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(54) **COLUMN HUNG TRUSS SYSTEM**

AN DEN STÜTZEN HÄNGENDES FACHWERKSYSTEM

SYSTEME DE TREILLIS MONTE SUR COLONNE

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Description

FIELD OF THE INVENTION

[0001] The present application relates to truss systems used in the construction industry, and in particular, relates to a column hung truss system for forming of concrete floors.

BACKGROUND OF THE INVENTION

[0002] Flying form trusses are used to form concrete floors in multi-story structures. Some flying form truss systems transmit the poured concrete load directly to the floor slabs below and in fast construction cycles, the concrete floor below may not be fully cured. For this reason, reshoring of the lower concrete floor may be necessary to transmit the loads to a slab which is fully cured. Reshoring takes additional time and also limits the access to some lower levels which are effectively cured.

[0003] To overcome the above problems, it is known to use column mounted flying form truss systems designed to transfer the concrete load to the columns as opposed to the lower floors. Column mounted truss systems allow full access to the lower floors and the follow-up trades can be working on any floors which have been previously poured. With this arrangement, the construction cycle can be reduced.

[0004] Column mounted flying truss systems are most commonly used with flat slab construction but can accommodate shallow internal beams and spandrel beams. Any projection from the slab soffit increases the stripping distance the support jacks must lower the truss to allow removal.

[0005] Flying form systems typically use two large I-beams which run parallel to the building support columns with the I-beams being supported by shoring jacks secured to the columns. The shoring jacks are adjustable in height and typically have a roller associated therewith to allow lowering of the I-beams and sliding of the truss out of the formed bay. These I-beams have a series of transverse beams secured to and extending perpendicular to the I-beams. A series of runner beams which typically support a plywood deck are secured and extend perpendicular to the transverse beams.

[0006] An I-sectioned light metal girder is disclosed in GB 2 036 150 A.

[0007] The construction design of the building in combination with the expertise of the contractor typically determine.whether a column hung truss system or a shoring frame truss system will be used. Column hung truss systems are often used for condominium and hotel construction, particularly when a short construction schedule is needed.

[0008] The transverse beams are of a length which is primarily determined by the width of the bays used in the building. The bay width is the distance between the columns. Surprisingly the bay width of different buildings varies substantially and thus different lengths of transverse beams are required. It is known to use composite transverse beams formed using L-shaped sections, see e.g. DE 1 434 335 B, or U-shaped channel sections placed in back to back relationship and secured in an overlapping adjustable manner. Typically mechanical fasteners are used to secure the channels to form the appropriate length of transverse beams. It is desirable to produce relatively stiff transverse beams such that the spacing between the beams can be large, thereby reducing the number of transverse beams required and reduce the weight of the system. It is desirable that the overall weight of the flying truss be reduced to ease the movement thereof and to accommodate the crane capacity used for the building construction.

[0009] The present invention provides improvements to the transverse beams and improvements to truss systems used in concrete forming.

SUMMARY OF THE INVENTION

[0010] An extruded elongate metal component according to the present invention comprises in cross section, a hollow section having a top securing section, first and second opposed side securing sections and a bottom securing section. The top securing section includes a recessed bolt slot extending the length of the structural component. The side sections have complimentary shapes with the first side securing section including a recess extending the length of the structural component, the second side securing section includes a projecting section sized for snug receipt in the recess of first side section. The bottom securing section includes at least one downwardly projecting securing flange extending the length of the structural component.

[0011] According to an aspect of the invention, the extruded elongate structural component is an extruded aluminum alloy component.

[0012] In a further aspect of the invention, the hollow section of the structural component is of a generally rectangular cross section.

[0013] In yet a further aspect of the invention, each side section has a series of holes extending therethrough and aligned with the holes through the other side section.

[0014] In yet a further aspect of the invention, the at least one downwardly projecting securing flange is two downwardly projecting securing flanges disposed in parallel relationship either side of the center line of the bottom section.

[0015] In yet a further aspect of the invention, the securing flanges include a series of securing holes passing therethrough and spaced in the length of the structural component.

[0016] In yet a further aspect of the invention, the recess in the first side section is a shallow U-shaped section which dominates the first side section and the projecting section of the side section includes opposed upper and lower shoulders for engaging sides of the shallow U-shaped section.

[0017] An assembled structural beam, according to the present invention, comprises a top chord and a bottom chord which are mechanically connected by a series of diagonal connecting members. The top chord includes on an upper surface, a longitudinally extending bolt slot. The bottom chord includes on a bottom surface, a longitudinally extending bolt slot. Each of the top chord and the bottom chord have two opposed side surfaces with a shallow channel recess in one side extending the length of the chord, and a complementary projection on the opposite side extending the length of the chord and sized for receipt in the shallow channel recess. Each of the top chord and the bottom chord are extruded components and include a securing flange which cooperates with the diagonal connecting members to secure the top chord to the bottom chord.

[0018] In an aspect of the structural beam, vertical connecting members are included.

[0019] In a preferred aspect of the invention, the top chord and the bottom chord of the assembled structural beam are of the same cross section.

[0020] In yet a further aspect of the invention, the chords and the diagonal connecting members are extruded aluminum alloy components.

[0021] In yet a further aspect of the invention, the diagonal connecting members are secured to the chords using mechanical fasteners.

[0022] The present invention is also directed to a header beam which is adjustable in length. The header beam comprises two beam sections secured one to the other in an overlapping manner. Each beam section is an assembled structure having a cop chord, a bottom chord and a series of connecting members secured thereto between. The top chord and the bottom chord of the beams include interfitting surfaces which maintain longitudinal alignment of the beam sections relative to each other. The beam sections further include a series of holes in the top chord and bottom chords and a plurality of structural fasteners passing through aligned holes in the chords which in combination with the interfitting surfaces, mechanically secure the beam sections.

[0023] An adjustable in length header beam according to an aspect of the invention, as each of the beam sections being of the same cross section.

[0024] In yet a further aspect of the invention, the top chord and the bottom chord are of the same cross section.

[0025] In a further aspect of the invention, the chords are formed by extrusion.

[0026] In yet a further aspect of the invention, the header beam is stackable with like header beams with the interfitting surfaces engaging to partially maintain the stack of beams.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Preferred embodiments of the invention are shown in the drawings, wherein:

Figure 1 is a perspective view of the column hung flying truss;
Figure 2 is a side view of the column hung truss;
Figure 3 is a partial perspective view of the column mounted jack;
Figure 4 is a perspective view of a beam section;
Figure 5 is an exploded perspective view of part of a beam section;
Figure 6 is a partial perspective view of a beam section supporting a runner beam;
Figure 7 is a side view of two beam sections secured together;
Figure 8 is a partial perspective view showing the securement of the beam sections;
Figure 9 is a sectional view showing two secured beam sections;
Figure 10 shows details of the column jack;
Figure 11 shows details of a support bracket used to secure the beam sections;
Figure 12 is a side view of a secured transverse beam;
Figure 13 shows details of a secured beam section to the support bracket;
Figure 14 shows two trusses at a support column;
Figure 15 shows further details of the column hung jack.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] Figure 1 schematically shows a bay of a building having the flying truss mounted to the columns in preparation for pouring of a concrete floor. The flying truss 2 has two main beams 4 which extend between columns 12 of the building and are supported by the columns by column mounted jacks 9 mechanically secured to the columns. The bay 11 of the building is generally the space between the columns 12. The main beams 4 have connected to them, a series of transverse beams 6 which are of a composite structure. These transverse beams are generally perpendicular to the main beams 4. A series of runner beams 8 are attached to the upper surface of the transverse beams 6 and support the plywood deck 14. Once the reinforced concrete floor 10 has been poured and partially cured, such that it can support its own weight, the flying truss may be lowered on the column jacks 9 and moved out of the bay in preparation for locating between the columns for pouring of the next floor or an adjacent bay.

[0029] Figure 2 shows the various elements of the flying truss 2 supported within the bay 11 of the building.

[0030] Figure 3 shows various details of the column mounted jack 9, the main beams 4 and the transverse beams 6. As shown, the transverse beams 6 are of a composite design and are of a depth which extends below the main beams 4. The increased depth provides greater stiffness and allows further separation of the transverse beams. The spacing between transverse beams 6 will depend on the concrete load however, this spacing is typically 64 to 108 inches (1 inch = 25,40 mm). This spacing is approximately double the spacing necessary if standard bar joist beams are used to carry the same load. The distance between the aluminum alloy runner beams 8 is 16 to 19 inches depending upon the plywood and the thickness of concrete to be poured.

[0031] As shown in Figure 3, the runner beams 8 are preferably of an I-beam section with a center channel for receiving a nailer strip. In this way, the plywood deck 14 may be secured by screws or nails to the nailer strip located in the runner beams.

[0032] Figure 7 shows details of the composite transverse beam 6. The composite transverse beam is made of two beams resp. beam sections 44 and 46 which are mechanically secured by a series of bolt and nut combinations 48, at the overlapping ends of the two beams. Both the bottom chord and the top chord are mechanically secured using a series of holes in the chord members as generally shown in Figure 9.

[0033] One beam section 44 is shown in Figure 4. This beam section includes a top chord 20, a bottom chord 22 and a series of diagonal bracing members 24 and a series of vertical members 26. Members 24 and 26 are mechanically secured to the top and bottom chords. Each of the chords is of the same structure and has a series of connecting ports resp. holes extending in the length of the chords. These holes pass directly through the chords and are used to mechanically fasten two sections, one to the other.

[0034] A top chord 20 is shown in Figure 6, and has a generally rectangular shaped enclosure resp. hollow section 30, having a top portion resp. section 32 ; opposed side portions resp. sections 34 and 36, and a bottom portion resp. section 38. The top portion 32 includes a longitudinally extending bolt slot 50 used to mechanically fasten the runner beams 8 to the transverse beams 6. The side portion 34 includes an outwardly extending elongate rail resp. projecting section 52 which is sized for receipt in the U-shaped receiving channel resp. recess 54 in the opposite side 36. The bottom portion 38 includes downwardly projecting securing flanges 40 and 42 centered either side of the center line of the chord and uses to mechanically secure the diagonal and vertical connecting members 24 and 26. As shown in Figure 5, the securing flanges 40 and 42 have a series of holes 43 at various points in the length of the chord and is used to fasten the connecting members by means of mechanical fasteners resp. bolts 45.

[0035] The flanges 40 and 42 are positioned inwardly of the sides 34 and 36 with the entire mechanical connection of the connecting members 24 and 26 located in a non interference position when two sections are secured, one to the other, as shown in Figures 7, 8 and 9. The side portions of the enclosure 30 are designed to mate and form a mechanical connection opposing racking of the sections when a load is carried by the transverse beam 6. The projecting rail 52 of one beam section 44 is received in the adjacent, receiving channel 54 of the other chord member. Mechanical fasteners resp. bolts 48 pass through the holes and mechanically secure one beam section to the other beam section to form the transverse beam 6. The length of the transverse beam 6 may be varied by releasing of the mechanical fasteners 48 and moving the sections one to the other until the desired length is achieved. In this way, the transverse beams 6 can be adjusted in length to accommodate different bay widths. This composite structure also allows for salvaging of components if certain portions of the transverse beam are damaged.

[0036] As can be seen, the top and bottom chords are of the identical section and merely reversed in orientation. If damage occurs to either the top chord or the bottom chord, a new chord member can be inserted. It can further be appreciated that damage may have occur to only part of the chord and a portion of the chord may be salvaged for another application.

[0037] Figure 11 and Figure 12 shows details of the bracket 100 used to secure the transverse beams-6 to the main beams 4. The bracket 100 is mechanically secured to the web 3 of the main beam by a nut and bolt connection which passes through the web and passes through holes in the bracket. The transverse beams are mechanically secured to the brackets using the series of holes in the top chord and appropriate holes provided in the bracket 100. A further brace can extend from the bracket to the bottom chord to increase the stability. Furthermore, the bottom chord members of the parallel spaced transverse beams 6 can be tied one to the other using the bolt slot provided in the bottom chord member to provide bracing. This increases the stiffness and stability of the system.

[0038] As shown in Figure 12, the transverse beams 6 are secured to the main beams 4 at a position below the top of the main beams 4. The transverse beams 6 are designed to support the extruded aluminum runner beams 8 which have an overall height of approximately six and one half inches. The upper surface of each runner beam 8 is three and one half inches above the top of the main beams 4. In this way, a series of wooden four-by-fours 110 can be positioned on the main beams 4 and across the main beams 4 to surround the column 12 and provide a support surface for the plywood deck 14 adjacent the column. In this way, the packing around the columns for supporting the concrete floor adjacent the column is relatively simple and straightforward. This aspect is clearly shown in Figure 14.

[0039] The transverse beams 6 are of a design such that the beam sections cooperate with one another along the top and bottom chords to oppose racking of the sections when the beams are loaded. The beam sections are mechanically secured one to the other and allow for ready adjustment in length of the transverse beams. As can be appreciated, for a given building structure, the bay width is essentially constant and therefore, the truss can be used for forming of the bay floor and then repositioned for forming of the floor thereabove. In many cases, the bay sizes will be somewhat standardized and there will be no requirement to vary the length of the transverse beams. In some cases due to the particular building design, the bay width may be somewhat unusual and thus, the transverse beams can be adjusted in length, to allow formation of the truss of appropriate width.

[0040] Details of the column hung jack assemblies are shown in Figure 15. A U-shaped saddle member 120 includes a column engaging plate 122 having two outwardly extending arms 124 and 126. The column engaging plate 122 is mechanically secured to the column using any of the series of holes 128. These holes allow for aligned or offset bolts. The adjustable jack 130 is received between the arms 124 and 126 and has an overlapping top slide plate 132. The jack has a securing flange 134 which cooperates with releasable pins 136 to locate the jack at one of three positions shown in Figure 15. Each position is shown by one of the pair of vertically aligned locking pin ports 138. The jack assembly includes a screw member 140 which can be adjusted by means of the bolt adjustment 142 for raising and lowering of the support plate 144. The support plate 144 engages the lower flange of one of the main beams 4. To allow movement of the truss out of the bay, the jack is adjusted to drop the main beams onto the support rollers 146 and thereafter, the truss may be moved out of the bay and raised to the next level. The column hung jack assembly of Figure 15 allows for minor variation in the spacing of the columns and allows for effective transfer of the loads through the jack to the columns 12.

[0041] It is preferred that the composite structural beams 44 and 46 be made of an extruded aluminum alloy components or similar lightweight high strength component. The top chord and the bottom chord are of the identical structure and the diagonal connecting members and the vertical members are tube members with relatively thick sidewalls which have the holes for connecting of the member to the chords and thinner end walls.

[0042] The transverse beams 6 can be spaced along the main beams 4 anywhere from 64 inches to 108 inches apart. The actual separation of the transverse beams 6 will be determined by the thickness and weight of the slab being poured.

[0043] The flying form truss, due to the large size thereof, is assembled onsite and is dismantled once the building is complete. The individual components are transported to and from the site and between jobs are stored in a construction yard. The transverse composite beams can be stacked sideways, one on top of the other, and interfit to maintain the stack. This stacking is particularly convenient with the individual beam sections. The projecting, elongate rail 52 is received in a U-shaped receiving channel of an adjacent beam section. This stabilizes the stack and is helpful in transportation and storage.

[0044] Although various preferred embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art, that variations may be made thereto without departing from the invention as defined by the appended claims.

Claims

1. An extruded elongate metal structural component comprising in cross, section a hollow section (30) having a top securing section (32), first and second opposed side securing sections (34, 36) and a bottom securing section (38); said top securing section (32) including a recessed bolt slot (50) extending in the length of said structural component; said bottom securing section (38) including at least one in use downwardly projecting securing flange (40, 42) extending in the length of said structural component, **characterised in that** said side sections (34, 36) having complementary shapes with said first side securing section (36) including a recess (54) extending the length of said structural component and said second side securing section (34) including a projecting section (52) sized for snug receipt in said recess (54) of said first side section (36).

2. An extruded elongate structural component as claimed in claim 1 wherein said component is an extruded aluminum alloy component.

3. An extruded elongate structural component as claimed in claim 1 wherein said hollow section (30) is of a generally rectangular cross section.

4. An extruded elongate structural component as claimed in claim 3 wherein each side section (34, 36) has a series holes extending there through and aligned with the holes through the other side section (34, 36).

5. An extruded elongate structural component as claimed in claim 3 wherein said at least one downwardly projecting securing flange (40, 42) is two downwardly projecting securing flanges (40, 42) disposed in parallel relationship either side of a centerline of said bottom section (38).

6. An extruded elongate structural component as claimed in claim 5 wherein said securing flanges (40, 42) include a series of securing holes (43) passing through said flanges (40, 42) and spaced in the length of said structural component.

7. An extruded elongate structural component as claimed in claim 5 wherein said recess (54) of said first side section (36) is of shallow U-haped section which dominates said first side section (36) and said projecting section (52) of said second side section

(34) includes opposed upper and lower shoulders for engaging sides of said shallow U-shaped section.

8. An extruded elongate structural component as claimed in claim 1 wherein said hollow section (30) has a series of connecting ports through the side securing sections (34, 36) with the ports spaced along the length of the structural component.

9. An extruded elongate structural component as claimed in claim 8 wherein said ports are aligned in pairs and each pair forms a passageway through said hollow section (30) perpendicular to said side securing sections (34, 36).

10. An assembled structural beam (44, 46) comprising a top chord (20) and a bottom chord (22) mechanically connected by series of diagonal connecting members (24), where each of said top chord (20) and said bottom chord (22) is of a structure as defined in claim 1.

11. An assembled structural beam as claimed in claim 10 wherein said top chord (20) and said bottom chord (22) are of the same cross section.

12. An assembled structural beam as claimed in claim 11 wherein each of said top chord (20) and said bottom chord (22) have two parallel securing flanges (40, 42) with ends of said diagonal connecting members (24) received between said parallel securing flanges (40, 42).

13. An assembled structural beam as claimed in claim 12 wherein said chords (20, 22) and said diagonal connecting members (24) are extruded aluminum alloy components.

14. An assembled structural beam as claimed in claim 13 wherein said diagonal connecting members (24) are secured to said chords (20, 22) using mechanical fasteners (45).

15. An adjustable in length header beam (6) comprising two structural beams (44, 46) where each structural beam (44, 46) is of a structure as defined in claim 10, said structural beams (44, 46) being secured one to the other in an overlapping manner; said recesses (54) and projecting sections (52) of said top chords (20) and said bottom chords (22) of said structural beams (44, 46) interfitting to maintain alignment, of said structural beams relative to each other, said structural beams (44, 46) further including a series of holes in said top and bottom chords (20, 22) through which a plurality of structural fasteners (48) pass and secure said structural beams (44, 46) one to the other.

16. An adjustable in length header beam (6) as claimed in claim 15 wherein said structural beams (44, 46) are of the same cross section.

17. An adjustable in length header beam (6) as claimed in claim 16 wherein said top chord (20) and said bottom chord (22) are of the same cross section.

18. An adjustable in length header beam (6) as claimed in claim 17 wherein said chords (20, 22) are formed by extrusion.

19. An adjustable in length header beam (6) as claimed in claim 18 wherein said header beam (6) is stackable with like header beams (6) with said interfitting surfaces engaging to partially maintain the stack of beams (6).

Patentansprüche

1. Extrudiertes, längliches metallisches Konstruktionselement, das im Querschnitt ein Hohlprofil (30) mit einem oberen Befestigungsabschnitt (32), ersten und zweiten sich gegenüberliegenden, seitlichen Befestigungsabschnitten (34, 36) und einem unteren Befestigungsabschnitt (38) aufweist, wobei der obere Befestigungsabschnitt (32) eine sich in Längsrichtung des Konstruktionselements erstreckende, hinterschnittene Bolzennut (50) aufweist, und der untere Befestigungsabschnitt (38) mindestens einen im Montagezustand nach unten abstehenden, sich in Längsrichtung des Konstruktionselements erstrekkenden Befestigungsflansch (40,42) aufweist, **dadurch gekennzeichnet, dass** die seitlichen Abschnitte (34, 36) komplementäre Profilierungen haben, wobei der erste seitliche Befestigungsabschnitt (36) eine sich entlang des Konstruktionselements erstreckende Vertiefung (54) und der zweite seitliche Befestigungsabschnitt einen Vorsprungteil (52) aufweist, dessen Größe zur bündigen Aufnahme in die Vertiefung (54) des ersten Seitenabschnitts (36) angepasst ist.

2. Extrudiertes, längliches Konstruktionselement nach Anspruch 1, **dadurch gekennzeichnet, dass** das Konstruktionselement ein extrudiertes Aluminiumlegierungsbauteil ist.

3. Extrudiertes, längliches Konstruktionselement nach Anspruch 1, **dadurch gekennzeichnet, dass** das Hohlprofil (30) im Wesentlichen einen rechteckigen Querschnitt hat.

4. Extrudiertes, längliches Konstruktionselement nach Anspruch 3, **dadurch gekennzeichnet, dass** jeder seitliche Abschnitt (34, 36) eine diesen seitlichen Abschnitt durchgreifende und fluchtend mit den Löchern des anderen seitlichen Abschnitts (34, 36) ausgerichtete Lochreihe aufweist.

5. Extrudiertes, längliches Konstruktionselement nach Anspruch 3, **dadurch gekennzeichnet, dass** der mindestens eine nach unten gerichtete Befestigungsflansch (40,42) aus zwei nach unten gerichteten Befestigungsflanschen (40, 42) besteht, die parallel zueinander, zu jeder Seite einer Mittellinie des unteren Abschnitts (38) angeordnet sind.

6. Extrudiertes, längliches Konstruktionselement nach Anspruch 5, **dadurch gekennzeichnet, dass** die Befestigungsflansche (40, 42) eine Reihe von Befestigungslöchern (43) aufweisen, welche durch die Flansche (40, 42) hindurchreichen und in Längsrichtung des Konstruktionselements voneinander beabstandet sind.

7. Extrudiertes, längliches Konstruktionselement nach Anspruch 5, **dadurch gekennzeichnet, dass** die Vertiefung (54) des ersten seitlichen Abschnitts (36) ein flach U-förmig ausgebildeter Abschnitt ist, welcher den ersten seitlichen Abschnitt (36) dominiert, und dass der Vorsprungteil (52) des zweiten seitlichen Abschnitts gegenüberliegende obere und untere Schultern zum Kuppeln mit Seiten des flachen U-förmigen Abschnitts aufweist.

8. Extrudiertes, längliches Konstruktionselement nach Anspruch 1, **dadurch gekennzeichnet, dass** das Hohlprofil (30) eine Reihe von Verbindungsöffnungen in den seitlichen Befestigungsabschnitten (34, 36) aufweist, wobei die Öffnungen in Längsrichtung der Baugruppe beabstandet voneinander angeordnet sind.

9. Extrudiertes, längliches Konstruktionselement nach Anspruch 8, **dadurch gekennzeichnet, dass** die Öffnungen paarweise angeordnet sind und jedes Paar einen senkrecht zu den seitlichen Befestigungsabschnitten (34, 36) verlaufenden Durchgang durch das Hohlprofil (30) bildet.

10. Zusammengebauter Träger (44, 46) mit einem oberen Gurt (20) und einem unteren Gurt (22), die mechanisch durch eine Reihe von sich diagonal erstreckenden Verbindungselementen (24) miteinander verbunden sind, **dadurch gekennzeichnet, dass** jeweils der obere Gurt (20) und der untere Gurt (22) eine Gestaltung hat, wie in Anspruch 1 definiert.

11. Zusammengebauter Träger nach Anspruch 10, **dadurch gekennzeichnet, dass** der obere Gurt (20) und der untere Gurt (22) dasselbe Querschnittsprofil aufweisen.

12. Zusammengebauter Träger nach Anspruch 11, **dadurch gekennzeichnet, dass** jeweils der obere Gurt (20) und der untere Gurt (22) zwei parallel zueinander verlaufende Befestigungsflansche (40, 42) aufweisen, wobei Enden der diagonalen Verbindungselemente (24) zwischen den parallel verlaufenden Befestigungsflanschen (40, 42) aufgenommen sind.

13. Zusammengebauter Träger nach Anspruch 12, **dadurch gekennzeichnet, dass** die Gurte (20, 22) und die diagonalen Verbindungselemente (24) extrudierte Aluminiumlegierungsbauteile sind.

14. Zusammengebauter Träger nach Anspruch 13, **dadurch gekennzeichnet, dass** die diagonalen Verbindungselemente (24) mittels mechanischer Befestigungselemente (45) mit den Gurten (20, 22) verbunden sind.

15. Längenverstellbarer Unterzug (6) mit zwei Trägern (40, 46), **dadurch gekennzeichnet, dass** jeder der Träger (44, 46) wie in Anspruch 10 definiert aufgebaut ist, die Träger (44, 46) in überlappender Weise aneinander befestigt sind und die Vertiefungen (54) und Vorsprungsteile (52) der oberen Gurte (20) sowie der unteren Gurte (22) der Träger (44, 46) zusammengesteckt sind, um die relative Ausrichtung der Träger zueinander beizubehalten, wobei die Träger (44, 46) ferner Lochreihen in den oberen und unteren Gurten (20, 22) aufweisen und eine Mehrzahl von Befestigungselementen (48) diese durchgreifen und die Träger (44, 46) aneinander befestigen.

16. Längenverstellbarer Unterzug (6) nach Anspruch 15, **dadurch gekennzeichnet, dass** die Träger (44, 46) dasselbe Querschnittsprofil haben.

17. Längenverstellbarer Unterzug (6) nach Anspruch 16, **dadurch gekennzeichnet, dass** der obere Gurt (20) und der untere Gurt (22) dasselbe Querschnittsprofil haben.

18. Längenverstellbarer Unterzug (6) nach Anspruch 17, **dadurch gekennzeichnet, dass** die Gurte (20, 22) durch Extrudieren hergestellt sind.

19. Längenverstellbarer Unterzug (6) nach Anspruch 18, **dadurch gekennzeichnet, dass** der Unterzug (6) mit gleichen Unterzügen (6) stapelbar ist, wobei die zusammensteckbaren Flächen ineinandergreifen, um den Stapel von Unterzügen (6) zusammenzuhalten.

Revendications

1. Composant structurel métallique allongé extrudé comprenant en section transversale une section creuse (30) ayant une section de fixation supérieure (32), des première et deuxième sections de fixation latérales opposées (34, 36) et une section de fixation inférieure (38) ; ladite section de fixation supérieure (32) comprenant une fente de boulon (50) en retrait s'étendant dans la longueur dudit composant structurel ; ladite section de fixation inférieure (38) comprenant au moins une bride de fixation (40, 42) faisant saillie vers le bas à l'usage s'étendant dans la longueur dudit composant structurel, **caractérisé en ce que** lesdites sections latérales (34, 36) présentent des formes complémentaires, ladite première section de fixation latérale (36) comprenant un creux (54) s'étendant dans la longueur dudit composant structurel et ladite deuxième section de fixation latérale (34) comprenant une section en saillie (52) dimensionnée pour une réception parfaite dans ledit creux (54) de ladite première section latérale (36).

2. Composant structurel allongé extrudé selon la revendication 1, dans lequel ledit composant est un composant d'alliage d'aluminium extrudé.

3. Composant structurel allongé extrudé selon la revendication 1 , dans lequel ladite section creuse (30) est d'une section transversale globalement rectangulaire.

4. Composant structurel allongé extrudé selon la revendication 3, dans lequel chaque section latérale (34, 36) comprend une série de trous s'étendant à travers elle et alignés avec les trous à travers l'autre section latérale (34, 36),

5. Composant structurel allongé extrudé selon la revendication 3 dans lequel ladite au moins une bride de fixation faisant saillie vers le bas (40, 42) se présente sous la forme de deux brides de fixation faisant saillie vers le bas (40, 42) disposées en relation parallèle de l'un et l'autre côté d'une ligne centrale de ladite section inférieure (38).

6. Composant structurel allongé extrudé selon la revendication 5. dans lequel lesdites brides de fixation (40, 42) comprennent une série de trous de fixation (43) passant à travers lesdites brides (40, 42) et espacées dans la longueur dudit composant structurel.

7. Composant structurel allongé extrudé selon la revendication 5. clans lequel ledit creux (54) de ladite première section latérale (36) est de section en forme de U peu profond qui domine ladite première section latérale (36) et ladite section en saillie (52) de ladite section latérale (34) comprend des épaulements supérieur et inférieur opposés pour coopérer avec des côtés de ladite section en forme de U peu profond.

8. Composant structurel allongé extrudé selon la revendication 1. dans lequel ladite section creuse (30) comprend une série de ports de raccordement à travers les sections de fixation latérales (34, 36) avec les ports espacés le long de la longueur du composant structurel.

9. Composant structurel allongé extrudé selon la revendication 8. dans lequel lesdits ports sont alignés en paires et chaque paire forme un passage à travers ladite section creuse (30) perpendiculaire aux dites sections de fixation latérales (34, 36).

10. Poutre structurelle assemblée (44, 46) comprenant une membrure supérieure (20) et une membrure inférieure (22) raccordées mécaniquement par une série d'éléments de raccordement diagonaux (24), ou chacune de ladite membrure supérieure (20) et de ladite membrure inférieure (22) est d'une structure selon la revendication 1.

11. Poutre structurelle assemblée selon la revendication 10, dans laquelle ladite membrure supérieure (20) et ladite membrure inférieure (22) présentent la même section transversale.

12. Poutre structurelle assemblée selon la revendication 11, dans laquelle chacune de ladite membrure supérieure (20) et de ladite membrure inférieure (22) comprend deux brides de fixation parallèles (40, 42), les extrémités desdits éléments de raccordement diagonaux (24) étant recues entre lesdites brides de fixation parallèles (40, 42).

13. Poutre structurelle assemblée selon la revendication 12, dans laquelle lesdites membrures (20, 22) et lesdits éléments de raccordement diagonaux (24) sont des composants en alliage d'aluminium extrudé.

14. Poutre structurelle assemblée selon la revendication 13, dans laquelle lesdits éléments de raccordement diagonaux (24) sont fixés aux dites membrures (20, 22) à l'aide d'organes de fixation mécaniques (45).

15. Poutre de chevêtre ajustable en longueur (6) comprenant deux poutres structurelles (44, 46) où chaque poutre structurelle (44, 46) est d'une structure selon la revendication 10, lesdites poutres structurelles (44, 46) étant fixées l'une à l'autre d'une manière chevauchante ; lesdits creux (54) et sections en saillie (42) desdites membrures supérieures (20) et desdites membrures inférieures (22) desdites poutres structurelles (44, 46) s'ajustant entre eux pour maintenir l'alignement desdites poutres structurelles les unes par rapport aux autres, lesdites poutres structurelles (44, 46) comprenant en outre une série de trous dans lesdites membrures supérieure et inférieure (20, 22) à travers lesquels une pluralité de fixations structurelles (48) passent et fixent lesdites poutres structurelles (44, 46) les unes aux autres.

16. Poutre de chevêtre ajustable en longueur (6) selon la revendication 15, dans laquelle lesdites poutres structurelles (44, 46) présentent la même section transversale.

17. Poutre de chevêtre ajustable en longueur (6) selon la, revendication 16, dans laquelle ladite membrure supérieure (20) et ladite membrure inférieure (22) présentent la même section transversale.

18. Poutre de chevêtre ajustable en longueur (6) selon la revendication 17, dans laquelle lesdites membrures (20, 22) sont formées par extrusion.

19. Poutre de chevêtre ajustable en longueur (6) selon la revendication 18, dans laquelle ladite poutre de chevêtre (6) peut être empilée avec des poutres de chevêtre similaires (6), lesdites surfaces à ajustement mutuel coopérant pour maintenir partiellement la pile de poutres (6).

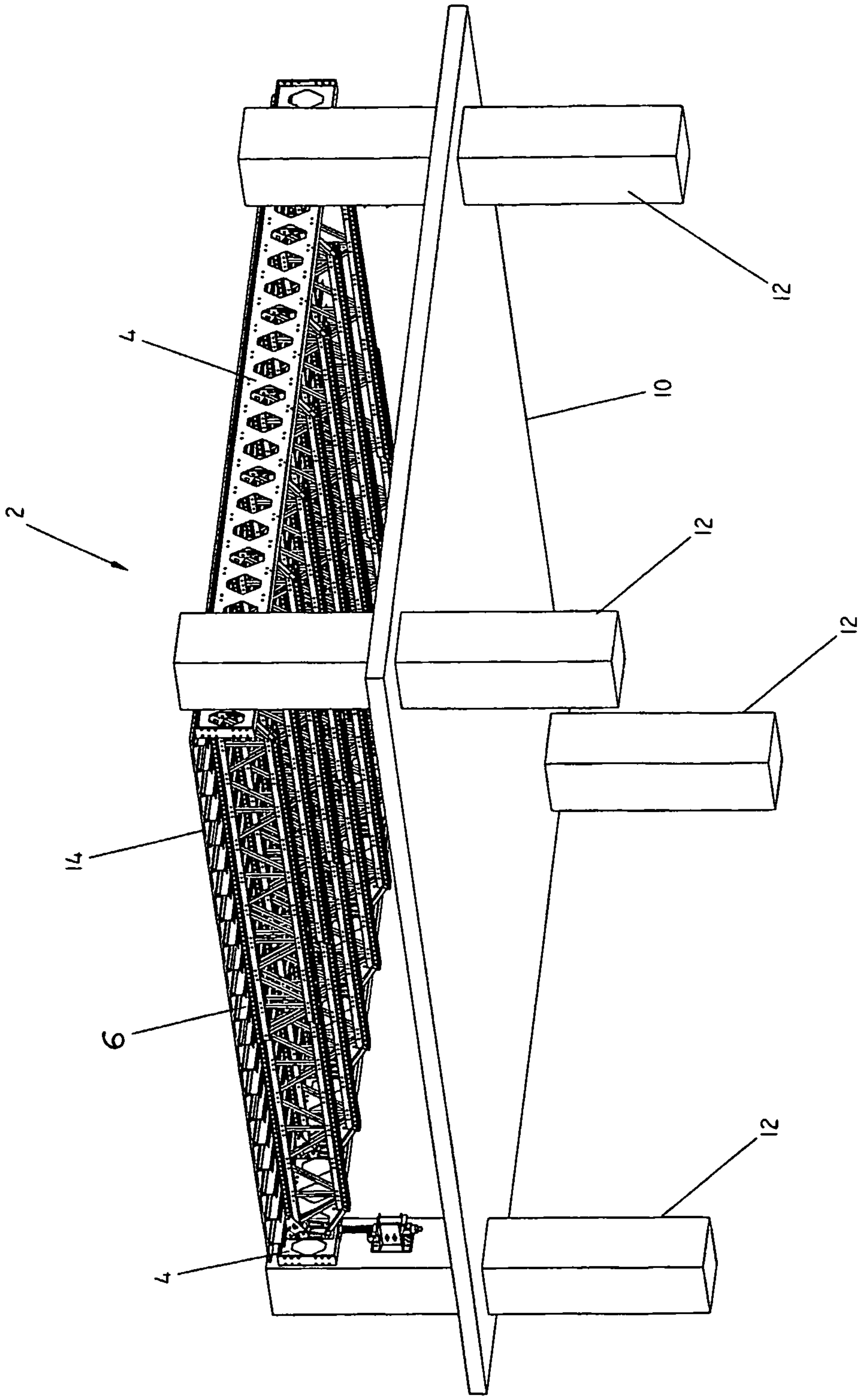


Figure 1

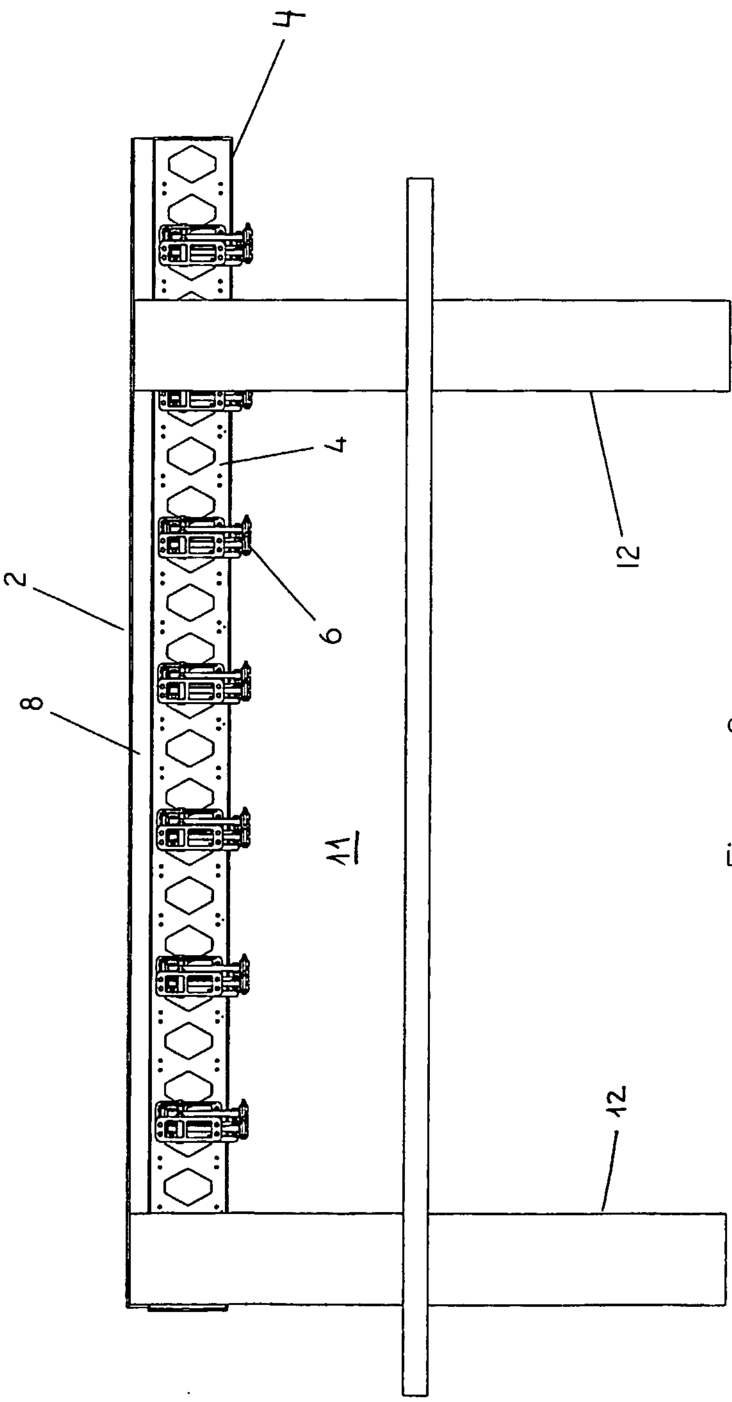


Figure 2

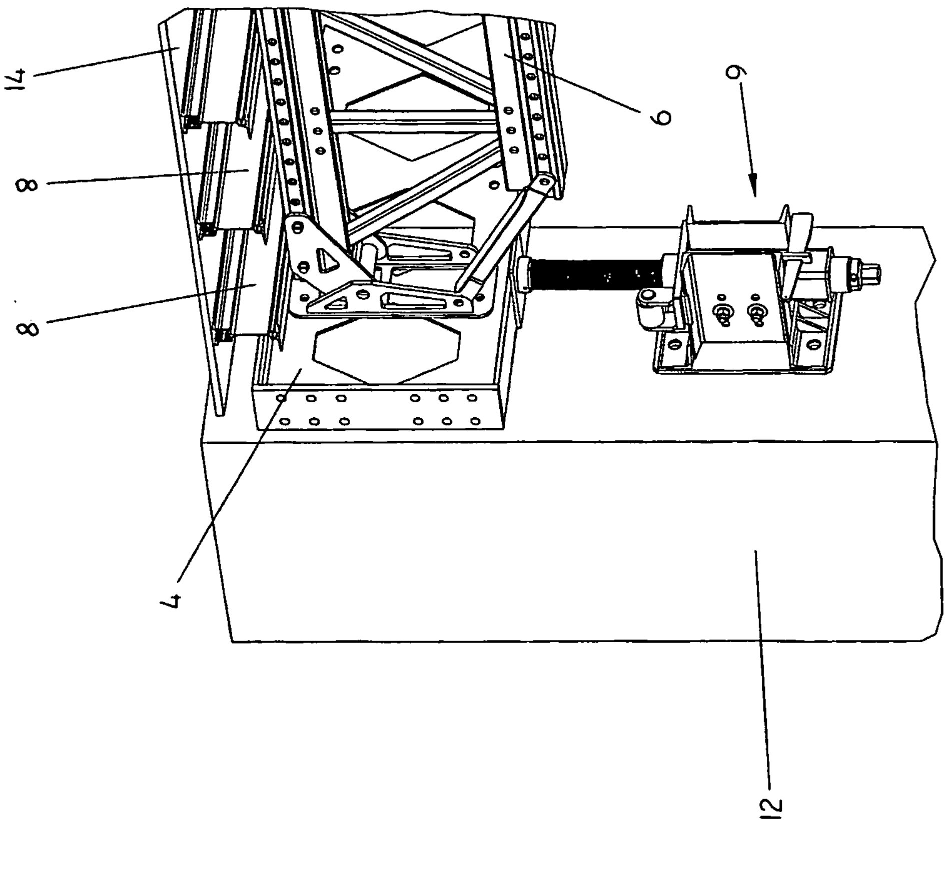
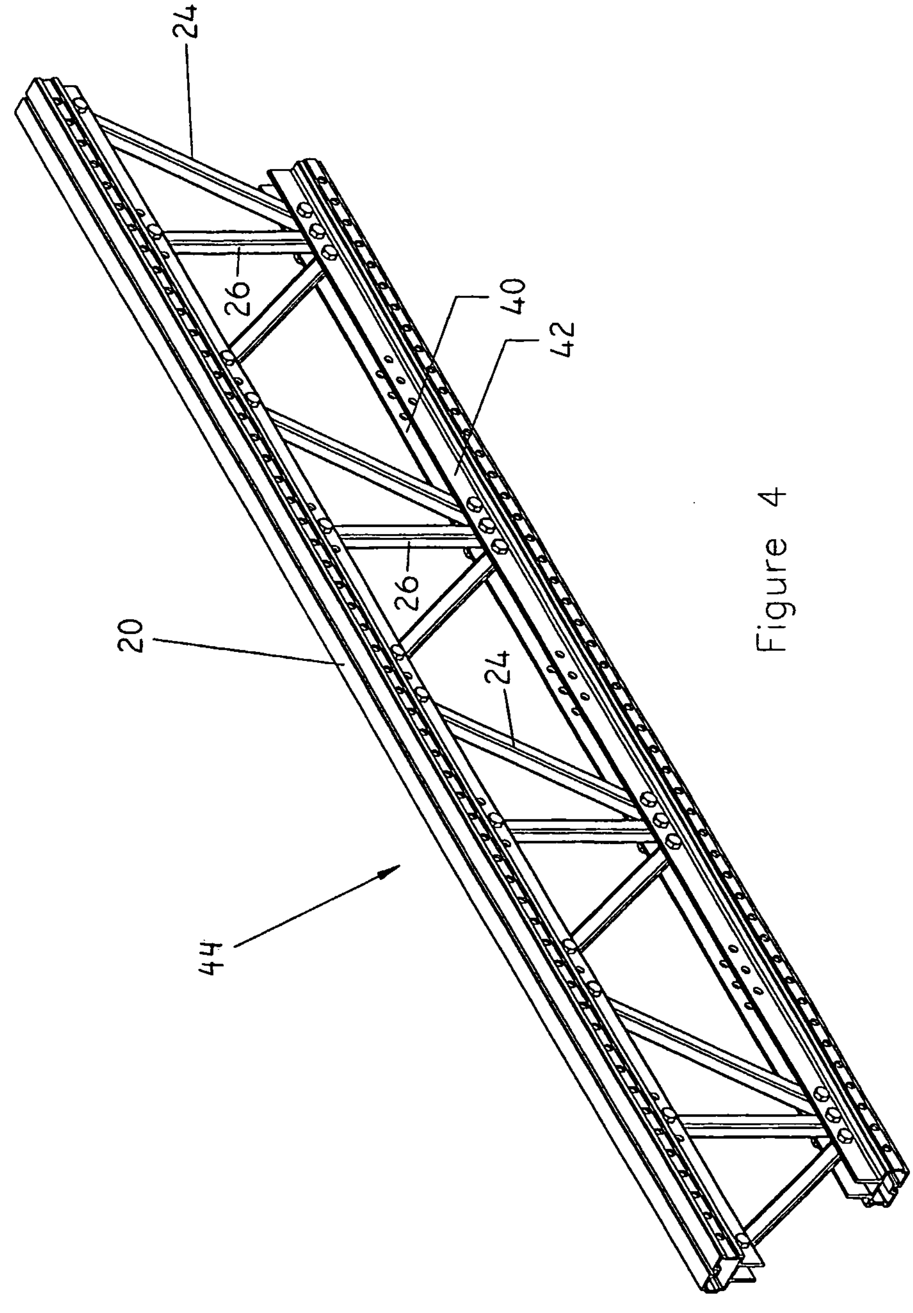


Figure 3



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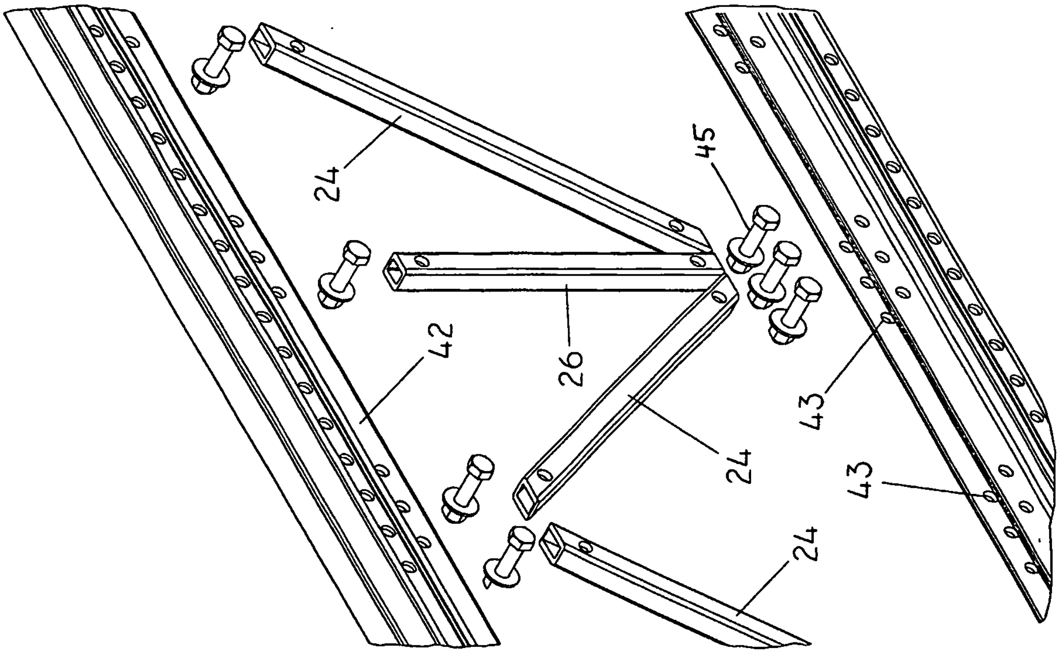

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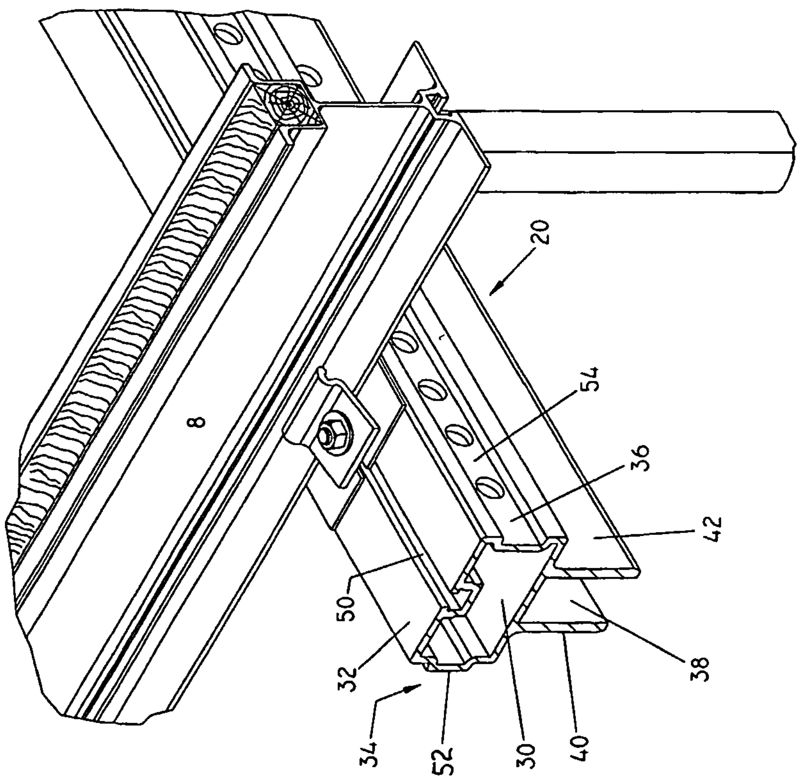

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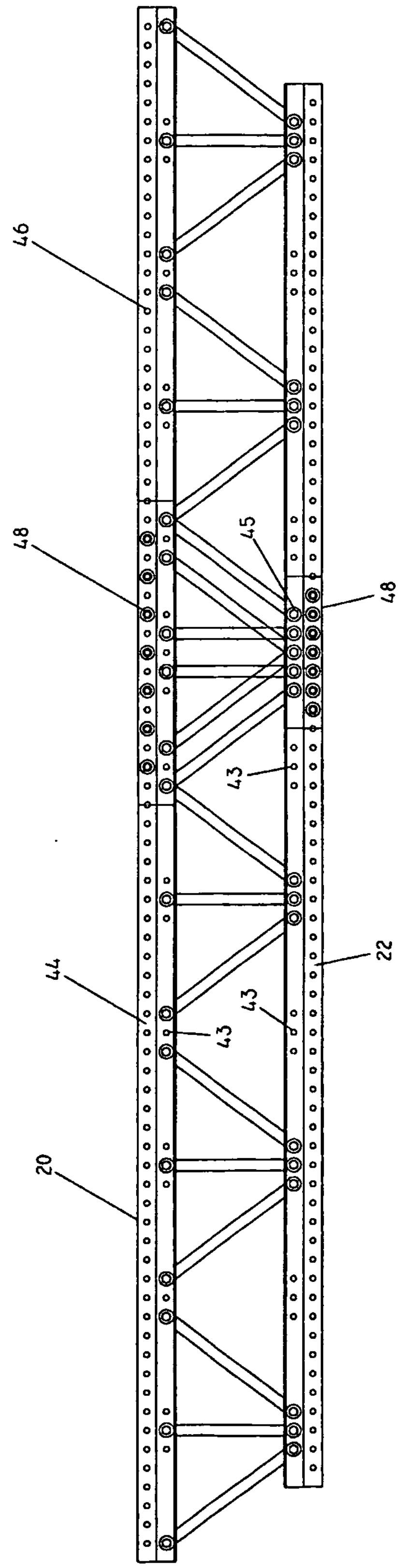

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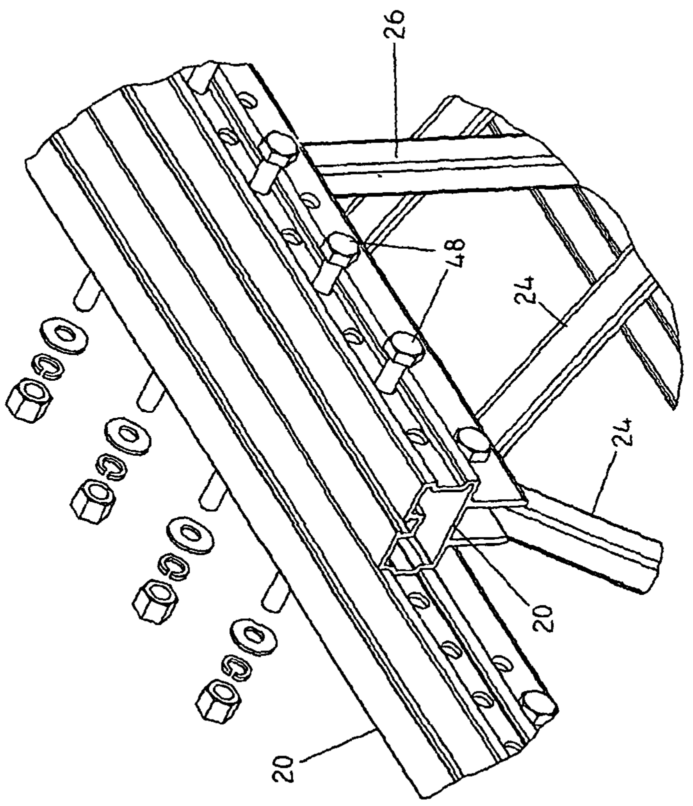

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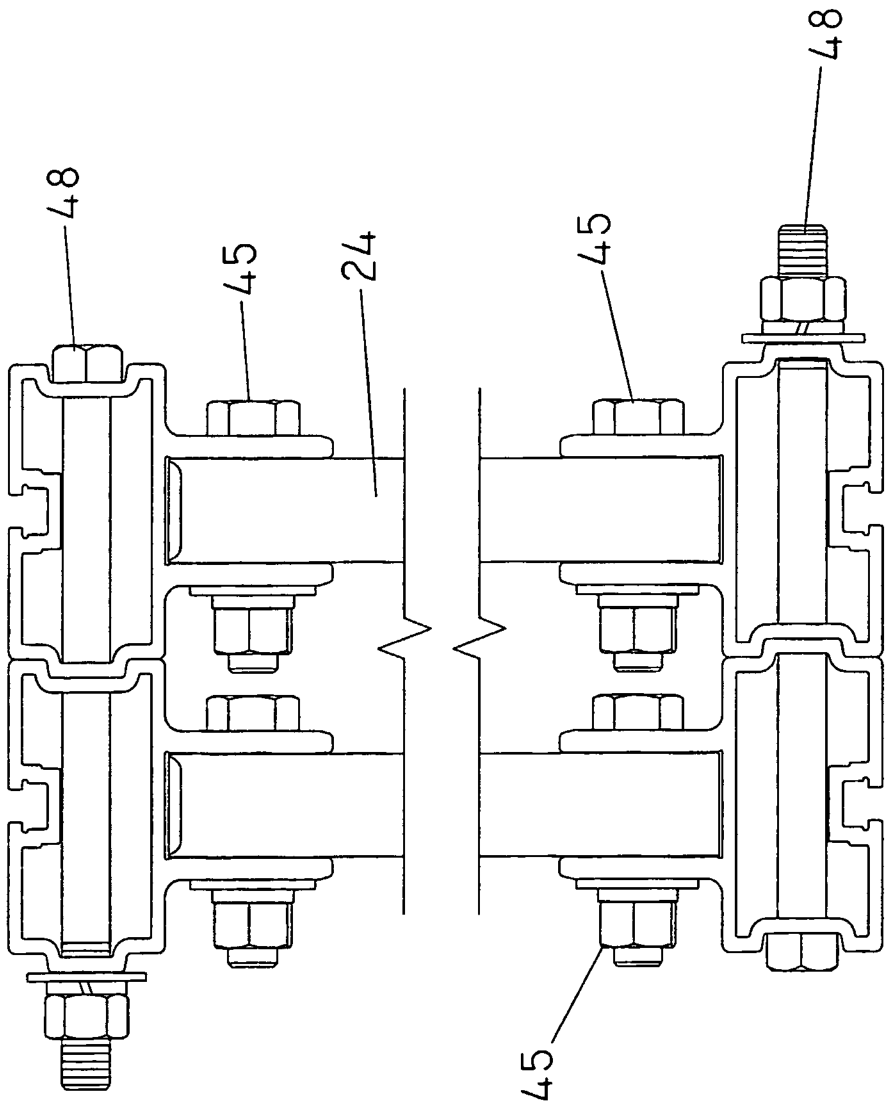

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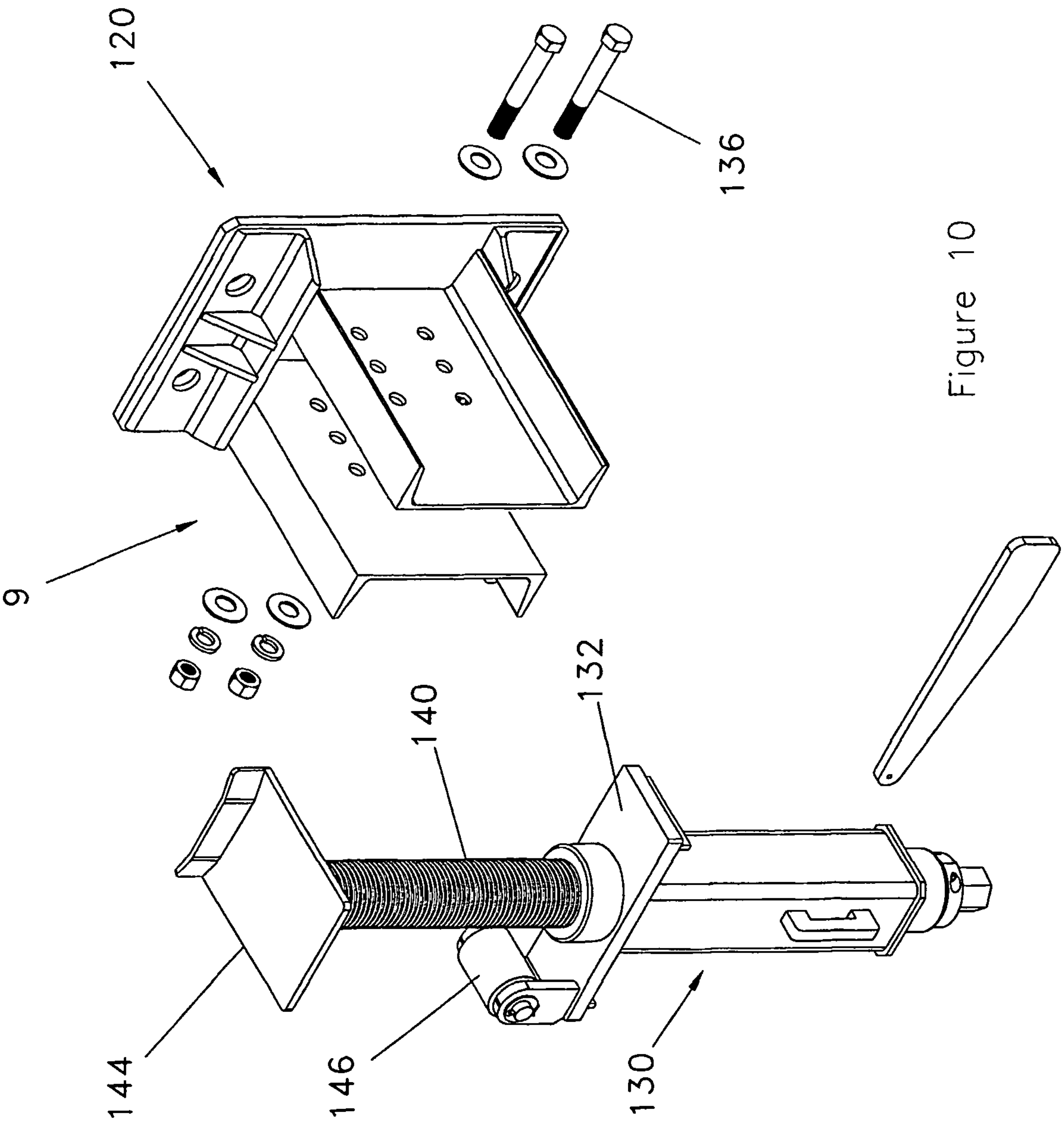


Figure 10

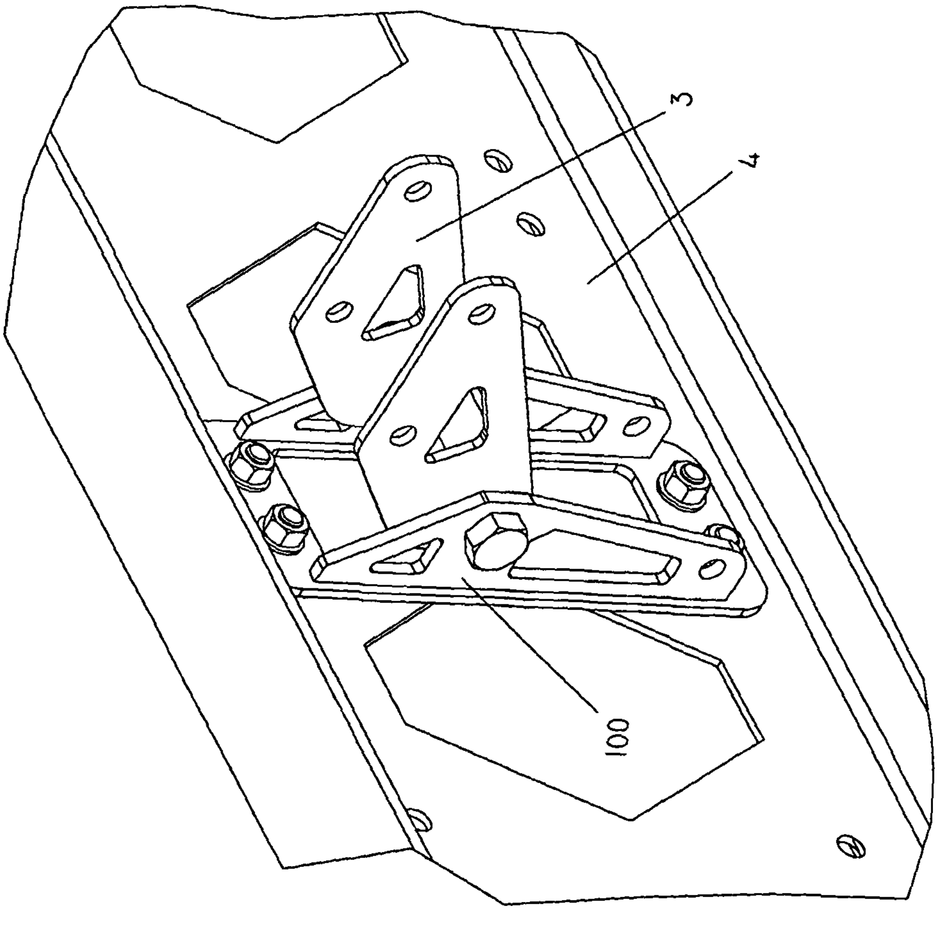


Figure 11

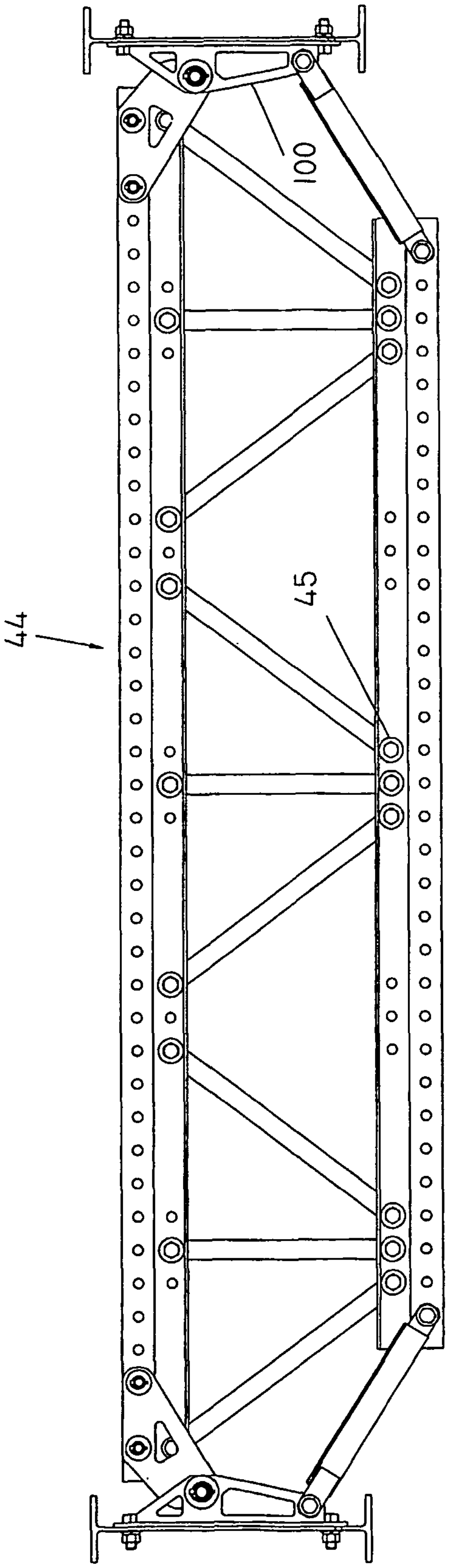
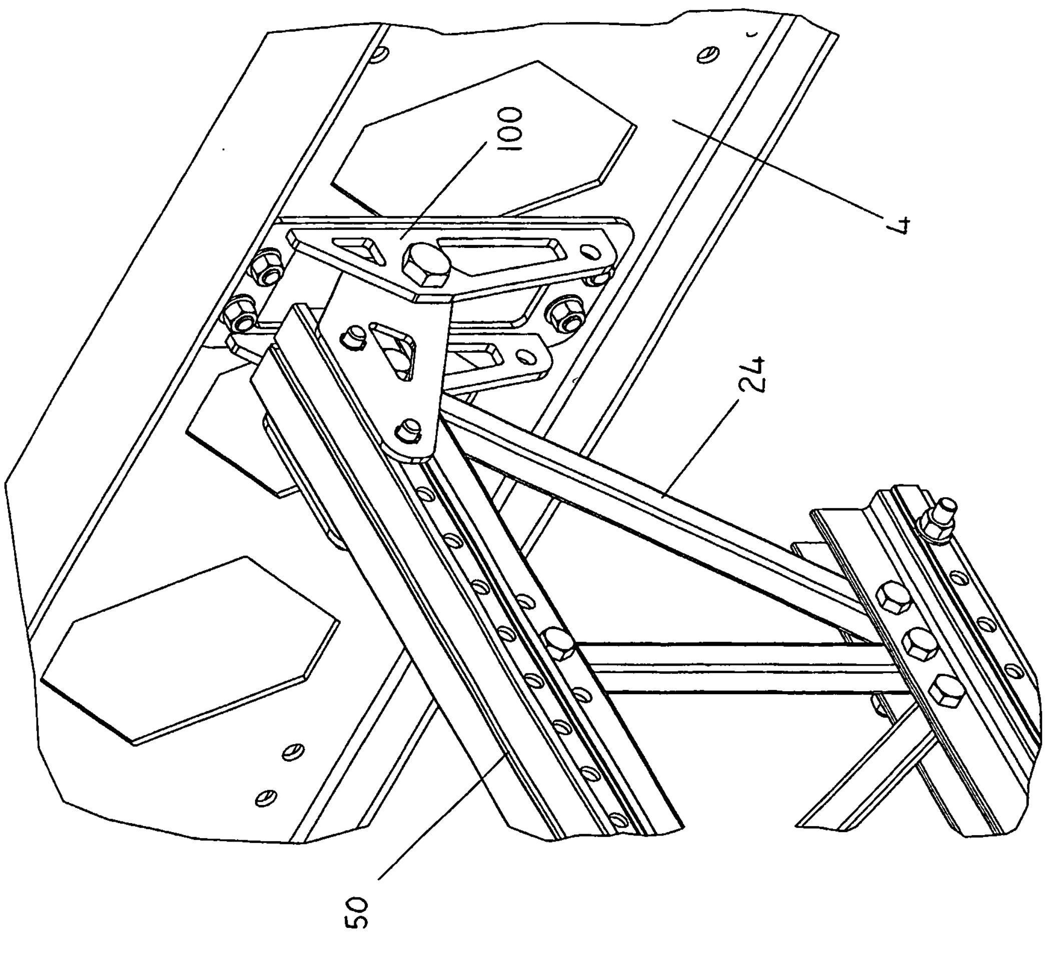


Figure 12



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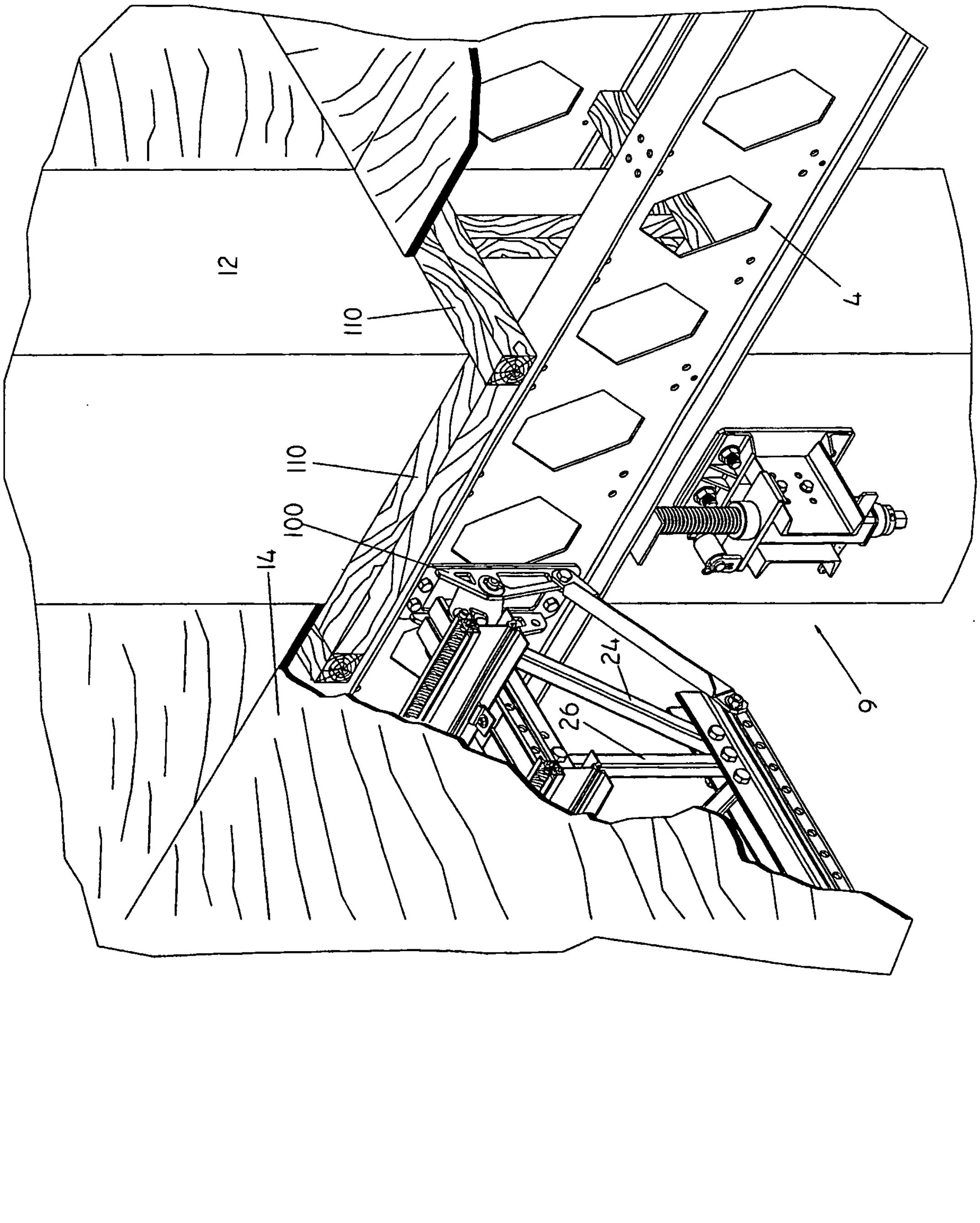

Figure 14

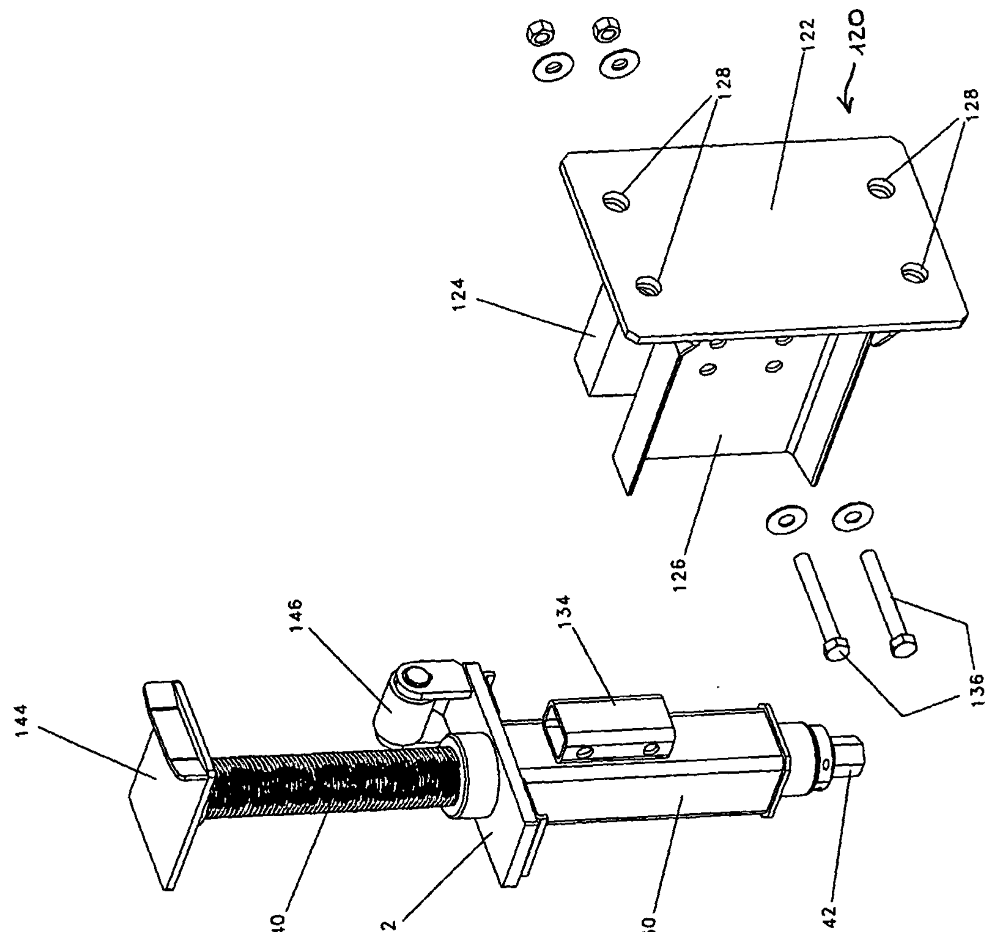

Figure 15