Nov. 15, 1966 E. J. PRISBE 3,285,700

BELT BUCKLE

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Fig. 1.

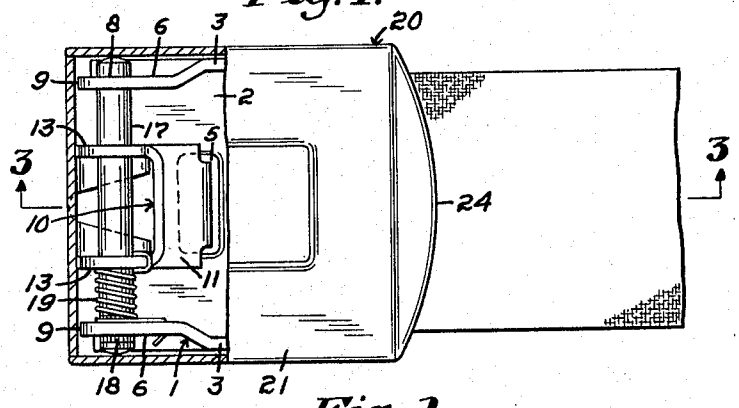


Fig. 2.

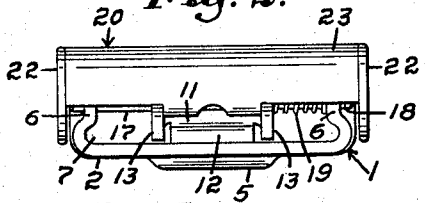


Fig. 3.

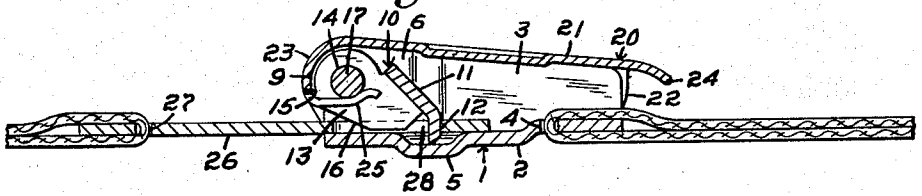
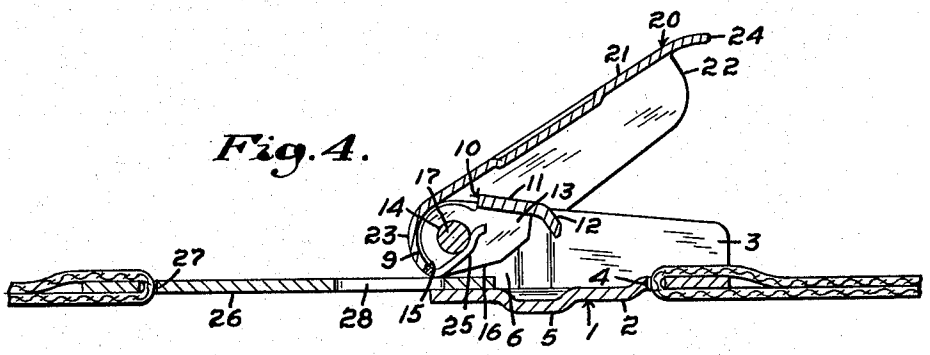


Fig. 4.



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Fig. 5.

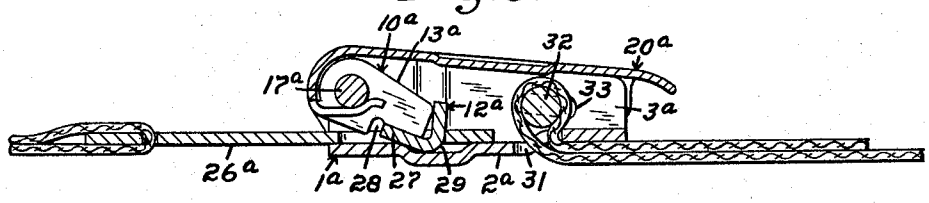


Fig. 6.

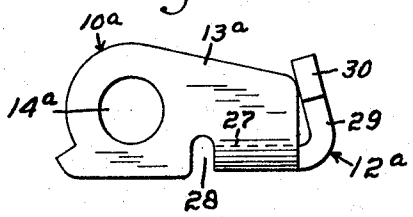


Fig. 7.

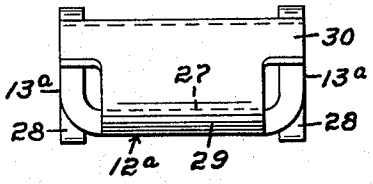
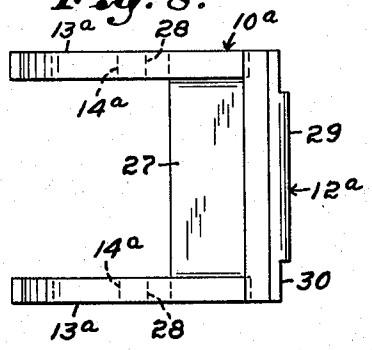


Fig. 8.



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3,285,700

BELT BUCKLE

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Filed July 13, 1965, Ser. No. 471,535
6 Claims. (Cl. 24—230)

This invention relates to belt buckles such as those utilized to releasably secure the ends of web safety belts used on motor vehicles.

An object of the invention is to provide a strong, durable, positively locking buckle.

A further object is to provide a buckle in which the locking mechanism is adapted to automatically operate upon insertion of the tongue member into the buckle.

A still further object is to provide a buckle having a low profile to reduce the probability of accidental unlocking, and smooth, flat outer surfaces to reduce the likelihood of injury to the person or clothing of the operator or the upholstery of the motor vehicle.

An additional object of the invention is to provide a buckle having a minimum number of component parts for ease of fabrication and assembly.

A still further object of the invention is to provide a buckle which will withstand the instantaneous application of considerable tension to a belt, as in the case of the occupant of a vehicle being thrown forward in a collision, without becoming unlocked.

Other objects and advantages of the novel buckle will become evident from a reading of the following detailed description in conjunction with a viewing of the accompanying drawings in which:

FIG. 1 is a top plan view of the invention showing a belt attached thereto and the cover partially broken away;

FIG. 2 is an end view of the buckle as seen from the left of FIG. 1;

FIG. 3 is a section taken on line 3—3 of FIG. 2 showing a tongue attached to a second belt section locked in the buckle;

FIG. 4 is a sectional view similar to FIG. 3 depicting the cover raised and the tongue partially retracted;

FIG. 5 is a sectional view depicting another version of the buckle;

FIG. 6 is a side elevation of the latch member shown in FIG. 5;

FIG. 7 is an end view of the latch member as viewed from the right of FIG. 6; and

FIG. 8 is a top plan view of the latch member shown in FIGS. 6 and 7.

The buckle includes a body portion **1** having a generally flat base portion **2**, opposed upwardly-extending sides **3**, a narrow slot **4** adjacent one end of the base **2** for receiving a web belt and a shallow well **5** located closer to the opposite end of the base for receiving the hook of a latch member. A portion **6** of each of the sides **3** is diverted inwardly and these portions **6** cooperate with the base **2** to provide a channel **7** for sliding engagement of a tongue member with the buckle. The inwardly-diverted portions **6** are also each provided with an opening **8** to receive a rod and the upper end edges **9** of the side portions **6** are arced to provide a pivotal support for a cover. The upwardly-extending slides **3** are highest at the end of the inwardly-diverted portions **6** and thereafter taper downwardly to their opposite ends.

The latch member **10** includes a back portion **11**, a hook **12** extending forwardly and downwardly from said back portion, and a pair of spaced slide flanges **13** extending downwardly and rearwardly of said back portion. Each of the rearwardly-extending side flanges **13** is provided with a rod receiving aperture **14** and the rearmost

end of each flange **13** is notched to provide a pair of latch dogs **15**. The lower edge **16** of each flange **13** extends toward the base **2** at an acute angle thereto and said edges act as camming surfaces as will be more fully explained hereinafter.

The latch **10** is connected to the inwardly-diverted side portions **6** by a fixed rod **17**. The rod is seated in a press-fit relationship in each of the apertures **8** in the side portions **6** and extends through each of the apertures **14** in the flanges **13** of the latch. One end **18** of the rod is knurled to lock the rod and prevent any rotation thereof with respect to the body of the buckle.

A torsion spring **19** is wound on the rod **17** adjacent its knurled end **18**. One end of the spring is connected to a side portion **6** of the body **1** and the other end overlies a portion of the latch **10**. The spring **19** is wound so as to bias the latch **10** in a downward direction, whereby the hook **12** extends into the shallow well **5** in the base **2** and the camming edges **16** are disposed at an acute angle with respect to the base.

The cover **20** is of one-piece construction and includes a top **21**, a pair of downwardly-extending sides **22**, a downwardly-curved rear flange **23**, a forwardly-extending, slightly arcuate handle **24**, and an integral, bifurcated spring clip **25** extending from the edge of the rear flange **23** in generally spaced, parallel relationship to the top **21**.

The assembly of the cover **20** to the remainder of the knuckle is accomplished by snapping the spring clip **25** under the rod **17** between the rearwardly-extending flanges **13** of the latch **10**. In addition to securing the cover the spring clip fixes the position of the latch **10** and prevents any lateral movement of the latter along the rod **17**. As best seen in FIGS. 2 and 3 the edge of the rear flange **23** rests on the latch dogs **15** and portions of the rear flange **23** rest on the upper edges **9** of the inwardly-diverted sides **6** which act as a fulcrum for pivotal movement of the cover. The downward spring bias on the latch **10** is transmitted through the latch dogs **15** to the flange **23** to retain the cover **20** in the down or closed position shown in FIG. 3.

The second section of the belt is connected to a flat tongue **26** through a narrow slot **27** adjacent one end of said tongue; and the tongue is further provided with a larger, generally rectangular, latch-receiving aperture **28** adjacent its free leading end.

From the foregoing detailed description the operation of the invention becomes readily apparent. With the respective parts positioned as shown in FIGS. 1 and 2 the tongue is inserted into the channel **7** in the rear of the buckle. As the leading edge of the tongue contacts the latch camming edges **16**, the latch **10** is pivoted upwardly about the rod **17**, independently of the cover, until the tongue is inserted to the point where the aperture **28** registers with the hook **12**, whereupon the latch **10** is spring-driven downwardly through the aperture **28** into the position shown in FIG. 3 and the tongue is locked in the buckle. Since the width of the aperture **28** is only slightly greater than the outside dimension across the flanges **13** and the lower portions of the same flanges also extend into the aperture, the hook **12** presents a substantial bearing surface for the tongue when tension is exerted on the belt sections, and flanges **13** resist lateral canting of the tongue. Further, the tongue cannot be rocked upwardly due to the bearing of the inwardly-diverted side portions **6** on its upper surface.

The uncoupling of the tongue and buckle is accomplished by gripping the handle **24** and rotating the cover upwardly to the position of FIG. 4. The upper edges **9** of the side portions **6** act as a fulcrum about which the cover pivots and the latch **10** is raised against the spring by the action of the edge of the rear flange **23** on the latch dogs **15**. Once the latch is removed from the

tongue aperture **28** the tongue may be readily retracted from the buckle. Thereafter, upon release of the cover the spring returns the latch and cover to the closed or normal position.

FIGS. 1, 2, and 3 quite clearly illustrate the improvement in the art contributed by the invention in terms of compactness and safety features. The use of the shallow well **5** as opposed to an opening in the base portion and the positioning of the outer side flanges **22** of the cover results in a substantial encapsulation of the inner component parts of the buckle. Thus the danger of catching and tearing one's clothing or the upholstery of a vehicle on bolts, pins, spring ends, etc., projecting outwardly of the buckle proper is eliminated. Further, the buckle presents a relatively low silhouette, thus reducing the possibility of a vehicle operator or passenger accidentally releasing the tongue. This feature is particularly significant at the time of collision or rapid braking of a vehicle when the occupants are often violently tossed about.

Since the buckle shown in FIGS. 1–4 has been designed primarily for use with automatic seat belt adjusting and retracting mechanisms, such as that disclosed by B. F. Monroe, Patent No. 3,100,669, there has been no showing of any additional means for adjusting the belt section as depicted in the drawings.

FIGS. 5–8 disclose another version of the buckle wherein a modified latch member is employed and a means for manually adjusting one of the seat belt sections is provided as an inherent part of the buckle.

The latch member **10***a* differs from the previously described latch **10** in that the hook portion **12***a* extends outwardly and upwardly from a lower cross member **27** rather than an upper cross member or back portion **11**. Further, the side flanges **13***a* are provided with a cutout **28** and the lower portion of the flanges between the cutout and the hook **12***a* are curved inwardly toward each other to join the cross member **27**.

The hook **12***a* includes a lower portion **29** which is of less width than the distance between the flanges **13***a* and is curved upwardly and rearwardly toward the flanges; and an upper portion **30** which extends across the flanges **13***a* and abuts the leading upper edge of each of them. Otherwise, the latch **10***a* is connected to the buckle and is operable in exactly the same manner as the previously described latch **10**. In this regard one should observe that the lower edges of the flanges **13***a* to the left of the cutout **28** are disposed below the curved, lower edges of the flanges to the right of the cutout to obviate the possibility of the leading edge of the tongue **26** becoming lodged in the cutout as the tongue is inserted into the buckle.

The buckle shown in FIG. 5, equipped with latch member **10***a*, provides for easy tongue insertion and an easy opening of the buckle when the belt sections are in tension in that the tongue member engages the lower curved portion of the hook **12***a* during insertion and retracting of the tongue. However, the most important improvement provided by the latch **10***a* is the superior strength imparted to the buckle and tongue connection. Since the hook **12***a* is braced by the side flanges **13***a* of the latch, substantial pull or load on the belts is resisted by the entire latch structure **10***a*; whereas in the buckle shown in shown in FIGS. 1–4 the forces generated by tension on the belts are generally resisted only by the free unsupported hook **12**.

The buckle of FIG. 5 is adapted for manual adjustment of the belt section attached thereto by providing an opening **31** in the base **2***a*, passing the free end of the belt section through the opening **31** and thereafter looping it over a knurled pin **32** and back through the aperture **31** along the top of the belt section. The knurled pin **32** is slidably supported in a pair of oval slots **33** located in the sides **3***a* of the body portion **1***a*.

This manual adjustment feature and its mode of operation will be well understood by those skilled in the art of adjustable seat belt buckles.

It is to be understood that what has been disclosed herein for purposes of illustration represents only two embodiments of the invention, and it is anticipated that further changes and modifications might be incorporated therein without departing from the scope of the invention as defined by the following claims.

I claim:

1. In an assembly of the type utilized to releasably connect separate sections of a belt wherein an apertured tongue member is attached to one belt section and a buckle to the other belt section,

a buckle comprising

(a) a body portion, said body portion including a base portion having a shallow latch-receiving well formed therein and spaced, upwardly-extending sides, portions of which overlie said base portion and co-operate therewith to provide a channel for receipt of the tongue member in said body portion, the upper edges of said side portions being arced to provide a pivotal support for a cover member;

(b) a rod, fixed to and extending between the side portions of said body in spaced parallel relation to said base;

(c) a latch pivotally connected to said rod, said latch including a plurality of vertically-extending, spaced side flanges connected by a cross member, and a hook portion extending forwardly from said cross member in the direction of said side flanges, portions of said flanges being notched to provide a plurality of latch dogs and the edges of said flanges being contoured to act as camming surfaces for independent pivotal movement of said latch responsive to insertion of the tongue member into said channel;

(d) means normally urging said latch member toward said base whereby said hook is disposed in the shallow well in said base portion to lock the tongue member in said buckle; and

(e) a cover member connected to said body portion in spaced relation to said base, said cover member including a top portion, an arced flange pivotally supported by the arced edges of the side portions of said body member, said flange extending toward said base and having portions of an edge thereof engaging said latch dogs, and an integral spring clip in snapped engagement with said rod to secure said cover to said body portion;

whereby pivotal movement of said cover away from said body portion causes a corresponding pivotal movement of said latch away from said base to permit retraction of the tongue member from said buckle.

2. A buckle according to claim **1** wherein said spring clip is bifurcated and is in snapped engagement with portions of said rod located between the flanges of said latch to prevent lateral movement of said latch with respect to said rod.

3. A buckle according to claim **1** wherein said cover is provided with downwardly-extending sides which overlie the sides of said body portion in spaced relationship thereto.

4. A buckle according to claim **1** wherein said means urging said latch towards said base portion is a torsion spring wound on said rod, having one end thereof connected to said body portion and another end overlying a portion of said latch.

5. In an assembly of the type utilized to releasably connect separate sections of a belt wherein an apertured tongue member is attached to one belt section and a buckle to the other belt section,

a buckle comprising,

(a) a body portion, said body portion including a base portion having a shallow latch-receiving

well formed therein and spaced upwardly-extending sides, portions of which overlie said base portion and co-operate therewith to provide a channel for receipt of the tongue member in said body portion, the upper edges of said side portions being arced to provide a pivotal support for a cover member;

(b) a rod fixed to and extending between the side portions of said body in spaced parallel relation to said base;

(c) a latch pivotally connected to said rod, said latch including a back portion, a hook extending forwardly and downwardly from said back portion and a pair of spaced flanges extending downwardly and rearwardly of said back portion, portions of said flanges being notched to provide a pair of latch dogs and the edges of said flanges being contoured to act as camming surfaces for independent pivotal movement of said latch responsive to insertion of the tongue member into said channel;

(d) means normally urging said latch member toward said base whereby said hook is disposed in the shallow well in said base portion to lock the tongue member in said buckle; and

(e) a cover member connected to said body portion in spaced relation to said base, said cover member including a top portion, an arced flange pivotally supported by the arced edges of the side portions of said body member, said flange extending toward said base and having portions of an edge thereof engaging said latch dogs, and an integral spring clip in snapped engagement with said rod to secure said cover to said body portion;

whereby pivotal movement of said cover away from said body portion causes a corresponding pivotal movement of said latch away from said base to permit retraction of the tongue member from said buckle.

6. In assembly of the type utilized to releasably connect separate sections of a belt wherein an apertured tongue member is attached to one belt section and a buckle to the other belt section,

a buckle comprising

(a) a body portion, said body portion including a base portion adapted to receive portions of a

latch member and spaced, upwardly-extending sides co-operating with said base to provide a channel for receipt of a tongue member in said body portion, portions of said sides being arced to provide a pivotal support for a cover member;

(b) a rod fixed to and extending between the sides of said portion in spaced relation to said base;

(c) a latch pivotally connected to said rod, said latch including spaced side flanges connected by a cross member and a hook, portions of said hook extending forwardly of said cross member and other portions of said hook extending upwardly of said cross member and terminating in a free end, portions of said free end extending across said flanges whereby said hook is braced by said flanges when the buckle is used under load, said latch member being adapted for independent pivotal movement away from said base responsive to insertion of the tongue member into said channel;

(d) means normally urging said latch member towards said base whereby a portion of said hook is positioned to lock the tongue member in said body portion; and

(e) a cover member connected to said body portion in spaced relation to said base, said cover member including a top portion and an arced flange pivotally supported by the arced portions of the sides of said body, said flange extending towards said base so as to engage the side flanges of said latch member, whereby pivotal movement of said cover away from said body portion causes a corresponding pivotal movement of said latch away from said base to permit retraction of the tongue member from the buckle.

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BERNARD A. GELAK, *Primary Examiner.*