July 1, 1947. L. H. MORIN 2,423,202

PULL APART SEPARABLE FASTENER

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Fig. 1.

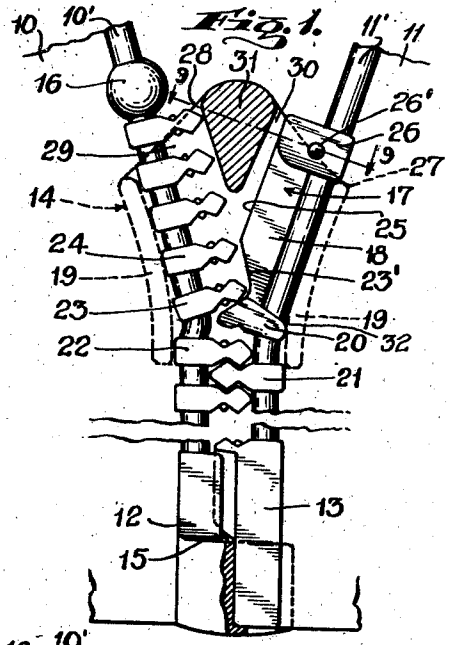


Fig. 2.

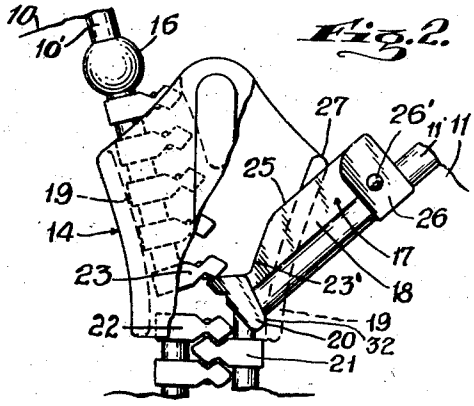


Fig. 3.

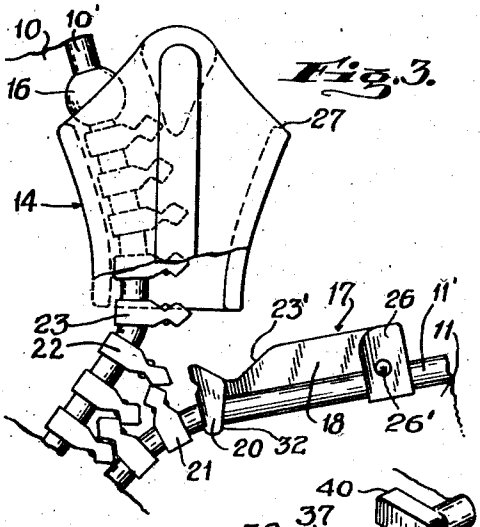


Fig. 4.

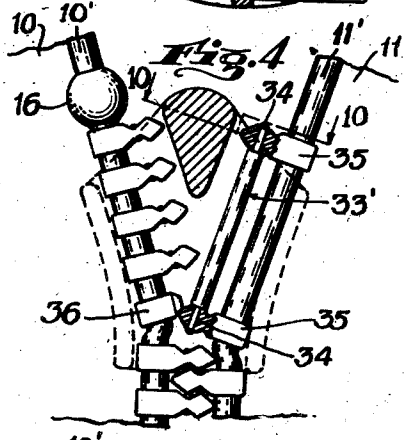


Fig. 7.

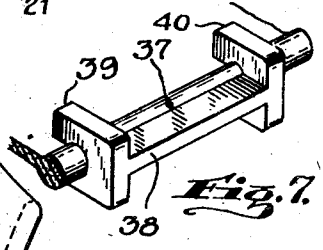
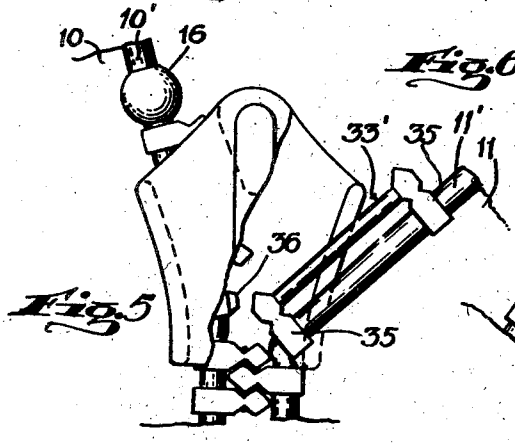


Fig. 6.

Fig. 5



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Fig. 8.

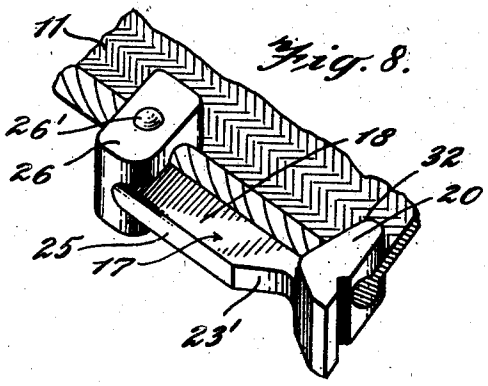


Fig. 9.

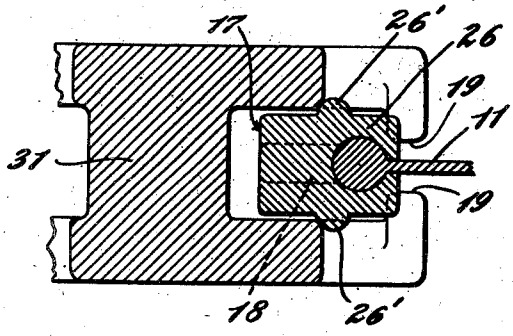
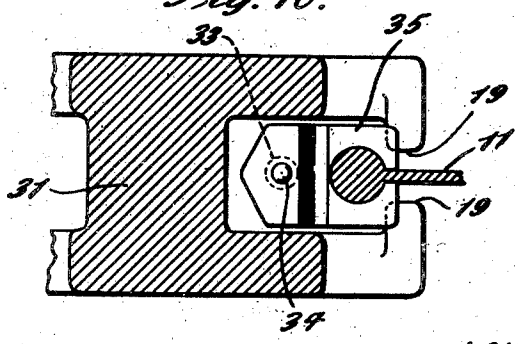


Fig. 10.



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UNITED STATES PATENT OFFICE

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PULL APART SEPARABLE FASTENER

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Application July 9, 1943, Serial No. 493,965

11 Claims. (Cl. 24—205)

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This invention relates to separable fasteners wherein each end of the stringers is equipped with means whereby the stringers may be separated or pulled apart at either end when the slider is adjacent thereto. Further, the invention comprises a pull apart end stop construction which will maintain the stringers normally in coupled relationship. The novel features of the invention will be best understood from the following descriptions when taken together with the accompanying drawings, in which certain embodiments of the invention are disclosed, and in which the separate parts are designated by suitable reference characters in each of the views; and in which:

Fig. 1 is a face view showing both end portions of a fastener, made according to my invention with parts of the construction broken away and in section.

Fig. 2 is a view similar to Fig. 1, showing only a part of the construction and with parts in a different position.

Fig. 3 is a view similar to Fig. 2, showing the parts in a further separated position.

Fig. 4 is a view similar to Fig. 1, illustrating only part of the construction and showing a modification.

Figs. 5 and 6 are views similar to Figs. 2 and 3, but showing the structure illustrated in Fig. 4.

Fig. 7 is a perspective view of another form of separator which I employ.

Fig. 8 is a perspective view of the separator 17 on an enlarged scale with respect to the other figures of the drawing.

Fig. 9 is a section through 9—9 of Fig. 1 on an enlarged scale with respect to the other figures of the drawing.

Fig. 10 is a section through 10—10 of Fig. 4 on an enlarged scale with respect to the other figures of the drawing.

In separable fasteners of the type and kind employing stringers with a slider movable along the stringers to couple and uncouple the same, it has been common to employ at one end of the stringers detachable couplings commonly referred to as box and pin members to provide complete separation of the stringers, particularly when the slider is adjacent the box member.

In such types of fasteners, it has been common to provide at the other end of the stringers stops for limiting upward or closing movement of the slider. In order to completely separate the stringers or fasteners of this kind, it has been necessary to move the slider along the stringers until it engages the box part at the other end thereof, at which time the pin part was removable. Where long stringers are employed, and furthermore where quick separation of the fasteners is desirable, the foregoing method of procedure would be objectionable.

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To overcome the objections to fasteners of the kind defined, I have provided at the stop end thereof, opposite the box and pin end, means providing detachment or separation of the stringers, with the slider arranged at said end, whereby the stringers may be literally pulled apart, thereby accomplishing the desired separation as quickly as this pull apart operation can possibly be performed by the individual operating the fastener.

This pull apart separator construction comprises a bar or rod like member preferably arranged on the stringer to which the pin part is attached, and having means in the form of a reduced portion facilitating free travel of the slider thereover. The ends of the bar portion have enlarged members normally engaging the slider to prevent accidental separation of said end of the stringers, particularly when both tapes of the stringers are strained in the direction to separate said stringers. The pull apart separation is accomplished by pulling the stringer to which the separator bar is attached laterally, while at the same time, moving the slider in the direction of said end of the stringers. This pull apart structure also includes the use of a defined stop on the other stringer for maintaining the slider against displacement from said stringer.

In Fig. 1 of the drawing I have somewhat diagrammatically illustrated the end portions of two separable fastener stringers 10 and 11, and for purposes of this description the stringer 10 will be identified as the box part stringer, whereas the stringer 11 will be the pin part or pull away stringer. Stringer 10 has a bead 10' and stringer 11 has a bead 11'.

One end of the stringer has a detachable coupling of more or less conventional box and pin construction. The box part being indicated at 12 and attached to the stringer 10, and the pin part 13 attached to the stringer 11. As in other devices of this kind the pin part is insertable and removable from the box part when the slider 14 is arranged adjacent the box part or the shoulder 15 thereon.

At the other end of the stringer 10 is a stop 16 in the form of a ball member, sufficiently large in diameter to check movement and detachment of the slider 14 when moved in the direction of said end of the stringers. To the corresponding end of the stringer 11 is secured one of my improved separators 17, in the form of a flattened bar 18, having a thickness less than the spacing between the conventional inturned flanges 19 at opposite sides of the slider 14. As is known, the spacing between these flanges is to clear and ride freely over the tapes of the stringers as the slider is moved longitudinally thereof.

The separator 17 includes at its inner end a link-like projection 20 spaced from the end link

21 of the stringer 11, so as to receive between the end link 21 and the link portion 20 the link 22 of the stringer 10.

The bar 18 is recessed on its inner end, as seen at 23', adjacent the link portion 20 to receive the link 23 on the stringer 10 next adjacent the link 22. At the outer end of the bar 18 is another enlargement 26, which is normally disposed beyond the end 27 of the flanges 19 (see Fig. 1), so as to facilitate lateral withdrawal of the tape 11 through the side of the slider 14. The ends 20, 26 of the separator 17 are substantially of the same thickness as the thickness of the links of the stringers, so as to freely enter the channels of the slider body, through which the links normally pass. The enlargement 26 also has on opposite sides projecting knobs 26' to check movement of the slider on the stringer 11.

When the slider 14 is in its normal closed position, the stop 16 is positioned beyond the wide end 28 of the slider body, having the diverging channels 29 and 30 separated by the connecting web 31.

In pulling the stringers 10 and 11 apart, the stringer 11, or the article to which the same is attached, is grasped in one hand and pulled laterally while the slider 14 is moved in the direction of the stop 16 by the other hand. At the beginning of this operation, the parts will assume a position substantially similar to that illustrated in Fig. 2, in which figure, it will be noted that part of the bar 18 has been moved through the side of the slider, and the enlargement 26 is out of engagement with the slider body, whereas the link end 20 is positioned at the narrow or contracted end 32 of the slider.

In this position of the parts the slider 14 is free to move along the stringer 10 to the point of engagement with the stop 16. The result of this operation is indicated in Fig. 3, in which position the stringer 11 is shown completely removed from the slider 14, and this represents the beginning of the pull apart separation of the stringers 10 and 11. On completing this operation the pin 13 is withdrawn from the box part 12.

In re-assembling the parts, the slider 14 is brought into engagement with the box part 12, the pin part inserted in the box part through the channel 30 of the slider, after which the slider is moved in the direction of the stop 16 in re-coupling the links of the stringers 10 and 11.

In Figs. 4 to 6 inclusive a slight modification of the structure shown in Figs. 1 to 3 is illustrated. With this construction I have substituted for the separator 17, a separator 33 in the form of a rod 33' having reduced ends riveted or otherwise coupled, as seen at 34, to spaced links 35, which links may be substantially of the same form and construction as the links of the stringers employed.

The diameter of the rod 33' will be such as to pass freely between the spaced inturned flanges of the slider as with the bar 18, and as the structure and mode of operation of the device as seen in Figs. 4 to 6 inclusive is substantially the same as that in Figs. 1 to 3 inclusive, further detailed description with regard to the several parts is not necessary.

It will be noted, however, that one of the links 36 of the stringer opposite to that which has the separator 33 thereon has its inner coupling end removable to provide clearance for the swinging of the separator within the slider, as will appear form a consideration of Fig. 5 of the drawing which shows the parts generally in position similar to that of Fig. 2, whereas Fig. 6 shows the complete separation of the two stringers, the same as in Fig. 3.

It will be understood at this time that the recess 23' serves the same function and purpose as the removal of the coupling end of the link 36 in providing the necessary clearance for free detachment of the separator 17 from the slider 14.

The structure shown in Fig. 7 represents a slight modification of the separators 17 and 33. In this figure the separator is generally identified by the reference numeral 37, and this separator includes a bar portion 38 which takes the place of the rod of the separator 33 and the bar 18 of the separator 17. The bar 38 has enlargements 39 and 40 at the ends thereof which take the place of the enlargements 20, 26 and links 35. The bar 38 is not recessed similar to the recess 23' in the bar 18 so that it would be used in a link structure similar to that shown in Figs. 4 to 6 inclusive.

With the structure shown in Figs. 1 to 3 inclusive and Fig. 7 the separator unit may be produced in a form of a casting and may be die cast directly upon the stringer tape. In some instances, however, this device may be made of stampings and attached to the stringer tape in the manner of tape and similar formed links or scoops. On the other hand it may be pre-cast and then attached to the stringer tape.

The separator member or device may be said to comprise an extended tandem linkage. This linkage by reason of the spacing of the link portions thereof with respect to the length of the flanges of the slider will normally retain the stringers against separation, but has a thin wall shank or bar portion joining the link ends which is free to pass through the slot or space formed between the inturned side flanges of the slider when the stringer and slider are relatively moved, as heretofore set forth.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. A separable fastener comprising stringers having links spaced along one edge of the stringers, a slider movable along the stringers to couple and uncouple said link, one end of the stringers having couplings for complete separation of the stringers, said coupling on one of said stringers having means limiting movement of the slider in the direction of said end of said stringer and retaining the slider against displacement from said end of the stringer, the other end of said stringer having a stop retaining the slider against displacement from the last named end of the stringer, the end not having said coupling of the other stringer having a separator normally engaging the slider, when at said last named end of the stringer, in retaining the stringers against separation, means on said separator providing detachment laterally through the side of the slider in pull apart separation of the stringers starting at said separator end thereof, said separator comprising link portions spaced on the stringer tape, and a bar joining said link portions.

2. The combination with separable fastener stringers employing a slider having a pair of flanges on each side thereof and movable along the stringers to couple and uncouple the links thereof, of a stop on the end of one stringer and a pull apart separator at the corresponding end of the other stringer, said separator comprising link portions spaced longitudinally of the edge of one stringer, a bar joining said link portions at said

edge of the stringer, the slider having diverging channels partially defined by the inturned and spaced side flanges thereof, and the thickness of said bar being less than the spacing between the flanges of said slider to provide lateral displacement of the separator from said slider.

3. The combination with separable fastener stringers employing a slider having a pair of flanges on each side thereof and movable along the stringers to couple and uncouple the links thereof, of a stop on the end of one stringer and a pull apart separator at the corresponding end of the other stringer, said separator comprising link portions spaced longitudinally of the edge of one stringer, a bar joining said link portions at said edge of the stringer, the slider having diverging channels partially defined by the inturned and spaced side flanges thereof, the thickness of said bar being less than the spacing between the flanges of said slider to provide lateral displacement of the separator from said slider, and the spacing between adjacent edges of the link portions of said separator being less than the length of the flanges of said slider.

4. The combination with separable fastener stringers employing a slider movable along the stringers to couple and uncouple the links thereof, of a combined end stop and separator comprising a stop member on one stringer engaging the slider to prevent separation of the slider from said stringer, an elongated tandem linkage on the other stringer, said linkage adapted to cooperate with said slider to provide pull away separation of the last named stringer from the slider when the latter is arranged at said end of the stringers, and said linkage having spaced link portions normally engaging the slider to prevent accidental separation of said end of the stringers.

5. The combination with separable fastener stringers employing a slider movable along the stringers to couple and uncouple the links thereof, of a combined end stop and separator comprising a stop member on one stringer engaging the slider to prevent separation of the slider from said stringer, an elongated tandem linkage on the other stringer, said linkage adapted to cooperate with said slider to provide pull away separation of the last named stringer from the slider when the latter is arranged at said end of the stringers, said linkage having spaced link portions normally engaging the slider to prevent accidental separation of said end of the stringers, said linkage occupying a space on its stringer comparable to a plurality of end links on the first named stringer, and said linkage being recessed to receive predetermined links of the first named stringer.

6. A combined top stop and separator for separable fasteners employing stringers, with a slider having inturned flanges and movable along the stringers to couple and uncouple the same, said combined stop and separator comprising a bar like blocking member on one stringer engaging links of a companion stringer within the slider body in limiting closing movement of the slider, the other stringer having a stop spaced beyond the slider when in normal stopped position, and said blocking member adapted to cooperate with said slider to provide lateral displacement of the stringer between the inturned flanges of the slider in movement of the slider in the direction of the second named stop.

7. A combined top stop and separator for separable fasteners employing stringers, with a slider movable along the stringers to couple and uncouple the same, said combined stop and separator comprising a bar like blocking member on one stringer engaging links of a companion stringer within the slider body in limiting closing movement of the slider, the other stringer having a stop spaced beyond the slider when in normal stopped position, said blocking member adapted to cooperate with said slider to provide lateral displacement of the stringer through the slider in movement of the slider in the direction of the second named stop, and said member having spaced link portions engaging the slider to prevent normal separation of the stringers.

8. An end stop for separable fastener stringers, comprising link portions spaced longitudinally of one end of one stringer, one link portion being spaced from the end link of said stringer to receive a link of a companion stringer, said link portions being of a thickness corresponding to the thickness of the links of the stringer, and said link portions being joined by a bar thinner than the link portions.

9. An end stop for separable fastener stringers, comprising link portions spaced longitudinally of one end of one stringer, one link portion being spaced from the end link of said stringer to receive a link of a companion stringer, the other link portion having projecting means forming a slider stop, said link portions apart from said stop means being of a thickness corresponding to the thickness of the links of the stringer, and said link portions being joined by a bar thinner than the link portions.

10. An end stop for separable fastener stringers, comprising link portions spaced longitudinally of one end of one stringer, one link portion being spaced from the end link of said stringer to receive a link of a companion stringer, said link portions being of a thickness corresponding to the thickness of the links of the stringer, said link portions being joined by a bar thinner than the link portions, and said bar being recessed to receive part of the links of a companion stringer.

11. An end stop for separable fastener stringers, comprising link portions spaced longitudinally of one end of one stringer, one link portion being spaced from the end link of said stringer to receive a link of a companion stringer, said link portions being of a thickness corresponding to the thickness of the links of the stringer, said link portions being joined by a bar thinner than the link portions, and means securing the ends of the bar to said link portions.

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