(12) UK Patent Application (19) GB (11) 2 145 752 A

(43) Application published 3 Apr 1985

(21) Application No 8323137

(22) Date of filing 27 Aug 1983

(51) INT CL⁴
E04B 5/55

(52) Domestic classification
E1D 2031 501 545 LEBD

(56) Documents cited
GB A 2099476 GB 1525735 GB 1380574
GB 1536463 GB 1420631

(58) Field of search
E1D
E1W

(71) Applicant
Phoenix Rollformed Sections Limited (United Kingdom),
Stanmore, Bridgnorth, Shropshire WV15 5JA

(72) Inventor
David Michael Walton

(74) Agent and/or Address for Service
Barker Brettell & Duncan,
138 Hagley Road, Edgbaston, Birmingham B16 9PW

(54) Suspension ceiling grids

(57) For the construction of a suspension ceiling grid from a plurality of such sections, a section of runner comprises opposite end portions comprising connecting plates 16. Each end portion is adapted to form a stable splice joint with an end portion of an identical section in constructing a main runner 56 for a main runner-cross runner grid system. There is also provided a slot 44 in a web 12 of the section into which the connecting plate 16 of an identical section can be introduced to become secured therein as a cross runner 58, either alone or as one of two connecting two such sections.

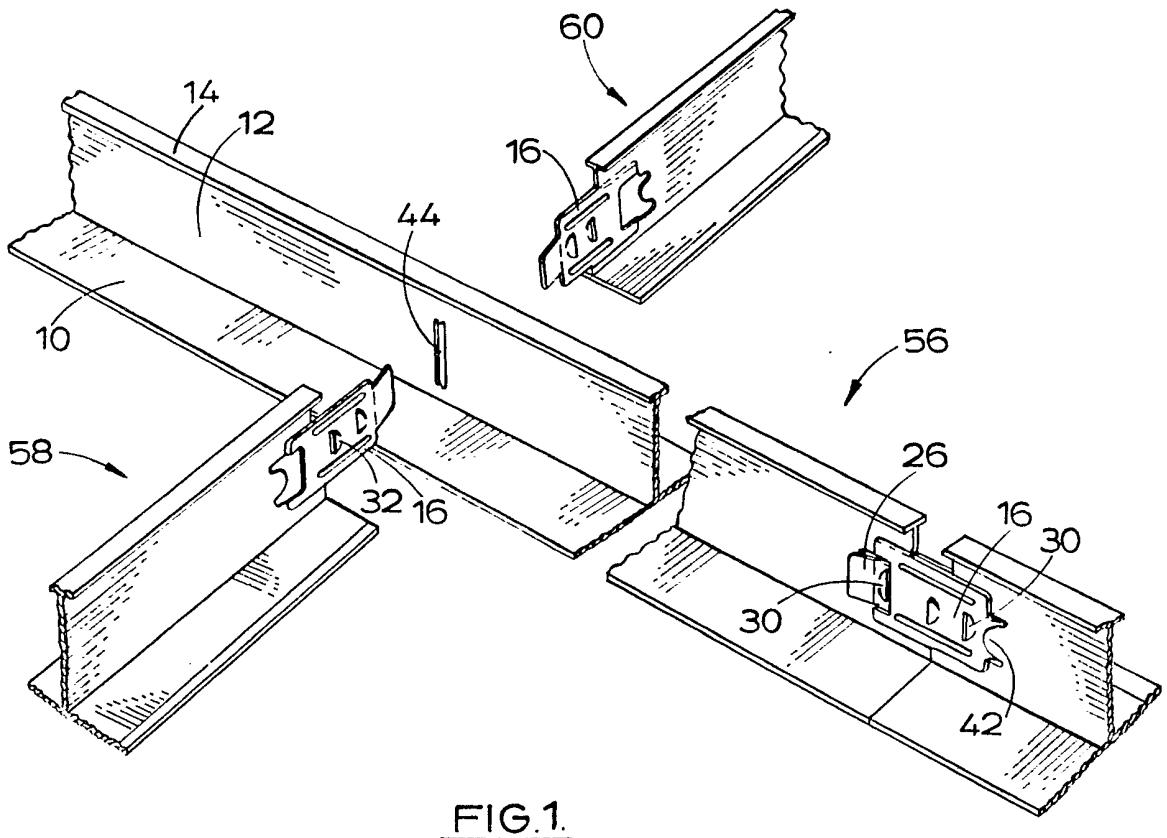

FIG.1.

GB 2 145 752 A

2145752

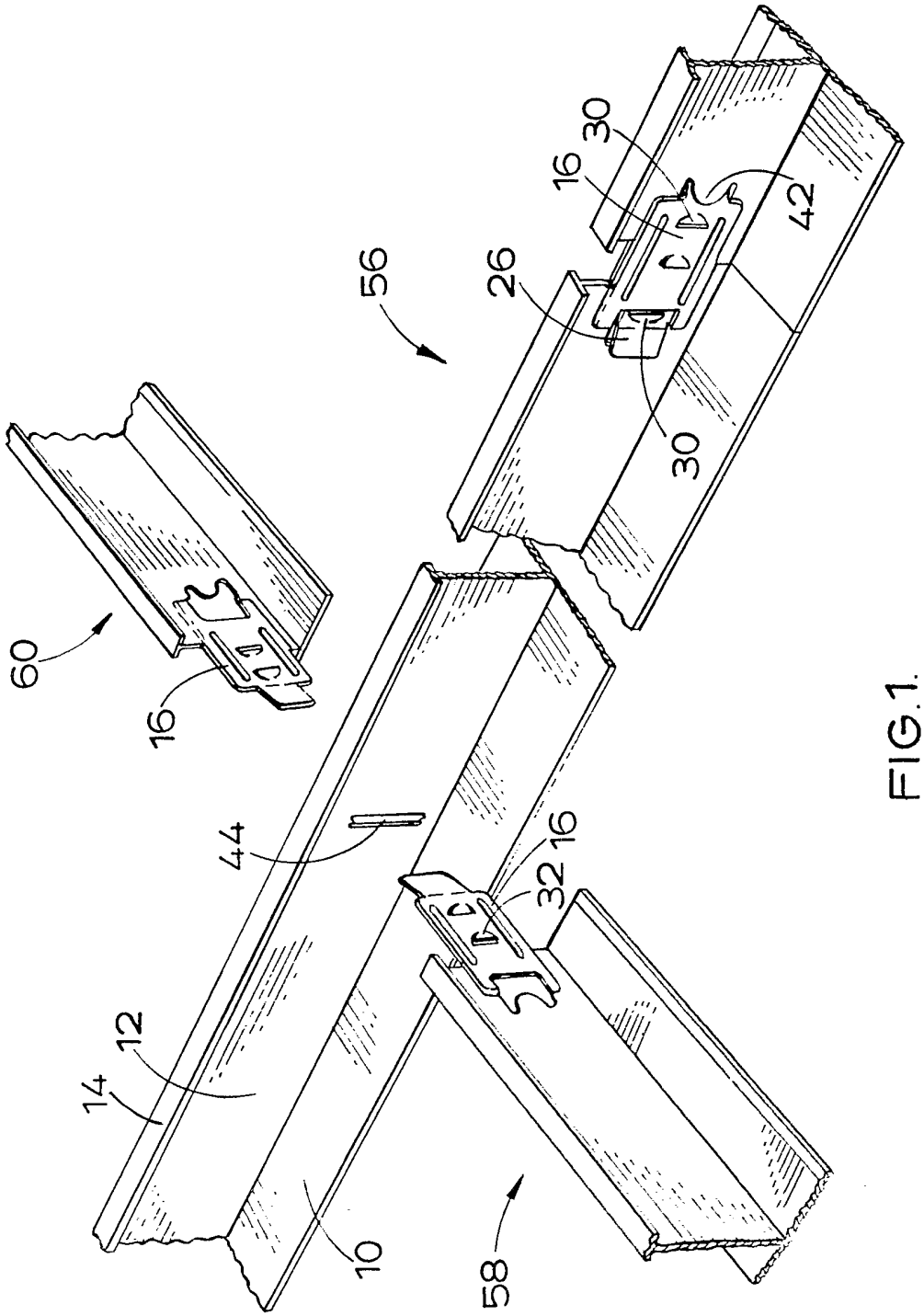

FIG.1.

2145752

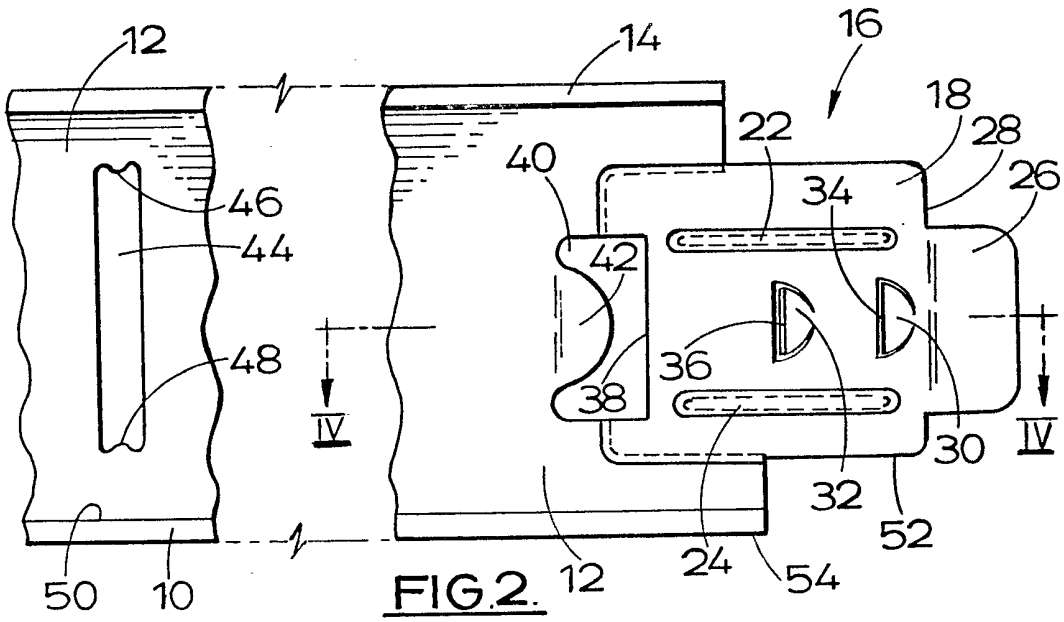

FIG.2.

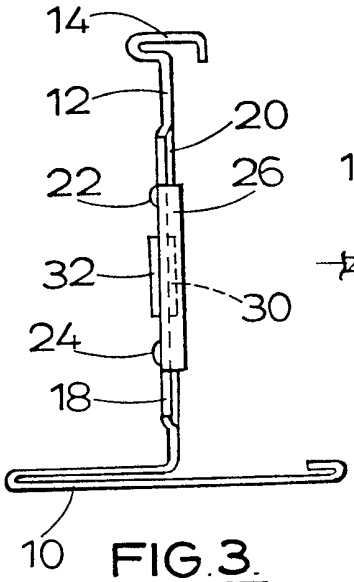

FIG.3.

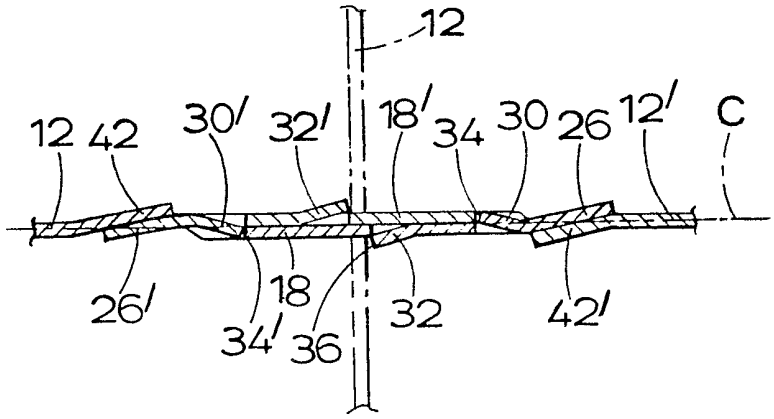

FIG.4.

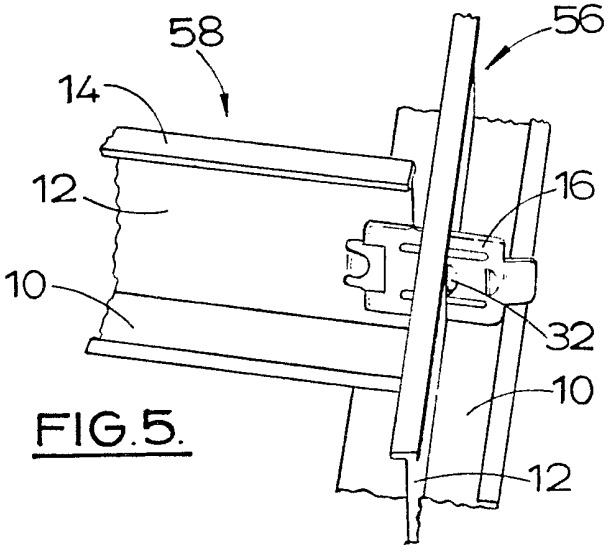

FIG.5.

SPECIFICATION

Suspension ceiling grids

This invention is concerned with improvements in or relating to suspension ceiling grids for suspended ceilings. By means of such grids, ceiling boards and panels, and fittings such as light fittings, can be suspended beneath supporting structure of a building.

Runners for such grids are conventionally built up from interlocking elongate sections which may be assembled to construct a grid according to one of two basic systems. Commonly the sections of runner are of 'T' cross-section, and the runners accordingly referred to as "tees".

One conventional assembly system involves the provision of parallel main runners which serve to support cross runners extending between them. The main runners are usually suspended from supporting structure by means of spaced-apart hangers. The cross runners usually comprise end tabs which can be introduced into vertical slots in vertical webs of the interconnected main runner sections, the tabs becoming secured in the slots to prevent accidental withdrawal; the slots are each arranged to take the end tabs of two aligned cross runners which extend in opposite directions from the main runner, though a single cross runner can be secured on its own. Sections making up each main runner are interconnected in such a manner as to provide fully stable joints; that is to say, the joints are in themselves stable against pivotal and torsional relative movements between the sections, providing a substantially inflexible main runner. The usual form of joint is a locking splice joint. Examples of components for main runner-cross runner grids are described, for example, in U.S. Patent Specifications Nos. 3 084 401, 3 501 185 and 4 108 563 and in GB patent specification No. 2 099 476.

Specification No. 2 099 476 illustrates also the second usual assembly system, which is often referred to as "brick bond" or "basketweave". In a "brick bond" grid the runners are not distinguishable as main runners and cross runners, the joint between any two interconnected aligned sections of runner being at a through runner extending perpendicularly to the two interconnected sections. Usually the arrangement is such that end tabs of the two aligned runner sections are interlocked within a vertical slot in a vertical web of the through runner.

In a "brick bond" grid, at each joint a through runner gives support to the joint and there is not the same requirement for any joint to be inherently stable in the way that a main runner joint must be for a main runner-cross runner system. Similarly, in a main runner-cross runner grid the connection of a cross runner to a main runner relies upon the stable main runner for support and any connection between two cross runners, at a main runner, need not be inherently stable. As a consequence, main runner-cross runner grids have conventionally been built up from two different sections, one for use in constructing the main runners and one for use in providing the cross runners.

It is an object of the present invention to enable suspension ceiling grids to be constructed in a generally improved manner, particularly with a view to the needs of the light commercial and home improvement markets.

We have realised that contrary to established practice in the art a single form of runner section can with advantage be provided for use in constructing both the main runners and the cross runners of a main runner-cross runner grid.

The invention provides in one of its aspects a section of runner suitable for use in constructing from a plurality of such sections a suspension ceiling grid, said section comprising an end portion at each of opposite ends adapted to form a stable splice joint (as hereinafter defined) with an end portion of an identical section in constructing a main runner for a main runner-cross runner grid system, and there being a slot in a web of said section into which an end portion of an identical section can be introduced to become secured therein as a cross runner either alone or as one of two connecting two such sections.

As a consequence of this arrangement, a single form of section only is required for constructing both the main runners and the cross runners of a main runner-cross runner grid. Furthermore, a similar component could be used in construction of a "brick bond" grid.

By a "stable splice joint" is meant, where the expression is used herein, a joint between two aligned sections of elongate runner in which a projecting connecting plate of each section overlaps the other section and becomes locked to the other section to prevent accidental separation from the other both longitudinally and transversely of the runner, the connecting plates each being interlaced with the other section whereby both pivotal and torsional relative movements between the sections are prevented. The interlacing may or may not involve a portion of each section traversing a central plane of the other.

In a preferred construction, the connecting plate at each end of a section of runner comprises two laterally raised portions which are spaced apart longitudinally of the section and which project to opposite sides of the plate. A leading one of said two portions is arranged to engage behind a trailing edge of the plate of another section in forming a joint so as to prevent longitudinal separation of the sections. The trailing one of said two portions

is arranged to engage behind a portion of the web adjacent to a web slot in forming a cross runner connection so as to prevent withdrawal from the slot. The raised portions are preferably in the form of side tabs pressed out from a body portion of the connecting plate. To acheive interlacing of two sections for a stable splice joint, each connecting plate may comprise an outer end portion arranged to pass through an opening in the other section behind said trailing edge.

There now follows a detailed description, to be read with reference to the accompanying drawings, of a section of runner and its use, along with other such sections, in constructing a suspension ceiling grid. It is to be understood that this section of runner and its use are described to illustrate the invention by way of example and not by way of limitation.

In the accompanying drawings:

Figure 1 is a perspective view illustrating assembly of a suspension ceiling grid;

Figure 2 is a view in elevation showing a section of runner, being one of a plurality of such sections used in assembling the grid;

Figure 3 is an end view of the section shown in Figure 2;

Figure 4 is a sectional plan view, at a position illustrated by line IV-IV of Figure 2, illustrating a joint formed by two aligned sections of runner; and

Figure 5 is a perspective view illustrating connection of a single cross runner to a main runner of the grid.

Each section of runner, of a plurality of such sections for construction of a main runner-cross runner suspension ceiling grid, is formed as best shown in Figures 2 and 3. The sections of runner vary only in their lengths.

The section is formed from a single piece of metal strip and, as shown in Figure 3, is of generally 'T' form in cross-section comprising a generally flat base 10, a planar web 12 upstanding perpendicularly from the base, and a top bulb 14. The section is straight and at each of its opposite ends it comprises an end portion comprising a connecting plate 16 which projects longitudinally of the section from the web 12.

The connecting plate 16 comprises a rectangular main body portion 18 which lies generally in a plane parallel to the plane of the web 12 but is slightly offset to one side in order that an inside face 20 of the body portion 18 lies on the centre-line C of the web (see Figures 3 and 4). Upper and lower longitudinally-extending strengthening ribs 22 and 24 serve to give the body portion 18 greater rigidity. An outer end portion of the plate 16 is in the form of an end tab 26 which projects fowardly from a leading edge 28 of the body portion 18. The depth of the tab 26 is less than that of the body portion 18, and the tab projects in a direction somewhat inclined to the body portion 18 to cross the centre-line C.

Spaced apart longitudinally of the section are leading and trailing side tabs 30 and 32, respectively, laterally raised from the body portion 18 of the connecting plate 16. The side tabs are so pressed out as to project generally rearwardly from where they are secured. The leading side tab 30 is pressed out to one side of the plate 16 to stand proud of the inside face 20 of the body portion 18. The trailing tab 32 is pressed out to the opposite side of the plate. The side tabs present trailing edges 34 and 36, respectively, which are offset to opposite sides from the body portion 18 of the connecting plate, the edges being perpendicular to the base 10.

Extending to the web 12 behind a trailing edge 38 of the connecting plate 16 is an opening 40 in the section.

The depth of the opening 40 is substantially the same as, though not less than, the depth of the end tab 26 of the connecting plate, the opening and the tab being at the same level in the section. The edge 38 of the plate is perpendicular to the base 10. Projecting generally forwardly from the web 12, from a position longitudinally opposite the edge 38 across the opening 40, is a tongue 42 which projects in a direction somewhat inclined to the web 12 to the opposite side of the centre-line C from that to which the body portion 18 of the connecting plate 16 is offset, the tongue being inclined similarly to the end tab 26.

At suitable spaced apart positions along the length of the section are elongate rectangular slots 44 in the web 12 (see Figures 1 and 2). The slots, extend perpendicularly to the base 10. From upper and lower edges bounding the slots, central dimples 46 and 48 project longitudinally of the slots. The depth of each slot, to each side of the dimples 46 and 48, is substantially the same as, though not less than, the depth of the body portion 18 of the connecting plate 16, and the lower edge bounding the slot is at a similar height above an upper surface 50 of the base 10 as a lower edge 52 of the connecting plate 16 is above a bottom surface 54 of the base 10. The width of each slot 44 is a little greater than twice the thickness of the metal of the body portion 18 of the connecting plate 16.

Construction of a grid is illustrated by Figures 1, 4 and 5. For clarity, the component parts of one section, being identical with the component parts of the other section, are referenced in Figure 4 with the addition of a prime. In assembling a main runner 56 (Figure 1) two aligned sections are interconnected by means of their connecting plates 16. To assemble the two sections, the end tab 26 of each section is inserted through the opening 40 in the other section, with the inside faces 20 of the connecting plates 16 opposed but separated. The two sections are then pushed together longitudinally with the end tabs 26,

26′ sliding over the tongues 42, 42′. The arrangement of the overlapping end tabs 26 and tongues 42 is such that in such longitudinal sliding movement the tongues draw the two connecting plates 16 laterally together until they substantially abut one another face-to-face. Upon being fully pushed together, the trailing edges 34, 34′ of the leading side tabs 30, 30′ each become engaged behind the trailing edge 38 of the body portion 18 of the connecting plate 16 of the other section. Interengagement of the trailing edges 34 and 38 prevents accidental separation of the connecting plates 16 in a longitudinal direction, and the engagement of the end tabs 26 with the tongues 42 prevents separation of the plates 16 transversely of the runner. Relative movement between the sections generally in the plane of the webs 12 is prevented by the interlacing between the sections achieved by the end tabs 26 extending through the openings 40, the tabs 26 being of the same depth as the openings 40, as hereinbefore described. A stable splice joint is thus achieved. Both pivotal and torsional relative movements between the sections are prevented.

The connection of cross runners 58 and 60 to the main runner 56 is illustrated by Figures 1 and 5. To connect a single cross runner 58, the connecting plate 16 of a section is inserted through a slot 44 in the web 12 of the main runner 56, being inserted through that portion of the slot to the right of the dimples 46 and 48. The plate 16 is pushed through the slot until the trailing side tab 32 of the plate has passed through the slot, the projection of the tab from the plate being such that it has to be snapped past the web. Having been snapped past the web the tab 32 then engages behind the web, and by means of its trailing edge 36 prevents withdrawal of the cross runner 58 from the slot 44 (see also Figure 4). As shown in Figure 5, the base 10 of the cross runner 58 stands on the base 10 of the main runner 56 when the connection is made. The slot 44 permits also the second cross runner 60 to be inserted and secured in a similar manner, the two cross runners further becoming more or less interconnected (so far as permitted by the dimples 46 and 48) by means of the connecting plates 16 in the same manner as in construction of a main runner.

CLAIMS

1. A section of runner suitable for use in constructing from a plurality of such sections a suspension ceiling grid, said section comprising an end portion at each of opposite ends adapted to form a stable splice joint (as hereinbefore defined) with an end portion of an identical section in constructing a main runner for a main runner-cross runner grid system, and there being a slot in a web of said section into which an end portion of an identical section can be introduced to become secured therein as a cross runner either alone or as one of two connecting two such sections.

2. A section according to claim 1 in which the connecting plate at each end of the section comprises two laterally raised portions which are spaced apart longitudinally of the section and which project to opposite sides of the plate, a leading one of said two portions being arranged to engage behind a trailing edge of the plate of another section in forming a joint, so as to prevent longitudinal separation of the sections, and a trailing one of said two portions being arranged to engage behind a portion of the web adjacent to a web slot in forming a cross runner connection so as to prevent withdrawal from the slot.

3. A section according to claim 2 in which the raised portions are in the form of side tabs pressed out from a body portion of the connecting plate.

4. A section according to any one of claims 1, 2 and 3 in which each connecting plate comprises an outer end portion arranged to pass through an opening in the other section behind the trailing edge, to achieve interlacing of two sections for a stable splice joint.

5. A section of runner substantially as hereinbefore described with reference to the accompanying drawings.

Printed in the United Kingdom for
Her Majesty's Stationery Office. Dd 8818935. 1985. 4235
Published at The Patent Office, 25 Southampton Buildings,
London. WC2A 1AY, from which copies may be obtained