(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 443 157 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.08.2004 Bulletin 2004/32

(51) Int Cl.[7]: **E04C 3/02**, E06B 1/70

(21) Application number: **03250615.6**

(22) Date of filing: **31.01.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT SE SI SK TR
Designated Extension States:
AL LT LV MK RO

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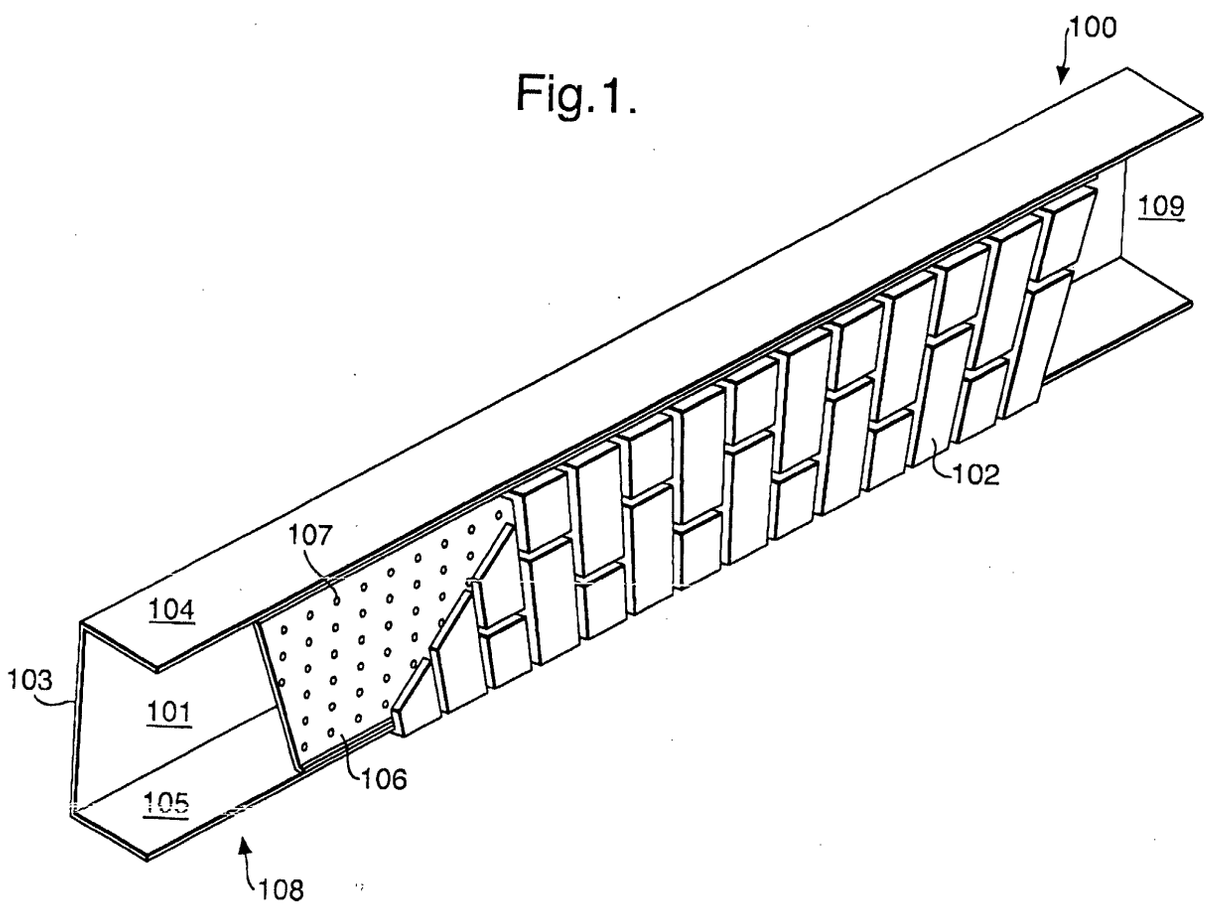
(54) Prefabricated structural building elements

(57) A structural building component comprising: a rigid elongate beam; and at least one facing element for facing a portion of said beam, said at east one facing element fixed to said beam.

Fig.1.



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Description

Field of the Invention

[0001] The present invention relates to the field of construction, and particularly, although not exclusively to a prefabricated structural building component; a method of manufacture thereof.

Background to the Invention

[0002] It is known in building construction, to provide a metal lintel for spanning a doorway, window, or other opening in a wall of a building.

[0003] Known lintels takes several forms. Firstly, for interior walls, a lintel may take the form of a precast concrete bar, having a plurality of steel reinforcing rods. It would be appreciated that a wide range of dimensions are known for such Lintels. Typically such lintels for interior brickwork would be used to span a doorway or window opening, and would be plastered over or otherwise covered so that they are not viewed when in use. For larger interior openings, such as an opening between interior rooms, a rolled steel joist (RSJ) maybe used to span across an opening. The RSJ may be plastered over, so that in use, it is not directly viewed.

[0004] For exterior walls, for typical commercial or domestic buildings, there is typically an inner wall built from breeze blocks, and an outer wall constructed from brick, there being an air gap there between, the inner and outer walls held together by a series of wall ties. For openings such as windows or doors in exterior walls, known lintels may be made from precast concrete or from a metal beam. A typical known lintel for an exterior wall may be constructed so as to be set back from an outer face of the wall, and have bricks cemented in front of the lintel.

[0005] Examples of prior art lintels are disclosed in DE 3009136, which discloses a metal lintel for spanning an aperture; WO 93/20302, which discloses another metal lintel; GB 2340514, which discloses a reinforced brick or block lintel, having a reinforcing rod through a plurality of bricks or blocks; GB 2287261, which discloses a 'top hat' type lintel made of metal; US 6,367,209 which discloses a box lintel.

[0006] Prior art examples of lintels are numerous, and include those disclosed in GB 2,078,821; GB 2,140,478.

[0007] A known method of construction of a modern building, using a known lintel is as follows. Firstly, an exterior wall is built up either side of an aperture in a wall, typically a door or window aperture. At the appropriate height, a lintel is fitted across the top of the aperture, spanning the gap between the two sections of wall either side of the aperture. The lintel is set back away from an exterior outer face of the wall, to leave room for bricks or other facing blocks to be constructed in front of the lintel, thereby allowing for an attractive presentation of the exterior wall, using the same facing material for example bricks or stone blocks as the rest of the wall. In order to provide an attractive finish, bricks may be specially cut into a pattern, for cementing in place with normal mortar or lime cement in front of the lintel.

[0008] However, this method of construction has several disadvantages. Firstly the process is labour intensive. Typically, the lintel is heavy, and therefore needs to be carried with one person each end. Therefore, fitment of the lintel involves at least two persons at the same time.

[0009] Secondly, the time taken to construct a lintel and exterior facing over an aperture is high. Preparation of the brickwork or other facing blocks is time consuming. Each brick has to be individually cut, using a disc cutter or other cutting means to provide the correct shape of brick for the particular facing block pattern which is being constructed. Then, each brick needs to be cemented in place individually using a known sand or lime based mortar cement. Construction of a single lintel with associated facing block work can take a few hours fitting the lintel and laying of the facing blocks is a skilled operation, requiring a skilled craftsman.

[0010] The known lintel structures and methods of construction of known lintels are not well adapted to rapid building of structures, and mass production of buildings.

[0011] Similar problems of time intensive construction, and the requirement for skilled labour occur in the construction of windowsills at a lower end of a window aperture. Prior art methods of constructing a windowsill as part of an exterior wall include the following:

In one type of sill, a layer of bricks is simply left bare, and a wooden window frame, having a prefitted wooden windowsill is fitted into the aperture, where a lip of the wooden windowsill extends over the brick work.

In a second type of known windowsill, a block of stone is shaped so as to overhang an exterior facing brickwork, or stone work is fitted across the top of a layer of external stone blocks or bricks and is cemented in place.

In a third known type of sill, a sill is constructed on top of an exterior brick or stone block wall from a series of bricks or brick slips cemented in place using a mortar or lime cement on top of the exterior wall. A wooden or metal window frame is fitted on top of the brickwork sill. Although the third type of sill is visually attractive, and often specified by architects, it has a disadvantage that it does not lend itself well to fast construction, and requires skilled brick layers to properly construct the sill. Each individual brick slip needs to be individually fitted, and may need to be cut to a special shape.

Summary of the Invention

[0012] Specific implementations according to the present invention aim to provide a pre-fabricated building component suitable for fitment across an aperture in a wall. Preferably the prefabricated component performs both a mechanical structural function, and a decorative function.

[0013] The component may have an advantage of being simple and easy to fit , requiring little skill on the part of a person fitting the component.

[0014] Further, the component may be quick to install, thereby increasing the speed of construction of a building.

[0015] According to a first aspect of the present invention there is provided a structural building component for spanning an aperture said component comprising:

a rigid elongate beam; and

at least one facing element for facing a portion of said beam, said at east one facing element fixed directly to said beam.

[0016] Preferably, said rigid elongate beam comprises:

a first elongate plate member;

a second elongate plate member extending alongside said first elongate plate member; and

a third elongate plate member extending alongside said first elongate plate member;

wherein said second elongate plate member extends in a plane transverse to a plane of said first elongate plate member; and

said third elongate plate member extends in a plane transverse to said plane of said first elongate plate member.

[0017] Said rigid elongate beam may comprise:

a first elongate plate member, said first elongate plate member having a first edge and a second edge, said first and second edges extending alongside each other and spaced apart from each other;

a second plate member extending along said first edge of said first plate member and fixed thereto; and

a third plate member extending along said second edge of said first plate member, said third plate member facing opposite said second plate member, said first plate member being disposed there between

[0018] Preferably, said beam comprises a substantially channel shape.

[0019] Said rigid elongate beam may comprise;

a first elongate edge portion;

a second elongate edge portion facing opposite said first elongate edge portion and spaced apart therefrom; and

a central portion connecting said first and second edge portions;

[0020] Preferably, said structural building component further comprises an adhesive material, said adhesive material fixing said at least one facing element to said beam.

[0021] Said adhesive material preferably comprises an adhesive selected from the set:

a polyurethane adhesive;

a styrene butadiene rubber adhesive

[0022] Preferably said rigid elongate beam member comprises at least one rigid metal sheet. Said rigid metal sheet may be provided with a plurality of through apertures.

[0023] Said rigid beam has first and second ends, and at each of said first and second ends there may be provided a location aperture for receiving a lifting device for lifting said component.

[0024] A said facing block may comprise a stone block, a brick slip, or a like block as may be found on a wall facing.

[0025] The structural building component may comprise:

a structural building component for spanning an aperture said component comprising:

a rigid elongate beam; and

at least one facing element for facing a portion of said beam, said at least one facing element fixed directly to said beam;

wherein a plurality of facing blocks are arranged directly fixed to said central plate member.

[0026] Said plurality of facing blocks may be arranged directly fixed to a surface of said rigid elongate beam substantially covering said surface.

[0027] The structural building component may comprise at least one surface of said rigid elongate beam being substantially covered by an epoxy paint.

[0028] The structural building component may comprise at least one surface of said rigid elongate beam being substantially covered by a powder coat.

[0029] According to a second aspect of the present invention there is provided a building component comprising:

a rigid elongate channel shaped beam capable of supporting a wall; and

a plurality of facing blocks;

wherein said plurality of facing blocks are directly fixed to said beam, and said plurality of facing blocks extend outwardly of said beam.

[0030] According to a third aspect of the present invention, there is provided a lintel for a building, said lintel comprising:

an elongate rigid beam member, said beam member comprising,

an upper rigid member;

a lower rigid member;

a first side member connecting said upper and lower rigid members;

said upper and lower rigid members disposed opposite each other and said connecting member disposed there between;

a second side member spaced apart from said first side member, said second side member connecting said upper and lower rigid members; and at least one facing member, said facing member fixed directly to said rigid beam.

[0031] Preferably, said lintel comprises an adhesive material, for bonding said at least one facing member to said beam.

[0032] Said upper and lower rigid members may extend substantially parallel to each other along a length of said beam.

[0033] In use, said first and second side members may extend in a substantially upright direction.

[0034] The lintel may comprise a plurality of said facing members, said plurality of said facing members arranged externally of said beam and presenting outwardly of said beam.

[0035] Said at least one facing member may extend between said upper and lower rigid members.

[0036] Said upper and lower members and said first side member may comprise a substantially 'C' shaped channel.

[0037] Said second side member may comprise;

a central plate member;

an upper lip portion extending along one edge of said central plate member;

a lower lip portion extending along another edge of said central plate member;

[0038] Said beam may comprise an arched portion.

[0039] Said first and second ends of said second side member may be each angled with respect to a main length of said beam.

[0040] Said beam may comprise first and second end recesses, each of said first and second recesses suitable for accepting at least one course of block work.

[0041] According to a fourth aspect of the present invention, there is provided a lintel component comprising:

an elongate metal beam member;

a plurality of facing blocks fixed directly to an outer surface of said elongate beam member,

wherein said elongate beam member comprises:

a first end portion comprising a first upper end plate, a first lower end plate and a side plate connecting said upper and lower end plates;

a second end portion comprising a second upper end plate, and a second lower end plate, said side plate extending there between;

a central box section, said central box section extending between said first and second end sections;

wherein said central box section extends to form an arch.

[0042] According to a fifth aspect of the present invention, there is provided a sill component for extending across an aperture in a building, said sill component comprising:

an elongate beam member; and

a plurality of facing blocks fixed directly to said elongate beam member

[0043] Preferably, said beam member comprises:

a elongate central plate;

a first elongate side plate, and a second elongate side plate; said first and second elongate side plates extending along a length of said elongate central plate; and

said first and second elongate side plates facing opposite each other on opposite sides of said elongate central plate.

[0044] Preferably, said sill comprises:

a plurality of facing blocks extend around an outer surface of said first side plate member, said central plate member, and said second side plate member.

[0045] Said sill may comprise:

a plurality of rows of facing blocks, extending along a length of said beam member, a first said row of said facing blocks covering said first side plate and a portion of said central upper plates; and

a second said row of said facing blocks covering said side plate and a second portion of said central plate.

[0046] Said beam member may comprise a substantially tubular, rectangular box section.

[0047] According to a sixth aspect of the present invention, there is provided a method of construction of a structural building component, said method comprising;

forming a metal beam member;

forming a plurality of facing blocks, in a shape which closely fits said beam member; and

fixing said plurality of facing blocks directly to an outer facing surface of said beam member.

[0048] Said step of forming a beam member may comprise:

forming a single sheet material into a substantially 'C' shaped channel.

[0049] Said step of fixing said plurality of facing blocks to said beam may comprise:

applying an adhesive material between said plurality of facing blocks and said beam, such that said adhesive material adheres said plurality of facing blocks to said beam.

[0050] Preferably, said plurality of facing blocks are shaped so as to fit externally around said beam.

[0051] Said step of forming a metal beam may comprise:

folding a sheet of metal along first and second bend lines so as to create;

a central connecting portion;

an upper peripheral portion; and

a lower peripheral portion,

wherein said upper and lower peripheral portions face oppositely each other, said connecting portion being disposed there between and connecting said upper and lower peripheral portions.

Brief Description of the Drawings

[0052] For a better understanding of the invention and to show how the same may be carried into effect, there will now be described by way of example only, specific embodiments, methods and processes according to the present invention with reference to the accompanying drawings in which:

Fig. 1 illustrates schematically a first lintel component according to a first specific embodiment of the present invention;

Fig. 2 illustrates schematically the first lintel component in situ within an outer course of a cavity wall;

Fig. 3 illustrates schematically a perspective view of one end of a beam component of the first lintel;

Fig. 4 illustrates schematically in end view the first lintel, in situ in an outer course of a cavity wall;

Fig. 5 illustrates schematically a detail of an upper flange and upper plate of the lintel in end view;

Fig. 6 illustrates schematically in end view a lower flange and lower plate of the first lintel;

Fig. 7 illustrates schematically a plurality of facing block components comprising the first lintel;

Fig. 8 illustrates schematically a metal sheet component used for the construction of a beam for the first lintel component, and a method of manufacture of the same;

Fig. 9 illustrates schematically in view from one end, the first metal plate component formed into a trough shaped channel;

Fig. 10 illustrates schematically a second metal plate component used in the construction of the beam of the first lintel component, and a method of manufacture of the same;

Fig. 11 illustrates schematically in end view the second metal plate component formed into a side plate component of the beam;

Fig. 12 illustrates schematically in end view, the beam component of the first lintel;

Fig. 13 illustrates schematically the second lintel component according to a second specific embodiment of the present invention.

Fig. 14 illustrates schematically a third lintel component according to a third specific embodiment of

the present invention.

Fig. 15 illustrates schematically a second lintel component according to a second specific embodiment of the present invention;

Fig. 16 illustrates schematically in a front view, a third lintel component according to a third specific embodiment of the present invention;

Fig. 17 illustrates schematically a first sill component according to a fourth specific embodiment of the present invention;

Fig. 18 illustrates schematically a second sill component according to a fifth specific embodiment of the present invention; and

Fig. 19 illustrates schematically a third sill component according to a sixth specific embodiment of the present invention.

Detailed Description of a Specific Mode for Carrying Out the Invention

[0053] There will now be described by way of example a specific mode contemplated by the inventors for carrying out the invention. In the following description numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent however, to one skilled in the art, that the present invention may be practiced without limitation to these specific details. In other instances, well known methods and structures have not been described in detail so as not to unnecessarily obscure the present invention.

[0054] Referring to Fig. 1 herein there is illustrated schematically a first lintel component 100 according to a first specific embodiment of the present invention.

[0055] The lintel comprises an elongate rigid beam 101; and a plurality of facing blocks 102; wherein the plurality of facing blocks are fixed to the beam by an adhesive bonding material. The lintel component is supplied as a prefabricated component having the plurality of facing blocks prefixed to the beam.

[0056] The beam comprises a first side plate 103 having inner and outer faces; an upper plate 104 having inner and outer faces; a lower plate 105 having inner and outer faces; and a second side plate 106 having inner and outer faces. The first side plate 101 and second side plate 106 extend substantially parallel to each other and spaced apart from each other, there being an air gap there between. The first side plate 101 extends between a first edge of the upper plate 104 and a first edge of the lower plate 105 on a first side of the beam, and the second side plate 106 extends between a second edge of the upper plate 104 and a second edge of the lower plate 105 on a second side of the beam. In use, the second side of the beam is presented outwardly of a wall into which the lintel component is fitted, so that the facing blocks 102 are presented on an outer surface of the wall, whilst the remainder of the lintel is hidden from view, being cemented into the wall.

[0057] The second side plate 106 is provided with a plurality of through apertures 107, which are of a size sufficiently large enough that the adhesive material may flow through the apertures thereby giving a greater surface area for bonding of the adhesive to the second side plate.

[0058] The second side plate 106 comprises a metal sheet having a quadrilateral shape comprising upper and lower substantially parallel elongate edges, the upper edge of the second plate being longer than the lower edge of the second plate; and first and second ends, wherein the first and second ends are angled in an opposite sense to each other. The upper edge of the second plate is provided with a turned-over flange which extends parallel to an innerface of the upper plate 104. Similarly, the lower edge of the second plate is provided with a lower turnover flange, which extends parallel to an upper inner face of the lower plate 105 of the beam.

[0059] The first side plate 103, upper plate 104 and lower plate 105 are formed from a single sheet of metal, which is bent along a first bend of the upper plate which also forms a first outer edge of the upper plate, and forms an upper edge of the first side plate, and along a second bend which extends between the first side plate and the lower plate, along a first outer edge of the lower plate, which edge also forms a lower edge of the first side plate.

[0060] The second side plate is fixed inside the upper and lower plates 104, 105 such that the second side plate 106 is slightly recessed compared to a second outer edge of the upper plate 104, and a second outer edge of the lower plate 104. The second side plate 106 is fixed to the upper and lower plates 104, 105 by a series of spot welds which weld the upper plate to the upper flange of the second plate, and the lower plate the lower flange of the second side plate 105. Whilst spot welding is a preferred mode of fixing the second side plate to the upper and lower plates, it would be appreciated that other means of fixing, such as riveting, gas welding, or bolts could be used in alternative implementations, for fixing the second side plate to the upper and lower plates. Further, it would be appreciated by those skilled in the art that whilst a fast and efficient mode of construction is to manufacture the upper and lower plates from a same sheet of metal as the first side plate 101, in alternative embodiments, such construction may be varied, for example by welding separate upper and lower plates 104, 105 to a first side plate 101 along the first edges of the upper and lower plates.

[0061] The facing blocks 102 in the example shown in Fig. 1 herein, comprise brick slips. In the example shown, the brick slips are manufactured by cutting conventional bricks, into the appropriate shape to fit a brick

work pattern on the second plate of the lintel. Each individual facing block is fixed to an outer face of the second side plate 106, so as to present externally of the beam. The facing blocks stand proud of the first edge of the upper plate and first edge of the lower plate, so that in use, the facing blocks stand proud of the whole beam, when the lintel is fitted into a wall.

[0062] A suitable adhesive for fixing the facing blocks to the second plate comprises a polyurethane adhesive. A suitable adhesive comprises the adhesive known under the name Rallithane High Performance adhesive, marketed by Allied Signal Specialty Chemicals, Astor Ltd, of Tavistock Road, West Drayton, Middlesex, England. However, the person skilled in the art will recognise that a wide range of commercially available adhesives may be suitable. A suitable adhesive has the property of allowing slight movement of the facing blocks relative to the second plate after setting of the adhesive, enough to accommodate flexing of the beam under loading from the weight of a wall built on top of the lintel. The adhesive should be readily flowable and spreadable between the outer surface of the second plate 106 and a rear surface of each facing block, so as to allow as large as possible surface area of the facing block to be adhered to the outer face of the second side plate. The adhesive should also be temperature stable, and durable over a long period of time, for example 25 or more years, to avoid the facing blocks coming loose from the beam and falling off the beam after installation. Reliability of the lintel after being built into a construction is important, since building regulations apply, and revisiting a construction after the construction has been completed costly, and replacement of the lintel, once it is built into a wall is difficult and expensive. Synthetic adhesives, having good 'grabbing' properties, and which are also flexible, may form suitable adhesive. Styrene Butadiene Rubber (SBR) adhesives may also be suitable.

[0063] At first and second ends of the lintel are provided first and second recessed portions 108, 109 respectively, where the second side plate does not extend to the end of the beam, and therefore leaves a recess in which there is no outer facing second side plate, and which is capable of accepting block work, so that the block work stands proud of the upper and lower plates, and flush with an outer face of the facing blocks 102 in use.

[0064] In the example shown, the facing blocks comprise brick slips. However, the facing blocks may comprise any other suitable facing material, for example stone blocks, ceramic tiles, concrete blocks, reconstituted stone blocks or the like.

[0065] Referring to Fig. 2 herein, there is illustrated schematically the first lintel component fitted within a wall of a building construction. First lintel component 200 is placed across an aperture 201, for example a window or door aperture. In Fig. 2, the lintel is viewed from the outside of a building, and prior to pointing being inserted between the brick slips of the lintel. The lintel is shown in cut away view, so that only a small section of the outer facing brick slips are shown. However, in use, the brick slips are pre-assembled to the beam, so that the lintel, is fitted with a full compliment of brick slips in place.

[0066] The lintel is placed upon supporting portions 202, 203 respectively of a wall, either side of the aperture 201, so that the lintel spans the aperture. Brickwork, or other block work such as stone work, is continued around and above the lintel, and along the top of the lintel. A block work is laid directly on top of the lintel, using a prior art mortar, and, optionally a damp proof membrane, directly on top of the upper plate, which forms a flat surface of dimension wide enough to support a course of the block work. The block work is laid directly on top of the beam, to which the outwardly facing brick slips are pre-fixed, so that the outwardly facing brick slips appear externally to be part of the brick work.

[0067] At each end of the beam, the block work is extended into the first and second recesses 204, 205 respectively of the beam, so that as the courses of block work are built up, courses are laid inside the end of the beam up to the ends of the second side plate.

[0068] There will now be described a method of construction of a wall, using the first lintel.

[0069] Block work is constructed in known manner around an aperture 201. Once the block work has reached a suitable height, and the block work is to be bridged by a lintel, the lintel is lifted into place to rest on top of an outer layer of the block work 202, 203 either side of the aperture. The lintel may be lifted by two or more persons, at least one person lifting each end of the lintel. If the lintel is relatively light, typically less than around 25kg to 50kg. Then a single person may fit the lintel by resting one end of the lintel on one side of the block work 203, and then carefully lifting the other end of the lintel on to the other side of the block work 202. In lifting the lintel onto the block work, for larger dimensioned lintels, mechanically assistance may be used, for example a crane or hoist. Lifting apertures 206, 207 are provided in the first side plate, in which to insert a hook or similar attachment, for lifting the lintel up onto the top of the outer wall.

[0070] Mortar is placed on an upper surface of the lower plate, in the recess portions 204, 205 at each end of the lintel. Block work is cut to shape, and raid in one or more courses, inside the recessed ends, so that the lintel is incorporated into the wall, and externally, the recessed end portions of the lintel are hidden from view, extending internally of the wall. Block work is continued in courses outside the lintel either side of the lintel, and above the lintel along the top of the lintel.

[0071] The facing blocks comprising the outer face of the lintel, are pointed typically using the same mortar used for the rest of the wall, so that the lintel, when fully pointed up and incorporated into the wall appears externally, to be part of the brick work, the outer facing blocks of the lintel, blending in with the rest of the brick

work, to appear to part of the overall external design of the wall. Once installed in the wall, the lintel carries the weight of any block work above the aperture. The outer facing blocks of the lintel are pointed using mortar, and present substantially flush with the rest of the blocks of the wall, to present a substantially flat outer fall surface in a typical construction.

[0072] In other embodiments, the facing blocks may be arranged to stand slightly proud of the rest of the brick work, however, the block work which is fitted inside the end recesses of the lintel, remains flush with the rest of the brick work.

[0073] It would be appreciated by the person skilled in the art that whether the facing blocks 102 of the lintel are of the same material as the external brick work or block work of the wall, or of a different type of material is a design feature which may be specified by architects. However, the general external appearance of the lintel in use is that the outer facing blocks of the lintel form part of the block work of the wall.

[0074] Referring to Fig. 3 herein, there is illustrated schematically in cut away view one end of a beam comprising the first lintel.

[0075] Second side plate 300 is positioned substantially upright, and spaced apart from first side plate 103. An end 301 of the second side plate extends between an inner surface of the upper plate 104, and an inner surface of the lower plate 105. An upper surface of upper flange 302 of the second side plate is fixed to the inner surface of the upper plate 104. Similarly, a downwardly facing lower surface of lower flange 303 of the second side plate is fixed to the upwardly facing inner surface of the lower plate 105. The second side plate 105 is rigidly fixed between the upper and lower plates, such that under compression, the second side plate 105 is load bearing. The upwardly facing surface of upper plate 104 is of dimensions suitable for carrying a course of block work, across the top of the beam.

[0076] The plurality of facing blocks bond to an outwardly facing surface of the second side plate 106, and between the upper and lower flanges 302, 303. In use, when the lintel is built into a construction and bears a load from block work, placed upon the upper surface of the upper plate 104, the whole beam undergoes loading, and can bend or flex a small amount. Typically, for a beam of length of the order 2 meters, an amount of bowing of the order of 2 to 3 mm may be experienced at the centre of the beam. Consequently, the second side plate 106 undergoes some movement under loading, and the facing blocks attached by adhesive to the second side plate, must continue adherence to the second side plate, even when there is slight movement of the beam under loading.

[0077] Referring to Fig. 4 herein, there is illustrated schematically in cut away side view the lintel of Figs. 1 to 3 herein. When fitted in a wall, facing blocks 102 are presented flush with an outer surface 400 of a wall. One or a plurality of layers of block work 401 - 403 are incorporated into each end of the lintel, securing the lintel firmly in place within the wall.

[0078] In edge view, the beam member comprises a first 'C' shape, comprising the first side plate 103, the upper plate 104, and the lower plate 105, and a second 'C' shape member comprising the second side plate 105, wherein the two 'C' shaped members are nested within each other, and rigidly fixed to each other. The plurality of facing blocks 102 extend proud of the second edges of the upper and lower plates, such that in use, the upper plate, and upper flange of the second side plate are cemented over using mortar, and are therefore not viewable when the lintel is fully installed within a wall. A damp proof membrane 404 may be fitted on top of the lintel and under the block work above the lintel.

[0079] Referring to Fig. 5 herein, there is illustrated schematically in cross section, a joint between upper plate 104, and upper flange 302 of the second side plate, with the lintel in situ within a wall. The upper flange 302 is spot welded to the upper plate 104. Each facing block 102 is bonded to an outer surface of second side plate 106 by a layer of adhesive 501.

[0080] A second edge 501 of the upper plate, and an outer edge of the upper flange 302 lie adjacent to each other, and facing blocks 102 extend outwardly of the edges of the upper plate and upper flange, so that in use, mortar may be pointed in a space between the facing block and a further layer of block work 502 which is laid on top of the upper plate 104.

[0081] Referring to Fig. 6 herein, there is illustrated schematically in enlarged view, a detail of a lower edge of the lintel, in situ, in a wall. A lower flange 303 of the second side plate 106 is fixed rigidly to an upper surface of the lower plate 105. A second edge 600 of the lower plate is recessed compared to an outer surface of the facing blocks 102, so that in use, the facing blocks overhang the second edge of the lower plate 105.

[0082] Referring to Fig. 7 herein, there is illustrated schematically a set of facing blocks cut to shape, and suitable for attachment to the second side plate of the lintel as shown in Figs. 1 to 6 herein.

[0083] The facing blocks shown here in front view, in the example shown, are arranged in a splayed arrangement, in the pattern of a load bearing brick span. However, it would be appreciated by a person skilled in the art that other patterns or facing blocks are possible, and since the facing blocks are non-load bearing, any suitable arrangement or pattern of facing blocks may be provided. All dimensions are shown in millimeters in the example shown, and are by way of example only.

[0084] Referring to Fig. 8 herein, there is illustrated schematically a first component 700 of the metal beam, of the lintel described in Figs. 1 to 7 herein. The first beam component comprises a rigid metal sheet, for example of mild steel of similar metal. A length, width, and thickness of the metal sheet may be varied as designable parameters depending upon the dimensions of the lintel to be fabricated. However, a metal sheet having

thickness of 2mm or greater is preferred. The metal sheet is formed into a substantially 'C' shaped component by bending the sheet along a first bend line 701 and along a second bend line 702, the first and second bend lines being substantially parallel to each other. The metal sheet may be provided with a plurality of through apertures, punched out of the sheet, in order to reduce the weight of the component.

[0085] Referring to Fig. 9 herein, there is illustrated schematically the first beam component constructed from a single metal sheet, after bending along first and second bend lines. The first component comprises the first side plate 103; the upper plate 104; and the lower plate 105. The upper plate 104 extends in a plane substantially perpendicular to a plane of the first side plate 103, and parallel to a plane of the lower plate 105. The lower plate 105 extends in a plane substantially parallel to a plane of the upper plate 104, and transverse to a plane of the first side plate 102. In use, the upper plate 104 and lower plate 105 are positioned substantially horizontally, whilst the first side plate 102 is positioned upright between first edges 900, 901 of the upper and lower plates respectively, which are formed along the first and second bend lines respectively.

[0086] Referring to Fig. 10 herein, there is illustrated schematically a second component 1000 of the beam, the second component forming the second side plate. The second side plate is formed by bending a quadrilateral shaped metal sheet along a first, upper bend line 1001 and along a second, lower bend line 1002. A distance between the upper bend line and an upper edge of the second beam component is typically of the order of 18mm, so that when the sheet is turned over, a flange is formed having a width of around 20mm. Similarly, the second bend line is created substantially parallel to a lower edge of the sheet, at a distance of around 18mm from the lower edge, so that when the sheet is turned over, the lower flange has an outer width of the order 20mm.

[0087] The second beam component is provided with a plurality of through apertures, which extend through a thickness of the metal sheet, and which is use, can accept adhesive which flows between an outer facing block and the outwardly facing face of the second side plate, in order to bond the facing blocks to the outer surface of the second side plate.

[0088] The second beam component has a lower edge which is of a length lower than an upper edge, and consequently, first and second ends 1003, 1004 respectively of the second beam component are angled towards each other, and point to a common point of origin, the first and second ends extending along first and second radii elevating from the point of origin.

[0089] Referring to Fig. 11 herein, there is illustrated schematically the second beam component in side view, after bending along the first and second bend lines. A height of the second beam component is such that it fits within the upper and lower plates of the first beam component, and upper surfaces of the upper and lower flanges 302, 303 can be spot welded inside the first beam component.

[0090] Referring to Fig. 12 herein, there is illustrated schematically in end view the first beam component and second beam component assembled into the beam component. The beam component comprises the first upright side plate 103; second upright side plate 106; upper plate 104; and lower plate 105, wherein second side plate 106 is inserted inside the upper and lower plates 104, 105 and welded thereto by a series of spot welds or other similar fixings made along the upper and lower flanges 302, 303. In side view, the beam member forms a substantially rectangular box section.

[0091] Referring to Fig. 13 herein, there is illustrated schematically a second lintel component 1300 according to a second specific embodiment of the present invention.

[0092] The lintel comprises an elongate rigid beam 1301; and a plurality of facing blocks 1302; wherein the plurality of facing blocks are fixed to the beam by an adhesive bonding material. The lintel component is supplied as a prefabricated component having the plurality of facing blocks prefixed to the beam.

[0093] The beam comprises a first side plate 1303 having inner and outer faces; an upper plate 1304 having inner and outer faces; a lower plate 1305 having inner and outer faces and a second side plate 1306 having inner and outer faces. The first side plate 1301 and second side plate 1306 extends substantially parallel to each other and spaced apart from each other, there being an air gap there between. The first side plate 1301 extends between a first edge of the upper plate 1304 and a first edge of the lower plate 1305 on a first side of the beam, and the second side plate 1306 extends between a second edge of the upper plate 1304 and a second edge of the lower plate 1305 on a second side of the beam. In use, the second side of the beam is presented outwardly of a wall into which the lintel component is fitted, so that the facing blocks 1302 are presented to an outer surface of the wall. The facing blocks 1302 comprise substantially L-shaped blocks each having an upper portion 1307 and angled at 90° to the upper portion a side portion 1308. The plurality of blocks are arranged in rows along a length of the beam, in each row, there have been provided a first block and a second block. The first and second blocks are offset, such that in each row a first block has an upper portion 1307 of a relatively shorter length, whereas a second block has an upper portion 1309 of a relatively longer length, the overall effect being to provide an effective block work covering the beam. Gaps are provided between each of the individual facing blocks in order to fill the blocks with mortar cement pointing when installed and fixed to the lower plate 1305 by an adhesive bonding material. The adhesive bonding material used to fix these L-shaped facing blocks to the lintel component comprise polyurethane adhesive. Other features relating to the con-

struction and functioning of this second lintel component are much as previously described for the first lintel component.

[0094] Referring to Fig. 14 herein there is illustrated schematically a third lintel component 1400 according to a third specific embodiment of the present invention.

[0095] The lintel comprises similar components to those described in the first specific embodiment of the present invention. These being an elongate rigid beam 1401, a plurality of facing blocks 1402 wherein the plurality of facing blocks are fixed to the beam by an adhesive bonding material. The lintel component being supplied as a pre-fabricated component having a plurality of facing blocks prefixed to the beam.

[0096] The beam comprises a first side plate 1403 having inner and outer faces; a lower plate 1404 having inner and outer faces, an upper plate 1405 having inner and outer faces and a second side plate 1406 having inner and outer faces. The first side plate 1401 and the second side plate 1406 extending substantially parallel to each other and spaced apart from each other, there being an air gap there between. The first side plate 1401 extends between a first edge of the upper plate 1404 and a first edge of the lower plate 1405 on a first side of the beam, and the second side plate 1406 extends between a second edge of the lower plate 1404 and a second edge of the upper plate 1405 on a second side of the beam. In use, the second side of the beam is presented outwardly of a wall in which the lintel component is fitted so that the facing blocks 1402 are presented to an outer surface of the wall. The outer face of the lower plate 1404 is covered with an epoxy paint 1407.

[0097] Alternatively the outer surface of the lower plate 1404 of the lintel component may be covered in a powder coat substance.

[0098] Other features relating to the construction and functioning of the third lintel component are much as previously described for the first lintel component.

[0099] A suitable epoxy paint for covering an outer surface of the beam comprises a polyester resin coating applied electronically to the outer face of the lower plate 1404 and cured. It is then finished off with a duplex finish. However, the person skilled in the art will recognise that a wide range of commercially available epoxy paints may be suitable. A suitable epoxy paint has the property of protecting the surface of the beam for a prolonged period of time in adverse weather conditions. The epoxy paint should be easily appliable and readily flowable and spreadable so as to allow as large as possible a surface area of the beam to be covered. The epoxy paint should also be temperature stable and durable over a prolonged period of time, for example, 25 years or more to avoid corrosion and other environmental factors from effecting the functioning of the beam after installation. Reliability of the lintel after being built into a construction is important, since building regulations apply and revisiting a construction after the construction has been completed is costly, and replacement of the beam once it is built into a wall is difficult and expensive.

[0100] Referring to Fig. 15 herein, there is illustrated schematically a fourth lintel component according to a fourth specific embodiment of the present invention, the second lintel component comprises an elongate arched beam 1500; a plurality of outwardly facing blocks 1501 arranged in an arch; wherein the plurality of outwardly facing blocks are fixed to the beam member by an adhesive material.

[0101] The beam member 1500 comprises a first side plate 1502 extending between first and second ends of the beam; a first upper end plate 1303 at a first end of the beam; a second upper end plate 1504 at a second end of the beam; a first lower end plate 1305 at the first end of the beam; a second lower end plate 1506 at the second end of the beam; a curved central upper plate 1506, positioned between the first and second upper end plates; a lower central plate 1507 positioned between the first and second lower end plates; a second side plate 1508, the second side plate having an outwardly facing surface 1509 to which the plurality of facing blocks are adhered, the second side plate extending between the upper and lower central plates.

[0102] The second side plate 1509 is arcuate in shape, and is provided with a plurality of through - apertures. The through apertures perform two functions. Firstly, they provided holes through which adhesive may flow, giving a larger surface area and better bonding of the facing blocks to the outer face 1309 of the second side plate. Secondly, the apertures reduce the weight of the second side plate component.

[0103] It would be appreciated by those skilled in art, that the whole of the beam structure may be provided with apertures for the purpose of reducing weight. However, it will be appreciated by the skilled person that there may be a reduction in strength of plate members by providing true apertures, and the size, number and density of apertures, the weight of the beam component, and the strength of the component are design variables, which can be adjusted for a particular application, strength, loading, and weight of lintel components.

[0104] Between the first and second ends of the lintel, the first side plate, second side plate, central upper plate, and central lower plate, form an arch. The plurality of facing blocks are arranged so as provide the visual appearance of a brick or stone block arch externally, when the lintel component is installed in a wall.

[0105] In Fig. 15 the plurality of facing blocks 1501 are shown having some facing blocks cut away. Between the facing blocks, is provided a spacing, wide enough to accept a mortar cement, for pointing of the facing blocks when installed in a wall.

[0106] Each of the first and second ends comprises an 'open trough shaped beam', wherein the first side plate 1502 forms a read upright member, and bricks or block work can be laid in courses on top of the first and second lower end plate 1504, 1505, to secure the lintel in position within an outer course of brick work or block

work of a cavity wall or the like.

[0107] The central arch formed by the upper and lower central plates 1506, 1507, and the first and second side plates 1502, 1509 is capable of bearing loading of courses of block work built above the lintel. The whole lintel structure is load bearing and the facing blocks are fixed directly to the second side plate, which is load bearing.

[0108] Referring to Fig. 16 herein, there is illustrated schematically a fifth lintel according to a fifth specific embodiment of the present invention.

[0109] The fifth lintel comprises an elongate box section beam, curved into an arch 1601; and a plurality of facing blocks 1602 fixed to the beam. The facing blocks are fixed to the beam using a polyurethane adhesive, or like adhesive such as described herein before.

[0110] The beam comprises a first side plate of substantially flat metal sheet, cut in an arcuate shape, having first and second ends, at a first end having a first curved portion 1603 which curves between the arcuate portion, and an upright portion 1604, and at a second end, a second curved portion 1605 which extends between the arcuate portion 1602 and a second upright portion 1606. The upright portions, curver portions are arcuate portion are all of a box section, having a first upright side spaced apart from the first upright side with a cavity there between; an upper plate; and a lower plate.

[0111] The plurality of facing blocks 1602 are cut to shape before fitment to the third lintel, and are fixed to the lintel, by means of adhesive. Metal sheeting comprising the first plate, second plate, upper plate, and lower plate, may be provided with a plurality of through apertures. The through apertures provide two functions, including providing a surface which the adhesive can seep through, to provide grater adherence of the facing blocks to the second side plate, and secondly, to reduce the weight of the overall structure.

[0112] The third lintel is a load bearing structure, capable of carrying block work or brick work across its span, when installed in a wall. Typically, the third lintel may be used for larger dimensioned spans in domestic or commercial buildings, for example spans of the order 3 to 5 metres width, although the third lintel is not restricted to spans in this range.

[0113] Referring to Fig. 17 herein, there is illustrated schematically a first sill according to a sixth specific embodiment of the present invention. The first sill 1700 comprises a structural beam component 1701; and a plurality of facing blocks 1702 shaped to fit the beam component; the plurality of facing blocks fixed to the beam component.

[0114] The beam component comprises a central elongate plate 1703 extending along a length of the beam; a first side plate 1704 extending substantially parallel to the length of the upper plate; a second side plate 1705 extending parallel and spaced apart from the first side plate, and extending along a second edge of the upper plate. The first side plate is fixed to a first edge 1706 of the upper side plate, and the second side plate is fixed along a second edge 1707 of the centre plate. The first and second edges run substantially parallel to each other.

[0115] The beam may be manufactured from a single sheet of metal by cutting a rectangular shaped metal sheet, and provided first and second bends substantially parallel to each other, wherein the central plate portion lies between the first and second bends, and a region between the first bend and a first outer periphery 1708 of the plate comprises the first side plate, and a region between the second bend and a second outer periphery 1709 of the metal plate comprises a second side plate.

[0116] The beam is a structural component, capable of bearing loads. The plurality of facing blocks are shaped such that they fit around the metal beam, covering both the centre plate, the first side plate and the second side plate. Spacings are provided between each of the facing blocks, in order for mortar cement to be pointed between the facing blocks in use.

[0117] In an installation of the first sill into an aperture, at a lower edge of the aperture, for example a window aperture, the sill is placed over or on top of a course work of bricks and/or breeze blocks or other wall blocks or wall structure, as such that the facing blocks provide a substantially horizontal surface, which can then be pointed, in order to provide a decorate sill, giving the appearance that the sill is made of individual block components, the beam member being hidden from view in use.

[0118] Referring to Fig. 18 herein, there is illustrated schematically a second sill component 1800 according to a seventh specific embodiment of the present invention. The first sill comprises a structural beam component 1801; and a plurality of facing blocks 1802 shaped to fit the beam component; the plurality of facing blocks fixed to the beam component.

[0119] The beam component comprises a central elongate upper plate 1803 extending along a length of the beam; a first side plate 1804 extending substantially parallel to the length of the upper plate and extending along a first edge of the upper plate; a second side plate 1804 extending parallel and spaced apart from the first side plate, and extending along a second edge of the upper plate. The first side plate is fixed to a first edge of the upper side plate, and the second side plate is fixed along a second edge of the centre plate where the first and second edges run substantially parallel to each other. The beam further comprises a lower central plate 1806, which runs underneath and spaced apart from the upper central plate 1803, the first side plate, second side plate, upper central plate, and lower central plate forming a tubular box section, of substantially rectangular cross section; a first edge 1807 of the lower plate joining a lower periphery of the first side plate to the lower central plate; and a second edge 1808 of the lower central plate joining lower periphery of the second side plate to

the central lower plate.

[0120] The lower central plate 1806, and part of the first side wall 1804, and part of the second side wall 1805 maybe similarly formed from a single metal sheet bent along lower edges 1807, 1808, such that the upper central plate 1803 and the lower central plate 1806 each form a substantially 'U' shaped trough, and the beam is formed by locating the two troughs opposite each other to form a rectangular box section beam, and spot welding the first and second metal sheets together, to form the first side plate and the second side plate.

[0121] The upper plate, and first and second side plates of the beam may be manufactured from a single sheet of metal by cutting a rectangular shaped metal sheet, and provided first and second bends substantially parallel to each other, wherein the upper central plate portion lies between the first and second bends, and a region between the first bend and a first outer periphery of the plate comprises the first side plate, and a region between the second bend and a second outer periphery of the metal plate comprises a second side plate.

[0122] The beam is a structural component, capable of bearing loads. The plurality of facing blocks are shaped such that they fit around the metal beam, covering both the upper centre plate, the first side plate and the second side plate. Spacings are provided between each of the facing blocks, in order for mortar cement to be pointed between the facing blocks in use.

[0123] In an installation of the first sill into an aperture, at a lower edge of the aperture, for example a window aperture, the sill is placed over or on top of a course work of bricks and/or breeze blocks or other wall blocks or wall structure, as such that the facing blocks provide a substantially horizontal surface, which can then be pointed, in order to provide a decorate sill, giving the appearance that the sill is made of individual block components, the beam member being hidden from view in use.

[0124] Referring to Fig. 19 herein, there is illustrated schematically a third sill component according to an eighth specific embodiment of the present invention.

[0125] The third sill component 1900 comprises a load bearing structural beam 1901 and a plurality of facing blocks 1902. The facing blocks are fixed to the beam member using an adhesive, as described hereinbefore with reference to the first embodiment.

[0126] The beam component comprises a central upper plate 1903; running along a first edge of the central upper plate 1903, a first upright side plate 1904; running along the second edge of the central upper plate, a second upright side plate 1905.

[0127] The structural beam component may be formed from a single sheet of metal bent along first and second bend lines which correspond to the first and second edges of the central upper plate 1903. Typically, the metal sheet is of mild steel, having thickness 2mm or greater.

[0128] The block components comprises substantially 'L' shaped blocks each having an upper portion 1906, and angled at 90° to the upper portion, a side portion 1907. The plurality of blocks are arranged in rows along a length of the beam, in each row, there being provided a first block and a second block. The first and second blocks are offset, such that in each row, a first block has an upper portion 1906 of a relatively shorter length, whereas a second block has an upper portion 1908 of a relatively longer length, the overall effect being to provide an effect of block work covering the beam. Gaps are provided between each of the individual facing blocks, in order to fill the blocks with mortar cement pointing when installed.

[0129] The third sill of Fig. 19 herein, may also be placed upright, in order to form a column, for example a column which may be fitted around an upright steel girder, in order to give the girder an appearance of being made of brick work or other block work.

Claims

1. A structural building component for spanning an aperture said component comprising:

a rigid elongate beam; and

at least one facing element for facing a portion of said beam, said at least one facing element fixed directly to said beam.

2. The structural building component as claimed in claim 1, wherein said rigid elongate beam comprises:

a first elongate plate member;

a second elongate plate member extending alongside said first elongate plate member; and

a third elongate plate member extending alongside said first elongate plate member;

wherein said second elongate plate member extends in a plane transverse to a plane of said first elongate plate member; and

said third elongate plate member extends in a plane transverse to said plane of said first elongate plate member.

3. The structural building component as claimed in claim 1 or 2, wherein said rigid elongate beam comprises:

a first elongate plate member, said first elongate plate member having a first edge and a second edge, said first and second edges extending alongside each other and spaced apart

from each other;

a second plate member extending along said first edge of said first plate member and fixed thereto; and

a third plate member extending along said second edge of said first plate member, said third plate member facing opposite said second plate member, said first plate member being disposed there between

4. The structural building component as claimed in any one of the preceding claims, comprising a substantially channel shape.

5. The structural building component as claimed any one of the preceding claims, wherein said rigid elongate beam comprises;

a first elongate edge portion;

a second elongate edge portion facing opposite said first elongate edge portion and spaced apart therefrom; and

a central portion connecting said first and second edge portions;

6. The structural building component as claimed in any one of the preceding claims, further comprising an adhesive material, said adhesive material fixing said at least one facing element to said beam.

7. The structural building component as claimed in claim 6, wherein said adhesive material comprises an adhesive selected from the set:

a polyurethane adhesive;

a styrene butadine rubber adhesive

8. The structural building component as claimed in any one of the preceding claims, wherein;

said rigid elongate beam member comprises at least one rigid metal sheet.

9. The structural building component as claimed in claim 7, wherein said rigid metal sheet is provided with a plurality of through apertures.

10. A structural building component as claimed in any one of the preceding claims, wherein said rigid beam has first and second ends, and at each of said first and second ends is provided a location aperture for receiving a lifting device for lifting said component.

11. The structural building component as claimed in any one the preceding claims, wherein said at least one facing element comprises a brick slip.

12. The structural building component as claimed in any one of the preceding claims, comprising:

a structural building component for spanning an aperture said component comprising:

a rigid elongate beam; and

at least one facing element for facing a portion of said beam, said at east one facing element fixed directly to said beam;

wherein a plurality of facing blocks are arranged directly fixed to said central plate member.

13. The structural building component as claimed in claim 12, wherein said plurality of facing blocks are arranged directly fixed to a surface of said rigid elongate beam substantially covering said surface.

14. The structural building component as claimed in any one of claims 1 to 12 wherein at least one surface of said rigid elongate beam is substantially covered by epoxy paint.

15. The structural building component as claimed in any one of claims 1 to 12 wherein at least one surface of said rigid elongate beam is substantially covered by a powder coat.

16. A building component comprising:

a rigid elongate channel shaped beam capable of supporting a wall; and

a plurality of facing blocks;

wherein said plurality of facing blocks are directly fixed to said beam, and said plurality of facing blocks extend outwardly of said beam.

17. A lintel for a building, said lintel comprising:

an elongate rigid beam member, said beam member comprising,

an upper rigid member;

a lower rigid member;

a first side member connecting said upper and lower rigid members;

said upper and lower rigid members disposed opposite each other and said connecting member disposed there between;

a second side member spaced apart from said

first side member, said second side member connecting said upper and lower rigid members; and at least one facing member, said facing member fixed directly to said rigid beam.

18. The lintel as claimed in claim 17, comprising an adhesive material, for bonding said at least on facing member to said beam.

19. The lintel as claimed in claim 17 or 16, wherein said upper and lower rigid members extend substantially parallel to each other along a length of said beam.

20. The lintel as claimed in any one of claims 17 to 19, wherein in use said first and second side members extend in a substantially upright direction.

21. The lintel as claimed in any one of claims 17 to 20, comprising a plurality of said facing members, said plurality of said facing members arranged externally of said beam and presenting outwardly of said beam.

22. The lintel as claimed in any one of claims 17 to 21, wherein said at least one facing member extends between said upper and lower rigid members.

23. The lintel as claimed in any one of claims 17 to 22, wherein said upper and lower members and said first side member comprises a substantially 'C' shaped channel.

24. The lintel as claimed in any of claims 17 to 23, wherein said second side member comprises;

a central plate member;

an upper lip portion extending along one edge of said central plate member;

a lower lip portion extending along another edge of said central plate member;

25. The lintel as claimed in any one of claims 17 to 24, wherein said beam comprises an arched portion.

26. The lintel as claimed in any one of claims 17 to 25, wherein first and second ends of said second side member are each angled with respect to a main length of said beam.

27. The lintel as claimed in any one of claims 17 to 26, wherein said beam comprises first and second end recesses, each of said first and second recesses suitable for accepting at least one course of block work.

28. A lintel component comprising:

an elongate metal beam member;

a plurality of facing blocks fixed directly to an outer surface of said elongate beam member,

wherein said elongate beam member comprises:

a first end portion comprising a first upper end plate, a first lower end plate and a side plate connecting said upper and lower end plates;

a second end portion comprising a second upper end plate, and a second lower end plate, said side plate extending there between;

a central box section, said central box section extending between said first and second end sections;

wherein said central box section extends to form an arch.

29. A sill component for extending across an aperture in a building, said sill component comprising:

an elongate beam member; and

a plurality of facing blocks fixed directly to said elongate beam member

30. The sill as claimed in claim 29, wherein said beam member comprises:

a elongate central plate;

a first elongate side plate, and a second elongate side plate; said first and second elongate side plates extending along a length of said elongate central plate; and

said first and second elongate side plates facing opposite each other on opposite sides of said elongate central plate.

31. The sill as claimed in claim 29 or 30, wherein:

a plurality of facing blocks extend around an outer surface of said first side plate member, said central plate member, and said second side plate member.

32. The sill as claimed in any one of claims 29 to 31, comprising:

a plurality of rows of facing blocks, extending along a length of said beam member, a first said row of said facing blocks covering said first side plate and a portion of said central upper plates; and

a second said row of said facing blocks covering said side plate and a second portion of said central plate.

33. The sill as claimed in any one of claims 29 to 32, wherein:

said beam member comprises a substantially tubular, rectangular box section.

34. A method of construction of a structural building component, said method comprising;

forming a metal beam member;

forming a plurality of facing blocks, in a shape which closely fits said beam member; and

fixing said plurality of facing blocks directly to an outer facing surface of said beam member.

35. The method as claimed in claim 34, wherein said step of forming a beam member comprises:

forming a single sheet material into a substantially 'C' shaped channel.

36. The method as claimed in claim 34 or 35, wherein said step of fixing said plurality of facing blocks to said beam comprises:

applying an adhesive material between said plurality of facing blocks and said beam, such that said adhesive material adheres said plurality of facing blocks to said beam.

37. The method as claimed in any one of claims 34 to 36, wherein said plurality of facing blocks are shaped so as to fit externally around said beam.

38. The method as claimed in any of one of claims 34 to 37, wherein said step of forming a metal beam comprises:

folding a sheet of metal along first and second bend lines so as to create;

a central connecting portion;

an upper peripheral portion; and

a lower peripheral portion,

wherein said upper and lower peripheral portions face oppositely each other, said connecting portion being disposed there between and connecting said upper and lower peripheral portions.

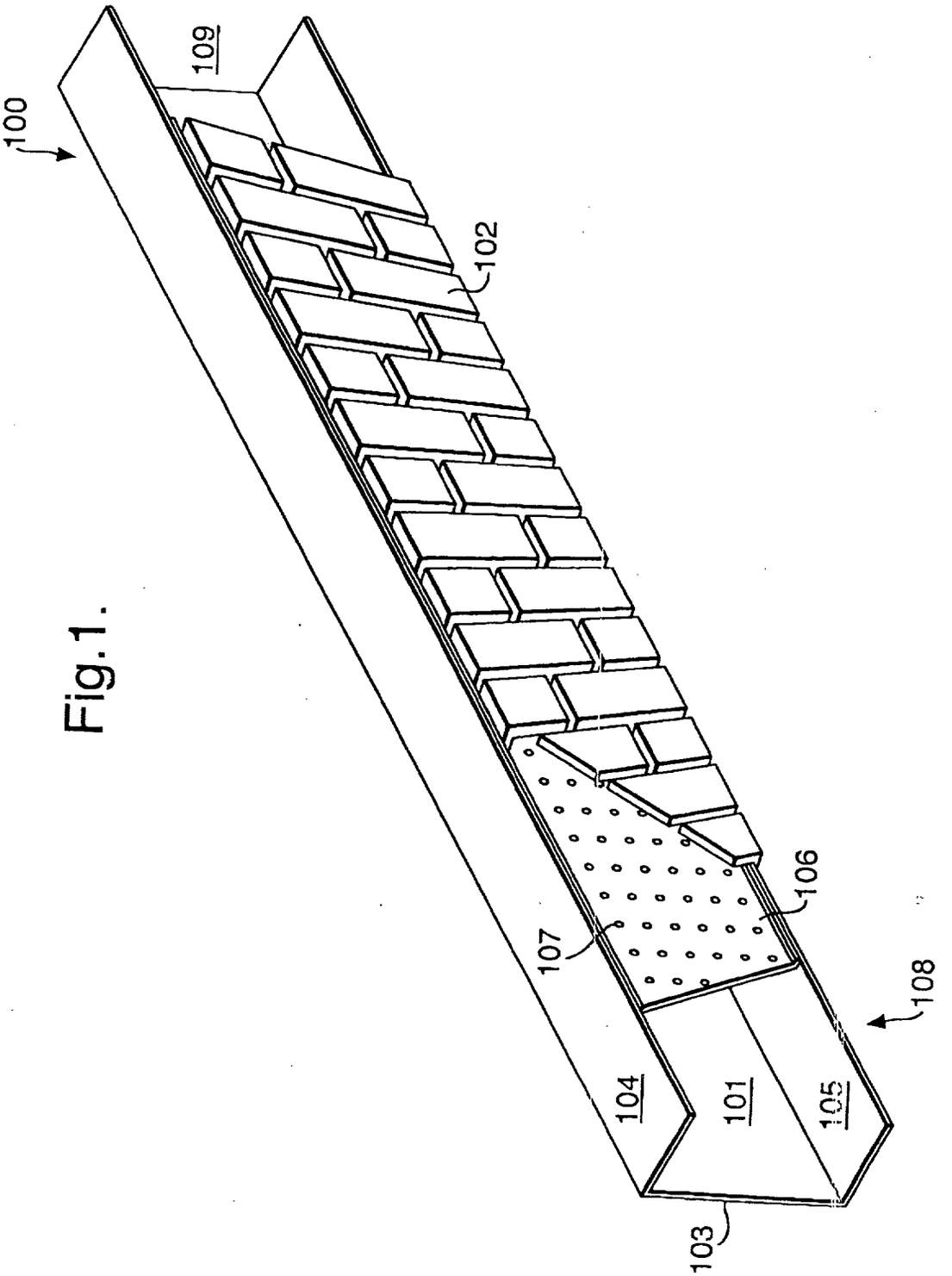


Fig.1.

Fig.2.

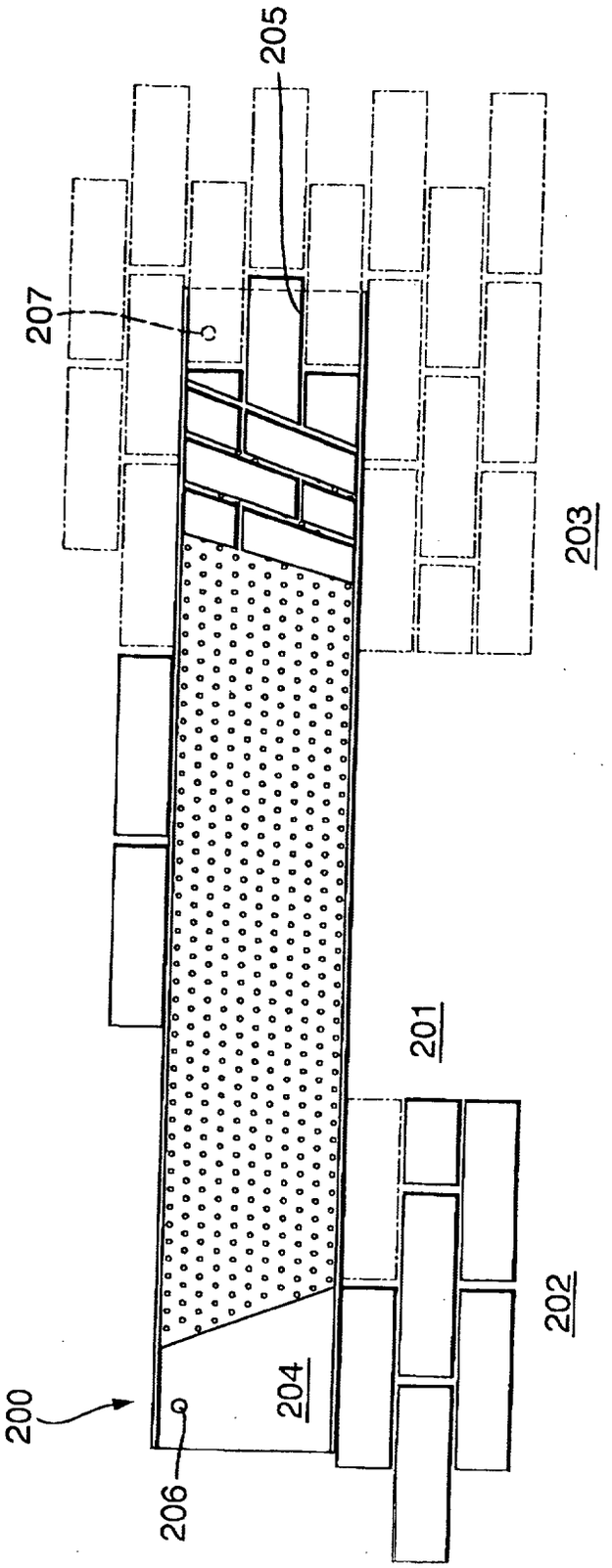


Fig.3.

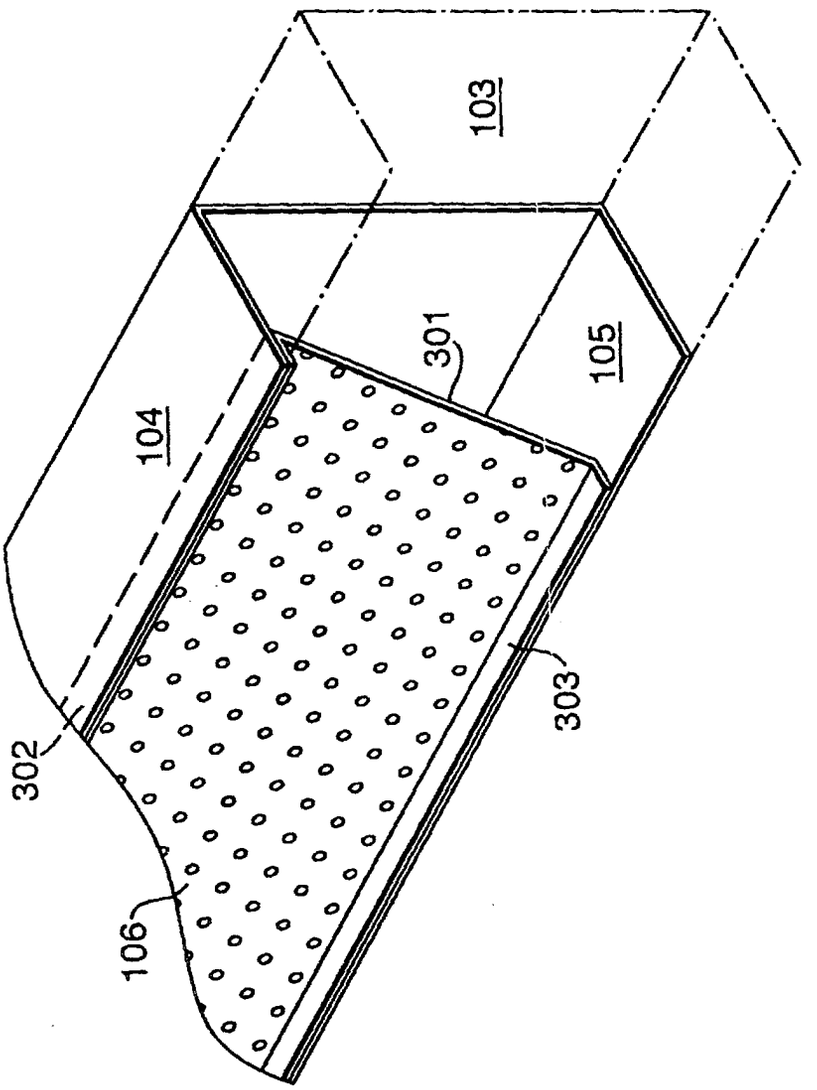


Fig.4.

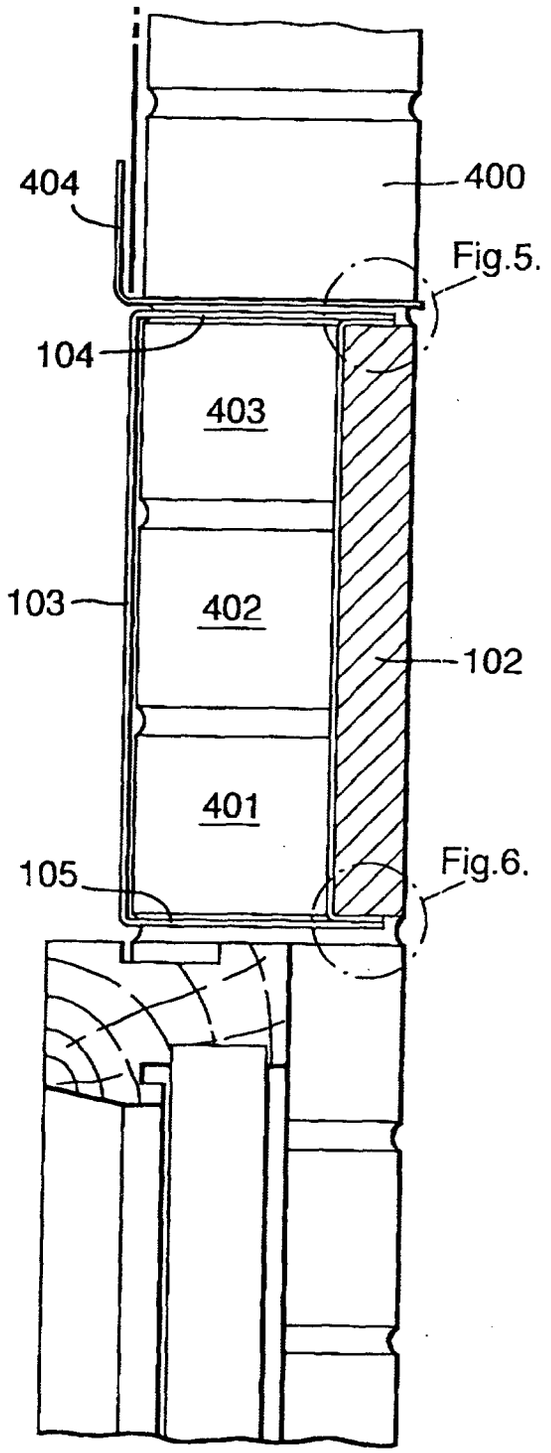


Fig.5.

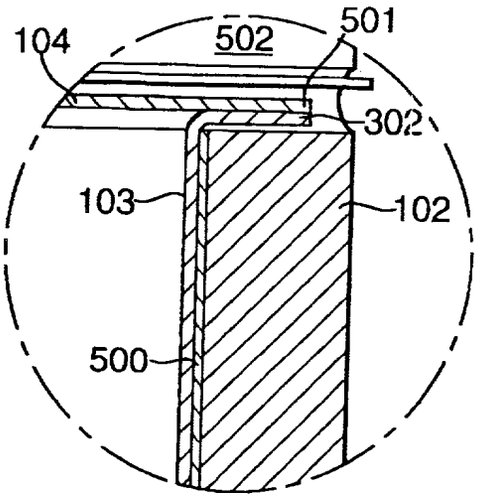


Fig.6.

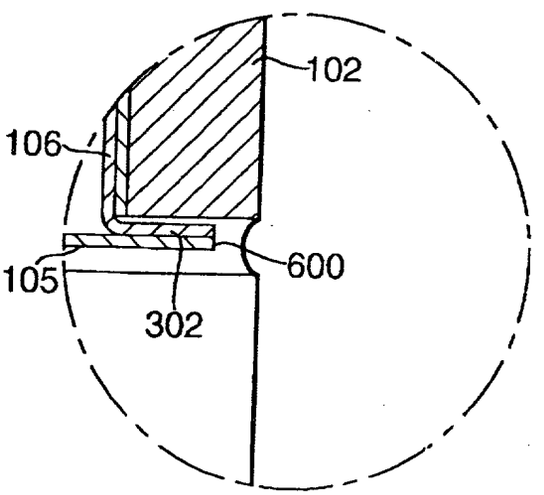


Fig.7.

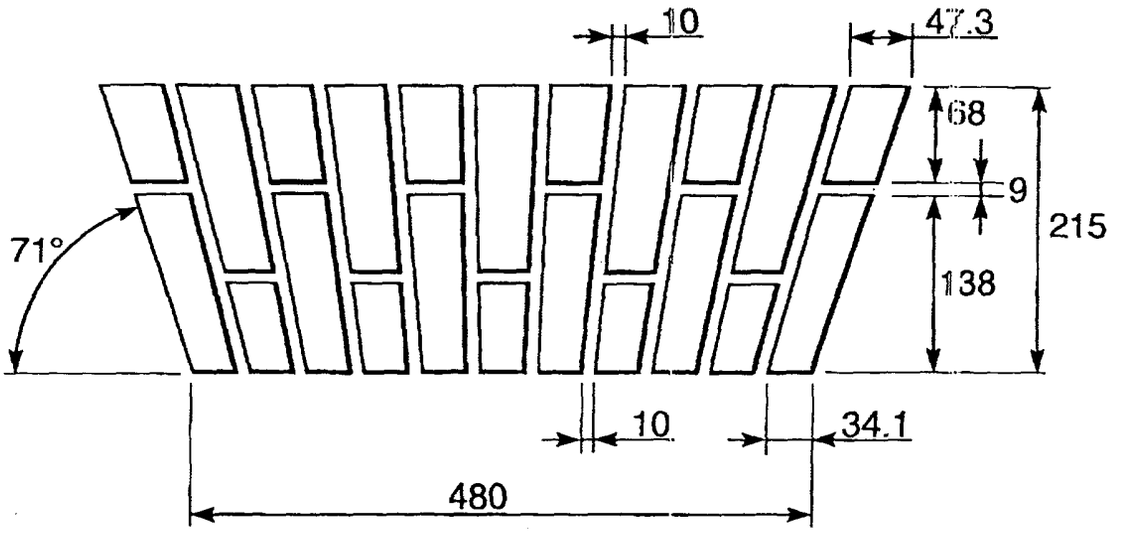


Fig.8.

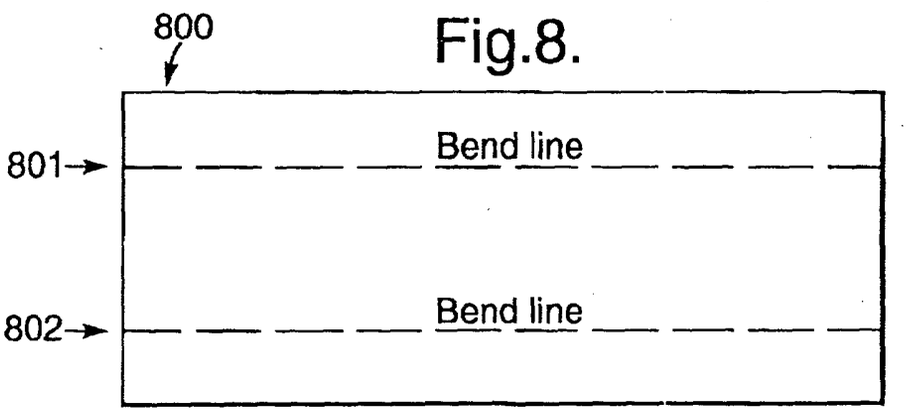


Fig.9.

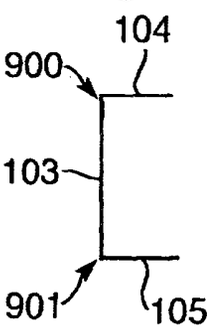


Fig.10.

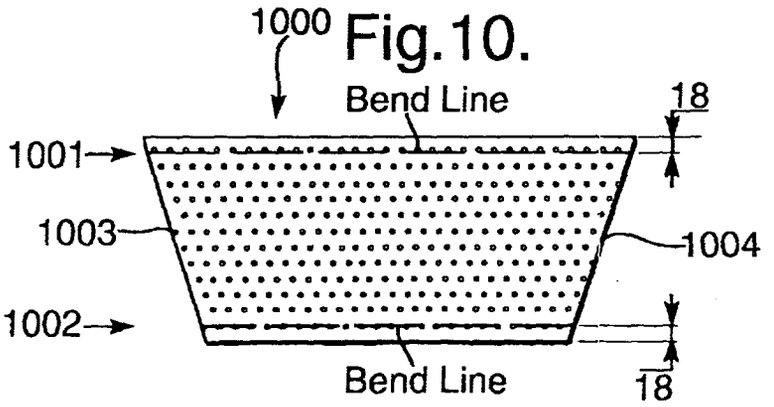


Fig.11.

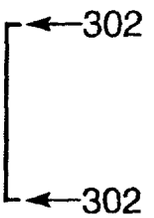
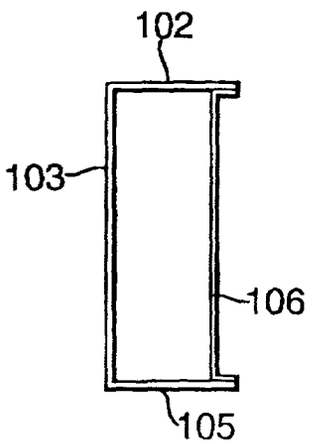


Fig.12.



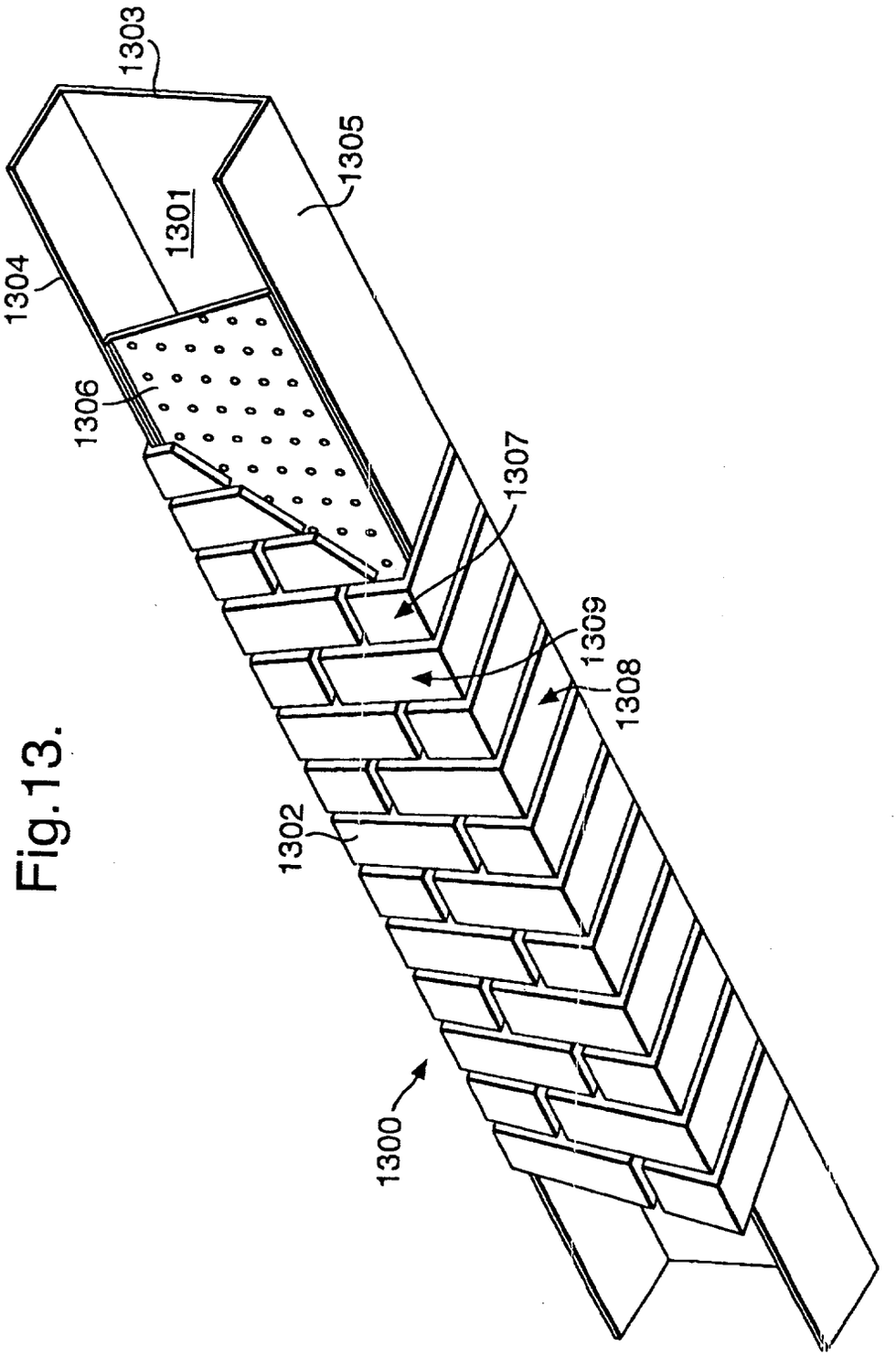


Fig.13.

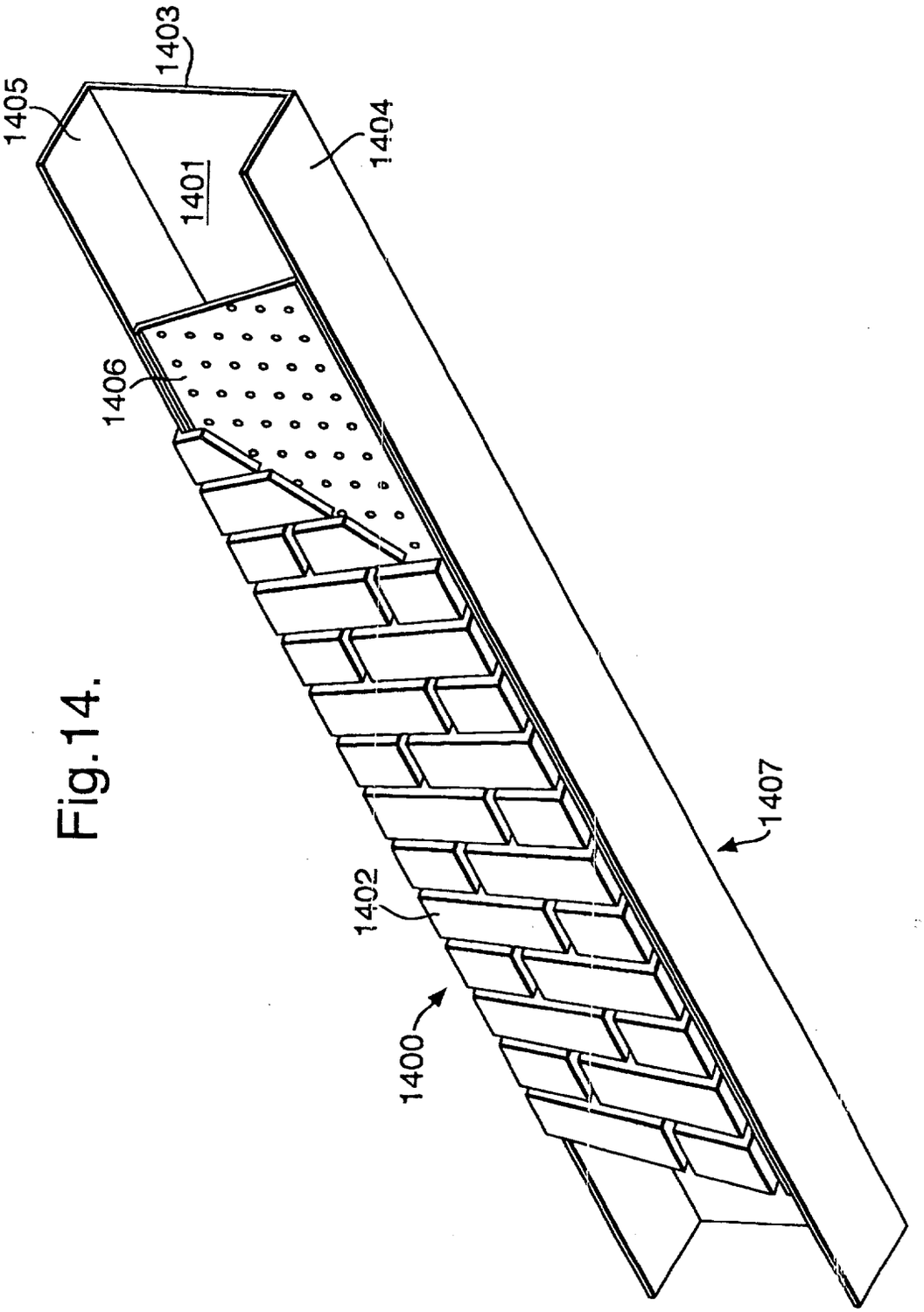


Fig.14.

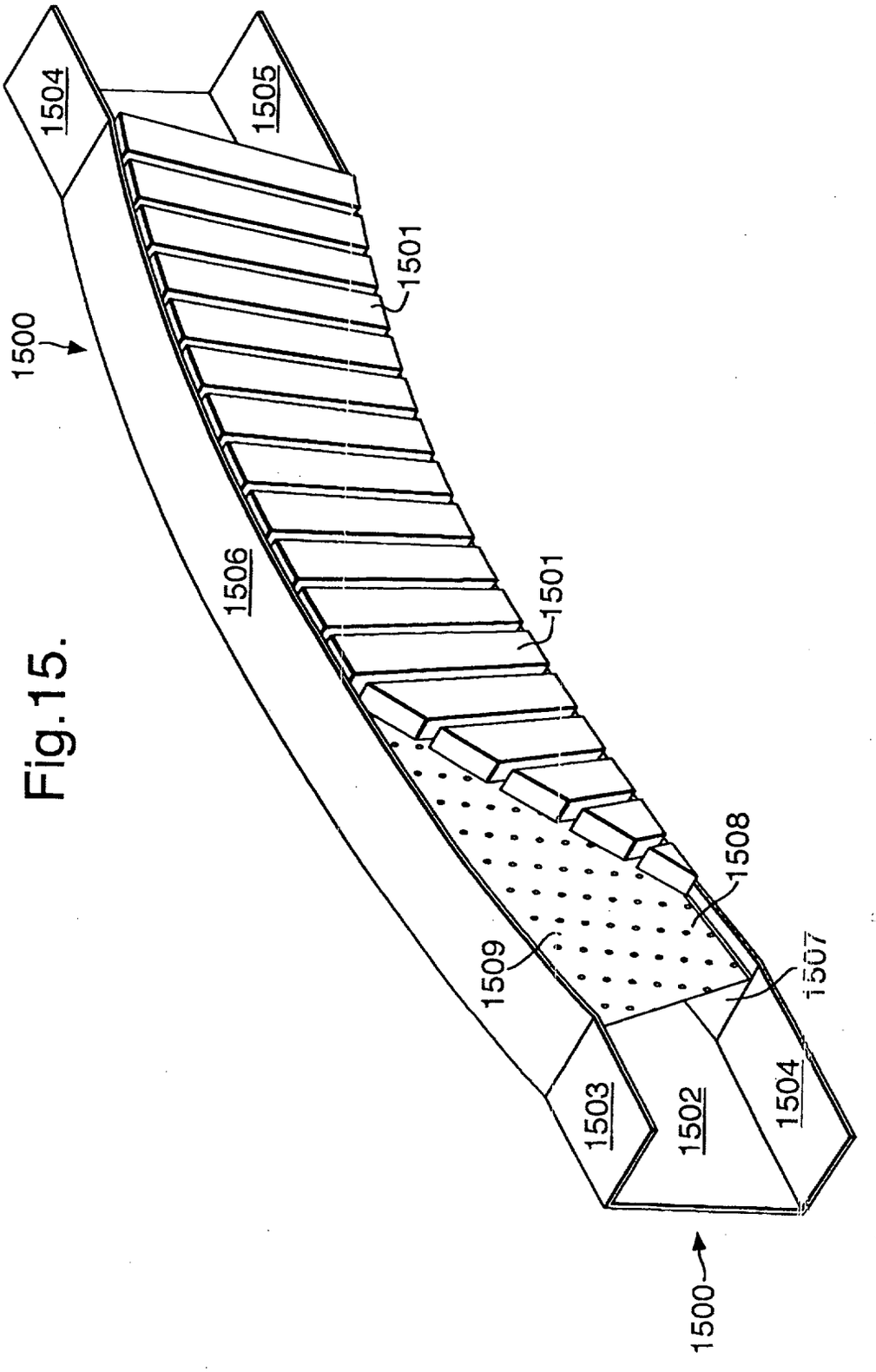

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Fig.15.

Fig.16.

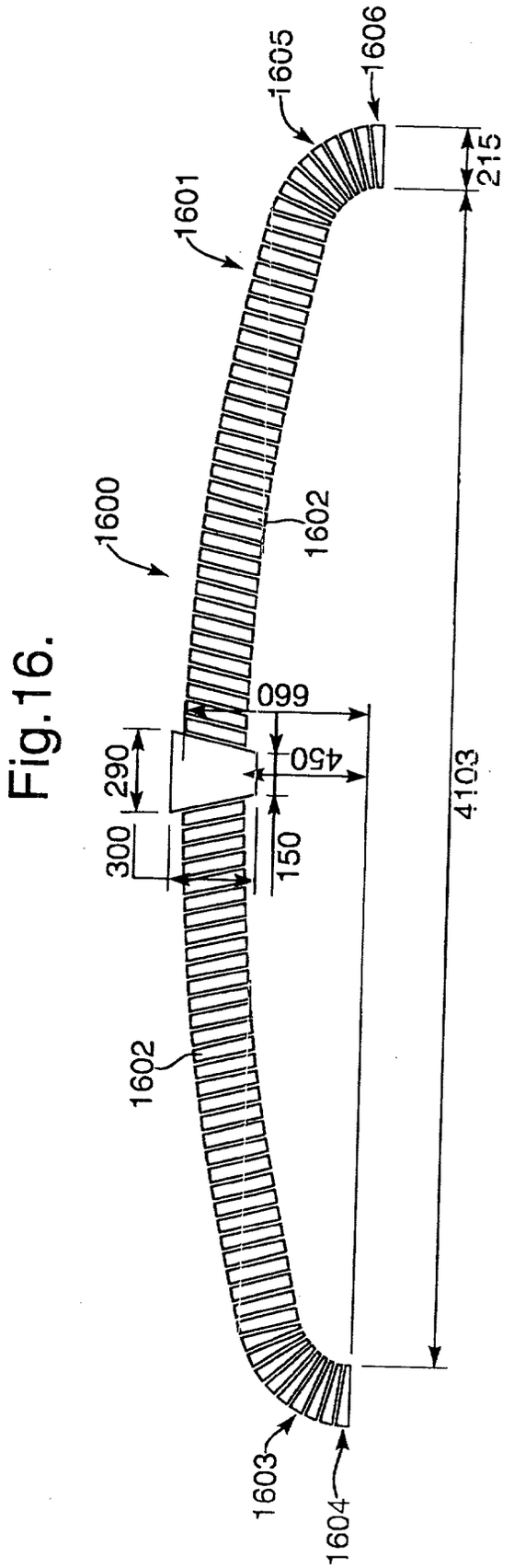
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Fig.17.

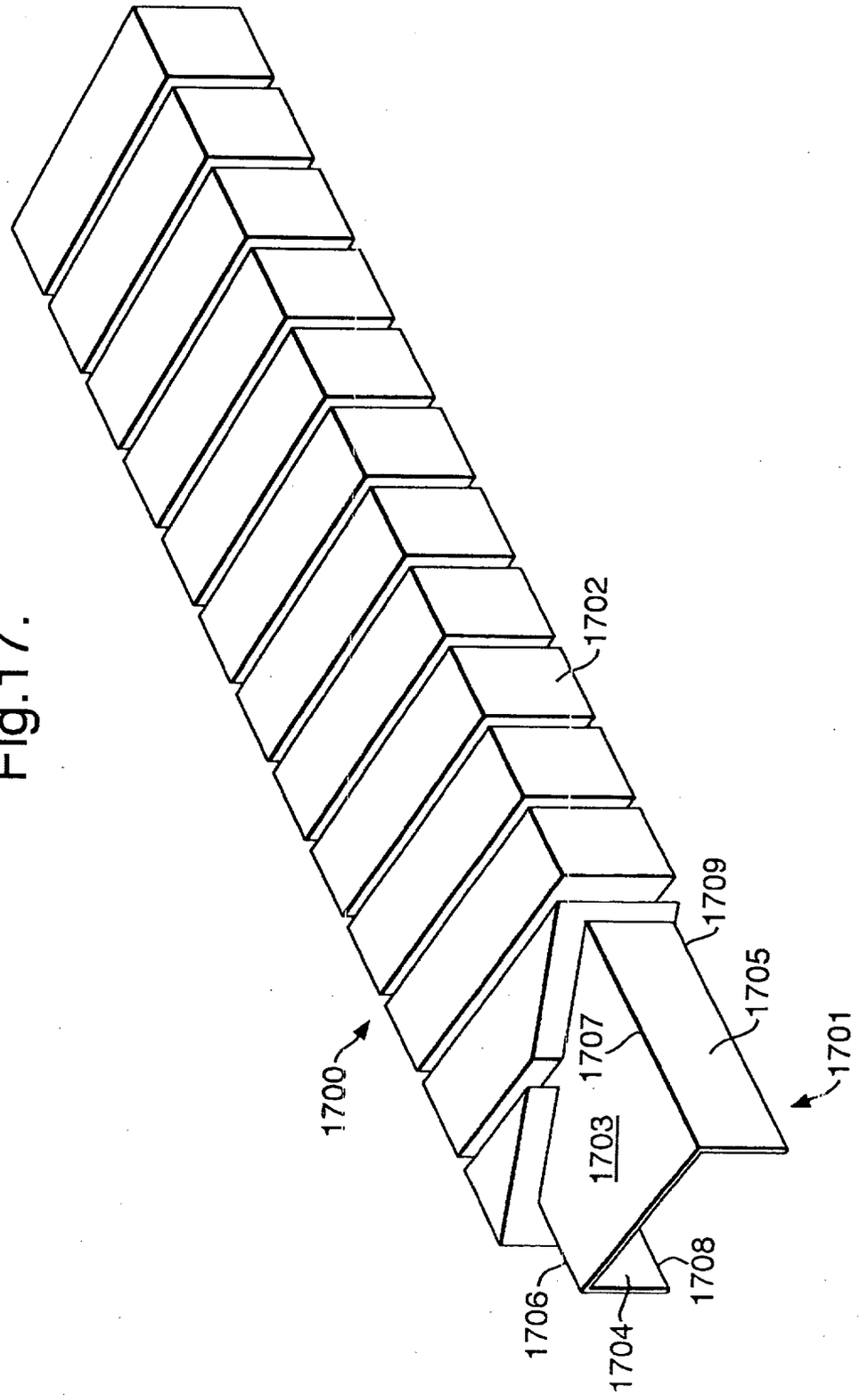


Fig.18.

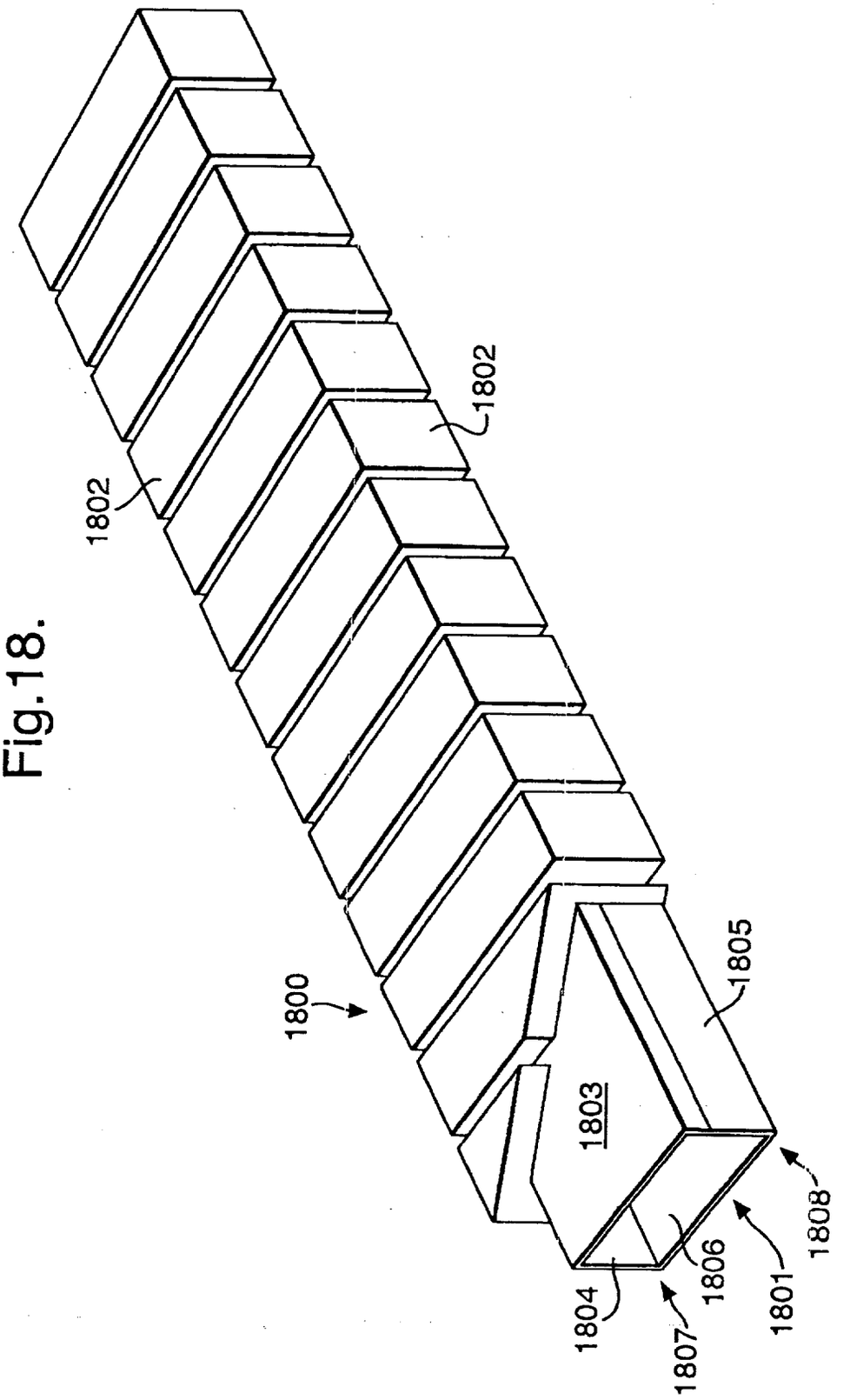
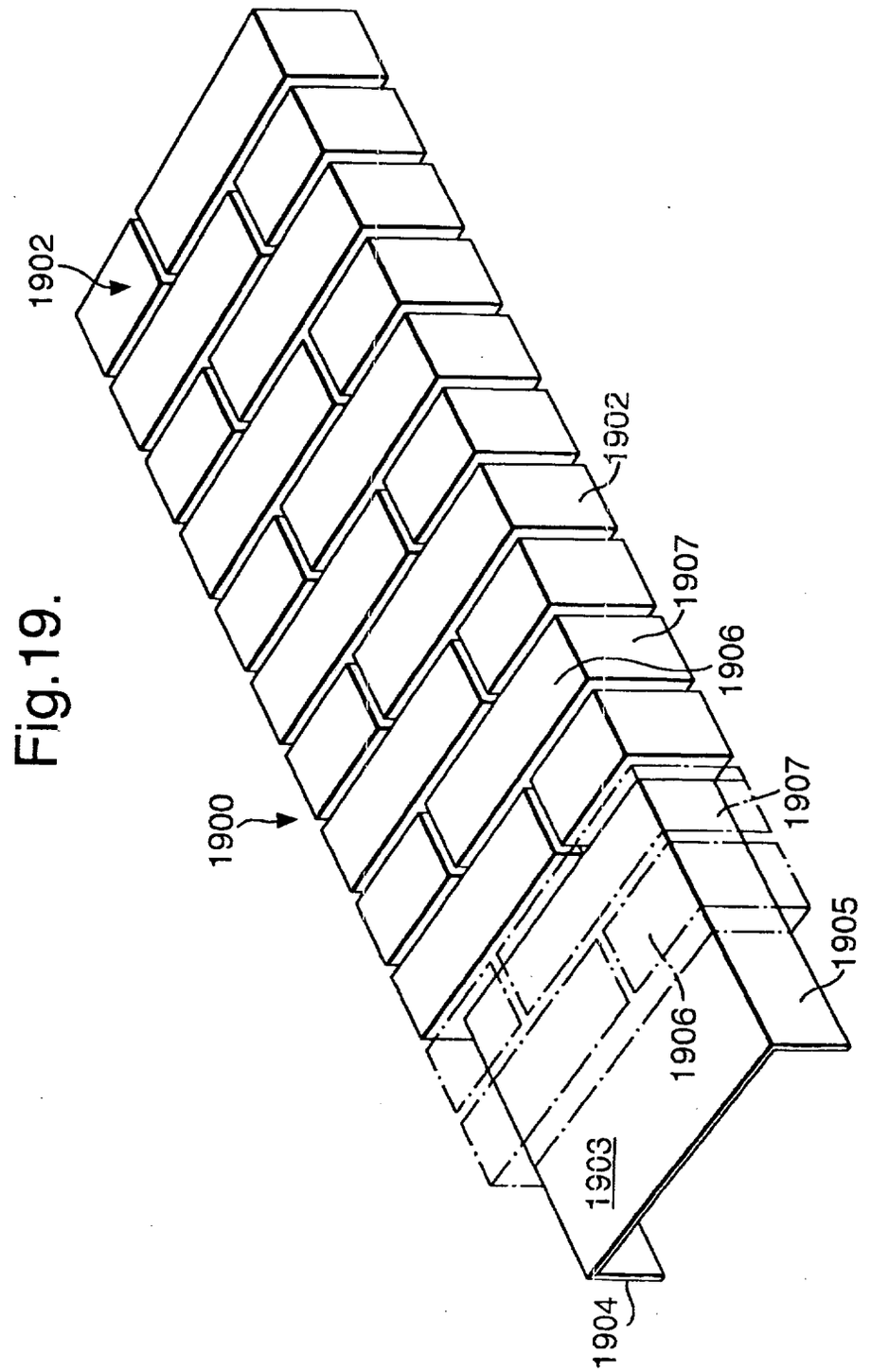


Fig.19.



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E06B
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 July 2003	Demeester, J

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