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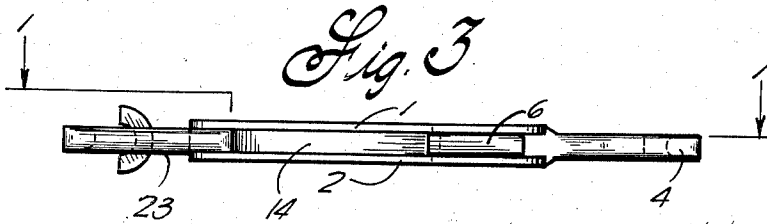
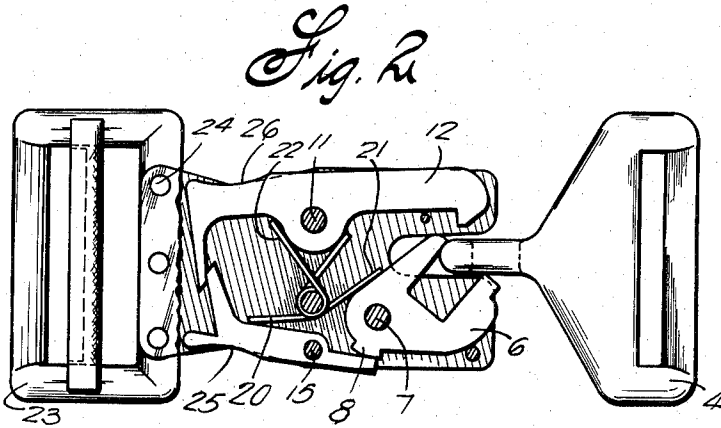
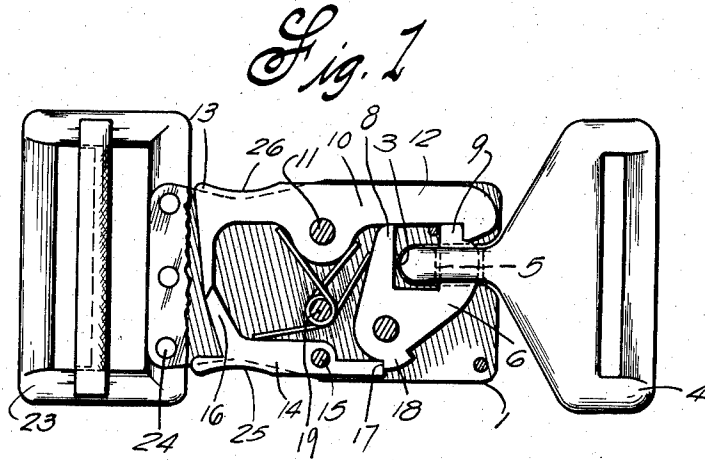
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2,863,200

LATCH EJECTION TYPE, QUICK ATTACHMENT AND RELEASE

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 5

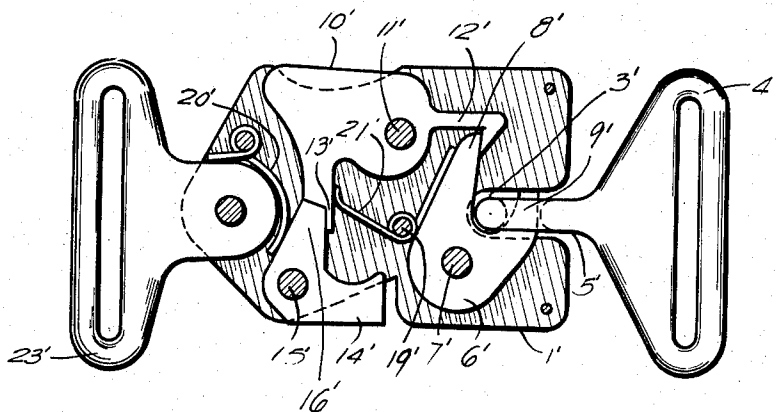
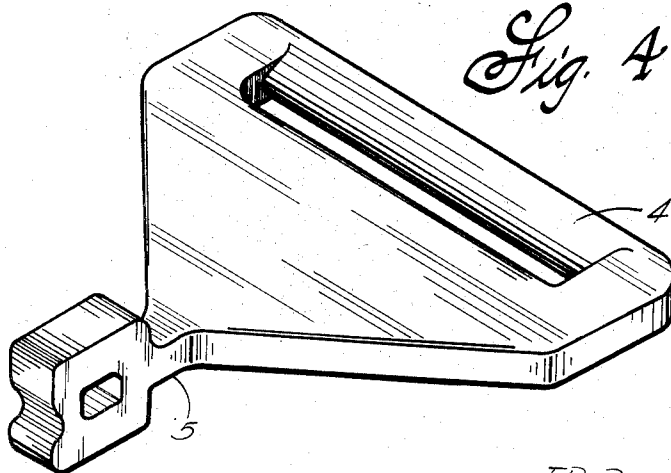


Fig. 4



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LATCH EJECTION TYPE, QUICK ATTACHMENT AND RELEASE

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1 Claim. (Cl. 24—230)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates to the art of couplings or latch devices and has for its object the improvement of quick release devices of this category.

The object of this invention is to provide an ejection type latch which cannot be released until both of a pair of cooperating holding members are actuated.

A further object of this invention is to provide a latch provided with means for ejecting the member holding to the element to be fastened thereby obtaining a quick release.

A still further object of this invention is to provide a fastening means utilizing a pair of holding means which will not release upon the application of force to only one of the holding means.

Another object of this invention is to provide a latching which automatically locks upon insertion of the holding means on the element to be secured into the latch.

Still another object of this invention is to provide a latch for the harness of a parachute, which latch cannot be accidentally released and yet will allow quick unbuckling of the harness to permit the wearer to disengage himself rapidly therefrom.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Figure 1 is a plan view of a preferred form of the invention with a side plate removed to show the interior construction.

Figure 2 is a similar view showing the latch in its open position.

Figure 3 is a side view of the latch.

Figure 4 is a side view of the member to be secured to the element to be fastened.

Figure 5 is a plan view similar to Figure 1 of another form the inventor may take.

Referring to Figures 1 and 2 of the drawing it is seen that the quick release or ejection latch comprises a housing or body member formed by a pair of side plates 1 and 2. The plates 1 and 2 are spaced apart and held together by pins, rivets or any other suitable means. A cut-away portion or slot 3 is formed in one end of the plates and receives the apertured extension 5 of a slotted means 4 which can be mounted permanently or otherwise on a belt, strap, chain, article of clothing or any means which it is desired to fasten. The shape of the means 4 is not significant in the construction of the invention and may be formed as found desirable and convenient. It is merely necessary that it have an apertured extension suitable for entry into the slot 3.

A latch member 6 is pivotally mounted on the pin 7 between the side plates 1 and 2 and formed substantially as a U-shaped member having legs 8 and 9. When the

2

latch device is in a closed or normal position the legs 8 and 9 are disposed across the slot 3 with the leg 9 passing through the aperture in the extension 5 to retain the member 4 secured to the latch member. A latch lever or holding means 10 is pivotally mounted between the side plates on the pin 11 and is provided with an upper L-shaped extension 12 which overlies a portion of the leg 9 to prevent outward pivoting movement of the latch 6 until such movement is desired. The lower portion of the latch lever 10 is formed as right angular extension 13.

Pivotally mounted on the pin 15 on a side of the housing opposite the latch lever 10 is a holding lever means 14. A lower portion of the lever means 14 is provided with an extension 16 having an inclined end normally engaging a confronting matched end on the extension 13. The upper end 17 of the lever 14 normally engages under a lug 18 formed on the latch 6 for a purpose to be brought out below.

Spring means 20 is mounted on the pin 19 and has a leg 21 bearing against the under surface of the leg 8. A spring 22 is also mounted on the pin 19 and has legs bearing against the latch lever 10 on either side of its pivot. The conformation of these springs is not of critical significance in the invention as it is only important that a means be provided to pivot the latch 8 outwardly when it is released and to maintain the levers 10 and 14 in their normal position.

A buckle or other means 23 suitable for fastening to a means to be latched is secured to the lower end of the housing by rivets or other means 24 passed through the side plates.

The operation of the latch device is as follows: Figure 1 shows the latch in a closed position with the elements 4 and 23 fastened to elements to be held together. The lever 14 is engaged at a finger grip 25 which may be provided for this purpose and pushed inwardly and thereby rotated clockwise, as seen in Figure 1, so that the inclined surface on its extension 16 no longer engages the similar surface on the extension 13. This action frees the latch lever 10 for similar inward movement by a force applied to its finger grip 26. The movement of latch lever 10 inwardly results in a counterclockwise rotation of the lever so that the extension 12 moves away from the leg 9, releasing the latch so that the force of the spring extension 21 may pivot the latch outward, thereby causing the leg 9 to move out of the aperture in the extension 5. The spring 21 still acting on the leg 8 causes continuing movement of the latch 6 and the leg 8 engages the bottom of the extension to force out of the slot 3 and away from the latch body. This is the ejection action of the latch device and the spring 21 and leg 8 are aided in this action by the fact that any belt or article which the latch is holding together will usually be under some tension, which tension will tend to pull the member 4 out of the slot and away from the body member.

The confronting ends of the extension 13 and 16 are so sloped that the forces acting on these ends, when an attempt is made to rotate the lever 10 counterclockwise without first depressing the lever 14, will act on the lower side of the pivot 15 tending to move the lever 14 counterclockwise also. This latter movement will be prevented by the engagement of the end 17 with the latch 8 so that the lever 10 likewise will not be capable of movement and the latch will not be released. Also, if the lever 14 is depressed either on purpose or accidentally without depressing the lever 10, the latch will similarly not be released.

Thus it is seen that the chances of accidental release of the latch are considerably lessened since both levers 10

and 14 must be depressed to move the extension 12 away from the leg 9.

The latch in its open position is shown in Fig. 2 with the extension 5 of the member 4 ready to enter into the slot 3 and in between the legs 8 and 9. The automatic relatching is as follows: The extension 5 acting against the leg 8 rotates the latch 6 counter-clockwise. When the latch is in the open position it will be seen that the lug 18 acting against the end 17 has cammed the lever 14 outwardly. This is done so that the extension 16 will be raised above the extension 13 as one arm of the spring 20 is tending to rotate the lever 14 counter-clockwise. This improper positioning of the extensions 13 and 16 could interfere with the automatic relatching. The counter-clockwise rotation of the latch 6 causes the outer end of the leg 9 to cam pass the L-shaped extension 12 and the end 17 is released by the lug 18 so that the spring 20 can force it to its normal position under the lug. This action also brings the slant end of extension 16 back into its engagement with the end of extension 13.

In the modified form of the invention shown in Fig. 5 the mechanism is mounted between a side plate 1' and another side plate (not shown). The extension 5' of the fastening element 4' fits into the slot 3' where it is retained by the leg 9', which passes through the aperture, of the latch 6' pivoting on the pin 7'. The L-shaped extension 12' of the latch lever 10' pivoting on the pin 11' engages the outer end of the leg 8' to retain the latch in its closed position. The lever 10' has a flange 13' formed on the end of an extension, which normally overlies the end 16' of the locking lever 14' which pivots on the pin 15'. These confronting ends are inclined so that force exerted, when the latch lever 10' is pushed, will not tend to cause rotation of the locking lever 14'. To release the latch the locking lever is pushed at its upper end to rotate it counter-clockwise so that end 16' moves away from the flange 13' permitting clockwise rotation of lever 10.

The spring 21' mounted on the pin 19' and the spring 20' engages the latch lever and locking lever respectively to maintain them in their normal closed position. The spring 21' also bears against the bottom of the leg 8 to act as the ejecting force for the fastening member 4'.

The latch disclosed herein is capable of wide application and affords a safe design in which the change of accidental release is considerably diminished. The latch

also has the features of ejection of the fastening member and automatic relocking by the fastening member. One obvious application of this latch is in the field of parachute harnesses wherein the ejection feature for quick disengagement of the harness is important and wherein it is highly desirable to avoid accidental release.

Obviously many modifications and variation of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claim the invention may be practiced otherwise than as specifically described:

What is claimed is:

An ejection type latch device comprising a body member, said body member having a slot disposed therein into which an apertured load engaging link is adapted to be positioned; a U-shaped latch pivoted on said body member such that one leg passes through the apertured link when the latch device occupies its latched position; a first latch operating lever pivoted on said body member, said first lever having an L-shaped extension adjacent one extremity thereof adapted to engage one leg of the latch in its latched position, said first lever also having a right-angle extension adjacent the other extremity thereof; spring means mounted on the body member engaging the latch and biasing it toward its unlatched position; a second latch operating lever pivoted on said body member, one extremity of the said second lever being constructed to engage the right-angle extension of the first lever when the latch occupies its latched position and no other portion of the said first lever at any time; a lug disposed on the latch for engagement with the other extremity of the second lever when the latch occupies its latched position and for delaying return of the second lever to its latched position during a latching operation; and spring means mounted on the body member engaging the first and second levers biasing them toward their latched positions.

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