Nov. 29, 1932. R. C. LEGAT 1,889,337

LOCKING END STOP FOR FASTENERS

Filed Jan. 6, 1932

Fig. 1.

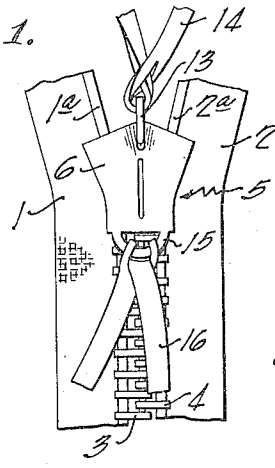


Fig. 2.

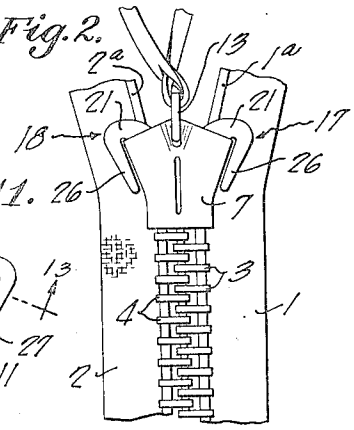


Fig. 11.

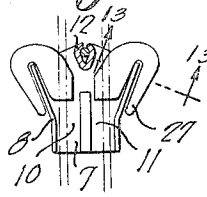


Fig. 12.

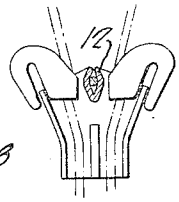


Fig. 4.

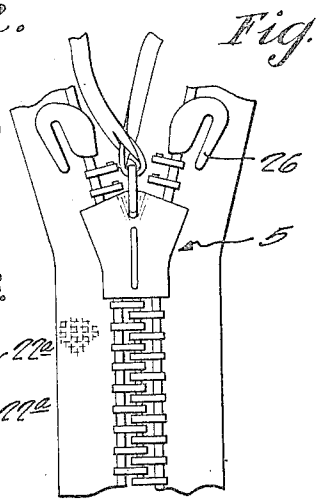


Fig. 3.

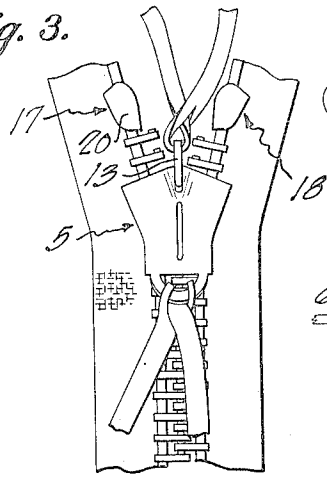


Fig. 13.

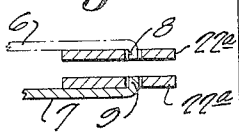


Fig. 5.

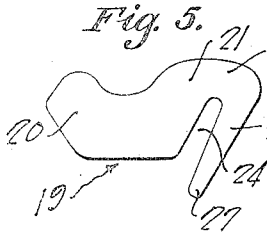


Fig. 6.

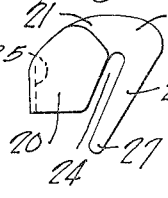


Fig. 7.

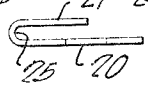


Fig. 8.

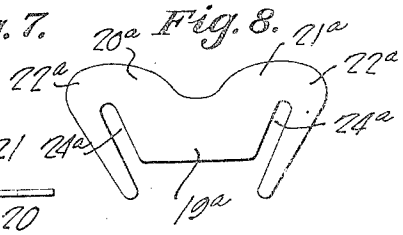
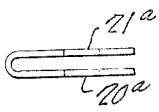


Fig. 9.



Fig. 10.



Inventor,
Robert C. Legat,
by Pruts, Cushman & Woodbury.
Atty's.

Patented Nov. 29, 1932 1,889,337

UNITED STATES PATENT OFFICE

ROBERT C. LEGAT, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO G. E. PRENTICE MANUFACTURING COMPANY, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT

LOCKING END STOP FOR FASTENERS

Application filed January 6, 1932. Serial No. 584,998.

This invention pertains to separable fasteners of the slider actuated type, and relates more particularly to means for retaining or locking the slider so as to prevent its accidental crawling along the series of fastener elements by reason of repeated stress in use. Various devices have heretofore been proposed for locking or retaining the slider in adjusted position and in particular to hold the slider substantially at the limit of its travel in closing the fastener, but in all such prior arrangements, so far as known to me, the provision of locking means has necessitated the addition of special parts, for example, cams, detents or hook-like members carried by the slider and associated with or operated by the pull tab by which the slider is moved lengthwise of the fastener,—or retaining loops, buttons or equivalent devices requiring special manipulation by the operator to engage or disengage them. All of said prior constructions add materially to the cost of production of the slider, and some such prior devices are only applicable to special forms of fastener and not adapted for use with the modern commercial staggered unit type of fastener. Moreover, if the locking means be of the kind which is dependent upon the action of the pull, it is necessary to provide the slider with a pull retaining member such as a rivet, lug, loop or the like, usually projecting from the front face of the slider, thus making the slider too bulky for use on undergarments, corsets or other so-called foundation garments where, although it is desirable to have the slider remain in fastener closing position, it is highly undesirable to have lugs or other elements projecting from the slider body.

The principal object of the present invention is to provide adequate retaining or locking means operative to prevent accidental movement or crawling of the slider along the series of fastener elements, and which is applicable to fasteners of usual commercial type without change in the fastener elements employed and which is equally useful, whether the slider be provided with a pull tab or not, and in particular to furnish retaining means which does not increase the front to rear thickness of the fastener or slider and which in fact may be disposed wholly within the space defined by the planes of the outer faces of the front and rear wings of the slider body.

Fasteners of this general class are usually provided (at that end of each series of fastener elements toward which the slider moves in closing the gap) with stop members fixed to the respective stringers and which cooperate with the slider positively to limit movement of the latter and prevent its accidental disengagement from the stringers. As the result of a series of experiments I have discovered that by properly shaping one or both of these end stop members, but without adding any moving parts either to the stop or the slider, it is possible to provide all of the locking or retaining action requisite to keep the slider in fastener closing position during use.

It has long been recognized that fasteners of this general class may be opened by a tearing action unless the angle or curvature of the slider be too steep,—the slider moving longitudinally of the series of fastener elements in response to a longitudinal component of force resulting from lateral stress applied to the stringers, and it is by reason of slight repeated stresses, as, for example, those imposed by movements of the wearer of the garment, that the slider crawls away from the end stops, thus permitting the gap to open. Obviously if the longitudinal component of stress could be eliminated or properly opposed, there would be little, if any, tendency of the slider to move or crawl along the fastener elements except when positively actuated by the operator, and I have found that if the edges of the opposed stringers at points closely adjacent to the end of the respective series of fastener elements are so held that the opposed series of elements can not curve away from each other at this point, the longitudinal component of stress is practically eliminated, and the slider shows little if any tendency to crawl away from the end stop.

In attaining the desired result I provide end stop members applicable to the stringers at the ends of the respective series of fastener elements and functioning in substantially the same way as the stops commonly used in the

art positively to limit movement of the slider in the gap closing direction, but my improved end stop is so modified, as compared with former constructions, as to have the further function of eliminating or opposing any component of lateral stress tending to cause longitudinal movement of the slider away from the end stop. My improved end stop is of unitary construction (by which I mean that it has no moving parts), it is easy to make and apply, and in a preferred construction is little if any different in external appearance (at least from the front of the fastener) from stops of prior construction. Moreover, this stop requires no substantial change in the slider itself, it may be associated with fastener units of any of the usual constructions, it is independent of a slider actuating pull so that the latter with its retaining means may be omitted, if desired, and further, the operation of the stop is entirely automatic, requiring no separate manipulation of parts other than that requisite to move the slider into engagement with the stop.

In the accompanying drawing I have illustrated certain desirable embodiments of the invention by way of example, but without thereby intending to limit the invention, and with the understanding that other specific embodiments of the invention are to be included, all as expressed within the scope of the appended claims.

In the drawing,

Fig. 1 is a fragmentary front elevation of a fastener of the class described provided with a slider and with slider retaining means embodying the present invention, the slider being at the limit of its movement in the gap closing direction and concealing the retaining means from view;

Fig. 2 is a rear elevation of the parts shown in Fig. 1,—portions of the slider retaining means being visible;

Fig. 3 is a view similar to Fig. 1, but showing the slider partly retracted and indicating the end stops;

Fig. 4 is a view similar to Fig. 3 but in rear elevation;

Fig. 5 is a plan view of a blank useful in making a preferred form of end stop;

Fig. 6 is a side elevation of the completed end stop before application to the stringer;

Fig. 7 is a plan view of the end stop shown in Fig. 6;

Fig. 8 is a plan view of a modified form of blank for making an end stop of slightly different construction;

Fig. 9 is a side elevation of the completed end stop made from the blank of Fig. 8;

Fig. 10 is a plan view of the end stop of Fig. 9;

Fig. 11 is a vertical transverse section through a slider of a desirable construction showing the position of the end stops relative to the slider at the limit of movement of the slider in the gap closing direction;

Fig. 12 is a view similar to Fig. 11, but showing the slider slightly withdrawn in the gap opening direction; and

Fig. 13 is a fragmentary section on the line 13—13 of Fig. 11, showing the front wing of the slider in broken lines.

Referring to the drawing, the fastener here illustrated comprises the flexible stringers 1 and 2 having the beaded edges 1^a and 2^a carrying the opposed series of fastener elements 3 and 4 respectively, which are moved into and out of engagement by the slider 5. This slider may, for example, be of the type disclosed in the application of G. E. Prentice, Serial No. 562,518, filed September 12, 1931, or of any other suitable construction, but as here specifically disclosed is provided with front and rear wings 6 and 7 respectively, said wings having lateral guide flanges 8 and 9 (Fig. 13) defining convergent channels 10 and 11 (Fig. 11) for the reception of the opposed series of fastener elements, said flanges, as is usual, constituting the lateral or side walls of the slider. The front and rear wings are united by a neck 12, and, as shown, this neck has associated therewith a pull retaining loop 13 to which a flexible pull member 14 is secured. The lower end of the front wing is provided with a pull retaining loop 15 to which the flexible pull member 16 is secured. The present invention is wholly independent of the specific construction of the slider or of the means for moving it longitudinally of the fastener elements, but is highly advantageous when employed in connection with a slider such as here illustrated, which is flat in a front to rear direction, and devoid of projections such as the usual pull tab and pull tab retaining means commonly protruding from the front of the slider body.

In accordance with this invention I provide end stops 17 and 18 at the upper ends of the respective series of fastener elements, and these end stops cooperate with the slider parts positively to stop the latter when the gap is closed so to prevent accidental separation of the slider from the stringers. These end stops are fixed to the beaded edges of the stringers as is usual and may have inner and outer surfaces engageable with the neck and lateral flanges of the slider respectively so as to move the upper ends of the series of fastener elements into close engagement when the gap is closed.

These end stops not only function to stop the slider when the gap is closed, but also to retain the slider in this position, and to this end I prefer to make these end stops of the construction more specifically illustrated in Figs. 5, 6 and 7. Thus, referring to Fig. 5, I provide a blank 19 (preferably of sheet metal) comprising the portions 20 and 21 adapted respectively to form the front and rear

walls of a pocket for the reception of the beaded edge of the stringer, such pocket being formed by bending the blank to a U-shape, as shown in Fig. 7. The blank comprises a lateral extension 22 carried by the part 21 and this lateral extension is furnished with an elongate slot 24 preferably having substantially parallel sides inclined with respect to the inner wall 25 of the pocket (when the blank has been folded) at substantially the same angle that the inclined or flaring portion of the slider flange 9 makes with the longitudinal axis of the slider. Moreover, this slot is of such width as to constitute a socket adapted to receive the inward projection or guide flange 9 of the slider, as hereinafter described, with a reasonably good sliding fit, so that the slot acts as a guide for the flange of the slider and vice versa. The outer portion of the extension or ear 22 extends downwardly, as indicated at 26, terminating at a point 27 such that (as indicated in Fig. 11) when the side flange 9 of the slider body extends to the top of the slot 24, the lower end 27 is disposed at a point substantially below the longitudinal middle point of the slider body and preferably at a point closely adjacent the beginning of the flare of the lateral flanges 9 of the slider. While preferably made of sheet material as just described, I contemplate that the improved stop may be made in other ways and of other materials, if desired.

The stop member, as shown in Fig. 6, is applied to the stringer, preferably with the member 21 at the rear side of the stringer, so that the extension member 22 is concealed from view, as indicated in Fig. 1. The stop is secured to the stringer preferably by compressing the side walls of the pocket closely into engagement with the fabric of the stringer with the beaded edge in the bend of the stop, it being noted that when a stop such as that shown in Fig. 6 is employed, I provide right and left stops for the opposite stringers. These stops are applied at the ends of the series of fastener elements, as shown in Fig. 3, and as the slider is moved into gap closing position, the side flanges 9 of the rear wing of the slider body enter the slots 24 of the stops and are guided by the slots so that when the slider comes to rest, the inner walls 25 of the stop pockets, and consequently the edges of the opposite stringers at this point, are brought into substantially parallel relation (Fig. 11). If lateral stress is now applied to the stringers, such stress has little if any tendency to cause the slider to move longitudinally of the series of fastener elements, the line of stress being substantially perpendicular to the edge of the stringer at this point. Moreover, even if the stress be applied at an acute angle to the length of the fastener so that the tendency is to tip the stop member, such tipping is prevented by the engagement of the slot with the flange 9 of the slider and particularly by the engagement of the lower end 27 of the stop member with the slider at a point below the center of the latter, whereby a pinching action is produced which positively opposes any tendency of the slider to crawl longitudinally of the fastener elements. Even though the slider should be displaced slightly from its limiting position, the action of the narrow slot upon the slider flange is substantially the same (as shown, for example, in Fig. 12) so that until the inner part of the stop is nearly free from the slider channel, the stop is prevented from tipping and the edges of the stringers at this point are kept substantially parallel, thus preventing the fastener elements from curving outwardly away from each other so as to set up an incipient longitudinal movement of the slider.

While this novel retaining means is certain in its action, it does not in any way interfere with the movement of the slider by the operator, either into or out of locking position, and, on the other hand, as the end stop need be no thicker (in a front-to-rear direction) than the usual end stop or the fastening units themselves, this improved retaining means does not add to the bulk of the fastener in a front-to-rear direction,—does not detract from its appearance,—does not substantially add to its cost of production, and requires no special knowledge or care on the part of the operator to obtain the desired locking action.

In Figs. 8, 9, 10 and 13, I have illustrated a modified form of stop which is made from a blank 19^a, preferably of the shape shown in Fig. 8, comprising the members 20^a and 21^a adapted to form the side walls of a stringer engaging pocket, each of the side walls in this case having lateral extensions or ears 22^a, each provided with a slot 24^a, respectively, similar to the slots 24 above described. When this symmetrical stop is employed, the same form of stop may be used for both right and left stringers. This stop provides guide means, that is to say, the slots 24^a, for engagement with the guide flanges 8 and 9 of both front and rear wings, respectively, of the slider, thus increasing the retaining effect and avoiding any slight tendency to rock the slider due to unsymmetrical action, but, on the other hand, the extensions 22^a which appear at the front side of the stringers may not be altogether desirable under some circumstances, and for this reason, and under present conditions at least, I prefer the form of stop and retaining element specifically disclosed in Figs. 5 to 7, respectively.

While I have herein disclosed certain desirable embodiments of the invention, it is to be understood that such embodiments are merely by way of example and illustrative of the general and broad principles, and that further modifications or structural varia-

tions, as well as the substitution of equivalents and materials, may be made without departing from the spirit of the invention.

I claim:

1. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said slider having a flange constituting its side wall, said stop consisting of a unitary piece of material disposed and arranged to embrace and firmly to grip the edge of the stringer, the stop having a socket adapted to receive and to form a guide for the flange of the slider whereby to prevent accidental movement of the slider longitudinally of the series of elements.

2. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said slider having an elongate flange at its side, said stop consisting of a unitary piece of material having a substantially U-shaped pocket adapted to embrace and firmly to grip the edge of the stringer, said stop having a slot into which the flange of the slider is adapted to enter with a sliding fit whereby to prevent accidental movement of the slider longitudinally of the series of fastener elements.

3. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a substantially U-shaped pocket adapted to embrace and firmly to grip the beaded edge of the stringer, one wall of the stop comprising parts which are constructed and arranged respectively to engage inner and outer longitudinal surfaces of the slider thereby to resist accidental movement of the slider longitudinally of the series of fastener elements.

4. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, the slider having front and rear wings, and guide flanges constituting the outer walls of channels for the series of fastener elements, and an end stop secured to one of the stringers adjacent to one end of the series of fastener elements carried by the latter, said stop having a narrow slot arranged to receive a portion of one of the guide flanges of the slider and thereby to prevent tipping of the stop relatively to the slider body.

5. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, the slider having front and rear wings, and guide flanges constituting the outer walls of channels for the series of fastener elements, and an end stop secured to one of the stringers adjacent to one end of the series of fastener elements carried by the latter, said stop having a part provided with an elongate slot arranged to receive the guide flange of one of the slider wings.

6. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, the slider having front and rear wings, and guide flanges constituting the outer walls of channels for the series of fastener elements, and an end stop secured to one of the stringers adjacent to one end of the series of fastener elements carried by the latter, said stop having overhanging portions depending at the front and rear of the stringer respectively and extending downwardly along and substantially parallel to the outer surfaces of the guide flanges of the front and rear wings.

7. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, the slider having front and rear wings, and guide flanges constituting the outer walls of channels for the series of fastener elements, and a fixed retaining device disposed adjacent to the end of one at least of the series of fastener elements, said retaining device having an elongate narrow slot provided with spaced parallel side walls adapted to receive between them the upper part of one of the guide flanges of the slider thereby to retain the slider in gap closing position.

8. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, the slider having front and rear wings, and guide flanges constituting the outer walls of channels for the series of fastener elements, and a unitary stop member at the end of one at least of the series of fastener elements, said stop being operative positively to limit movement of the slider in one direction, and having spaced parts adapted to engage inner and outer surfaces respectively of a guide flange of the slider thereby tending to prevent the opposed series of fastener elements from curving away from one another in the neighborhood of the stop,

whereby to eliminate any component of lateral stress which would cause the slider to crawl along the series of fastener elements.

9. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engag ng relation, a stop secured to one of the stringers adjacent to one end of the series of fastener elements carried by the latter, said stop having a part which extends downwardly along and outside of the guide flange of the slider and which is operative by engagement with said flange to prevent accidental crawl of the slider long tudinally of the series of fastener elements.

10. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, the slider having front and rear wings, and guide flanges constituting the outer walls of channels for the series of fastener elements, an end stop secured to one of the stringers adjacent to one end of the series of fastener elements carried by the latter, said stop having a part which embraces the upper end of one of the guide flanges of the slider and extends downwardly at the outer side of the flange in close proximity to the outer surface thereof and which is operative to prevent curvature of that part of the stringer carrying the endmost fastener elements of the opposed series.

11. A fastener of the kind having stringers carrying opposed series of interengaging fastener elements and a slider for moving the elements of the opposed series into and out of engaging relation, and a stop secured to one of the stringers adjacent to one end of the series of fastener elements carried by the latter, said stop having an overhanging leg extending downwardly along the slider body and operative by engagement with the slider body to prevent tipping of the stop.

12. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a substantially U-shaped pocket adapted to embrace and firmly to grip the beaded edge of the stringer, one wall at least of the pocket extending beyond the bead of the stringer and having an elongate slot comprising spaced substantially parallel walls adapted to receive a part of the fastener actuating slider between them.

13. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, the slider having front and rear wings, and guide flanges constituting the lateral walls of channels for the series of fastener elements, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a substantially U-shaped pocket adapted to embrace and firmly to grip the beaded edge of the stringer, the rear wall of the pocket having a hook-like lateral projection formed to hook over the upper edge of the guide flange of the slider to extend downwardly along the outer face of said flange.

14. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said slider having guide flanges which constitute the lateral walls of the slider, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a pocket adapted to embrace and firmly to grip the beaded edge of the stringer, one wall of the pocket having a lateral extension overlapping the stringer inwardly of its beaded edge, said extension having an elongate slot of a width such as to receive and closely to embrace the upper portion of one of the guide flanges of the slider.

15. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said slider having guide flanges whose outer faces constitute the outer lateral surfaces of the slider, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a pocket adapted to embrace and firmly to grip the beaded edge of the stringer, the front and rear walls of the pocket having lateral extensions disposed at the front and rear sides respectively of the stringer, said extensions having parts which extend downwardly outside of and close to the adjacent guide flange of the slider far enough to engage the outer lateral surface of the guide flange at a point below the longitudinal center of the latter.

16. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening

and closing a gap respectively, said slider having a relatively narrow lower part and a wider upper portion flaring upwardly from the lower part, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a pocket adapted to embrace and firmly to grip the edge of the stringer, the front and rear walls of the pocket having lateral extensions spaced to receive the stringer between them, each such extension having an elongate slot for the reception of one of the guide flanges of the slider, the slots being of such length that when fully engaged with the slider, the lower extremity of each lateral extension engages the lateral outer surface of the slider body at a point closely adjacent to the lower end of the flaring portion of said lateral surface.

17. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said slider having guide flanges constituting the lateral walls of the slider, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a pocket adapted to embrace and firmly to grip the beaded edge of the stringer, one wall at least of said pocket having an ear projecting beyond the lateral wall of the slider, said ear having a slot for the reception of the lateral wall of the slider, the lower extremity of said ear being adapted to engage the lateral wall of the slider at a point below the longitudinal center thereof.

18. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a substantially U-shaped pocket adapted to embrace and firmly to grip the edge of the stringer, the end stop having guide means comprising parts engageable respectively with the inner and outer lateral surfaces of the slider, said stop as thus constructed and arranged being operative substantially to prevent rocking of the end stop in a lateral direction until it is substantially free from the slider.

19. An end stop for use in separable fasteners of the kind having opposed series of fastener elements and beaded stringers supporting the respective series of elements, and a slider for moving the elements of the opposed series into and out of engaging relation for opening and closing a gap respectively, the slider having front and rear wings, and guide flanges constituting the lateral walls of channels for the series of fastener elements, said stop consisting of a unitary piece of sheet material having spaced front and rear walls united to form a substantially U-shaped pocket adapted to embrace and firmly to grip the beaded edge of the stringer, said end stop having a narrow slot open at its lower end and having spaced parallel walls engageable respectively with the inner and outer surfaces of a lateral guide flange of the slider and being constructed and arranged to maintain the bead engaging portion of the stop substantially parallel to the longitudinal axis of the slider so long as the stop is in substantial engagement with the slider.

Signed by me at Berlin, Connecticut, this fourth day of January, 1932.

ROBERT C. LEGAT.