opposite end to said outer member for receiving an end of the belt between said inner and intermediate members, a latch member pivotally mounted on the pivotal connection between said intermediate and inner members for independent movement of said latch member, said latch member having a serrated cam face adapted to impinge said belt end against the inner member, spring means tensioning said inner, intermediate and outer members and said latch member for normally retaining said members in adjacent relation and the latch member in impinging engagement with the belt end, and said latch member having a projecting portion adapted to be engaged by said intermediate member for releasing the latch member from impinging engagement with the belt by relative movement of said outer and intermediate members with reference to the inner member.

6. A buckle for a safety belt comprising an inner member, an outer member, an intermediate member pivoted at one end to said inner member and at its opposite end to said outer member for receiving an end of the belt between said inner and intermediate members, a latch member pivotally mounted on the pivotal connection between said intermediate and inner members for independent movement of said latch member, said latch member having a serrated cam face adapted to impinge said belt end against the inner member, spring means tensioning said outer member and intermediate member for normally retaining the same in adjacent relation, spring means tensioning said latch member for normally retaining the same in engagement with the belt end, and said latch member having a projecting portion adapted to be engaged by said intermediate member for releasing the latch member from impinging engagement with the belt by relative movement of said outer and intermediate members with reference to the inner member.

OWEN H. GRISWOLD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,086,090	Schroeder	Feb. 3, 1914
1,440,339	Chabot	Dec. 26, 1922
1,533,650	Jaso	Apr. 14, 1925
2,327,741	Poole	Aug. 24, 1943

FOREIGN PATENTS

Number	Country	Date
203,943	Great Britain	Sept. 20, 1923
704,864	France	Feb. 24, 1931