April 27, 1965 M. M. MURPHY, SR 3,179,992

SEPARABLE FASTENER

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Fig. 1.

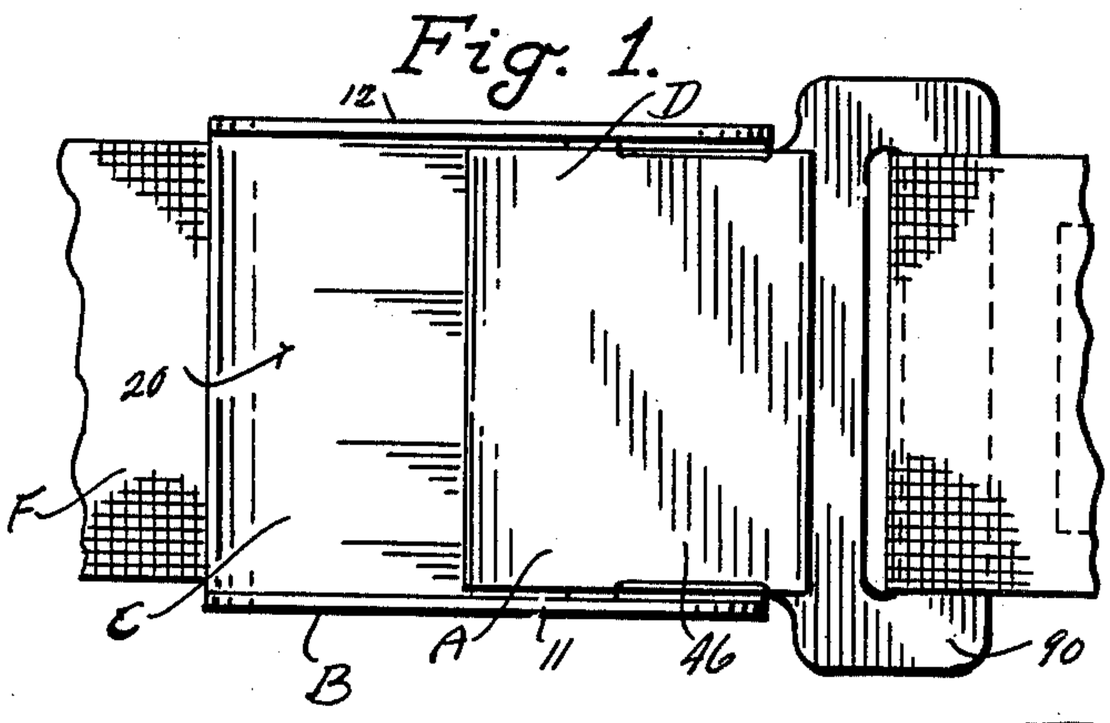

Fig. 2.

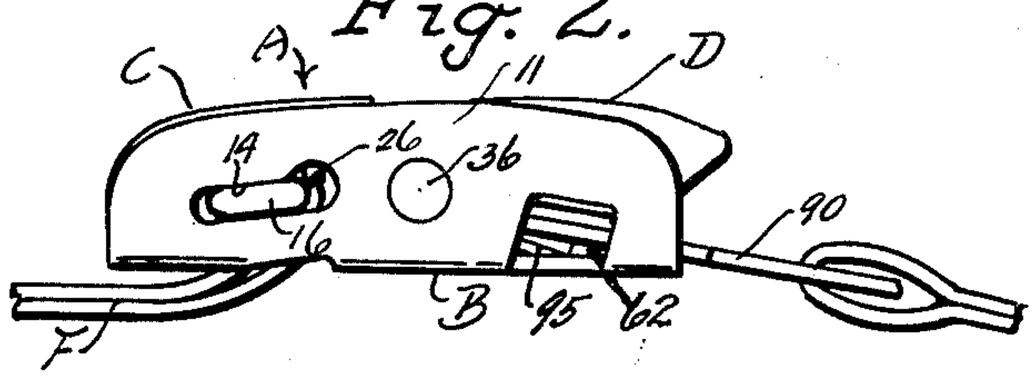

Fig. 3.

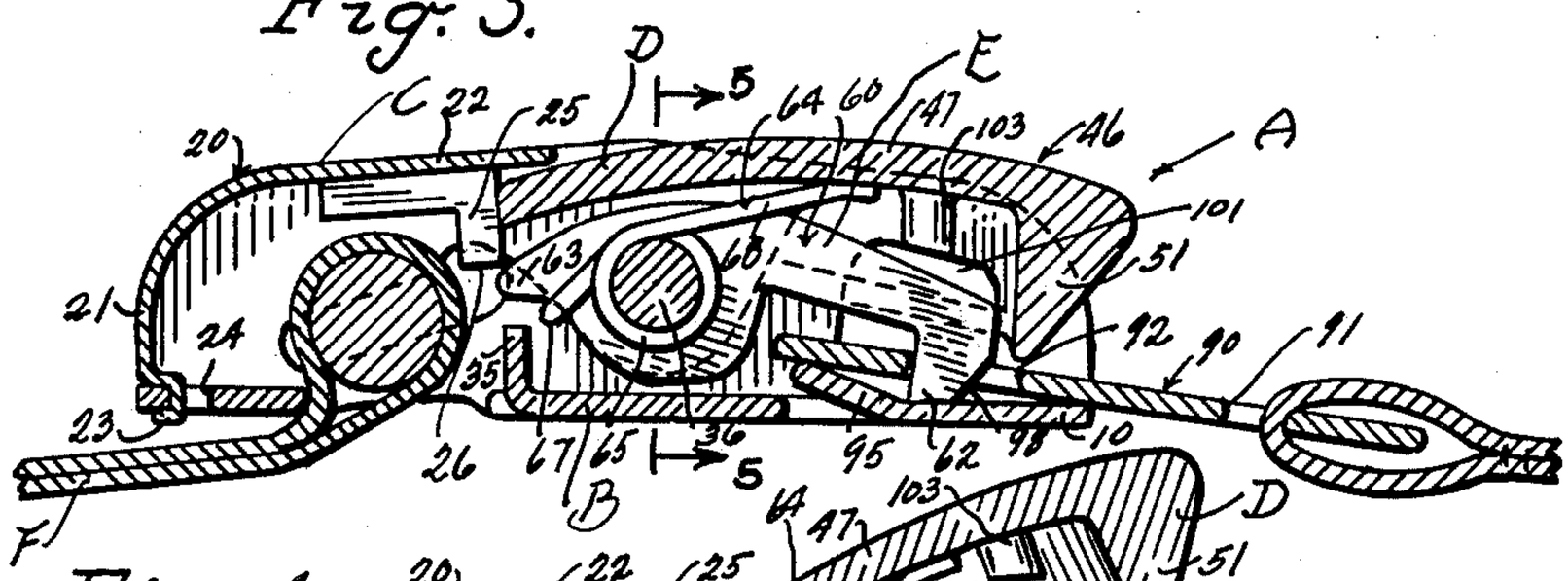

Fig. 4.

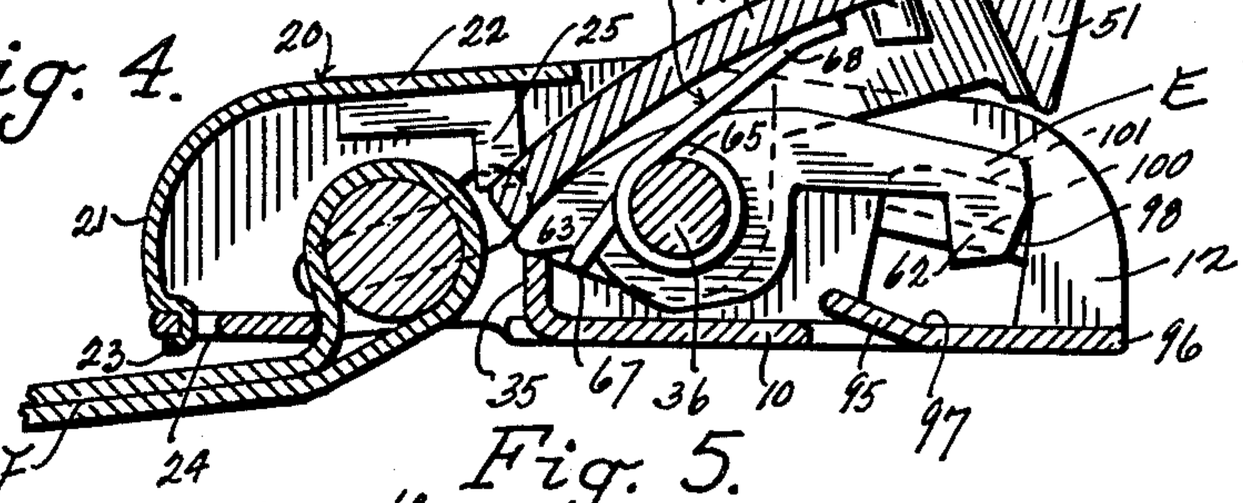

Fig. 5.

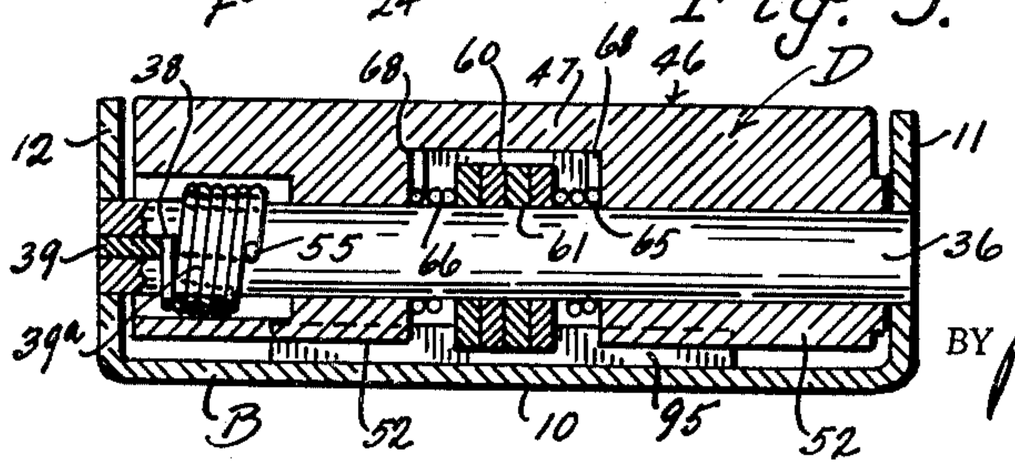

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Fig. 7.

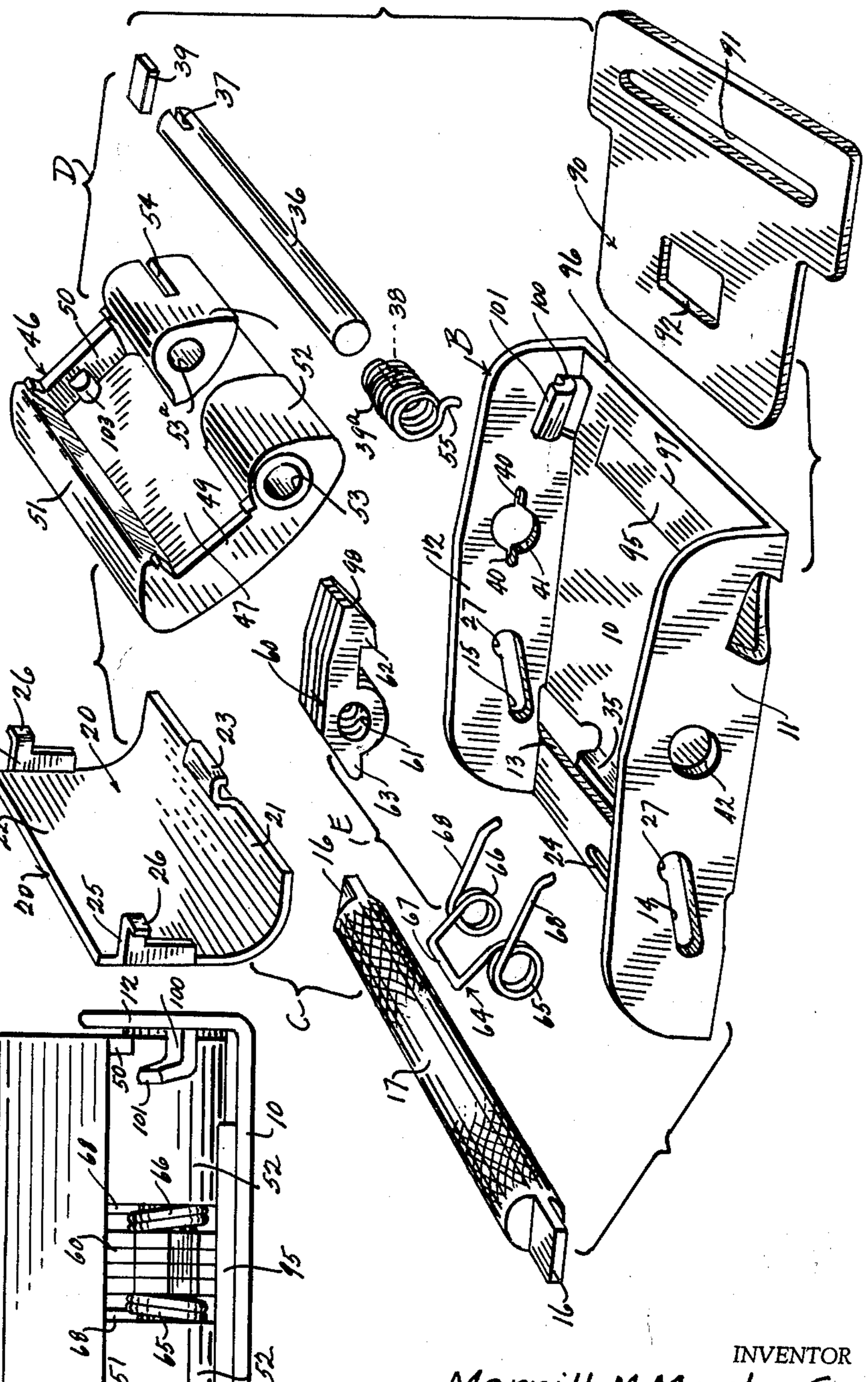

Fig. 6.

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SEPARABLE FASTENER

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7 Claims. (Cl. 24—77)

This invention relates to improvements in fastening buckles more particularly utilized in connection with seat belts.

The present invention relates to an improved seat belt buckle having improved features which will admit of the safe application and removal of the latching tongue of the belt without liability of a false connection; the parts being so constructed and arranged that the latching tongue can only be applied to the buckle under such circumstances that the latch dog will correctly receive the tongue plate.

A further object of this invention is the provision of an improved cover construction for a buckle at the webbing clamping bar portion thereof.

A further object of this invention is the provision of an improved latching dog assemblage and means for the safetying thereof.

A further object of this invention is the provision of improved biasing spring means for the latching dog construction.

A further object of this invention is the provision of a safety belt buckle having a base portion provided with a bottom wall; the bottom wall having an inclined forwardly positioned ramp thereon; the buckle furthermore having a spring urged latch with a latching end which is adapted to engage the base entirely forwardly of the ramp so that no portion of the latch at any time engages the ramp. This enables the belt clip to more easily lift the latch and to be attached to the latching mechanism.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification and wherein similar reference characters designate corresponding parts throughout the several views:

FIGURE 1 is a plan view of the buckle in closed position having the seat belt webbing attached thereto in adjustable relation at one end and showing the tongue plate attached thereto and to the webbing of the belt at the opposite end of the belt.

FIGURE 2 is a side elevation of the buckle shown in FIGURE 1.

FIGURE 3 is a cross sectional view taken longitudinally through the buckle showing the dog in tongue latching position.

FIGURE 4 is a view showing the lever handle in opened position such as would be the case when the operator lifts the same to release the belt tongue plate.

FIGURE 5 is a cross sectional view taken through the axle or pin which mounts both the handle or lever and the dog or latch in position, substantially on the line 5—5 of FIG. 3.

FIGURE 6 is a front elevational view of the buckle in opened position.

FIGURE 7 is a perspective exploded view of the buckle parts and tongue plate.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the letter A generally designates the buckle which may include a casing having a base portion B, strap bar and cover assembly C; operating lever and its associated parts D, and latch or dog parts E.

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The base B preferably comprises a bottom wall 10 having right angled parallel side walls 11 and 12 at opposite side margins thereof. It, as well as most parts of the buckle, may be made of stamped metal, with the possible exception of the handle or lid portion. At its rear portion the bottom wall 10 is provided with a transverse opening 13 adapted to receive the adjusting end of the belt webbing F. The side walls 11 and 12 are provided with inclined slots 14 and 15 adapted to receive the reduced ends 16 of a knurled webbing bar 17 of cylindrical shape, as shown in FIG. 7. Such bars are old in the art and are intended to receive the adjusting end of the webbing F; the ends of the webbing F being extended through the slot 13 and wrapped around the bar 17. The inclination or slope of slots 14 and 15 is such that under tension the webbing F will pull the bar 17 in the direction of the down ends of the slots 14 and 15 and clamp the webbing at its adjusting end between the bar and the edge of the slot 13, as shown in FIGS. 3 and 4. Since the reduced ends 16 slide along the slots 14 and 15 the webbing or belt can be adjusted as to size in a manner well known in the art.

A feature of the buckle A consists in a cover 20, preferably of sheet metal having an end wall 21 and a top wall 22. The lower end of the end wall 21 is provided with a hook shaped flange 23 adapted to detachably engage in an opening 24 provided in the rear end of the base bottom wall 10. The top wall 22 is provided with a pair of latching prongs 25 extending in right angled relation from the top wall in a downward direction. They have hook ends 26 laterally extended outwardly. These prongs 25 are intended to be yieldable or springy in order that the outturned ends 26 may snap into the upper ends of the slots 14 and 15 which are enlarged at 27 so as not to interfere with the sliding of the reduced ends 16 of the webbing bar 17. The hooked ends 26 are shown in their hook positions in the extension ends 27 of the slots 14 and 15 in FIGS. 2, 3 and 4 of the drawings.

It is apparent that the cover 20 will be held in place over the webbing and its bar assemblage to protect the same, and that the cover may be easily removed for any purpose which may require replacement of webbing or the like.

At its front end the opening 13 in the bottom wall of the base B is provided with an upturned stop flange 35 located midway the ends of the slot 13 adapted to act as a stop flange to limit the opening movement of the dog or latch as shown in FIG. 4 of the drawings.

Referring to the operating lid assembly D and the latch assembly E, the same are interconnected and therefore will be described together. An axle pin or shaft for the dog and lid designated at 36 is of cylindrical formation, having one end thereof diametrically slotted at 37 to receive an end 38 of a coiled torsion spring 39a. The latter is slipped over the slotted end of the axle 36. The slot 37 also receives a key piece 39 the ends of which extend radially from the pin 36 and are adapted to enter the slots 40 at opposite sides of opening 41 in side plate 12. The other side plate 11 has a corresponding opening 42 to receive the opposite end of the axle 36. The axle 36 does not rotate and is held by the key 39 against such rotation.

The lid 46 includes a top wall 47 which lies between the side walls 11 and 12 of the base B and operates freely in the space between the inner surfaces of the side wall; said wall 47 being complementary to the wall 22 of the webbing closure 20. The wall 47 is provided with downwardly extended side walls 49 and 50 and a front wall 51 is also provided. At its rear end the wall 47 is provided with relatively spaced hubs 52 transversely apertured at 53 and 53a in aligning relation to receive the axle of pin 36 therein. The lid 46 turns on said axle 36 which

is a stationary part of the buckle. One hub **52** is slotted at **54** and is adapted to receive a radially outturned end **55** of torsion spring **39a** (see FIG. 7). The spring **39a** is normally biased so that it will bring the lid **46** to a closing position as shown in FIG. 3. In order to open the lid it is necessary to manually lift the lid to the position shown in FIG. 4. This tensions the spring **39a** due to its ends **38** and **55** being keyed respectively to the axle **36** and the lid **46**.

Referring to the dog assembly **60** shown in FIG. 7, the same may be made of a plurality of sheet metal stamped parts or may be made of a single part. The part or parts are arranged to provide an opening **61** thereon to receive the axle **36**. The forward ends of the dog **60** are provided with latch legs or hooked ends **62** and the rear ends have tail portions **63**. A torsion spring **64** shown in perspective in FIG. 7 is provided having coiled portions **65** and **66** which receive the axle pin **36** therethrough; the inner ends of these coils being connected by a U-shaped bight portion **67** which extends rearwardly and engages the undersides of the latch tail extensions **63**. The outer sides of the coils **65** and **66** extend forwardly to provide legs **68** which engage the underside of the lid **46**. The spring **64** is biased to force the latching end extension **62** of the latch **60** downwardly to the position shown in FIG. 3. The spring **64** urges the dog downward even when the lid **46** is opened as shown in FIG. 4. It will be noted that the lid **46** has a limited opening as shown in FIG. 4 due to engagement of the tail ends **63** of the dog against the flange **35**. The rear end of the wall **47** will also engage the extensions **63** when opened to prevent too far opening of the lid. It should be noted that the lid **46** can be opened with respect to the dogs even while they are latched and in latching position until the rear end of the wall **47** engages the extensions **63** and then the lid can be further raised to the position shown in FIG. 4 against biasing of the torsion spring **39a** to release the tongue clip **90**.

The belt clip or tongue plate **90** has one end of the webbing permanently secured thereto as in conventional practice, and it is provided with a narrow opening **91** therein for receiving such webbing and an opening **92** in its forward plate portion to receive the detent ends **62** of the dog assemblage **60**.

The base bottom wall **10** is provided with an inclined ramp **95** a short distance inwardly of the forward edge **96** thereof. Since these parts are preferably made of sheet metal the score or bending line **97** of the ramp **95** is indicated in the drawings. The ramp **95** extends at an acute angle upwardly and to the rear. The ramp is of less width than the bottom wall **10** as is shown in FIG. 7 of the drawings, but is of greater width than the opening **92**. Assuming the plate or clip **90** not to be connected to the buckle, the operator inserts the clip into the forward end of the buckle in the space provided therefor beneath the wall **51** of the lid **46**. The plate first slides parallel with the bottom wall **10** and while so doing engages the inclined cam shaped edge **98** of the latch mechanism. As the clip continues to be inserted the dog will be raised against the biasing of its torsion spring **64** to the point where the opening **92** permits the latch legs **62** to drop into the opening **92**. It should be noted that the latch legs **62** of the dog engage the inner surface of the flat horizontal portion of the wall **10** entirely forwardly of the ramp so that no portion of the dog at any time engages the ramp. This enables the clip to be attached to the dog mechanism with greater ease. When the rear end of the clip **90** has been sufficiently inserted it will engage the ramp **95** and will be moved to an inclined position and securely latched as shown in such position in FIG. 3.

In order to prevent a false connection of the tongue clip **90**, guide flanges **100** are struck inwardly from the material of the base in the foreportion at the inner sides of the walls **11** and **12** and then flanged upwardly in

right angled relation at **101**. The flanges **100** act as guards to prevent the clip from engaging in the buckle in an unsafe crosswise position and the upstanding flanges **101** prevent the clip from being inserted on top of the guard flanges **100**. It will be noted that lugs **103** are provided at the inner sides of the lid **46**, the lower edges of which are adapted to engage the top edges of the flanges **101** to effectively limit the closed position of the lid **46** to the position of parts shown in FIG. 3.

It will be apparent from the foregoing that an improved safety belt buckle has been provided in which the dog mechanism is so associated with protective features that the dog will always be in proper position and the user cannot falsely latch or connect the tongue plate in the buckle. This will be noted from FIG. 4 in which it is shown that the vertical flanges **101** extend above the cam edge **98** of the dog. Since the clip **90** at its inserting end is wider than the spacing of the flanges it will be impossible to latch the dog on the clip when the lid **46** is in its raised position because the tongue plate at its inserting edge will engage the flanges **101**.

Various changes in the size, shape and arrangement of parts may be made to the form of invention herein shown and described without departing from the spirit of the invention or scope of the claims.

I claim:

1. In a safety belt buckle structure the combination of a casing base comprising a bottom wall and upstanding relatively spaced parallel side walls, latching means mounted upon said side walls, said side walls rearwardly of the latching means having a belt webbing receiving bar movably mounted on said side walls for fore and aft movement, and a removable cover connected to said casing base and side walls for enclosing said webbing bar, said base at its rear end being provided with an opening therethrough and said cover being provided with a depending hook detachably connected in said opening, said cover at its fore portion having means for detachable connection with the side walls.

2. The combination defined in claim 1 in which the means for detachable connection of the cover with the side walls comprises yieldable spring-urged detents connected at each side thereof and in which the spaced parallel side walls of the base are provided with sockets for detachably receiving said detents.

3. In a safety belt buckle structure the combination of a base including a bottom wall and upstanding longitudinally extending side walls, a handle-type lid, means pivotally mounting said handle-type lid upon said side walls, spring means normally biasing said lid so that it will move into closed position, a dog pivotally mounted upon said lid pivot means between the lid and base wall, said dog at its forward end having a depending latching leg, spring means normally urging said dog downwardly towards the bottom wall, said bottom wall having an upwardly and rearwardly extending raised ramp at a location entirely rearwardly of said depending leg of the dog, and a tongue plate having an opening therein adapted to be inserted from forwardly of the buckle between the lid and bottom wall, said tongue plate having an opening therein of a size to receive the latching leg.

4. The buckle defined in claim 3 in which the side walls of the base are provided with inwardly extending inverted L-shaped lugs each comprising a bottom leg and an upstanding leg at opposite sides of the ramp disposed in a position above the normal top of the ramp to define a tongue plate guide which will only admit of a correct insertion of the tongue plate below said legs to a position movable over said ramp.

5. The buckle of claim 4 in which the dog latching leg has a forwardly facing downwardly and rearwardly sloping cam edge and in which the upstanding legs of the lugs are spaced closer together than the width of the tongue plate at its inserting end and in which the dog when

raised to its maximum extent will have said cam edge lying below the top of the upstanding legs of said lugs.

6. In a safety belt buckle structure the combination of a base, including a bottom wall and upstanding longitudinally extending side walls, a handle type lid, means pivotally mounting said handle type lid upon said side walls, spring means normally biasing said lid so that it will move into closed position, a dog pivotally mounted upon said lid between the lid and base wall, said dog at its forward end having a depending latching leg, spring means normally urging said dog downwardly towards the base bottom wall, said base bottom wall having an upwardly and rearwardly extending raised ramp thereon, a tongue plate having an opening therein adapted to be inserted from forwardly of the buckle between the lid and bottom wall to engage said ramp to raise the tongue plate, said tongue plate having an opening therein of a size to receive the latching leg, the side walls of the base having inwardly extended inverted L-shaped lugs mounted thereon at opposite sides of the ramp, each comprising a bottom leg attached to the side wall and an upstanding leg disposed at an elevation above the normal top

of the ramp to define a guide for the tongue plate which will only admit of only a correct insertion of the tongue plate below said lug bottom legs to a position movable over said ramp.

7. The buckle of claim 6 in which the dog latching leg has a forwardly facing downwardly and rearwardly sloping cam edge and in which the upstanding legs of the lugs are spaced closer together than the width of the tongue plate at its inserting end and in which the dog when raised to its maximum extent will have said cam edge lying below the tops of the upstanding legs of said lugs.

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