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END STOP FOR FLEXIBLE STRINGERS

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Fig. 1.

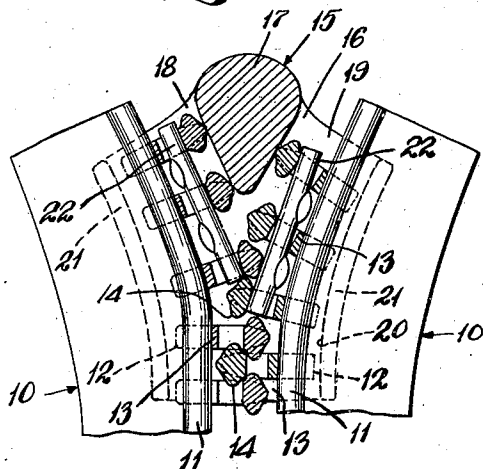


Fig. 2.

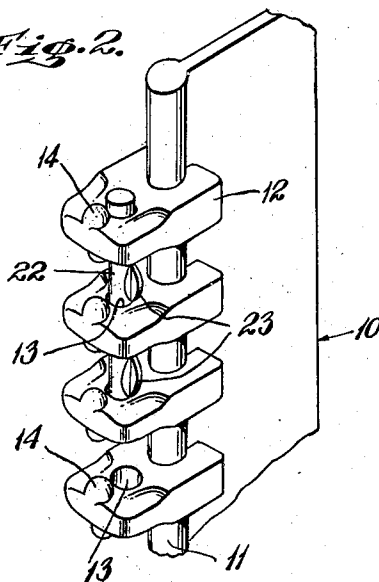


Fig. 3.

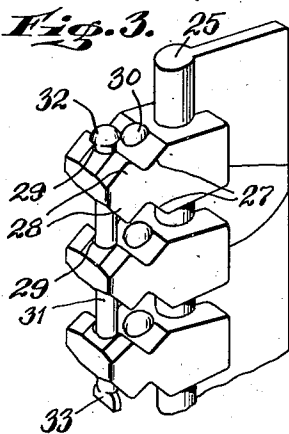


Fig. 4.

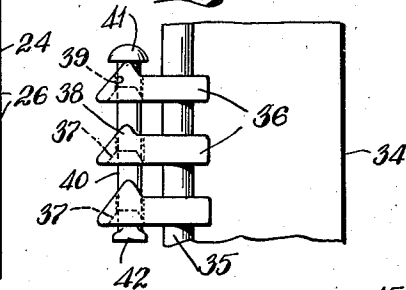
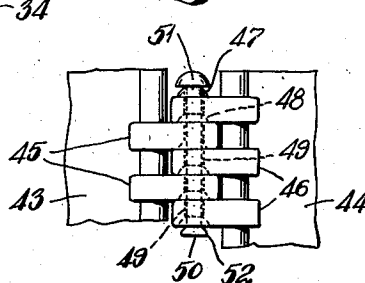


Fig. 5.



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END STOP FOR FLEXIBLE STRINGERS

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17 Claims. (Cl. 24-205)

This invention relates to separable fasteners employing stringers with a slider movable along the stringers. More particularly, the invention relates to an end stop construction for limiting movement of the slider in one direction on the stringers. The novel features of the invention will be best understood from the following description when taken together with the accompanying drawing, 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 detail view of one end portion of two stringers showing parts of the links or scoops in section and illustrating a slider in section on said stringers.

Fig. 2 is a perspective view of one end portion of a stringer detached showing an end stop formed according to my invention.

Fig. 3 is a view similar to Fig. 2 showing a modification.

Fig. 4 is a side view of one end portion of a stringer showing another adaptation of the invention; and

Fig. 5 is a view similar to Fig. 4 showing two stringer portions coupled together by a coupling pin.

In the construction of end stops and particularly what have been commonly termed top stops of separable fastener stringers, that is to say, devices employed to check upward movement of a slider along the stringers, it has been the common practice to employ a stop having a portion mounted upon the tape at or adjacent end links or scoops on the tape. This type of construction has presented many objections, a few of which are, for example, the difficulty in removing an applied stop to make changes or alterations in stringer lengths or for any other purpose. In removing such stops, invariably the tape has become destroyed, thus resulting in outstanding losses. Furthermore, the common stops do not produce a neat and finished appearance of the slider at the end of the stringers when completely assembled. Still further, stops of this type and kind are comparatively costly; they are subject to becoming displaced; if improperly located, they result in jamming of the slider.

The present objectionable features to end stops are overcome by my simplified and economical end stop construction which comprises a plain or headed pin mounted in and supported solely by the end links or scoops of a stringer and produces, in conjunction with the coupled links, a means

checking and blocking further closing movement of the slider. These coupling and blocking pins are maintained within peripheral boundaries of the links or scoops thus permitting the stop, formed by the coupled scoops, to enter the channel of the slider and permitting maximum movement of the slider on the stringers in producing a neat and finished appearance thereon. Furthermore, these coupling pins may be readily removed by a tool in making repairs or alterations. Still further, a stronger end stop construction is provided, in that the stop formed by the coupled links extends itself along a greater length of the stringer than was commonly practiced with the conventional type of stop attached directly to the stringer tape.

In Figs. 1 and 2 of the drawing I have shown one adaptation of the invention. In Fig. 1, 10 represents parts of two stringers, to the beaded edges 11 of which are attached links or scoops 12 of the double acting type. In other words, each link 12 is of the same construction and the coupling end which protrudes beyond the beaded edge 12, has adjacent the beaded edge an aperture 13 opening through upper and lower surfaces of the link or scoop. Outwardly of the aperture, the scoop has upwardly and downwardly projecting members 14 which enter the apertures 13 in links or scoops of an opposed stringer, as clearly illustrated in the lower portion of Fig. 1. At 15 is shown, in cross section, a slider mounted on the stringers to couple and uncouple the links or scoops 12, the slider comprising side plates 16, one of which is shown, joined at the wide end of the slider by a connecting web or frog 17 forming at the wide end of the slider diverging channels 18 and 19 which converge into a single channel 20 at the narrow end of the slider. As is the usual custom, the channels are bordered at the sides of the slider by inturned flanges 21 which guide the links into the channels.

In the construction shown, three of the end links on each stringer 10 have a stop or blocking pin 22 mounted in the apertures 13 thereof in forming the end or top stops of the stringers. Only one of these pins is required in engaging the links of one stringer. However, when the balanced effect is desired, from a standpoint of appearance on the stringers, the two pins will be employed as shown in Fig. 1.

The pins 22 of Figs. 1 and 2 are made from a wire or other strand and portions of this wire or strand intermediate pairs of links are offset or enlarged, as seen at 23, to provide key members

which retain the pins against displacement from the links. It is preferred that the pins 22 are slightly less in diameter than the diameter of the apertures 13, so as to provide the free flexure of the links or scoops 12. This will facilitate free entrance of the end links or scoops into the channels 18 and 19 maintaining the outermost links or scoops on the stringers concealed within the channels 18 and 19 of the slider. This produces the neat and finished appearance of the completely closed stringers at the ends thereof employing the end stops.

When it is desired to remove the end stop pins 22 for any reason, all that is necessary is to sever the pins intermediate adjacent links and then to substitute new pins for the severed pins when the desired correction or alteration has been made.

In Fig. 3 of the drawing is shown a slight modification of the structure illustrated in Figs. 1 and 2 and in this figure a single stringer 24 is shown, to the beaded edge 25 of which is secured links or scoops 26. The links or scoops 26 are also of the double acting type, that is to say, upper and lower surfaces of these scoops have adjacent the bead 25 recesses 27 which receive correspondingly formed projections 28 on the scoops of an opposed stringer. Extending through the portion of the links or scoops having the projections 28 and centrally thereof is an aperture 29 which opens through upper and lower surfaces of the links or scoops. These apertures form sockets to receive projecting elements or pin portions 30 arranged centrally of the recesses 27, the elements 30 engaging the apertures or sockets 29 of the links or scoops of an opposed stringer and serve to key links or scoops against separation.

With the stringer structure, as shown in Fig. 3, I employ a stop or blocking pin 31 which is mounted in the apertures 29 of two or more links, three links being shown. It will be understood that a pin similar to the pin 22 can be employed, but in Fig. 3 the pin 31 has a preformed head 32 at one end and after the pin has been inserted in the links, the innermost end is flattened, as seen at 33, to key the pin against displacement from the links. Ordinary headed pins of suitable wire diameter can be used for producing the stop and blocking elements 31 and the pointed ends of these pins may be cut off, as well as flattened as at 33.

With both of the structures shown in Figs. 1-3 inclusive, the links or scoops of the stringers are of the so called double action type, capable of being coupled and uncoupled by a slider moving in either direction on the stringers in coupling the stringers. In other words, the wide end of the slider may be directed toward either end of the stringers. In Fig. 4 of the drawing, however, I have shown the invention applied to a more or less conventional link or scoop structure. In this figure, 34 represents part of the stringer and on the beaded edge 35 of the stringer tape is arranged links or scoops 36 having the aperture or socket portions 37 on one surface only and corresponding projecting members 38 on the opposed surface. With this construction, apertures 39 are formed centrally through the sockets 37 and projections 38 to receive the stop and block pin 40, which may be like the pin 22 but as shown the pin 40 is similar to the pin 31 of Fig. 3, in other words, has a preformed head 41 at one end and a flattened portion 42 at the other end.

In all of the forms of construction shown, the apertures 13, 29 and 39 may be preformed in the

links or scoops and on the other hand, the links or scoops may be formed solid or substantially so, and these apertures are formed in end links only of the stringer or stringers by drilling or otherwise, it being understood that the links will be arranged in a suitable tool or fixture to support the same in the operation of forming the apertures in the links to receive the end stop or blocking pins. These pins also serve as a means to flexibly couple two or more end links of a stringer and in fact these pins form a blocking unit in combination with the links or scoops which are coupled thereby. Thus the blocking element becomes much stronger in that it extends over a greater length of the stringers and further has the advantageous property of extending into and being concealed by the slider.

In Fig. 5 of the drawing is shown another adaptation of the invention which might be used as a bottom stop checking movement of the slider in the direction of the coupled ends of the stringers and also as a means to form the coupling between the stringers. This construction may also be utilized in forming couplings between two stringers or short lengths of stringers in forming swivelled or hinge like members thereof. In this figure, 43 and 44 represent parts of two stringers or mounting portions. To 43 is attached two spaced links or scoops 45. To 44 is attached end links or scoops 46. Each link or scoop 45, 46 has on one surface a rounded projection 47 and on the other surface a correspondingly formed socket 48 producing between the coupled links or scoops 45, 46 what might be termed ball and socket coupling, which will permit free swinging movement of the links one upon the other. Through the coupling portions 47, 48 are formed apertures 49 to receive the coupling pin 50 which has a head 51 and is flattened or enlarged, as shown at 52 at the other end.

Of course, any number of the links on each stringer may be coupled together in the manner illustrated. However, in forming the bottom stops, a combination of two links on one stringer and three links on the other, or even one link on one stringer and two links on the other will be sufficient to provide an assembled unit which will check further movement of a slider on the stringers. This unit may be spaced slightly from an end link on one stringer with a pin structure of the type and kind illustrated.

With the construction as seen in Figs. 1-4 inclusive and as apparent from a consideration of Fig. 1, the protruding end of one link of one stringer strikes the stop or blocking pin coupled with the link of the opposed stringer in checking the stringers against further coupling and this blocking engagement takes place within the channel of the slider structure. As a general rule, and particularly with the smaller type of links or scoops, it probably would be desirable to arrange the pins in at least three of the links in order to prevent any possibility of forced, complete detachment of the slider.

In addition to the clearance provided between the pin and the apertures in which the pin is mounted, the links or scoops are free to travel along the pin in the flexing of the stringer. In this connection, the pin may also have spring properties in certain uses thereof to compensate for excessive flexures or bending of the stringer tape.

While in the foregoing, reference has been made to the use of the stop in forming a top stop and in forming a bottom stop and also in

forming a hinge-like coupling between two link supporting members, the same principle of the invention is applicable to some stops intermediate ends of a stringer employing links or scoops of the double acting type, particularly when two sliders are mounted on the stringers to couple and uncouple the same. In this arrangement, the stop section, which may be located centrally or otherwise on the stringer, will have the links flexing sufficiently to permit engagement of the pin with three or four links. This may be applied to one stringer alone and, when applied to both stringers, the second pin will be coupled with opposed or companion links of the other stringer. This will form upon the stringers intermediate the ends thereof a blocked stop section, which neither of the sliders can pass. In a structure of this type and kind, it will be apparent that the stop or blocking section becomes substantially invisible upon the complete fastener, thus eliminates the unsightly appearance which would be necessary in providing conventional stops in this section or area.

Furthermore, where it is desirable in different uses of double acting stringers to vary stopping points of two sliders on the stringers, headed pins may be employed and inserted in three or four links at any desired point along the stringers to form these stops. In other words, the flattening retaining means on the pin can be dispensed with and the pin may be used as a freely hand insertable and removable stop or blocking element. This type of construction is applicable to links or scoops where the aperture is preformed in all of the links or scoops.

In other words, instead of having what might be termed end stops, stops may be provided intermediate stringer ends and one or two of these stops can be employed at different points along a stringer.

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

1. A slider stop for separable fasteners employing stringers having links spaced longitudinally of stringer edges with coupling portions projecting from said edges, said coupling portions of the links having apertures arranged in common alinement, a pin member mounted in the apertures of a predetermined number of adjacent spaced links of one stringer to form a slider stop or blocking element on the stringer, and means on the pin member engaging said links for permanently retaining the pin member against accidental displacement from said links.

2. A slider stop for separable fasteners employing stringers having links spaced longitudinally of stringer edges with coupling portions projecting from said edges, said coupling portions of the links having apertures arranged in common alinement, a pin member mounted in the apertures of a predetermined number of adjacent spaced links of one stringer to form a slider stop or blocking element on the stringer, means on the pin member engaging said links for permanently retaining the pin member against accidental displacement from said links, and means providing free flexure of the links coupled by said pin member to compensate for flexure of the stringer.

3. Means providing a stop checking movement of a slider in one direction on stringers of separable fasteners, said stringers having spaced links including projecting coupling end portions, said means comprising a member coupled with

and permanently retained against displacement from coupling end portions only of adjacent links of one stringer, and said member being positioned to engage at least one link of an opposed stringer in blocking meshing engagement of the stringer links.

4. A blocking or stop member checking movement of a slider in one direction on stringers of separable fasteners, the stringers having independent links spaced longitudinally of one edge of the stringer tapes, the links having aligned sockets outwardly of the tape edges, said member comprising a pin mounted in the sockets of adjacent links of one stringer, means on the pin engaging the links for retaining the pin against displacement from said links, and said pin providing between adjacent links a blocking element engaged by a link of an opposed stringer to block meshing engagement of the stringer links.

5. A blocking or stop member checking movement of a slider in one direction on stringers of separable fasteners, the stringers having independent links spaced longitudinally of one edge of the stringer tapes, the links having aligned sockets outwardly of the tape edges, said member comprising a pin mounted in the sockets of adjacent links of one stringer, means on the pin engaging the links for retaining the pin against displacement from said links, said pin providing between adjacent links a blocking element engaged by a link of an opposed stringer to block meshing engagement of the stringer links, and said pin having a free mounting in the sockets of said links to provide relative movement of said links, one with respect to the other.

6. A blocking or stop member checking movement of a slider in one direction on stringers of separable fasteners, the stringers having independent links spaced longitudinally of one edge of the stringer tapes, the links having aligned sockets outwardly of the tape edges, said member comprising a pin mounted in the sockets of adjacent links of one stringer, means on the pin engaging the links for retaining the pin against displacement from said links, said pin providing between adjacent links a blocking element engaged by a link of an opposed stringer to block meshing engagement of the stringer links, said pin having a free mounting in the sockets of said links to provide relative movement of said links, one with respect to the other, and the retaining means of said pin comprising enlargements at both ends of the pin.

7. A blocking or stop member checking movement of a slider in one direction on stringers of separable fasteners, the stringers having independent links spaced longitudinally of one edge of the stringer tapes, the links having aligned sockets outwardly of the tape edges, said member comprising a pin mounted in the sockets of adjacent links of one stringer, means retaining the pin against displacement from said links, said pin providing between adjacent links a blocking element engaged by a link of an opposed stringer to block meshing engagement of the stringer links, said pin having a free mounting in the sockets of said links to provide relative movement of said links, one with respect to the other, and the retaining means of said pin comprising enlarged portions thereon intermediate adjacent links.

8. An end stop for stringers of separable fasteners, said stop comprising a pin member mounted in socket portions of adjacent end links of a stringer, said pin extending between and

operatively engaging adjacent links outwardly of and spaced from the stringer edge to form between said links a blocking element preventing engagement of the links of a companion stringer with said first named links and means retaining the pin against displacement from said links.

9. An end stop for stringers of separable fasteners, said stop comprising a pin member mounted in socket portions of adjacent end links of a stringer, said pin extending between and operatively engaging adjacent links outwardly of and spaced from the stringer edge to form between said links a blocking element preventing engagement of the links of a companion stringer with said first named links, the sockets of said links comprising apertures arranged in common alinement on adjacent links, said pin member being of less diameter than the diameter of said apertures to provide free movement of the links on said pin member and means retaining the pin against displacement from said links.

10. An end stop for stringers of separable fasteners, said stop comprising a pin member mounted in socket portions of adjacent end links of a stringer, said pin extending between and operatively engaging adjacent links outwardly of and spaced from the stringer edge to form between said links a blocking element preventing engagement of the links of a companion stringer with said first named links, the sockets of said links comprising apertures arranged in common alinement on adjacent links, said pin member being of less diameter than the diameter of said apertures to provide free movement of the links on said pin member, and said means comprising an enlarged portion on the pin member preventing displacement from said links.

11. The combination with double acting scoops of separable fastener stringers, of a stop or blocking element, said element comprising a member engaging adjacent spaced links of at least one stringer to block engagement of said links with links of the companion stringer, and means on said member engaging the links for permanently retaining said member against accidental displacement from said links.

12. The combination with double acting scoops of separable fastener stringers, of a stop or blocking element, said element comprising a member engaging adjacent spaced links of at least one stringer to block engagement of said links with links of the companion stringer, means on said member engaging the links for permanently retaining said member against accidental displacement

from said links, and means providing relative movement of said links on said member.

13. The combination with double acting scoops of separable fastener stringers, of a stop or blocking element, said element comprising a member engaging adjacent spaced links of at least one stringer to block engagement of said links with links of the companion stringer, means on said member engaging the links for permanently retaining said member against accidental displacement from said links, means providing relative movement of said links on said member, and said member having spring properties.

14. The combination with the coupling links of two independent mounting members having alined apertures opening through adjacent surfaces of said links outwardly of and spaced from the mounting for said links, of a pin mounted in the apertures of at least two adjacent links of one member and spaced from said member, and means permanently retaining said pin against accidental displacement from said links.

15. The combination with the coupling links of two independent mounting members having alined apertures opening through adjacent surfaces of said links outwardly of and spaced from the mounting for said links, of a pin mounted in the apertures of at least two adjacent links of one member and spaced from said member, means permanently retaining said pin against accidental displacement from said links, and said pin engaging a corresponding aperture in a link of an opposed mounting member.

16. The combination with links of separable fastener stringers having coupling portions projecting from the edges of the stringer tapes, of blocking means projecting from the normal coupling portions of at least two links of one stringer and spaced from the tape of said stringer for preventing the engagement of said links with a link of an opposed stringer.

17. A blocking or stop member checking movement of a slider in one direction on stringers of separable fasteners, said member comprising a pin mounted in sockets of adjacent links of one stringer, means retaining the pin against displacement from said links, said pin providing between adjacent links a blocking element engaged by a link of an opposed stringer to block meshing engagement of the stringer links, and the retaining means of said pin comprising enlarged portions thereon intermediate adjacent links.

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