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(54) **I-BEAM**

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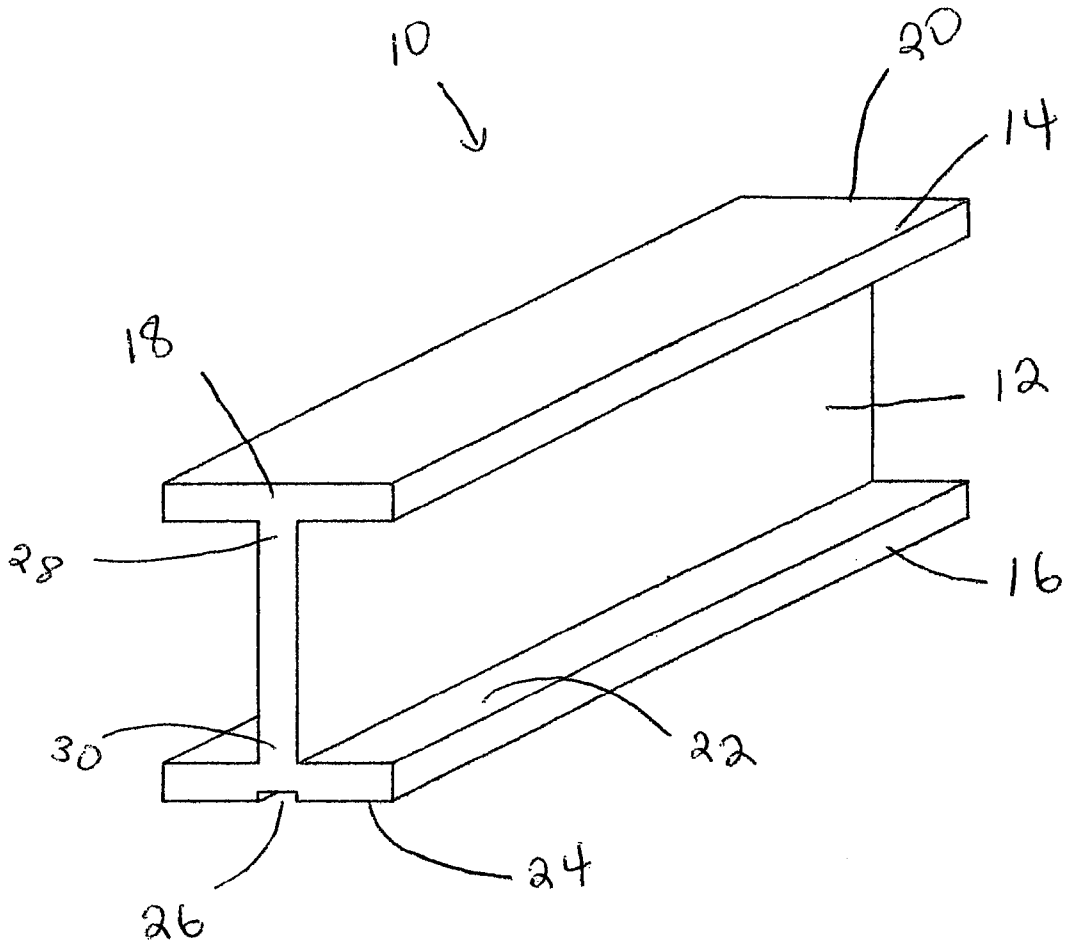
(57) **ABSTRACT**

In accordance with the present invention, there is provided a timber formwork I-beam which incorporates a bolt receiving channel. The I-beam is formed from an elongated generally planar web member of laminated wood having opposite side edges. A first elongated rectangular wooden flange is rigidly attached to one of the side edges and a second elongated rectangular wooden flange is rigidly attached to the opposite side edge, the first and second flanges extending substantially along the entire length of the web portion. The second elongated flange has opposite first and second sides, the web being rigidly attached to the first side. An elongated metal conduit is contained within the second flange between the first and second sides, the conduit extending along the length of the flange. The conduit defines an elongated passage extending along the conduit. The second flange has an elongated slot opening on the second side, said slot communicating with the passage of the conduit. The slot and passage each has an internal diameter, the internal diameter of the slot being less than the internal diameter of the passage.



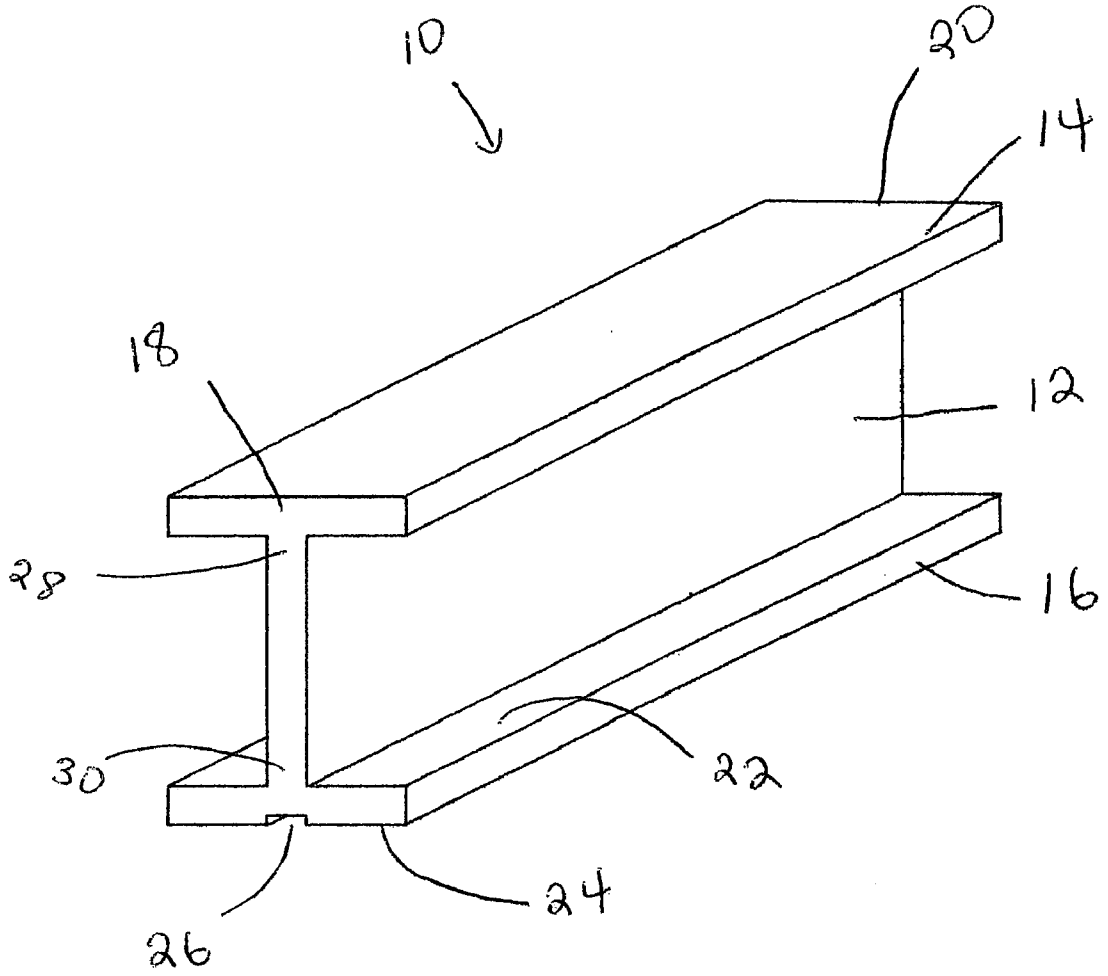


Fig. 1

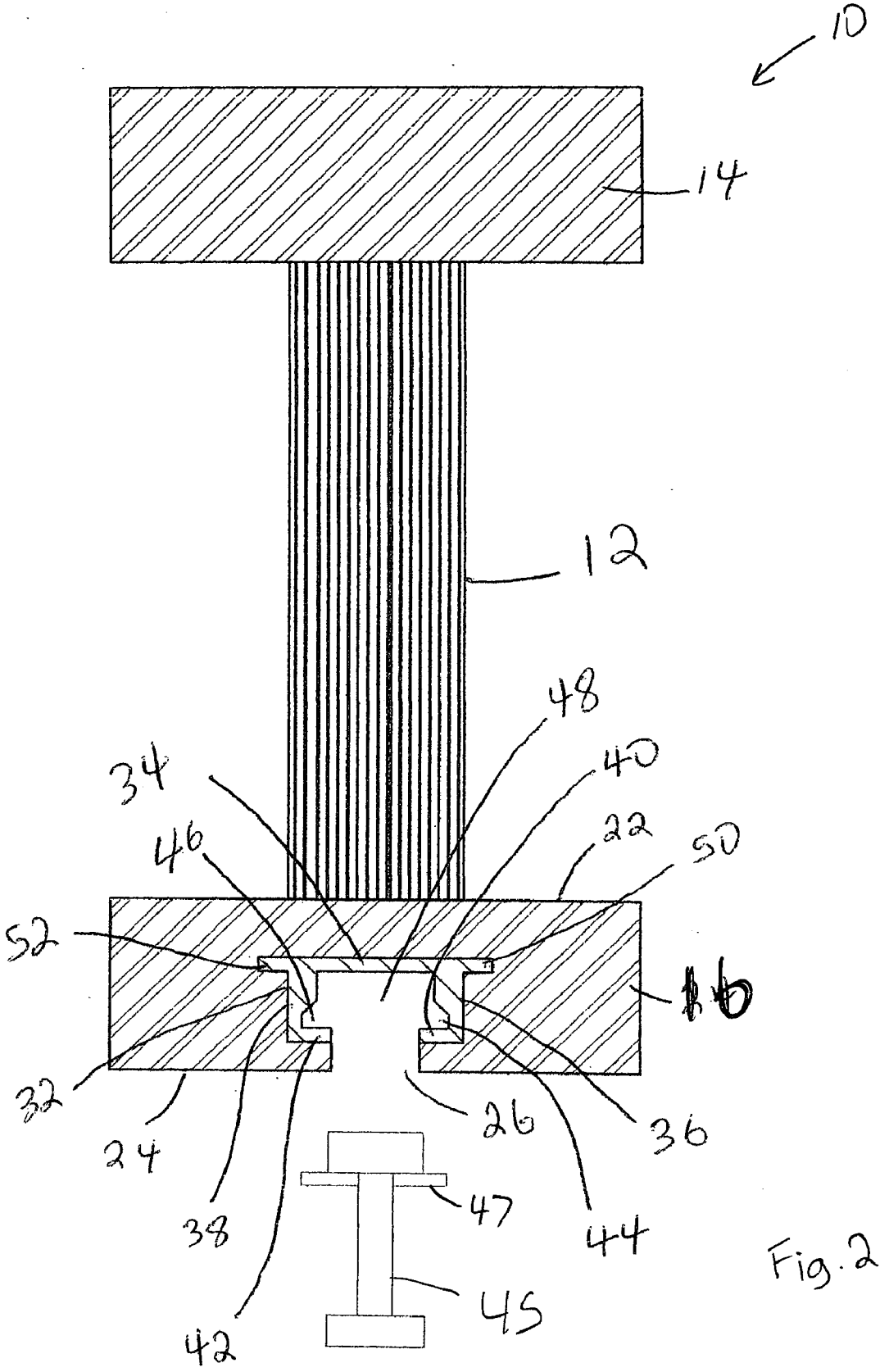


Fig. 2

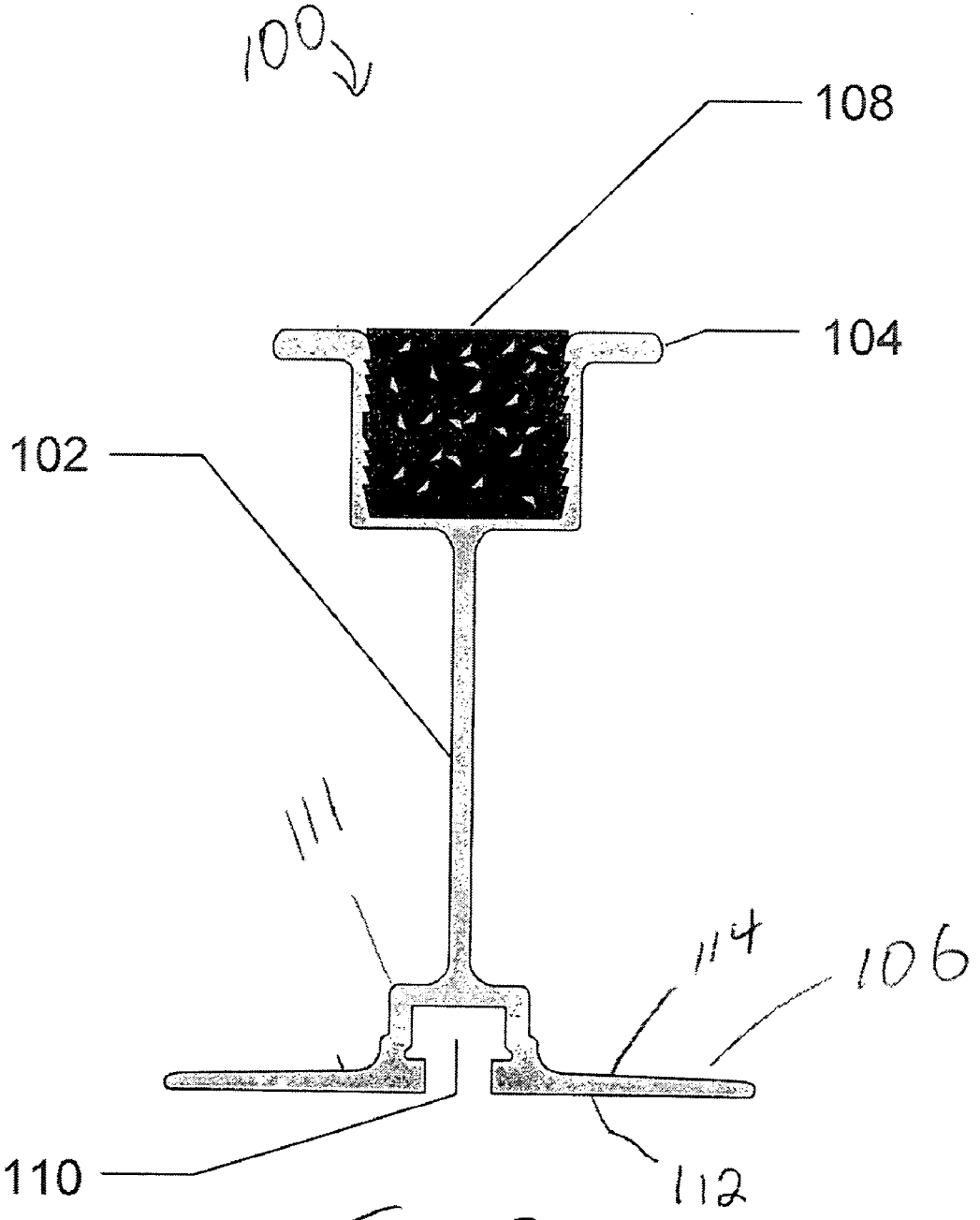


Fig. 3

I-BEAM

FIELD OF THE INVENTION

[0001] The invention relates generally to I-beams for constructing concrete forms.

BACKGROUND OF THE INVENTION

[0002] I-beams are often used in the construction industry. These I-beams are often made of either wood, steel or aluminum. Wooden I-beams made of laminated wood have been quite popular for the construction of concrete forms. In recent years however, wooden I-beams have been superceded by aluminum I-beams for use in concrete form construction. These I-beams generally consist of a flat planar web portion mounted between two perpendicular flange portions. One of the flange portions may incorporate a nailing strip made of plastic while the other flange may incorporate a channel for receiving one or more mounting bolts. The bolt receiving channel is a useful feature as it permits the quick assembly of scaffolding and the like to the I-beam. The bolt receiving channel also facilitates the easy disassembly and reuse of the I-beams. While these aluminum I-beams are effective, they suffer from two significant drawbacks. Firstly, these I-beams have only a single nailing strip, making the I-beam less versatile since nails cannot be driven into any other portions of the I-beam. Also, the cost of these I-beams is often prohibitive. A more cost effective I-beam is desirable.

SUMMARY OF THE INVENTION

[0003] In accordance with the present invention, there is provided a timber formwork I-beam which overcomes the drawbacks of the prior art. The present invention is formed from an elongated generally planar web member of laminated wood having opposite side edges. A first elongated rectangular wooden flange is rigidly attached to one of the side edges and a second elongated rectangular wooden flange is rigidly attached to the opposite side edge, the first and second flanges extending substantially along the entire length of the web portion. The second elongated flange has opposite first and second sides, the web being rigidly attached to the first side. An elongated metal conduit is contained within the second flange between the first and second sides, the conduit extending along the length of the flange. The conduit defines an elongated passage extending along the conduit. The second flange has an elongated slot opening on the second side, said slot communicating with the passage of the conduit. The slot and passage each has an internal diameter, the internal diameter of the slot being less than the internal diameter of the passage.

[0004] With the foregoing in view, and other advantages as will become apparent to those skilled in the art to which this invention relates as this specification proceeds, the invention is herein described by reference to the accompanying drawings forming a part hereof, which includes a description of the preferred typical embodiment of the principles of the present invention.

DESCRIPTION OF THE DRAWINGS

[0005] **FIG. 1**. is a perspective view of an I-beam made in accordance with the invention.

[0006] **FIG. 2**. is a cross sectional view of an I-beam made in accordance with the present invention.

[0007] **FIG. 3**. is a cross sectional view of a prior art I-beam.

[0008] In the drawings like characters of reference indicate corresponding parts in the different figures.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Referring firstly to **FIG. 3**, a prior art I-beam for use in constructing concrete forms is shown generally as item **100**. The I-beam consists of an aluminum extrusion having web portion **102**, top flange **104** and bottom flange portion **106**. Top flange **104** has elongated plastic block **108** which acts as a nailing strip. Bottom flange portion **106** has bottom surface **112** and top surface **114**. Hub portion **111** is formed in web **102** adjacent flange **106**. Hub **111** is essential a rectangular housing containing a passage **110**. Housing **111** projects above flange **106**. Passage **110** is configured to receive a mounting bolt (not shown) to permit scaffolding and the like to be quickly mounted to the I-beam. Fasteners such as nails and screws can only be attached to plastic block **108**, since the rest of the I-beam is made of aluminum.

[0010] Referring now to **FIG. 1**, an I-beam made in accordance with the present invention, shown generally as item **10**, consists of an elongated flat web **12** and rectangular wooden flanges **14** and **16**. Web **12** is made of laminated wood such as plywood and has side edges **28** and **30**. First flange **14** is preferably a flat rectangular piece of wood (either solid wood or laminate) which is rigidly attached to edge **28** of web **12** by adhesive or by means known generally in the art. Likewise, second flange **16** is preferably a rectangular piece of wood (either solid wood or laminate) which is rigidly attached to edge **30** of web **12** by means known generally in the art. Second flange **16** has opposite surfaces **22** and **24**. Slot opening **26** is milled into flange **16** and extends between ends **18** and **20** of I-beam **10**.

[0011] Referring now to **FIG. 2**, flange **24** has a conduit **32** extending the length of the flange. Conduit **32** is entirely contained within flange **16** and is positioned between surfaces **22** and **24**. Conduit **32** is formed of a strong metal such as steel, but is preferably made from an aluminum extrusion. Conduit **32** is bonded to flange **16** by means of an adhesive. Several suitable adhesives specifically designed to bond wood to metal are currently available in the marketplace. Conduit **32** has back wall **34**, side walls **32** and **36** and front walls **40** and **42**. Walls **34**, **32**, **36**, **40** and **42** define a passage **40** which communicates with slot opening **26**. Slot opening **26** also separate front walls **40** and **42**. Back wall **34** extends beyond side walls **32** and **36** to form wings **52** and **50**, respectively. Wings **52** and **50** extend into flange **16** at least 5 millimeters. Wings **52** and **50** are positioned within flange **16** such that the wings are positioned between surfaces **22** and **24**. Preferably, wings **52** and **50** are 13 millimeters from surface **22** and 22 millimeters from surface **24**. Wings **52** and **50** are an important feature as they help prevent conduit **32** from twisting relative to flange **16** when force is applied to the conduit. By extending past side walls **32** and **36**, wings **50** and **52** help to anchor conduit **32** within flange **16**. Front walls **40** and **42** are positioned within flange **16** and at least 7 millimeters from surface **24** of flange **16**. Likewise, back wall **34** is positioned at least 13 millimeters from surface **22** of flange **16**.

[0012] Conduit **32** is configured such that passage **40** is dimensioned and configured to receive and retain bolt **45**. Side walls **38** and **36** have notches **46** and **44**, respectively, positioned adjacent walls **42** and **44**, respectively. Notches **46** and **44** widen passage **40** adjacent slot opening **26** such that the passage can accommodate flange **47** of bolt **45**.

[0013] To construct I-beam **10**, a wooded I-beam is first constructed by bonding flanges **16** and **16** to web portion **12**. An opening having a slightly larger cross-sectional profile than conduit **32** is then milled into flange **16**. After the opening is milled, the outside surface of the conduit is coated with an adhesive layer and then inserted into the opening. The beam is then left until the adhesive cures.

[0014] The present invention has many advantages over the prior art. Firstly, since flanges **14** and **16** and web **12** is made of wood, virtually any portion of the I-beam can be nailed or screwed making the I-beam more versatile. Furthermore, the positioning of conduit **32** within flange **16** together with wing portions **50** and **52** make the conduit particularly secure within flange **16**. Wings **50** and **52** increase the surface area of contact between conduit **32** and flange **16** thereby permitting a stronger bond between the conduit and the flange. Also, wings **50** and **52**, by projecting into flange **16** beyond walls **36** and **34** actually anchor the conduit within the flange, making the conduit more resistant to twisting and warping. Also, conduit **32** is completely surrounded and supported by flange **16**, making it less likely that the conduit will warp or fail. The net result is that conduit **32** of I-beam **10** is actually stronger than housing **111** of I-beam **100** (see **FIG. 3**). Finally, another advantage of the present invention is that it can be used in conjunction with existing aluminum beam constructions. This is a significant advantage over traditional wooden I-beams. Traditional wooden I-beams cannot be bolted to aluminum beam constructions, while I-beams made in accordance with the present invention, having conduit **32**, are compatible with aluminum beam constructions.

[0015] A specific embodiment of the present invention has been disclosed; however, several variations of the disclosed embodiment could be envisioned as within the scope of this invention. It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

Therefore, what is claimed is:

1. A timber formwork I-beam comprising:

a. an elongated generally planar web member of laminated wood having opposite side edges,

b. a first elongated rectangular wooden flange rigidly attached to one of the side edges and a second elongated rectangular wooden flange rigidly attached to the opposite side edge, the first and second flanges extending substantially along the entire length of the web portion,

c. the second elongated flange having opposite first and second sides, the web being rigidly attached to the first side,

d. an elongated metal conduit contained within the second flange between the first and second sides, the conduit extending along the length of the flange, the conduit defining an elongated passage extending along the conduit, the flange having an elongated slot opening on the second side, said slot communicating with the passage of the conduit, the slot and passage each having an internal diameter, the internal diameter of the slot being less than the internal diameter of the passage.

2. The timber formwork I-beam of claim 1 wherein the conduit has opposite parallel side walls perpendicularly attached to a back wall and a pair of parallel front walls, each front wall extending from a side wall, the front walls being separated by the slot opening.

3. The timber formwork I-beam of claim 2 wherein the back wall of the conduit has opposite side edges and wherein the side walls extend from the back wall adjacent to and perpendicularly from each of the side walls.

4. The timber formwork I-beam of claim 3 wherein each side wall has a notch extending the entire length of the side wall, the notch of each side wall being located adjacent the front wall.

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