

May 5, 1959

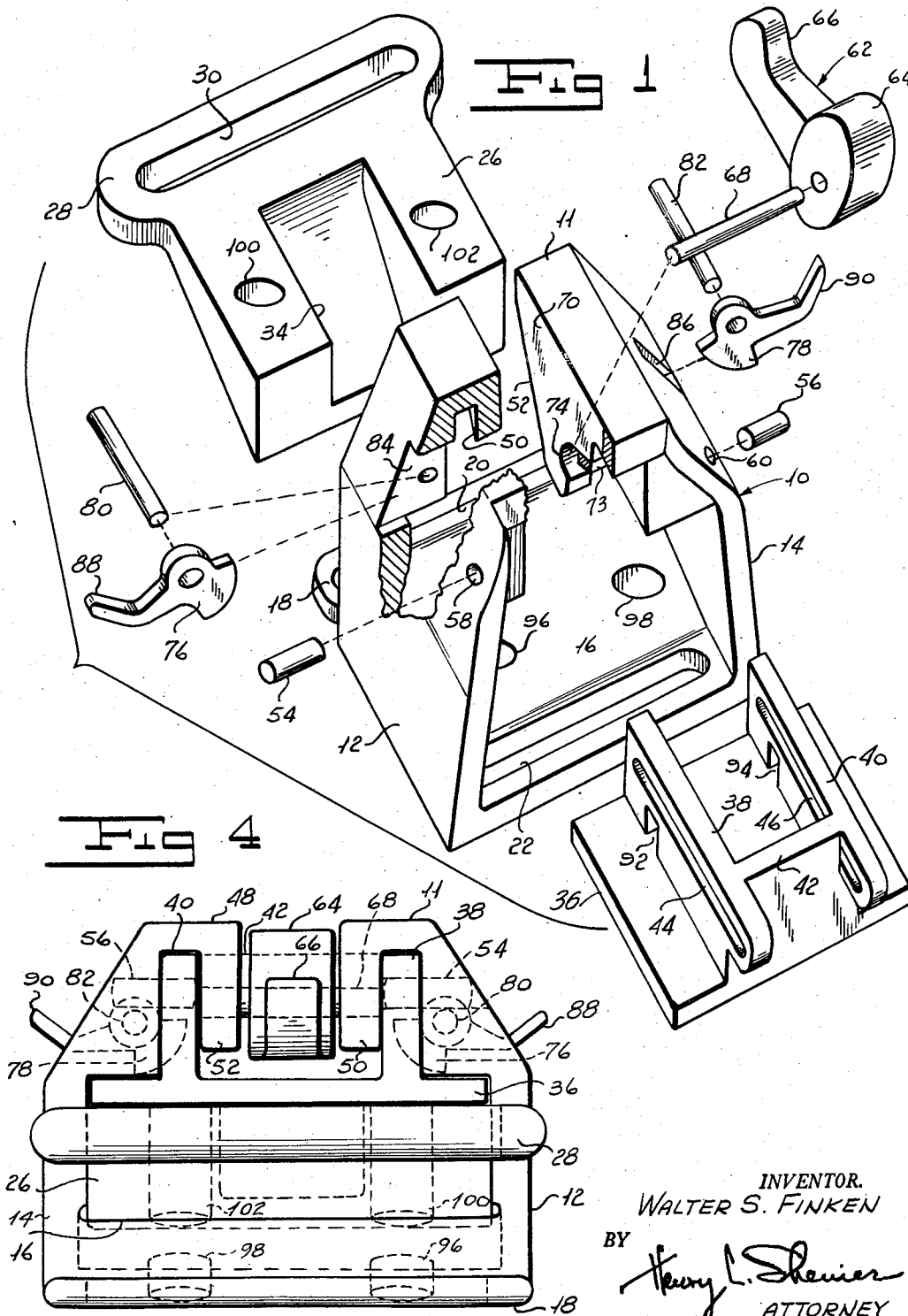
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2,884,676

READILY RELEASABLE PARACHUTE HARNESS BUCKLE

Filed May 18, 1953

4 Sheets-Sheet 1



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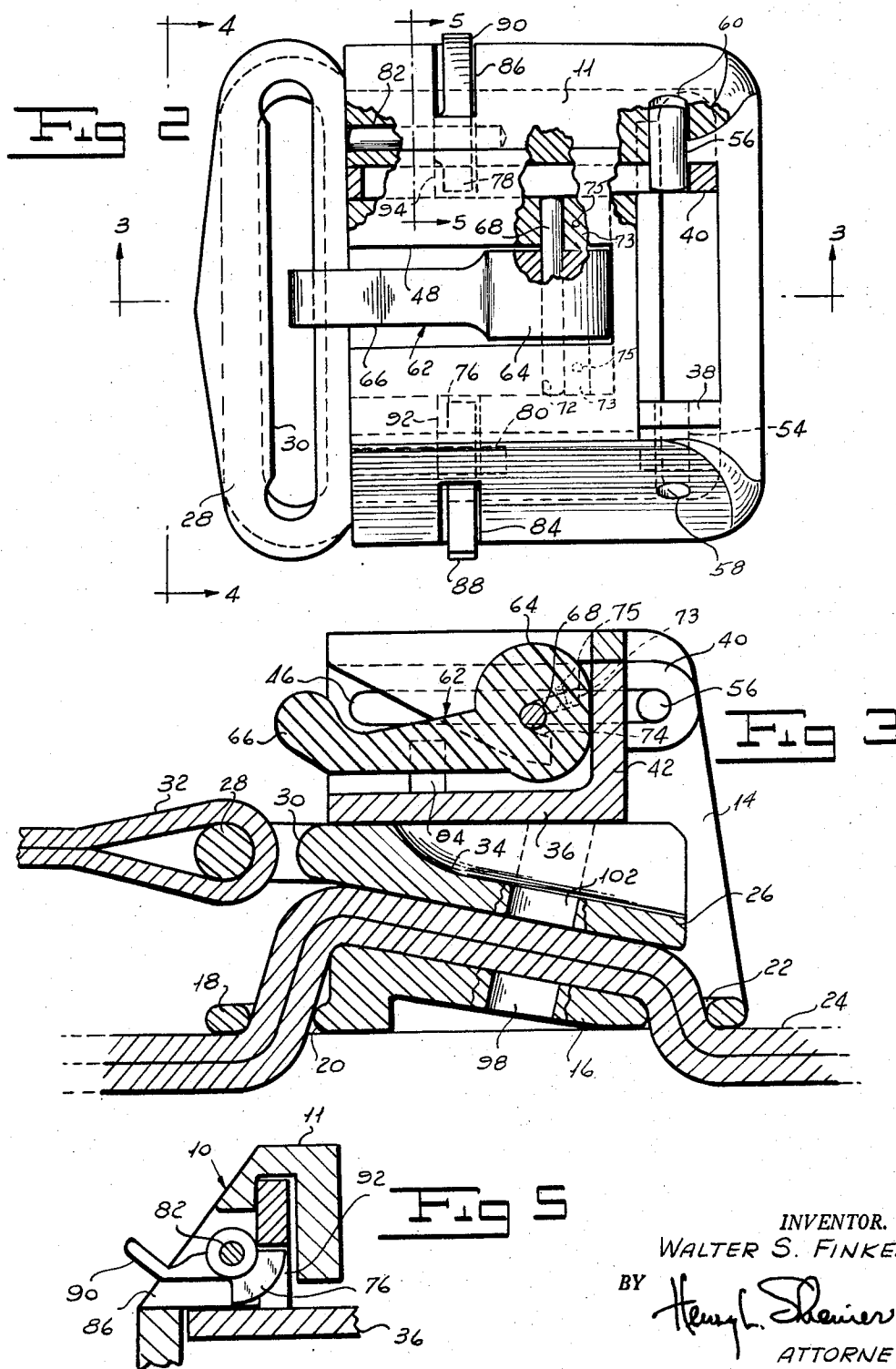
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READILY RELEASEABLE PARACHUTE HARNESS BUCKLE

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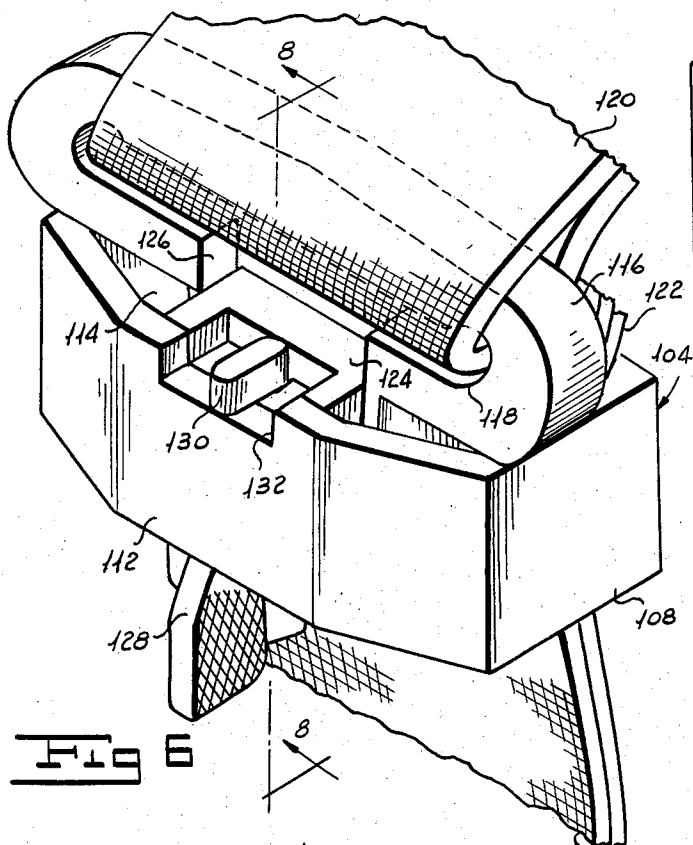


FIG 6

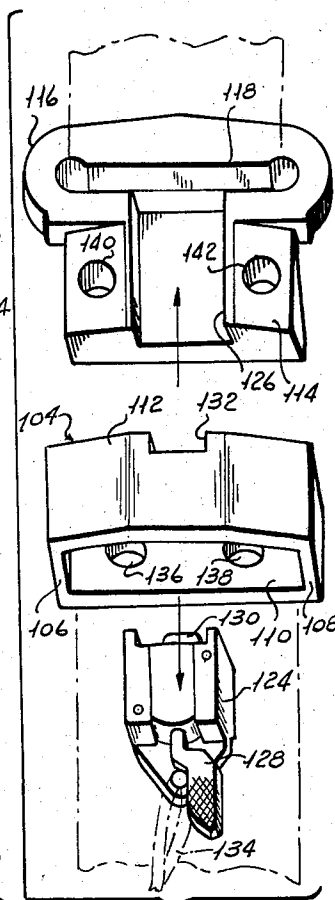


FIG 7

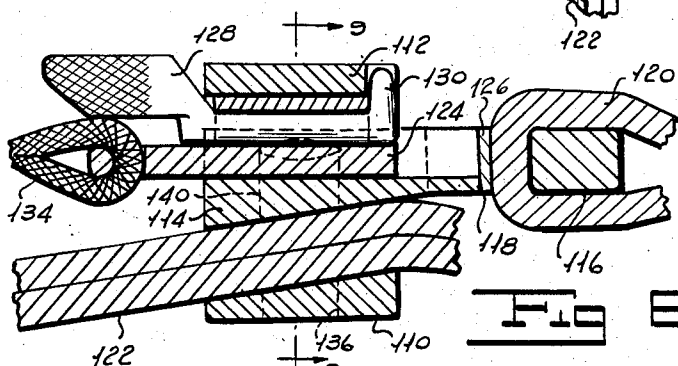


FIG 8

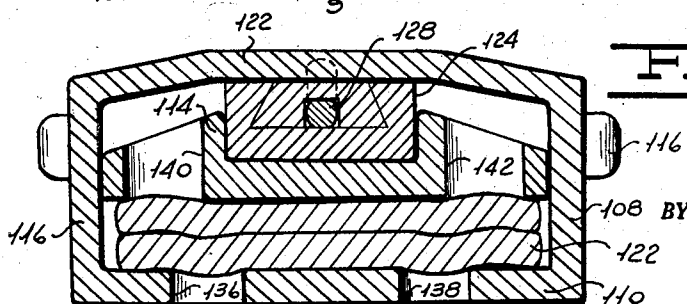


FIG 9

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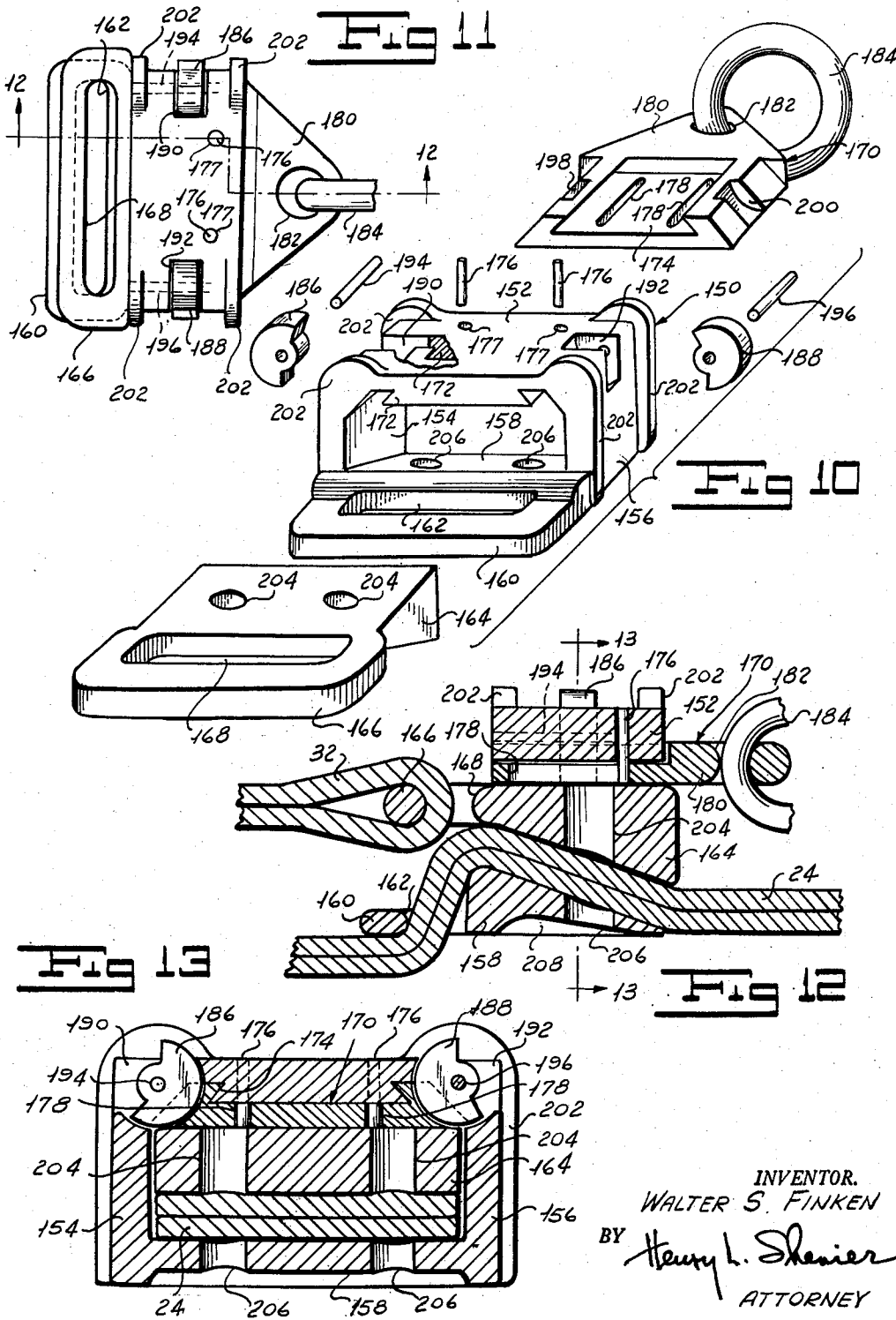
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READILY RELEASABLE PARACHUTE HARNESS BUCKLE

Filed May 18, 1953

4 Sheets-Sheet 4



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1

2,884,676

READILY RELEASABLE PARACHUTE HARNESS BUCKLE

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Application May 18, 1953, Serial No. 355,797

8 Claims. (Cl. 24—171)

My invention relates to a parachute harness buckle and more particularly to a parachute harness buckle which is strong, lightweight, safe and reliable in operation and which is readily releasable.

Parachute harness buckles are designed to permit the quick detachment of the parachute from the harness on the wearer's body when he comes in contact with the ground or water upon landing. The buckles should be readily releasable with a minimum of effort to prevent dragging of the wearer by ground winds. In addition it is desirable that they embody features which prevent an inadvertent release by the wearer or an accidental release when the parachute fouls during the descent. I have invented a readily releasable parachute harness buckle which is strong enough to provide a secure engagement between the harness and the parachute risers and which is composed of only a small number of parts so as to be relatively lightweight. In my parachute harness buckle the load is borne by the buckle frame or housing. I have provided my buckle with safety features which prevent the inadvertent or accidental release of the buckle and have arranged the parts so that the buckle is nevertheless readily releasable.

One object of my invention is to provide a readily releasable parachute harness buckle in which the load is borne by the buckle housing or frame.

Another object of my invention is to provide a readily releasable parachute harness buckle which is provided with safety features to prevent the inadvertent or accidental release of the buckle.

A further object of my invention is to provide a readily releasable parachute harness buckle which is strong, safe and reliable in operation and lightweight.

Other and further objects of my invention will appear from the following description.

In general my invention contemplates the provision of a readily releasable parachute harness buckle which includes an open end housing or frame having a top, a pair of sides and a bottom formed with a tapered cross section. The parachute harness webbing passes through the housing and lies across the bottom thereof. A wedge to which a parachute riser is attached has an oppositely tapered cross section to that of the housing bottom and is inserted within the housing over the harness webbing. A block is inserted between the top of the housing and the upper surface of the wedge to compress the harness webbing between the undersurface of the wedge and the upper surface of the housing bottom. Locking means are provided for locking the wedge in place within the housing. The arrangement of parts is such that the force of compression on the harness webbing between the wedge and the bottom of the housing increases as the pull on the parachute riser strap increases. This results from the opposite tapers of the wedge and the bottom of the housing, and the block bearing between the top of the housing and the wedge.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunc-

2

tion therewith and in which like reference numerals are used to indicate like parts in the various views:

Figure 1 is an exploded perspective view of my readily releasable parachute harness buckle.

5 Figure 2 is a top plan view of my readily releasable parachute harness buckle with parts broken away.

Figure 3 is a sectional view of my readily releasable parachute harness buckle taken along the line 3—3 of Figure 2.

10 Figure 4 is a front view of my readily releasable parachute harness buckle taken along the line 4—4 of Figure 2.

Figure 5 is a fragmentary view showing the block locking means of my readily releasable parachute harness buckle.

15 Figure 6 is a perspective view of a modified form of my readily releasable parachute harness buckle.

Figure 7 is an exploded perspective view on a reduced scale of the form of my invention illustrated in Figure 6.

20 Figure 8 is a sectional view of my readily releasable parachute harness buckle taken along the line 8—8 of Figure 6.

Figure 9 is a sectional view of my readily releasable parachute harness buckle taken along the line 9—9 of Figure 8.

25 Figure 10 is an exploded perspective view of a further form of my readily releasable parachute harness buckle.

Figure 11 is a top plan view of the form of my readily releasable parachute harness buckle shown in Figure 10.

30 Figure 12 is a sectional view of the form of my readily releasable parachute harness buckle shown in Figure 10, taken on the line 12—12 of Figure 11.

Figure 13 is a sectional view of the form of my invention illustrated in Figure 10 taken along the line 13—13 of Figure 12.

35 More particularly referring now to the drawings, I provide a housing or frame, indicated generally by the reference character 10, having a top 11, sides 12 and 14 and a bottom 16. It is to be noted that bottom 16 has a tapered cross section to form a wedge as can be clearly seen from an examination of Figure 3. The central portion of the wedge is removed to lighten the over-all structure. A flange 18 is formed at one end of the bottom 16 and provided with a longitudinal slot 20. A slot 22 is formed at the other end of the bottom 16. The webbing 24 of the parachute harness is threaded through these slots so that the body 10 may be moved to any desired position along the length of the webbing 24.

40 A wedge 26 has a flange 28 formed at its reduced end. I provide a slot 30 in the flange 28 to which a parachute riser 32 is attached, as can be seen in Figure 3. Wedge 26 is similarly lightened in the area indicated by reference character 34. Wedge 26 is oppositely tapered to bottom 16 and adapted to be inserted within the housing 10 over the length of webbing 24.

55 To lock the wedge in place within the housing, I provide a block 36 having a pair of spaced upstanding flanges 38 and 40 on its upper surface. These flanges are connected by a web 42 at one end of the block 36 and provided with respective longitudinal slots 44 and 46. The top 11 of the housing is formed with a pair of spaced depending flanges 50 and 52 on its underside. Block 36 is adapted to be inserted within the housing over the wedge 26 so that the tops of flanges 38 and 40 ride in the slots formed between flanges 50 and 52, respectively, and sides 12 and 14. A pair of stop pins 54 and 56 are fixed in holes 58 and 60, respectively, provided in sides 12 and 14. These pins ride in the slots 44 and 46 and limit the movement of block 36 relative to housing 10.

70 To provide an initial force to release block 36 from its position within the housing, I provide a cam member, indicated generally by the reference character 62, hav-

3

ing a cam surface 64 and a release arm 66. A pivot pin 68 mounts cam member 62 in a slot 70 cut in the top 11 of housing 10 between flanges 50 and 52. Pin 68 is carried by bosses 72 and 74 formed on the bottom of flanges 50 and 52, respectively, and held therein by a retaining member 73 extending between flanges 50 and 52. Member 73 is fixed to the underside of flanges 50 and 52 by means such as screws 75.

A pair of lock members 76 and 78 are mounted on pivot pins 80 and 82, extending across slots 84 and 86 cut in sides 12 and 14. These lock members are adapted to be rotated by means of their respective arms 88 and 90 to positions where they engage recesses 92 and 94 formed in the respective flanges 38 and 40 of block 36. When cam member 62 has been rotated to a position where its arm 66 lies below the plane of the top 11 of housing 10 and the block is in its inmost position, lock members 76 and 78 are rotated clockwise and counterclockwise, respectively, as viewed in Figure 4, to engage slots 92 and 94, and the block is securely retained within the housing. The cooperation of the locking means 76 with its respective slot 92 is illustrated in detail in Figure 5.

It is to be noted that I provide the bottom 16 of the housing with a pair of spaced holes 96 and 98 and wedge 26 with similar spaced holes 100 and 102. When the fabric is compressed between bottom 16 and wedge 26, the webbing will be squeezed up in these holes to provide a still firmer engagement between the wedge and the housing.

In the form of my invention illustrated in Figures 6 to 9, I provide a housing indicated generally by the reference character 104 having a pair of sides 106 and 108, respectively, a tapered bottom 110 and a top 112. A wedge 114 has an extension 116 at one end thereof which is provided with a transverse slot 118 to which a parachute riser 120 may be secured. The parachute harness webbing 122 is adapted to pass through housing 104 over the tapered bottom 110. Wedge 114 is inserted within the housing over the webbing 122. It is to be noted, as is clearly indicated in Figure 8, that bottom 110 and wedge 114 have opposite tapers in cross section so that as wedge 114 is pulled away from housing 104, the webbing is squeezed between the wedge and the bottom.

A block 124 is provided for retaining the wedge in position within the housing. Wedge 114 has a recess 126 in its upper surface to receive block 124. When the wedge has been positioned within the housing, block 124 is slid into recess 126 so that its upper surface bears on the undersurface of top 112 of housing 104, and its undersurface bears on the wedge. It will be apparent that if an attempt is made to withdraw the wedge from the housing, the block 124 holds the wedge in position so that the webbing 122 is compressed between the wedge and the bottom of the housing to resist the pull.

To lock block 124 in the housing, a lock member 128 is rotatably mounted within the block. One end of the lock 128 has an extension 130 formed thereon. When the block is inserted within the housing, member 128 is rotated to a position where extension 130 cooperates with a slot or notch 132 formed in the top 112 to prevent withdrawal of the block by means of lanyard 134 attached to the block.

Bottom 110 is provided with spaced holes 136 and 138 and wedge 114 is provided with holes 140 and 142. These holes provide recesses into which the webbing is squeezed by the force of compression between wedge 114 and the bottom 110 when a pull is exerted on riser 120.

In the form of my invention illustrated in Figures 10 to 13, I provide a buckle frame or housing, indicated generally by reference numeral 150 having a top 152, sides 154 and 156 and a tapered bottom 158. On one end of the bottom 158 of housing 150, I form a flange 160 having a transverse slot 162 for the reception of the parachute harness webbing 24. As can be seen by reference to

4

Figure 12, the webbing 24 is passed up through slot 162 and through housing 150 so as to lie across the bottom 158 thereof.

I provide a wedge 164 which is tapered in cross section oppositely to the taper of the bottom 158 of housing 150. A flange 166 having a transverse slot 168 is formed on the reduced end of wedge 164. The parachute riser 32 is adapted to be passed through slot 168, as can be seen by reference to Figure 12. Wedge 164 is adapted to be inserted within housing 150 so that webbing 24 lies between the undersurface of wedge 164 and the bottom 158 of housing 150. This can be seen by reference to Figure 12.

To lock wedge 164 securely within housing 150, I provide a locking block, indicated generally by reference numeral 170. It is to be noted that the underside of top 152 is formed with a dovetail 172 and the block 170 is formed with a complementary dovetail recess 174. Block 170 is slidably mounted for limited movement within housing 150 on dovetail 172 by means of pins 176 fixed in holes 177 in top 152 and riding in slots 178 in block 170. A lug 180 is formed on one end of block 170 and provided with a hole 182 through which a pull ring 184 or a lanyard passes to provide means by which block 170 can be withdrawn to the limit of its movement from within housing 150. It will be appreciated that after wedge 164 has been inserted within housing 150 over webbing 24, block 170 can be slid to its innermost position within the housing. In that position block 170 serves to provide a firm engagement between wedge 164 and housing 150 so that webbing 24 is firmly clamped between wedge 164 and bottom 158.

To lock block 170 in its inner position within housing 150 and thereby prevent its accidental release, I provide a pair of knurled, segmental lock members 186 and 188. Members 186 and 188 are rotatably mounted in slots 190 and 192 cut in sides 154 and 156 of housing 150 by means of respective pins 194 and 196 running across the slots. The sides of block 170 are formed with notches 198 and 200 for engagement with the respective lock members 186 and 188 when the latter are rotated to locking position. It is to be noted that the ends of sides 154 and 156 of housing 150 are each provided with a laterally extending bead or flange 202 which serves to protect the safety locks 186 and 188 from damage or accidental release when the buckle is in use.

As is the case with the other forms of my invention, the bottom 158 of housing 150 is formed with a pair of spaced holes 206 and wedge 164 with a pair of spaced holes 204. These holes provide a space into which webbing 24 can squeeze when a force is exerted on riser 32 which tends to separate wedge 164 from housing 150. In this form of my invention also excess metal may be removed from the solid portions of the buckle such, for example, as the space within bottom 168, indicated by reference numeral 208.

In use of the form of my invention illustrated in Figures 1 to 5, the parachute harness webbing is threaded through slots 20 and 22 so that a portion of the webbing lies over the tapered bottom 16. Block 36 is moved to its out positions; that is, to the right in Figure 3, so that the left-hand end of slots 44 and 46 engage stop pins 54 and 56. Arm 66 of cam member 62 is rotated to a position where it lies in the plane of top 48. Wedge 26 is inserted within the housing, and block 36 is slid to the left as viewed in Figure 3. To lock the block 36 securely within the housing, members 76 and 78 are rotated clockwise and counterclockwise, respectively, as viewed in Figure 4, by means of their arms 88 and 90 so that they are inserted into slots 92 and 94 and lock the block 36 within the housing.

It will be appreciated that an increase in the pull on the riser 32 will increase the compressive force on webbing 24 resulting from the opposite taper of the wedge 26 and the bottom 16, since the wedge is held in place

5

by block 36. Under this compressive force, webbing 24 tends to bunch up in the openings 96, 98, 100 and 102. At the same time, after the pressure is relieved, the position of the buckle along the length of webbing 24 can be adjusted by sliding the entire assembly up and down on the webbing. This is possible because movement of the entire assembly with respect to the webbing 24 does not appreciably affect the wedging action.

To release the buckle, the wearer grasps the arms 88 and 90, respectively, with his thumb and middle finger and at the same time, the arm 66 with his forefinger. By pulling all the arms together, the block is unlocked and under the action of the cam surface 64, is forced to the right, as shown in Figure 3, to release the wedge.

In use of the form of my invention illustrated in Figures 6 to 9, the harness webbing 122 is inserted through the buckle so that it lies over the tapered bottom 110. Wedge 114 is then inserted within housing 104 over the webbing 122 so that the cross-sectional tapers of the wedge and the bottom are oppositely disposed as shown in Figure 8. Block 124 is then inserted in the recess 126 in wedge 114 and lock member 128 rotated to a position where the extension 130 cooperates with the slot 132. It will be appreciated that any increase in pull on wedge 114 only serves to increase the compressive force on the webbing to force the webbing into openings 136, 138, 140 and 142.

To release the wedge, member 128 is rotated so that the extension 130 is out of engagement with slot 132, and the block is withdrawn by the lanyard 134. It will be understood that this assembly can be adjusted along the webbing 122 without affecting the wedging action to an appreciable extent.

The operation of the form of my invention illustrated in Figures 10 to 13 is similar to that of the other forms of my invention. In use, harness webbing 24 is inserted up through slot 162 and across bottom 158 of housing 150 to mount the housing on the webbing for sliding movement therealong. To secure riser 32, attached to wedge 164, to the buckle housing, block 170 is withdrawn by means of pull ring 184 to its outermost position from within housing 150. This outward movement of block 170 is limited by stop pins 176 riding in slots 178. Next, wedge 164 is inserted within housing 150 over the webbing 24, and block 170 is inserted to its inmost position with housing 150. It is to be understood, of course, that lock members 186 and 188 have previously been rotated to positions where they will permit the withdrawal of block 170 and in this position will not interfere with block 170 when it is slid into its inmost position. When the parts occupy these relative positions as shown in Figure 12, any pull exerted on riser 32 will serve only to clamp webbing 24 more firmly between bottom 158 and wedge 164. As the force is increased, portions of webbing 24 may be squeezed into holes 204 and 206 to provide a still firmer engagement between wedge 164 and housing 150. In order to prevent the accidental or inadvertent withdrawal of block 170 after it has been inserted within the housing, lock members 186 and 188 are rotated to positions where they engage and register with the respective notches 190 and 200 in the sides of block 170.

Thus it will be seen that I have accomplished the objects of my invention in that I have provided a readily releasable parachute harness buckle which is simple and reliable in operation and which is lightweight. I have provided my buckle with safety features to prevent inadvertent or accidental release of the buckle and yet have provided means whereby the buckle may be readily released.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing

6

from the spirit of my invention. It is therefore to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. A readily releasable buckle including in combination a housing through which a webbing is adapted to pass, said housing having a bottom formed with a tapered cross section to provide the bottom with a base surface and with a webbing-engaging surface forming an angle with the base surface, a wedge formed with a tapered cross section to provide the wedge with a base surface and with a webbing-engaging surface forming an angle with the wedge base surface, means for attaching a riser to said wedge, said wedge positioned in said housing with the wedge cross section and the housing bottom cross section tapering in opposite directions, webbing positioned between the webbing-engaging surface of the bottom of the housing and the webbing-engaging surface of the wedge and readily releasable means adapted to be positioned within said housing in engagement with said wedge for holding the wedge in engagement with the webbing to provide the connection between said wedge and said housing, said readily releasable means being manually actuatable to permit said wedge to be separated from said housing.

2. A readily releasable buckle as in claim 1 including locking means for locking said readily releasable means in position within the housing.

3. A readily releasable buckle as in claim 1 including means for initiating the disengagement of said readily releasable means from said wedge to release the wedge.

4. A readily releasable buckle as in claim 1 wherein said bottom and said wedge are formed with re-entrant portions into which a portion of said webbing is squeezed under the action of the compressive force between said wedge and said bottom.

5. A readily releasable parachute harness buckle including in combination a housing through which a parachute harness webbing is adapted to pass, said housing having a bottom formed with a tapered cross section to provide the bottom with a base surface and with a webbing-engaging surface forming an angle with the base surface, a wedge formed with a tapered cross section to provide the wedge with a base surface and with a webbing-engaging surface forming an angle with the wedge base surface, means for attaching a parachute riser to said wedge, said wedge being positioned in said housing with the wedge cross section and the bottom cross section tapering in opposite directions, harness webbing positioned between the webbing-engaging surface of the bottom of the housing and the webbing-engaging surface of the wedge and readily releasable means for holding the wedge in engagement with the harness webbing to provide the connection between said wedge and said housing, said readily releasable means being manually actuatable to permit said wedge to be separated from said housing.

6. A readily releasable buckle including in combination a housing through which a webbing is adapted to pass, said housing having a top and a base formed with an upper surface, said upper surface being disposed at an angle with respect to the plane of said top, a wedge formed with a tapered cross section to provide the wedge with a base surface and with a webbing-engaging surface forming an angle with the base surface, means for attaching a riser to said wedge, said wedge positioned in said housing with said webbing-engaging surface substantially parallel to said upper surface, webbing positioned between the upper surface of the housing base and the webbing-engaging surface of the wedge, a readily releasable means for holding the wedge in engagement with the webbing to provide the connection between said wedge and said housing, said readily releasable means being manually actuatable to permit said wedge to be separated from said housing.

7

7. A readily releasable buckle including in combination a housing through which a webbing is adapted to pass, said housing having top and bottom walls, said bottom wall formed with a tapered cross section, a wedge, means for attaching a riser to said wedge, said wedge positioned in said housing, webbing positioned between the bottom of the housing and the wedge, a block adapted to be positioned within said housing between said top wall and said wedge and adapted to hold the wedge in engagement with the webbing to provide the connection between said wedge and said housing and manually operable readily releasable means for actuating said block to permit said wedge to be separated from said housing.

8. A readily releasable buckle including in combination a housing through which a webbing is adapted to pass, said housing having a bottom formed with a tapered cross section, a wedge, means for attaching a riser to said wedge, said wedge positioned in said housing, webbing positioned between the bottom of the housing and the wedge, a block adapted to be positioned within the housing for holding the wedge in engagement with the

8

webbing to provide the connection between the wedge and the housing, manually operable readily releasable means for actuating said block to permit said wedge to be separated from said housing, means having recesses therein carried by said block and releasable locking means on said housing adapted to engage said recesses.

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