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WOVEN LADDER WEBBING

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Fig. 1.

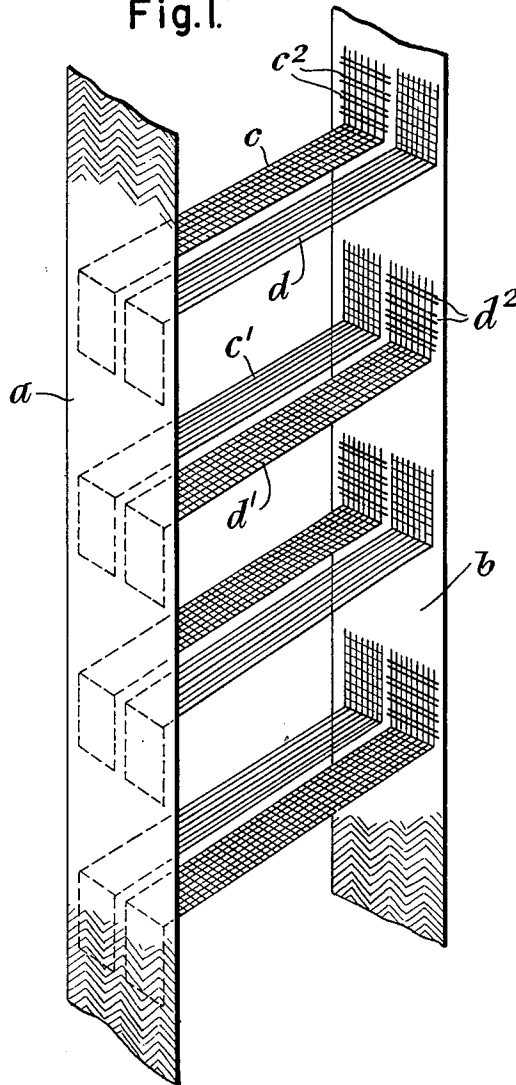
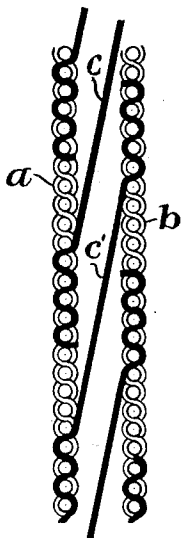


Fig. 2.



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WOVEN LADDER WEBBING

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2 Claims. (Cl. 139—384)

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This invention relates to the manufacture of woven ladder webbing, that is to say webbing consisting of at least two main webs between which are located cross straps secured to or "bound-in" any two adjacent main webs by, and in the operation of, weaving of the main webs.

Woven ladder webbing as above defined has been known for very many years and in a large number of varieties, particularly as regards the number of the main or body webs, the number and relative disposition of the cross straps, the manner of securing or "binding-in" of such cross straps to the main or body webs, and the nature of the cross straps. For example, while a ladder web has usually only two main or body webs, ladder web is known having three body webs and it would not be impossible to increase that number. Again, the number and relative disposition of the cross straps have varied greatly while the nature of the cross straps has included such variations as the use of cords, tapes, and unwoven warps, as distinct from the original woven cross tapes, woven simultaneously with the main or body webs.

Since the commencement of manufacture of woven ladder webbing as above defined, many varieties have been conceived and produced, mainly for some primary object or other. With the evolution of any new variety there are always certain fundamental considerations to be taken into account, such as the mechanical limitations of the available loom and the essential factors of overlap for the slats and speed and cost of production. Some of the aforesaid primary objects have been to increase the security of attachment of the ends of the cross straps as by variation or selection of weave at the binding-in, or by increasing the length of the attachment or binding-in, or to increase the width of the cross straps relative to the width of the body webs, or to duplicate the number or effective number of cross straps so that each slat may be embraced by a pair of such straps for its more effective positioning.

According to the invention the improved ladder web comprises two body webs and two rows of side-by-side cross straps, each strap being of such length as to overlap longitudinally with, and be overlapped respectively by, the adjacent cross straps in the same row; alternate cross straps in each row being woven and side-by-side with unwoven warp threads forming a cross strap in the other row.

A ladder web according to this invention is illustrated in the accompanying drawing in which

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Fig. 1 is a diagrammatic perspective view of a length of ladder webbing made in accordance with the invention, and Fig. 2 is a sectional view of a like piece of ladder webbing made in accordance with the invention.

The ladder web consists of body webs *a* and *b* connected at intervals by alternate pairs of cross straps *c*, *d* and *c'*, *d'*, the ends of which are bound into the body webs in known manner. The strap *c* is shown woven and at the bindings-in with the body webs it will be seen that the warps for the strap have been woven alternately by the weft for the body web and by its own weft, the latter showing as lines at *c*². The strap *d* consists of unwoven warp threads. The straps *d'* and *c'* are similar to the straps *c* and *d* respectively, that is to say the strap *d'* is woven and its weft shows as lines *d*² at the binding-in, while the strap *c'* is of unwoven warp threads.

The example of the invention shown in the drawing was made as follows:

A four shuttle loom was set up for the body webs to be woven by the upper and lower shuttle respectively, with the usual twill pattern. In addition to the two sets of warps for the body webs *a* and *b* there are four sets of warps for the four cross straps respectively *c*, *c'* and *d*, *d'*, i. e. two sets for each pair of straps, such warps could all come from the same beam but they are grouped and arranged for shedding as four separate sets of warps. The shedding is arranged so that the weaving of the two body webs in twill goes on continuously. Considering the two rows of cross straps *c*, *c'* and *d*, *d'* each strap is rather less than one third of the width of the body webs and those of a pair, e. g. *c*, *d* are symmetrically disposed side-by-side so that the space between them is substantially equal to the space at each edge, such space allowing the blind cord to pass through. The weaving and shedding for the cross straps is the same for each row, that is to say, of the alternate cross straps *c*, *c'*, only the straps *c* are woven, the intermediate cross straps *c'* being formed by a weftless set of warp threads. The weftless cross strap of one row is however side-by-side with the woven cross strap of the other row. Starting with binding-in of the cross strap warp threads for any one pair of straps, e. g. *c*, *d*, into the upper web *a* of the body webs, this is conveniently effected so that for successive pairs of picks, these warps are shed with the body warps for binding thereto by the weft of the top shuttle (No. 1) which weaves the body web *a* and in the case of the strap *c* only intermediately for being woven by the adjacent shuttle (No. 2) counting

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from the top. This latter weft shows as lines across the binding-in, e. g. at c². After such binding-in has been effected for about $\frac{3}{4}$ inch and immediately following a shedding with the top body web warp threads, the set of cross strap warps for the strap c are separately woven by No. 2 shuttle while the body webs are woven by Nos. 1 and 4 shuttles respectively. The warps for the strap d are held floating. During this time No. 3 shuttle is weaving the end of the preceding cross strap d'. The preceding cross strap c' consists merely of unwoven warp threads which are also held floating adjacent the lower body web. After weaving for about $\frac{3}{8}$ of an inch of the cross strap the shedding for the lower body web b changes so that the warp threads of the cross straps c' and d' are bound in by the weft of such body web in the same manner as the woven and unwoven straps c, d, the weaving of the cross strap c and of the upper body web continuing. After about $\frac{3}{4}$ of an inch further weaving the warp threads for the cross strap c' and d' are taken across (lifted) through the warps of the cross strap c, d above them so as to be bound-in in similar manner with the warps of the upper body web a. This carrying across (lifting) forming the short cross-overs which are subsequently cut, is effected between consecutive picks, and thereafter No. 1 shuttle continues to weave the upper body web while at the same time binding-in the lifted warps c', d', No. 2 continues weaving the cross strap c, and No. 4 shuttle continues weaving the lower body web. The weaving continues until the strap c is the required length, and then its warp threads and the unwoven warps d are taken across (lowered) into the warp threads of the lower body web where they are "bound-in" as previously described using for the strap c alternate picks of the main body web and of No. 2 shuttle, the succeeding weftless strap threads c'

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being held meanwhile above No. 2 shuttle, while the strap d' is being woven by No. 3 shuttle. When the binding-in has been completed the warp threads for the straps c and d are taken across (lifted) through the weftless warp threads of the succeeding cross strap for re-commencement of the cycle by binding-in with the warps of the upper body web.

The side-by-side cross straps are intended to be so used that the slats are carried by the stronger woven cross straps, while held down by the unwoven straps against displacement by the wind. By having the woven cross straps alternately in each row, displacement of the slats will be controlled by woven straps in each direction.

What we claim is:

1. Ladder web comprising two body webs and two rows of side-by-side cross straps, each strap being of such length as to overlap longitudinally with, and be overlapped respectively by, the adjacent cross straps in the same row; alternate cross straps in each row being woven and side-by-side with unwoven warp threads forming a cross strap in the other row.

2. Ladder web according to claim 1, wherein the warps of the woven cross straps at the binding-in to a main web are woven alternately with their own weft and with the weft of the main web.

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