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Improvements in Girder Fittings

This invention relates to the attachment of scaffolding platforms, workmen's platforms or cradles and the like to flanged girders of steel or like material and is particularly concerned with fittings for securing scaffolding to such girders.

It is known to clamp scaffold tubes to one another at right angles by means of clamps which are shaped to engage around the scaffold tubes and which are held in position by means of a single screw. Such arrangements are disclosed for example in GB—A— 785128 and 653810. However, such arrangements cannot be used to clamp scaffold tubes to flanged girders.

The present invention aims to provide a fitting which can be used to clamp a scaffold tube to a flanged girder, the scaffold tube forming part of a workmen's platform or cradle whereby said platform can be secured directly to the girder.

US—A—2,165,221 discloses a fitting adapted to be secured to a horizontal length of scaffold tube for clamping said scaffold tube to the horizontal flange of a flanged girder, said fitting comprising a main body, a clamp pivotally mounted on the lower portion of the main body, said clamp and main body being so shaped as to co-operatively receive and clamp between them said length of scaffold tube, fastening means for releasably securing the clamp to the main body, and a screw arranged to engage the surface of said girder flange to clamp the main body to the girder, whereby, in use, the main body and clamp are secured to the scaffold tube at a position adjacent to an edge portion of the girder flange, a part of the main body overlying the upper surface of horizontal flange of the flanged girder and the main body being clamped to the girder flange by the screw engaging the surface of said flange.

This prior arrangement provides a coupler for two scaffold tubes which is intended to be placed against a girder for rigidity purposes for the fitting itself and is not designed for use as the main weight bearing device for constructing a drop scaffold tube used in the construction of a workmen's platform or cradle. This prior fitting has a boss which is designed to take a latch securing bolt but is not intended to seat on the horizontal flange of a girder. If the bolt were to shear, the latch jaw would be released and the scaffold tube held therein could jump out. Furthermore, the small area of the boss which would drop onto the girder flange in the event of bolt failure would be insufficient to maintain the scaffold in place particularly if the scaffold tube had worked loose or fallen down as a result of failure of the bolt. The fitting is therefore totally unsuitable for use in constructing workmen's cradles or platforms.

The primary aim of this invention is to provide a fitting which can be used with

complete safety to construct a workmen's cradle or platform by securely clamping a scaffold tube forming part of the cradle or platform directly to a flanged girder.

Accordingly, the present invention is characterized in that the major length of the main body extends, in use, in the vertical direction, the fastening means is substantially horizontally disposed when the fitting is in use, the part of the main body extends, at a position remote from the pivotal connection of the clamp, in a direction substantially at right angles to the major length of the main body, and the said main body has at its lower end a portion which is provided with an arcuate recess to receive and engage the scaffold tube such that the vertical load of the scaffold tube is borne substantially entirely by the main body, the fastening means being only subjected to horizontal loads from the fitting being clamped onto the scaffold tube.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation of one embodiment of a girder fitting according to the invention;

Figure 2 is a front elevation of the fitting shown in Figure 1;

Figure 3 is a side elevation of a second embodiment of a girder fitting according to the invention;

Figure 4 is a front elevation of the fitting shown in Figure 3;

Figure 5 shows one manner in which fittings according to the invention may be used in the construction of a working platform; and

Figure 6 is a section taken on the line VI—VI in Figure 5.

In the drawings, like parts are denoted by like reference numerals.

Reference will first be made to Figures 1 and 2 of the drawings in which the fitting 10 comprises a main body 1 having, adjacent one end, an arcuate recess 2 and on which one end of a latch or clamp 4 is pivotally mounted by means of a rivet 3. A latch bolt 6 is also pivotally mounted on the main body 1 and is receivable in a slot 5 in the other end of the clamp 4. The latch bolt 6 is screw-threaded along at least part of its length and a nut 7 and washer 8 are provided thereon.

The other end of the main body 1 is curved from the axis of the major portion of the length of said body and terminates in a part 11 extending substantially at right angles to said axis. The part 11 is provided with a screw-threaded bore for receiving a screw 12.

In use, the fitting is secured to a length of scaffold tube 9 by engaging the arcuate recess 2 on said scaffold tube 9 and pivoting the clamp 4 into engagement with said scaffold tube 9. The latch bolt 6 is then allowed to drop into the

slot 5 in the clamp 4 and the nut 7 turned until the body 1 and clamp 4 are clamped to the scaffold tube 9 in an immovable manner. The fitting is then ready for the part 11 of the main body 1 to be hooked over the flange 13 of a flanged girder. The screw 12 is then turned to draw the scaffold tube 9 into engagement with the underside of the flange 13.

Owing to the main body 1 being in a vertical plane, the vertical load from the scaffold tube 9 is transferred via the lug retaining the rivet 3, into the main body 1. By means of this arrangement, the latch bolt 6 is only subjected to loads from the fitting 10 being clamped onto the scaffold tube 9.

Referring now to Figures 3 and 4 of the drawings, the fitting 10 comprises a main body 14 having adjacent one end an arcuate recess 15 and on which one end of latch or clamp 16 is pivotally mounted by means of a rivet 17. A latch bolt 18 pivotally mounted on the main body 14 is receivable in a slot 19 in the other end of the clamp 16. Part of the length of the latch bolt 18 is screw-threaded for receiving a nut 20, a washer 21 being interposed between the nut 20 and clamp 16.

The other end of the main body 14 is curved from the axis of the major portion of the length of said body 14 and terminates in a part 22 extending substantially at right angles to said axis. The end of said part 22 is provided with a bar-like projection 22a the longitudinal axis of which is substantially perpendicular to said axis of the main body 14 as well as to the remainder of part 22. The projection 22a is intended to rest on the flange 13 of a flanged girder.

Located intermediate the ends of the main body 14 and extending substantially at right angles to the said axis of the main body 14 is a lug 23 which is aligned with the part 22 but spaced therefrom. The lug 23 is provided with a screw-threaded bore for receiving a screw 24.

As with the embodiment described with reference to Figures 1 and 2 of the drawings, the fitting shown in Figures 3 and 4 can be secured to a length of scaffold tube 9 by engaging the arcuate recess 15 on the scaffold tube 9 and pivoting the clamp 16 into engagement with the said scaffold tube 9. The latch bolt 18 is then allowed to drop into the slot 19 in the clamp 16 and the nut 20 turned until the main body 14 and clamp 16 are clamped to the scaffold tube 9 in an immovable manner. The part 22 can then be hooked over the flange 13 of a flanged girder so that the projection 22a bears on said flange 13 and the screw 24 turned to clamp the fitting 10 to the flange 13.

Again, in this case, the vertical load from the scaffold tube 9 is transferred to the main body 14 via the lug retaining the rivet 17 so that the latch bolt 18 is subjected only to the load of the fitting 10 being clamped onto the scaffold tube 9. Moreover, in this embodiment, the load of the scaffold tube 9 and fitting 10 is borne by the part 22 and its projection 22a, the screw 24

serving merely to secure the fitting 10 onto the girder and not being subjected to direct load.

The main body 1 or 14 and latch or clamp 4 or 16 are preferably made of drop forged steel while the bolt 6 or 18 and screw 12 or 24 are preferably made of mild steel although other materials may be used if desired.

Either of the above described fittings according to the invention can be used in a variety of applications, examples of which are shown in Figures 5 and 6 of the accompanying drawings.

Figures 5 and 6 show the manner in which fittings according to the invention can be used to suspend a working platform from a series of flanged girders forming the steelwork of, for example, a bridge or roof in order to gain access for painting or maintenance work for example. As shown in Figure 5, a single scaffold tube 9 is secured to the flanges 13 of two parallelly-extending girders 25 and 26 by two fittings 10.

A series of vertical scaffold tubes 27 are secured at spaced intervals to the scaffold tube 9 and a horizontal scaffold tube 28 is secured to the scaffold tubes 27 to extend parallel to the scaffold tube 9 to form a framework. This framework is secured to a like framework 29 (Figure 6) by further horizontal scaffold tubes 30, 31 and 32, the tubes 32 being interconnected between the two frameworks by a transversely extending scaffold tube 33. Timber boards 34 are laid on the scaffold tubes 28 and 33 to form a working platform. Additional vertical boards 35 serve as toe boards and the scaffold tubes 31 serve as hand rails. The platform may be extended further by other frameworks 29 as shown in Figure 6.

It will be seen that, by means of the fitting according to the invention, standard equipment used throughout the scaffolding industry may be used to secure a variety of working platforms to girder form steelwork thus representing a considerable saving in special equipment which would otherwise be necessary.

Other embodiments and modifications of the above described fittings are possible without departing from the scope of this invention as defined by the appended claims.

Claims

1. A fitting (10) adapted to be secured to a length of scaffold tube (9) for clamping said scaffold tube (9) to the horizontal flange (13) of a flanged girder; said fitting (10) comprising a main body (1, 14), a clamp (4, 16) pivotally mounted on the lower portion of the main body (1, 14), said clamp and main body being so shaped as to co-operatively receive and clamp between them said length of scaffold tube (9), fastening means (6, 7; 18, 20) for releasably securing the clamp (4, 16) to the main body (1, 14); and a screw (12, 24) arranged to engage the surface of said girder flange (13) to clamp the main body (1, 14) to the girder; whereby, in

use, the main body (1, 14) and clamp (4, 16) are secured to the scaffold tube (9) at a position adjacent an edge portion of the girder flange (13), a part (11, 22) of the main body overlies the upper surface of the horizontal flange (13) of the flanged girder and the main body (1, 14) is clamped to the girder flange (13) by the screw (12, 24) engaging the surface of said flange, characterized in that the major length of the main body (1, 14) extends, in use, in the vertical direction, the fastening means (6, 7; 18, 20) is substantially horizontally disposed when the fitting (10) is in use, the part (11, 22) of the main body (1, 14) extends, at a position remote from the pivotal connection (3, 17) of the clamp (4, 16), in a direction substantially at right angles to the major length of the main body (1, 14), and the said main body (1, 14) has at its lower end a portion which is provided with an arcuate recess (2, 15) to receive and engage the scaffold tube (9) such that the vertical load of the scaffold tube is borne substantially entirely by the main body (1, 14), the fastening means (6, 7; 18, 20) being only subjected to horizontal loads from the fitting being clamped onto the scaffold tube (9).

2. A fitting according to claim 1, characterised in that the clamp (4, 16) is pivotally mounted at one end on the main body (1, 14), in that the other end of the clamp (4, 16) is provided with a slot (5, 19), in that the releasable fastening means comprise a bolt (6, 18) pivotally mounted on the main body (1, 14) and engageable in the slot (5, 19) in said clamp (4, 16), in that the head of the bolt (6, 18) is pivotally mounted in the main body (1, 14) and said bolt (6, 18) has a screw-threaded shank and in that a nut (7, 20) is engaged on said screw-thread and is effective, on being turned, to draw the said other end of the clamp (4, 16) towards the main body (1, 14).

3. A fitting according to claim 1 or claim 2, characterised in that the said part (11) of the main body (1) extending substantially at right angles to the major length of said main body (1) is provided with a screw-threaded bore and in that the screw (12) is engageable with the screw-thread of said bore.

4. A fitting according to claim 1 or claim 2, characterised in that the main body (14) is provided, intermediate its ends, with a lug (23) aligned with said part (22) of the main body (14) extending substantially at right angles to the major length of said main body (14) but spaced from said part (22).

5. A fitting according to claim 4, characterised in that the lug (23) is provided with a screw-threaded bore and in that the screw (24) is engageable with the screw-thread of said bore.

Revendications

1. Raccord (10) destiné à être fixé à une

section de tube (9) d'échaffaudage pour bloquer ledit tube (9) d'échaffaudage sur l'aile horizontale (13) d'une poutre; ledit raccord (10) comprenant un corps principal (1, 14), une pince (4, 16) montée de façon pivotante sur la partie inférieure du corps principal (1, 14) ladite pince et ledit corps ayant une form telle que ces deux pièces coopèrent de manière à recevoir et à enserrer ladite section de tube (9) d'échaffaudage, un moyen d'attache (6, 7; 18, 20) servant à fixer de façon amovible ladite pince (4, 16) au corps principal (1, 14); et une vis (12, 24) disposée de manière à venir s'appliquer contre la surface de ladite aile (13) de poutre de manière à bloquer le corps principal (1, 14) sur cette poutre; grâce à quoi en cours d'utilisation, le corps principal (1, 14) et la pince (4, 16) se trouvent assujettis au tube (9) d'échaffaudage et une position voisine du bord de l'aile (13) de la poutre, une partie (11, 22) du corps principal recouvre la face supérieure de l'aile horizontale (13) de la poutre et le corps principal (1, 14) est bloquée sur l'aile (13) de la poutre au moyen de la vis (12, 24) appliquée contre la surface de ladite aile, caractérisé par le fait que la majeure partie de la longueur du corps principal (1, 14) est orientée, en cours d'utilisation, verticalement, le moyen d'attache (6, 7; 18, 20) est disposé pratiquement suivant la direction horizontale lorsque l'on utilise le raccord (10), la partie (11, 22) du corps principal (1, 14) est disposée, en une position éloignée du raccord pivotant (3, 17) de l'aile (4, 16) suivant une direction pratiquement perpendiculaire à la majeure partie de la longueur du corps principal (1, 14) et ledit corps principal (1, 14), présente à son extrémité inférieure, une partie comportant une cavité courbe (2, 15) destinée à recevoir le tube (9) d'échaffaudage et à s'appliquer contre ce tube, de façon que la charge verticale exercée par le tube d'échaffaudage soit supportée en quasi-totalité par le corps principal (1, 14), le moyen d'attache (6, 7; 18, 20) n'étant soumis qu'à des charges horizontales du fait que le raccord est bloqué sur le tube (9) d'échaffaudage.

2. Raccord selon la revendication 1, caractérisé par le fait la pince (4, 16) est montée de façon pivotante à une extrémité du corps principal (1, 14), par le fait que l'autre extrémité de la pince (4, 16) comporte une fente (5, 19) par le fait que le moyen d'attache amovible comprend un boulon (6, 18) monté de façon pivotante sur le corps principal (1, 14) et qui peut venir s'engager dans la fente (5, 19) de ladite pince (4, 16), par le fait que la tête du boulon (6, 18) est montée de façon pivotante dans le corps principal (1, 14) et que ledit boulon (6, 18) a une tige filetée et par le fait qu'un écrou (7, 20) est vissé sur ledit filetage et a pour rôle, lorsqu'on le tourne, d'entraîner ladite autre extrémité de la pince (4, 16) en direction du corps principal (1, 14).

3. Raccord selon la revendication 1 ou la revendication 2, caractérisé par le fait que ladite

partie (11) du corps principal (1) orientée à peu près perpendiculairement à la majeure partie de la longueur dudit corps principal (1) comporte un alésage taraudé et par le fait que la vis (12) peut venir se visser dans le filetage dudit alésage.

4. Raccord selon la revendication 1 ou la revendication 2, caractérisé par le fait que le corps principal (14) est muni en un point situé entre ces extrémités, d'une patte (23) alignée avec ladite partie (22) du corps principal (14) à peu près perpendiculairement à la majeure partie de la longueur dudit corps principal (14) mais à une certaine distance de ladite partie (22).

5. Raccord selon la revendication 4, caractérisé par le fait que la patte (23) comporte un alésage taraudé et par le fait que la vis (24) peut se visser dans le taraudage dudit alésage.

Patentansprüche

1. Halterung, welche zur Befestigung an einem Gerüstrohrstück (9) gestaltet ist, um das Gerüstrohr (9) am horizontalen Flansch (13) eines Doppel-T-Träger festzuklemmen, bei der diese Halterung (10) enthält einen Grundkörper (1, 14) und eine Schelle (4, 16), welche schwenkbar im unteren Bereich des Grundkörpers (1, 14) befestigt ist, wobei die Schelle und der Grundkörper so gestaltet sind, daß sie gemeinsam das Gerüstrohrstück (9) zwischen sich aufnehmen und klemmen können; Befestigungsmittel (6, 7; 18, 20) zum lösbaren Befestigen der Schelle (4, 16) am Grundkörper (1, 14) und eine Schraube (12, 24), welche so angeordnet ist, daß sie auf die Oberfläche des Trägerflansches (13) auftreffen kann, um den Grundkörper (1, 14) am Träger festzuklemmen, wobei im Gebrauch der Grundkörper (1, 14) und die Schelle (4, 16) am Gerüstrohr (9) einem Randabschnitt des Trägerflansches (13) gegenüberliegend befestigt sind und ein Teil (11, 22) des Grundkörpers über die obere Fläche des horizontalen Flansches (13) des Doppel-T-Trägers greift, und bei der der Grundkörper (1, 14) am Trägerflansch (13) mittels der Schraube (12, 24) festgeklemmt ist, welche die Oberfläche des Flansches berührt, dadurch gekennzeichnet, daß die Hauptlänge des Grundkörpers (1, 14) sich in Gebrauch in senkrechter Richtung erstreckt, daß die Befestigungsmittel (6, 7; 18, 20) bei Ge-

brauch der Halterung im wesentlichen waagrecht angeordnet sind, daß der Teil (11, 22) des Grundkörpers (1, 14), der sich von der schwenkbaren Verbindung (3, 17) der Schelle (4, 16) entfernt erstreckt im wesentlichen im rechten Winkel zur Hauptlänge des Grundkörpers (1, 14) ausgerichtet ist, daß der Grundkörper (1, 14) an seinem unteren Ende einen Bereich hat, welcher mit einer bogenförmigen Ausnehmung (2, 15) zur Aufnahme und Halterung des Gerüstrohres (9) versehen ist, derart, daß die vertikale Last des Gerüstrohres im wesentlichen vollständig von dem Grundkörper (1, 14) getragen wird, und daß die Befestigungsmittel (6, 7; 18, 20) nur horizontalen Kräften durch die auf das Gerüstrohr (9) geklemmte Halterung ausgesetzt ist.

2. Halterung gemäß Anspruch 1, dadurch gekennzeichnet, daß die Schelle (4) mit einem Ende am Grundkörper (1, 14) schwenkbar befestigt ist, daß das andere Ende der Schelle (4, 16) einen Schlitz (5, 19) hat, daß die lösbaren Befestigungsmittel einen Schraubenbolzen (6, 18) aufweisen, der schwenkbar am Grundkörper (1, 14) befestigt ist und in den Schlitz (5, 19) der Schelle (4, 16) zu Greifen vermag, wozu der Kopf des Schraubenbolzens (6, 18) schwenkbar im Grundkörper gelagert ist, und der Schraubenbolzen (6, 18) einen Gewindegewinde hat, und daß eine Mutter (7, 20) auf dieses Gewinde geschraubt ist und bei Drehung das andere Ende der Schelle (4, 16) in Richtung des Grundkörpers (1, 14) zu ziehen vermag.

3. Halterung gemäß Anspruch 1, oder Anspruch 2, dadurch gekennzeichnet, daß der Teil (11) des Grundkörpers (1), welcher sich im wesentlichen in rechten Winkeln zur Hauptlänge des Grundkörpers (1) erstreckt, mit einem Gewindeloch versehen ist, in dessen Gewindengang die Schraube (12) einschraubbar ist.

4. Halterung gemäß Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß der Grundkörper (14) zwischen seinen Enden einen Ansatz (23) hat, welcher mit dem Teil (22) des Grundkörpers (14) fluchtet, der sich in im wesentlichen rechten Winkeln zur Hauptlänge des Grundkörpers (14) erstreckt, jedoch Abstand von dem Teil (22) hat.

5. Halterung gemäß Anspruch 4, dadurch gekennzeichnet, daß der Ansatz (23) ein Gewindeloch hat, und daß eine Schraube (24) in das Gewinde des Loches einschraubbar ist.

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FIG. 1.

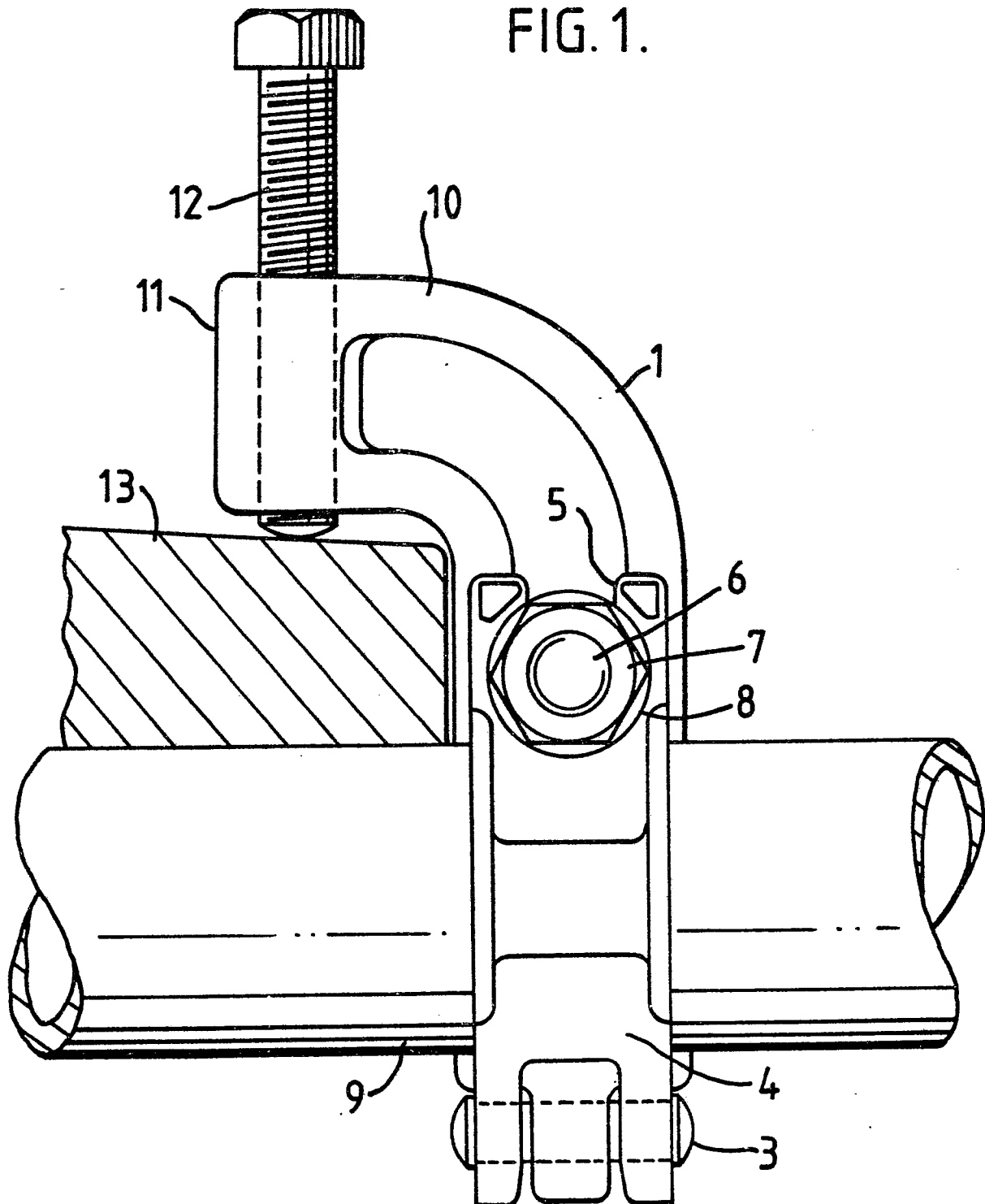
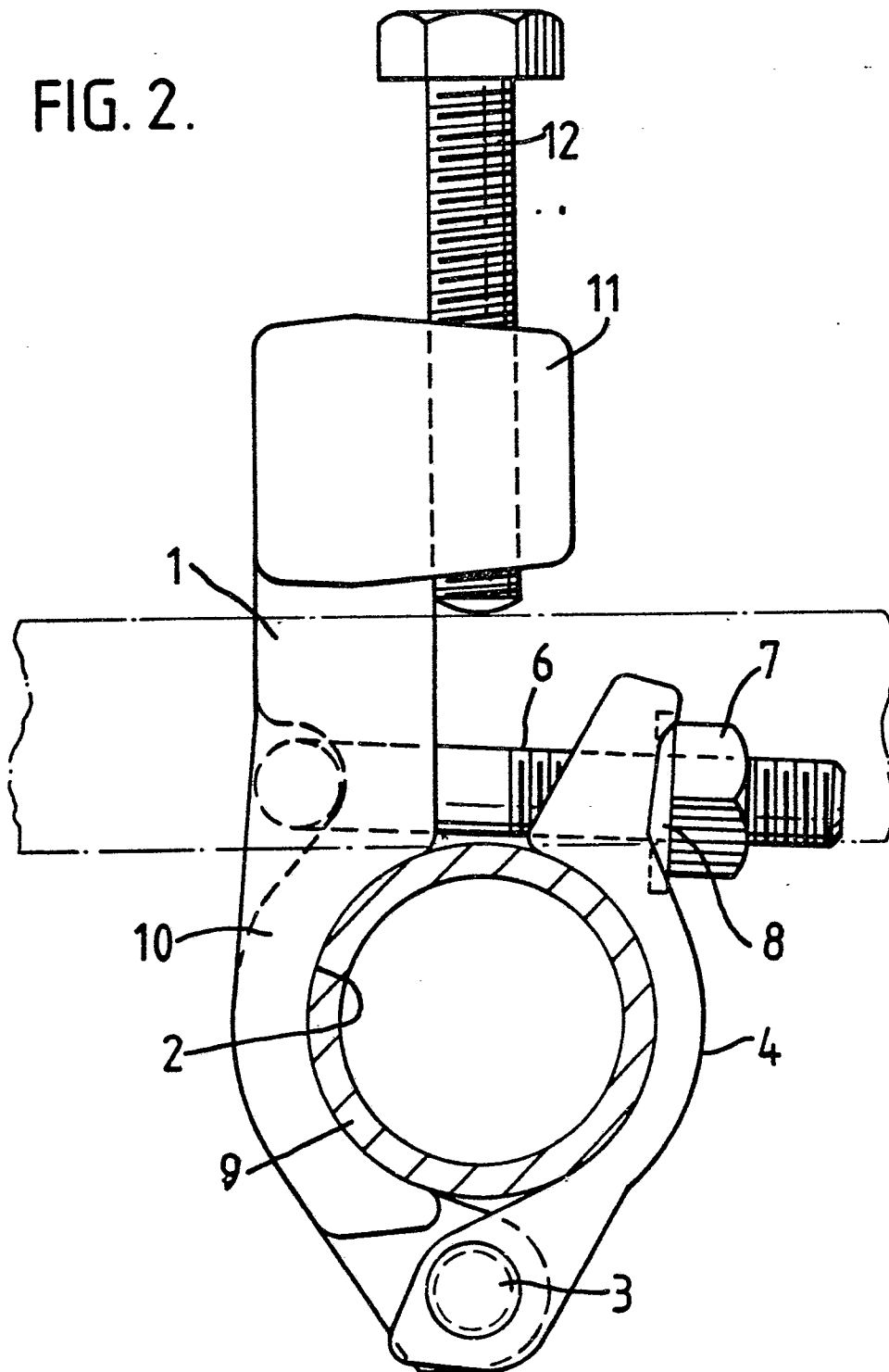
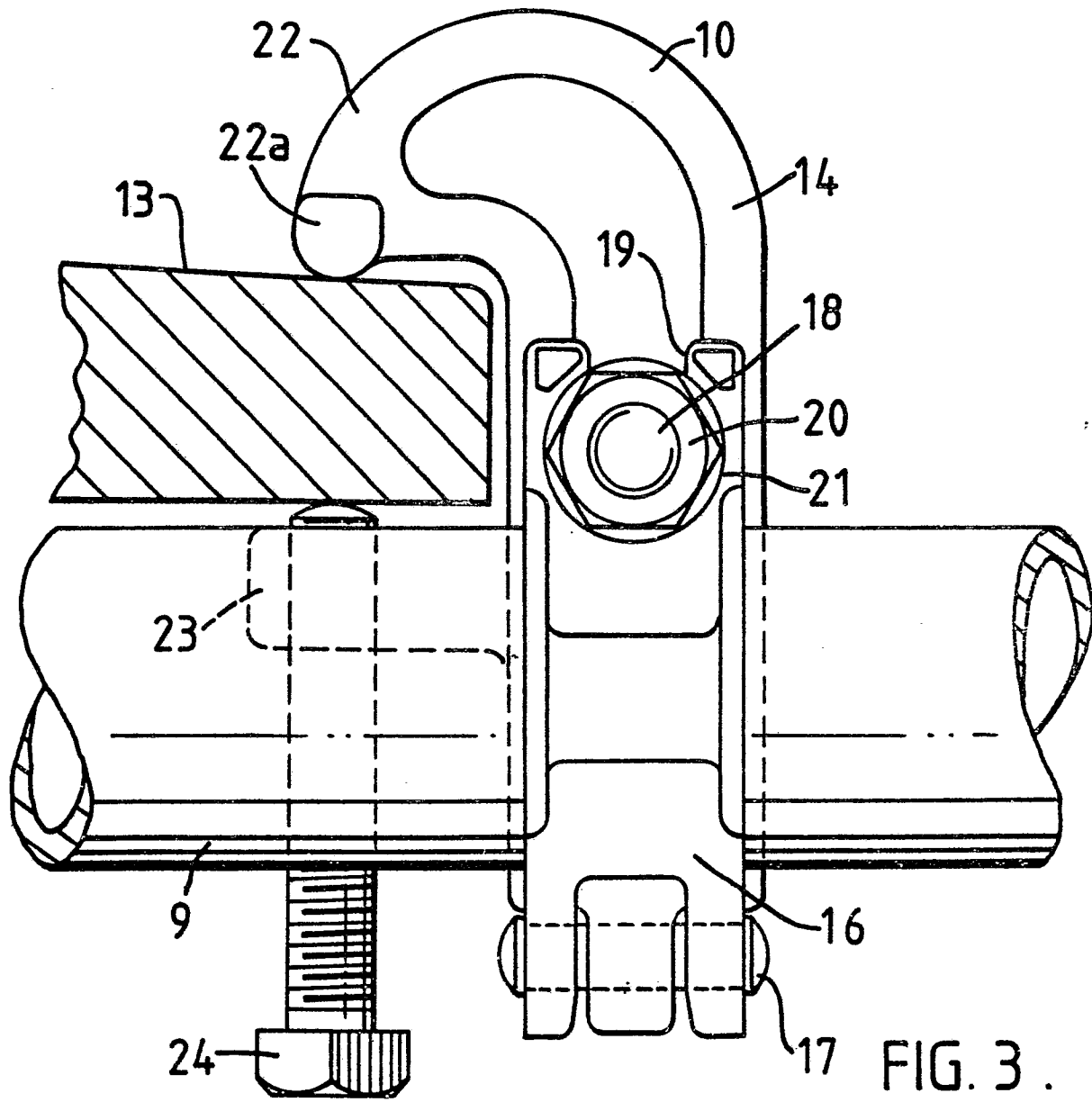
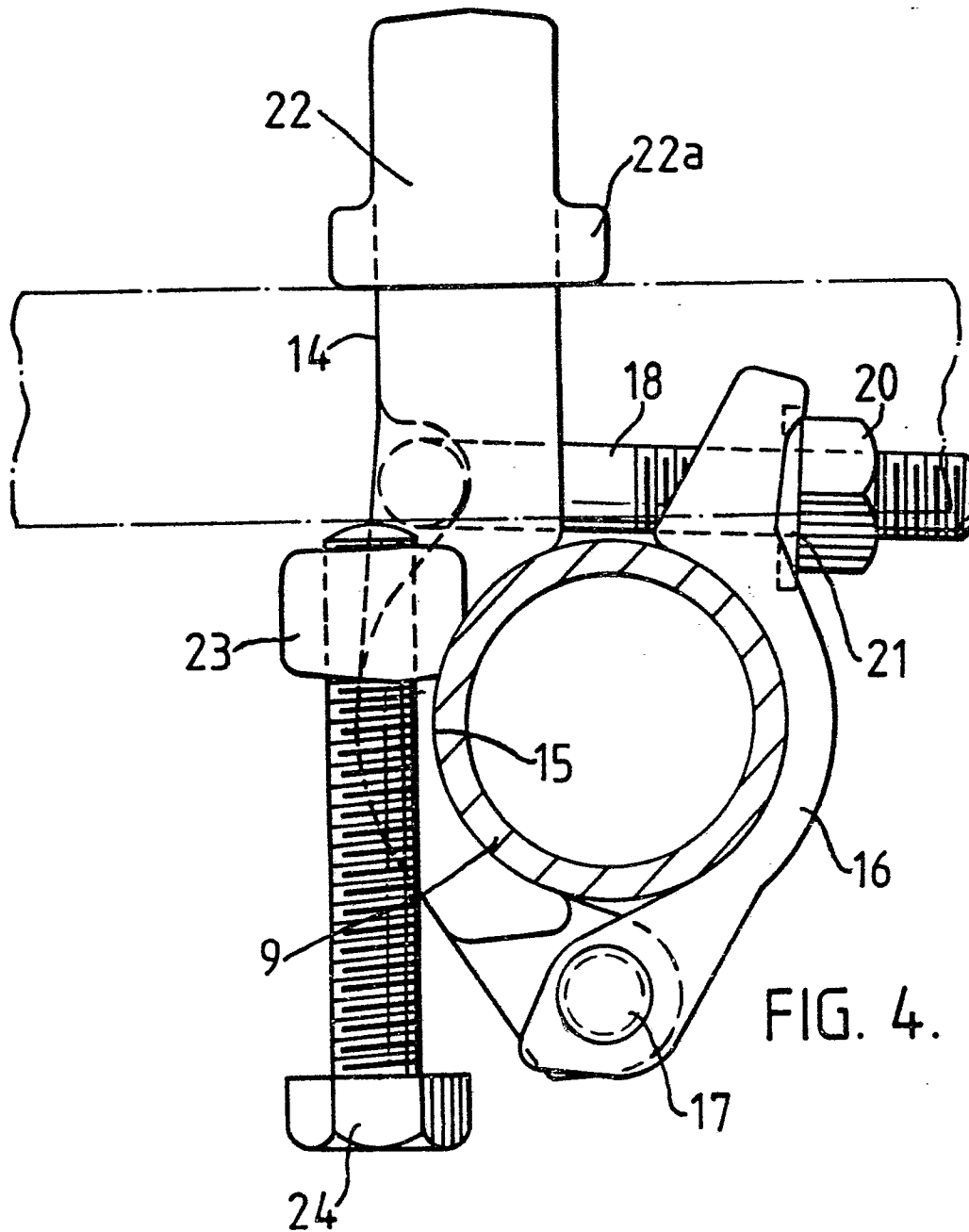
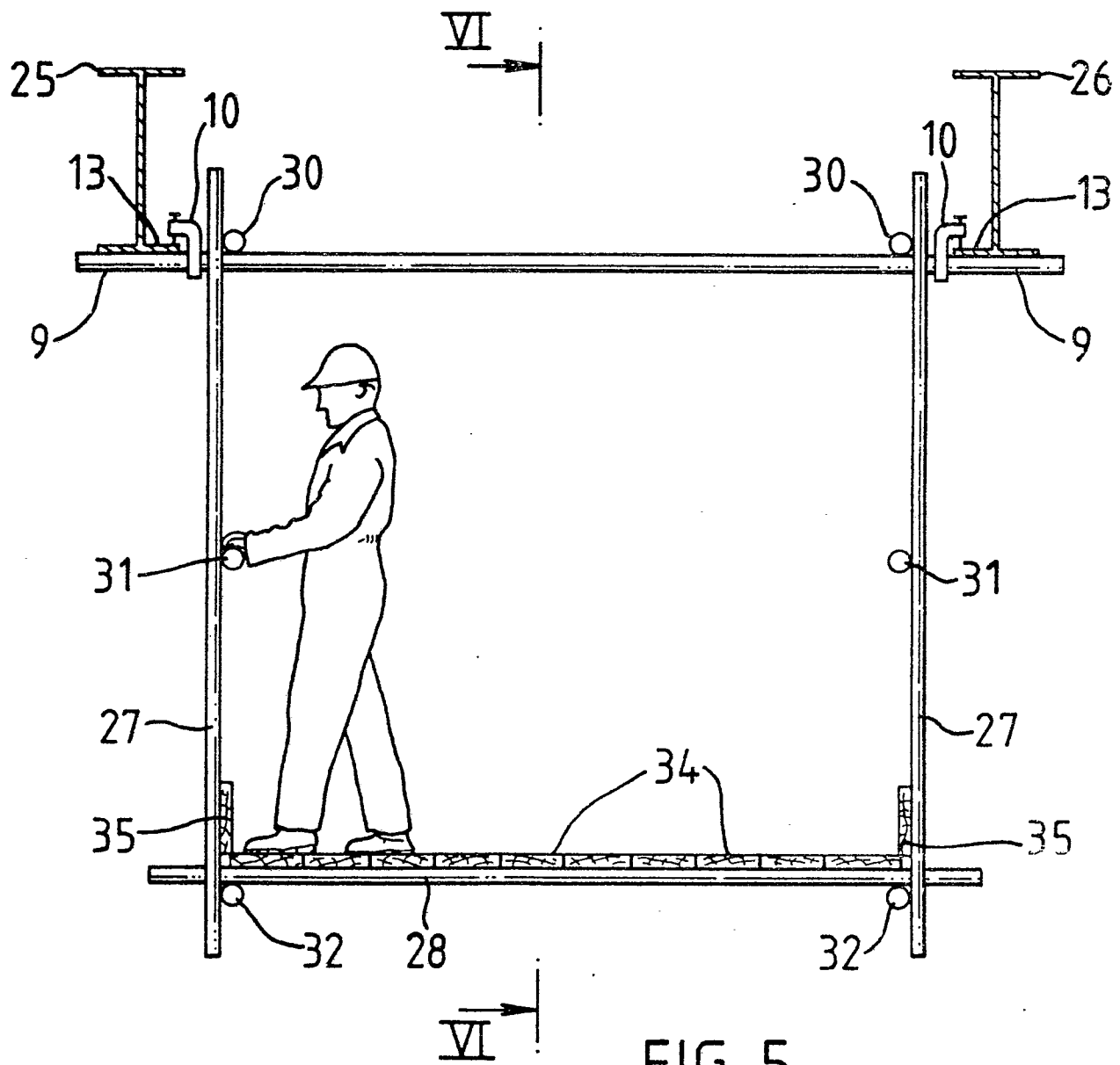


FIG. 2.









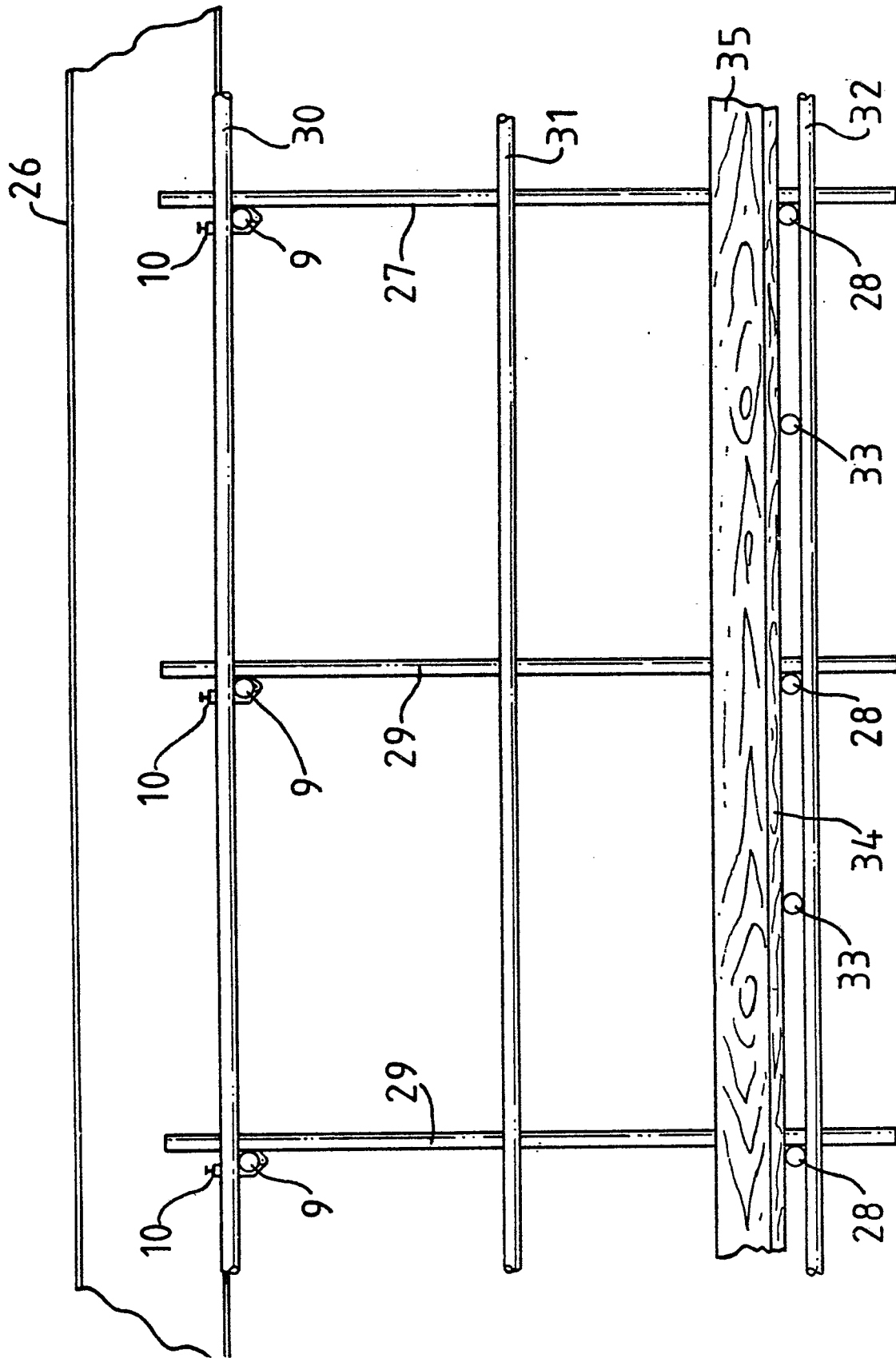


FIG. 6 .