

June 17, 1969

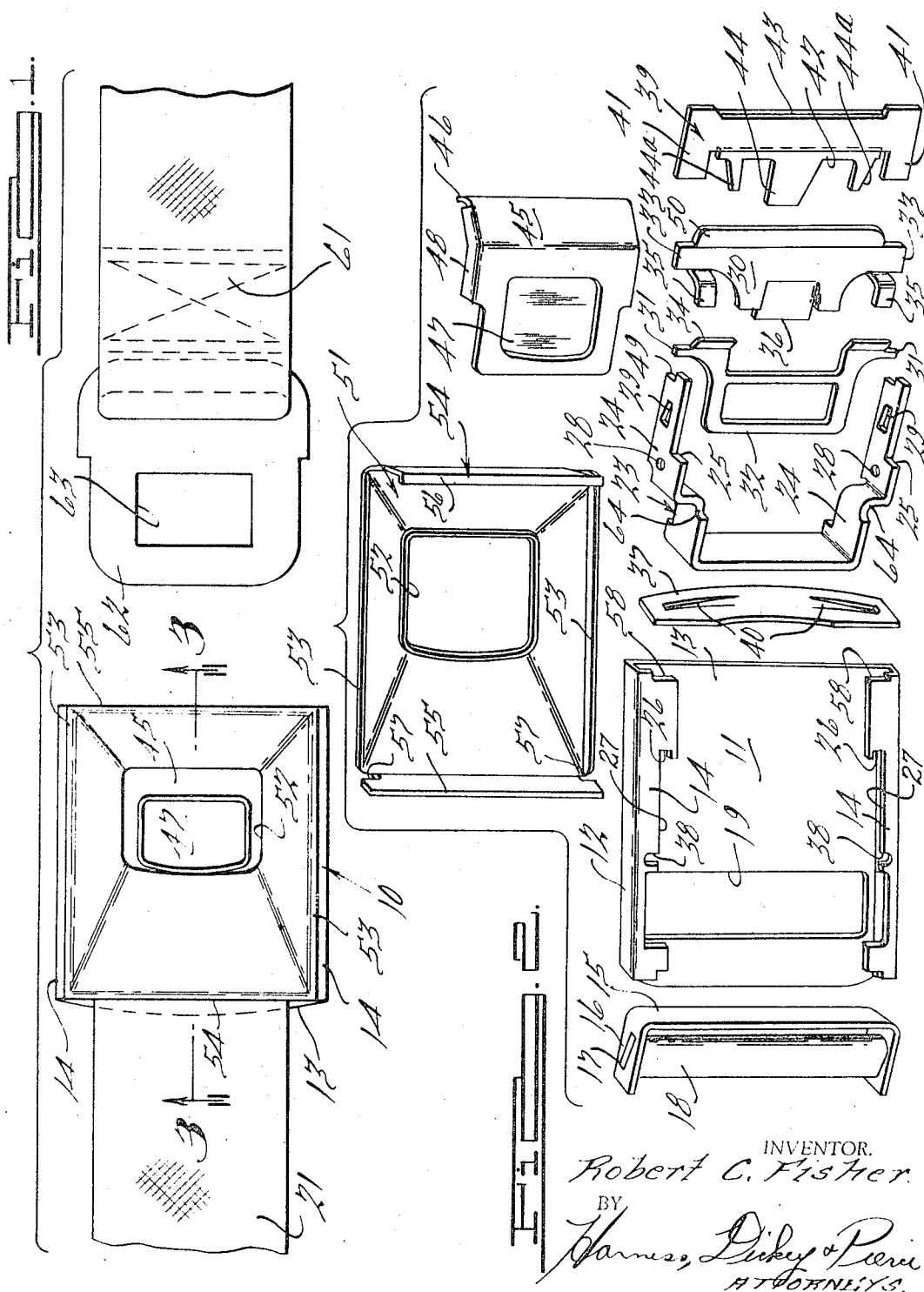
R. C. FISHER

3,449,800

SEATBELT BUCKLE

Filed Oct. 20, 1966

Sheet 1 of 3



INVENTOR.
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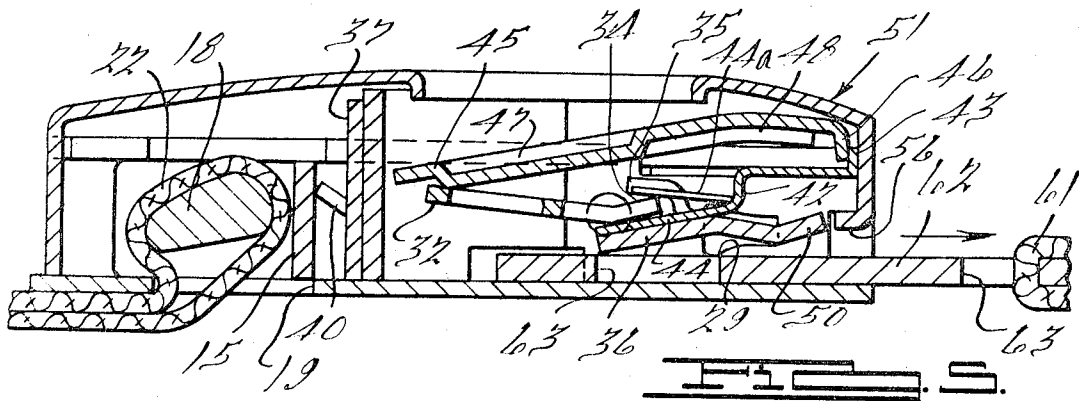
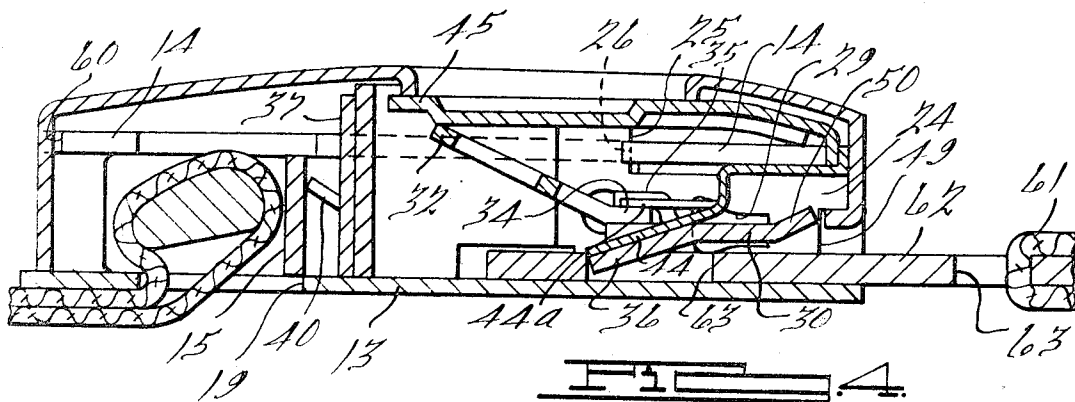
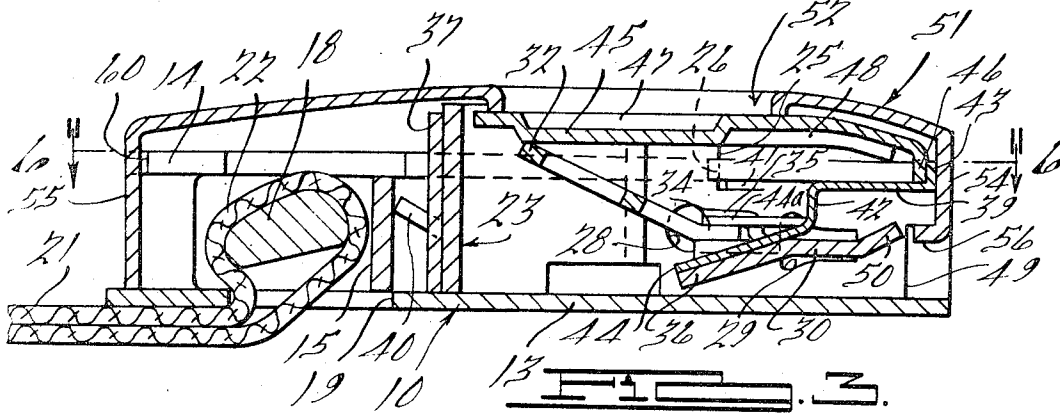
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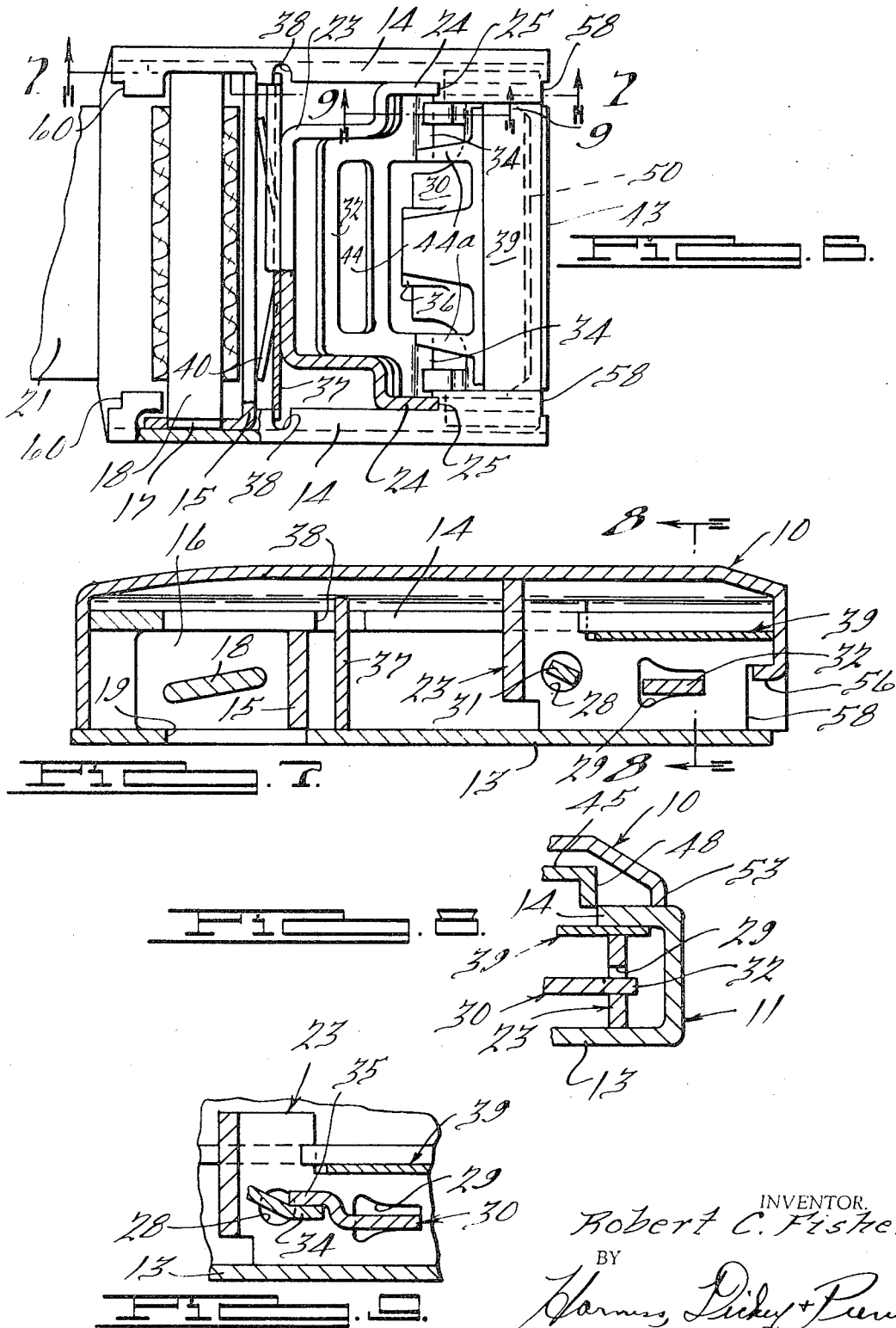
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SEATBELT BUCKLE

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U.S. Cl. 24—77

10 Claims

ABSTRACT OF THE DISCLOSURE

The seatbelt buckle has a case assembly in which an inter-related latch and lever are pivoted with the lever having forwardly and rearwardly extending portions one of which is engaged by a spring for urging the other portion against a manual operator which when moved downwardly releases the latch to permit a belt tongue engaged thereby to move from the belt buckle.

In the copending application of R. C. Fisher, Ser. No. 525,817, filed Jan. 21, 1966, for Seat Belt Buckle, now Patent No. 3,331,108, a latch is employed which is released by a push button. In this arrangement, the latching tongue slides into the buckle case above the latching plate. In the buckle of the present invention, the tongue slides in the case beneath the latching plate to be positioned adjacent to the bottom of the case and to the body of the person protected thereby. A lever system is employed for raising the latch plate and releasing the tongue so arranged as to provide a mechanical advantage whereby a small force on the push plate operates the link system to release the latch. The case has side walls which are flanged inwardly at the top to receive the latch plate and lever, both of which are mounted on a U-shaped carrier which slides within the case and retained therein by a spring element. A spring urges the latch plate downwardly and the operating lever upwardly into engagement with the push plate located beneath an aperture in a cover plate which snaps over and encloses the case. A slot is provided in the base or web of the case through which the belt extends when looped over a belt bar in a manner to permit one end of the belt to be adjusted and the other end to become locked when tension is applied thereto. The opposite end of the case has a slot for receiving the tongue on the end of the other belt portion. The tongue slides under the latch plate which is urged down by the spring into the slot therein to lock the tongue to the belt buckle. The push plate is available through an aperture in the cover plate to be moved downwardly and pivot the long arm of the lever downwardly and the short arm thereof upwardly for raising the latch plate from the slot and releasing the tongue from the buckle.

Accordingly, the main objects of the invention are: to provide a positive latching belt buckle which secures the tongue on one belt section against the base of the buckle case; to provide a lever having a long and short arm with the former in position to be moved downwardly by a push plate actuated through an aperture in the cover plate to raise the short arm and move the latch plate upwardly out of the slot in the tongue to release the buckle therefrom; to employ a stamped spring element having a tongue bent downwardly to urge the latch plate downwardly into the slot of the tongue and having two additional fingers which bear against the short end of the lever to urge the long end upwardly against the push plate, and in general, to provide a seatbelt buckle which is simple in construction, positive in operation and economical of manufacture.

Other objects and features of novelty of the invention will be specifically pointed out or will become apparent when referring, for a better understanding of the inven-

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tion, to the following description taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a plan view of a belt buckle and a latching tongue which embody features of the present invention;

FIG. 2 is an exploded view of the elements of the buckle illustrated in FIGURE 1, with the elements shown substantially to size;

FIG. 3 is an enlarged sectional view of the buckle illustrated in FIGURE 1, taken on the line 3—3 thereof with the tongue omitted;

FIG. 4 is a view of the structure illustrated in FIG. 3, with the tongue secured in latch position therein;

FIG. 5 is a view of the structure illustrated in FIG. 4, with the tongue in released position;

FIG. 6 is a reduced sectional view of the structure illustrated in FIG. 3, taken on the line 6—6 thereof;

FIG. 7 is an enlarged sectional view of the structure illustrated in FIG. 6, taken on the line 7—7 thereof;

FIG. 8 is a broken sectional view of the structure illustrated in FIG. 7, taken on the line 8—8 thereof; and

FIG. 9 is a broken sectional view of the structure illustrated in FIG. 6, taken on the line 9—9 thereof.

Referring to the exploded view of FIG. 2, the various elements of the buckle illustrated in FIGURE 1 are found in the order of assembly. A case 11 has side walls 12 extending upward from a web 13 which extend inwardly at the top to provide flanges 14 disposed parallel to the web 13. A U-shaped frame 15 has slots 16 in the end sections which receive the end flanges 17 on the ends of an oval-shaped belt bar 18. The frame 15 slides into one end of the case to be disposed over a slot 19 in the web 13 through which the ends of a belt 21 pass when the belt forms a loop 22 over the belt bar 18. The belt 21 may be lengthened or shortened by adjusting the bottom section of the belt about the bar 18 and after adjustment a pull on the top portion of the belt which is anchored to the floor securely locks the belt to the case.

A U-shaped frame 23 has offset extending arms 24 provided with shoulders 25 which engage notches 26 at the forward edge of the top flange 14. Oppositely disposed notches 27 in the flanges provide clearance for the arms 24 when the frame 23 is inserted in the case beneath the top flange 14. The arms have aligned cylindrical aperture 28 and aligned elongated V-shaped aperture 29. Oppositely disposed fingers 31 on a lever 32 are pivoted within the apertures 28 and extending fingers 33 on a latch plate 30 extend into the slots 29 for limited pivotal movement. Actuating arms 34 are angularly disposed on the lever 32 adjacent to the fingers 31 and are disposed below and in engagement with arms 35 on the latch plate 30. When the lever 32 is pivoted downwardly, the actuating arms 34 move upwardly raising the arms 35 of the latch plate 30. This raises a latch finger 36 of the latch plate 30 away from the web 13 on the case 11. The U-shaped frame 23 with the lever 32 and latch plate 30 pivoted thereto form a unit which is disposed on the web 13 of the case 11 beneath the top flanges 14, the notches 26 of which are engaged by the shoulders 25 of the arms 24. After being inserted in the case 11 a flat bowed spring 37 is disposed in engagement therewith when moved downwardly in the slots 38 in the flanges 14. A flat spring 39 has end portions 41, a downwardly offset portion 42 and an upwardly extending flange 43. The offset portion 42 has a downwardly sloping central finger 44 and a pair of spaced fingers 44a. The spring rests upon the latch plate 30 when slid beneath the flanges 14 with the end portions 41 resting upon the top edge of the arms 24. In this position, the finger 44 engages the latch finger 36 and the fingers 44a engage the actuating arms 34.

A push plate or manual operator 45 has a downwardly

extending flange 46 which rests against the end face of the flange 43 of the spring 39 with its forward end resting upon the end of the lever 32, as clearly illustrated in FIGS. 3 and 4. A depression 47 is provided in the push plate or manual operator 45 for receiving a medallion of a user or having it stamped therein. Side flanges 48 strengthen the push plate and prevent it from deflecting and bending.

A cover plate 51 has a central opening 52 in the top portion which slopes downwardly therefrom to side flanges 53 and end flanges 54 and 55. The end flange 54 is notched at the ends and provided with an inwardly extending end flange 56 and the flange 55 is provided with notches 57 adjacent to the top portion. The flanges 14 at the forward end are recessed at 58 to receive the flange 54 which extends therewithin. After the flange 54 is engaged in this manner, the flange 55 at the opposite end of the cover will slide over the ends of the top flanges 14 having notches 60 which will extend within the notches 57 and lock the cover plate in firm fixed position with the push plate 45 engaging the underside of the opening 52 thereof.

It will be noted in this arrangement that the latch plate 30 has an upwardly directed flange 50 at the forward end on which the spring 39 rests. It will be noted also that the spring 37 has arms 40 lanced therefrom and extending outwardly from the concave side of the spring. By having the spring bowed in this manner, force will be applied from the convex side directly against the rear of the frame 23. It will be noted further that the arms 24 have a notch 49 on the bottom side which receives the flange 56 on the end flange 54 which is placed thereunder before the cover plate 51 is pivoted downwardly over the other end of the case in fixed position therewith.

Referring more particularly to FIGS. 3, 4 and 5, it will be seen that the other portion of the belt 61 is secured to a tongue 62 having a slot 63 therein in which the latch spring 36 is urged by the spring finger 44. After the tongue has been inserted into the case along the surface of the web 13, it will be noted that a notch 64 is provided on the bottom surface of the U-shaped frame 23 at the S-shaped bend portion between the arms 24 and the U-shaped end portion. The notch 64 has a depth only slightly greater than the thickness of the tongue 62 so as to retain the forward end of the tongue directly adjacent to the surface of the web 13 so that the finger 36 can be moved upwardly out of the slot 63 without moving the forward end of the tongue 62 upwardly therewith. It will be noted in FIG. 3 that the latch finger 36 is urged downwardly adjacent to the web 13 of the case 11.

In FIG. 4, the tongue 62 has been advanced to latch position. The latching finger 36 being urged upwardly by the forward end of the tongue 62 until the slot 63 passes over the end of the tongue which is then urged downwardly thereinto by the spring finger 44.

In FIG. 5, the push plate 45 has been pushed downwardly, tilting the lever 32 downwardly and raising the arms 34 upwardly to raise the arms 35 and thereby move the latch finger 36 from the slot 63 as clearly illustrated in FIG. 5. As mentioned hereinabove, the forward end of the tongue 62 is prevented from moving upwardly by the adjacent edge of the notches 64 so as to make certain that the latch finger 36 is raised above the tongue 62. This releases the tongue from the buckle and the portions of the belt 21 and 61 from the person secured thereby.

What is claimed is:

1. In a safety belt buckle, a bottom case assembly containing two sets of aligned apertures and an open front end, a latch pivoted to the set of apertures adjacent to said opening, a lever pivoted in the set of apertures located more remote from said opening, said lever and latch

having interengaging portions which releases the latch when the lever is deflected toward the bottom of the case assembly, a cover for said case assembly having an aperture, a manual operator in said cover actuatable through the aperture thereof and movable relative to said cover and said lever for moving the latter toward the bottom of the case assembly for releasing said latch, said lever having portions extending frontward and rearward of the set of apertures in which the lever is pivoted, one of said extending portions being engageable by said manual operator, and spring means engaging said other extending portion for biasing said one extending portion toward said manual operator.

2. In a safety belt buckle as recited in claim 1, wherein the case assembly has a base of channel shape, and a U-shaped frame containing said apertures secured within said base.

3. In a safety belt buckle as recited in claim 1, wherein said spring means is supported in the case in engagement with the top of said other extending portion for moving it downwardly relative to the bottom of the case assembly.

4. In a safety belt buckle as recited in claim 3, wherein said manual operator has pivotal relation with the spring element at one end and disposed in engagement with said other extending portion of the lever at the other end.

5. In a safety belt buckle as recited in claim 3, wherein the forward extending portion of the latch is urged downwardly adjacent to the bottom of the case assembly, and a tongue slidable on said bottom and having a slot into which the latch finger is retained when the tongue is in latched position.

6. In a safety belt buckle as recited in claim 2, wherein the U-shaped frame has a shallow notch disposed above said bottom substantially equal to the thickness of the tongue for retaining the tongue against the bottom.

7. In a seatbelt buckle as recited in claim 6, wherein the opposite end of the case from that which receives the tongue has a belt bar supported therein above a slot in the bottom of the case through which the belt extends when looped around the bar to permit the belt to be adjusted thereon and locked thereto.

8. In a safety belt buckle as recited in claim 7, wherein a cover plate has an aperture against the edge of which the manual operator is urged by the lever and through which the manual operator is actuated to move the lever and tilt the latch to released position.

9. In a safety belt buckle as recited in claim 8, wherein the cover plate has downwardly extending end walls one of which is flanged inwardly to engage notches at one end of the case when the opposite end is pivoted downwardly to have the end wall move into locked relation with the flanges of the case.

10. In a safety belt buckle as recited in claim 2, wherein a bowed spring strip secured in notches in the flanges urges the U-shaped element against the flanges.

References Cited

UNITED STATES PATENTS

3,270,388	9/1966	Humphrey.
3,273,214	9/1966	Keeling.
3,331,108	1/1967	Fisher.
3,345,712	10/1967	Smith.

FOREIGN PATENTS

743,697	10/1966	Canada.
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U.S. Cl. X.R.