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Scaffolding System

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ABSTRACT

A scaffolding system including at least one pair of hook-on scaffold assemblies; said system further including a plank support element comprising a frame structure supportable on any one of said hook-on scaffold assemblies; said frame supporting end to end arrangements of scaffolding planks in which upper surfaces of abutting said planks are flush.

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**COMPLETE SPECIFICATION
FOR A DIVISIONAL PATENT APPLICATION**

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Invention Title:

SCAFFOLDING SYSTEM

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The invention is described in the following statement together with the best means of performing the invention known to us:

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SCAFFOLDING SYSTEM

The present invention relates to safety devices for use in the construction of buildings and, more particularly to support structures for personnel working above ground level.

BACKGROUND

Safety of personnel involved in the building industry has increasingly become the subject of regulation. A particularly dangerous aspect of work on construction sites is where personnel is required to work at some height above ground level, for example on two-storey buildings or where steeply sloping terrain is involved.

In at least some jurisdictions it is now a requirement that scaffolding be installed where personnel is required to work at a greater than a set height above ground level. Scaffolding supported at ground level involves the erection of a large number of structural elements of frames with adjustable feet, cross bracing and fasteners etc, being expensive in both material and labour. Moreover, where sloping ground, projecting patios and other obstructions are encountered, the use of scaffolding becomes particularly awkward and time consuming.

A continuing problem remains in the arrangement of planking providing the working surface for personnel and

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equipment above ground level. Planking is laid between and supported by pairs of adjoining cross-members to form a platform element. Typically such cross members are lengths of tubular steel, or may take the form of a length of right angled hollow section (RHS).

To bridge between adjoining planking platform elements so as to form a continuous length of supporting surface, planks forming the bridging sections must be laid over the ends of the adjoining platform elements. This introduces the risk of tripping as one steps from the lower level of a platform element onto the bridging planking. As well, there is the risk that the bridging planking may slide on the supporting planks, for example when wheeled equipment is moved along the scaffolding.

It is an object of the present invention to address or ameliorate some of the above disadvantages.

NOTE:

The term "comprising" (and grammatical variations thereof) is used in this specification in the inclusive sense of "having" or "including", and not in the exclusive sense of "consisting only of".

BRIEF DESCRIPTION OF INVENTION

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Accordingly, in a first broad form of the invention, there is provided a scaffolding system including at least one pair of hook-on scaffold assemblies; said system further including a plank support element comprising a frame structure supportable on any one of said hook-on scaffold assemblies; said frame supporting abutting end to end arrangements of scaffolding planks in which upper surfaces of said planks are flush.

Preferably, each of said hook-on scaffold assemblies includes a vertical main shaft provided with a hook structure at an upper end of said vertical main shaft and a securing bracket rotatably attached at a lower end of said vertical main shaft; each of said hook-on scaffold assemblies further including a braced hook-on arm; and wherein in use, said hook structure engages with a horizontal top plate of a building frame; and wherein said securing bracket is rotatable through at least 90 degrees so as to engage with a vertical stud or with a horizontal element of said building frame.

Preferably, said assembly further comprises a safety rail assembly for attachment to said pair of hook-on scaffold assemblies.

Preferably, said vertical main shaft comprises a length of metal rectangular hollow section; said vertical main shaft

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provided at intervals along its length with hooking eyes projecting from said vertical main shaft in a first outward direction; said braced hook-on arm engaging with said hooking eyes.

5 Preferably, said hook structure comprises a metal horizontal plate section projecting from said upper end of said vertical main shaft in a second inward direction; said hook structure further including a metal vertical plate section depending from an outer end of said horizontal
10 plate section.

Preferably, said securing bracket comprises a generally U-shaped structure comprising a spaced apart pair of arms extending from a back plate in said second inward direction; said arms adapted to accept between them a said
15 vertical stud or a said horizontal element of said building frame; said pair of arms being of a length so as to project past an inner face of said vertical stud or said horizontal element; outer ends of said arms provided with apertures; an outer pair of said apertures adapted to accept
20 therethrough a securing element; said securing element securing said vertical stud or said horizontal element between said back plate and said securing element.

Preferably, said securing element is a first wing bolt passing through a first aperture of said outer pair of

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apertures; said first aperture in a first of said arms;
said bolt threadably engaging with thread of a second
aperture of said outer pair of apertures; said second
aperture in a second one of said arms.

5 Preferably, one of said arms is provided with a threaded
aperture at a median position along said arm; said threaded
aperture accepting a second wing bolt; said second wing
bolt engaging with said vertical stud or said horizontal
member so as to prevent any movement of said bracket
10 relative said vertical stud or said horizontal element.

Preferably, said vertical main shaft is provided with at
least one pair of said hooking eyes comprise U-shaped
elements projecting horizontally from said vertical main
shaft; arms of said U-shaped elements attached to opposing
15 sides of said vertical main shaft, and wherein separation
between an outer face of said vertical main shaft and
inside faces of cross bars of said U-shaped elements is
adapted to accept hooking lugs of said braced hook-on arm.

Preferably, said vertical main shaft is provided with two
20 pairs of said hooking eyes; said two pairs providing two
levels of attachment of said hook-on arm.

Preferably, one of each of said at least one pair of
hooking eyes is provided with an aperture through said
cross bar of said U-shaped element; said aperture adapted

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to receive a spring-loaded pin of a locking structure; said locking structure securing one of said hooking lugs inserted in said hooking eye.

Preferably, said braced hook-on arm includes a horizontal support member, an angled bracing member and at least one intermediate brace member extending between said horizontal supporting member and said angled bracing member.

Preferably, an inner end of each of said horizontal support member and said angled bracing member is provided with one of said hooking lugs; each respective one of said hooking lugs adapted for insertion into a corresponding one of a said at least one pair of hooking eyes; said hooking lug of said horizontal support member being provided with an aperture; said aperture aligning with said aperture in a said cross bar of a said hooking eye, thereby allowing passage therethrough of said spring-loaded pin; said spring-loaded pin passing through said aperture in a said hooking eye when said braced hook-on arm is assembled to said vertical main shaft.

Preferably, said horizontal support member is of length sufficient to support thereon at least two side-by-side ones said of said scaffolding planks; at least an inner end and an outer end of said horizontal support member provided with plank-retaining safety hook elements.

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Preferably, said horizontal support member is further provided at an outer end with a vertical safety rail support element; adjoining ones of said hook-on scaffold assemblies, when in use each supporting a stanchion of said safety railing in a respective said safety rail support element; said safety railing extending between said adjoining hook-on scaffold assemblies; said safety railing including upper and lower horizontal rail elements.

Preferably, said upper end of said vertical main shaft is provided with at least one bracket for attachment of a cross bracing member of said safety railing; said cross bracing member provided with a spring-loaded pin assembly; said spring-loaded pin engaging with an aperture provided in said at least one bracket so as to secure said cross bracing member inadvertent disengagement with said at least one bracket.

Preferably, said plank support element comprises a fabricated structure; said fabricated structure comprising a pair of frameworks; said pair of frameworks linked by linking plates so that in use said pair of frameworks locate either side of said hook-on arm; each of said frameworks including an upper cross member for support of at least two side by side scaffolding planks.

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Preferably, said system further includes a moveable safety rail stanchion support element; said support element including a tubular section for insertion of a said stanchion; said stanchion support element including a
5 securing structure for releasably securing said support element to said horizontal support member of a said hook-on arm.

In another broad form of the invention, there is provided a scaffolding plank support system for attachment to frame
10 elements of a building; said system including a hook-on scaffold element; said hook-on scaffold element including a vertical main shaft; said vertical main shaft having a hooking plate at an upper end, and a securing bracket at a lower end of said vertical main shaft; said system further
15 including a hook-on arm releasably attached to said vertical main shaft; said hook-on arm providing support for a scaffold plank support element; said scaffold plank support element supporting ends of pairs of abutting scaffolding planks laid end to end such that upper surfaces
20 of said scaffolding planks are substantially flush.

In a further broad form of the invention, there is provided a scaffolding plank support element for a scaffolding assembly; said element including a structure comprised of a pair of linked frames; said linked frames supportable on
25 either side of at least one horizontal element of a

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scaffolding assembly; said structure extending outwardly from both sides of said at least one horizontal element; said structure supporting abutting ends of pairs of said scaffolding planks laid end to end so that upper surfaces
5 of said abutting scaffolding planks are flush.

Preferably, said at least one horizontal element is a hook-on arm of said scaffolding assembly; said hook-on arm releasably attached to a main vertical shaft of a hook-on element of said scaffolding assembly; said vertical main
10 shaft supported at an upper end from a horizontal top plate of a building frame and secured at a lower end to an upright or horizontal member of said building frame.

Preferably, said at least one horizontal element of said scaffolding assembly comprises two tubular cross members of
15 a tubular steel scaffolding assembly; said two tubular cross members arranged one above the other such that each of a pair of frame elements of said scaffolding plank support element is disposed at opposite sides of said two tubular cross members.

20 In yet a further broad form of the invention, there is provided a method for supporting at least one scaffolding plank and safety railing at a side of a building; said method including the steps of:

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- (a) hooking a hook plate of at least one pair of hook-on scaffold assemblies over a horizontal top plate of a frame of said building,
 - (b) securing a bracket of each of said scaffold assemblies to a vertical stud or a horizontal element of said frame,
 - (c) positioning said at least one scaffolding plank over horizontal members of hook-on arms of said at least one pair of said scaffold assemblies.

10 Preferably, said method further includes the steps of;

- 15
- (a) inserting stanchions of said safety railing into stanchion support elements of said scaffold assemblies,
 - (b) attaching horizontal railing elements to said stanchions,
 - (c) bracing said railings by cross bracing members extending between said railings and brackets on vertical shafts of said at least one pair of scaffold assemblies.
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BRIEF DESCRIPTION OF DRAWINGS

Embodiments of the present invention will now be described with reference to the accompanying drawings wherein:

5 Figure 1 is a side elevation view of a hook-on scaffold assembly according to a first preferred embodiment of the invention with a hook-on arm adapted to support two side by side scaffold planks,

10 Figure 2 is a perspective view of a main vertical shaft and associated components of the scaffold assembly of Figure 1,

Figure 2A is a perspective view of the upper end of the main vertical shaft of Figure 2,

15 Figure 3 is a perspective view of a first hook-on arm of the scaffold assembly of Figure 1,

Figure 3A is an enlarged side view of a spring-loaded pin mechanism of the hook-on arm of Figure 3,

20 Figure 3B is a side view of a second hook-on arm adapted to accommodate up to five side by side scaffold planks,

Figure 4 is a perspective detailed view of a securing bracket of the scaffold assembly of Figures 1 and 2,

Figure 5 are representations of bolts for use with the scaffold assembly of Figures 1 to 4,

Figure 6 is a perspective view of a safety railing for attachment to the scaffold assembly of Figure 1,

Figure 7 is a detail view of the inner end of a cross bracing member of the safety railing attachment of Figure
5 6,

Figure 7A and 7B are side and end views respectively of a safety rail stanchion support device,

Figure 8 is a perspective view of a pair of scaffold assemblies of Figure 1 attached to the frame of a building
10 and supporting a pair of scaffolding planks and a safety railing,

Figure 9 is a perspective view of a plank supporting element for use with the scaffold assembly of Figures 1 to
8,

Figure 10 is a side view of the plank supporting
15 element of Figure 9 showing sections of adjoining and abutting planking,

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

20 With reference to Figure 1, a scaffold assembly 10 according to a preferred embodiment of the invention, comprises a vertical main shaft 12 and a braced hook-on arm 14. Main shaft 12 includes a vertical length of rectangular section tubing 16 to which is affixed at an upper end 18 a
25 hook structure 20. Hook structure 20 may be formed of a

piece of steel or other metal angle, strengthened with a rib 21 as shown in Figure 2A.

A securing bracket 22 is rotatably attached at a lower end 24 of tubing 16. Also attached at intervals along the lower portion of the length of tubing 16, are two pairs of first hooking eyes 23 and 23A, and 26 and 26A in the form of U-shaped brackets as best seen in Figure 2. Attached at upper end 18 of main shaft 12 are a further pair of hooking eyes 25 and 25A, shown in more detail in Figure 2A.

Braced hook-on arm 14 comprises a horizontal support member 28, and an angled bracing member 30 formed of flat bars (or rectangular section tubing) affixed one to the other towards their respective outer ends and provided with intermediate bracing elements 32. Both the inner end of horizontal support member 28 and angled bracing member 30 are provided with vertical hooking lugs 34 and 36 respectively (as best seen in Figure 3), adapted for insertion into either the upper pair 23 and 23A, or the lower pair of hooking eyes 26 and 26A.

Sides of the U-shaped pairs of brackets 23 and 23A, and 26 and 26A, are affixed to opposite sides of tubing 16 such that a sufficient gap is left between the inside faces of the base of the brackets and the outside face of tubing 16 for insertion of vertical hooking lugs 34 and 36. The upper brackets 25 and 25A are similarly constructed and

arranged; in this case to accept a cross brace 110 of the safety railing system to be further described below.

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Braced hook-on arm 14 is provided with a spring loaded pin mechanism 33 (shown in enlarged detail in Figure 3A) located on the underside and at the inner end of horizontal support member 28. Mechanism 33 comprises a U-shaped bracket 41 with apertures in the legs of the bracket for slidably retaining pin 38. Pin 38 is provided with a washer 39, welded to pin 38, and a coaxial compression spring 43 retained between washer 39 and the inside of bracket 41. Pin 38 is further provided with an aperture 47 at an outer end of pin 38 for attachment of a split ring 45, by which means pin 38 may be pulled into a retracted position relative to vertical hooking lug 34. Vertical hooking lug 34 is provided with a hole 37 (as shown in Figure 3) coaxial with pin 38 of mechanism 33.

Each of the upper ones 23 or 26 of the pairs of brackets 23 and 23A, and 26 and 26A, is provided with a hole 27, the arrangement being such that when lug 36 is inserted into a bracket 23 or 26, initially with pin 38 of spring-loaded mechanism 33 retracted, the pin 38 is driven by spring 43 through holes 37 and 27 in vertical hooking lug 34 and bracket 23 or 26 respectively (as best seen in Figure 1) to secure braced hook-on arm 14 to main shaft 12. Main shaft 12 may also be provided with apertures axially aligned with apertures 27 of brackets 23 and 26

such that with a sufficiently long pin 38, the end of the pin passes through the wall of tubing 16.

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The vertical hooking lug 34 of horizontal support member 28 is extended upwards to incorporate an inner end safety hook element 40. An outer end safety hook element 42 is provided near the outer end of horizontal support member 28. Half way between these safety hook elements 40 and 42 is a divider lug 46. The length of horizontal support member 28 and the distances between the divider lug 46 and insides of safety hook elements 40 and 42, in this instance, is such as to provide support for two side by side standard scaffolding planks 44.

It will be understood that with suitable choice of materials and bracing, horizontal support member 28 may be made of a length to suit several side by side standard scaffolding planks such as the arrangement shown in Figure 3B which may support up to 5 planks.

The outermost end of horizontal support member 28 is provided with a vertical safety rail support element 48, which is adapted to receive an upright 102 of a safety rail assembly 100, more fully described below.

Where a longer hook-on arm is used, but it is desired to use a lesser number of planks than that arm can accommodate, it will be necessary to provide for a safety railing adjacent to the outermost plank. With reference to Figure 3C and 3D, a moveable safety rail support element 49

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is provided which may be fixed at intermediate positions along horizontal support member 28 as shown in dashed outline in Figure 3B. Moveable safety rail support element 49 comprises a section of tubing 49a, brace block 49b and attachment arms 49c. A securing bolt 49d allows the support element 49 to be locked into position along support member 28.

With reference now to Figures 1, 2 and 4, the securing bracket 22 rotatably attached to the lower end 24 of main shaft 12, comprises a back plate 50 and first and second side plates 52A and 52B to form a generally U-shaped structure. Back plate 50 is provided with an aperture 51 to allow bracket 22 to be attached by a bolt 53 to the lower end 24 of main shaft 12. For this purpose, main shaft 12 is provided with an aperture 54 and a threaded nut 55 welded to the inside wall of tubing 16 as can be seen in the section A-A of Figure 2.

First and second side plates 52A and 52B are respectively provided with an aperture 56 and an aperture and threaded nut 58 adapted to accept therethrough the wing bolt 60 shown in Figure 5A. The length of first and second side plates 52A and 52B is such that a vertical stud, or a horizontal element of a building frame can be retained between the side plates 52A and 52B and back plate 50 and wing bolt 60.

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Side plate 52A is further provided with a second aperture and threaded nut 62 at an intermediate position along the length of side plate 52A, adapted to accept the shorter wing bolt 64 shown in Figure 5B. Wing bolt 64 may
5 be driven through the aperture and threaded nut 62 to engage with the side of a vertical stud or horizontal member of a building frame to firmly secure the securing bracket 22 to the frame member. Preferably, wing bolts 60 and 64 are attached to bracket 22 by short lengths of chain
10 65 and 66.

With reference to Figure 8, a pair of scaffold assemblies 10 and 10A are shown attached to the side of a building frame 70. Scaffold assemblies 10 and 10A are spaced apart to suit the length of two side by side
15 scaffolding planks 44.

The portion of building frame 70 shown in Figure 8 includes vertical uprights or studs 72, a top plate 74 and an intermediate noggin or horizontal frame member 76. The hook structures 20 and 20A are hooked over top plate 74,
20 with the securing bracket 22 of scaffold assembly 10 secured to one of the studs 72 while the securing bracket of scaffold assembly 10A is rotated at 90 degrees and secured to horizontal frame member 76.

In the arrangement shown in Figure 8, the braced hook-
25 on arms 14 and 14A have been attached to the upper pair of brackets. At this higher level, in some jurisdictions at

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least, it may be a requirement that the scaffolding arrangement of scaffold assemblys 10, 10A and planks 44 be provided with a safety railing.

Figure 6 shows a safety railing system 100 for use with scaffolding elements 10 and 10A. Safety railing 100 is comprised of stanchions 102 and horizontal top rail 104 and horizontal intermediate rail 106. Each of top rail 104 and 106 is made up of telescoping sections so that the length of the railings between adjoining stanchions may be readily adjusted.

Preferably, stanchions 102 and rails 104 and 106 are interconnected by snap-locks 108. The vertical safety rail support elements 48 and 48A of braced hook-on arms 14 and 14A are adapted to accept as inserts stanchions 102 and 102A of safety railing 100.

For added security, safety railing 100 is provided with a number of cross braces 110 connected at an outer end by a snap-lock fitting 112 either to top rail 104 as shown in Figures 1, 6 and 7, or to stanchion 102. Cross brace 110 is provided at an inner end with a locking structure 114 adapted for attachment to main shaft 12 by hooking into the upper brackets 25, when attached to top rail 104, or to 25A when attached to a stanchion 102.

Locking structure 114 is shown in more detail in Figure 7 and is of similar construction to the spring-loaded mechanism of hook-on arm 14 previously described. As

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for that mechanism, the spring-loaded pin 120 of locking structure 114 passes through a hole 31 provided in brackets 25 and 25A when a cross brace 110 is connected to main shaft 12, thus preventing inadvertent disengagement of the cross brace and endangering the integrity of the railing system.

It will be understood that the scaffold assemblies of the present invention may be used equally effectively on timber, steel or aluminium framing members. As well, the components making up the scaffolding elements and safety railing may be fabricated out of steel, aluminium or a combination of these materials, and that the specific design details may be modified without departing from the principles of the invention.

With reference now to Figures 9 and 10, a plank supporting element 80 is provided for location over the horizontal supporting member 28 (shown dashed in Figure 9) of a braced hook-on arm 14 as described above. The plank supporting element 80 comprises a pair of frameworks 81 and 82 linked by linking plates 83 and 84 so as to locate on either side of the supporting member 28.

Preferably the frameworks 81 and 82 are fabricated of metal right angled hollow section, and again preferably of 25x25mm section. Each framework 81 and 82 is formed of a pair of horizontal outrigger arms 85 and 86 (referring now to just framework 81), supporting an upper cross member 88.

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Vertical elements 89 and 90 extend from below linking plates 83 and 84 respectively with the lower ends of these vertical elements 89 and 90 linked by a lower cross member 92. Angled bracing elements 93 and 94 extend from the lower ends of vertical elements 89 and 90 to the undersides of outrigger arms 85 and 86 to provide rigidity to the framework. Upper cross member 88 is provided at its outer ends with plank retaining brackets 95 and 96.

The length of upper cross member 88 is made to suit multiples of standard scaffold planking and may be adapted for 2 to 5 plank scaffold platforms for example. As can be seen in Figures 10 and 11, end 120 and 121 of respective scaffold planks 122 and 123 of adjoining scaffold platforms, may be supported on the plank supporting element (resting on upper cross members 88) so that the ends 120 and 121 are abutting and the upper surfaces 124 and 125 are flush.

In practice, the scaffolding system of the present invention includes scaffold planks made in lengths equal to multiples of timber building standard frame stud intervals. The hook-on arms 14 of the system are attached to a building frame as described above, at intervals equal to the length of the planks to be used. This ensures that, together with the plank supporting elements 80, a continuous safe platform can be provided along the length of a building.

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Although the plank supporting element 80 of the present invention is primarily intended for use with the hook-on arms 14 described above, it should be understood that the plank supporting element 80 may be used with conventional round tubular scaffolding members. In this instance, the upright elements (not shown) of a scaffolding assembly are placed at intervals equal to standard scaffold plank lengths. With reference to Figure 11, instead of a single cross member being used to support the planking platforms, two cross members 126 and 127, closely spaced one above the other are attached between the scaffold uprights.

As can be seen in Figure 11, this allows a plank supporting element of the present invention to be used with conventional scaffolding also and provides the same safety advantages of abutting adjoining scaffold planks supported end to end with the upper surfaces flush.

SUMMARY

The hook-on scaffold 180 is an adjustable apparatus which can be used by carpenters/builders who are installing truss roofs and also floor bearers on two storey buildings. The scaffold is used in a set of at least two. It does not require tools when setting up. The scaffold, which can accommodate two side-by-side builder's planks, gives workers a bigger safety area to walk on. The work area width is enlarged from 95mm to 460mm. When set at correct working height, safety harnesses are not required. Provision is made for a detachable safety rail.

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The components making up the hook-on scaffold are:

1. MAIN SHAFT WITH SIX HOOKING EYES.
2. HOOK PLATE.
- 5 3. HOOK ON ARM.
4. SAFETY BRACKET.
5. LOCKING WING BOLT.
6. SPRING-LOADED MECHANISM
7. SAFETY RAIL
- 10 8. SAFETY RAIL CROSS BRACE
9. PLANK SUPPORT ELEMENT
10. SAFETY RAIL STANCHION SUPPORT DEVICE

1. MAIN SHAFT WITH FOUR HOOKING EYES.

15 The Main Shaft (12) is preferably a square tubing 50mm by 50mm by 1.6mm and the average length is 1.3 metres. Hooking eyes (26) and (26A) are welded to the main shaft (12) at the required safety height with a 6mm gap from the main shaft (12). Hooking eyes (23) and (26) are different to hooking eyes (23A) and (26A) in that they have a hole to enable a spring-loaded pin to lock the hook-on arm (14) to the main shaft (12). There is a nut (55) welded inside the bottom of the main shaft (12) to which the safety bracket
20 (22) is attached. Main Shaft (12) also has further hooking eyes (25) and (25A) for attachment of a safety rail cross brace (110).
25

2. HOOK PLATE.

30 The Hook Plate (20) is welded to the main shaft (12) which hangs over the top plates of timber/metal frame. The hook plate (20) is 100mm wide to suit 95mm to 100mm top plates. It may be reinforced with a strengthening rib (21)
35

3. HOOK ON ARM.

The hook on arm (14) is made from steel which consists of two bars, the first being a horizontal bar and the other
40 bar is at an angle. It has a non adjustable hooking lug (34) and (36) at the end of the horizontal bar (28) and the end of the angle bar (30). Hooking lug (34) has a hole in it to enable a spring-loaded pin (38) to lock the hook on arm (14) to the main shaft (12). For extra strength braces
45 (32) are welded between the horizontal bar (28) and the angle bar (30). The hook on arm (14) hooks into the hooking eyes (26), on the main shaft (12), which are set at the appropriate working height conditions. At each end of the arm is a plank safety hook (40) & (42) to hold the two
50 planks in place and between each plank there is a divider lug (46). On the outside of the hook on arm (14) a cylinder (48) is welded to hold the safety rail (100).

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4. SAFETY BRACKET.

5 The safety bracket (22) is bolted to the main shaft (12)
and locks around the stud of timber/metal. The safety
bracket (22) is a 'U' shaped frame of flat steel. It is
held in place around the stud by a wing bolt (60). The
safety bracket (22) can be rotated 90 degrees to suit
noggins on a frame. The safety bracket (22) consists of a
10 back plate (50) which can be rotated and has a hole (51) to
insert a bolt (53) to attach the safety bracket (22) to the
main shaft (12). Two side plates (52A) & (52B) are attached
to the back plate (50). Side plate (52A) has two nuts
welded to accommodate wing bolts (60) & (64) and safety
15 chain (65) is also welded to it. Side plate (52B) has a
hole to accommodate wing bolt (60), and the safety chain
(66) is also welded to it.

5. LOCKING WING BOLT.

20 A wing bolt (60) is at the end of the safety bracket (22)
and a locking wing bolt (64), which bites into the stud, is
half way along the safety bracket (22). The two wing bolts
are on opposite sides of the safety bracket (22). Attached
25 to each wing bolt (60) & (64) are safety chains (66) &
(65). On each wing bolt (60) & (64) there is a spacer
washer to control penetration of the wing bolts.

6. SPRING-LOADED MECHANISM

30 The spring-loaded mechanism (33) is a safety feature that
secures the hook-on arm (14) to the main shaft (12). The
spring-loaded mechanism (33) consists of a U-shaped bracket
(41), spring-loaded pin (38) and spring (43). Pin (38)
35 extends through holes in bracket (41) and is provided with
a hole (47) for attachment of a split ring (45). Pin (38)
is further provided with a washer (39) welded to the shaft
of the pin.

40

7. SAFETY RAIL.

The safety rail (100) consists of two horizontal rails
(104) & (106) utilising telescopic aluminium tubing. There
45 are two upright posts (102), each having two snap lock
hooks (108), one hook being at the top of the post and the
other at the centre of the post. The bottom end of the
upright post (102) is inserted into the cylinder (48)
welded to the hook-on arm (14). The Safety rail (100) is
50 held in place by the snap lock hooks (108) to upright posts
(102). A locking arm (110) locks the safety rail (104) to
the frame with a snap lock on one end and a hook (114) on

the other end. The hook has a hole so it can be fixed to the shaft.

The above describes only some embodiments of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope and spirit of the present invention.

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CLAIMS

1. A scaffolding system including at least one pair of hook-on scaffold assemblies; said system further including a plank support element comprising a frame structure supportable on any one of said hook-on scaffold assemblies; said frame supporting abutting end to end arrangements of scaffolding planks in which upper surfaces of said planks are flush.
2. The system of claim 1 wherein each of said hook-on scaffold assemblies includes a vertical main shaft provided with a hook structure at an upper end of said vertical main shaft and a securing bracket rotatably attached at a lower end of said vertical main shaft; each of said hook-on scaffold assemblies further including a braced hook-on arm; and wherein in use, said hook structure engages with a horizontal top plate of a building frame; and wherein said securing bracket is rotatable through at least 90 degrees so as to engage with a vertical stud or with a horizontal element of said building frame.
3. The system of claim 1 or 2 wherein said assembly further comprises a safety rail assembly for attachment to said pair of hook-on scaffold assemblies.

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4. The system of claim 2 or 3 wherein said vertical main shaft comprises a length of metal rectangular hollow section; said vertical main shaft provided at intervals along its length with hooking eyes projecting from said vertical main shaft in a first outward direction; said braced hook-on arm engaging with said hooking eyes.
5. The system of any one of claims 2 to 4 wherein said hook structure comprises a metal horizontal plate section projecting from said upper end of said vertical main shaft in a second inward direction; said hook structure further including a metal vertical plate section depending from an outer end of said horizontal plate section.
6. The system of any one of claims 2 to 5 wherein said securing bracket comprises a generally U-shaped structure comprising a spaced apart pair of arms extending from a back plate in said second inward direction; said arms adapted to accept between them a said vertical stud or a said horizontal element of said building frame; said pair of arms being of a length so as to project past an inner face of said vertical stud or said horizontal element; outer ends of said arms provided with apertures; an outer pair of said apertures adapted to accept therethrough a

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securing element; said securing element securing said vertical stud or said horizontal element between said back plate and said securing element.

- 5 7. The system of claim 6 wherein said securing element is a first wing bolt passing through a first aperture of said outer pair of apertures; said first aperture in a first of said arms; said bolt threadably engaging with thread of a second aperture of said outer pair of apertures; said second aperture in a second one of
10 said arms.
8. The system of any one of claims 6 or 7 wherein one of said arms is provided with a threaded aperture at a median position along said arm; said threaded aperture accepting a second wing bolt; said second wing bolt
15 engaging with said vertical stud or said horizontal member so as to prevent any movement of said bracket relative said vertical stud or said horizontal element.
9. The system of any one of claims 4 to 8 wherein said
20 vertical main shaft is provided with at least one pair of said hooking eyes comprise U-shaped elements projecting horizontally from said vertical main shaft; arms of said U-shaped elements attached to opposing sides of said vertical main shaft, and wherein

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separation between an outer face of said vertical main shaft and inside faces of cross bars of said U-shaped elements is adapted to accept hooking lugs of said braced hook-on arm.

- 5 10. The system of any one of claims 4 to 9 wherein said vertical main shaft is provided with two pairs of said hooking eyes; said two pairs providing two levels of attachment of said hook-on arm.
- 10 11. The system of claim 9 or 10 wherein one of each of said at least one pair of hooking eyes is provided with an aperture through said cross bar of said U-shaped element; said aperture adapted to receive a spring-loaded pin of a locking structure; said locking structure securing one of said hooking lugs inserted
15 in said hooking eye.
12. The system of any one of claims 2 to 11 wherein said braced hook-on arm includes a horizontal support member, an angled bracing member and at least one intermediate brace member extending between said
20 horizontal supporting member and said angled bracing member.
13. The system of claim 12 wherein an inner end of each of said horizontal support member and said angled bracing member is provided with one of said hooking lugs; each

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respective one of said hooking lugs adapted for
insertion into a corresponding one of a said at least
one pair of hooking eyes; said hooking lug of said
horizontal support member being provided with an
5 aperture; said aperture aligning with said aperture in
a said cross bar of a said hooking eye, thereby
allowing passage therethrough of said spring-loaded
pin; said spring-loaded pin passing through said
aperture in a said hooking eye when said braced hook-
10 on arm is assembled to said vertical main shaft.

14. The system of any one of claims 12 or 13 wherein said
horizontal support member is of length sufficient to
support thereon at least two side-by-side ones said of
said scaffolding planks; at least an inner end and an
15 outer end of said horizontal support member provided
with plank-retaining safety hook elements.

15. The system of any one of claims 12 to 14 wherein said
horizontal support member is further provided at an
outer end with a vertical safety rail support element;
20 adjoining ones of said hook-on scaffold assemblies,
when in use each supporting a stanchion of said safety
railing in a respective said safety rail support
element; said safety railing extending between said
adjoining hook-on scaffold assemblies; said safety

railing including upper and lower horizontal rail elements.

16. The system of any one of claims 2 to 15 wherein said upper end of said vertical main shaft is provided with at least one bracket for attachment of a cross bracing member of said safety railing; said cross bracing member provided with a spring-loaded pin assembly; said spring-loaded pin engaging with an aperture provided in said at least one bracket so as to secure said cross bracing member inadvertent disengagement with said at least one bracket.
17. The system of any of claims 2 to 16 wherein said plank support element comprises a fabricated structure; said fabricated structure comprising a pair of frameworks; said pair of frameworks linked by linking plates so that in use said pair of frameworks locate either side of said hook-on arm; each of said frameworks including an upper cross member for support of at least two side by side scaffolding planks.
18. The system of any one of claims 12 to 17 wherein said system further includes a moveable safety rail stanchion support element; said support element including a tubular section for insertion of a said stanchion; said stanchion support element including a

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securing structure for releasably securing said support element to said horizontal support member of a said hook-on arm.

19. A scaffolding plank support system for attachment to
5 frame elements of a building; said system including a hook-on scaffold element; said hook-on scaffold element including a vertical main shaft; said vertical main shaft having a hooking plate at an upper end, and a securing bracket at a lower end of said vertical
10 main shaft; said system further including a hook-on arm releasably attached to said vertical main shaft; said hook-on arm providing support for a scaffold plank support element; said scaffold plank support element supporting ends of pairs of abutting
15 scaffolding planks laid end to end such that upper surfaces of said scaffolding planks are substantially flush.

20. A scaffolding plank support element for a scaffolding assembly; said element including a structure comprised
20 of a pair of linked frames; said linked frames supportable on either side of at least one horizontal element of a scaffolding assembly; said structure extending outwardly from both sides of said at least one horizontal element; said structure supporting
25 abutting ends of pairs of said scaffolding planks laid

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end to end so that upper surfaces of said abutting scaffolding planks are flush.

21. The scaffolding plank support element of claim 20 wherein said at least one horizontal element is a hook-on arm of said scaffolding assembly; said hook-on arm releasably attached to a main vertical shaft of a hook-on element of said scaffolding assembly; said vertical main shaft supported at an upper end from a horizontal top plate of a building frame and secured at a lower end to an upright or horizontal member of said building frame.

22. The scaffolding plank support element of claim 20 wherein said at least one horizontal element of said scaffolding assembly comprises two tubular cross members of a tubular steel scaffolding assembly; said two tubular cross members arranged one above the other such that each of a pair of frame elements of said scaffolding plank support element is disposed at opposite sides of said two tubular cross members.

23. A method for supporting at least one scaffolding plank and safety railing at a side of a building; said method including the steps of:

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(a) hooking a hook plate of at least one pair of hook-on scaffold assemblies over a horizontal top plate of a frame of said building,

5 (b) securing a bracket of each of said scaffold assemblies to a vertical stud or a horizontal element of said frame,

(c) positioning said at least one scaffolding plank over horizontal members of hook-on arms of said at least one pair of said scaffold assemblies.

10 24. The method of claim 26 wherein said method further includes the steps of;

(a) inserting stanchions of said safety railing into stanchion support elements of said scaffold assemblies,

15 (b) attaching horizontal railing elements to said stanchions,

(c) bracing said railings by cross bracing members extending between said railings and brackets on vertical shafts of said at least one pair of scaffold assemblies.
20

25. A scaffold assembly as herein described and with reference to the accompanying drawings.

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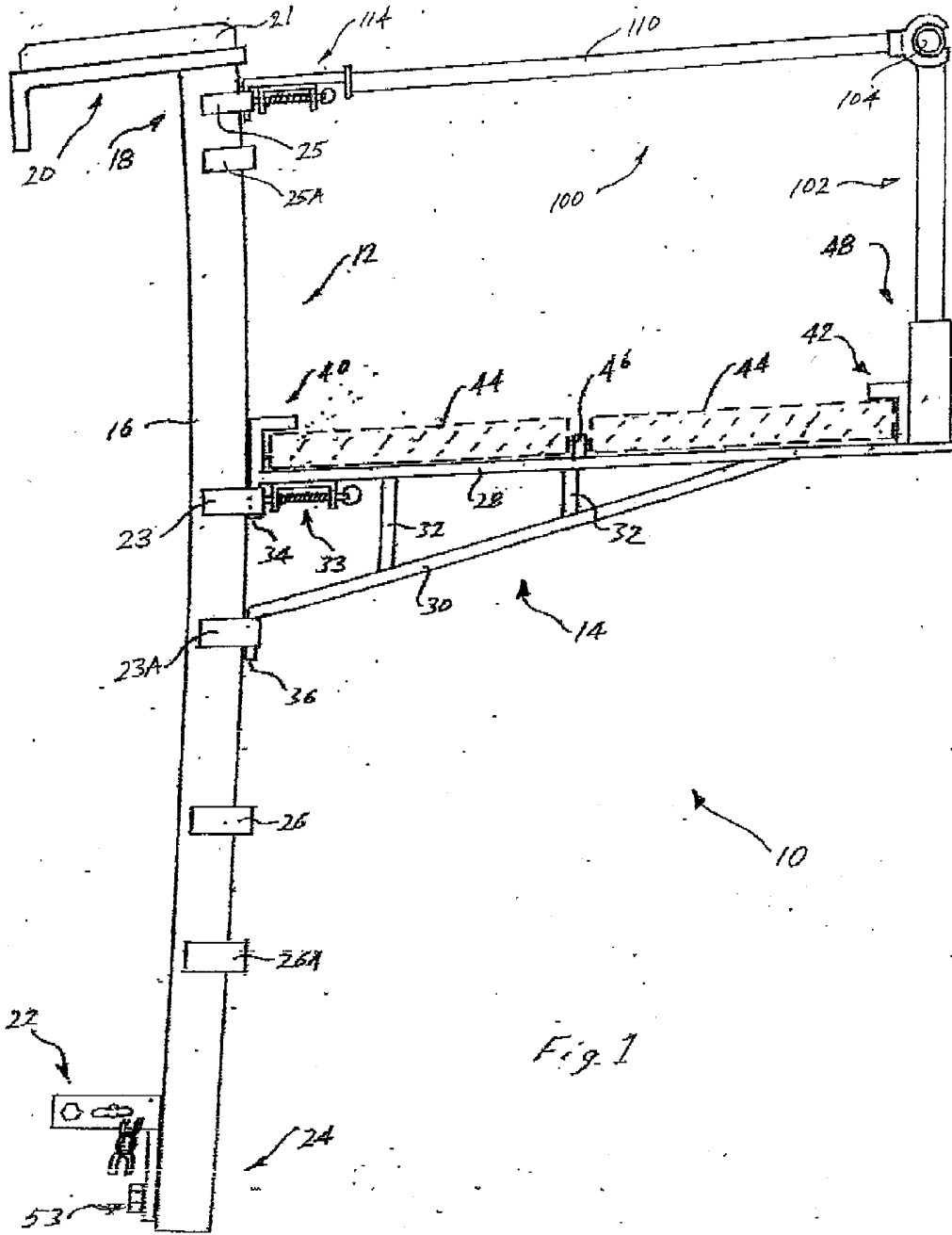
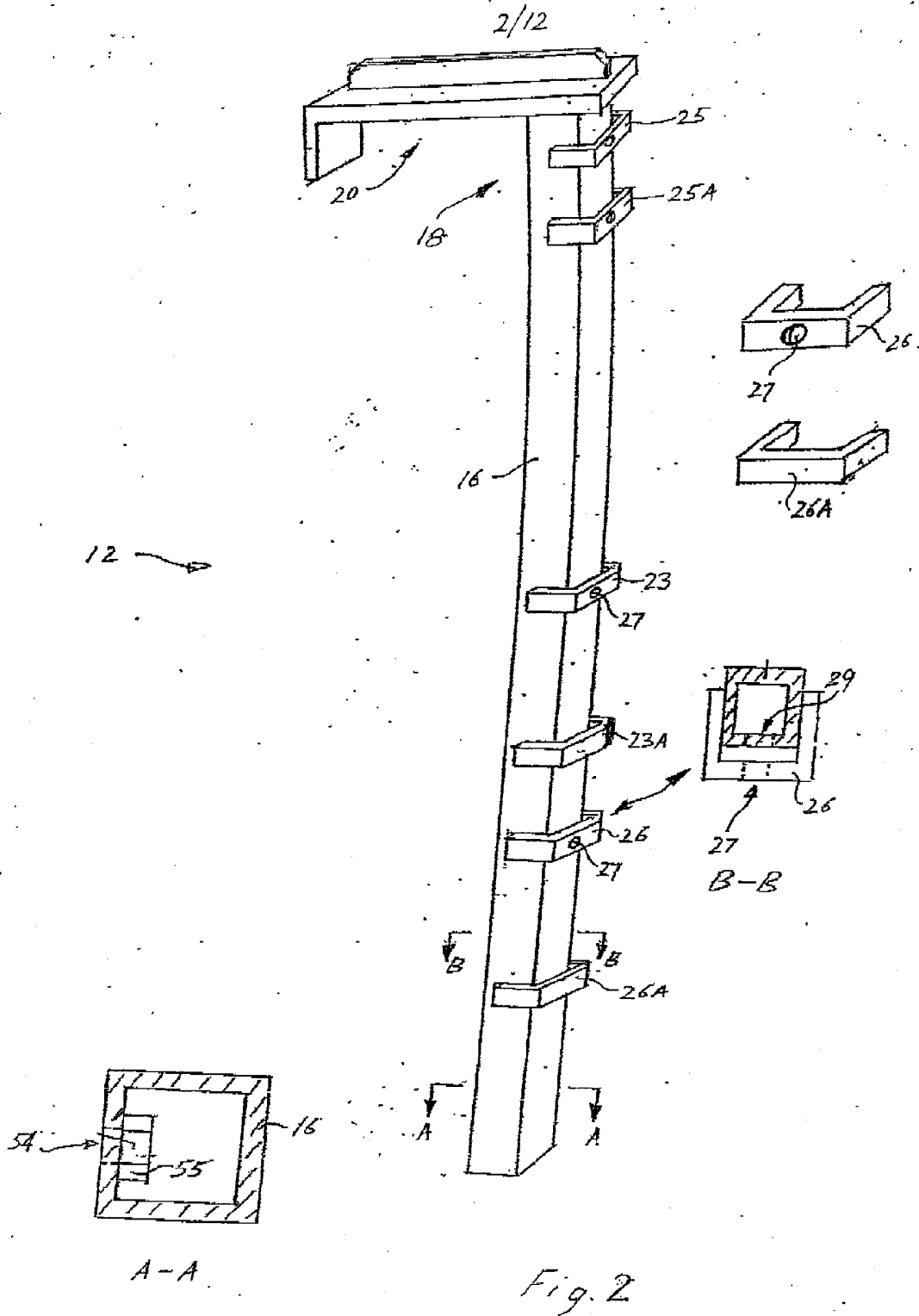


Fig. 1

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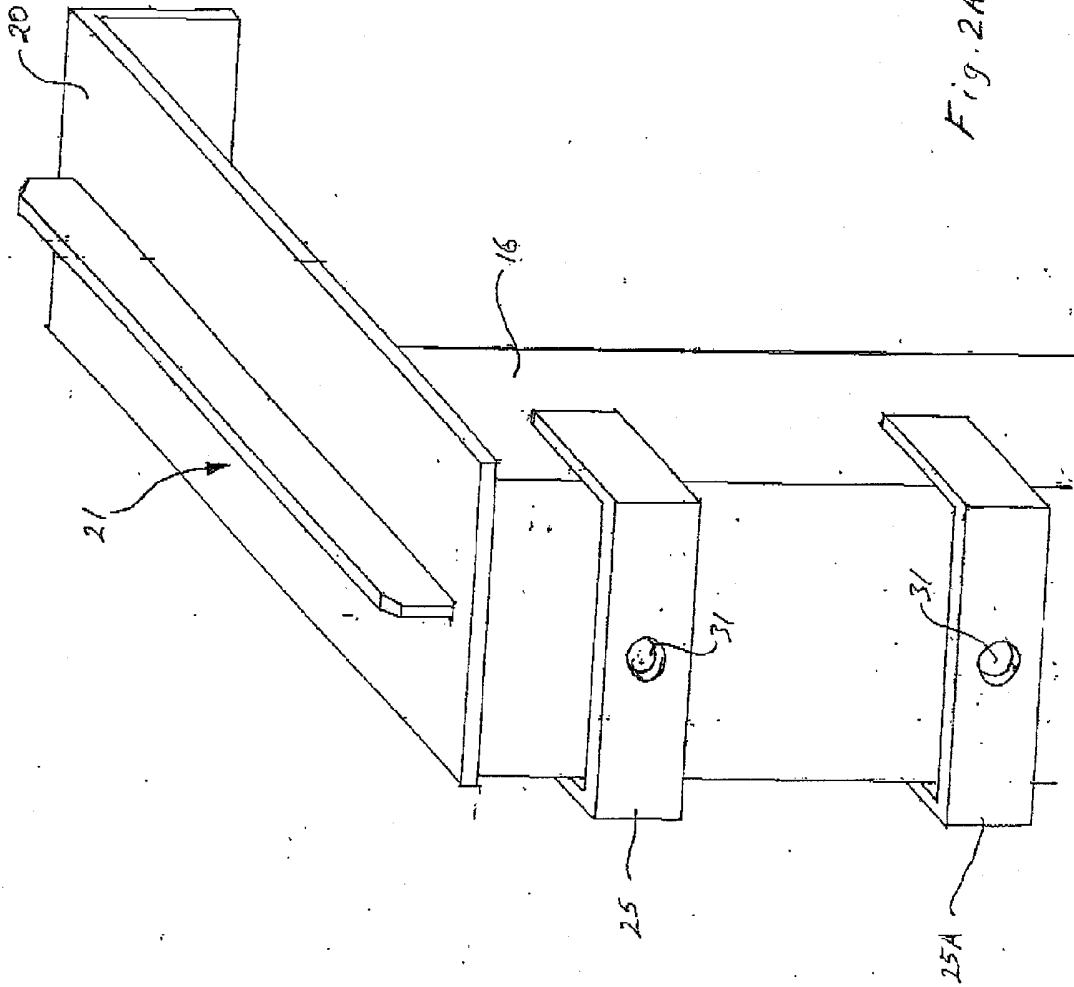
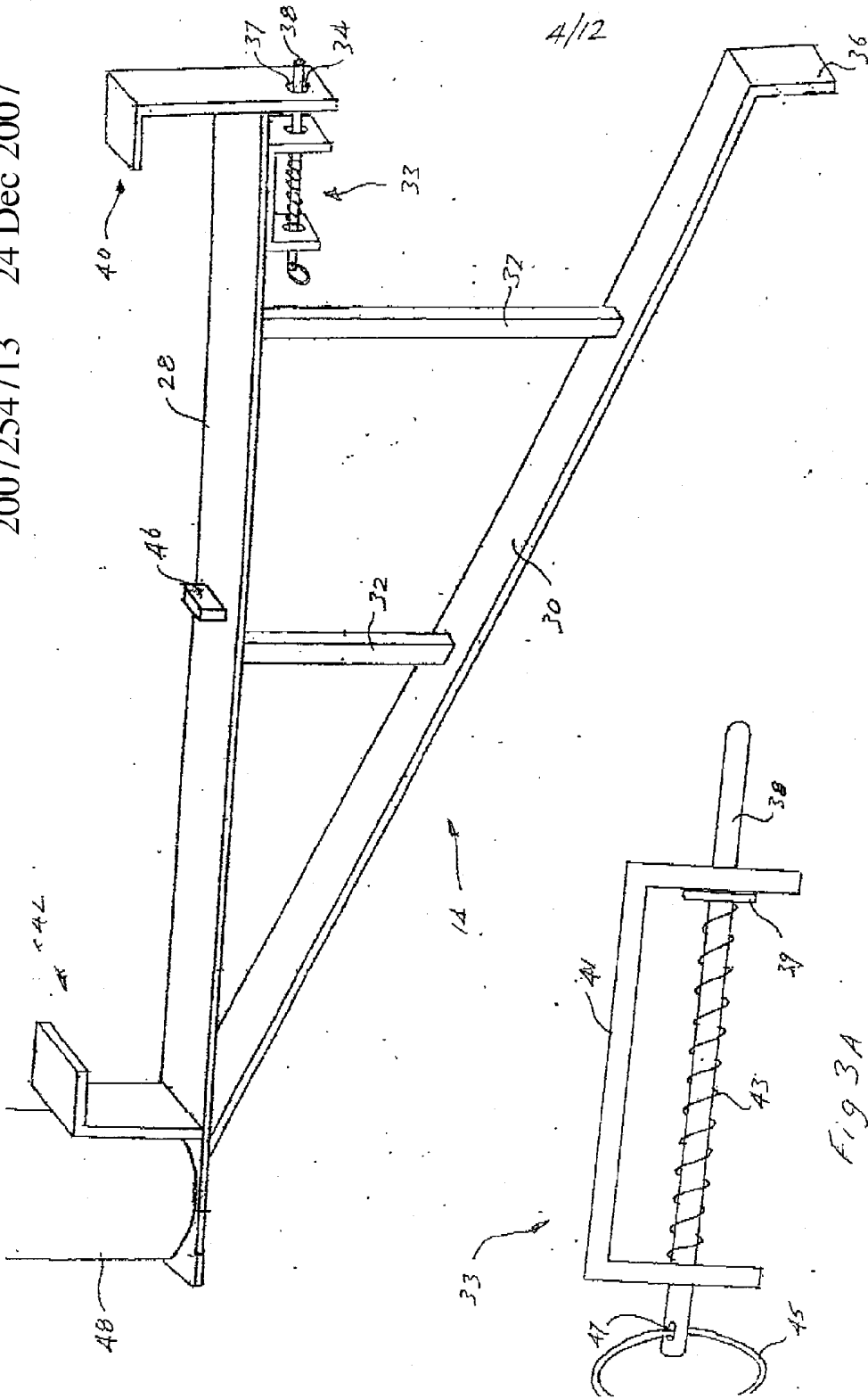


Fig. 2A

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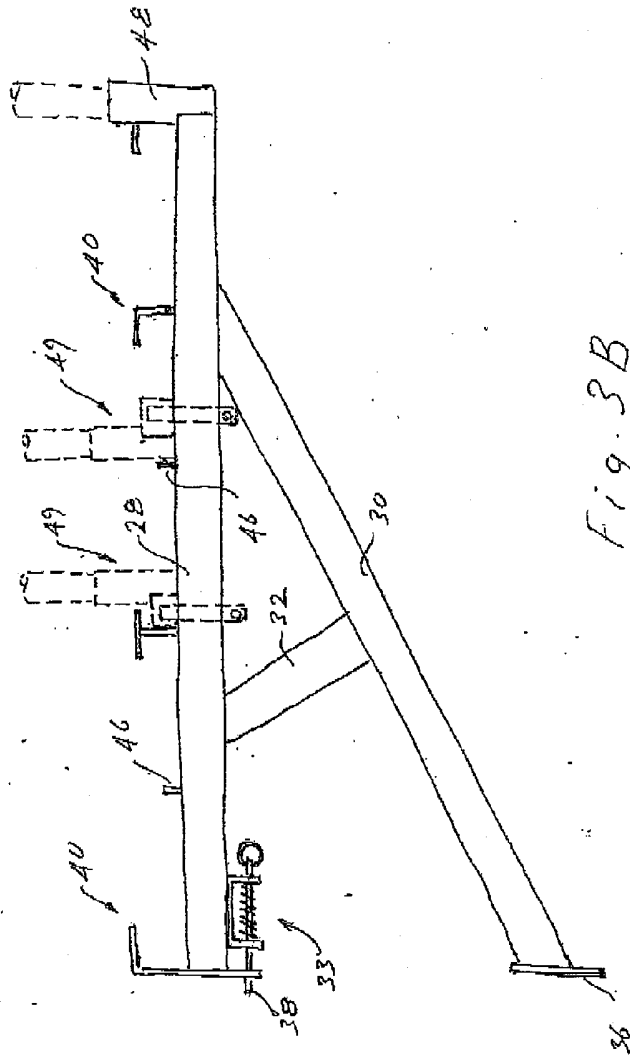


Fig. 3B

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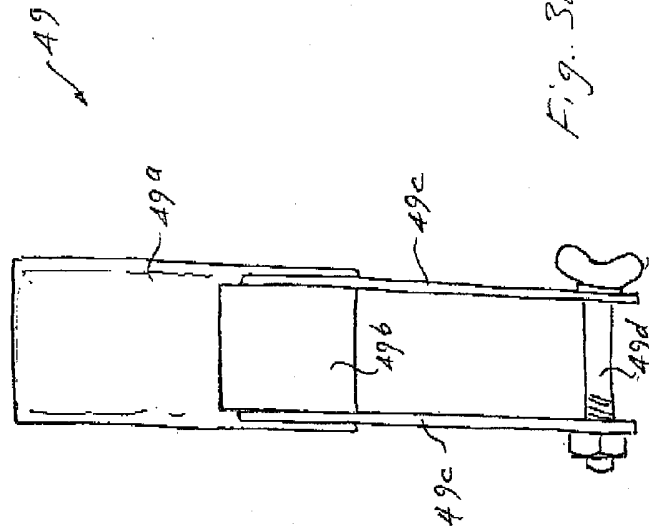
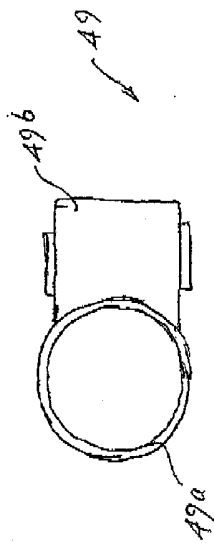


Fig. 3D

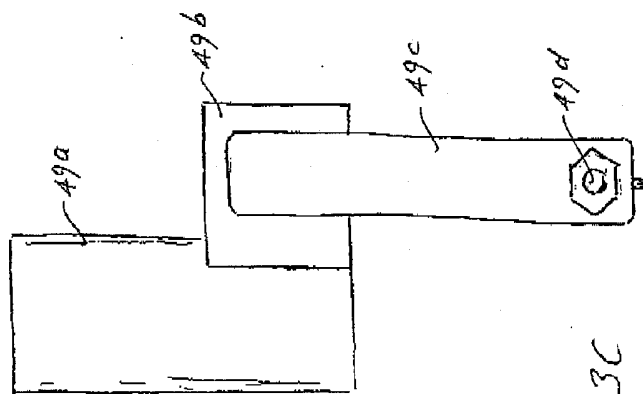


Fig. 3C

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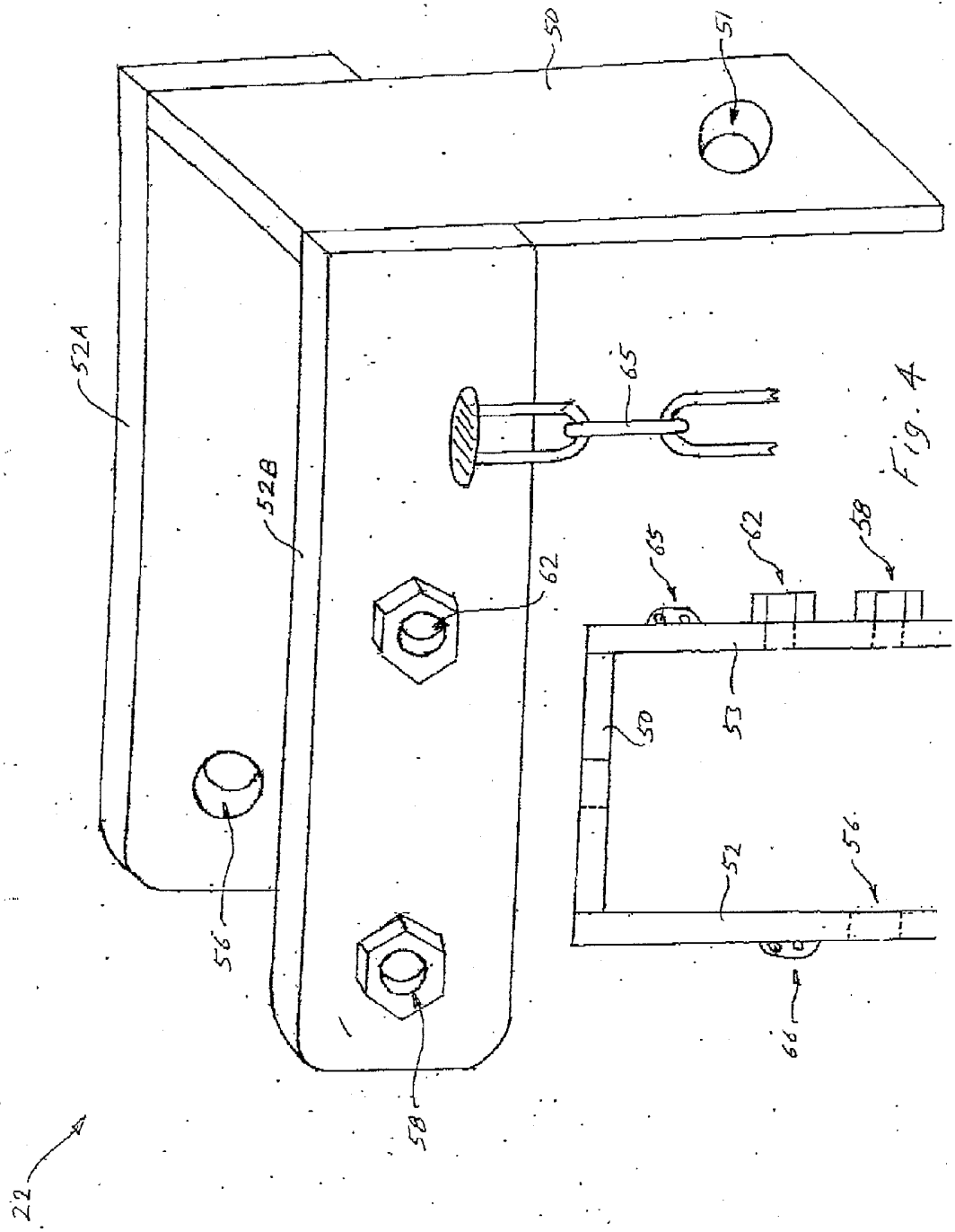


Fig. A

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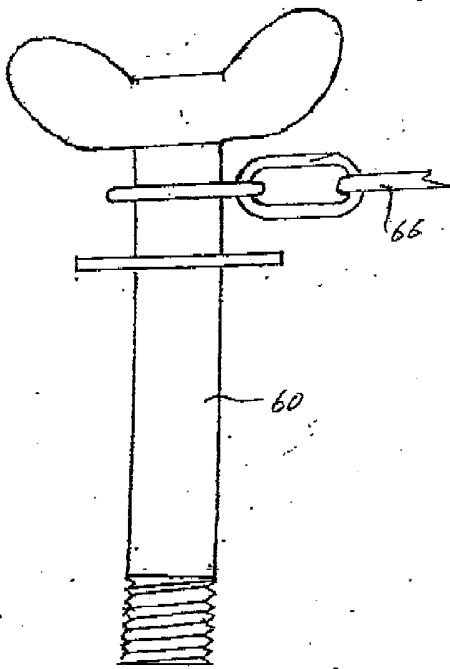


Fig. 5A

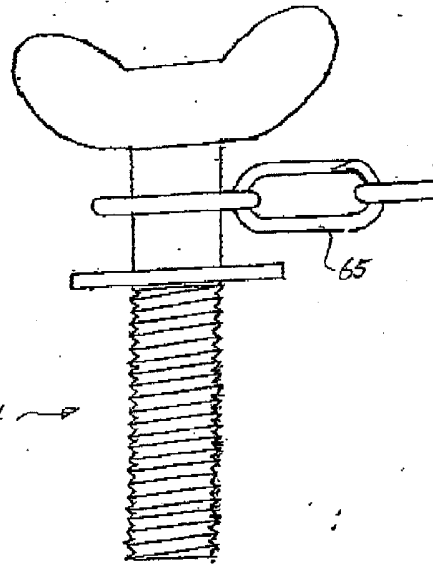


Fig. 5B

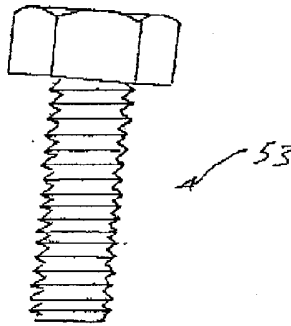


Fig. 5C

Fig. 5

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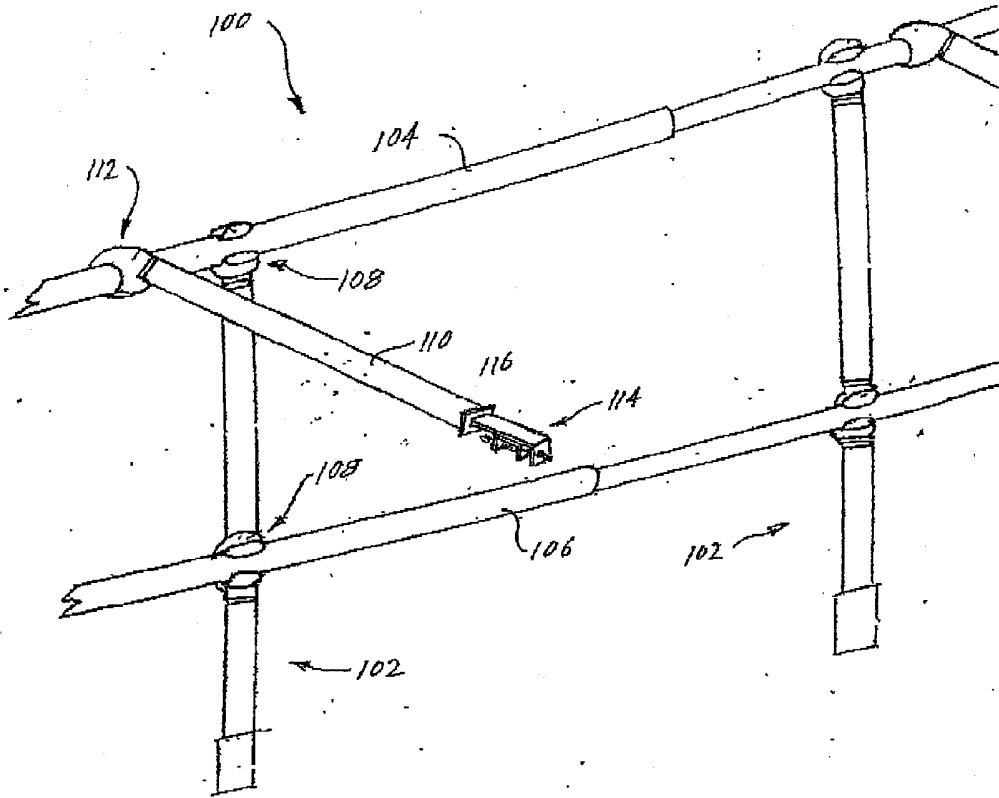


Fig. 6

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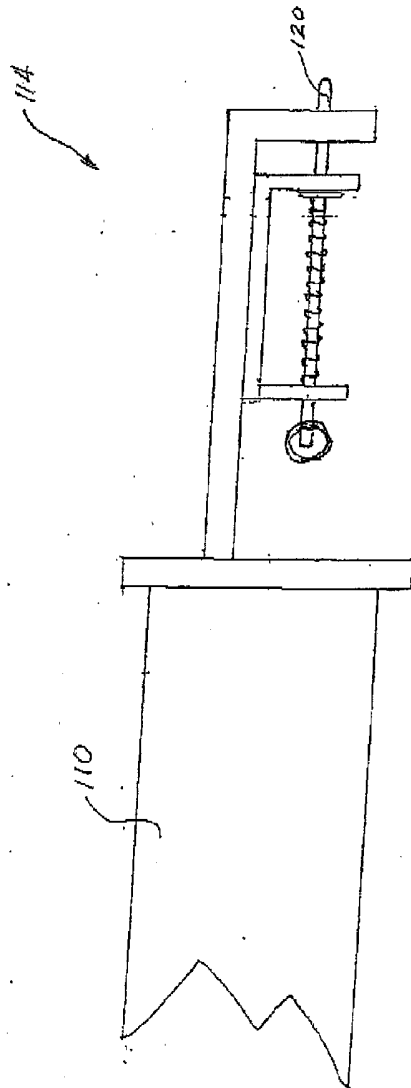


Fig. 7

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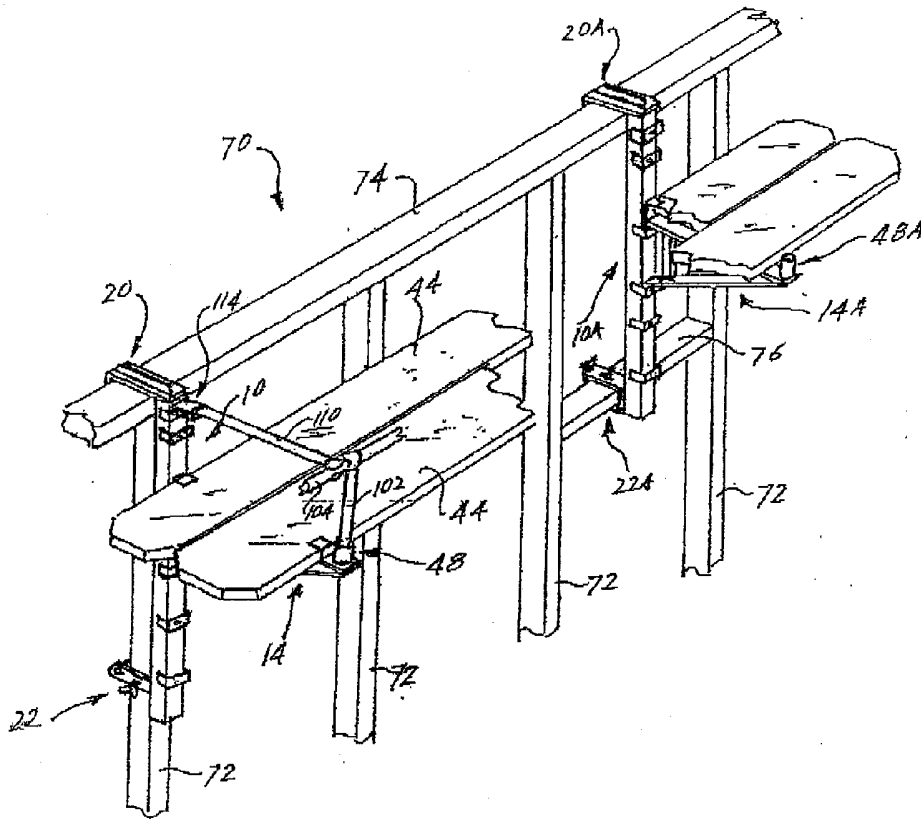


Fig. 8

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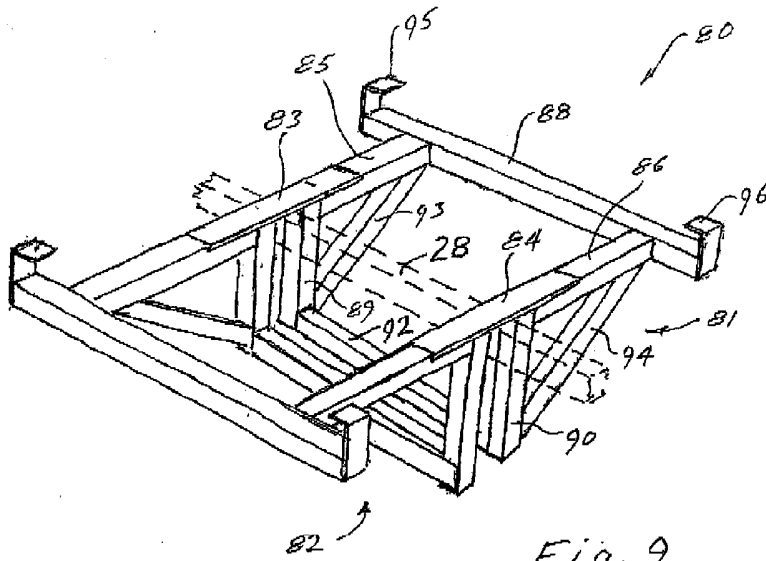


Fig. 9

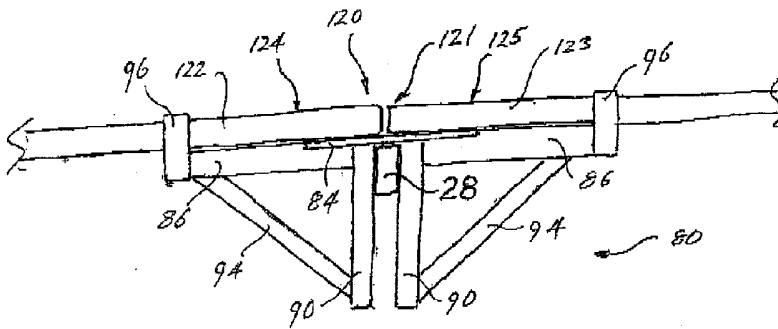


Fig. 10

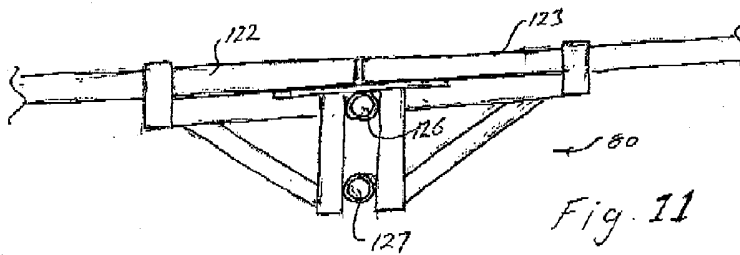


Fig. 11