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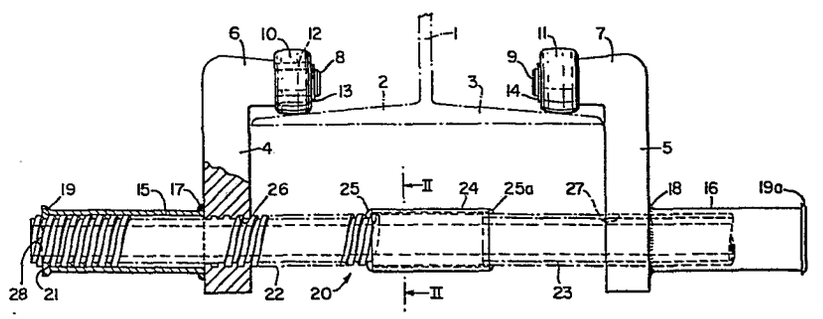
(54) Scaffold suspension structure.

(57) A suspension structure for use in securing a scaffold to a girder having two opposite flanges. The structure comprises two horizontally spaced vertical carriers (4, 5) each having at their upper end a spindle (8, 9) carrying a roller (10, 11), the rollers engaging the opposite flanges. Each carrier has at its lower end a support section (15, 16), the support sections being axially aligned and extending horizontally away from one another. The carriers are coupled by a coupling member (20) having screw-threaded regions (22, 23) of opposite hand lying to opposite sides of the centre of the coupling member and engaging screw-threaded regions (26, 27) of the carriers (4, 5) so that on rotating the coupling members the horizontal spacing between the carriers may be adjusted.

Fig.1.



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SCAFFOLD SUSPENSION STRUCTURE

This invention relates to a suspension structure for use in securing a scaffold to a beam or girder having two opposite flanges.

Various systems have been proposed for roller fittings which will allow a scaffold to be suspended from a girder in such a way that the scaffold may be moved along the girder with the rollers travelling on the upper surfaces of the flanges. However, there is a need for a fitting which is adjustable so that it may be fitted to girders of different sizes and which presents simple horizontally extending scaffold support sections.

According to the present invention a suspension structure for use in securing a scaffold to a girder having two opposite flanges comprises two horizontally spaced vertical carriers each having at their upper end a spindle and at their lower end a support section, the two spindles being axially aligned and extending horizontally one towards the other and each spindle carrying a roller mounted for rotation about the axis of the spindle, the two support sections being axially aligned and extending horizontally away from one another, a coupling member coupling together the two carriers below the level of the rollers, the coupling member having screw-threaded regions of opposite hand lying to opposite sides of the centre of the coupling

member, and screw-threaded sections engaging the screw-threaded regions of the coupling member so that on relative rotation between the coupling member and the screw-threaded sections the horizontal spacing between the carriers may be adjusted.

It will be appreciated that a suspension structure according to the invention can be fitted to a girder of any width in a simple and straight-forward manner, merely by locating the rollers so that they will engage the upper surfaces of the girder flanges and using the screw-threaded adjustment mechanism to adjust the spacing between the carriers so that vertical surfaces of the carriers lie just clear of respective edges of the girders. The inward extent of the spindles and position of the rollers on the carriers should be such that in this condition the rollers lie well into the width of the flange to ensure a safe and secure support of the structure on the girder. It will be apparent that the structure may be fitted onto the girder from one end thereof, and it also has the advantage that it may be fitted to the girder at any intermediate position of the girder by adjusting the spacing between the carrier so that the distance between the inner ends of the spindles is greater than the width of the girder. The structure may thus be presented to the girder from below and when the rollers lie above the level of the flanges adjustment may be effected to move the rollers inwardly into position where they will engage the flanges. In addition to the versatility given by this adjustment feature the structure also presents horizontally extending support sections to each side of the girder which are thus readily accessible for the securing of other scaffold members thereto.

Preferably the coupling member is axially aligned with the support sections, and desirably the support sections are hollow and the coupling member extends into

those sections. In this way the coupling member can act as a useful internal reinforcement for the support sections.

Conveniently the screw-threaded sections are internally threaded, horizontally aligned holes formed through the vertical carriers, the threads of the holes in the two carriers being of opposite hand. Rotation of the coupling member will thus effect simultaneous movement of the two carrier axially along the coupling member.

It is preferred that the outer surface of each support section be of circular cross-section and have an external diameter that is the same as the standard external diameter of scaffold tubes. A useful additional feature of the invention can be the provision of an unthreaded centre section of the coupling member, the centre section having an outer surface of circular cross-section, which again has an external diameter equal to the external diameter of standard scaffold tubes. This provides an attachment point immediately below the girder from which the structure is suspended, as well as attachment points to each side of that girder. The vertical extent of the carriers should then be such that the clearance between the base of the girder and the unthreaded centre section is such as to allow scaffold connections to be made to the centre section.

In order that the invention may be better understood a particular embodiment will now be described in more detail, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 is a side elevation, with parts sectioned, of the structure in position on a girder;and

Figure 2 is a cross-section on the line II-II of Figure 1, with the girder omitted, on an enlarged scale.

Referring now to Figure 1 this shows a girder 1

having two opposite flanges 2, 3. A suspension structure for securing a scaffold to the girder comprises two horizontally spaced vertical carriers 4, 5 each having an upper part 6, 7 which terminates in a spindle 8, 9 respectively. The two spindles are axially aligned and extend horizontally one towards the other. Rollers 10, 11 are supported one on each spindle by bush or roller bearings such as 12, each roller being retained on its respective spindle by a circlip 13, 14 respectively. Each roller is at least partially spherical so that it can be used on both tapered and flat flanged girders.

Each carrier has at its lower end a support section 15, 16 respectively, the two support sections being axially aligned and extending horizontally away from one another. Each support section is in the form of a tube having internal and external surfaces of circular cross-section, the external diameter of each section being equal to the standard external diameter of scaffold tubing. Each support section is welded as at 17, 18 to the respective carrier and the end of the support section remote from the carrier is outwardly flaredas at 19, 19a to form retention points that will prevent fixing members sliding off the ends of the support sections.

The two carriers are coupled together below the level of the rollers by a coupling member shown generally as 20 that is axially aligned with the support sections 15, 16 and that extends into and possibly through those support sections. Where the coupling member does not extend through the section the open end of the section may be closed off by an end cap, as indicated by the end cap 21 on section 15. The coupling member 20 has two screw-threaded regions 22, 23, the threads being of opposite hand and the regions lying to opposite sides of the centre of the coupling member. A

tubular sleeve 24 is fitted over the centre region of the coupling member and is welded thereto at 25 and 25a. The external diameter of the sleeve 24 is equal to the external diameter of a standard scaffold tube. Each screw-threaded region of the coupling member passes through a respective internally threaded hole 26, 27 formed in the carriers 4 and 5. The screw-threaded regions, where they lie within these holes and within the support section 15, 16 are packed with grease for lubrication purposes.

Each screw-threaded region 22, 23 is provided at its free end with a stop member 28, which may for example be a spot weld on the region or a grub screw threaded into the region. The size of each stop member is such that it will not interfere with free movement of the respective screw-threaded region within its respective support section 15 or 16, but that it will contact the outer side face of the carrier 4 or 5 to prevent those carriers from being only partially mated with, or wound off from, their associated screw-threaded regions of the coupling member.

It will readily be seen that as the coupling member is rotated the two vertical carriers will be moved either further apart or closer together depending on the direction of rotation. Thus, the structure is adjustable and may be fitted to a girder having flanges of any size within a given range, fitting being effected so that as shown in Figure 1 the inner vertical surfaces of the carriers 4 and 5 lie spaced from the edges of the respective flanges, with the rollers safely positioned on the body of the flange. Scaffold tubes can be secured to the end support sections 15 and 16 and to the central sleeve 24 as required. Any type of coupling may be used, either conventional bolted couplings or hook-type couplings of the type described and claimed in our co-pending application No. 80.37144.

It will be apparent that there are many modifications that may be made to the structure as described with reference to the drawings. For example, additional auxiliary rollers may be mounted on further spindles extending inwardly from the vertical carriers so that the auxiliary rollers may contact the lower surfaces of the respective flanges. Such auxiliary rollers would have the effect of stabilising the structure against lifting from one or the other of the flanges in the event of an uneven loading being applied to the structure. A similar effect could be achieved by inserting a check fitting within the clearance between the sleeve 24 and the lower surface of the girder, there being a small clearance between that surface and the upper surface of the fitting so that the fitting will contact the girder in the event of uneven loading. Such a check fitting could be provided with one or more rollers or balls on its upper surface so that it will not restrict travel of the structure along the beam. The structure will generally be self-centring when used on tapered flanged girders so that the amount of fouling between the inner vertical surfaces of the carriers and the edges of the girders should be minimal. However, it would be possible for further additional rollers to be mounted on the carriers for rotation about vertical axes, these rollers being positioned so that they may contact the edges of the girders.

As shown, the coupling member and support section are axially aligned and this leads to the preferred, simple to manufacture structure. However, it will be apparent that this axial alignment is not necessary, and that an adjustable coupling arrangement that is offset from the support sections may be used. The coupling member shown relies for adjustability on screw-threaded engagement between the outer surface of

the coupling member and the inner surface of holes formed through the vertical carrier. Alternatively, the coupling member could be in two separate sections, each section secured, for example, by welding to respective ones of the vertical carriers. The centre sleeve 24 could then be of greater length than that shown in the drawing and have an internally threaded surface, the threads to each side of the centre of the sleeve being of opposite hand and cooperating with the threads on the respective parts of the coupling member. Thus, rotation of the centre section would then cause axial adjustment between the two vertical carriers.

It will be appreciated that other modifications would also be possible.

CLAIMS:

1. A suspension structure for use in securing a scaffold to a girder having two opposite flanges, the suspension structure comprising two horizontally spaced vertical carriers each having at their upper end a spindle and at their lower end a support section, the two spindles being axially aligned and extending horizontally one towards the other and each spindle carrying a roller mounted for rotation about the axis of the spindle, the two support sections being axially aligned and extending horizontally away from one another, a coupling member coupling together the two carriers below the level of the rollers, the coupling member having screw-threaded regions of opposite hand lying to opposite sides of the centre of the coupling member and screw-threaded sections engaging the screw-threaded regions of the coupling member so that on relative rotation between the coupling member and the screw-threaded sections the horizontal spacing between the carriers may be adjusted.

2. A suspension structure according to claim 1 in which the coupling member is axially aligned with the support sections.

3. A suspension structure according to claim 2 in which the support sections are hollow bores and the coupling member extends into the hollow bores.

4. A suspension structure according to any one of the preceding claims in which the screw-threaded regions are formed externally of the coupling member.

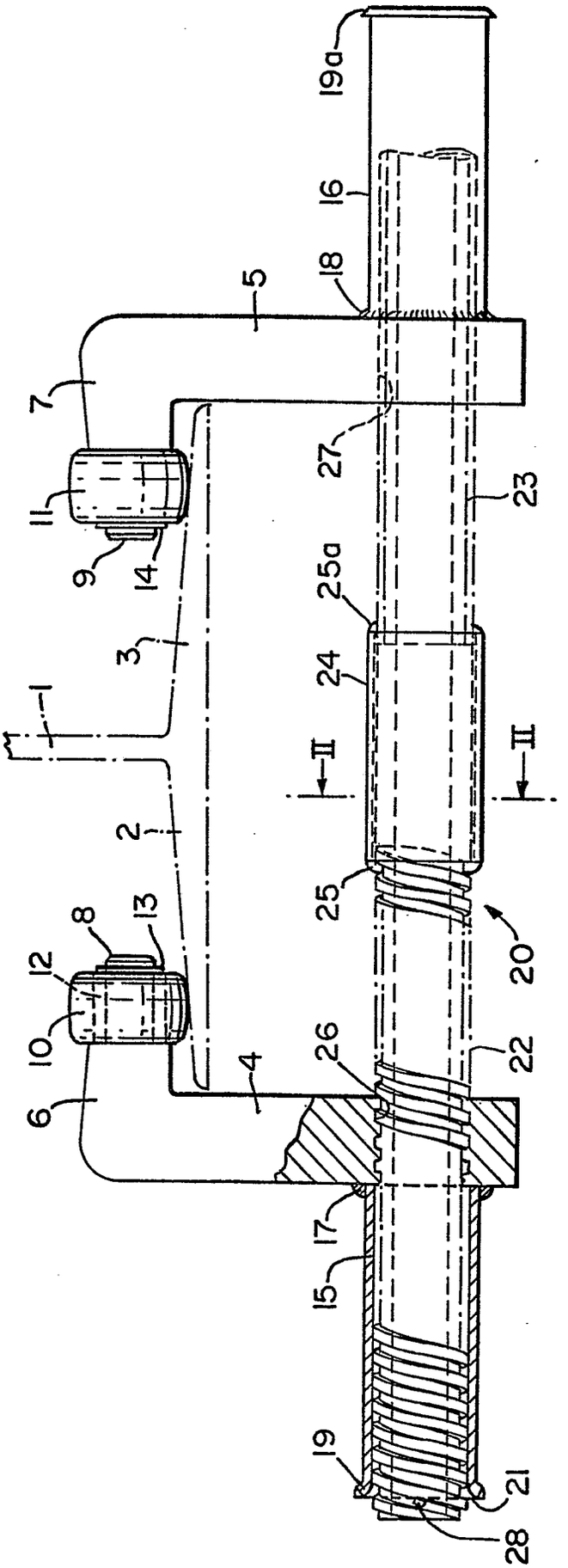
5. A suspension structure according to claim 4 in which the screw-threaded sections are internally threaded, horizontally aligned holes formed through the vertical carriers, the threads of the holes in the two carriers being of opposite hand and being engaged by a respective screw-threaded region of the coupling member.

6. A suspension structure according to any one of

the preceding claims in which the outer surface of each support section is of circular cross-section.

7. A suspension structure according to any one of the preceding claims in which an axial centre section of the coupling member has an unthreaded outer surface of circular cross-section.

Fig. 1.


19a
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18
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25a
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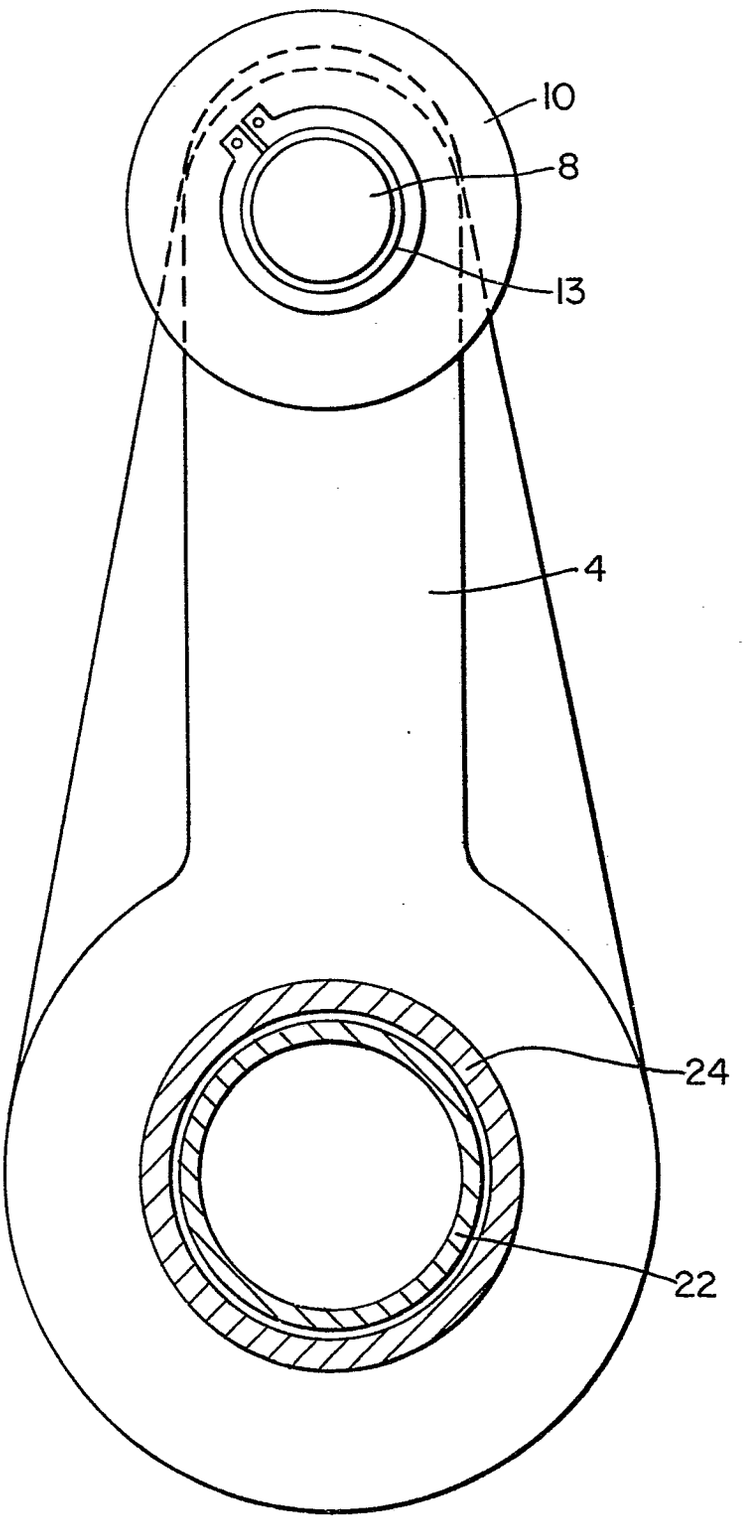
Fig. 2.



European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 81 30 4993.9

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	EP - A1 - 0 001 341 (DEBORAH SERVICES LTD.) * fig. 1, 3 *	
A	GB - A - 2 022 533 (RIGGERS (STEEPLE-JACKS) LTD.) * fig. 1, 2, 9 *	
A	US - A - 3 096 064 (H.G. LEONARD) * fig. 5 *	
A	US - A - 2 980 384 (H.G. LEONARD) * fig. 1, 3 *	

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

E 04 G 3/10

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

E 04 G 3/00

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

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

Place of search	Date of completion of the search	Examiner
Berlin	08-02-1982	v. WITTKEN