Nov. 17, 1942. H. J. THELEN 2,302,586

GRATING

Filed July 1, 1939

FIG. 1.

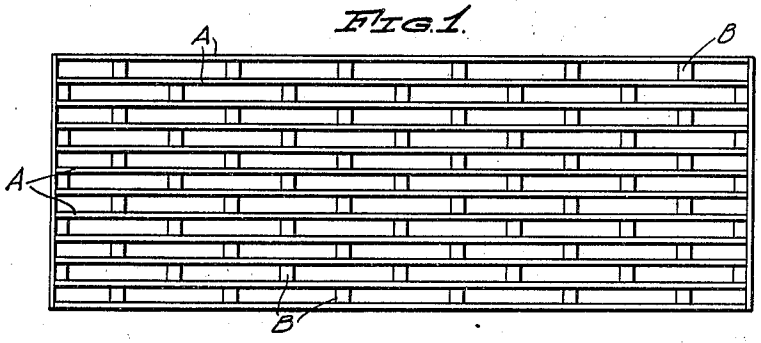


FIG. 2.

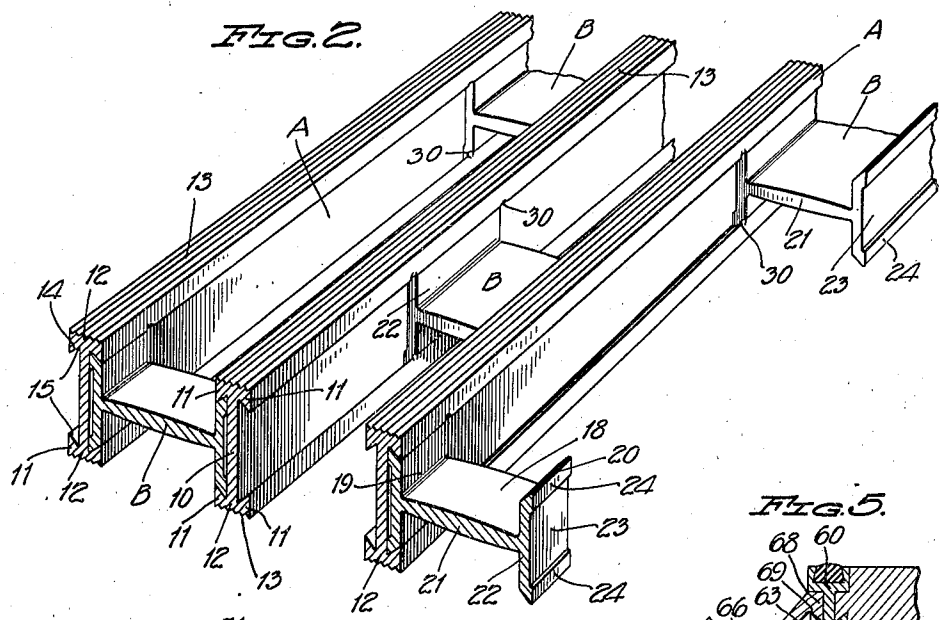


FIG. 5.

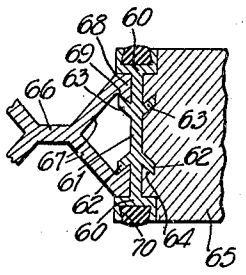


FIG. 3.

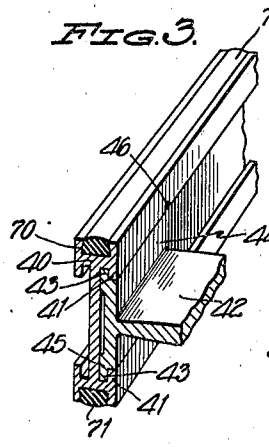
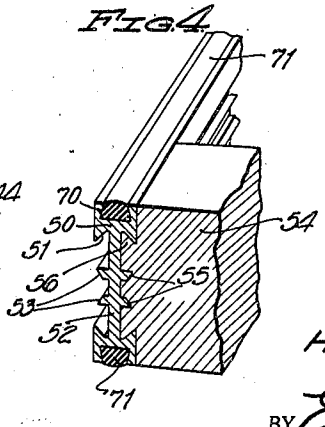


FIG. 4.



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WITNESS:

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GRATING

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2 Claims. (Cl. 189—82)

This invention relates to new and useful improvements in composite or built-up structures more particularly of the type employed as sidewalk gratings, grilles, fire escapes and similar tread structures.

One object of the present invention is to improve the construction of devices of the aforementioned character and to render them more efficient than devices which are at present in use.

A feature of the invention resides in the provision of a plurality of elements which may be assembled into a rigid structure without the use of rivets, bolts or similar elements.

Another feature of the invention resides in a novel structure by which the several elements which make up the structure may be connected together to provide a rigid structure without employing separate fastening elements.

A further feature of the invention resides in a novel construction whereby the several elements which go to make up the finished grating may be readily and easily assembled.

Still a further feature of the invention resides in the employment of certain elements which lend themselves readily to the use of inserts or treads of anti-slip materials upon the tread surfaces of the finished product.

Still a further feature of the invention resides in a novel structure which is reversible in use.

In the accompanying drawing, I have illustrated several forms in which the invention may be carried out, and in said drawing,

Figure 1 is a top plan view of a complete grating or section of grating constructed in accordance with the present invention,

Figure 2 is a fragmentary sectional view in perspective and on an enlarged scale,

Figure 3 is a fragmentary perspective view partly in section illustrating a modified form of the invention,

Figure 4 is a view similar to Figure 3 illustrating a still further modified form of the invention, and

Figure 5 is a fragmentary transverse sectional view illustrating a still further modified form of the invention.

A device constructed in accordance with the present invention comprises, generally speaking, a plurality of spaced bars which are maintained in spaced relation by means of spacing elements.

In the present device the bars are of the general type known as I-bars, that is they consist of a main body portion or web with flanges projecting in opposite directions from each longitudinal side edge of the body or web.

In the accompanying drawing, the bars are designated A and the spacing elements by which they are connected are designated B.

The bars A comprise a main body portion 10 in the form of a web and projecting in opposite directions from each longitudinal side edge of said body portion 10, there are flanges 11. The flanges on each edge constitute a head-like portion 12 and the outer face thereof is provided with a plurality of longitudinally extending grooves 13. This construction is present at each side of the body portion 10. The flanges 11 are undercut as at 14 to provide trackways or guides 15, and there are two of these trackways or guides at each side of the body portion 10.

The spacing elements are designated 18 and preferably consist of relatively short sections of I-bars. The flanges of the spacing elements are designated 19 and these flanges are beveled as at 20. The flanges constitute, together with the main body portion 21 of the spacing element, heads 22, and said heads 22 are preferably cutaway as at 23, providing relatively flat faces 24 upon opposite ends of the heads 22.

In its assembled form the grating comprises a plurality of bars A secured together in spaced relation by the spacing elements B. In assembling the elements, the spacing elements are interlocked with the bars by passing the beveled sections or faces 20 thereof in the trackways or guides 15, the beveled faces 20 being interlocked with the undercut portion 14 of the heads 12. The parts are so constructed that the spacing elements will slide in the guides or trackways 15 to any desired position along the bars A with the flat faces 24 thereof engaging the body portion or web 10 of the bars A. By this construction it will be apparent that the spacing elements and bars have interlocking engagement with each other and that when they are assembled, particularly with the spacing elements in staggered relation as shown, a rigid structure results.

To retain the spacing elements B in position with respect to the bars A, the guides or trackways 15 are deformed as at 30 at opposite sides to each of the spacing elements B. The deformed portions are so formed as to project into the guides or trackways 15 and exert a binding action upon the heads 22 of the spacing elements to prevent sliding movement thereof relative to the bars.

When the grating has been assembled as de-

scribed, the bars A stand in a vertical position with the spacing elements B in a horizontal position, with the heads 12 of the bars presenting the tread elements of the grating, the grooves 13 providing a roughened tread surface.

In that form of the invention illustrated in Figure 3, the head portions 40 of the bars are provided with depending flanges 41. In this instance, the spacing elements which are designated 42 are not formed with beveled faces 20 but are, instead, formed with flange-projections 43 which are adapted to be received behind the flanges 41 of the bars, the heads 44 of the spacing elements being preferably cut-away as at 45 to form these flanges, although the flanges may be formed in any desired manner.

In this form of the invention the spacing elements are also slidable with respect to the bars and are retained in desired position by deforming portions of the flanges 41 as designated by the reference character 46.

In that form of the invention illustrated in Figure 4, the heads 50 of the bars are undercut as at 51 in a manner similar to the construction employed in that form illustrated in Figure 2. In the form illustrated in Figure 4, however, the body portion or web 52 of the bars is provided on each side with a plurality of flanges 53 and the spacing elements which are designated 54 are formed with channels 55 to receive these flanges 53 when the spacing elements are placed in position to secure together a plurality of the bars. The spacing elements are also formed with projecting guides or the like 56 which are received in the undercut portions 54 of the heads 50 and by this construction several of the bars may be interlocked with the spacing elements to provide the grating, it being understood that the flanges formed by the undercutting 51 will be deformed as heretofore described to retain the spacing elements against movement.

In this form of the invention the spacing elements 54 vary slightly in that their body portion is preferably of rectangular form in section and their top faces are flush with the top faces or tread portions of the heads 50 of the bars.

In Figure 5 there is a still further modified form of the invention. In this form, the heads 60 of the bars are of substantially the same form as that shown in Figure 3, except that the side flanges are omitted. In the form shown in Figure 5, the body portion or web which is designated 61 is provided upon each of its sides with two angularly extending flanges 62 and 63. These flanges are undercut as at 64 to provide guides or trackways with which the spacing elements engage to interlock the bars with the spacing elements. In Figure 5, two types of spacing elements are illustrated. At the right in said fgure, the spacing element designated 65 is of the same type as that illustrated in Figure 4. However, at the left of Figure 5, the spacing element consists of a member which is of double Y formation in cross sectional form, that is it comprises a main body portion 66 from each end of which two arms 67 project in diverging relation. The end of each of the arms 67 is formed with a head 68 which is undercut as at 69 to conform to the undercut portions 64 of the flanges 62 in such a manner that as the spacing elements and bars are assembled, the heads 68 of the arms 67 are interlocked with the flanges 62 and 63 to retain the parts together in a rigid structure, it being understood that in this form of the invention the spacing elements are retained against sliding movement by deforming portions of the flanges 62 and 63 upon opposite sides of the spacing elements.

In each of the forms illustrated in Figures 3, 4 and 5, the heads of the bars are channeled as at 70 to receive a tread composition 71 which may be of any approved type.

It is to be understood that the tread compositions, heretofore mentioned, are preferably of the well-known anti-slip type.

From the foregoing it will be apparent that the present invention provides a new and novel construction of grating in which the several parts bear interlocking relation to provide a rigid structure without the use of rivets, bolts, or similar fastening elements. Furthermore, it will be obvious that the construction provides for ready and easy assembly of the parts without necessitating the use of specific tools for the job.

While I have described the invention in various forms, it is to be understood that it is not to be limited to the specific constructions herein illustrated and that it may be practiced in other forms without departing from the scope thereof.

Having thus described the invention, what is claimed is:

1. A rigid grille structure of the character described comprising in combination, a plurality of rigid bars and means for securing said bars together in spaced parallel relation, each of said bars comprising a web-like body portion, oppositely disposed flanges extending along each of the side edges of said body portion, said flanges being undercut upon their inner faces to provide upon each side face of the body portion a channel, having side walls arranged at acute angles to each other and each of the securing and spacing means comprising a relatively narrow elongated body portion, and a head member upon each end of the body portion, the head members having acute angular faces for interengagement with the acute angular faces of the aforementioned channels of the bars and being of a size to be received within said channels and have sliding engagement therewith.

2. A grate structure comprising a plurality of longitudinal rigid bars of substantially I-beam form, each of said bars being of substantially uniform cross-section throughout its length, and each comprising a web of slender elongated cross-section, and a pair of flanges on each extremity of said web extending laterally from opposite sides thereof, each of said flanges defining with said web a channel extending lengthwise of the bar and having opposed side walls, one of which is defined by said web while the other is defined by said flange, and a plurality of rigid cross members extending transversely between each pair of adjoining longitudinal bars and spaced along said bars for rigidly securing said bars together in spaced parallel relationship, each of said cross members being of a width along said bars substantially less than the length of said bars, and being formed at each end with a pair of spaced sections extending with a snug slide conforming fit into respective channels on each side of the corresponding bar, whereby said cross members are interlocked with said bar against relative movement transversely of said bars.

HUBERT J. THELEN.