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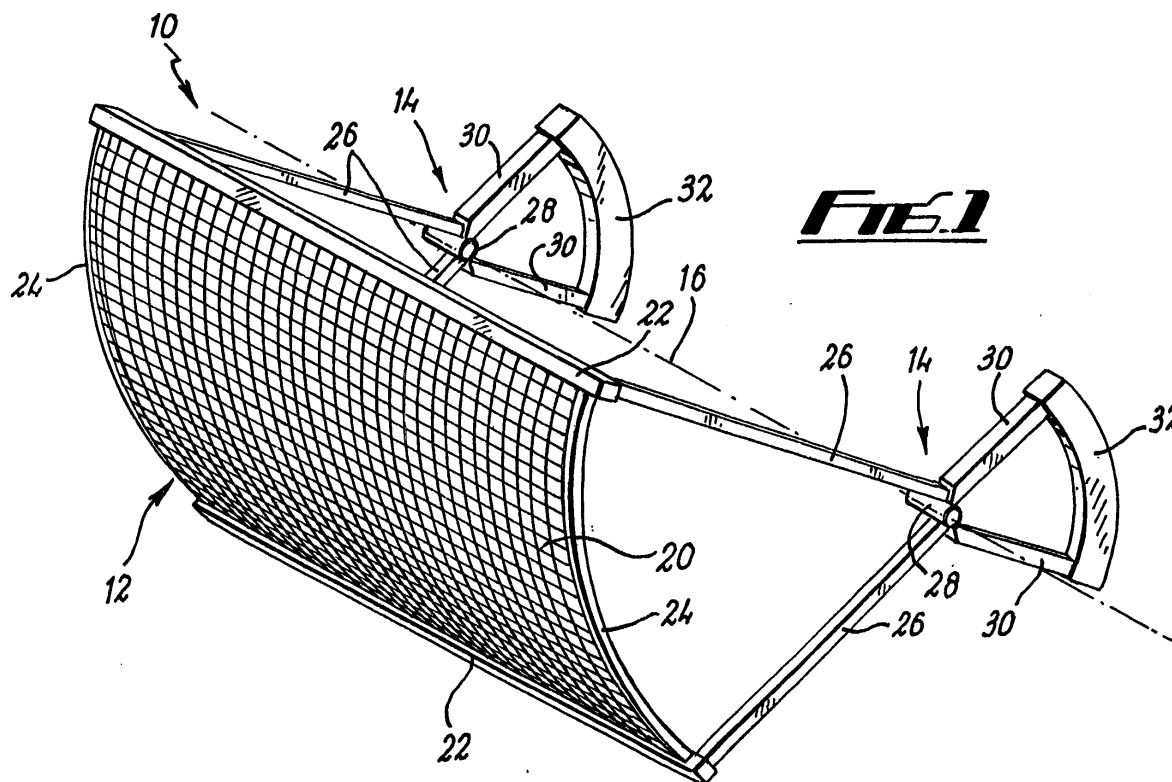
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(54) **Safety gate**

(57) A safety gate (10) comprises a barrier portion (12) and mounting means (14) for mounting the gate for use. The mounting means (14) provides pivotal move-

ment of the barrier portion about a pivot axis (16) and the barrier (12) has a concave curvature facing the pivot axis.



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Description

[0001] The present invention relates to a safety gate and in particular, to a safety gate intended for use with scaffolding and in like situations.

[0002] Scaffolding is conventionally erected to provide access for workers during the construction or renovation of buildings and other structures. Workers may be required to work at significant heights above the ground. Consequently, safety regulations impose requirements for safety equipment of various types.

[0003] In one conventional operating technique, materials, equipment or other loads are provided for workers by lifting them from the ground by means of a fork truck, crane or the like, placing them onto a loading bay at the top of an access tower to which the workers have access from scaffold walkways. The action of loading or unloading the bay can represent a danger to a worker, as can the risk of falling from the bay.

[0004] The present invention provides a safety gate comprising a barrier portion and mounting means for mounting the gate for use, the mounting means providing for pivotal movement of the barrier portion about a pivot axis, and the barrier having a concave curvature facing the pivot axis.

[0005] Preferably the concave curvature is substantially centred at the pivot axis. Preferably, substantially the whole of the barrier portion is concave as aforesaid. The pivot axis is preferably substantially horizontal. The barrier portion may be movable from a first position shielding an area from a first direction, to a second position shielding the same area from a second direction. The first and second directions are preferably horizontal, whereby the area is accessible for placement of a load therein from the first direction while the barrier portion prevents manual access from the second direction, and the barrier member can be moved to allow manual access to the load from the second direction while preventing placement of a further load from the first direction.

[0006] The mounting means preferably comprises a counterweight providing a counterbalance effect for pivotal movement of the barrier portion about the pivot axis. The mounting means may comprise a pivotal mounting arrangement, and at least one limb connecting the barrier member with the mounting means. The mounting means may comprise a further limb extending away from the pivot axis and carrying the counterweight. The mounting means may comprise a socket for receiving an axle member to provide relative rotation of the socket and axle member about the axis of the axle member. The socket is preferably fixed relative to the barrier portion. The socket may have an internal diameter which allows the receipt of a scaffold tube of standard outside diameter for forming a journal bearing therewith.

[0007] In a second aspect, the invention provides a safety gate comprising a barrier portion and mounting means for mounting the gate for use, the mounting

means providing for pivotal movement of the barrier portion about a pivot axis, and comprising a counterweight providing a counterbalance effect for pivotal movement of the barrier portion about the pivot axis.

[0008] In a third aspect the invention provides a safety gate comprising a barrier portion and mounting means for mounting the gate for use, the mounting means providing for pivotal movement of the barrier portion about a pivot axis, the mounting means comprising a socket for receiving an axle member to provide relative rotation of the socket and axle member about the axis of the axle member, the socket being fixed relative to the barrier member, and having an internal diameter which allows the receipt of a scaffold tube of standard outside diameter for forming a journal bearing therewith.

[0009] Preferably the gate further comprises an axle member as aforesaid, and clamp means for clamping the axle member to a support structure.

[0010] A safety gate according to the second or third aspect of the invention may incorporate any feature, features or combination of features set out above in relation to the first aspect of the invention.

[0011] An embodiment of the present invention will now be described in more detail, by way of example only, and with reference to the accompanying drawings, in which:

Fig. 1 is a schematic perspective view of a safety gate according to the present invention, prior to installation;

Fig. 2 is an enlarged plan view of the mounting arrangement for the gate of Fig. 1; and

Figs. 3 to 6 are schematic elevations of the gate of Fig. 1, showing an alternative form of counterweight, in use on scaffolding, part of which is removed for clarity.

[0012] Fig. 1 shows a safety gate 10 which comprises a barrier portion indicated generally at 12, and mounting means indicated generally at 14 for mounting the gate for use. The mounting means provides for pivotal movement of the barrier portion 12 about a pivot axis 16, as will be described. The barrier portion 12 has a concave curvature facing the pivot axis 16.

[0013] In more detail, the barrier 12 is formed from mesh 20 supported by a generally rectangular frame of cross-members 22 and side members 24. The ends of the side members 24 are attached to ends of respective limbs 26 which converge toward a socket 28 which forms part of the pivotal mounting of the gate. Diametrically opposite the limbs 26, a further arms 30 extend away from the socket 28 and carry a counterweight 32, for reasons which will become apparent.

[0014] Fig. 2 illustrates in more detail how the socket 28 is used to provide pivotal mounting of the gate 10.

[0015] The socket 28 is arranged with its axis gener-

ally horizontal and has an internal diameter sufficient to receive a length of standard scaffold tube 34 to provide a close fit, so that the socket 28 can turn relative to the axle 34, in the manner of a journal bearing. A conventional scaffold fitting 36 is used to clamp the axle 34 to a vertical tube 38 forming part of the scaffold structure with which the gate 10 is being used.

[0016] When attached to the tube 38 in this way, the axle 34 provides support for the socket 28, while allowing the socket 28 to pivot around the axle 34 for reasons which will become apparent from the description of Figs. 3 to 6, set out below.

[0017] A socket 28 is provided at each side of the gate 10, with their axes aligned, so that each may be supported in the same manner as described above. It is an important feature of the invention to note that the socket 28 is formed as a through passage, so that the length of the axle 34 is not restricted, and the axle 34 can be moved axially relative to the socket 28 without affecting the pivotal mounting. Accordingly, any convenient length of scaffold tube can be used for the axle 34 and in addition, the separation of the tubes 38 on either side of the gate 10 is not critical, because an adequate pivotal mount can be provided by the use of an axle 34 of appropriate length. This provides for great versatility of installation of the gate 10, substantially regardless of the separation of the tubes 38.

[0018] Turning now to Figs. 3 to 6, the gate 10 is shown installed for use on the access tower of a scaffold (from which the support tubes 38 have been removed, in the interests of clarity). Figs. 3 to 6 also show an alternative form of counterweight, which is an enlarged limb attached to the socket 28.

[0019] The scaffold 40 is built adjacent a building 42 and supported on vertical tubes 44 and horizontal tubes 46. Boards 48 are rested on the tubes 46. Five adjacent boards in the region 50 form a walkway adjacent the building 42. A further six boards in the region 52 form a loading bay onto which loads may be placed by means of fork truck, crane etc.

[0020] Fig. 3 shows the gate 10 with the barrier portion 12 in a first position in which the walkway 50 is shielded from the loading bay 52 to prevent a worker on the walkway 50 from entering the loading bay 52, either accidentally or deliberately. It can be seen from Fig. 3 that the walkway 50 is reduced in width when the barrier portion 12 is in this position, but remains sufficiently wide for a worker to pass along the walkway 50.

[0021] When the barrier portion 12 is in this position, the bay is accessible from the opposite direction, so that a load 54 can be placed onto the loading bay 52.

[0022] Once the lifting equipment is clear of the loading bay 52, a worker on the walkway 50 can grasp the mesh 20, a cross-member 22 or other part of the gate 10, lifting the barrier portion 12 to pivot around the axis 16, first reaching a position as shown in Fig. 4.

[0023] The action of lifting the barrier portion 12 is assisted by the presence of the counterweight 32 on the

opposite side of the axis 16, so that the worker is not required to lift the full weight of the barrier portion 12.

[0024] Fig. 4 shows the barrier portion 12 as it begins to move past the upper edge of the load 54. At this point, the significance of the curvature of the barrier portion 12 becomes apparent. By virtue of the barrier portion 12 being concave facing the pivot axis 16, and centred substantially at the pivot axis 16, the barrier portion 12 can move past the edge of the load 54 with substantially the same clearance being maintained at all positions of the barrier portion 12. By contrast, a flat mesh 20 would tend to foul the edge of the load 54, in the region of the mid-point of the mesh 20.

[0025] As the barrier portion 12 continues to move, it will pass by the other upper edge of the load 54, as shown in Fig. 5. Again, the significance of the curvature of the mesh 20 is apparent, again ensuring clearance as the barrier portion 12 passes the load 54.

[0026] Eventually, the position of Fig. 6 is reached. In this position, the barrier portion 12 is again resting on the boards 48, this time closing off the loading bay 52 from access from outside the scaffold (i.e. from below by lifting equipment) but opening the loading bay 52 to full access by workers from the walkway 50. The load 54, which might be an item of equipment or additional materials, can therefore be unloaded safely onto the walkway 50 without danger from lifting equipment placing additional loads in the loading bay 52, and with workers being protected from falling off the loading bay 52, by the barrier portion 12.

[0027] Once the loading bay 52 has been emptied, the barrier portion 12 can be lifted and swung back to the original position (Fig. 3) which allows access to the loading bay 52 from below, for placement of a further load, while the barrier portion 12 once again protects workers on the walkway 50, both from injury by the load or lifting mechanisms, and from entering or falling off the loading bay 52.

[0028] There is thus provided an arrangement which gives advantages of safety, by preventing simultaneous access to the loading bay by workers and by lifting mechanisms, but which is readily fitted (by virtue of the versatility of the mounting), is easy to use (by virtue of the counterweight) and allows the volume of the loading bay to be used to maximum effect (by virtue of the curvature of the mesh).

[0029] Many variations and modifications can be made to the apparatus described above, without departing from the scope of the invention. In particular, dimensions, relative dimensions, materials, shapes and forms can be changed according to the intended application. The socket of the example described may be journal mounted to turn around an intermediate tube which is itself captive on the axle. For example, the intermediate tube may have an associated radial bolt which can be tightened against the axle, to hold the intermediate tube relative to the axle. The intermediate tube may carry collars or other formations to retain the socket against axial

movement relative to the intermediate tube and axle.

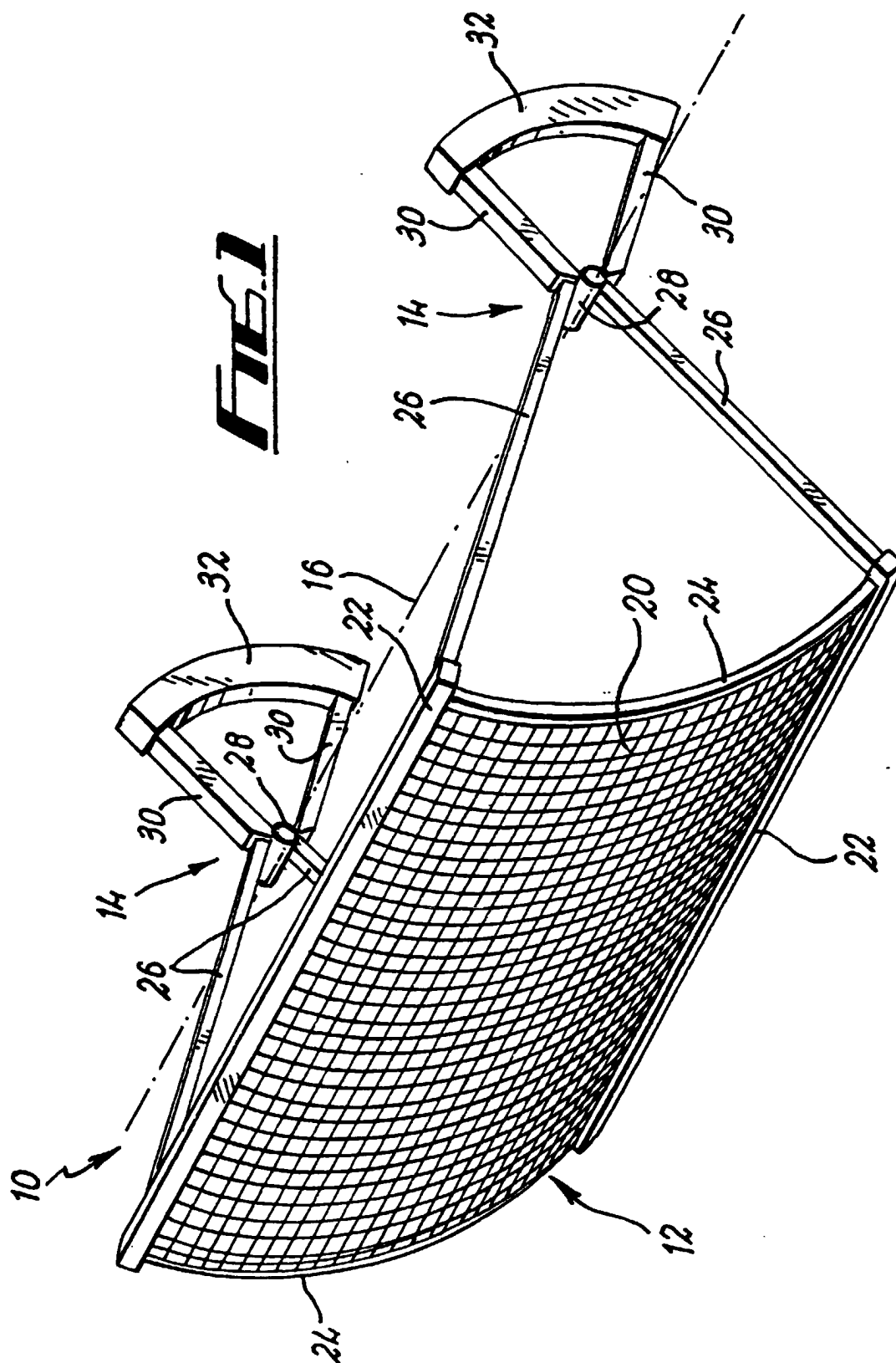
[0030] Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims

1. A safety gate comprising a barrier portion and mounting means for mounting the gate for use, the mounting means providing for pivotal movement of the barrier portion about a pivot axis, and the barrier having a concave curvature facing the pivot axis. 15
2. A safety gate as claimed in claim 1, wherein the concave curvature is substantially centred about the pivot access. 20
3. A safety gate as claimed in claim 1 or claim 2, wherein substantially the whole of the barrier portion is concave. 25
4. A safety gate as claimed in any one of the preceding claims, wherein the pivot access is substantially horizontal. 30
5. A safety gate as claimed in any one of the preceding claims, wherein the barrier portion is movable from a first position shielding an area from a first direction, to a second position shielding the same area from a second direction. 35
6. A safety gate as claimed in claim 5 wherein the first and second directions are horizontal, whereby the area is accessible for placement of a load therein from the first direction while the barrier portion prevents manual access from the second direction, and the barrier member is movable so as to allow manual access to the load from the second direction. 40
7. A safety gate as claimed in any one of the preceding claims, wherein the mounting means comprises a counterweight providing a counterbalance effect for pivotal movement of the barrier portion about the pivot axis. 45
8. A safety gate as claimed in claim 7, wherein the mounting means comprises at least one limb connecting the barrier member with the mounting means. 50
9. A safety gate according to claim 7 or 8, comprising a further limb extending away from the pivot axis 55

and carrying the counterweight.

10. A safety gate as claimed in any one of the preceding claims, wherein the mounting means comprises a socket for receiving an axle member to provide relative rotation of the socket and the axle member about the axis of the axle member. 5
11. A safety gate as claimed in claim 10, wherein the socket is fixed relative to the barrier portion. 10
12. A safety gate as claimed in claim 10 or claim 11, wherein the socket comprises an internal diameter which allows the receipt of a scaffold tube of standard outside diameter for forming a journal bearing therewith.
13. A safety gate as claimed in claim 10 or 11, further comprising an intermediate member and received in the socket and relative to which the socket and barrier portion are free to rotate, the intermediate member being fixable relative to the axle member.
14. A safety gate as claimed in claim 13, wherein the intermediate member comprises means for fixing the intermediate member relative to the axle member, and for fixing the socket against axial movement relative to the intermediate member.
15. A safety gate comprising a barrier portion and mounting means for mounting the gate for use, the mounting means providing for pivotal movement of the barrier portion about a pivot axis, and comprising a counterweight providing a counterbalance effect for pivotal movement of the barrier portion about the pivot axis. 35
16. A safety gate comprising a barrier portion and mounting means for mounting the gate for use, the mounting means providing for pivotal movement of the barrier portion about a pivot axis, the mounting means comprising a socket for receiving an axle member to provide relative rotation of the socket and axle member about the axis of the axle member, the socket being fixed relative to the barrier member, and having an internal diameter which allows the receipt of a scaffold tube of standard outside diameter for forming a journal bearing therewith.
17. A safety gate according to claim 16, wherein the gate further comprises an axle member as aforesaid, and clamp means for clamping the axle member to a support structure.
18. A safety gate according to claim 15, 16 or 17, and any of claims 1 to 14.



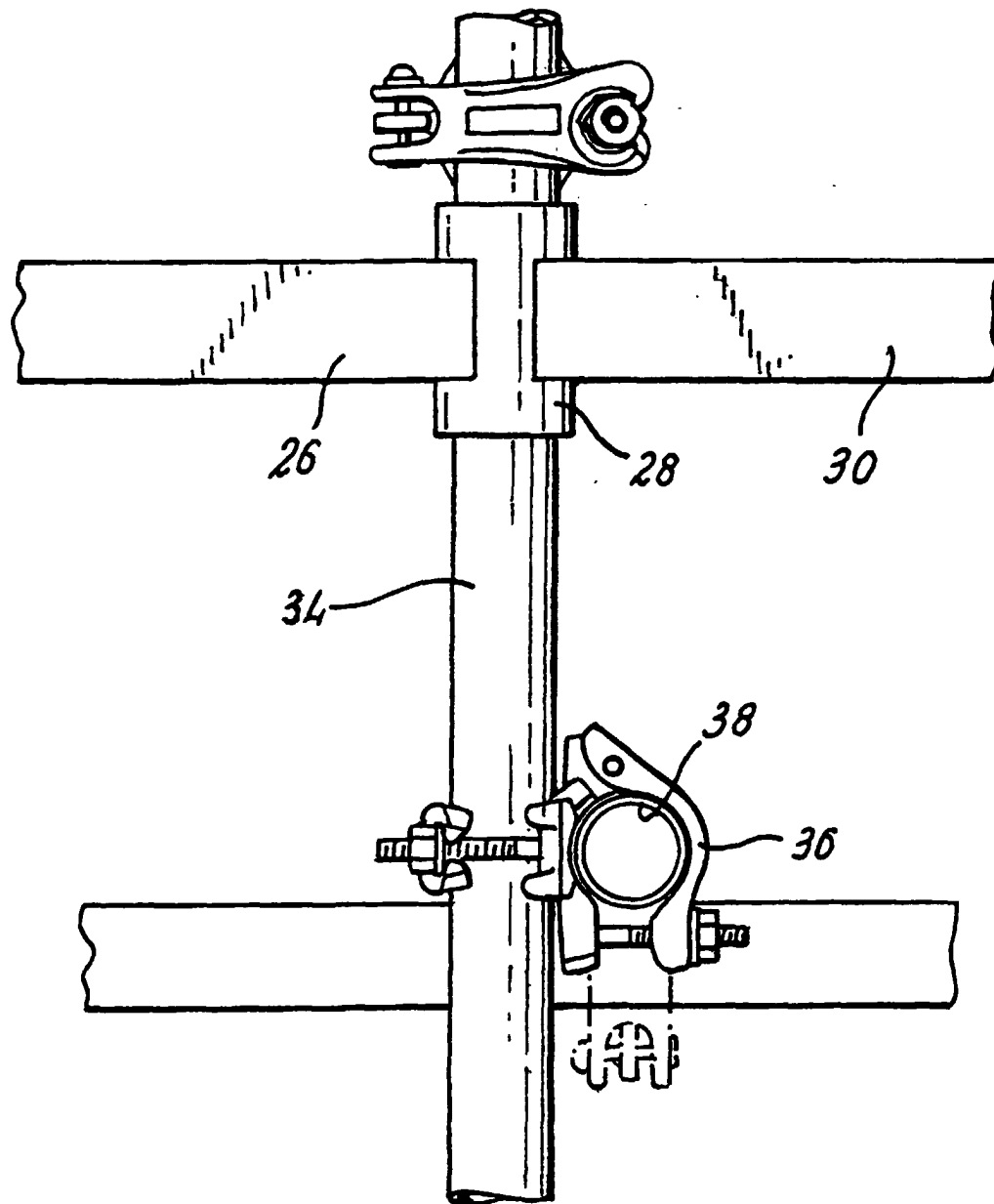


FIG. 2

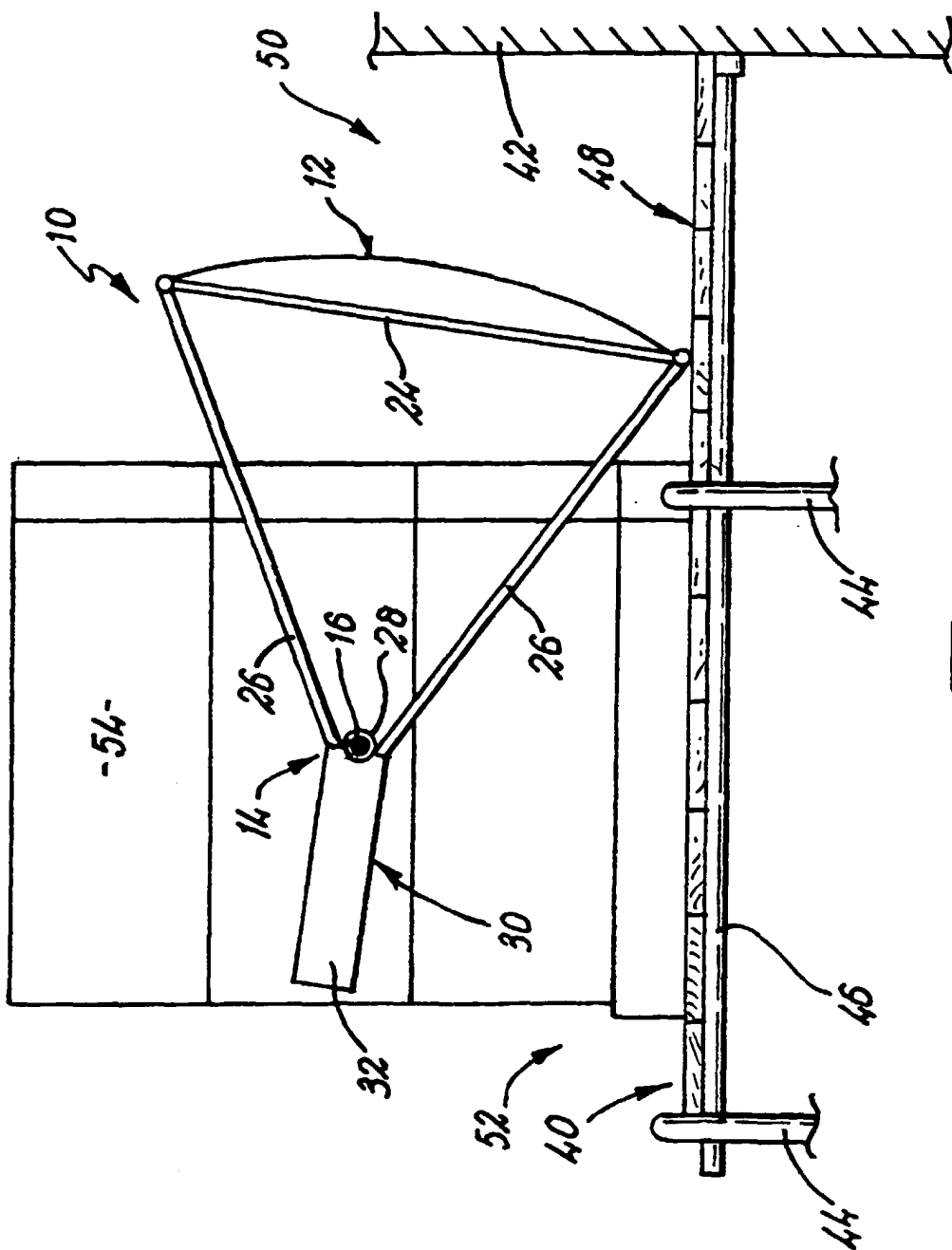


FIG. 3

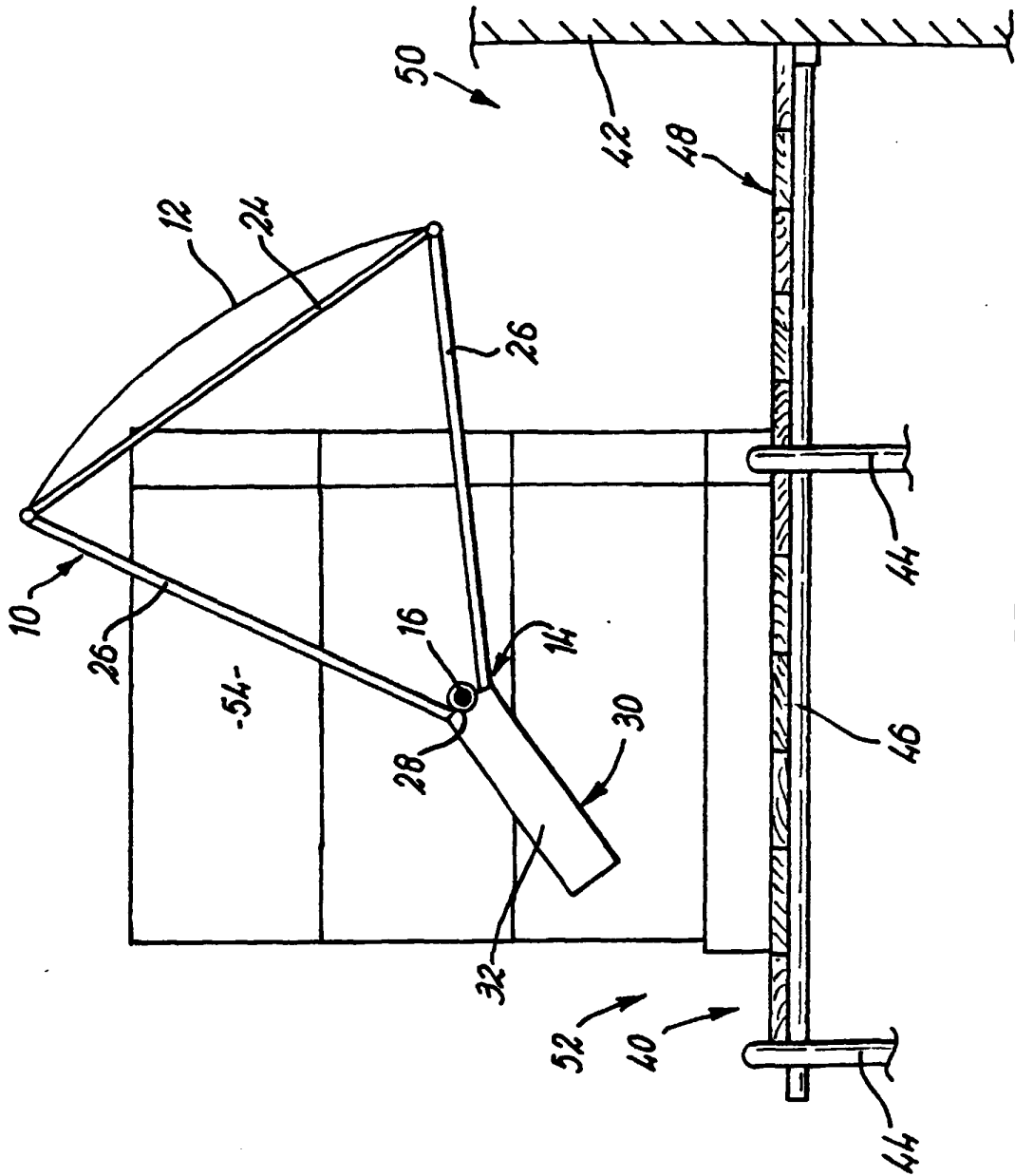
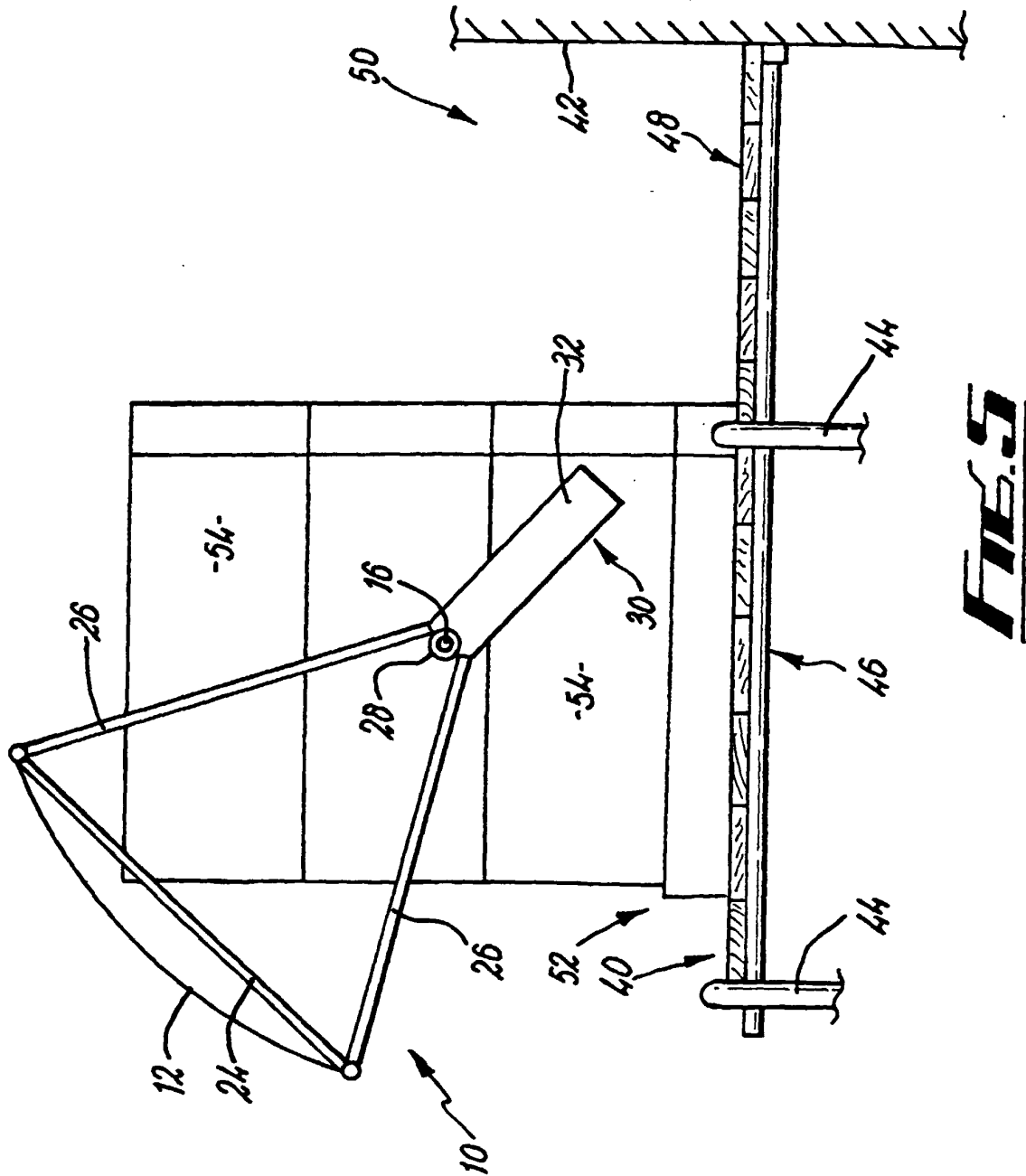


FIG. 4



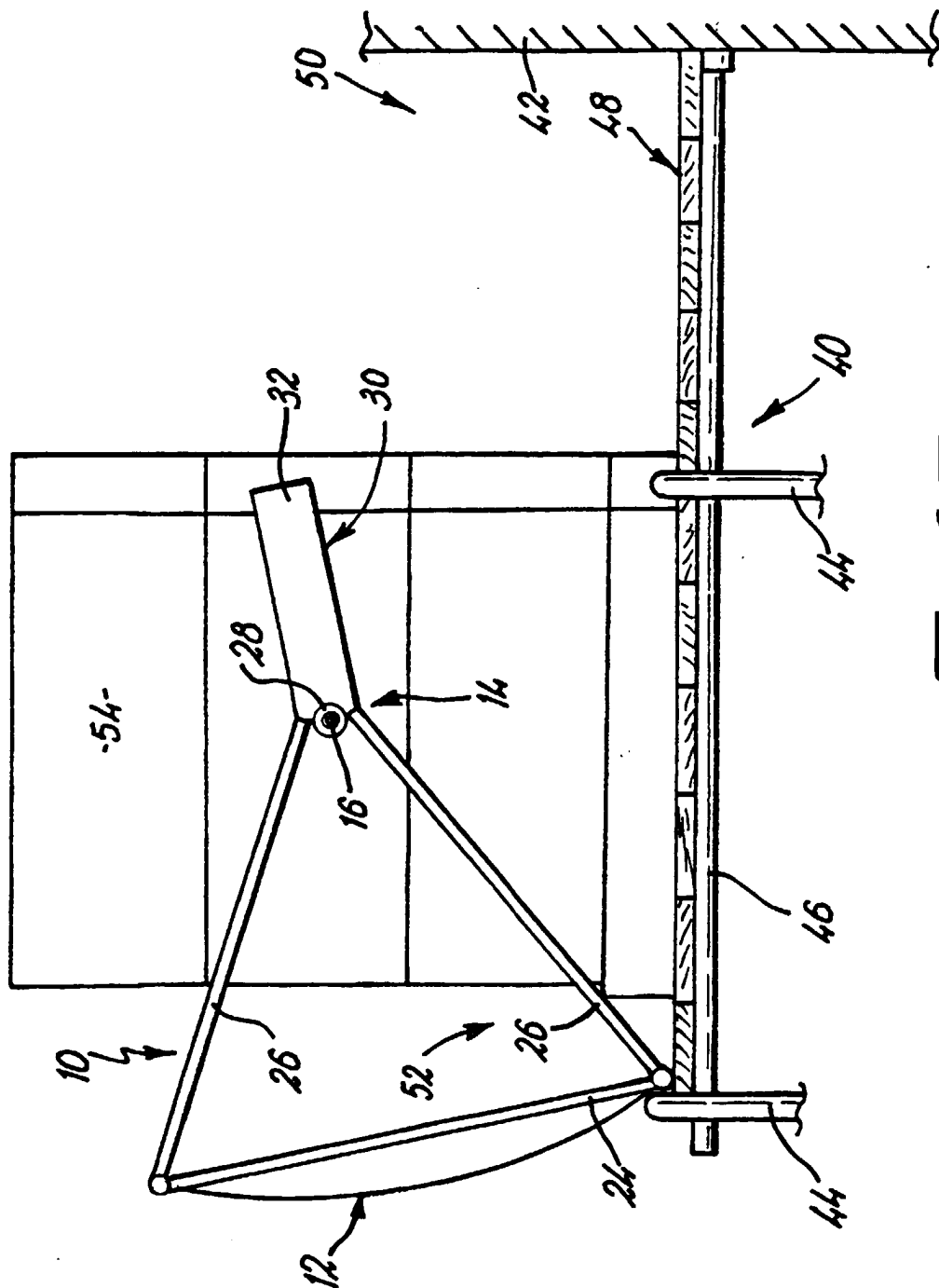


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 00 30 4895

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	GB 2 304 137 A (WRIGHT) 12 March 1997 (1997-03-12) * page 2, paragraph 3 - page 3; claims; figures * ---	1,4-6,8	E04G1/26
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04G E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 September 2000	Examiner Vijverman, W
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 00 30 4895

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