April 21, 1959 J. F. SPIELMAN 2,882,581

BUCKLES

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FIG. 1

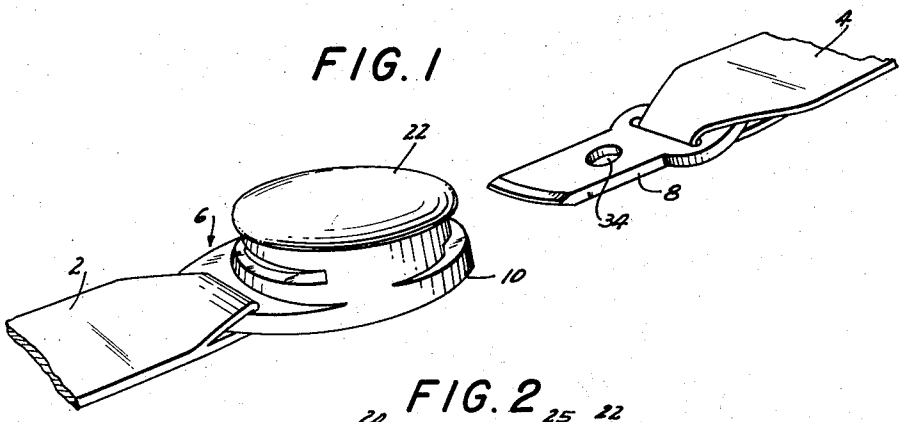


FIG. 2

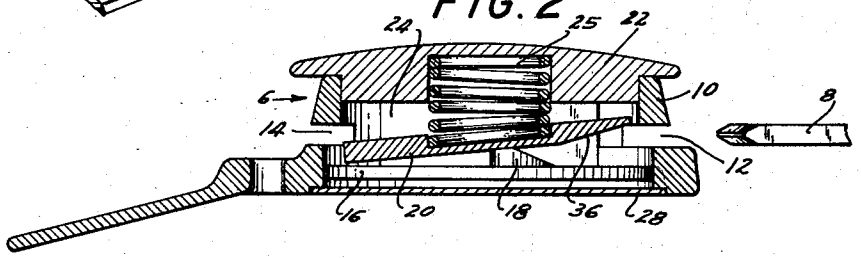


FIG. 3

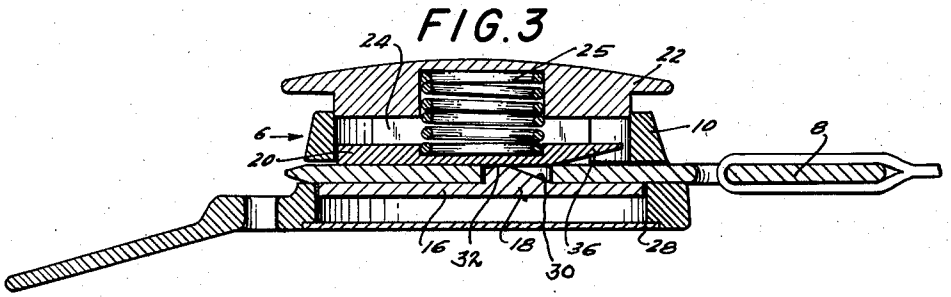
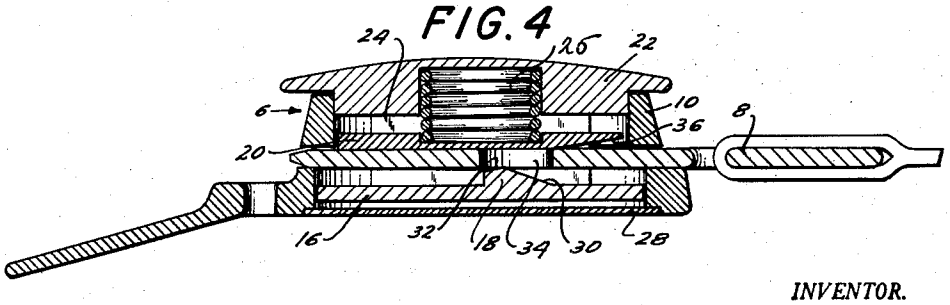


FIG. 4



INVENTOR.
JAMES F. SPIELMAN

BY James A. Bethell

ATTORNEY

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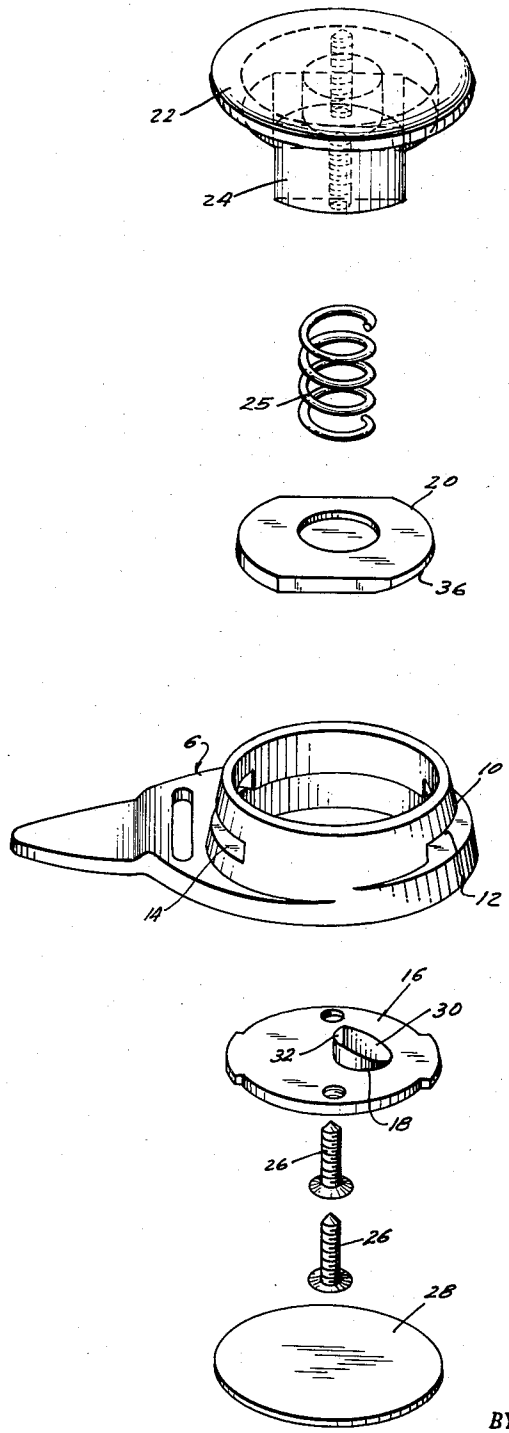


FIG. 5

INVENTOR.
JAMES F. SPIELMAN

BY James F. Bethell

ATTORNEY

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2,882,581

BUCKLES

James F. Spielman, Torrington, Conn., assignor to The Aerotherm Corporation, Bantam, Conn., a corporation of Connecticut

Application June 13, 1957, Serial No. 665,445

3 Claims. (Cl. 24—230)

My invention relates to an improvement in belt buckles in general and to safety belt buckles in particular.

One of the objects of my invention is to provide a belt buckle which, while capable of maintaining the two ends of a belt or strap attached to each other under very high tensional stresses, may be released instantaneously, even though the belt may be under high tension, by simply striking the buckle a sharp blow with the hand, arm, elbow, or any other part of the body which may be available. This feature is of value, of course, in buckles for many uses but is particularly valuable for use on safety belts, where the user of the belt may be involved in an accident, such as a plane crash, for example, and may be in such a position or condition that his hands are not free to release the buckle in conventional fashion but is able to strike the buckle a sharp blow to effect its release.

In general, my improved buckle comprises a belt fitting which is attached to one end of the belt, and a tongue which is adapted to be attached to the adjacent end of the belt. These two parts are so constructed and arranged that, while they will remain locked to each other even when the belt is subjected to comparatively high tensions, they are readily separable by simply striking the buckle a sharp blow with the hand or other part of the body.

I am aware, of course, that buckles are notoriously old and embrace a great many different designs, varying from the simple type in which a tongue, affixed to one end of a belt, passes through a hole in the other end of the belt to the more involved designs where levers and cams or cam surfaces are employed to retain the buckle in locking position. These buckles all require the use of two hands or some other type of manipulation for release, as distinguished from my construction in which it is merely necessary to strike the buckle a sharp blow to effect its release or disengagement.

In the accompanying drawings,

Fig. 1 shows an embodiment of my invention in perspective;

Fig. 2 is a sectional, elevational view showing the buckle completely disengaged;

Fig. 3 is a sectional, elevational view showing the buckle engaged;

Fig. 4 is a sectional, elevational view showing the positions occupied by the movable parts of the buckle after being struck a sharp blow so that the two ends of the belt are disengaged; and

Fig. 5 is an exploded view of the buckle.

Referring to the drawings in detail, 2 and 4 designate the two belt ends which are to be buckled together. Secured to the belt end 2 is a buckle base 6, while secured to the belt end 4 is a cooperating belt fitting or buckle tongue 8.

The buckle base 6 is shaped to provide an integral, annular housing 10, extending upwardly from the upper face of the buckle base. The housing wall is slotted at 12 and 14 (Figs. 2 and 5) to permit the buckle tongue 8 to be inserted into the housing, as will be brought out hereinafter.

Lying within the lower part of the base 6 is a lock plate 16, which is provided on its upper face with a locking lug 18. The enlarged bore in which the lock plate 16 is installed prevents movement of the plate above the level of the lower side of the slots 12 and 14 in the buckle base 6, while the irregular periphery of the lock plate prevents rotation thereof in relation to the buckle base.

20 designates a lever lock plate, which is within the housing 10 and overlies the lock plate 16, its lower face resting upon the locking lug 18 of the lock plate.

Extending into the upper end of the housing 10 is a release button 22. The stem or shank 24 of this button is slotted in alignment with the slots 12 and 14 in the buckle base 6, to enable the stem to be slipped over the lever lock plate 20 without interfering with pivoting of the latter. A coil spring 25 is provided within the button shank between the upper face of the lever lock plate 20 and the top or roof of the shank slot.

The release button 22 and the lock plate 16 are rigidly secured to each other, with the lever lock plate between them, by two screws 26 (see Fig. 5). These screws, of course, are outside the boundaries of the lever lock plate so as not to interfere with the necessary pivoting of this plate.

28 designates a cover plate at the bottom of the housing. This bottom cover plate is fixed in position in any convenient fashion, as by peening, for example.

From the description thus far given it will be seen that the release button 22, the lock plate 16, and all of the internal elements are capable of being reciprocated as a unit within the housing 10, and that the lever lock plate 20 in itself is free to pivot on the top of the locking lug 18. In this connection it may be noted that the top of the locking lug is bevelled in opposed directions, front and rear, as seen at 30 and 32 (Figs. 4 and 5).

In the construction illustrated, the belt fitting or buckle tongue 8 is provided with a hole 34, which is adapted to cooperate with the locking lug 18 when the buckle is engaged or locked.

When the buckle is not in use, the parts embodied in the buckle base 6 will be in the approximate positions illustrated in Fig. 2, the button 22 and the lock plate 16 being in their lowermost position within the housing 10, with the lever lock plate 20 pivoted or tilted out of parallelism with the lock plate 16 and resting upon the bevelled area 32 at the top of the locking lug 18. With the parts in this position, the buckle tongue 8 can be inserted into the housing 10, between the lever lock plate 20 and the lock plate 16, through the side slot 12, and be pushed across the housing until the hole 34 in the tongue 8 registers with the locking lug 18. To facilitate entry of the tongue beneath the lever lock plate 20, not only is the locking lug 18 bevelled at 30, as already pointed out, but the lever lock plate 20 at its forward edge, that is, the edge adjacent the slot 12, is bevelled as seen at 36 (Fig. 2).

As the tongue 8 is advanced, the lever lock plate 20 will be pivoted to a horizontal position, as seen in Fig. 3, and the spring 25 will be compressed, until finally, when the hole 34 in the tongue 8 registers with the locking lug 18, the lock plate 16 and the button 22 will move upwardly as a unit to move the locking lug 18 into locked position in the tongue 8. The buckle tongue 8 is, in fact, pressed between the lever lock plate 20 and the lock plate 16, to provide a direct shear load on the locking lug 18. The form of interlock which I have illustrated between the tongue 8 and lock plate 16 has proven very effective, and I have found it capable of withstanding very high tensions on the belt. It is to be understood,

however, that other forms of interlock may be employed within the purview of this invention.

As well illustrated in Fig. 3, the button **22** and lock plate **16** have both been moved upwardly with respect to the housing **10**, and the lever lock plate **20** is now lying in a horizontal position, namely, parallel to the lock plate **16**. Now, assuming that it is desired to release or disengage the buckle, it is merely necessary to strike the button **22** a sharp blow, and regardless of the applied tension on the belt this will move the button and lock plate **16** downwardly within the housing **10** until the locking lug **18** clears the hole **34** in the tongue **8**, as illustrated in Fig. 4, the tongue then withdrawing from the housing **10** by reason of the tension under which we assume the belt to be, and the parts will once more assume the positions illustrated in Fig. 2.

From all of the foregoing it will be appreciated that my invention provides a quick-release buckle, which requires no manipulation other than striking the release member or button a sharp blow when the buckle is to be disengaged or unlocked.

It is to be understood that, while I have shown one embodiment of my invention, changes may be made in the details of construction and arrangement of parts illustrated and described within the purview of my invention.

What I claim is:

1. A belt buckle comprising, in combination, a buckle base; a buckle tongue insertable into said base transversely thereof; a lock plate within the base having limited movement axially thereof; means carried by said lock plate and interlockable with said buckle tongue for locking the buckle tongue against withdrawal from the buckle base; a second plate within said base overlying the said lock plate, said second plate being tiltable and being normally tilted at an angle to the plane of the lock plate; means within said base limiting the angle of tilt of said second plate; a release button at the exterior of the said base and having a stem extending into the said base, said stem being rigidly secured to the said lock plate; and a spring carried by said button stem between said button and said second plate, insertion of the belt tongue into said base between said two plates tilting the said second plate into parallelism with the said lock plate and compressing said spring to bias the lock plate into interlocking relation to the belt tongue, depression of said release button in opposition to said spring moving the lock plate out of interlocking relation to the belt tongue, to permit the belt tongue to be withdrawn from between the said two plates.

2. A belt buckle comprising, in combination, a buckle base and a buckle tongue, said base being provided with an opening in its side wall for the insertion of the said tongue into the base transversely of the base; a lock plate within said base having a limited movement axially of the base; a release button at the exterior of said base having a stem extending into the base, said stem being rigidly

secured to said lock plate; a locking lug carried on one face of said lock plate; a floating lever lock plate within said base in superposed relation to said first plate, said lever lock plate being tiltable on said lug as a fulcrum and being normally tilted at an angle to the plane of the lock plate; means within said base for limiting the angle of tilt of the lever lock plate; and a spring between said lever lock plate and said release button whereby, when the said buckle tongue is inserted into said base between the said two plates, the lever lock plate will be tilted so as to be parallel to the first lock plate, and the release button and the first lock plate will be displaced from the buckle base to bring said lug into interlocking relation to said tongue, said spring permitting depression of said release button and said first lock plate with the buckle tongue between the two plates to disrupt the interlock between the lug and buckle tongue to permit the buckle tongue to be withdrawn from the buckle base.

3. A belt buckle comprising, in combination, a buckle base and a buckle tongue, said base being provided with an opening in its side wall for the insertion of the said tongue into the base transversely of the base; a lock plate within said base having a limited movement axially of the base; a release button at the exterior of said base having a stem extending into the base, said stem being rigidly secured to said lock plate; a locking lug carried on one face of said lock plate; a floating lever lock plate within said base in superposed relation to said first plate, said lever lock plate being tiltable on said lug as a fulcrum and being normally tilted at an angle to the plane of the lock plate; means within said base for limiting the angle of tilt of the lever lock plate, the edge of said lever lock plate adjacent the said opening in the side wall of the base being beveled to facilitate entry of the belt tongue into said base between the opposed faces of the lock plate and the lever lock plate; and a spring between said lever lock plate and said release button whereby, when the said buckle tongue is inserted into said base between the said two plates, the lever lock plate will be tilted so as to be parallel to the first lock plate, and the release button and the first lock plate will be displaced from the buckle base to bring said lug into interlocking relation to said tongue, said spring permitting depression of said release button and said first lock plate with the buckle tongue between the two plates to disrupt the interlock between the lug and buckle tongue to permit the buckle tongue to be withdrawn from the buckle base.

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