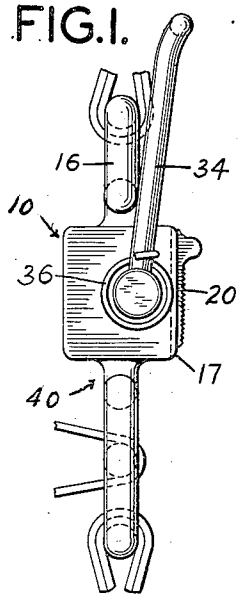
Jan. 18, 1949. T. J. HENDERSON 2,459,223

RELEASABLE SHACKLE

Filed Dec. 4, 1946

FIG.1.



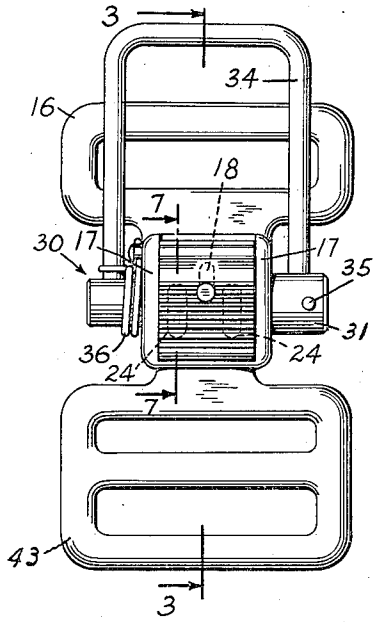


FIG.2.

FIG.3.

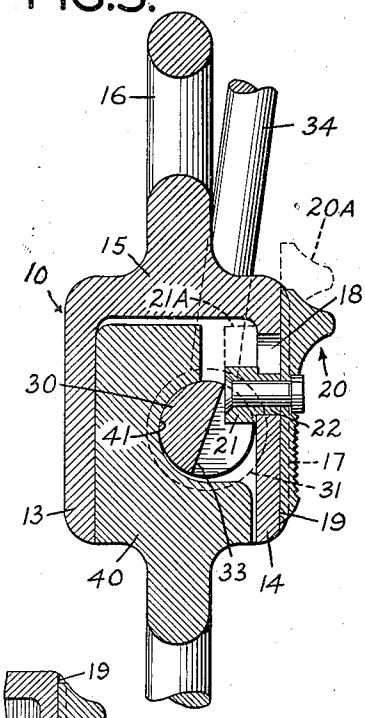
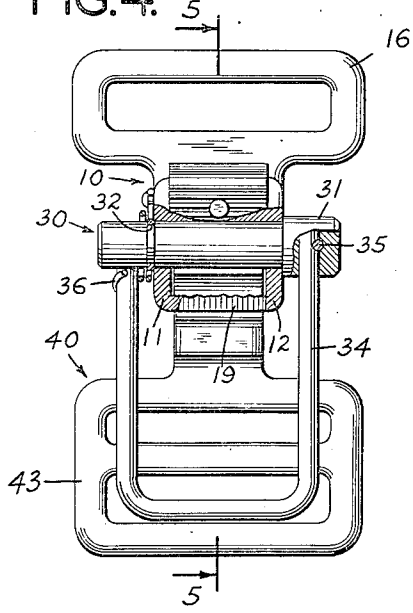


FIG.4.



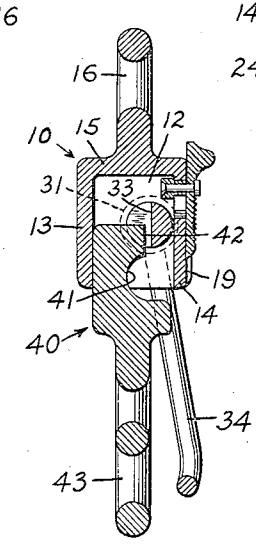


FIG.5.

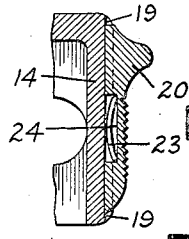
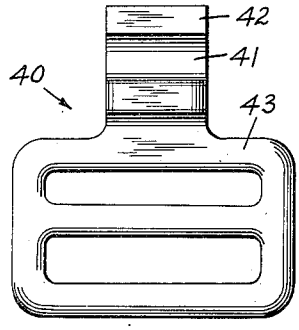


FIG.7.

FIG.6.



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Patented Jan. 18, 1949

2,459,223

UNITED STATES PATENT OFFICE

2,459,223

RELEASABLE SHACKLE

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Application December 4, 1946, Serial No. 713,891

7 Claims. (Cl. 24—235)

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This invention relates to releasable shackle arranged to form a connection between two such instrumentalities as the shroud lines of a parachute and an aviator's parachute harness.

Its object is to provide a device for this and similar purposes which cannot be opened accidentally, but which can be actuated easily and quickly to release the connection. Another object is to provide a simple safety lock for the connector and a release lever associated therewith, both of which may be actuated by the thumb and fingers of one hand, even if the hand be gloved.

A still further object is to provide a spring for holding the release lever in locking position combined with mechanism for preventing its movement for unlocking the connection it controls in the event of the spring becoming broken. According to my invention, all of the parts of the device are enclosed and protected from injury, and have great strength but little weight.

Referring to the drawings,

Fig. 1 is a side elevation, and Fig. 2 a front elevation, of a device which is made according to and embodies my invention;

Fig. 3 is a sectional side elevation on a larger scale of parts of the device shown in the preceding figures, the section being taken on the line 3—3 of Fig. 2. In these figures, the device is shown with its parts in the relative positions in which they are closed and locked.

Fig. 4 is a front elevation, and Fig. 5 a sectional side elevation, of the same device, with the parts in the relative positions in which they are unlocked. Parts of Fig. 4 are broken away to show some details of the construction in section. The section in Fig. 5 is taken on the line 5—5 of Fig. 4. In Figs. 4 and 5 the parts are unlocked and partly separated.

Fig. 6 is a front elevation of a releasable member, which forms part of the device; and

Fig. 7 is a sectional side elevation of a part of the device, the section being taken on the line 7—7 of Fig. 2.

10 designates a housing, which forms a rectangular pocket having side walls 11, 12, a rear wall 13, and a front wall 14. The inner surfaces of these walls are flat. The top of the pocket is closed by an integral part 15 of the housing, which forms a shackle 16. Ribs 17 having parallel straight sides are formed at the edges of the outer surface of the wall 14. Between them is a slot 18.

20 is a thumb piece mounted to slide between the ribs 17. To the thumb piece a lug 21 is riveted. This has a narrowed portion 22, which extends through the slot 18. A pair of springs 23

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in pockets 24 in the thumb piece ride upon the outer surface of the front wall 14 between the ribs 17 to retard the movement of the thumb piece (see Figs. 2 and 7). The lower portion of this surface is colored, as indicated at 19, for a purpose which will be pointed out hereinafter.

30 is a transverse cylindrical pin, which extends through and beyond the sides of the housing 10. One end portion 31 of this pin is rotatively mounted in the side wall 12. The rest of the pin is of smaller diameter and forms, with the portion 31, a shoulder which abuts the outer surface of the side wall 12 to prevent lateral movement of the pin in one direction. The other end portion of the pin is rotatively mounted in the side wall 11. A spring ring 32 in a groove in the pin 30 abuts the outer surface of the side wall 11 and prevents lateral movement of the pin in the other direction. A part of the pin between the side walls of the housing is cut away to form a flattened portion 33. 34 is a U-shaped release lever, the arms of which fit the parts of the pin which extend beyond the housing. 35 is a pin which extends through a hole in the enlarged portion 31 of the transverse pin and engages the slot in the arm of the release lever to prevent the removal of the release lever. A spring 36 surrounds the pin 30. Its ends are attached respectively to the release lever and the housing. This spring biases the pin 30 to rotate and raise the release lever into the position in which it is shown in Figs. 1 and 2. Its movement in this direction is limited by its arms abutting the lower part of the shackle 16. 40 is a releasable member, the upper part of which forms a slidable fit with the inner surfaces of the walls 11, 12, 13, 14 of the housing. A hemi-cylindrical groove 41 is formed in this upper part of the member 40 to fit the cylindrical part of the pin 30, which is between the side walls 11, 12 when the pin is in the position shown in Fig. 3. Above the groove the member is cut back as at 42 to clear the flattened portion 33 of the pin when the latter is in the position shown in Fig. 5. The lower part of the member 40 forms a shackle 43.

When the parts are in the relative positions in which they are shown in full lines in Fig. 3, the member 40 is in the housing 11 with its groove 41 around the cylindrical part of the pin 30 between the side walls 11, 12, and with its part 42 engaging the upper part of this cylindrical surface of the pin. The member 40 is thus securely locked in the housing. The spring 36 maintains the pin in this locking position. It cannot rotate in an anti-clockwise direction because of the engage-

ment of the arms of the release lever with the shackle 16.

By moving the release lever downwardly the pin 30 will be rotated in a clockwise direction. When the release lever reaches the position shown in Figs. 4 and 5, the flattened portion 33 of the transverse pin will be parallel with the inner surface of the rear wall 13 of the housing. The distance between these parallel surfaces is somewhat greater than the thickness of the upper part of the member 40 between its rear surface and the part 42 thereof. The member 40 is thus unlocked from the housing 10 and may be removed therefrom; in fact, if the housing is held in a vertical position, the member 40 will drop out of it. In Figs. 4 and 5 the member 40 is shown partly out of the housing. In order to prevent accidental movement of the release lever, I have provided a safety lock which comprises a slidable thumb piece 20 and its lug 21. When these parts are in their lowermost position, as shown in full lines in Fig. 3, the center of the lug 21 is opposite the upper edge formed on the pin 30 between its cylindrical surface and its flattened surface 33. This makes it impossible to rotate the pin. By sliding the thumb piece upwardly into the position shown in dotted lines and designated by 20A in Fig. 3, the lug will be raised into the position 21A, where it is clear of the pin. Thus, when the safety lug is raised, the release lever may be actuated to rotate the pin in the manner previously described. When the thumb piece is in its raised position, its lower end will be raised above the portion 19 of the front wall 14, which, as I have pointed out, preferably is colored. I have used red for this coloring, as the purpose of uncovering this surface is to provide a visual indication of the opening of the safety lock.

This device, in the form shown and described, has been designed for the specific use of a flight gear connector link, but obviously it is not limited to that or any other specific use.

Various modifications in construction, mode of operation, method and use of an invention may and do occur to others, especially after benefiting from knowledge of such a disclosure as that herein presented of the principles involved, but the invention itself is not confined to the present showing.

I claim:

1. A hollow housing, having an inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a removable member having a rear surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, and manually releasable means for locking the pin against rotation.

2. A hollow housing, having an inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a removable member having a rear surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, a vertically movable lug in the path of movement of an edge of the flattened portion of the pin to prevent rotation of the pin, and means for moving the lug out of said path of movement.

3. A hollow housing, having an inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a removable member having a rear surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, manually releasable means for locking the pin against rotation, and means for rotating the pin when said locking means has been released.

4. A hollow housing, having an inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a removable member having a rear surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, a vertically movable lug in the path of movement of an edge of the flattened portion of the pin to prevent rotation of the pin, means for moving the lug out of said path of movement, and means for rotating the pin when said lug is moved out of said path of movement.

5. A hollow housing, having an inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a release lever extending from a part of the pin outside of the housing for rotating the pin in one direction, said lever abutting the housing to prevent rotation of the pin in the opposite direction, a removable member having a rear surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, and a spring for yieldably holding the release lever against the housing.

6. A hollow housing, having an inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a release lever extending from a part of the pin outside of the housing for rotating the pin in

one direction, said lever abutting the housing to prevent rotation of the pin in the opposite direction, and a removable member having a rear surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, and manually releasable means for locking the pin against rotation by the release lever.

7. A hollow housing, having a flat inner rear surface, a transverse cylindrical pin extending through the housing spaced from said surface and rotatably mounted in the housing, a part of the pin within the housing being cut away to form a flattened portion normal to a radius of the pin, a release lever extending from a part of the pin outside of the housing for rotating the pin in one direction, said lever abutting the housing to prevent rotation of the pin in the opposite direction, a spring for yieldably holding the release lever against the housing, a removable member having a rear flat surface slidable over the rear surface of the housing, said member being provided with a transverse groove in its front surface adapted to receive the transverse pin, the thickness of the part of the member above the groove being less than the minimum distance of the flattened portion of the pin from said rear surface of the housing, a vertically movable lug inside the housing in the path of movement of an edge of the flattened portion of the pin for locking the pin against rotation by the release lever, and a thumb piece on the outside of the housing for moving the lug out of said path of movement.

THOMAS J. HENDERSON.

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