

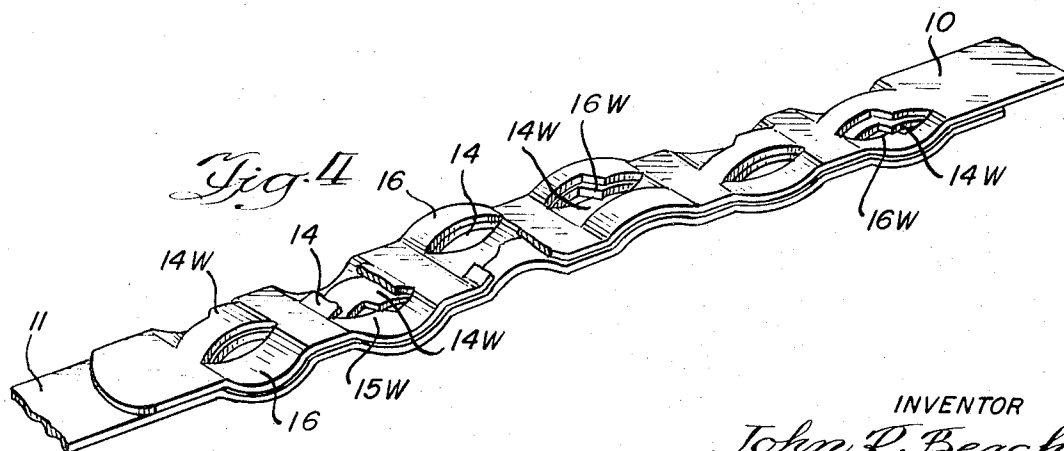
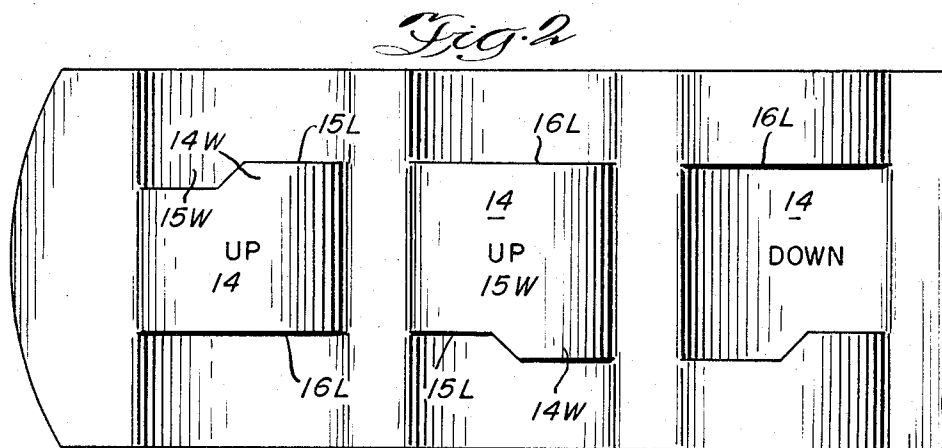
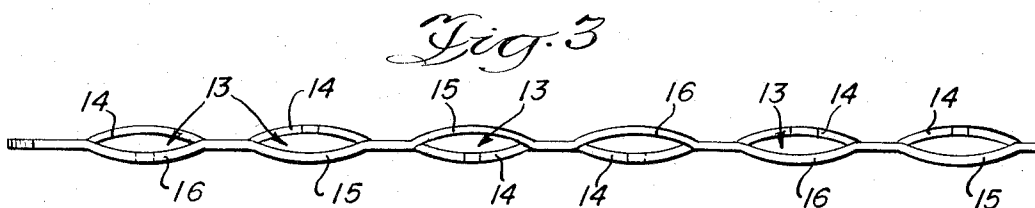
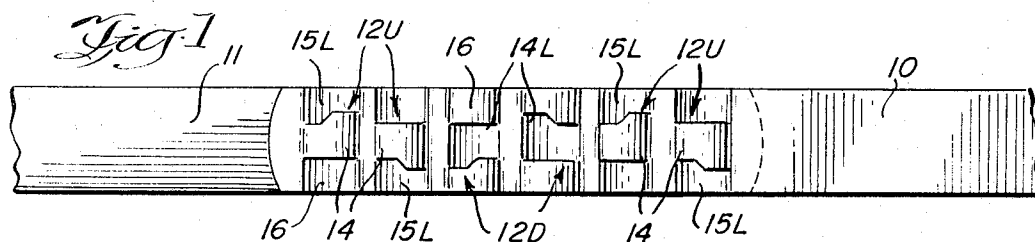
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SEALLESS STRAP CONNECTION

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3,303,540

SEALLESS STRAP CONNECTION

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This invention relates to metal strapping and more particularly is concerned with sealless connections between overlapped lengths of metal strap.

It has long been conventional practice to provide sealless connections between strap ends in the form of a tandem array of longitudinally spaced shear lock joints. The most popular form of shear lock joint utilizes a central tongue provided with lateral wing extensions partly along its opposite edges.

Many variations from this double wing tongue pattern have been suggested over the years and this is evidenced by numerous prior art patents on this subject including Anderson 1,606,331, Leslie 2,268,339 and 2,276,988, Mosey 3,137,047 and Timmerbeil 3,177,538.

The present invention provides a sealless connection corresponding generally to the type that has proved acceptable over all these years but in the practice of the present invention a higher strength joint is realized.

A sealless connection in accordance with the present invention employs a tandem array of longitudinally spaced joints wherein a central tongue has a lateral wing extension along only one side.

The single wing tongue arrangement achieves sufficient interlocking action and any side thrust from the unbalanced configuration is taken along the wingless side. Higher strength through the joint results from the unique single wing pattern for the tongue, with one of the flanking marginal webs having the usual single wing and with the other marginal webs being wingless and wider than the narrow end of the companion winged web.

In the entire array, the single wing tongues are arranged in balanced fashion to orient tongue wings towards both sides of the strap.

Other features and advantages of the invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings which show an illustrative embodiment of the present invention.

In the accompanying drawings forming a part of the specification, and in which like numerals are employed to designate like parts throughout the same.

FIG. 1 is a plan view of overlapping lengths of strap nested in full registry in preparation for offset movement into interlocking relation;

FIG. 2 is an enlarged plan view of the upper strap end of FIG. 1;

FIG. 3 is a side elevational view of the strap end pictured in FIG. 2; and

FIG. 4 is a fragmentary perspective view of portions of the strap lengths pictured in FIG. 1 and showing the same interlocked.

Referring now to the drawings, upper and lower overlapped lengths of metal strap 10 and 11, respectively, are shown for tension transmitting inter-engagement by means of a sealless strap connection defined therebetween. Such sealless strap connections conventionally include a tandem array of longitudinally spaced shear lock joints, six of which are shown in FIG. 1 and designated as 12U or 12D, the reference character 12U designates a joint structure offset upwardly from the plane of the strap lengths and reference character 12D designates a joint structure offset downwardly from the plane of the strap lengths. The particular sections of strap which overlap and interlock to make up each joint are configured to nest substantially fully to enable the overlapping lengths 10

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and 11 to engage in substantially full surface contact. In a six joint connection array, each strap length has six such nestable sections.

Each of the nestable strap sections, as best seen in FIG. 3, is characterized by a central recess 13 bounded across one face by an integral tongue 14 and flanked on opposite sides by integral marginal webs 15 and 16. For each strap section, the tongue 14 merges with the body of the strap at each of its lengthwise ends. Similarly, each of the webs 15 and 16 integrally merges endwise with the strap body. The tongue 14 is defined from the webs 15 and 16 only along lengthwise lines of severance shown at 15L and 16L. One of these lines of severance 15L has an intermediate lateral jog so that the region of the tongue thereadjacent has a lateral wing extension 14W and the region of the side web 15 thereadjacent also has a lateral wing extension 15W which is complementary to that of the tongue. Thus, each of these wing extensions 14W and 15W lie only partly along the length of the tongue or web on which it is carried.

It will be noted that in the case of each of the joints 12U which are here described as upwardly offset, it is the tongue 14 which is offset upwardly and correspondingly, the joints 12D described as downwardly offset have the tongue 14 offset downwardly from the plane of the strap.

By direct comparison with the tongue pattern of the conventional prior art sealless strap connections, it can be seen that the tongues 14 of the present invention have their narrow ends 14N of the same width as in the past and centered with respect to the strap width so that the wingless web 16 is of greater strength than heretofore by virtue of having no offset. In the particular strap end configuration shown herein for purposes of illustrative disclosure, a metal strap of $\frac{3}{4}$ inch width is considered and the tongues and web are each of $\frac{7}{16}$ inch overall length and are offset to an arcuate configuration on a radius of curvature of $\frac{7}{16}$ inch.

At each joint, the receiver strap section presents a recess 13 to receive the tongue 14 of the filler section and the tongue which is received within the recess is here referred to as the locking tongue. Correspondingly, the webs of the filler strap section are received within the webs of the receiver strap section. The winged web 15 of the filler strap section is here referred to as the locking web. Thus, with reference to FIG. 1, wherein only the tongues and webs of the top strap 10 are visible, the locking tongues are designated 14L and the locking webs are designated 15L. It should also be noted that to facilitate nesting of the strap lengths together, the locking tongues are of slightly less width than the tongues within which they nest. This is conventional practice.

The assembly and completion of the sealless connection is accomplished by first nesting the strap lengths 10 and 11 in their position of full registry as shown in FIG. 1. Thereafter the strap lengths 10 and 11 are shifted longitudinally to effect one way mutual interlocking relationship between the wing regions 14W and 15W of each mating locking tongue and locking web.

The final mechanical interlock relationship is illustrated in FIG. 4 wherein it is apparent that the edge of the straight web 16 is engageable laterally with the straight edge of the locking tongue 14 to take any side thrust developed by the one sided interlocking wing relationships. The increased width of the straight web 16 not only makes it stronger in the longitudinal strap tensioning direction but gives it lateral stability sufficient to handle side thrust forces without leading to failure at the joint.

Thus, while preferred constructional features of the invention are embodied in the structure illustrated herein, it is to be understood that changes and variations may be

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made by those skilled in the art without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a sealless strap connection between overlapped lengths of metal strap, a tandem array of longitudinally spaced shear lock joints, each joint comprising nestable strap sections, partly offset longitudinally to engage in one way mutually interlocking relation, each strap section having a central recess bounded at one face by an integral tongue portion offset in one normal direction from said section and flanked by integral marginal web portions offset in the opposite normal direction, said tongue portion being defined from said web portions only along lengthwise lines of severance one of which has an intermediate lateral jog such that said tongue and one of said webs each have a single integral lateral wing, said wings being complementary, each joint having one section presenting a locking tongue nestable within the recess of the other section and partly offset longitudinally thereof to establish one way interlocking engagement between the wing of said locking tongue and the web wing of said other section.

2. In a sealless strap connection between overlapped lengths of metal strap, a tandem array of longitudinally spaced shear lock joints, each joint comprising nestable strap sections, partly offset longitudinally to engage in one way mutually interlocking relation, each strap section having a central recess bounded at one face by an integral tongue portion offset in one normal direction from said section and flanked by integral marginal web portions offset in the opposite normal direction, said tongue portion being defined from said web portions only along lengthwise lines of severance one of which has an intermediate lateral jog such that said tongue and one of said webs each have a single integral lateral wing, said wings being complementary, each joint having one section presenting a locking tongue nestable within the recess of the other section and partly offset longitudinally thereof to establish one way interlocking engagement between the wing of said locking tongue and the web wing of said other section, said joints being oriented in opposite longitudinal directions and in opposite offset directions to present a balanced array.

3. In a sealless strap connection between overlapped lengths of metal strap, a tandem array of longitudinally spaced shear lock joints, each joint comprising nestable strap sections, partly offset longitudinally to engage in one way mutually interlocking relation, each strap section having a central recess bounded at one face by an integral tongue portion arcuately offset in one normal direction from said section and flanked by integral marginal web

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portions arcuately offset in the opposite normal direction, said tongue portion being defined from said web portions only along lengthwise lines of severance one of which has an intermediate lateral jog such that one web is wingless and said tongue and the other of said webs each have a single integral lateral wing, said wings being complementary, each joint having one section presenting a locking tongue nestable within the recess of the other section and partly offset longitudinally thereof to establish one way interlocking engagement between the wing of said locking tongue and the web wing of said other section with any side thrust occasioned at such joint by such interlocking being accommodated by lateral interaction between said tongue and the wingless web of said other section.

4. In a sealless strap connection between overlapped lengths of metal strap, a tandem array of longitudinally spaced shear lock joints, each joint comprising nestable strap sections, partly offset longitudinally to engage in one way mutually interlocking relation, each strap section having a central recess bounded at one face by an integral portion arcuately offset in one normal direction from said section and flanked by integral marginal web portions arcuately offset in the opposite normal direction, said tongue portion being defined from said web portions only along lengthwise lines of severance one of which has an intermediate lateral jog such that one web is wingless and said tongue and the other of said webs each have a single integral lateral wing, said wingless web having a greater minimum width than the other web, each joint having one section presenting a locking tongue nestable within the recess of the other section and partly offset longitudinally thereof to establish one way interlocking engagement between the wing of said locking tongue and the web wing of said other section, with any side thrust occasioned at such joint by such interlocking being accommodated by lateral interaction between said tongue and the wingless web of said other section, said joints being oriented in opposite longitudinal directions and in opposite offset directions to present a balanced array.

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