

[54] **STRUCTURAL ELEMENT**
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 52/602

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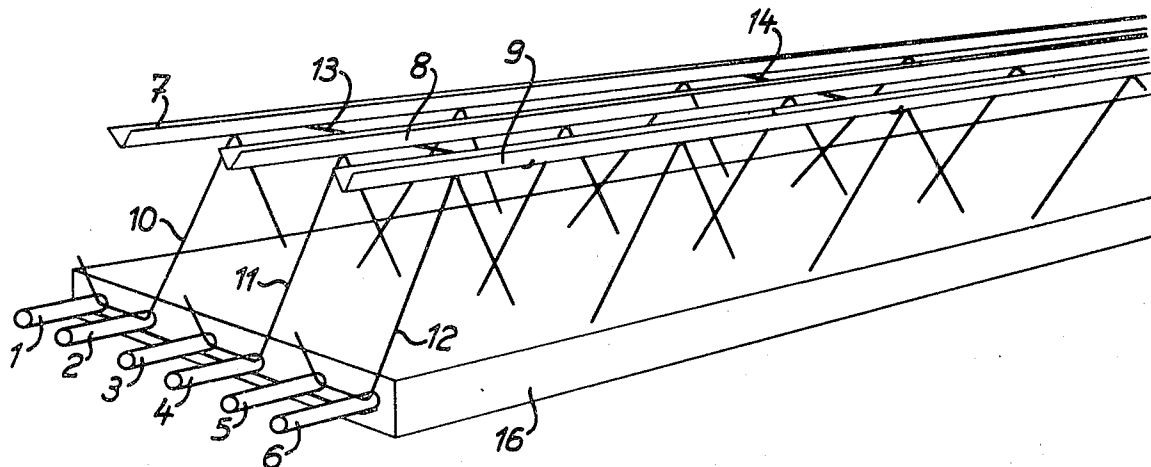
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[57]

ABSTRACT

A prefabricated metal beam is constituted at least of two reinforcing elements each comprising at least one lower member destined to take up tensional stresses, at least one upper member destined to take up compressive stresses and intermediate members for the absorption of shear stresses. Said reinforcing elements are disposed parallel to one another and are connected rigidly by said intermediate members.

7 Claims, 5 Drawing Figures



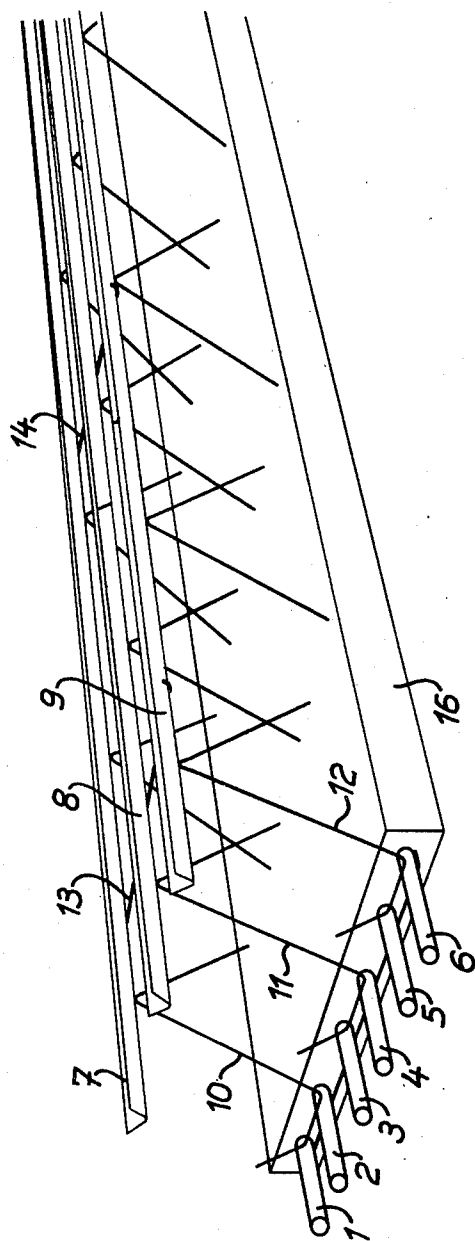


FIG. 1

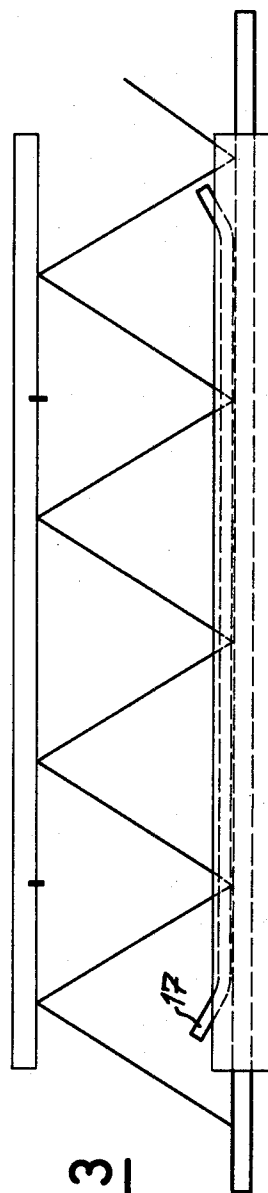


FIG. 3

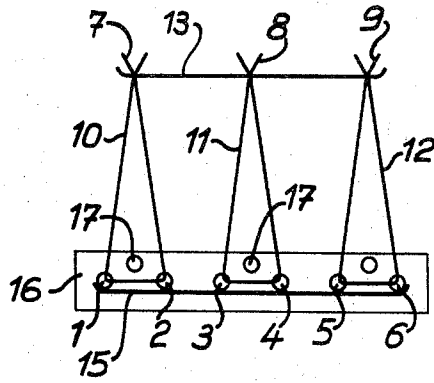


FIG. 2

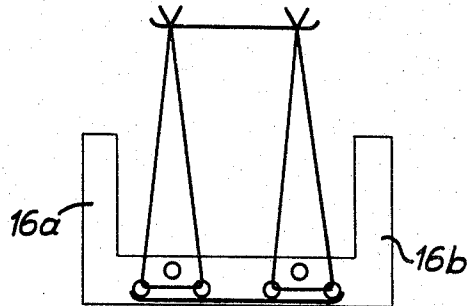


FIG. 4

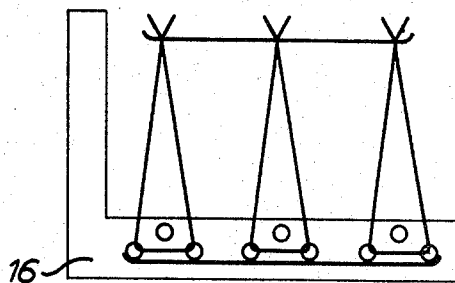


FIG. 5

STRUCTURAL ELEMENT

The present invention relates to a structural element and more particularly to prefabricated beams and girders which are designed to be manufactured in different dimensions and which are capable of supporting high loads. It is an object of the invention to provide such structural elements of great strength and which can be manufactured in dimensions necessitated by individual requirements at relatively low cost and from easily available material.

According to the invention there is provided a prefabricated metal beam characterised by the fact that it is constituted at least of two reinforcing elements each reinforcing element comprising at least one lower member which is destined to take up tensional stresses, at least one upper member which is destined to take up compressive stresses and intermediate members for the absorption of shear stresses, the said reinforcing elements being disposed in parallel in relation to one another and being connected rigidly by said intermediate members.

The annexed drawings show, by way of example only, an embodiment of the invention plus variants thereof:

FIG. 1 shows a beam of the invention in a perspective view;

FIG. 2 shows said beam in an end view in elevation;

FIG. 3 is a lateral elevational view of the beam;

FIG. 4 shows a first variant, and

FIG. 5 a second variant.

The beam shown in FIGS. 1, 2 and 3 comprises straight bars of circular cross-section which are arranged in parallel and designated by the numerals 1-6, these bars being destined to take up tension stresses. The beam further comprises bars 7, 8, and 9 which are of V-profile and which are destined to take up compressive stresses. The bars 1-6 are preferably constituted by ordinary reinforcing steel bars of relatively high coefficient of expansion. The bar 7 is connected with bars 1 and 2, the connection being constituted by rigid steel wire 10 connecting bars 1, 2 and 7 in the order 1, 2, 7, 1, 2, 7, etc., the wire being destined to take up shear stresses. All connections are effected by welding. A second reinforcing element is constituted in the same manner by the bars 3, 4 and 8 connected by a wire 11 and a third reinforcing element constituted by bars 5, 6, and 9 connected by wire 12.

Thus the three reinforcing elements 7, 8 and 9 which are so formed are connected by cross bars 13 and 14 which are arranged at regular distances from one another on the underside of the bars, while the lower bars 1-6 are interconnected by transverse bars 15, all these bars being welded or otherwise connected with the bars 1 to 6, (see FIG. 2).

The beam so formed may be used in the form described as a supporting element and also as reinforcement for concrete. In the executional form shown, the bars 1-6 and their connecting or transverse bars 15 are embedded in a slab of concrete 16 which may serve later on as part of a shuttering. In this concrete slab there may be embedded further reinforcements 17 as indicated in FIGS. 2 and 3.

In a modification the cross bars 13, 14 may be secured to the upperside of the bars 7, 8 and 9.

In the variant according to FIG. 4 the concrete slab 16 is provided with two vertical flanges 16a and 16b

thus forming with the slab itself a channel or U-shaped profile in which concrete can be cast. In the executional form of FIG. 5 the concrete slab 16 is formed in an L profile.

The number of reinforcing elements which are assembled to form the beam may be greater than three but it will at least be two.

It should be noted that the concrete slab 16 may itself form a connecting element between the bars 1-6, dispensing with the transverse bars 15.

What is claimed is:

1. A concrete reinforcement and supporting beam structure comprising, at least one bottom pair of metallic longitudinal members disposed parallel longitudinally and spaced laterally from each other, an upper longitudinal metallic member spaced upwardly from said pair of parallel longitudinal members parallel therewith, said upper longitudinal member being disposed in a plane intermediate the bottom pair of longitudinal members reinforcement rod configured zig-zag as triangles having upper apices substantially aligned on and joined to the upper longitudinal member with the sides of the individual triangles joined at the bottom to individual alternate ones of the bottom longitudinal members, said bottom longitudinal member's being spaced from each other a space greater than the thickness of said reinforcement rod, said reinforcement rod having continuations of the sides of said triangles extending transversely of a space between the bottom longitudinal members defining cross members joining the triangles and the bottom longitudinal members, and a prestressed slab of concrete within which said bottom longitudinal members and the transverse cross bars are embedded, said bottom longitudinal members extending axially outwardly from said concrete slab at opposite ends thereof.

2. A concrete reinforcement and supporting beam structure according to claim 1, in which said triangles are similar and of substantially the same dimension, and said transverse cross members are substantially normal to the bottom longitudinal members and substantially equally spaced.

3. A concrete reinforcement and supporting beam structure according to claim 1, in which said triangles are spaced from each other longitudinally of said bottom longitudinal members.

4. A concrete reinforcement and supporting beam structure according to claim 1, including an L-shaped prestressed concrete slab in which said bottom longitudinal members and cross bars are embedded in a horizontal portion of said slab.

5. A concrete reinforcement and supporting beam structure according to claim 1, including a U-shaped prestressed concrete slab having a base portion in which said bottom longitudinal members and cross bars are embedded.

6. A concrete reinforcement and supporting beam structure according to claim 1, in which said upper longitudinal member comprises a V-shaped channel member with the apices of the triangles joined to the apex of said channel member.

7. A concrete reinforcement and supporting beam structure according to claim 6, in which said bottom longitudinal members are circular in cross section.

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