Feb. 4, 1947. E. LUTZ ET AL 2,415,254

EXPANDIBLE BELT

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Fig. 1.

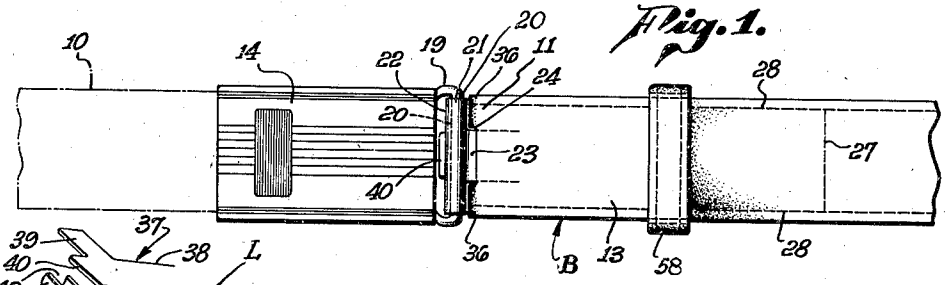


Fig. 6.

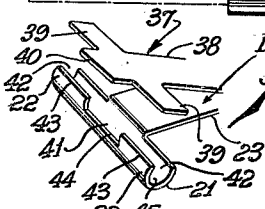


Fig. 2.

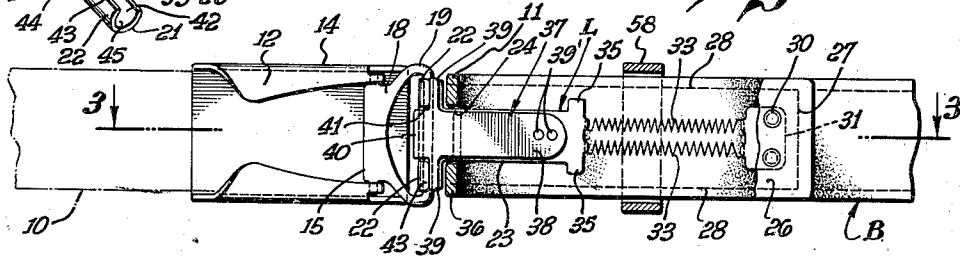


Fig. 3.

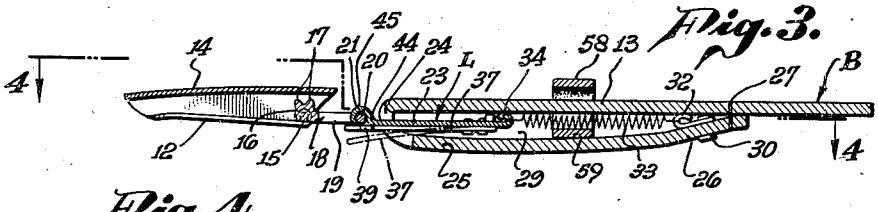


Fig. 4.

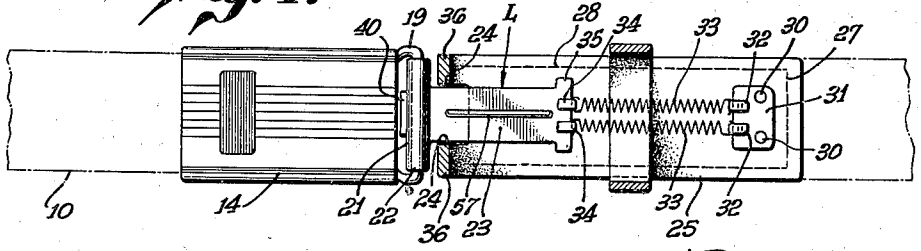
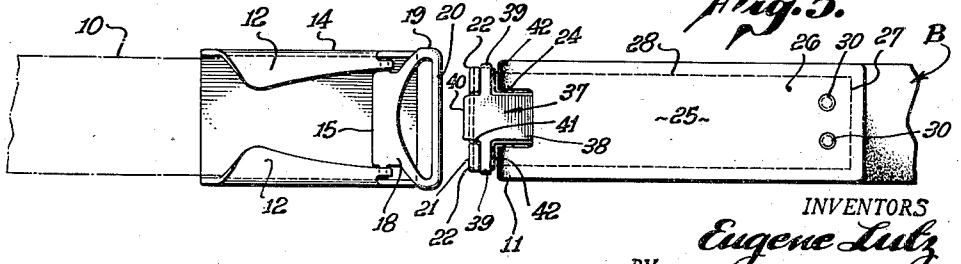


Fig. 5.



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Fig. 7.

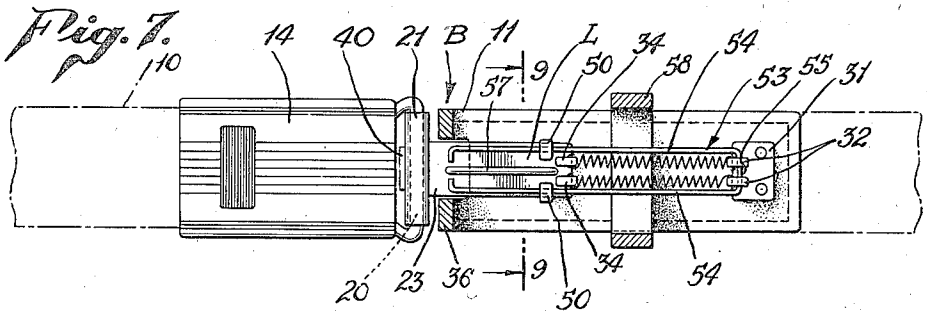


Fig. 8.

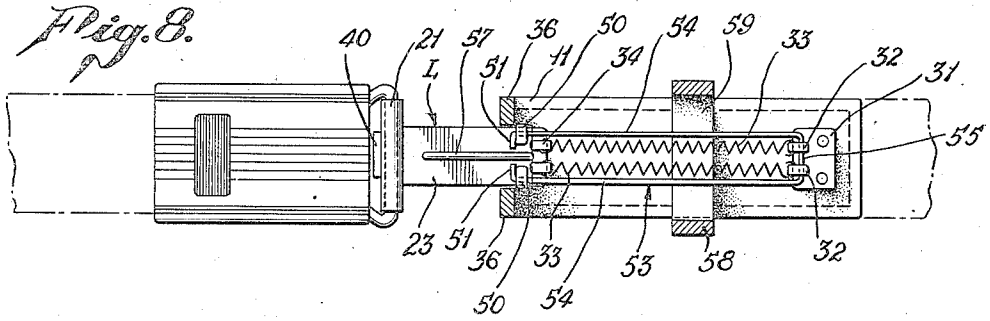
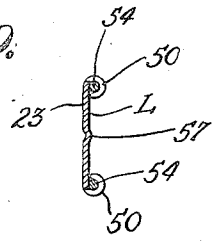


Fig. 9.



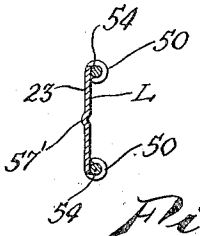
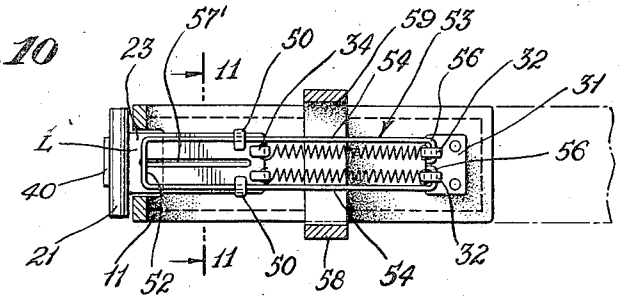


Fig. 11.

Fig. 10



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2,415,254

UNITED STATES PATENT OFFICE

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EXPANDIBLE BELT

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Application October 17, 1946, Serial No. 703,804

15 Claims. (Cl. 2—322)

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The present invention is directed to an expandible belt for appropriately sustaining trousers, slacks, or the like about the body of the wearer. More particularly the invention is directed to a serviceable belt wherein a yieldingly controlled and normally self retracted and reciprocably guided link rotatably or swingably sustains one end of a buckle adapted to threadably receive and removably clamp a free end of the belt. One important object of the invention, inter alia, is to provide a novel connection between the self retracting link and the buckle whereby the latter may be conveniently attached or detached from the link. Another object of the invention is realized in the provision of an effective self retracting reciprocable link extendible and retractable out of or into a looped portion of the belt and comprising complementary locking components for disconnectably holding a swingable hasp of the buckle. As a further aspect the invention is concerned with a functionally and structurally improved and sturdy but resiliently controlled link comprising transversely curved bearing means removably and rotatably sustaining swingable means carried by the buckle and comprising self retracting resilient closure means for removably interlocking with the bearing means to either retain the swingable means in an operative but rotatable relation therewith or permit removal of the swingable means therefrom. The invention has a further important object to permit inexperienced operators, as belt retailers to promptly and properly substitute on a belt one indicia carrying buckle for another indicia carrying buckle with convenience and facility. Specifically the invention has as another important object the provision of transversely curved keeper means defining a hollow bearing for rotatably but removably sustaining a swingable hasp of the buckle by a relatively flat leaf spring having a forwardly projecting and medially disposed lip removably interlocking with the walls of a recess interrupting the bearing, the leaf spring having laterally extending wing means cooperating to removably bridge alined gaps of the bearing to retain a shank of the swingable hasp of the buckle rotatably confined therein.

More particularly the invention has a further important object to provide in a stretch or expandible and contractible belt of the character referred to a reciprocable link having its distal or rear portion connected to normally contracted spring means secured to an anchoring plate concealed with the loop portion of the belt and embodying spaced sockets slidably guided by spaced arms of a wire loop or stabilizing means retained in part by the anchoring plate and desirably straddling the spring means and comprising proximal transversely disposed terminal means serving as stop means to cooperate with the spaced sockets to limit the withdrawal or projection of the slidably guided link out of the loop portion of the belt and against the resistance of the spring means. Other important and salient objects, features, and functional and structural advantages of the invention will appear from the following description considered with the teachings of the accompanying drawings wherein:

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Fig. 1 is a front elevational view of a fragmentary portion of the compensatory and extendible belt according to my invention.

Fig. 2 is a rear view of Fig. 1 but illustrating the loop portion of the belt partly broken away.

Fig. 3 is a longitudinal sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3 showing the link slightly projected out of the loop portion of the belt.

Fig. 5 is a view substantially similar to Fig. 2 however illustrating the buckle disconnected from the keeper of the automatically retractable link.

Fig. 6 is a fragmentary perspective view of the link illustrating the front or proximal end of the resilient and flexible locking leaf spring lifted or unlocked from the bearing.

Fig. 7 is a view similar to Fig. 4 however illustrating a slightly modified tongue of the reciprocable link which is shown partly withdrawn from the loop portion of the belt.

Fig. 8 is a view along the lines of Fig. 7 illustrating the link in its maximum withdrawal out of the loop portion of the belt at which time the spaced sockets of the tongue or shank of the link cooperate with inwardly bent ends of the loop or stabilizing means straddling the spaced springs to limit withdrawal of the link.

Fig. 9 is a sectional view on the line 9—9 of Fig. 7.

Fig. 10 is a fragmentary portion of Fig. 8 however illustrating a slightly modified loop and tongue, and

Fig. 11 is a sectional view on the line 11—11 of Fig. 10.

Illustrative of the embodiments disclosed, the belt generally denoted B comprises a terminal portion 10 and a looped portion 11. The terminal portion 10 is adapted to be removably threaded

into and retained by the inwardly turned flanges 12 of the buckle 14 having the rotatable belt crank lever 15 appropriately journaled thereto. This lever has one arm 16 (Fig. 3) provided with spaced detents or teeth 17 for camming and clamping the terminal portion 10 of the belt against the body of the buckle 14 against displacement relative to the latter.

Bell crank lever 15 is also characterized by an arm 18 having the hasp 19 defining the cross rod or shank 20 adapted to be removably retained in the hollow transversely curved socket or bearing 21 having ends 22 integral with and extending laterally of the tongue or shank 23 of the self retracting link or member generally denoted L rectilinearly guided in opening or mouth 24 in the body of the belt and its contiguous turned over portion 25 which has its end 26 secured to the body of the belt by the vertical line of stitching 27 and by the spaced longitudinally disposed lines of stitching 28 defining an internally arranged chamber 29 in which tongue 23 is normally concealed.

Appropriately secured within the chamber 29 but to the end 26 of the turned over portion 25 of the belt B by the rivets 30 is the anchoring plate 31 having the spaced hooks 32 for desirably retaining the posterior or distal ends of the spaced helicoidal normally contracted springs 33 having their anterior or front ends desirably mounted or retained on the spaced hooks 34 projecting from the distal or rear portion of the extendible and retractable tongue 23 of the link L having in the form according to Figs. 2 and 4 the laterally extending distal lugs 35 cooperating with the forward portions 36 of the loop portion 11 defined by the belt B and its secured turned over portion 25 to limit the projection or extension of the link L out of the chamber 29. The spaced springs 33 of course resist the projection or withdrawal of the link out of the chamber 29 and recoil to automatically retract the link upon removal of the outward pull or thrust on the keeper or bearing 21. Such retraction is limited when the bearing 21 strikes the forward portions 36. This is the normal position of the link.

Associated with the link L and for a major part extending longitudinally thereof is the flat and relatively thin sheet metal leaf spring or retainer broadly designated 37 characterized by a relatively elongated shank 38 having its rear end anchored by the spaced rivets 39' (Fig. 2) to tongue 23 of link L. Shank 38 normally projects through opening or mouth 24 of the loop 11 of the belt and is provided with a cross shaped head having the laterally extending wings or portions of spring 37 intermediate the ends of the latter 39 and the medially disposed lip 40. Normally the spring or resilient and flexible retainer 37 is maintained flatwise against the link L and in such relation characterizes locking closure means for recess 41 interrupting bearing 21 and for the alined gaps 42 defined by the transversely curved lobes 43 of the ends 22 of bearing or keeper 21.

As illustrated in Fig. 5, the depressible or liftable lip 40 of the leaf spring 37 normally projects forwardly beyond the recess 41 of the bearing 21 although in part is confined within recess 41 and yieldingly bears against wall 44 thereof (Fig. 6). In the matter of connecting the buckle 14 to the slidably guided link L, by shifting the buckle 14 towards the transversely curved bearing or member 21 or the latter towards the buckle, lip 40 is initially flexed out of recess 41 by the shank or cross rod 20 of the buckle. Thereafter shank 20 further displaces or actuates the leaf spring causing the latter to further flex outwardly and ultimately wings 39 are lifted out of the alined gaps 42 of the bearing 21. Consequently shank 20 of the buckle rides under the wings 39 and into the alined gaps 42, falling within the confines of bore 45 of the bearing 21, the recess 41 may be said to interrupt the anterior portion or terminal means of the bearing 21 and defines with the spaced posterior or distal portion of the bearing an open face or channel of which the alined gaps 42 are a part.

Pursuant to reception of shank 20 into the bore of the bearing, the leaf spring automatically retracts by reason of its own resiliency to its normal position, thus lip or anterior terminal means 40 enters recess 41 to interlock with the walls thereof while wings 39 bridge the alined gaps 42, hence precluding direct access to shank 20 and concomitantly rotatably retaining this shank confined within bore 45 of the bearing 21. By the arrangement disclosed leaf spring 37 may be said to characterize means complementary to the bearing or keeper 21 for rotatably and disconnectably sustaining the buckle. To disconnect the latter from the bearing a rotational thrust is applied to the buckle, thus causing shank 20 to lift wings 39 initially away from the alined gaps 42, which action in turn causes lip 40 to be shifted or lifted out of recess 41 whereby shank 20 may be quickly withdrawn or removed from the bore of the bearing, and consequently the buckle is disconnected. Following such action, the depressible leaf spring 37 automatically reflexes or retracts to removably interlock with the walls of recess 41 or in other words with the bearing 21.

With the buckle connected to the bearing and retained in a rotatable relation therewith by the leaf spring 37, terminal 10 of the belt may be desirably threaded into the buckle and appropriately clamped as is well understood in an adjusted position by the swingable or rotatable belt crank lever 15 as heretofore pointed out. If the belt be around the body of the wearer and clamped in an adjusted position, the belt is automatically compensatory in response to the oscillations of the body of the wearer, that is, the belt expands and contracts or "breathes" as it is worn. By such action link L bodily oscillates or yieldingly reciprocates into and out of the mouth or opening 24 against the resistance of the normally contracted springs 33.

In the embodiment according to Figs. 2 and 4, the proximal transversely disposed portions 36 of the loop portion 11 of the belt as previously stated cooperate with the distal lugs 35 to limit the projection of the link L out of the belt. Where these lugs are eliminated as in the embodiments in accordance with Figs. 7 and 10, withdrawal of the link L is limited by the coaction of the hollow and curved sockets or ears 50 integral with and extending from the sides of the shank or tongue 23 of the link L and the proximal inwardly turned in ends or stops 51 in Figs. 7 and 8 or the proximal bridge portion 52 of a relatively sturdy wire loop generally designated 53 comprising sides or arms 54 straddling the normally contracted helicoidal springs 33 attached to or mounted on the ears or hooks 32 of the anchoring plate 31 and to the ears or hooks 34 of the link L.

In the case of the form illustrated in Figs. 8

and 9, bridge 55 interconnecting arms 34 of loop 53 is loosely but rotatably confined against removal in the closed but hollow hooks 32 and sides or arms 54 of the loop 53 serves as track or stabilizing means slidably guiding the curved sockets or bearings 50. By this arrangement upon withdrawal of the link L from the belt portion 11, the link may be said to be rectilinearly guided by the arms 54. This is also true upon the retraction of the link into the belt. But in the form shown in Fig. 8, the inwardly turned proximal lugs or ends 51 of the wire loop L characterize stop means for the sockets 50 to limit the extension of the link out of the belt. Otherwise the embodiment of Figs. 7–9 is along the lines illustrated in Figs. 1–6.

In Fig. 10, the posterior terminals 56 of the arms 54 are appropriately rotatably retained by the spaced hooks 32 of the fixed anchoring plate 31 and the uninterrupted bridge portion 52 acts as stop means for the coiled sockets or bearings 50 of the loop 53 slidably guiding the normally retracted link L. In other aspects the form according to Figs. 10 and 11 is substantially identical to the embodiment illustrated in Figs. 1–6 except in Figs. 7–9 the strengthening rib 57 extends above the top face of the link L whereas in Figs. 10 and 11 the rib 57' although struck out of the link extends from the rear face thereof to permit flatwise positioning of the wire loop on the link.

Subsequent to threading clamping portion 10 of the belt B in the buckle, this portion may be removably retained in close juxtaposition with the body of the belt by a conventional loop 58 appropriately surrounding the upper portion 13 (Fig. 3) of the loop 11. The bottom portion 59 of loop 58 in part sustains the spaced springs 33 to preclude undesirable sagging and in the embodiments shown in Figs. 7 and 10, the wire loop 53 is also precluded from sagging by loop 58 and of course is prevented from bodily longitudinal displacement lengthwise of the belt.

By the present invention it is appreciated that the buckle may be readily connected or disconnected from the extendible and retractible link even though the latter is resiliently anchored within the belt. Such action may be readily accomplished by even inexperienced operators, such as, by retailers who in completing a sale may desire to substitute one indicia carrying buckle for another buckle carrying different initials or indicia.

Various changes may be made in the details of construction and arrangement of parts without departing from the spirit of the invention or sacrificing any of the advantages thereof inherent therein.

We claim:

1. In a belt wherein a buckle is provided with a shank, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying bearing means arranged outside of said loop portion and having a bore, said bearing means having terminal means spaced from a distal portion thereof and constituting a channel disposed longitudinally of said bearing means in communication with said bore, said terminal means having spaced lobes defining a recess, and a relatively flat leaf spring having a posterior portion secured to said link and having a liftable anterior portion removably and normally disposed within said recess and having laterally extending wings removably and normally disposed

across said channel to preclude removal of said shank from said bore, said anterior portion normally extending forwardly beyond said lobes and adapted to be actuated by said shank for removal of said anterior portion out of said recess and said wings out of said channel for projecting said shank into said bore.

2. In a belt wherein a buckle is secured at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying bearing means arranged outside of said loop portion and having a bore, recess means and a channel, and a leaf spring disposed flatwise relative to said link and having a posterior part secured thereto and having a forwardly disposed lip removably interlocking with the walls of said recess and extending forwardly of said bearing means and having means extending laterally relative to said lip for removably bridging said channel, said lip adapted to be depressed by said buckle and moved out of said recess to remove said means extending laterally of the lip from said channel for reception of a part of said buckle within said bore, said lip and said means extending laterally thereof pursuant to reception of said part of said buckle into said bore automatically retracting whereby said lip interlocks with the walls of said recess and said means extending laterally of said lip is disposed across said channel to preclude removal of said aforementioned part of said buckle from said bearing means.

3. In a device of the character described wherein a slidably guided tongue is adapted to be concealed within a loop portion of a belt and wherein the tongue is connected to normally contracted spring means concealed and retained within said loop portion, the combination of, a loop in part mounted on said tongue and adapted to be concealed within said loop portion, means spaced from said link for securing said loop against bodily longitudinal displacement relative to said loop portion sockets carried by said tongue and slidably guided by said loop, and transversely disposed means integral with said loop and cooperating with said sockets to limit the projection of said tongue out of said loop portion.

4. In a device of the character described wherein a slidably guided tongue is adapted to be concealed within a loop portion of a belt and wherein the tongue is connected to normally contracted spring means concealed and retained within said loop portion, the combination of, a loop in part mounted on said tongue and adapted to be concealed within said loop portion and having spaced arms, means spaced from said link for securing said loop against bodily longitudinal displacement relative to said loop portion sockets carried by said tongue and slidably guided by said arms, and transversely disposed means carried by and at one end of said loop for cooperating with said sockets to limit the projection of said tongue out of said loop portion and against the resistance of said spring means.

5. In a device of the character described wherein a slidably guided tongue is adapted to be concealed within a loop portion of a belt and wherein the tongue is connected to normally contracted spring means concealed and retained within said loop portion, the combination of, a loop in part mounted on said tongue and adapted to be concealed within said loop portion and having spaced and longitudinally disposed arms, means spaced from said link for securing said loop against bodily longitudinal displacement relative to said loop

portion sockets integral with said tongue and slidably guided by said arms, and transversely disposed stop means integral with said arms and cooperating with said sockets to limit the projection of said tongue out of said loop portion and against the resistance of said spring means.

6. In a device of the character described wherein a slidably guided tongue is adapted to be concealed within a loop portion of a belt and wherein the tongue is connected to normally contracted spring means concealed and retained within said loop portion, the combination of, a wire loop in part mounted on said tongue and adapted to be concealed within said loop portion and having spaced and longitudinally disposed rectilinear arms, means spaced from said link for securing said loop against bodily longitudinal displacement relative to said loop portion sockets integral with said tongue and slidably guided by said arms, proximal transversely disposed stop means integral with said arms and cooperating with said sockets to limit the projection of said tongue out of said loop portion and against the resistance of said spring means, and stiffening means extending longitudinally of said tongue.

7. In a belt wherein a buckle is provided with a shank; a member at one end of said belt, means sustaining said member on said belt, said member embodying bearing means disposed outside of said end and having spaced portions defining recess means and having a bore disposed longitudinally thereof and having a channel in communication with said bore for receiving said shank prior to reception of the latter within said bore, and spring closure means having a portion secured to said member and having depressible means removably interlocking with the walls of said recess and extending forwardly thereof and having means for removably bridging said channel to resist removal of said shank from said bore and through said channel.

8. In a belt wherein a buckle is carried at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying transversely curved hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel in communication with said bore, said bearing means having a recess in communication with said bore and channel, and a relatively flat leaf spring having its rear end secured to said link and having laterally extending wings removably bridging said channel to resist removal of the aforementioned part of said buckle from said bore and having medially disposed means normally removably disposed within said recess and projecting forwardly thereof and adapted to be actuated by said buckle to flex said spring for removing said medially disposed means out of said recess and said wings from said channel.

9. In a belt wherein a buckle is carried at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying transversely curved hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel in communication with said bore, said bearing means having a recess intermediate thereof and in communication with said bore and channel, an automatically retractable relatively flat leaf spring having its rear end secured to said link and having laterally extending wings removably bridging said channel to resist removal of the aforementioned part of said buckle from said bore and having a medially disposed means normally removably disposed within said recess and projecting forwardly thereof and adapted to be actuated by said buckle to flex said spring for removing said medially disposed means out of said recess and said wings from said channel, and helicoidal spring means anchored within said loop portion and secured to said link for normally holding said bearing means adjacent to said loop portion.

10. In a belt wherein a buckle is carried at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying transversely curved hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel in communication with said bore, said bearing means having a recess intermediate thereof and in communication with said bore and channel, an automatically retractable relatively flat leaf spring having its rear end secured to said link and having laterally extending wings removably bridging said channel to resist removal of the aforementioned part of said buckle from said bore and having medially disposed terminal means normally removably disposed within said recess and projecting forwardly thereof and adapted to be actuated by said buckle to flex said spring for removing said medially disposed means out of said recess and said wings from said channel, spaced helicoidal springs attached to said link and anchored within said loop portion, stabilizing means straddling said helicoidal springs, means mounting said stabilizing means against bodily displacement longitudinally of said loop portion, and means slidably guiding said link on said stabilizing means and lengthwise of said belt.

11. In a belt wherein a buckle is carried at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying transversely curved hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel in communication with said bore, said bearing means having a recess intermediate thereof and in communication with said bore and channel, an automatically retractable relatively flat leaf spring having its rear end secured to said link and having laterally extending wings removably bridging said channel to resist removal of the aforementioned part of said buckle from said bore and having medially disposed terminal means normally removably disposed within said recess and projecting forwardly thereof and adapted to be actuated by said buckle to flex said spring for removing said medially disposed means out of said recess and said wings from said channel, spaced helicoidal springs attached to said link and anchored within said loop portion, a wire loop having spaced arms disposed adjacent to said helicoidal springs, means mounting said wire loop against bodily displacement longitudinally of said loop portion, spaced sockets carried by said link and slidably guided by said arms, and transversely disposed means carried by said wire loop and cooperating with said sockets to limit the withdrawal of said link out of said loop portion.

12. In a belt wherein a buckle is carried at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying transversely curved hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel in communication with said bore, said bearing means having a recess intermediate thereof and in communication with said bore and channel, an automatically retractable relatively flat leaf spring having its rear end secured to said link and having laterally extending wings removably bridging said channel to resist removal of the aforementioned part of said buckle from said bore and having medially disposed means normally removably disposed within said recess and projecting forwardly thereof and adapted to be actuated by said buckle to flex said spring for removing said medially disposed means out of said recess and said wings from said channel, an anchoring plate secured within said loop portion and spaced from said link, spaced helicoidal springs secured to said link and plate, loop means in part mounted on said link and having spaced arms straddling said helicoidal springs, means carried by said plate for retaining said wire loop within said loop portion and against bodily longitudinal displacement relative to said belt, and sockets on said link and slidably guided on said arms and cooperating with said loop means to limit withdrawal of said link out of said loop portion.

13. In a belt wherein a buckle is provided with a shank, a member at one end of said belt, means sustaining said member on said belt, said member embodying bearing means disposed outside of said end and having spaced portions defining recess means and having a bore disposed longitudinally thereof and having a channel in communication with said bore adapted to receive said shank prior to reception of the latter within said bore, a self retracting depressible closure disposed outside of said bearing means and having a lip normally removably interlocking with the walls of said recess and extending forwardly thereof and having laterally extending wings normally removably bridging said channel to resist removal of said shank from said bore and through said channel, and means mounting the rear portion of said closure on said link to provide for displacement of said lip and wings bodily towards or away from said bearing means.

14. In a belt wherein a buckle is carried at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying transversely curved hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel disposed longitudinally of said bearing and in communication with said bore, said bearing means having a recess in communication with said bore and channel, a depressible closure for said channel disposed outside of and contiguous to said bearing means and having posterior means and having laterally extending wings normally removably bridging said channel to resist removal of the aforementioned part of said buckle from said bore and having anterior terminal means integral with said wings and normally removably disposed within said recess and having a portion projecting forwardly thereof, and means mounting said posterior means on said link to provide for displacement of said anterior terminal means and said wings bodily towards or away from said recess and channel respectively.

15. In a belt wherein a buckle is at one end thereof, a loop portion having an opening, a link movably concealed in part within said portion and in part projectible out of said opening and embodying hollow bearing means arranged outside of said loop portion and provided with a bore for removably receiving a part of said buckle and having a channel in communication with said bore, a relatively flat leaf spring disposed outside of said link and having means disposed intermediately the ends thereof removably closing said channel to resist removal of the aforementioned part of said buckle from said bore and having anterior terminal means projecting forwardly of said channel and adapted to be actuated by said buckle to flex said spring for removing said means disposed intermediately of said spring outwardly away from said bearing and channel, and means mounting the posterior portion of said spring on said link to provide for bodily displacement of said terminal means and said means disposed intermediately of said link towards or away from said bearing means respectively.

EUGENE LUTZ.
SAMUEL SEGAL.

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