

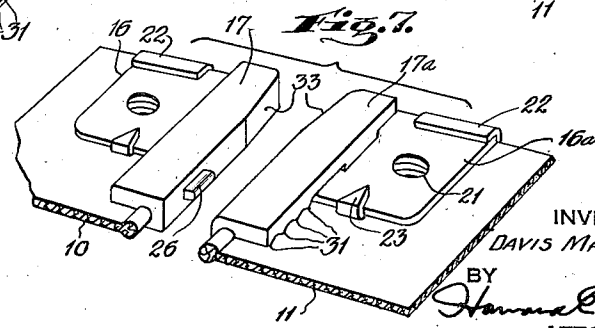
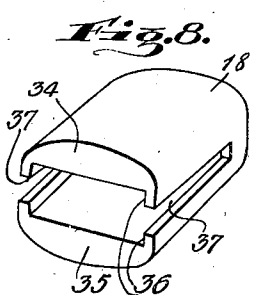
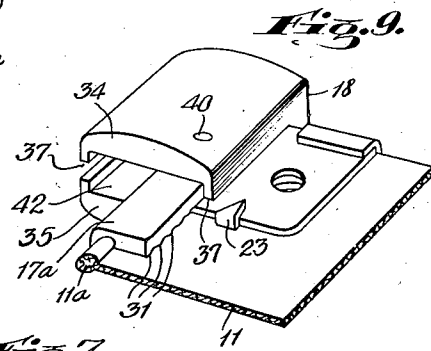
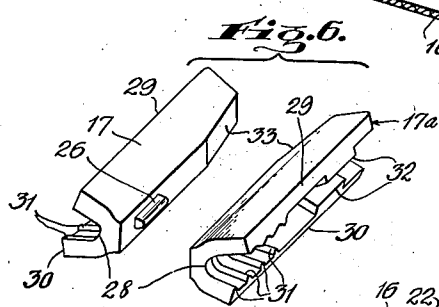
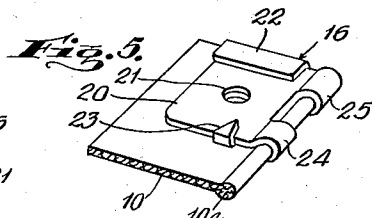
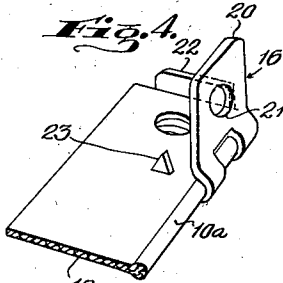
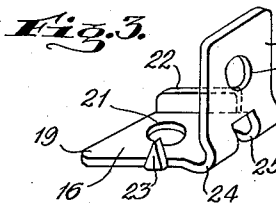
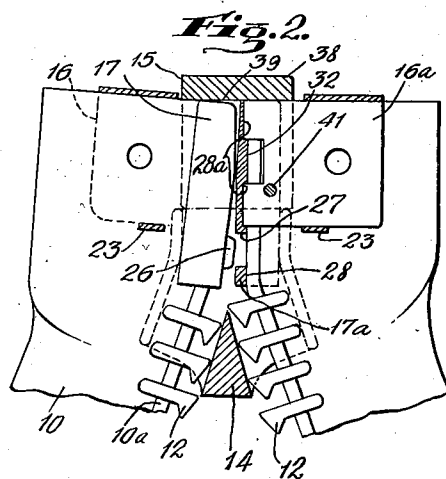
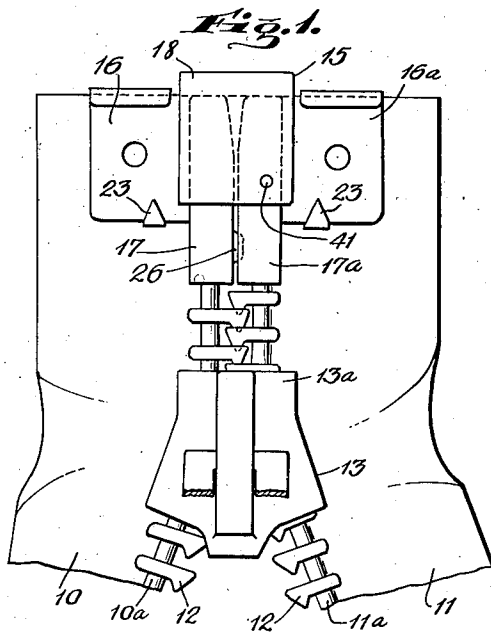
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METHOD OF MANUFACTURING END STOPS FOR SEPARABLE FASTENERS

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METHOD OF MANUFACTURING END STOPS
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This invention relates to what are known as end stops and especially detachably coupled end stops for separable fasteners, and particularly to the method of forming and assembling the several parts of the end stops upon the stringers; and the object of the invention is to provide a simple and economical method of constructing and assembling devices of the class described to form a strong and durable detachable end stop which is also simple in the structure of the parts and in the method of coupling and uncoupling the same; a further object being to provide detachable end stops, the several parts of which have relatively long bearing or engaging surfaces on the tapes or stringers, and further wherein the separate parts are interlocked with each other to prevent relative movement of the parts; a further object being to provide an end stop consisting of preformed parts which may be formed from stampings or die castings and which when assembled will be interlocked one with the other and which includes means in addition to the mounting plates for retaining the parts against displacement from the tapes or stringers; and with these and other objects in view, the invention consists in an end stop of the class and for the purpose specified, which is constructed in parts and in assemblage in accordance with the method hereinafter more fully described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is an enlarged detail view of one end portion of a separable fastener showing one of my improved end stops mounted in connection therewith.

Fig. 2 is a view showing a part of the structure shown in Fig. 1 with parts in section.

Fig. 3 is a perspective view of one of the mounting plates which I employ, detached.

Fig. 4 is a view similar to Fig. 3 indicating the first step in the method of attaching the plate to one end of a tape or stringer.

Fig. 5 is a view similar to Fig. 4 showing the plate secured to the tape.

Fig. 6 shows perspective view of two channeled coupling bars which I employ, illustrating the form thereof prior to attachment to the stringers.

Fig. 7 shows the bars attached to two stringers and the coupling plates secured to the stringers.

Fig. 8 is a perspective view of a yoke-shaped coupling block or housing which I employ; and, Fig. 9 shows the method of attaching the block or housing to one of the stringers or the bar and plate attached to the stringer.

In Figs. 1 and 2 of the drawing, I have shown for the purpose of illustrating one use of my invention one end portion of the tapes 10 and 11 of a separable fastener, to the beaded edges 10a, 11a of which are secured the coupling links 12. The links are interlocked and separated in the use of the fastener by a slider 13 movable longitudinally of the fastener stringers in coupling and uncoupling said links. The slider has top and bottom plates joined by a V-shaped body 14 at the enlarged end portion of the slider as in other devices of this kind, which body 14 also forms the diverging channels through which the separated links 12 pass. At 13a I have shown the reduced end portion of the slider having the single channel into which the diverging channels extend as in other sliders of this class.

In Figs. 1 and 2 of the drawing, I have also shown at 15 a detachably coupled end stop device, by means of which the end portions of the tapes 10, 11, may be detached one from the other to permit the separation of the garment or other parts to which the fastener device is secured in the use of devices of this kind on such garments as jackets, wind-breakers and the like or in any other uses where it is desirable to separate the two stringers of the fastener for any purpose whatever. The end stop device 15 consists of two substantially similar mounting or coupling plates 16, 16a, two substantially similar coupling bars 17, 17a and a coupling block or housing 18. In constructing the end stop device 15, the parts 16, 17 and 18 are separately formed and are then assembled in the manner hereinafter described.

Each of the parts 16, 16a is of the same general construction and these parts are simply formed "lefts" and "rights" to adapt their mounting to the stringers 10 and 11, and the brief description of one plate will apply to both. In Figs. 3, 4 and 5 of the drawing, I have shown the plate 16 and have indicated the manner of attaching the same to the tape 10. As shown, the plate 16 is preferably formed from a sheet metal blank which is cut out to form side plate portions 19 and 20 having apertures 21 adapted to register with each other. When the plate 16 is secured to the support 10 as shown in Fig. 5, one side edge of the side plate 19 is provided with a flange 22 and the other side edge with a prong 23 and the curved wall 24 which joins the plates 19 and 20 is cut

out as seen at 25 to form a key receiving portion as later described.

After the plates 16, 16a have been formed and shaped in the manner illustrated in Fig. 3 of the drawing, the trimmed end portion of the tapes is placed upon the inner surface of the plate 19 with the prong 23 passing upwardly through the tape as may be seen in Fig. 4 of the drawing, after which the plate 20 is then folded downwardly upon the tape 10, and the flange 22 and prong 23 are folded inwardly upon the plate 20 in the manner shown in Fig. 5 of the drawing, it being understood that the curved wall 24 joining the plates 19 and 20 extends around the beaded edge 10a of the tape, and it is preferred that the parts be securely pressed together and upon the tape to retain the same against displacement therefrom.

After the coupling or mounting plates 16, 16a have been secured to the tapes of the stringers, the next step in the method of forming the complete device consists in applying the channeled bars 17, 17a thereto. Two of these bars are shown in detail in Fig. 6 of the drawing, and aside from the provision of a projecting tongue 26 on one bar 17 and the provision of a recess or aperture 27 on the bar 17a, note Fig. 2 of the drawing, the two bars 17, 17a are of the same construction and are each provided with a longitudinal channel 28 to receive the beaded edge of the stringers. The channeled structure forms side walls 29 and 30 and the surfaces of the channel 28 are provided with longitudinally spaced ribs or teeth 31 arranged at one end portion of the bar which are adapted to engage the fabric of the tapes 10, 11 to aid in retaining the bars 17, 17a against longitudinal movement upon the stringers, and in like manner, to aid in securing the attaching plates 16, 16a to the stringers through the interlocking engagement of the bars with the plates by reason of the inwardly projecting members 32 engaging the cut out or recess portions 25 of the plates 16, 16a as is indicated in Fig. 2 of the drawing in the coupling of the bar 17a with the plate 16a.

The bars 17 and 17a are normally in the position shown in Fig. 6 of the drawing or with the walls 29 and 30 separated so as to facilitate the mounting of the bars upon the plates 16, 16a and the stringers 10 and 11. After placing the bars in position thereon to bring the projections 32 into registering alignment with the recesses 25, the bars are compressed upon the plates and tapes in the manner shown in Fig. 7 to securely couple the parts together and to the tapes 10 and 11. The inner adjacent surfaces of the bars 17, 17a are straight and preferably beveled to a slight degree at one end thereof as indicated at 33 to facilitate the coupling and uncoupling of the bar 17 with the housing 18 in attaching and detaching the stringers.

It is preferred that the channeled bars or rods 17, 17a be formed from die castings so as to economize and simplify the production thereof, it being understood that the castings will be formed in the general contour or arrangement shown in Fig. 6 of the drawing and may be secured in position by the application of pressure to bring the opposed walls 29 and 30 into firm engagement with the adjacent surfaces in connection with which the bars are coupled. In this connection, it is also preferred that the coupling-block or housing 18 of the device be formed from a die cast material in order to simplify and economize the production of this part,

The block 18 consists of an elongated yoke-shaped body, the side walls 34 and 35 of which have rounded outer surfaces and the side edges of these walls terminate in inwardly extending flanges 36 which are spaced apart to form channels 37 to receive the plates 16, 16a. The cross-head 38 of the block 18 joins the side plates 34 and 35. The inner surface 39 of the crosshead 38 serves as a stop wall limiting inward movement of the bar 17 as is indicated in Fig. 2 of the drawing. The block 18 is secured to the bar 17a only, the bar 17 and the associated parts being attachable and detachable with respect to the block. The walls 34, 35 of the block 18 as formed are slightly diverged, and the block 18 is slid onto the bar 17a over the end of the tape 11; and when moved into its innermost position, the walls 34 and 35 are compressed upon the plate 16a and bar 17a, and a hole 40 is drilled or otherwise formed through the walls 34, 35 of the block 18, through the bar 17a, and through the plate 16a and the tape 11, and a rivet or coupling pin 41, note Figs. 1 and 2, is then passed through the several parts and riveted over to secure said parts together and to firmly couple the block 18 to its associated parts. The side flanges 37 are arranged directly upon the outer edges of the walls 29 and 30 and inwardly of the flange 22, and the inner adjacent surfaces of the walls 34 and 35 rest upon the upper and lower surfaces of the bar 17a.

In practice, the bar 17 will be made slightly smaller in its dimensions to permit free movement of said bar into and out of the channel which is indicated at 42 in Fig. 9 of the drawing and which is formed within the block 18 at one side of the bar 17a and the flanges 37 to the left of the block 18 as shown in Fig. 9. These flanges serve to engage the outer edges of the walls 29 and 30 of the bar 17 to securely retain this bar against displacement from the block 18 when the parts are secured together in the manner clearly seen in Figs. 1 and 2 of the drawing. The several parts of the detachably coupled end stop 15 may be plated or otherwise treated to give the same the desired finish and appearance consistent with that of the appearance of the links 12 employed on the stringers.

With the several parts of the device 15 assembled in the manner or in accordance with the method above defined, the device is then ready for use. In coupling the detachable parts of the device, the slider 13 is first brought into the position shown in Fig. 2 of the drawing and the bar 17 is then passed through the slider and into the channel 42 and moved into the position shown in Fig. 2, in which position, the projecting tongue 26 enters the recess 27, after which the slider 13 is moved outwardly in the manner partially illustrated in Fig. 1 of the drawing in the operation of coupling the stringers together. Thus, when the separate parts of the fastener are coupled together as shown in Fig. 1, the detachably coupled ends of the stringers will be securely retained against displacement or detachment as long as the links 12 remain coupled together. In this connection, it will of course be understood that the bars or rods 17, 17a project beyond the inner end of the coupling block 18, and the reduced end 13a of the slider is adapted to extend onto said projecting ends of said bars when it is desired to uncouple or separate the stringers. By moving the slider into this position which is shown in Fig. 2 of the drawing, the bar 17 may be withdrawn from the block 18 through the

slider 13, thus permitting the separation of the stringers 10 and 11 one from the other.

The projecting tongue 26, in addition to aiding in securing the bars 17, 17a against relative movement when coupled together, also provides means for preventing movement of the slider 13 in the operation of closing the fastener until the tongue 16 has entered the recess 27. When the tongue is in proper position, the operation of coupling the stringers may be performed without danger of slippage or movement of the bar 17 and its associated stringer with respect to the companion bar 17a and the housing 18 thereof, thus facilitating the coupling of the fastener stringers.

The separate pairs of parts 16, 16a, 17, 17a and 18 will be preformed by the tools, dies or other means provided for the construction thereof, and these parts will be mounted or assembled upon the stringer tapes in a successive series of operations in the manner above defined. By constructing the separate parts in the manner disclosed, a very simple and yet, a very positive means is provided for securing the parts to the stringer tapes in such a way as to eliminate as much as possible the stresses and strains to which the parts are subjected, and to avoid the possibility of detachment of the parts from the stringer tapes when excessively strained. The teeth or projections 31 aid materially in this reinforcement of the mounting upon the tape and extend the engaging or gripping area of the parts to a large degree over the surface of the tapes including the beaded edges thereof.

The apertures 21 are provided for certain reinforced mountings to garments or other articles in connection with which the fasteners are employed; and when such mountings or attachments are not essential, the plates 16, 16a may be materially reduced in size, or in fact, may be confined to portions engaging the beaded edge portions of the mounting tapes. In some uses of the invention where the stress or strain upon the end stops is relatively light, the mounting plates or their equivalent may be dispensed with entirely and the bars 17 and 17a alone employed directly upon the tapes, the same being shaped or characterized to fit the tapes. In this connection, it will be understood that the bores or channels 28 on the portions of the bars 17, 17a that project beyond the block 18 are of less diameter than the portions or sections of said bore which engage the plates 16, 16a as may be seen at the right of Fig. 2 of the drawing, in which the larger diameters of said bores are designated by the reference character 28a. The illustrations in the accompanying drawing are all enlarged and exaggerated as to size in order to more clearly illustrate the details of construction.

When the slider is moved upon the projecting ends of the bars 17, 17a, the transverse V-shaped portion 14 of the slider in separating the end links also serves to lock the bar 17 so as to move the projecting tongue 26 out of the recess or aperture 27, permitting the free release of the bar 17 and its associated stringer in the separation of the stringer. At the same time, this position of the parts facilitates the free insertion of the bar 17 into the position shown in Fig. 2 and in moving the slider 13 into the position shown in Fig. 1, the projecting end portion of the bar 17 is moved in the direction of the bar 17a and the projecting tongue 26 into the recess or aperture 27.

Having fully described my invention, what I

claim as new and desire to secure by Letters Patent, is:

1. The herein described method of producing detachably coupled end stops on separable fastener stringers which consists in first forming pairs of mounting plates and bars, and a yoke-shaped block or housing, forming the mounting plates from sheet metal stampings and the bars and block from die castings, first attaching the mounting plates to one end portion of the stringers by folding and compressing the plates thereon, then applying the bars to one edge of the tape and plates, the bars having means engaging the tapes and mounting plates to retain the bars against relative movement thereon, the inner end portions of the bars projecting onto the tape beyond the corresponding ends of said plates, and then mounting one side portion of said block upon one of said bars and tapes and securing the same thereto to provide outwardly of and longitudinally of said bar a channel in said bar with which the other of said bars is detachably mounted.

2. The herein described method of producing detachably coupled end stops on separable fastener stringers, which consists in first forming pairs of mounting plates and bars and a yoke-shaped block or housing, forming the mounting plates from sheet metal stampings and the bars and block from die castings, first attaching the mounting plates to one end portion of the stringers by folding and compressing the plates thereon, then applying the bars to one edge of the tape and plates, the bars having means engaging the tapes and mounting plates to retain the bars against relative movement thereon, the inner end portions of the bars projecting onto the tape beyond the corresponding ends of said plates, then mounting one side portion of said block upon one of said bars and tapes and securing the same thereto to provide outwardly of and longitudinally of said bar a channel in said bar with which the other of said bars is detachably mounted, said bars being in the form of elongated channel strips adapted to extend onto both side portions of the mounting tape and said coupling plates and attached thereto by compression of said bars to secure one edge portion of the tape and plate within the channel thereof.

3. The herein described method of producing detachably coupled end stops on separable fastener stringers, which consists in first forming pairs of mounting plates and bars and a yoke-shaped block or housing, forming the mounting plates from sheet metal stampings and the bars and block from die castings, first attaching the mounting plates to one end portion of the stringers by folding and compressing the plates thereon, then applying the bars to one edge of the tape and plates, the bars having means engaging the tapes and mounting plates to retain the bars against relative movement thereon, the inner end portions of the bars projecting onto the tape beyond the corresponding ends of said plates, then mounting one side portion of said block upon one of said bars and tapes and securing the same thereto to provide outwardly of and longitudinally of said bar a channel in said bar with which the other of said bars is detachably mounted, said bars being in the form of elongated channel strips adapted to extend onto both side portions of the mounting tape and said coupling plates and being attached thereto by compression of said bars to secure one edge portion of the tape and plate within the channel thereof, and securing the block to the bar and plate of

one stringer by a rivet extending transversely therethrough and providing the mounting plates with a recess portion and said bars with a projecting member entering the recess portion of the plates to retain the bars against longitudinal movement on said plates.

4. In a separable fastener, the stringers of which are provided at one end with mounting plates, the method of forming detachable couplings for said ends of the stringers which consists in providing die cast channel bars, arranging and compressing said bars on adjacent edge portions of opposed stringers and on said coupling plates to compress and secure the stringers and plates within the channels of said bars, then mounting a yoke-shaped block upon and securing the same to one of said bars in such manner as to project substantially half of the block outwardly of one side edge of the bar to which the block is attached to provide a channel in connection with which the bar of the other stringer is adapted to be inserted and withdrawn in coupling and uncoupling the stringers.

5. In a separable fastener, the stringers of which are provided at one end with mounting plates, the method of forming detachable couplings for said ends of the stringers which consists in providing die cast channel bars, arranging and compressing said bars on adjacent edge portions of opposed stringers and on said coupling plates to compress and secure the stringers and plates within the channels of said bars, then mounting a yoke-shaped block upon and securing the same to one of said bars in such manner as to project substantially half of the block outwardly of one side edge of the bar to which the block is attached to provide a channel in connection with which the bar of the other stringer is adapted to be inserted and withdrawn in coupling and uncoupling the stringers, the bars of both stringers projecting onto the stringers beyond said block, and forming interengaging portions on the projecting ends of said bars to retain said bars against lateral and longitudinal displacement when coupled together.

6. In a separable fastener, the stringers of which are provided at one end with mounting plates, the method of forming detachable couplings for said ends of the stringers which consists in providing die cast channel bars, arranging and compressing said bars on adjacent edge portions of opposed stringers and on said coupling plates to compress and secure the stringers and plates within the channels of said bars, then mounting a yoke-shaped block upon and securing the same to one of said bars in such manner as to project substantially half of the block outwardly of one side edge of the bar to which the block is attached to provide a channel in connection with which the bar of the other stringer is adapted to be inserted and withdrawn in coupling and uncoupling the stringers, the bars of both stringers projecting onto the stringers beyond said block, forming interengaging portions on the projecting ends of said bars to retain said bars against lateral and longitudinal displacement when coupled together, and forming longitudinally spaced projecting members in the channel of said bars to engage the tapes of the stringers to aid in retaining the bars against displacement therefrom.

7. In a separable fastener, the stringers of which are provided at one end with mounting plates, the method of forming detachable couplings for said ends of the stringers which consists

in providing die cast channel bars, arranging and compressing said bars on adjacent edge portions of opposed stringers and on said coupling plates to compress and secure the stringers and plates within the channels of said bars, then mounting a yoke-shaped block upon and securing the same to one of said bars in such manner as to project substantially half of the block outwardly of one side edge of the bar to which the block is attached to provide a channel in connection with which the bar of the other stringer is adapted to be inserted and withdrawn in coupling and uncoupling the stringers, the bars of both stringers projecting onto the stringers beyond said block, forming interengaging portions on the projecting ends of said bars to retain said bars against lateral and longitudinal displacement when coupled together, forming longitudinally spaced projecting members in the channel of said bars to engage the tapes of the stringers to aid in retaining the bars against displacement therefrom, and forming recesses in the mounting plates of the stringers and projecting members in the channels of said bars for engaging said recesses to retain the bars against movement longitudinally of said plates.

8. In detachably coupled end stops for separable fastener stringers of the class described, the herein described method of forming and applying the coupling bars or rods of said end stops which consists in die casting an elongated bar in such manner as to form a channel longitudinally of one side edge thereof with the side walls of the channel normally diverging with respect to each other, forming a plurality of longitudinally spaced projections on the inner walls of the channel at one end portion thereof, and a projecting key member on the wall of the channel adjacent the other end of said bar, then arranging one edge portion of a fastener stringer including a coupling element within the channel of said bar, then applying pressure to the side walls of the channel to compress the bar upon said edge of the stringer and the coupling element thereon to force the projecting members and said projecting key into the fabric of the stringer and into engagement with said coupling element respectively in retaining and securing the bar against movement with respect to the stringer and said coupling element.

9. In detachably coupled end stops for separable fastener stringers of the class described, the herein described method of forming and applying the coupling bars or rods of said end stops which consists in die casting an elongated bar in such manner as to form a channel longitudinally of one side edge thereof with the side walls of the channel normally diverging with respect to each other, forming a plurality of longitudinally spaced projections on the inner walls of the channel at one end portion thereof and a projecting key member on the wall of the channel adjacent the other end of said bar, then arranging one edge portion of a fastener stringer including a coupling element within the channel of said bar, then applying pressure to the side walls of the channel to compress the bar upon said edge of the stringer and the coupling element thereon to force the projecting members and said projecting key into the fabric of the stringer and into engagement with said coupling element respectively in retaining and securing the bar against movement with respect to the stringer and said coupling element, forming the bar of one stringer with a projecting tongue on

the inner edge thereof and forming a recess on the adjacent edge of the bar of an opposed stringer to provide interengagement of said bars to prevent lateral and longitudinal displacement when coupled together.

10. In detachably coupled end stops for separable fastener stringers of the class described, the herein described method of forming and applying the coupling bars or rods of said end stops which consists in die casting an elongated bar in such manner as to form a channel longitudinally of one side edge thereof with the side walls of the channel normally diverging with respect to each other, forming a plurality of longitudinally spaced projections on the inner walls of the channel at one end portion thereof and a projecting key member on the wall of the channel adjacent the other end of said bar, then arranging one edge portion of a fastener stringer including a coupling element within the channel of said bar, then applying pressure to the side walls of the channel to compress the bar upon said edge of the stringer and the coupling element thereon to force the projecting members and said projecting key into the fabric of the stringer and into engagement with said coupling element respectively in retaining and securing the bar against movement with respect to the stringer and said coupling element, forming the bar of one stringer with a projecting tongue on the inner edge thereof and forming a recess on the adjacent edge of the bar of an opposed stringer to provide interengagement of said bars to prevent lateral and longitudinal displacement when coupled together, and then mounting a yoke-shaped coupling block upon the outer end portion of one of said bars in such manner as to provide in a portion of the block projecting from the inner edge of the bar a channel into and out of which the bar of the other stringer is movable in coupling and uncoupling the stringers.

11. In detachably coupled end stops for separable fastener stringers, the method of forming and applying the mounting plates of end stops to the stringer tapes, which consists in providing an elongated sheet metal blank folded centrally to form end plate portions, one of said end plate portions being provided at one side with a foldable flange and at its opposed side with a prong, mounting one end portion of the stringer tape upon said plate with the end of the tape adjacent said flange and with said prong piercing the tape inwardly of said end and one side edge of the tape, arranging said side edge of the tape at the fold of said plates, then folding the other plate upon the tape and said first named plate, then turning the flange and said prong inwardly upon the last named plate to secure the plates together with the tape therebetween, the side edge of the tape being beaded and the fold of said plates extending around the beaded edge of the tape, and forming an aperture in the folded portion of said plates to provide a recess between said edges of the plates where folded.

12. In detachably coupled end stops for separable fastener stringers of the class described, the herein described method of forming and applying the coupling bars or rods of said end stops which consists in die casting an elongated bar in

such manner as to form a channel longitudinally of one side edge thereof with the side walls of the channel normally diverging with respect to each other, forming a plurality of longitudinally spaced projections on the inner walls of the channel at one end portion thereof, and a projecting key member on the wall of the channel adjacent the other end of said bar, then arranging one edge portion of the fastener stringer within the channel of said bar, then applying pressure to the side walls of the channel to compress the bar upon said edge of the stringer to force the projecting members into the fabric of the stringer in retaining and securing the bar against movement with respect to the stringer.

13. In detachably coupled end stops for separable fastener stringers of the class described, the herein described method of forming and applying the coupling bars or rods of said end stops which consists in die casting an elongated bar in such manner as to form a channel longitudinally of one side edge thereof with the side walls of the channel normally diverging with respect to each other, forming a plurality of longitudinally spaced projections on the inner walls of the channel at one end portion thereof, and a projecting key member on the wall of the channel adjacent the other end of said bar, then arranging one edge portion of the fastener stringer within the channel of said bar, then applying pressure to the side walls of the channel to compress the bar upon said edge of the stringer to force the projecting members into the fabric of the stringer in retaining and securing the bar against movement with respect to the stringer, forming the bar of one stringer with a projecting tongue on the inner edge thereof and forming a recess on the adjacent edge of the bar of an opposed stringer to provide interengagement of said bars to prevent lateral and longitudinal displacement when coupled together.

14. In detachably coupled end stops for separable fastener stringers of the class described, the herein described method of forming and applying the coupling bars or rods of said end stops which consists in die casting an elongated bar in such manner as to form a channel longitudinally of one side edge thereof with respect to each other, forming a plurality of longitudinally spaced projections on the inner walls of the channel at one end portion thereof, and a projecting key member on the wall of the channel adjacent the other end of said bar, then arranging one edge portion of the fastener stringer within the channel of said bar, then applying pressure to the side walls of the channel to compress the bar upon said edge of the stringer to force the projecting members into the fabric of the stringer in retaining and securing the bar against movement with respect to the stringer, and then mounting a yoke-shaped coupling block upon the outer end portion of the bar fixed to one stringer in such manner as to form a channel in said block at one side of said bar to permit movement of the bar of another stringer into and out of said channel in coupling and uncoupling the pair of stringers.

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